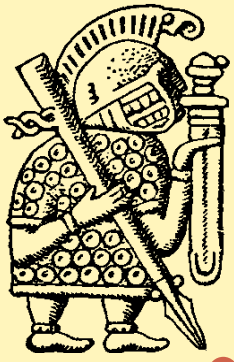

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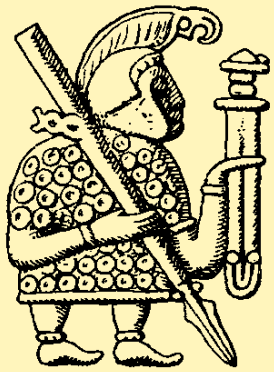

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Eastern Middle Sweden, Finland and beyond in the Late Vendel and Early Viking periods

In memory of Professor Ella Kivikoski, Helsingfors (1901–1990)

By Johan Callmer

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The Scandinavian interest in the Eurasian fur trade started in the early 8th century. Contacts between the Baltic Finns and the Permian groups in the Volga-Kama-Vjatka river region was the impetus for these contacts. The trail is seen in distinct Nevolino belt fittings, chain holders with twin horse heads and glass beads emanating from the East. Scandinavian fur traders established close interaction with the Baltic Finns in what is today Finland and probably Northern Estonia increased from AD 700. Scandinavian glass beads and swords were in use in South-Western Finland in the early 8th c. Finnish A III pottery emerged in Eastern Middle Sweden already in the late 7th c., both as imports proper but also as local products made by Finnish women. In this early phase of interaction personal contacts obviously played a major role. After c. AD 860 these connections changed. The Baltic Finns expressed their cultural identity in a more exposed way. Scandinavian traders turned their attention to the expanding market based on Birka and the Rus'. From c. AD 860 territorial claims in the East were accentuated, leading to the later, bigger Rus'.

Keywords: Fur trade, Baltic Finns, Merovingian Period, Viking Age, Eastern expansion, glass beads, Nevolino belts, Baltic Finnic fine ware, Carinated pottery

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Introduction

Before we start I want to be explicit about the time and the scene of this study. Our discussion is centered on the period before the Viking Period and on the very beginning of it. The scene unfolds in Eastern Middle Sweden and like a broad ribbon proceeds far towards the East. That means that not only the taiga wood lands east of Ladoga, on Beloe Ozero and further on towards the Vjatka and the Kama are in some respects included. For lack of space the highly relevant history of southern Ostrobothnia will not be discussed. However some data concerning this area appear on the maps.

This contribution is centered on the question why the remnants of material culture traveling between Eastern Middle Sweden, the Åland Islands and Finland and the lands beyond in the east are so much more plentiful

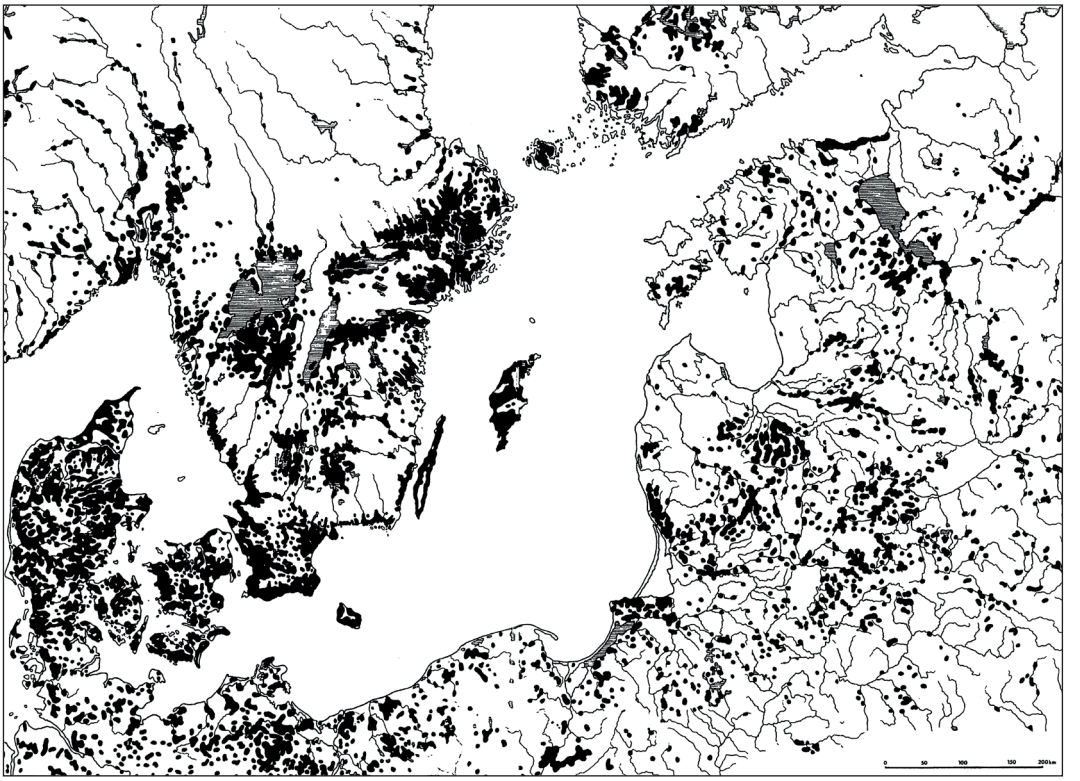

Fig. 1. The sedentary population of the Baltic Region ca. AD 800. Map: Johan Callmer.

during the century before the Viking Period and the Early Viking Period than before. The answer is of course that they indicate increased exchange but the next question is what exchange and why. The answer to these latter questions is no doubt complex. However it is my conviction that the motor behind these patterns of exchange is the fur trade (Henning 1930; Schier 1951; Odner 1981). That means that fur trade is the *sine qua non* of patterns of interaction beginning in the Early Middle Ages in Northern Europe and subsequently moving eastward during the later part of the Middle Ages crossing into western Siberia in the 15th century and moving further on through Siberia ending up in Alaska and on the western coast of Canada and the US in the 19th century. There the Russian trappers met the French and Anglo-Saxon backwoodsmen, who had begun their move towards the west in New England and on the St. Lawrence River in the 16th century. However it is also obvious that along with the fur trade went a number of more or less closely connected exchange systems. Only later the slave trade became increasingly important in the east. This is in my opinion something culminating in the 10th and 11th centuries. In the 8th century its impact had just begun to be discernible in the Baltic Region. We must also remember that slave trade never became important in the vast lands of the Euro-Asian taiga. The enormous distances and the demography never made it profitable in the north (fig. 1). Slave trade was something of the south with much more numerous populations.

It is most likely that a certain demand for high quality furs had developed in Southern Europe and the Orient already in the Late Bronze Age. We will, of course, not dwell on this early history of the fur trade here. Suffice it to say that after a period of strong development in the Late Roman and Early Migration Period

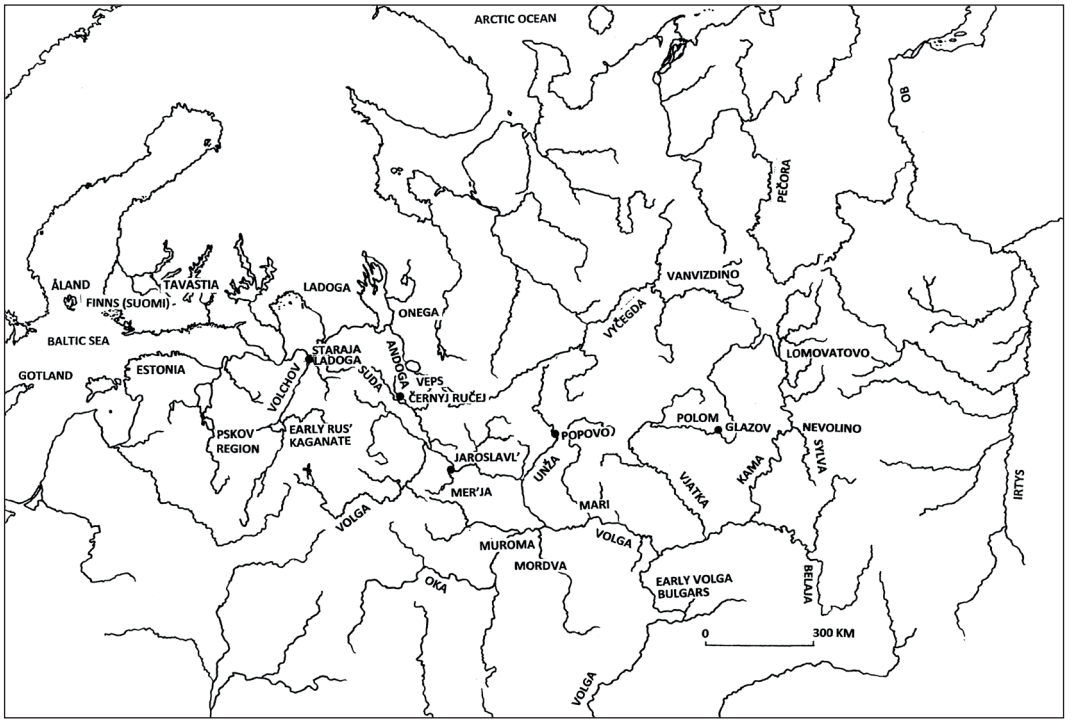

Fig. 2. North-Eastern Europe in the 8th and 9th centuries. Map: Johan Callmer.

we must note a certain weakening and slowing down of long distance trade. The reasons for this phenomenon will not be commented on here although this low is contemporary with a general slow-down. We must, however, assume that the fur trade had not ceased altogether but it is not until the later part of the 7th century or ca. 700 AD that the fur trade along with other strategies to exploit the taiga slowly begins to play an important role again in the North (Lindholm & Ljungkvist 2016, pp.13, 18–21; Hennius 2021). Most probably the real potential for the hunting of furbearing animals had been extinguished in many of the more easily reached parts of Scandinavia. Fur trapping in Eurasia from early times was practiced in excess. Furbearing animals with the best furs were hunted to extinction or almost extinction. This means that it took a very long time before the overhunted lands could be profitable hunting grounds again, if ever (Kirikov 1960).

The fur trade in the early 8th century: the lands between Uppland and the Kama

Finland had certainly been touched upon in the Roman and Migration periods but probably had a smaller community of hunters and far more extensive hunting grounds (Callmer 1986). The more distant lands further away towards the North and the East had not been tapped at all. However, if we switch our view towards North-Eastern Europe (fig. 2), we can follow a similar development. In the drainage of the big Volga tributaries, the Kama and the Vjatka, and in the taiga to the north of them fur hunting had been important for a long time as well. Probably we have a certain decrease in the activities in the Migration Period but in the 7th century exchange with the south rebounds. The contact ways towards the north were from the Caspian along the Volga towards the junctions with the Kama and the Vjatka and from the district of Khwarezm to the south of the Aral Sea following an old

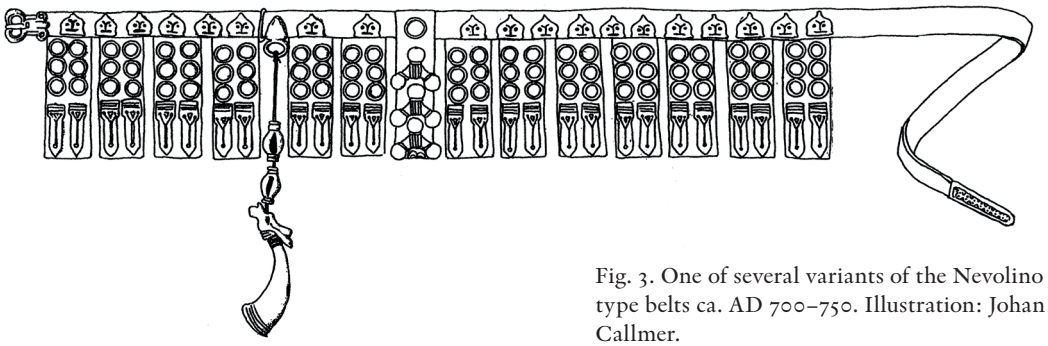

Fig. 3. One of several variants of the Nevolino type belts ca. AD 700–750. Illustration: Johan Callmer.

traditional caravan route across the steppe to the lower Kama River. The four or five key regions of these transactions were on the Kama and its tributaries and on the upper Čepca, a tributary of Vjatka. The local groups here are archaeologically named the Nevolino, the Lomovatovo and the Polom cultures (Goldina 1985; Goldina & Vodolago 1990; Ivanov 1998). However the real hunting was not so much there as in the taiga lands further north. There were long distance winter hunting expeditions setting out for many months in the taiga. For the hunting local groups along the northern rivers were even more important. We know them as the Vanvizdino culture and Proto-Samoyed groups (Česnokova 1983; Savel'eva 1995). Towards the north these exchange activities reached the coast of the Arctic Ocean (Murygin 1992). The exchange links emanating from the settlements on the Kama and the Vjatka rivers not only stretched out towards the north but also towards the east and the west.

For us the successive extension towards the west is of course most interesting. Distinctive cultural attributes from the Kama and the Vjatka turned up on the lower Oka River, a tributary joining the Volga from the southwest east of Moscow, in graves of the Mordovian and Muroma groups (e.g. Grišakov & Zeleneev 1990; e.g. Peterburgskij 2011). For reasons which will soon be obvious we are here primarily interested in finds of mounted belts of the so called Nevolino type (fig. 3). These belts imitate late heraldic Nomad belts and were produced in the Kama region. They date from the time around AD 700 to ca. AD 750 according to professor Rimma Goldina, the major authority on the Nevolino and Lomovatovo cultures (Goldina 2012). For some time the finds in the Oka region were used to reconstruct a south-western trade link along the middle Volga (Carpelan 2004). Today we must, however, consider another more likely extension of the eastern fur trade network towards the west. Excavations of two key sites in the taiga ca. 600 km directly west of the Čepca settlements (fig. 2) bear ample evidence of close contacts with the east and visits of people coming from that direction. We are here concerned with the two settlements Popovo Gorodišče (Leont'ev 1989) and Unorož (Rjabinin 1992). A further 300 km on towards the west, in the lands of the Veps, settlement sites and cremation cemeteries at Černyj Ručej and Stupolochta yielded a rich material indicating very close and regular contacts not only in general with the east but more exactly with the Kama-Vjatka heartlands (Kudrjašov 2008; 2014). Among the finds there are distinctive Nevolino belts (fig. 3), beads and pottery indicative of the early 8th century. With this new *pointe d'appui* we are no more than another 300 km from Lake Ladoga. At Staraja Ladoga just south of the lake there is another, rather old, grave find with a Nevolino belt close by Staraja Ladoga (Brandenburg 1895). This new situation is of course highly interesting with regard to the strong representation of Nevolino belts in western Finland (fig. 4) (Kivikoski 1973, pp. 83–84). The majority of the finds are from Satakunda. The other contemporary eastern imports to Finland will not be treated here for

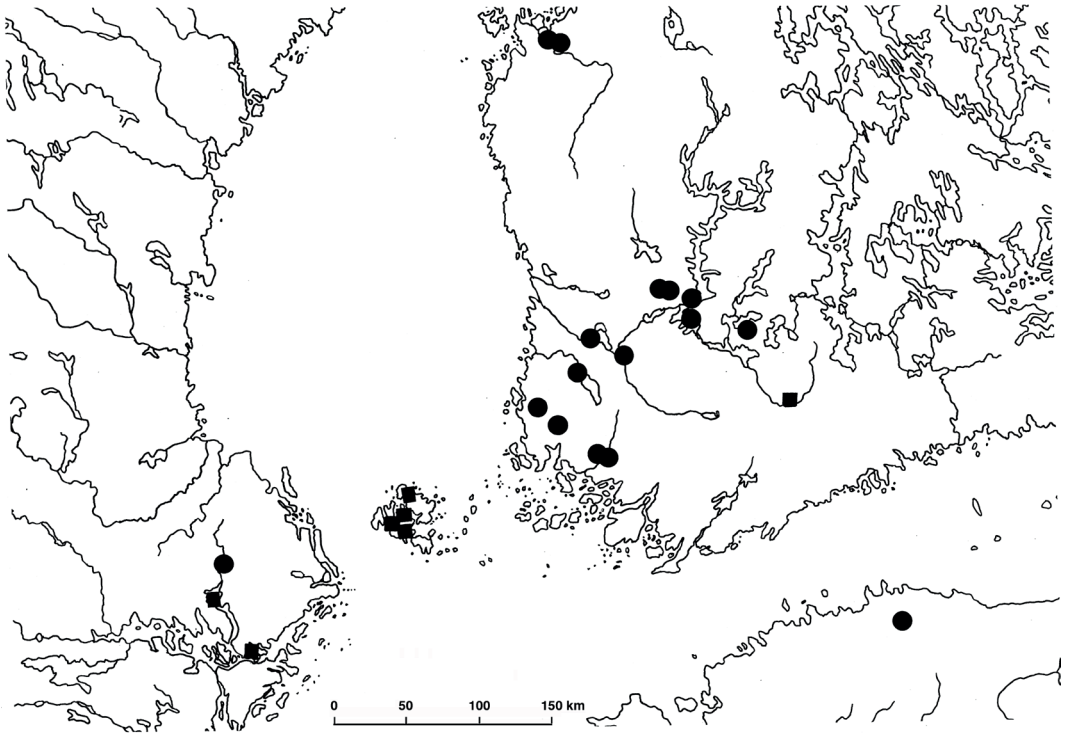

Fig. 4. Finds of Nevolino type belts (dots) and Nevolino beads (squares) in the central Baltic Region ca. AD 700–750. Map: Johan Callmer.

lack of space. Very striking is also a well known old find from the so called Gold Barrow at Gamla Uppsala (Ljungkvist 2013). That there are no other find on the Swedish side may be a coincidence. There are very few really rich finds from men's cremation burials in Eastern Middle Sweden. Quite important is the occurrence of an Eastern belt buckle dating from the second half of the 8th century in one of the graves in the Helgö cemeteries (most probably Late Nevolino) (Melin 2001, p. 24). On the map fig. 4 finds of glass beads of a distinctive Nevolino type with eight raised eyes are also marked. The Swedish finds on the map are only two but from Åland we have four finds. The finds are perhaps not so many but they are definitely there and tell of a more differentiated exchange pattern. It is quite interesting that these two finds on the Swedish side have been found in two micro regions, which remain important for exchange with Finland.

This eastern link obviously fascinated many Finnish scholars. Meinander in a well-known article in the Kivikoski festschrift stressed the changed sexual attribution of the Nevolino belts from female to male among the Western Finns (Meinander 1973, p. 150). The problem may not be that great. Belts with bronze mounts are in general carried by men in major parts of Europe in the Early Medieval period. Already among the Finnish groups on the Oka the female connection is more or less lost. So the Finnish warriors parading the Nevolino belts were after all not laughed at by Eastern guests. We must consider it most likely that the Finns procured many of these belts from Veps groups (e.g. the Černyj Ručej–Stupolochta settlements cf. above), whom they met on long distance hunting expeditions. The appearance of Veps hunters on the Finnish lake plateau cannot either be ruled out. It is quite possible that we had quite a complex cultural situation in inner Finland in the 8th century with

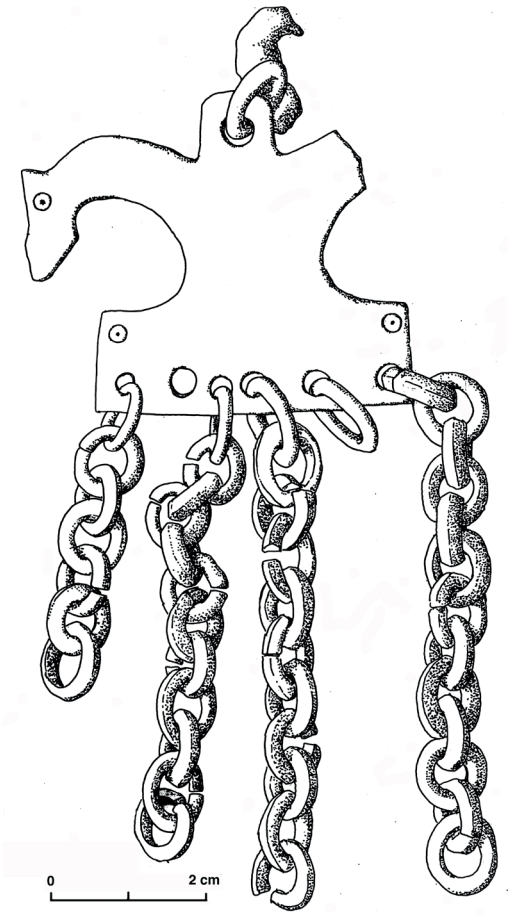

Fig. 5. Chain holder of East-Finnish type produced in Finland ca. AD 700–750. Illustration: Johan Callmer.

Finns of two kinds, Sami and also the Eastern guests.

The strength of this cultural transmission from the east is very considerable and as well complex. This is also clearly indicated through the chain holders with two reversed horse heads known from finds in Finland Proper and on the Åland Islands (fig. 5). It seems they are exactly contemporary with the Nevolino-belts. The motive became popular in the 6th and 7th centuries among the population in the Kama-Vjatka area. The horse became a strongly loaded symbol for positive powers and kept its popularity among many Eastern Finnish groups for centuries (Pavlova 2008, pp. 91–103). Somehow the horse succeeded the elk as one of the most important of the holy animals. The horse may have been seen both as a cultural being and as a part of nature and consequently an important mediator. The acceptation of this form among the population of Finland may make us inclined to modify our somewhat negative view of the possibility of encounters not only with Veps but also with Permiaks from further east. Space does not allow us to discuss the earliest neck rings of the Glazov type and their appearance in the west. They, however, also belong in this very special cultural and economic situation (Callmer 2015) as well as some early examples of round bottomed pottery with cord decoration (Hirviluoto 1986).

Fur hunting and exchange in Finland in the 8th and 9th centuries

As repeatedly stressed interaction between Finland and Eastern Middle Sweden increased steadily through the 7th century and became intensive from ca. AD 700. Since the days of prof. Ella Kivikoski comparatively little research has been carried out on the specific questions of trade relationships and cultural interaction between Eastern Middle Sweden and Finland. Numerous studies have touched on the subject but have not penetrated into the intricate complex of questions related to the interaction between the two regions. Swedish and Finnish scholars carry equal responsibility for this somewhat strange deficit.

The question who were the hunters of furs cannot be answered satisfactory presently. Members of the Finnish groups especially in inner Satakunda and Tavastia may have taken part but their main interest was probably to profit from the exchange along the route towards the coast. The most important hunters were no doubt the Sami groups of Northern Fenno-Scandia including major parts of inner Finland. The relationship between the Sami and the sedentary Finnish may be understood in the light of what we know about Norse and Sami coexistence in the Viking Period. Exchange with the Sami and tributes from dependent Sami groups were preconditions for the wealth of Norse chieftains (Hansen 1990). This conclusion I have arrived

at according to my idea of how hunting was organized further east. This medieval fur hunting period in Northeastern Europe and Western Siberia is after all well documented (cf. Delort 1979). The problem as we all know is the vague and elusive cultural remains of the Sami culture. More targeted and creative research in Sweden, Finland and Russia is needed.

We have seen that the transfer of Scandinavian metalwork to Finland, both weapons and jewelry, became very considerable in the late Merovingian Period. For some reason import from Gotland has been suggested for several items (Lehtosalo-Hilander 1983; Schauman-Lönnquist 1994). To me the stressing of Gotlanders as important traders in Finnish-Swedish exchange

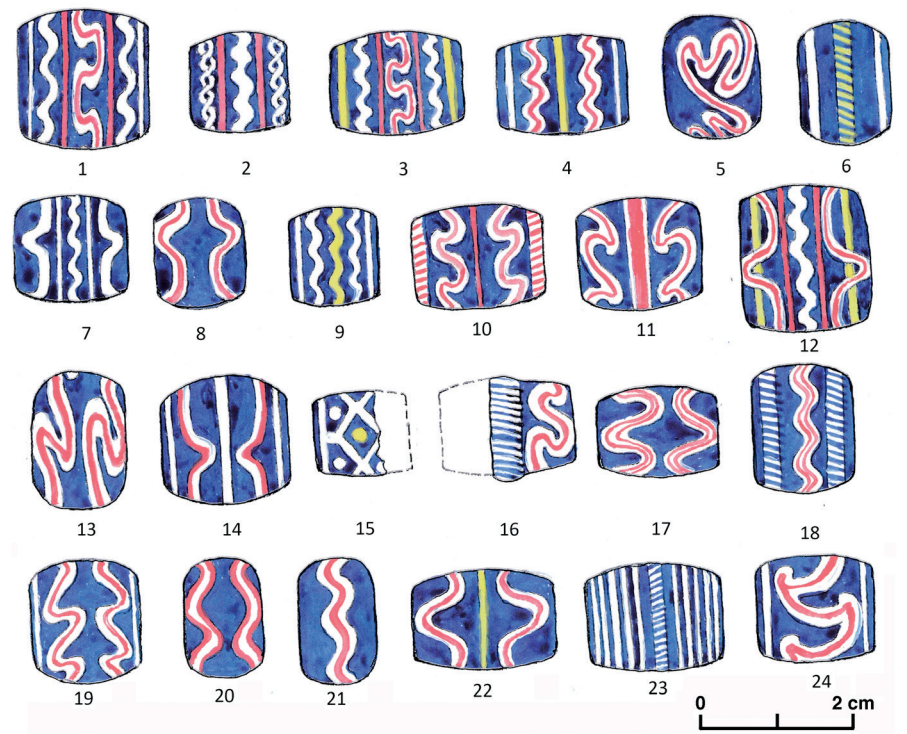

Fig. 6. Scandinavian blue, white and red beads found in Finland ca. AD 710–760. Row 1 from the left: 1) KM 1112 Ostrobothnia, Storkyro (Isokyrö) parish, 2) KM 2548:37 Finland Proper, Letala (Laitila) parish, Kansakoulumäki, 3) KM 2918:1 Satakunda, Kivijärvi parish, Kivijärvi, 4–6) KM 2995: 11 Satakunda, Eura parish, Käräjämäki. Row 2 from the left: 7–8) KM 2995:13 Satakunda, Eura parish, Käräjämäki, 9) KM 2995:11 Satakunda, Eura parish, Käräjämäki, 10–11) KM 2996 Ostrobothnia, Vörå (Vöyri) parish, Gulldynt, 12) KM 3336;65 Finland Proper, Kaland (Kalanti) parish, Hallu. Row 3 from the left: 13) KM 4162:2 Finland Proper, Sagu (Sauvo) parish, Pappila, 14) KM 4573:12 Satakunda, Karkku parish, Kirkkovainio, 15) KM 5270 Finland Proper, Kaland (Kalanti) parish, 16) KM 5853:94 Satakunda, Karkku parish, Palviala, Tuomisto, 17) KM 6913:33 Finland Proper, S:t Karins (Kaarina) parish, Ristimäki, 18) KM 6913:166 Finland Proper, S:t Karins (Kaarina) parish, Ristimäki. Row 4 from the left: 19) KM 6913:184 Finland Proper, S:t Karins (Kaarina) parish, Ristimäki, 20) KM 8912:840 Finland Proper, Kaland (Kalanti) parish, Kalmumäki, 21) KM 8912:931 Finland Proper, Kaland (Kalanti) parish, Kalmumäki, 22) KM 11063:453 Satakunda, Eura sn, Pappilanmäki, 23) KM 11063:459 Satakunda, Eura sn, Pappilanmäki, 24) KM 11063:458 Satakunda, Eura sn, Pappilanmäki. Illustration: Johan Callmer.

leads in the wrong direction and is poorly supported by the find material when we are interested in the period AD 700–1000. The importance of Gotland in these transactions comes after AD 1000. I have chosen to present a map of the distribution of glass beads of Scandinavian production using mainly blue glass for the body and white and red (and occasionally yellow) for decoration (Callmer 2007) (fig. 6). The distribution of these blue-white and red beads stretches from Eastern Middle Sweden and the Åland Islands over to Finland and reaches the interior (fig. 7). This type of beads we find all over Scandinavia. The excellent thing about these beads is that the production is firmly dated to ca. AD 710–760. Of course, they could turn up a little later as well as antiquities but the record is rather that that seldom is the case. The very interesting second thing about these beads is that they are never found in contemporary graves on Gotland and from settlements they are only known from the very special coastal site of Paviken on the coast of southwestern Gotland with many non-Gotlandic finds (Lundström 1981). This is of course very strange but the Gotlanders would not use glass beads of the types used in the rest of Scandinavia. They made their own beads from imported glass (Callmer 2006; Råhlander in prep.). The exclusivity of the Gotlandic culture had to be maintained into absurdity. From the 7th century onward they also used different special Gotlandic items of bronze in their dress. As far as I can see there are almost no finds at all of Gotlandic origin from the 8th and 9th centuries found in Finland. Consequently it is my conviction that the importation of things from the Southwest to Finland arrived from Eastern Middle Sweden possibly often via the Åland Islands.

Let us however go back to the first half of the 8th century and the blue, white, red beads (fig. 7). When I now discuss the Finnish finds it is important to state that my knowledge is based

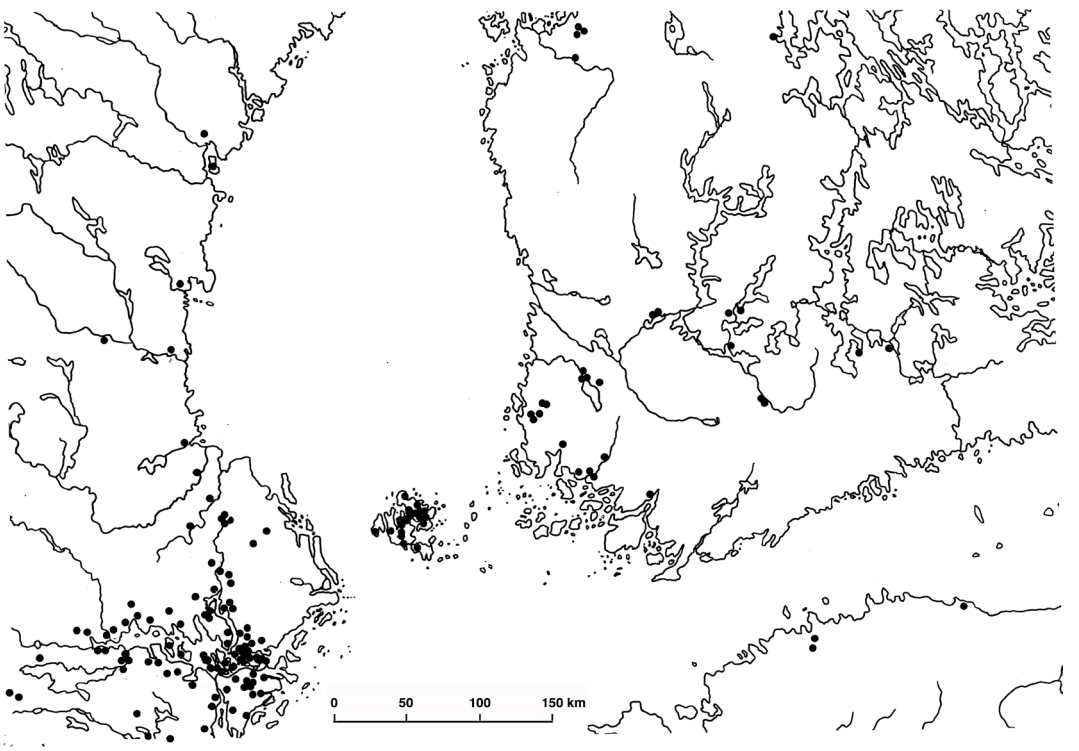

Fig. 7. Finds of Scandinavian blue, white and red beads in the Central Baltic Region ca. AD 710–760. Please note that the easternmost finds are outside the coverage of the map. Map: Johan Callmer.

on my notes from 1979 with only a few later additions. It must be assumed that the number of finds is bigger today. The finds in Finland show an interesting distribution with the majority of the finds from the inland regions of Satakunda and Tavastia. In fact they reach as far as eastern Tavastia with the striking depot from Mäntylä, Kernaala in Janakkala parish (Schauman 1971, p. 18) (fig. 8). That means that the beads reached not so far from more the limits of permanently settled country in Finland. From Kivijärvi in northernmost Tavastia comes a stray find of a bead of this type (KM 2918:1). No doubt this is a find far away from settled land. It is also important that these bead finds are contemporary with the Nevolino belts. In the Kernaala find the various cultural influences in the interior of Finland can be demonstrated in a most striking

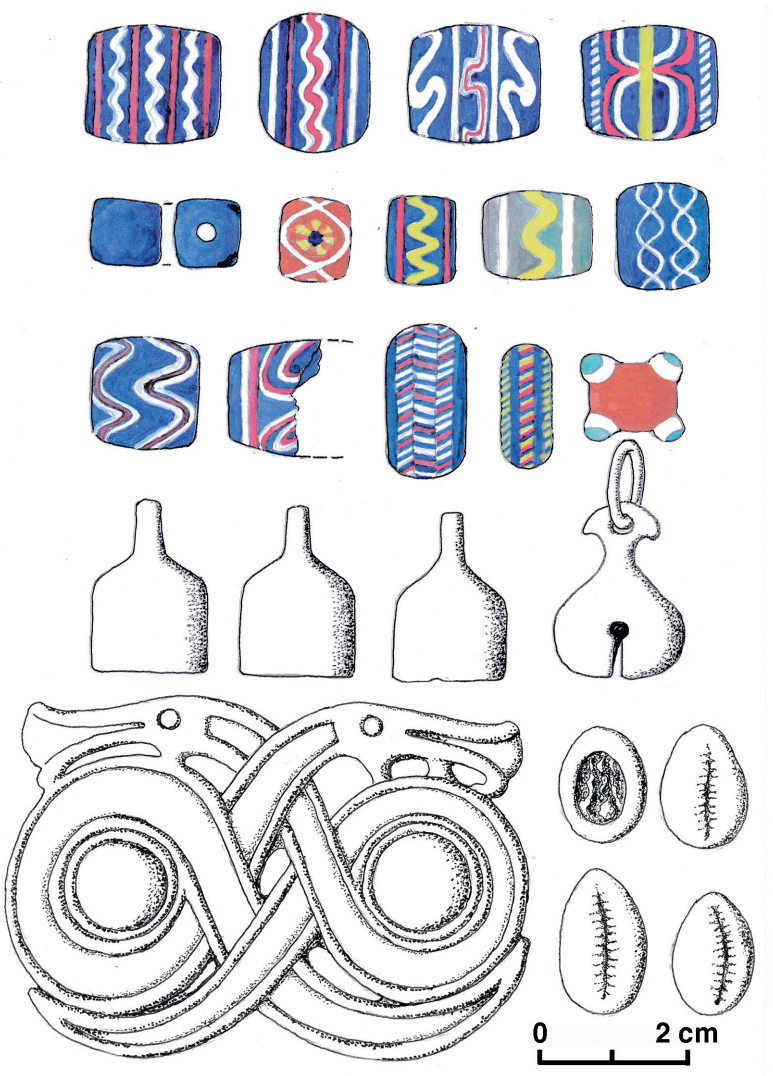

Fig. 8. The depot found at Mäntylä farm, Kernaala, Janakkala parish in eastern Tavastia ca. AD 700–750. A loop-shaped dragon fibula, three bottle-shaped pendants, a jingle bell, 14 glass beads and four cowries. Illustration: Johan Callmer.

and instructive manner and thus merits some detailed comments. The Keernala find is a chance find retrieved when a new byre had to be built at the Mäntylä farm in Kernaala. Most probably this is a depot and not a grave. It belongs to a small group of similar finds deposited in the 8th century in innermost Tavastia. The three finds were all made close to the southern end of Lake Päijänne. This is one of the major lakes in Finland, often rather narrow but more than 120 km long and with a south-north extension. It is the given way both in summer and in winter for those who want to penetrate deeper into the taiga zone. The zone in the south where the deposits were interred is, as already noted, in fact the very borderline of Finnish settlement in the interior in the first half of the 8th century. Further north and further east was most probably Sami territory. Later in the Viking Period Tavast settlement expanded further north. All three deposits comprise magnificent chain sets and in addition copper alloy jewelry and beads which are strong indications of relative wealth among the Finns here. The center piece in the Kernaala depot is the chain set with eight chains and spacers and holders. A very similar chain set is depicted by Kivikoski (1973, p. 70, Tafel 51:469). In addition to the chain set there is a triangular pendant no doubt a Finnish item (Kivikoski 1973, p. 71). Associations with the west and more precisely with the Åland Islands and Eastern Middle Sweden we note for thirteen of the glass beads. Eleven beads are very typical representatives of the already mentioned Scandinavian blue-white-red beads (dating AD 710–760) (Callmer 2007) and another two beads are also no doubt Scandinavian. The fourteenth bead is perhaps the most interesting. This is an elongated reddish brown, opaque bead with four white and turquoise eyes at each end. This type of bead often also turns up with identical eyes but with a black body. This is, as already stated, an eastern bead with no connection with the West. These beads are very characteristic of the Nevolino-culture on the Sylva River, tributary of the Kama, from where the Nevolino belts came (Goldina 2010, pp. 35–36, 55). They are, as I have pointed out, also closely contemporary with the belts. With the exception of a few finds on the Åland Islands and in Eastern Middle Sweden these beads are never found in other parts of Scandinavia. Seen in a wider perspective these beads turn up among the Mordovians (Peterburgskij 2011, p. 104), on the lower Volga, in the Northern Caucasus and in Northern Iran (Kovalevskaja 2000, pp. 49–52; Fukai 1977, Pl. 47). They must be products of the early Caliphate. Contacts even further away are indicated by four cowries (Cyprea moneta) the top of one of which has been sawn off. Cowries of this Cyprea species appear in North-European finds in the second half of the 7th century. Among the early 7th and 8th century finds the vast majority are from the North (Northern Norway: Vinsrygg 1979, p. 27) and the Northeast (Finland: Kivikoski 1973, p. 73, Estonia: Tvauri 2012, p. 149 and Latvia: Mugurevič 1965, pp. 54–59, Urtans 1970, p. 75). From Birka there are 7 specimens found in the 19th century excavations in the Black Earth (Stolpe 1876, p. 626). Their dating is unfortunately uncertain. Cowries are also frequent finds among the Volga Finns (e.g. Peterburgskij 2011, p. 104). From the Late Viking Period we have some finds from Gotland (Thunmark-Nylén 2006, pp. 225–226). The eastern connections are also evident with the appearance of three bottle shaped copper alloy pendants in the Kernaala find (Kivikoski 1973, p. 73). These pendants are part of the Finnish dress style together with numerous other jingling pendants so typical of Finnish women's dress. Bottle shaped pendants are found among the Volga-Finnish and Permian groups. They appear in a few different variants, sometimes even with applied secondary ringing pendants. The variant met with here is plain and rather big. They are most common among the Merja (Leont'ev 1996, pp. 174, 211, 224), Mari and Udmurt groups (Goldina 1985, p. 47). It is worth noting that they are not found among the Nevolino groups on the Sylva mentioned above. The Mordovians have similar pendants but they are a little smaller and more slender (Peterburgskij 2011, p. 105). These bottle shaped pendants look like little bells, but they were carried on thin tresses or on wool cords. When the bearer was in motion they would produce a clinking sound. It is also important that we have a whole set of pendants intended

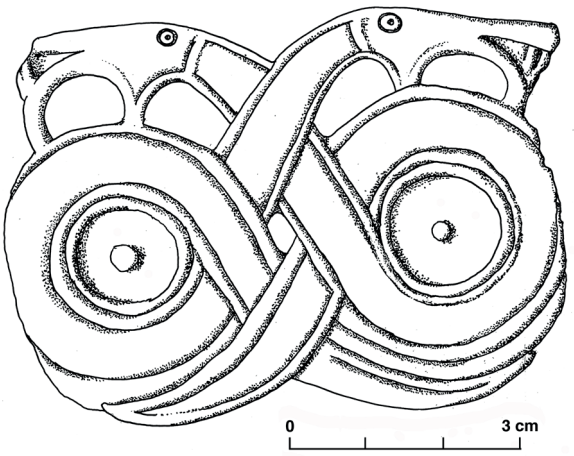

Fig. 9. Loop-shaped dragon fibula ca. AD 700–750. Illustration: Johan Callmer.

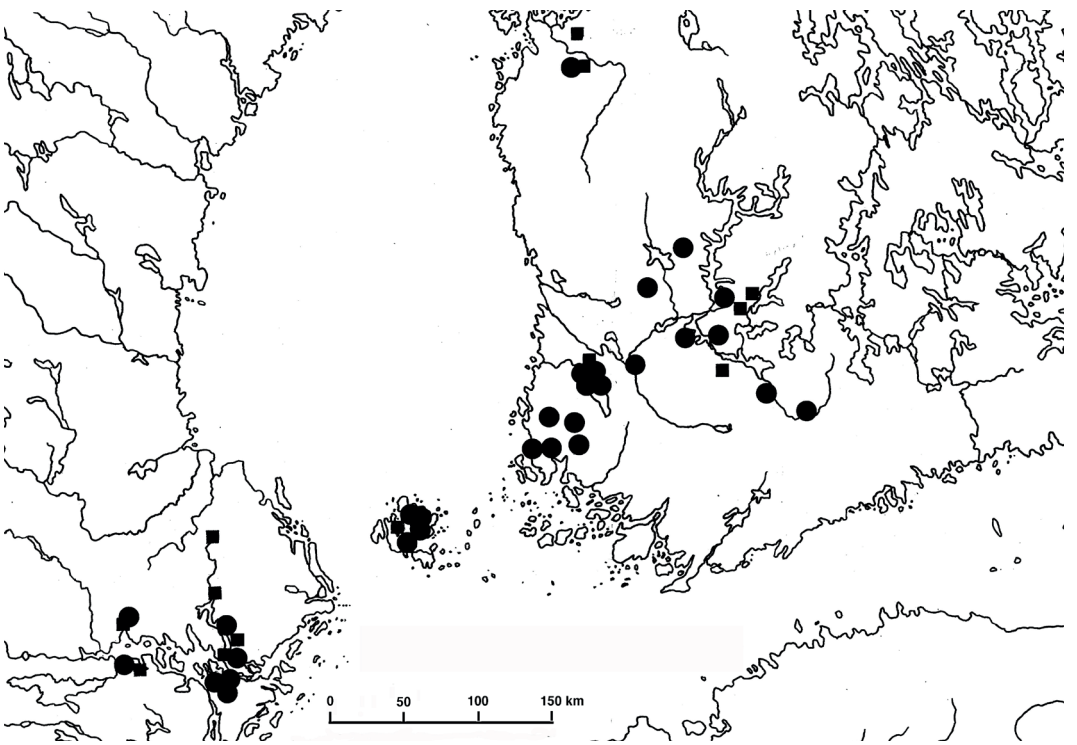

Fig. 10. Finds of loop-shaped dragon fibulae in the Central Baltic Region ca. AD 650–750. The squares indicate early fibulae of smaller size. Map: Johan Callmer.

for their original function in dress. There are other find localities from Finland, one of which is from the Papinsaari (Kuhmoinen parish) depot in Tavastia with a single pendant (Kivikoski 1973, p. 73; Raisio 2010, p. 63). A cemetery in Western Finland yielded two pendants, but they were not found together, and another find also in the south-west is as well of a single pendant. Beside the pendants there is in this rich depot also an elegantly designed jingle bell which is

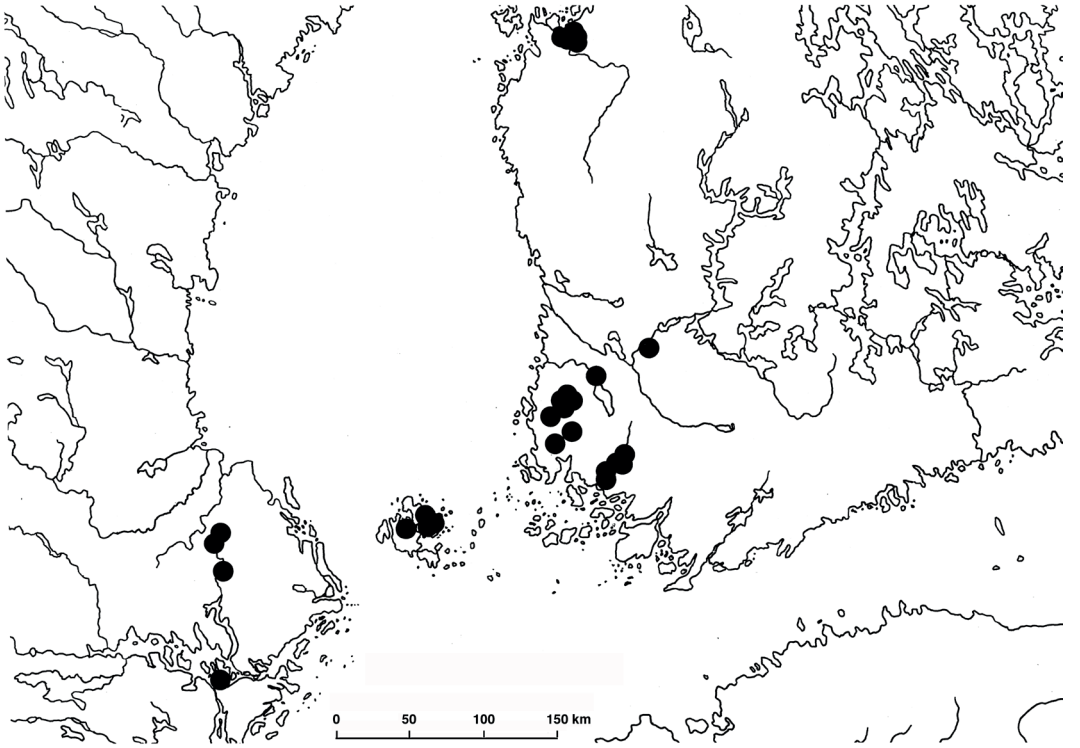

Fig. 11. Finds of high status Scandinavian swords with bronze hilts in the Central Baltic Region ca. AD 700–800. Map: Johan Callmer.

difficult to place in a Finnish cultural milieu (Kivikoski 1973, p. 73). In what direction we should look for parallels is difficult to say. The last find to be mentioned here from the Kernaala depot is a loop-shaped dragon fibula and it actualizes again specifically the questions concerning exchange between Eastern Middle Sweden and Finland.

Let us have a closer look on these rather singular loop-shaped dragon fibulae (fig. 9) (Cleve 1927; Kivikoski 1973, p. 62). This type of fibula is the only one with Germanic animal ornamentation in the Merovingian Period in Finland. From rather smallish forms in the 7th century they develop into much bigger fibulae with a single or two animals. The last fibulae of this kind probably were made in the late 8th century or ca. AD 800. Both early and late forms occur in Eastern Middle Sweden, on the Åland Islands and in Finland. It is important that a mould for casting this type of fibula was found in building group 2 on Helgö. The origin of this form of fibula with its striking animal decoration is by all means located on the Swedish side. As Nils Åberg pointed out already more than half a century ago it is not a Gotlandic form (1953). The distribution in Finland is in my opinion somewhat singular (fig. 10). It seems that the find spots together form a rather straight line from the Kaland–Letala region on the coast towards the northeast through central Satakunda into the Finnish Lake Plateau. There are only two finds in Tavastia in addition to the Kernaala find. It is difficult to avoid the impression that this rather linear distribution marks a chain of interaction and communication from Eastern Middle Sweden and Åland on to the Finnish side and into the interior. It seems as if the southern part of Finland Proper was not involved. If these interpretations are correct it follows that individuals and groups all along the chain were aware of the importance of this sign of agree-

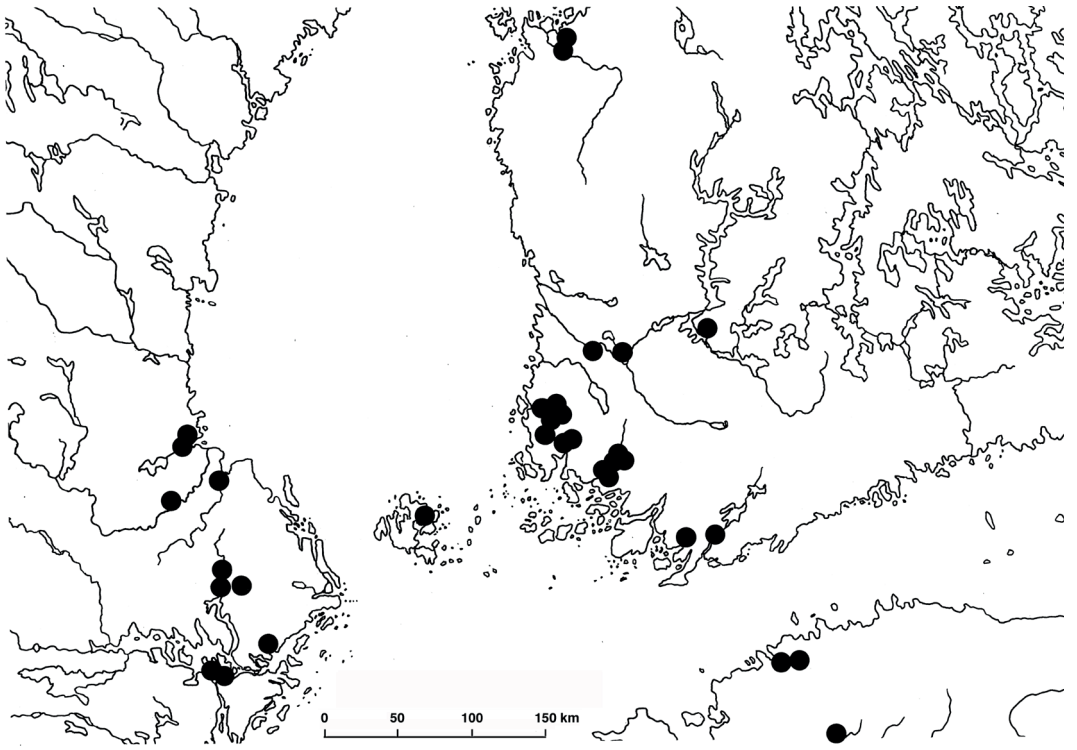

Fig. 12. Finds of type B-swords (Petersen 1919) in the Central Baltic Region ca. AD 760–800. Map: Johan Callmer.

ment and trust for the transfer of products and for travel. We can dimly imagine a long social chain with several links and many actors. And last and not least this means that women were quite important to maintain this system.

Imported combs and weapons in Finland

When we again turn to the archaeological record to tell us more about interaction between Eastern Middle Sweden and Finland we have at our disposal a wealth of relevant finds from the cemeteries on the Finnish side. A little known category of Scandinavian craft products brought over to Finland are antler combs. Fragments of Pre-Viking and Viking Period combs are known from Finnish cremation cemeteries. This is however a difficult material to work with and as yet there is no study of them. Pre-Viking and Viking Age combs have been found far to the east even into the basin of the Volga (Sarskoe Gorodišče; Leont'ev 1996, pp. 150–153). We have, as already pointed out, many finds of imported weapons. In earlier research it has, as already stressed, often been argued that the import of weapons came from Gotland where beautifully ornamented hilts and scabbards were added to Continental sword blades (fig. 11) (Nordman 1931; Salmo 1938; Lehtosalo-Hilander 1983; Schauman-Lönnquist 1994). Later the ornamental details on the swords became less popular and the import is then more or less described as a direct import to Finland from Western Europe. We may have a look at a map of the distribution of the type B swords from the late 8th century or ca. AD 800 (fig. 12). Many high quality lance heads came the same way according to the same scholars. In my opinion this view on the importation of weapons during our period of interest is unlikely. The importance of Gotland is, as already pointed out, overstated as far as Finland and, we assume, Estonia as well are concerned. It is likely that Gotlanders

had closer contacts with the Balt peoples in the Gulf of Riga, in Curonia and in Prussia. These lands were rather densely populated which could mean that slave trade became important rather early. Prussia and the Curonian coast were also rich in amber. Amber had a considerable value and was in great demand. The moment for the Gotlanders in the trade on Finland comes, as I have already pointed out above, after AD 1000. The trade route bringing West-European high quality arms entered the Baltic at the crossing in Slesvig and proceeded along the East-Scandinavian coast to Eastern Middle Sweden and then on via the Åland Islands across to Finland. The reasons for this misconception, I think, are several. One important reason is a strongly negative attitude towards display of weapons on the male side in the almost totally dominant cremation rite burials in Eastern Middle Sweden and on the Åland Islands. We do not know if weapon parts were removed from the pyre or if weapons were not represented at all among the grave goods. There is no reason to think that the male population of eastern Middle Sweden was less well provided with weapons than their counterparts in Norway for example. The inhumations in boats at Vendel, Valsgärde and Ulltuna are strange exceptions to this rule. Unfortunately they take much attention among many scholars. The very few sword finds in the cremation graves from the Merovingian Period in Eastern Middle Sweden are mainly from the 7th century or from ca. AD 700. There are in fact only two cremation grave complexes with swords to discuss before the inception of the B-swords towards the end of the 8th century. On the Finnish side we have numerous finds of splendid imported weapons. In Finland they eloquently speak for the high status of local potentates in the key areas of coastal Finland and on the major trails towards the interior (Raninen 2005). The most striking example is the sword grave from Pappilanmäki, Eura parish in Lower Satakunda (Salmo 1940). This grave also was equipped with a Permian belt. Near the coast control over economic transactions with people from outside was easy. Only rather few of these weapons reached the hinterland.

Were there no items of material culture in addition to the furs coming across the water from Finland? It has often been pointed out that small iron fibulae (Moilanen 2013) and penannular brooches of the same material on the Åland Islands and in Eastern Middle Sweden could be imports from Finland. Unfortunately iron fibulae and brooches seem to turn up all over Scandinavia and it could in my opinion as well be the other way round. Consequently we have to try harder to find evidence of exchange directed from Finland to Eastern Middle Sweden and Åland.

Finnish pottery and potters in Eastern Middle Sweden and on the Åland Islands

With her for that time (1955) excellent and pioneering dissertation on the Viking Period and Early Medieval pottery of Sweden Dagmar Selling opened a new possibility to study long distance exchange. As her category AIII she defined thin shelled pottery of Finnish type. Notwithstanding the very positive impact on research there were three shortcomings with Selling's treatment of her sources. For practical reasons her work was centered on the Birka material with the study of which she had been engaged for so many years. One of the major draw backs of the Birka material was its strong domination of 10th-century graves. From the grave inventories at Birka there are thirty one complexes with AIII pottery of which however seven cannot be closely dated. Sixteen graves can be dated to after AD 860. Only eight graves belong to the period before that date. The second problem was the weak control on chronology. There were considerable uncertainty when differentiating between the 8th, the 9th and the 10th centuries. Selling was of the opinion that the 10th-century finds also outside Birka dominated heavily and that the early finds outside Birka were few and did not go back in time before the end of the 9th century (Selling 1955, p. 147). Unfortunately Selling had only very limited knowledge of the comparative find material in Helsingfors (at that time with many finds from the Åland Islands) and she had not visited the Åland Islands and the museum at Mariehamn. Already in the late sixties I became interested in the Finnish pottery in Sweden and on the Åland Islands. With time the number of Swedish finds outside Birka increased

Fig. 13. Finds of Early Finnish (and Estonian) pottery vessels of type AIII (Selling 1955) in Eastern Middle Sweden and on the Åland Islands ca. AD 700–860. Map: Johan Callmer.

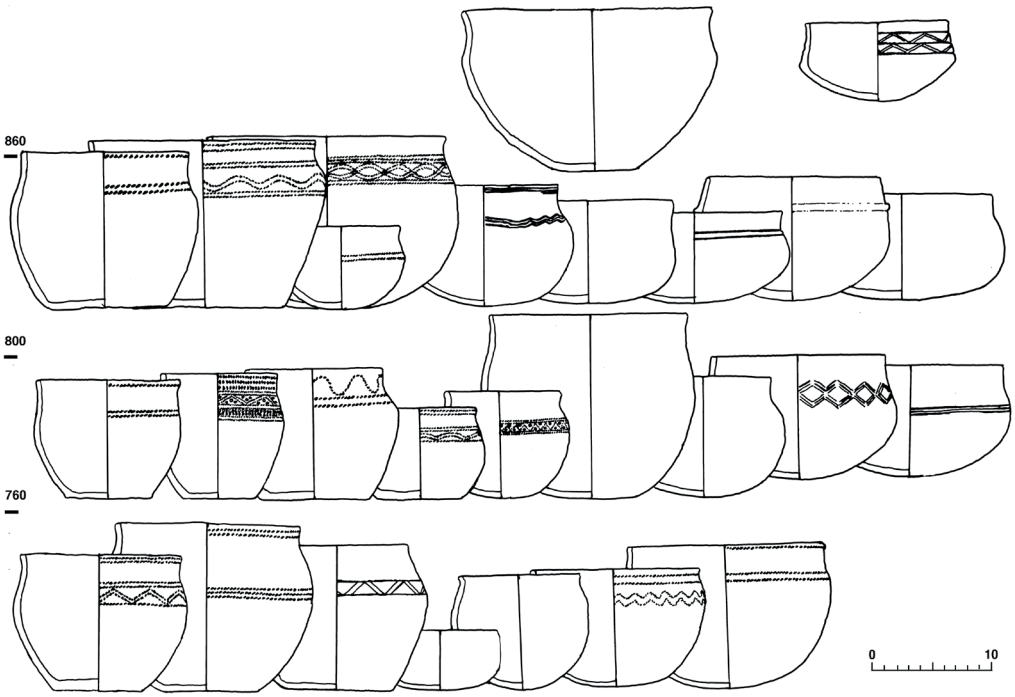

Fig. 14. Early Finnish (and Estonian) pottery vessels of type A III (Selling 1955) in Eastern Middle Sweden ca. AD 700–860 (grave finds). Illustration: Johan Callmer.

substantially (today at least 40 finds from before AD 860). More striking was however the number of finds on the Åland Islands (today 48 finds from before AD 860). Concerning numbers we must remember that only finds with a reliable dating are counted. There was also a number of new data on technology and typology. However the major innovation in research was in fact the obvious chronology. Even the find material available for Selling should have told her that there were several early finds. Today we can state that Finnish fine pottery begins to arrive in Sweden already at the very end of the 7th century or ca. AD 700 (Callmer in prep.). The Finnish pottery on the Åland Islands, as we may expect, is equally early and the number of finds is larger than on the Swedish side.

All the parishes on Central Åland (including Eckerö and Lemland) have several finds. In Eastern Middle Sweden the distribution of finds is of more interest (fig. 13). Looking at this distribution map of the finds of Finnish pottery there we must of course consider the very large number of excavated cemeteries in some key regions of today. The find localities to the North of Stockholm are located in an area with very many excavations. We must also note that the number of excavations of cemeteries in the coastal region of the province of Uppland is very small. This is of course negative since we could expect the coastal population to have been engaged in contacts and water transport. There is no located and excavated coastal site in the region dating to before the end of the 10th century, which of course is another serious deficit. With due regard to these problems we can single out three micro regions with early Finnish pottery (ca. AD 700–860). The Uppsala region is important with regard to the centre there and the recent excavations have brought even more relevant pottery finds to light (they are not considered here). The Southernmost part of the medieval district of

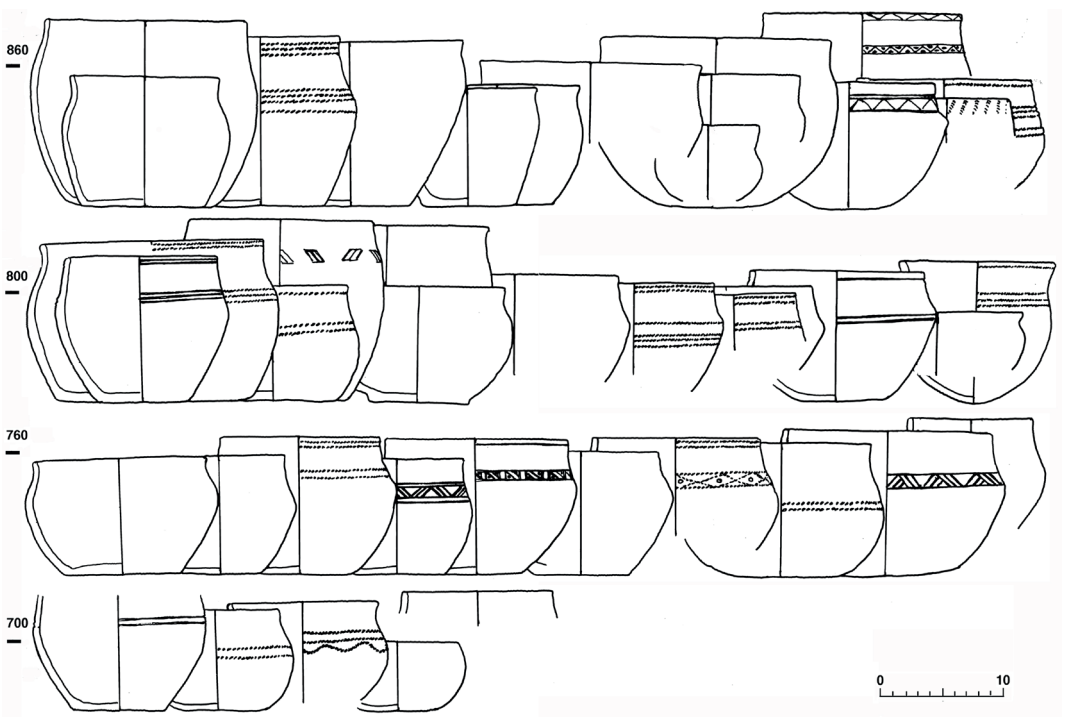

Fig. 15. Early Finnish (and Estonian) pottery vessels of type A III (Selling 1955) on the Åland Islands ca. AD 700–860 (grave finds). Illustration: Johan Callmer.

Roden (i.e. finds to the West of Stockholm and on the big islands in the eastern part of Lake Mälaren. Most striking is the almost complete absence of finds in the eastern and central parts of the province of Södermanland (only one find). The number of excavations there has however also been limited. A little astonishing are the finds quite far away in the western part of the same province. Already Selling's map showed the same main tendencies. In this early phase of intensive interaction between the two sides of the Baltic we can state that there were population groups in some distinct parts that were engaged and other groups which were not or much less so.

Now let us have a look at the AIII fine pottery itself (figs. 13–14). The Finnish fine pottery vessels from Eastern Middle Sweden and the Åland Islands are mainly rather small. The height seldom exceeds twenty centimeters (the smallest is only 5.6 cm high) and the diameter is mostly less than sixteen centimeters (the biggest diameter is 20.3 cm). The volume is between ca. 30 and ca. 400 centiliters. In fact there are three size groups. Group 1 comprises vessels holding ca. 30–40 centiliters. Much bigger vessels holding 100–150 centiliters form group 2. Group 3 comprises very big vessels holding as much as 200–400 centiliters. The small vessels of group 1 no doubt represent drinking cups. Vessels of groups 2 and 3 could be interpreted as bowls. Seen together these vessels could be understood as pieces in representative drinking sets. A high-ranking household would have a fine set. Drinking-bouts certainly were part among the social practices surrounding the interaction between Eastern Middle Sweden and the Åland Islands on one side and Finland on the other. Already from the beginning flat bottoms and rounded bottoms are equally common. Decoration consists of horizontal cord impressions and more seldom drawn lines. Complex patterns are mostly zigzags. In the second half of the 9th century a few examples with more complex patterns including cord impression and circular dots could be noted. The shape often features a rounded

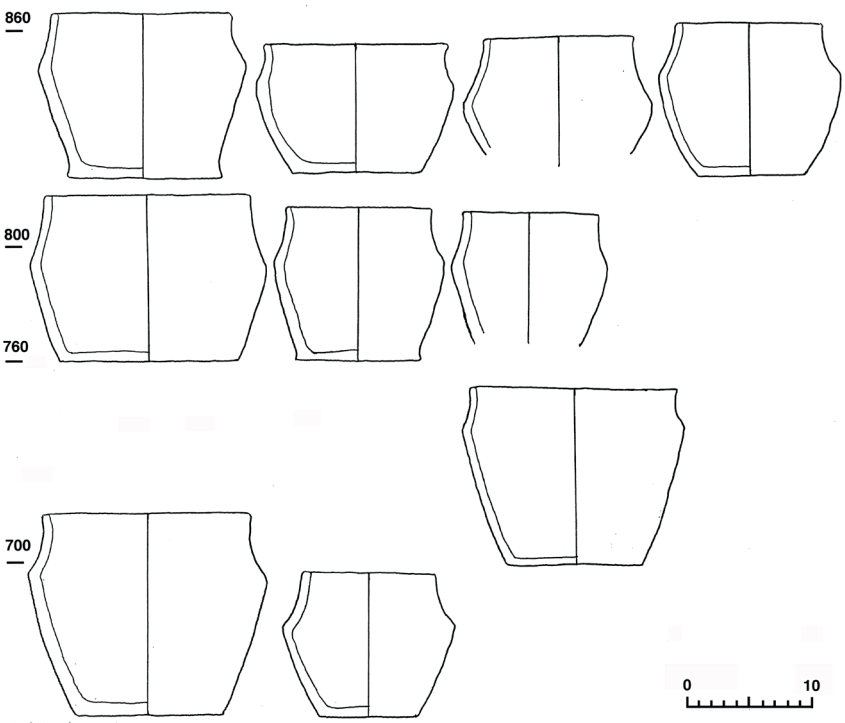

Fig. 16. Finds of carinated pottery in Eastern Middle Sweden ca. AD 680–860 (grave finds). Illustration: Johan Callmer.

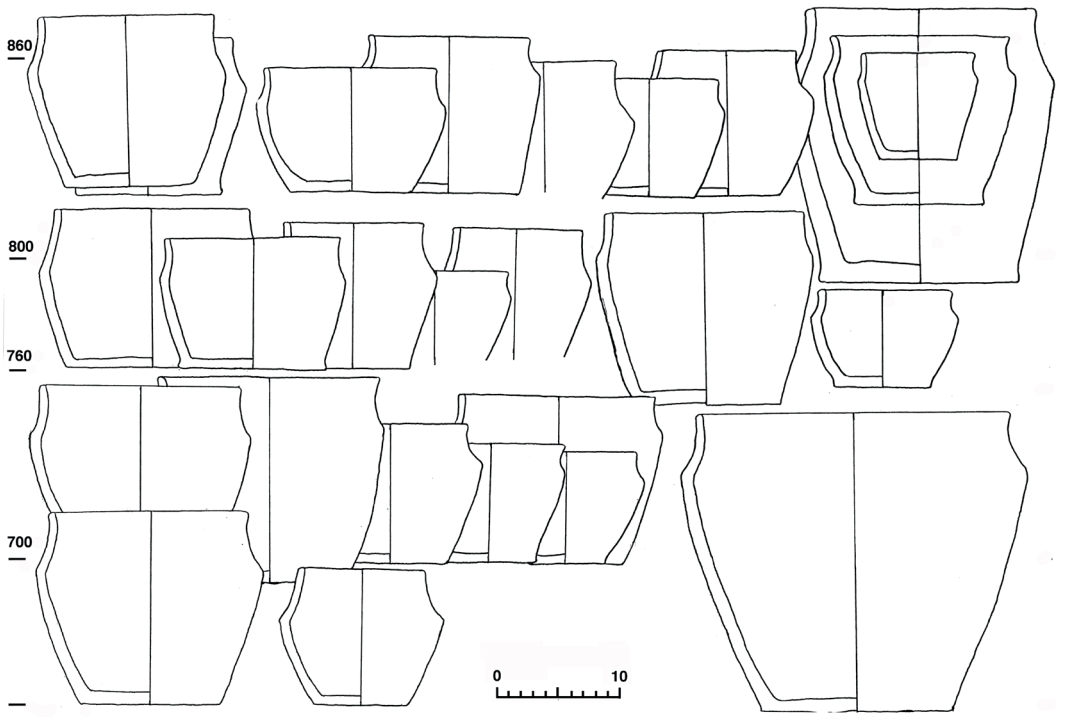

Fig. 17. Finds of carinated pottery on the Åland Islands ca. AD 680–860 (grave finds). Illustration: Johan Callmer.

shoulder. Some vessels have a funnel shaped neck. Carinated profiles occur and obviously become more numerous later on. These profiles are often combined with a rounded bottom.

The origin of this pottery is certainly Southwestern Finland and Northern Estonia. In detail it is not easy to decide if a vessel is Finnish or Estonian. However in a few cases typical Estonian pottery can be noted. It is of course possible and sometimes proven that some pottery has been produced also on the western side of the sea but then by foreign potters (Gustin & Wessman 2021, p. 69). The place of production is perhaps not so important. Of much greater importance is the distinct pottery technology of these producers. The tempering material is in most cases sand or sieved crushed rock and the thickness of the shard ca. five millimeters (much less than normal Swedish domestic pottery with a thickness of ca one centimeter or just a trifle less). The potters behind these vessels no doubt were Finnish women brought up in a Finnish cultural milieu. These observations make it very likely that Finnish women played an important role in the exchanges between Finns and Scandinavians. To decide whether these Finnish women were maids or wives is not possible. The very low representation of Finnish women's jewelry in Eastern Middle Sweden in the 8th and 9th centuries may be used as an argument for the latter alternative. Married women would accept the culture and consequently also the dress of a husband's close relatives. From Åland, however, we have a number of graves with a full Finnish women's dress set (e.g. Kivikoski 1963, p. 127). This acceptance of another cultural element is an unusual cultural phenomenon. It has something to say about the extraordinary high status of Finnish wives in the local society.

Today we have an important addition to Selling's AIII pottery for our studies of East-West relations. Numerous Swedish finds of carinated

pottery were noted by me in the store rooms of Statens Historiska Museum (Stockholm) already in the 1960's (figs. 16–17). Unfortunately my possibilities to study this pottery in the Swedish collections have been more limited than concerning the well-known AIII pottery. To sort out the carinated pottery you have in principle to look through all the "domestic" coarse and better thick-walled pottery from Sweden. The Åland material I have been through completely. However incomplete for Sweden, these notes are of value. In the find material from Eastern Middle Sweden and the Åland Islands the carinated pottery is not unusual in the late Vendel and Viking Periods. The qualitative technological properties of these pottery vessels are highly variable and in general difficult or impossible to differentiate from domestic Scandinavian pottery. The decisive properties of this pottery are the profile with a concave neck part and a distinctive marked (rather sharp) shoulder. The vessels are of very widely varying size. I have noted vessels more than 25 centimeters high and with a diameter of more than 30 centimeters. A majority of the vessels have a medium or coarse tempering and the surface has a partial slip. This pottery has a long tradition in Estonia but according to Lang it goes more or less out of production in Northern Estonia in the late 8th century (Lang 1996, p. 89). As far as I can see carinated pottery is also known from Finland (e.g. Vainionmäki, Laitila parish, Satakunda; Purhonen 1996) but I am uncertain about for how long it has been produced. The Estonian data make it probable that the Swedish and Ålandic finds mainly come from Finland and not from Estonia. The carinated pottery is well known also further east as we shall see quite soon below. Of great interest is the long history of carinated pottery imports in Eastern Middle Sweden. There are several finds from the 7th century (e.g. SHM 33817 Södermanland, Eskilstuna, Svista RAÄ 519: A 45; SHM 34108 Södermanland, Härad parish, Härad RAÄ 15: A 25:2) and the latest ones date to the 10th century.

A time of change in relations between Eastern Middle Sweden, the Åland Islands and Finland

It is obvious that something serious happens to the relations between Eastern Middle Sweden and Finland in the second half of the 9th century. If we look at the number of finds of Finnish pottery of type A III in Sweden, we can see, that finds later than ca. AD 860 are much less than the number of early ones (9 to 41 finds). The decrease is the same on the Åland Islands (12 to 48) where almost all late finds come from the two eastern parishes Saltvik and Sund. We can also note the complete difference from the figures from the Birka cemeteries already commented on. This is by all means a very strong tendency. When we have a look at the Scandinavian bronze brooches (mostly equal armed brooches and oval brooches) imported to Finland we can note a similar rhythm. Using the data of Kivikoski 1973 we can note no less than thirty seven items from ca. AD 860 and earlier and only seven later items. When we turn to Scandinavian armlets, which were very popular in Finland, we find the same picture. Armlets imported to Finland from Scandinavia after ca. AD 860 seem to be next to unknown. Probably this is also the time when the typical Finnish Viking Age female dress set with its basis in the pair of round fibulae with four snakelike animals is created in Finland. This is a most remarkable change which we can, I think, very well compare with the rise of the special Gotlandic dress concept 200 years earlier. What happened on the masculine side is more difficult to say, but there was, we assume, also change.

I am inclined to interpret these changes ca. AD 860 as very important transformations of the exchange system between Eastern Middle Sweden, the Åland Islands and Finland. An older system based on close social contacts managed the transfer of furs from Finland in the beginning mainly towards the west. The system was organized with several links. Somehow (the exact reason we cannot pin point) this system breaks down. More precisely we are concerned with the interaction between the Scandinavians and the Finns somewhere on the Finnish coast. Obviously social groups on the Finnish side find it necessary to stress their cultural and social independence from a more open and mixed cultural pattern with both western and eastern components. The, for the Finns necessary, exchange is increasingly taken over by professional

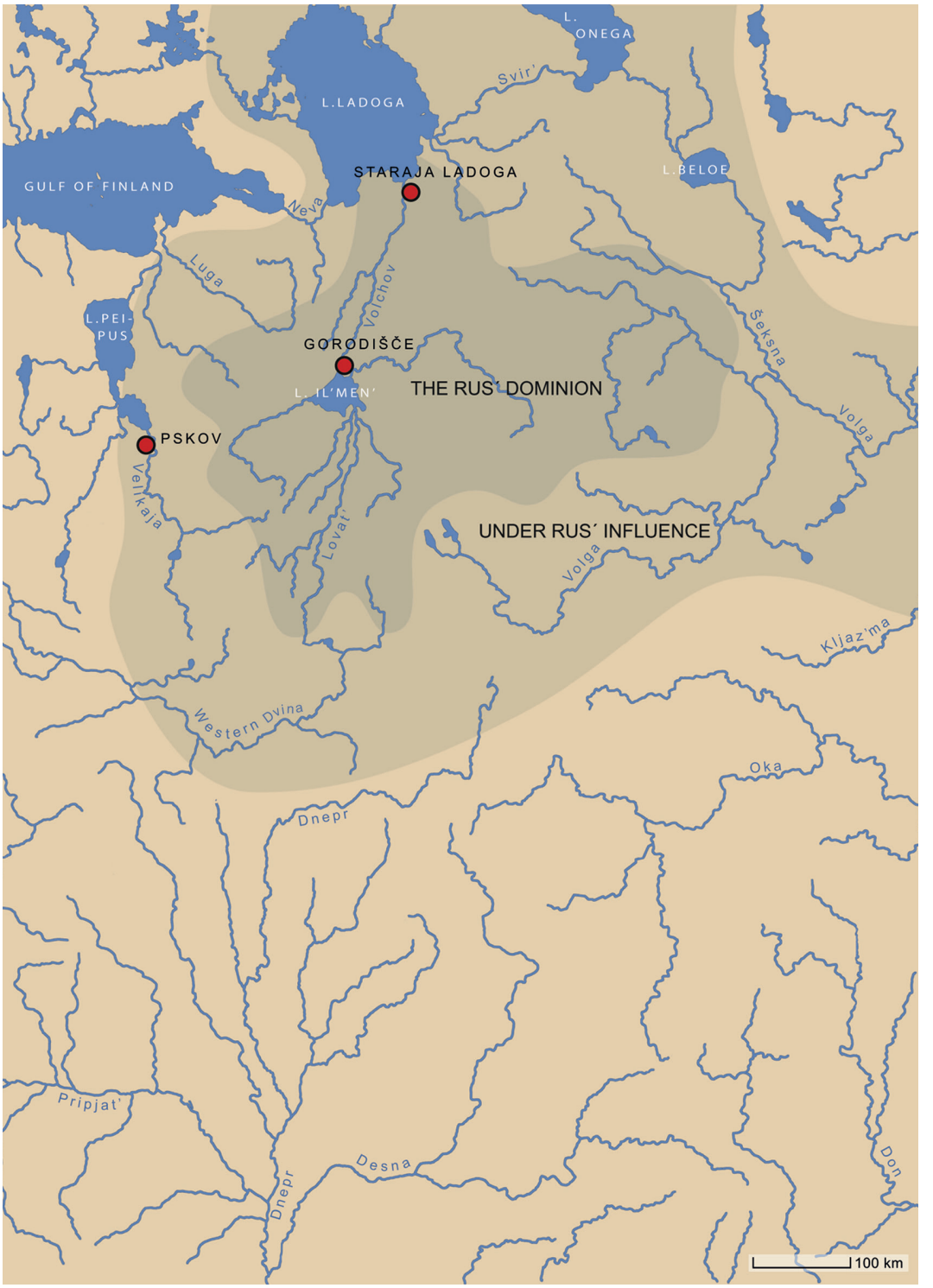

Fig. 18. The core area of the Early Rus' (before ca. AD 860). Map: Staffan Hyll.

traders dominating the trading station at Birka. Probably they are also familiar with and engaged in the trading networks in Russia. The fur trade period in Finland was not over or near at its end yet (this probably comes in the 12th century) but the relative importance of Finland decreased already in the 11th century (if not earlier).

The center of gravity of the fur trade in Northern Europe had however already much earlier moved on towards the east (fig. 18). The blue, red and white beads dated to AD 710–760 mentioned already have turned up in key regions in Northwestern Russia. We can note finds from Staraja Ladoga (Gorodišče Ljubša) (Rjabinin &Dubašinskij 2002, Ris. 48), from Gorodišče just outside Novgorod (Nosov, Gorjunova, Plochov 2005, Tabl. VIII: 56) and from the left bank settlement at Pskov (Jakovleva, Salmina, Korolëva 2012, Ris. 11:11). The contexts are vague but the evidence cannot be turned down. In the middle of the 8th century more substantial Scandinavian activities are documented at Staraja Ladoga on the lower Volchov (Sindbaek 2017). We are here concerned with the mid-8th century smithy at the Zemljanoe Gorodišče in Staraja Ladoga (Rjabinin 1985, pp. 55–64). In the second half of the 8th century Staraja Ladoga turns into a busy center of the fur trade and in the vast basin of Lake Il'men' a strong cultural process is started. It is difficult to characterize the material culture in Northwestern Russia before the middle of the 8th century. At that time a special type of pottery begins to be produced there. It is of great interest that this pottery type is a variant of the carinated Finnish pottery well known, as we have seen, both from Estonia and Finland (Callmer 2017, p. 148; cf. also Seničenkova 2014, pp. 356–359). It is not the only type of pottery there but from the very beginning it is the dominating form type. Also a special burial rite is introduced: cremations in immense barrows of the so called sopka-type (Callmer 2017, pp. 141). Several elements of this burial rite are original but others are definitely of Scandinavian origin. Possibly also some local elements could be noted. The complicated burial which also calls for the cooperation of many individuals has had an important integrative role in this new social milieu. There was also a special type of house integrating both Scandinavian traditions and traditions from house building in the taiga zone (Callmer 2017, p. 145). Possibly there were also some significant dress elements (Callmer 2017, p. 151). From this center the Rus' dominion develops in the late 8th and early 9th centuries. The social structure is a complex one with a ruling elite which both Arab geographic and ethnographic sources, West European historical and other written sources and later Russian chronicles define as of Scandinavian origin. The economy is primarily based on the fur trade and involves long distance trade through Eastern Europe to Khazar trading sites or even further away.

Conclusions

The central role of Scandinavian and Finnish interaction in the early phase of these developments which lead on to the creation of the Rus' dominion in Northwestern Russia have been paid little attention to. The archaeological material makes it possible to study several aspects on this phase. However there are questions for which we have still far too little sources. The most urgent is no doubt the life in the hunting grounds of the hunters. They are still very anonymous and difficult to grasp. We are much better informed of the second link in the chain of human relations in the North. In Finland we can identify persons and groups who profited from the transfer towards the south. The routes changed and had alternatives. Most interesting is of course the network which involved agents of trade from far to the east. Both the Nevolino-belts and the chain holders with twin horse heads provide striking proof of this. However these links were more complex than that for which the bottle shaped pendants give information. The beads as well as the cowries also give important information on trade often over great and even immense distances. The patterns of exchange between Scandinavians and Finns can be studied as socially embedded links most probably also involving marriages. When the scene opens up towards the east and the establishment of Rus' hegemony in the lands beyond the Gulf of Finland we are confronted with another major problem. These lands only had a very sparse pop-

ulation before the 8th century. In the centuries from the first half of the 8th century to the 10th century settled land and more precisely settlements increase immensely in numbers. These dynamics of demographic change are yet very little understood. The Russian North had at the beginning of the second millennium AD in general a Baltic Finnish population. From where these Finns came is difficult to say. It is unlikely that that the majority of them was autochthons. The single hint we can note is the relative scarcity of graves as archaeological indications of settlement in Northern Estonia in the 9th and 10th centuries (Tvauri 2012, pp. 284–285). For this there could however be other explanations. In the course of the Medieval Period parts of the Russian North were Slavicized (Nuorluoto 2006). This means that the influx of Finnish groups already during our period of interest must have been considerable. The number of Scandinavians (most of them certainly from Eastern Middle Sweden and the Åland Islands) was very much smaller. The majority of them was not farmers and they lived in major and minor centers. A Scandinavian farmer colonization in the east was with one conditional exception not a reality. Only in some pockets in the Mesopotamia of the Volga and the Kljazma, far to the east of Moscow, a rural settlement pattern evolved in the 9th century (Callmer 2000, pp. 80–82). This is however a later stage in the developments, the beginnings of which, we have dealt with here. Directly or indirectly these settlements were however also in the beginning intimately linked to the fur trade.

Acknowledgements
Writing these lines I have often recalled my discussions of many aspects of these questions with professor Ella Kivikoski (1901–1990), Helsinki and I feel inclined to dedicate the paper to her memory. The text is a revised version of a lecture held at Tavastehus, Finland in 2015.

Abbreviations
KM = Kansallismuseo, Helsinki, Finland.
SHM = Statens historiska museum, Stockholm, Sweden.

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Middelalderfiske, fellefangst og fraflytting

En dendrokronologisk undersøkelse av et 1300-talls stasjonært fiskeanlegg i Nord-Mesna, Sørøst-Norge

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Middelalderfiske, fellefangst og fraflytting: En dendrokronologisk undersøkelse av et 1300-talls stasjonært fiskeanlegg i Nord-Mesna, Sørøst-Norge. (Medieval fishing and abandonment: A dendrochronological investigation of a 14th-century stationary fishing trap in Lake Nord-Mesna, in the interior of Scandinavia.) *Fornvännen* 119. Stockholm.

Fishing in rivers and lakes has traditionally been a longstanding and dependable means of sustenance for the people of inland Scandinavia. However, our understanding of pre-modern fishing traditions has been hampered by a lack of written sources, as well as a scarcity of archaeological data. However, a recent excavation and comprehensive dendrochronological analysis of a fish trapping enclosure system in Lake Nord-Mesna (520 masl.), in the boreal forests of inland Norway, has provided unique insight into freshwater fishing traditions, techniques and organization. The excavated structure, believed to be a fish weir with lath screen traps set into shallow water, was established in the late 1200s. In the following years it was regularly maintained in the spring/early summer. The last documented repair was in 1343. Its abandonment is interpreted as resulting from a recession likely induced by factors such as plague and climatic deterioration, that affected inland areas of Scandinavia in the 1300s. These results provide archaeological evidence of medieval utilization of effective enclosure traps in the region. This contradicts the prevailing notion that this form of fishing was later introduced by Forest Finns who migrated to the area in the 17th century. In addition, the findings give new and significant information about the organization and practice of medieval fishing in inland Scandinavia.

Keywords: Dendrochronology, Fish trap technology, Boreal forests, Crisis of the Late Middle Ages, Forest Finns

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Innledning

Det siste tiåret har det blitt en økt interesse for å undersøke fiskeredskaper som ligger bevart på den gamle innsjøbunnen. De arkeologiske funnene forteller om et rikt og variert innlandsfiske, blant annet drevet med garn og med faststående feller som ble satt opp i bekker, elver og vann (Bjørkli et al. 2016; Mansrud et al. 2022, Mjærum & Johannessen 2019). I 2021 ble den hittil mest inngående undersøkelsen av et slikt fortidig fiskeanlegg gjennomført i innsjøen Nord-Mesna, i det østnorske innlandet (Friis et al. 2023). Undersøkelsen av denne fellen har gitt helt ny innsikt i middelalderens fisketradisjoner og dannet grunnlag for å diskutere hvordan fisket faktisk foregikk. I denne artikkelen blir ulike sider ved dette fisket drøftet, slik som hvordan det ble organisert, hvem som drev det og utbyttet. I tillegg knytter vi fisket til samfunnsutviklingen på 1200- og 1300-tallet.

3,5 % av landarealet i Norge anvendes til jordbruk i våre dager, mens 6,2 % er ferskvann (Kartverket 2022). Det øvrige er hovedsakelig skog, fjell, myr og annet åpent terreng. Disse forholdstallene har variert noe gjennom århundrene, men de synliggjør uansett at Norge er et «utmarksland» hvor tilgangen på egenproduserte landbruksprodukter alltid har vært begrenset. Fiske har, sammen med jakt, fangst og sanking derfor vært en viktig del av ressursgrunnlaget i landet, spesielt utenfor de sentrale jordbruksbygdene (f.eks. Eknæs 1979; Mjærum & Wammer 2016). Høymiddelalderen (ca. år 1130–1350) var et tidsrom hvor det utviklet seg et befolkningspress med mangel på jordbruksland (Øye 2002, s. 412–414). I en slik situasjon er det nærliggende å anta at utnyttelsen av skog, vidder og fiskevann ble ytterligere intensivert (Pilø et al. 2018; jf. Gundersen 2021, s. 289–299). Frem til nå har vi imidlertid visst nokså lite om hvordan fisket egentlig foregikk, hvordan det var organisert, og hvilken avkastning dette fisket faktisk hadde.

Riktignok finnes det antydninger om viktigheten av fisket i ferskvann, og da spesielt laks (*Salmo salar*), men også ørret (*Salmo trutta*) og ål (*Anguilla anguilla*), i norske lovtekster på 1000–1200-tallet (L VII, 48-5; jf. Øye 2002, s. 365–368). Blant annet var det bestemmelser om fiskerett, forbud mot å sperre av elveløp med *þvergarðar* og straff for å ødelegge andres fiskeredskaper (se L VII 48, VII 62-7; F XIV 8, XIII-9; G 85). Andre tekstkilder beretter om stridigheter knyttet til rettigheter til fisket (Ugulen 2016). Blant annet foreligger minst 18 brev om rettigheter og om uenighet knyttet til bruken og samarbeidet av omfattende sperringer med tilhørende teiner (teinlag) for fangst av ørret i nedre del av storelven Gudbrandsdalslågen på 1400- og 1500-tallet (Huitfeldt-Kaas 1917, s. 219–223; Aass 2011). Samtidig vet vi at Paven utstedte et vernebrev for å sikre Hamar kirkes rett til fiske i dette området alt i 1234 (Motzfeldt 1908, s. 61–62).

Felles for disse kildene er at de synliggjør at fisket var viktig, og at det kunne være stridigheter om de verdifulle resursene. Like iøynefallende er imidlertid den generelle mangelen på detaljkunnskap om middelalderens fisketradisjoner.

Kattiser i sørøstnorske innsjøer

Det finnes en rekke ulike former for faststående fiskefeller i ferskvann, hvor alle har til felles at de har et fangstkammer der fisken lett finner veien inn, men vanskelig finner veien ut. Størst variasjon av slike fiskefeller er knyttet til rennende vann hvor tilpasninger til lokale forhold har hatt stor innvirkning på utformingen. Fiskefeller i ferskvann har blitt laget for bruk i alt fra småelver og tjern til store innsjøer og elver med deltaer, stryk og fosser. Noen feller var tilpasset fangst av én art, mens andre fanget bredt over hele artsspekteret (Berg 1986; Eknæs 1979).

Kattisa (norsk dialekt stakarøsk, svensk katsa eller kartsor, finsk katiska, russisk kotsy) er ei fiskefelle med lange tradisjoner i innsjøer, sund, elvemunninger og åer (Norsk skogmuseum 2020). Fra skriftlige kilder berettes det ofte om at denne felletypen hadde et ledegjerde som gikk ut fra land (fig. 1). Ei kattise kunne imidlertid også settes opp i en bukt uten gjerde inn til bredden. Ledegjerdet nærmest land besto ofte av en rekke med staur hvor det ble flettet inn bar og annet greinverk (Claesson 1937, s. 53, jf. fig. 1). Utover i vannet ble gjerdet avløst av en tettere sperring laget av spiler frem til selve fangstkammeret. Selve fangstkammeret hadde

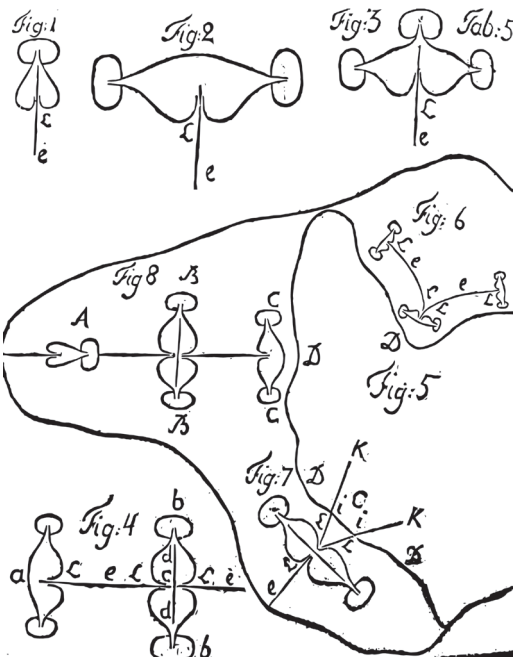


Fig. 1. Prinsippskisse av ulike typer kattiseanlegg, slik det er fremstilt av Jacob Gabriel Gyllenborg 1770 [1979]. – Sketch of different types of enclosure systems for fish trapping.

ett eller flere labyrintlignende rom (Sirelius 1908, s. 283–303; Valonen 1953). Utformingen av kattisene varierte, men et fellestrekk var at veggene i fangstkammeret var laget av trespiler som var sammenbundet med vidjer. Disse dannet palisadelignende gjerder som strakk seg fra sjøbunnen til overflaten og ble som regel festet til staur som var satt ned i bunnsedimentene.

I Fennoskandia og Baltikum finnes det arkeologiske belegg for felletypen tilbake til yngre steinalder (Bērziņš 2008; Koivisto 2012, s. 241–250; Koivisto & Nurminen 2015), og redskapsformen er dokumentert i svenske og finske skriftlige kilder fra senmiddelalder og fram til moderne tid (Virtanen 1963). I Norge er kattisa beskrevet ifra 1600- og 1700-tallet. Svenske kilder forteller om vidstrakt bruk på 1700-tallet. Gyllenborg (1770 [1979], s. 23) omtalte bruken slik: «…kartsor äro så almänt kiända så jag tror det näppeligen någon fins, som icke wet huru en sådan skall göras».

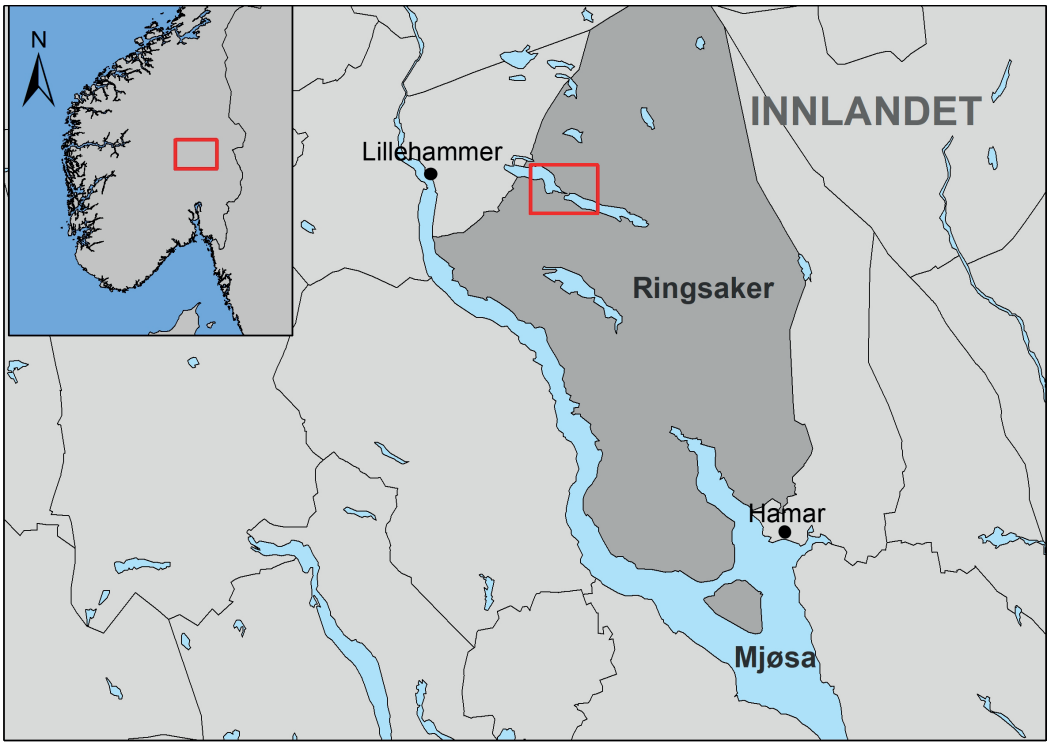
Kattisa, slik vi kjenner den fra historisk tid i Norge, har vært tett knyttet til den skogfinske befolkningen. Dette var bosettere som innvandret fra det sørlige Finland til barskogstraktene i Sverige og Norge fra sent på 1500-tallet og utover på 1600-tallet (Brochmann & Kjeldstadli 2014, s. 88–89). Hos disse innvandrerne sto innlandsfisket sterkt, og det har blitt argumentert for at de introduserte bruken av kattise til Norge (Fossen 1992, s. 62–71). Det er registrert flere titalls steder hvor det enten er gjort funn, det er kjent stedsnavn knyttet til kattisa eller det finnes tradisjoner knyttet til kattiser, primært i Østfold, men også Oslo, Akershus, Innlandet, Buskerud og Rogaland (Ahrens et al. 2016; Norsk skogsmuseum 2020; Eknæs 1979, s. 67–68; Fossen 1992, s. 68).

Flere av kattisene i Norge er godt bevarte og dokumenterte. I Eidskog kommune i Innlandet fylke finnes den hittil eldste, og inntil nå best undersøkte. Fellen, med flere fangstkamre, er radiokarbondatert til eldre bronsealder (Eknæs 1972, s. 119–120; 1979, s. 35–36). De siste tiårene har det også blitt dokumentert og datert slike feller fra de siste århundrene, blant annet i Nøklevann i Oslo og i Åkersvika ved Hamar (Ahrens et al. 2016; Skauen & Smiseth 2015, s. 32–33).

Mest tallrike er allikevel sporene etter kattisefisket i de to naboinnsjøene Nord- og Sør-Mesna, øst for Lillehammer. Her er det kjent totalt 23 områder med rester etter fiskefeller, hvorav fem samlinger med staur knyttet til slike fangstredskaper er C14-datert til 1600–1800-tallet (Friis et al. 2023; Grøndahl 2013). En staur fra en sjette samling ble i 2019 C14-datert til middelalder (1295–1415 e.Kr. (590±35 BP, LuS 14869)) og denne tidfestingen dannet utgangspunktet for at dette anlegget ble nærmere undersøkt i 2021.

Mesna-området i middelalder og nyere tid

De to sørøstnorske innsjøene Nord- og Sør-Mesna (ca. 520 moh.) har en samlet lengde på ca. 14 km og er bundet sammen av den ca. 1 km lange Bustokkelva (fig. 2). Innsjøene har sine kilder i lavereliggende fjellområder (ca. 1000 moh.) mot nord. Fra Mesnavannene strekker vassdraget seg vestover, ned til Lillehammer hvor Mes-


N
INNLANDET
Lillehammer
Ringsaker
Hamar
Mjøsa

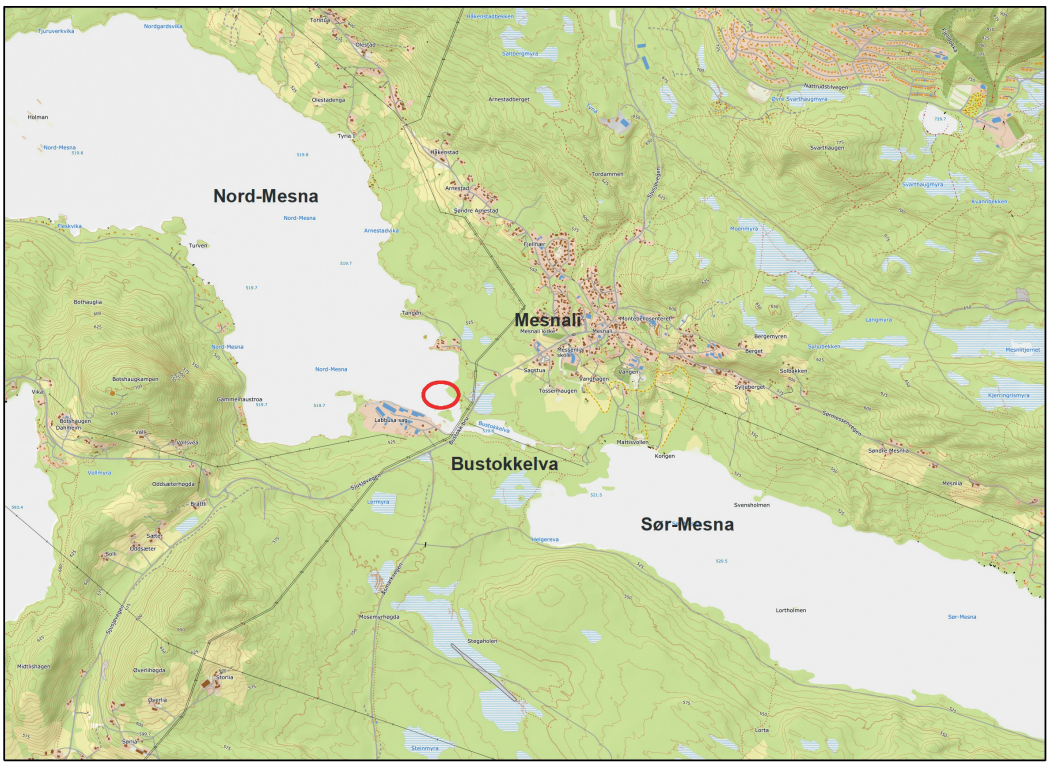

Nord-Mesna
Mesnali
Bustokkelva
Sør-Mesna

Fig. 2. Mesnavannene i Ringsaker og Lillehammer kommuner, samt stedsnavn omtalt i teksten. Kartgrunnlag: Statens kartverk. Utarbeidet av Axel Mjærum og Ellen K. Friis, KHM. – The Mesna Lakes in Ringsaker and Lillehammer municipalities, as well as place names mentioned in the text.

naelva renner ut i Norges største innsjø, Mjøsa (ca. 120 moh.). Ved Mjøsa finner man rike jordbruksbygder. Fra østhellingen av Mjøsa, forbi Mesnavannene og videre mot øst, er det store og sammenhengende områder med boreal barskog.

I dag befinner tettstedet Mesnali seg på nordsiden av Mesnavannene, og i åssiden nord for vannene ligger også hoveddelen av den øvrige bebyggelsen i området. Ved bredden av vannene finner man nå enkelte hytter, naust og noen næringsbygg, mens det på 1800- og 1900-tallet lå flere sagbruk ned mot strendene. Randsonen til vannene har imidlertid alltid vært relativt lite utbygd. De store ubebygde arealene har de siste århundrene i hovedsak vært dominert av barskog, samt blitt utnyttet som beite- og slåttemark.

Langs Mjøsa lå det rike og tett befolkede jordbruksbygder i middelalderen (Iversen 2021). Fra disse sentralbygdene avtok gårdstettheten i østlig retning, blant annet forårsaket av dårligere jordsmonn og klima. Bildet de skriftlige middelalderkildene gir av samtidens gårdsbebyggelse, er ufullstendige, men de nærmeste gårdene man kjenner til lå 2–3 km fra Mesnavannene (Ormøy 1992, s. 73–77; jf. Fauskerud 2011). De arkeologiske kildene gir heller ingen entydige holdepunkter for gårdsbosetning ved vannene i middelalderen, men derimot om utmarksaktiviteter som jakt og produksjon av myrmalmsjern (Friis et al. 2023). Områdene knyttet til selve Mesnavannene var følgelig skogområder, trolig hovedsakelig allmenning (Iversen 2021), slik de også er i dag.

Fra 1600-tallet foregår det nyrydning i liene rundt disse innsjøene, både av norske bønder og av skogfinner (Opsahl 1990, s. 52–53; Fauskerud et al. 2011). På 1660-tallet fikk blant annet Lauritz og Anders Finde [altså skogfinner] tillatelse til å rydde land i Mesnali. I tillatelsen het det seg at rydningen «udi fieldmarken er beliggende, och ingen Gaarde til fortrengsel» (Fogedregnskapene 1660; Opsahl 1990, s. 53–54, jf. fig. 2).

Fiskeressursene i Mesnavannene

Fiskesamfunnet i Mesnavannene består i dag av ørret, abbor (*Perca fluviatilis*), krøkle (*Osmerus eperlanus*), sik (*Coregonus lavaretus*), ørekyte (*Phoxinus phoxinus*) og gjedde (*Esox lucius*). I tillegg finnes steinsmett (*Cottus poecilopus*) i flere av tilløpsbekkene til Sør-Mesna og trolig finnes den også i selve innsjøene (Lie et al. 2018, s. 53–55). Sik er bare utbredt i Nord-Mesna (Qvenild 2010, s. 51). Den første koloniseringen av fisk i vannene er ukjent. Naturlig innvandring for fisk påvirkes av bratte gradienter og fossefall, som ofte vil framstå som uoverkommelige barrierer (Hesthagen & Sandlund 2004). Utløpselva fra Mesnavannene er Mesnaelva, og topografien har gjort elva uten muligheter for fisk å vandre helt opp fra Mjøsa (Skår et al. 2017, s. 8). Dette må forventes å ha vedvart gjennom hele etter-istiden. Tilløpselver til Mesnavannene er flere med nedbørfelt i høyereliggende skog og lavalpine fjellområder. Det er usikkert hvorvidt naturlig innvandring kan ha skjedd fra andre nærliggende vassdrag.

Det er beskrevet at sik og gjedde har blitt spredt til Nord-Mesna av mennesker i nyere tid (Kraabøl 1998; Sandlund et al. 2013, s. 352). Krøkle og ørekyte har vært mye brukt som agn, og også disse artene har blitt introdusert til innsjøen relativt nylig (jf. Huitfeldt-Kaas 1918, s. 79; Hesthagen & Sandlund 1997). Historikken til etableringen av bestandene av ørret og abbor i Mesnavannene er derimot ikke kjent. Utsettinger fra nærliggende vassdrag med naturlig innvandring kan ha skjedd for lang tid tilbake. Å bære fisk til fisketomme vann ser ut til å ha vært mest vanlig i Sørøst-Norge, med lang avstand til kysten (Berg 1986, s. 16).

Abbor brukt som agnfisk er lite beskrevet i Norge, men rene utsettinger av abbor er kjent fra nyere tid. I Ljøsvannet i Brumundavassdraget ble abbor satt ut på midten av 1980-tallet (Qvenild & Museth 2023). Det er også kjent at abbor ble fanget inn i Melsjøen og satt ut i Reinsvatnet på 1960-tallet (Smestad 2023). Sør-Mesna

har to stedsnavn med abbor som kan indikere at fiskearten har eksistert i innsjøen over lengre tid. En rekke innsjøer i den sørlige delen av Gudbrandsdalen, og som har manglet muligheter for naturlig oppvandring for fisk, har bestander av abbor i tillegg til oftest ørret og ørekyte. Utsetting av abbor kan antas å ha hatt et visst omfang gjennom lengre tid, tilsvarende ørret.

Fra gammelt av er Mesnavannene kjent som meget gode fiskevann. I dag er det gode ørretfisket regnet som ødelagt på grunn av etableringen av gjedde og de sterke vannkraftreguleringene (Håkenåsen 1982, s. 313–319; Bergundhaugen 2006, s. 34). I middelalderen kan fisket i Mesnavannene altså ha vært rettet mot ørret og abbor, eller bare én av dem. Både ørret og abbor er ansett som gode matfisker. Abbor er en vårgytende art og den lar seg fange spesielt effektivt i gytetiden.

Metodiske tilnærminger

Metodikk, arkeologi

Nord-Mesna er som omtalt et regulert vann, der vannstanden senkes med inntil åtte meter hver vinter/vår. Da blottlegges innsjøbunnen og dermed også konstruksjoner som vanligvis ligger under vann, slik som fiskefeller. Den undersøkte fellen fra middelalder lå om lag 100 meter utenfor den opprinnelige strandlinjen, nær munningen av Bustokkelva (fig. 3). Det vil si at funnene ble gjort i et område som tidligere har ligget på om lag 1,5 m dybde. Reguleringen av vannet til vannkraftproduksjon har imidlertid bidratt til betydelig erosjon, og høyst trolig lå fellen opprinnelig så grunt at det var mulig å stå i vannet.

Fiskefellen ble gravd ut i mai 2021, på et tidspunkt da kulturminnet lå på tørt land (fig. 4). Vannstanden stiger imidlertid vanligvis raskt på denne tiden, og det var derfor viktig å gjennomføre feltarbeidet så tidlig som mulig. Det lå et opp mot 20 cm tykt, heldekkende isdekke over fiskefellen da utgravningen startet opp. Isen hadde imidlertid lagt seg før vannet ble tappet ned gjennom vinteren, og det kunne derfor enkelt fjernes ved hjelp av gravemaskin som kunne stå på det stabile isdekket. Der det var mulig ble gravemaskinen også benyttet til å fjerne løsmasser mellom staurene. Fordi treverket ofte sto veldig tett måtte dette arbeidet likevel i stor grad gjøres manuelt med spade og krafse. Kun 5–15 cm av enkelte av staurene stakk opp over innsjøbunnen og antall staur økte betraktelig etter hvert som løsmasser ble fjernet (fig. 4). Stauren som tidligere var C14-datert til middelalder sto 1,8 meter ned i sedimentene. Denne viste seg imidlertid å være et unntak og den var den aller lengste i området. Flesteparten av staurene stakk ikke dypere enn ca. 0,5 meter. Diameteren på alle staurene ble dokumentert, og 90 staur ble helt eller delvis gravd opp. Mange av staurene sto skrått ned i sedimentene. Hovedsakelig var forskyvningen 0,1–0,2 meter mellom topp og bunn, men opp mot 0,7 meters forskyvning ble dokumentert på enkelte staur. Skråstillingene er tolket som resultat av forskyvning over tid, og at bunnpunktet i større grad representerer den opprinnelige plasseringen. Der det var mulig ble derfor bunnpunktet eller det dypeste punktet vi fikk blottlagt målt inn på de staurene vi så var mest skråstilte. Likevel kan det være mulige feilkilder i forskyvninger av staur som kan bidra til å vanskeliggjøre tolkningen av fangstkammer og ledegjerder i fiskefellen.

Metodikk, dendrokronologi

Til dendrokronologisk datering ble det tatt prøver av 59 staurer ved innløpet til Nord-Mesna og to staurer i Bustokkelva. Innledningsvis ble 12 staurer som sto *in situ* boret tvers gjennom på to steder. Av de øvrige 47 staurene ble det sagd skiver, de fleste etter at de var gravd opp. De fleste stokker hadde intakt barkkant, dvs. at den ytterste årringen under barken var til stede. I noen tilfeller kunne ytterveden være noe nedbrutt eller skallet av. Prøvene ble artsbestemt under mikroskop (Mork 1966). Årringene ble studert på frossent og tinende materiale. Overflaten på boreprøvene (4 radier per staur) og skivene (2 radier) ble preparert med industriblad og kritt. Nedbrutt ved og meget smale ringer kunne by på utfordringer i ytterveden. I noen tilfeller måtte det måles på bruddflater etter at den øverste veden var forsiktig løftet opp. Årringsbreddene ble registrert ved hjelp av en stereolupe (8–80 × forstørrelse), et målebord (Velmex, oppløsning 0,001 mm) og programvaren TSAPWin 4.82b2. Måleseriene ble kryssdatert innbyrdes og slått sammen til middelkurver for de enkelte

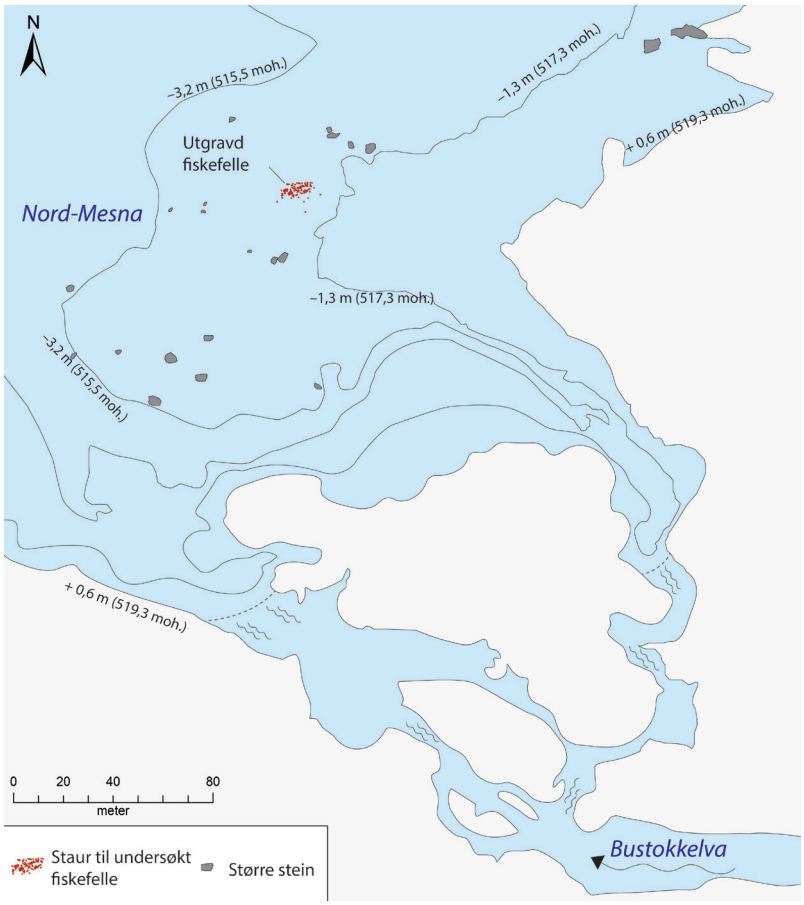


Fig. 3. Fiskefellen i Nord-Mesna var plassert om lag 100 m fra den opprinnelige strandlinjen, ved utløpet av Bustokkelva. Illustrasjon: Axel Mjærum. Det mangler dybdekart i området. Dybdelinjene er derfor basert på flyfoto på tidspunkt med ulik vannstand.
– The fish trap in Nord-Mesna was located about 100 m from the original shoreline, at the outlet of the river Bustokkelva. There is a lack of depth maps for the area. The depth lines are therefore based on aerial photographs at times with different water levels.

staurene. Noen staurer kunne synkroniseres med hverandre og slås sammen til en relativt datert middelkurve for fiskefellen, MSN_GRAN. Denne middelserien og samtlige enkeltserier ble så forsøkt absolutt tidfestet mot ulike regionale grunnkurver og enkeltkronologier.

Redigeringen og kryssdateringen av seriene ble støttet av TSAP og COFECHA 6.06P (Holmes 1983; Speer 2010) og kontrollert visuelt. TSAP beregner blant annet Gleichläufigkeit Glk (Eckstein & Bauch 1969) og t-verdiene t_{BP} og t_H (Baillie & Pilcher 1973; Hollstein 1980) og rapporterer de statistisk beste synkronposisjonene. COFECHA beregner korrelasjonskoeffisienter mellom årringserier innenfor kortere, overlappende tidsvinduer, også dette etter framheving av den årvisse variasjonen i ringbredden. Dette bidrar til å peke ut manglende eller falske ringer, målefeil eller perioder med uregelmessig vekst. Prinsippet er at den årvisse variasjonen i årringsbreddene i hovedsak er bestemt av de klimatiske forholdene under vekstsesongen. For furu i Sørøst-Norge er dette julitemperaturen ved tregrensen og juninedbøren på tørre steder i lavlandet eller regnskyggen (Slåstad 1957).

Resultater

Resultater av den arkeologiske undersøkelsen

Vår undersøkelse viser at fiskefellen har bestått av minst 145 staur, der flesteparten var samlet innenfor et område på ca. 13 x 6 meter (fig. 3). Området rundt ble saumfart for synlige staurer i overflaten, uten hell. Vi er derfor ganske sikre på å ha fanget opp hovedkonsentrasjonen med bevarte staur, men det kan ikke utelukkes at enkelte skjulte seg lengre ned i sedimentene. Alle

Fig. 4. Undersøkelse av fiskefellen i Nord-Mesna. Det fremkom tydelige rekker av stokker etter at isdekket og ca 20 cm av grunnen var fjernet med gravemaskin og håndkraft. Foto: Ellen K. Friis, KHM.
– Excavation of the medieval fish trap in Nord-Mesna. Clear lines of logs appeared after the ice cover and approx. 20 cm of the soil had been removed with an excavator and manual labour.

staurene som ble gravd opp viste seg å være godt bevart. Stokkene var hugd til og spisset i endene. Én staur hadde skadet spiss, noe som tyder på at den må ha truffet noe hardt, sannsynligvis en stein. Dette forteller også at staurene må ha blitt dunket ned i innsjøbunnen. Diameteren på staurene var 2,2–10,1 cm, mens lengden varierte mellom 15 og 180 cm. De lengre staurene var stort sett også blant de tykkeste og motsatt, uten at dette ser ut til å ha utgjort en fast regel. De opprinnelige lengdene på staurene er usikre, da det kun var de delene som sto nede i sedimentene som var bevart. Det har foregått erosjon på stedet som en følge av vannkraftproduksjon. Det er derfor usikkert hvor mye av den opprinnelige sjøbunnen som har forsvunnet, og følgelig også hvor mye av staurene som har blitt brutt ned. Den målte lengden på staurene forteller dermed egentlig hvor dypt enden av staurene sto i under dagens overflate, men lite om den opprinnelige lengden. Avstanden mellom staurene varierte mye, fra kun noen få cm opp til over en meter. I flere tilfeller sto mange staurer helt tett sammen i små klynger, og slike samlinger kan representere utskiftinger eller reparasjoner av fiskefellen.

I Bustokkelva, ca. 550 meter øst for fiskefellen i Nord-Mesna, ble det også i 2021 gjort funn av flere staurer (fig. 2, nederst). Disse sto noen meter ut fra elvebredden. Det ble ikke gjort en grundigere undersøkelse av hvor mange staurer det dreide seg om eller hvordan de sto plassert. En av disse (MSN902) passet imidlertid inn i årringserien fra fiskefellen i Nord-Mesna, og dateres dermed til middelalder. Hva slags innretning

denne representerer er usikkert, men vi kan anta at den kan stamme fra en form for ledegjerde eller stengsel i elva. Elva er på dette stedet omtrent 30 meter bred og anslagsvis 4–5 meter dyp. Det går også en liten sideelv inn akkurat der staurene står, og denne kan ha vært en god gyteplass. Tvers over elva ligger det en fangstgrop, og det kan derfor ikke helt utelukkes at stokkene i elva kan knyttes til et lede/sperregjerde for fangst av storvilt, fremfor fisk. Det er ikke gjort funn av sperregjerder i tilknytning til fangstsystem i elver, men både i Snertingdal og på Dokkfløy er det undersøkt sperregjerder funnet i myrer (Gustafson 2007; Jacobsen 1992).

Resultater av de dendrokronologiske analysene

Blant de dendrokronologisk analyserte staurene var 51 gran (*Picea abies*), 9 furu (*Pinus sylvestris*) og 1 vier/selje (*Salix* sp.). Diameterne var 3,2–9,0 cm. Medianen for gran og furu var med hhv. 5,9 og 6,0 cm ganske lik, mens vierstauren var noe tynnere (5,1 cm). Alle staurer manglet bark. Lengden av 28 staurer som var gravd opp og avfotografert, ble målt til 40–144 cm (median 74 cm): de 24 granstaurene til 40–144 cm (median 71 cm), de 3 furustaurene til 58, 94 og 135 cm, og vierstokken til 112 cm. Den midlere alderen for gran og furu er hhv. 57 og 60 år, og dermed ganske lik (gran 11–162 år, furu 12–74 år). *Salix*-prøven viste bare 17 ringer. Det er uvisst hvilken høyde over rota disse målene gjelder, dvs. nær rota eller lengre oppe mot trekronen. Man kan også anta at flere staurer ble tilvirket av samme tre, men dette kunne ikke påvises.

Materialet må anses som utfordrende å analysere dendrokronologisk. Antallet årringer er relativt lavt. En stor del av disse representerer ungdomsved som gjerne er preget av tennaraktig, altså eksentrisk vekst med tilfeldig årringsvariasjon. Spesielt hos grana går veksten deretter rask over i til dels meget smale årringer, i snitt under 0,25 mm/år fra 50-årsalderen og utover. Dette tyder på at det dreier seg om ungtrær som sto i tette klynger eller underskog. Konsistensen av den indre veden var i de fleste tilfeller fast. De ytterste ca. 2 mm derimot var i flere tilfeller

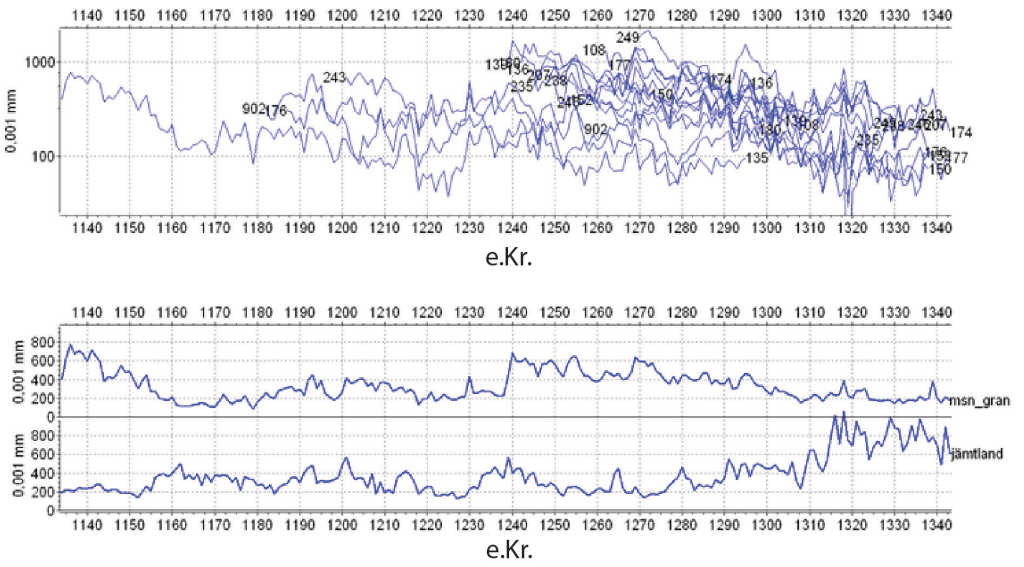
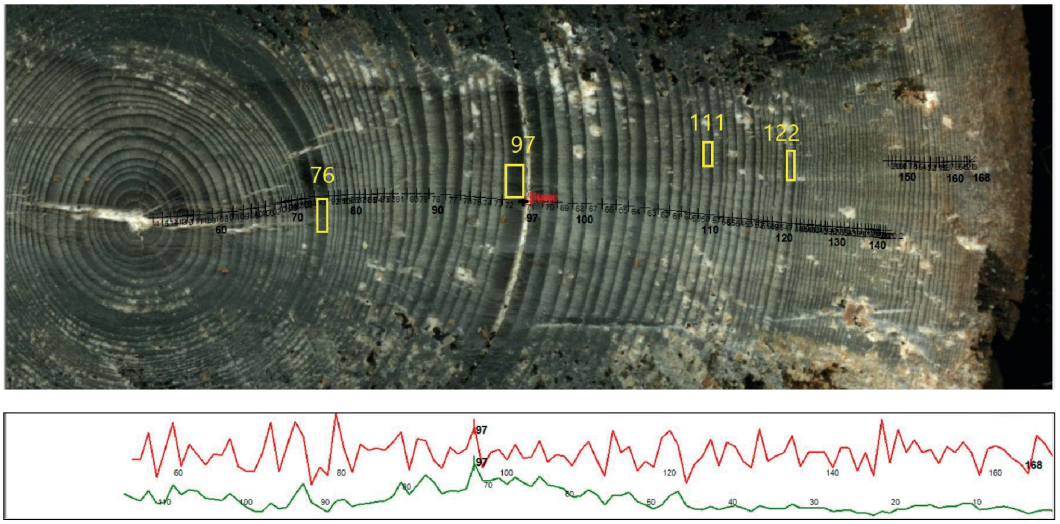


Fig. 5. Øverst: Middelseriene for 17 innbyrdes kryssdaterte staurer. Årringsbredder i logaritmisk skala. Nederst: Middelseriene av de 17 innbyrdes kryssdaterte staurene, MSN_GRAN. – Top: The mean series for 17 mutually cross-dated poles. Annual growth widths on a logarithmic scale. Bottom: The mean series of the 17 mutually cross-dated poles, MSN_GRAN.



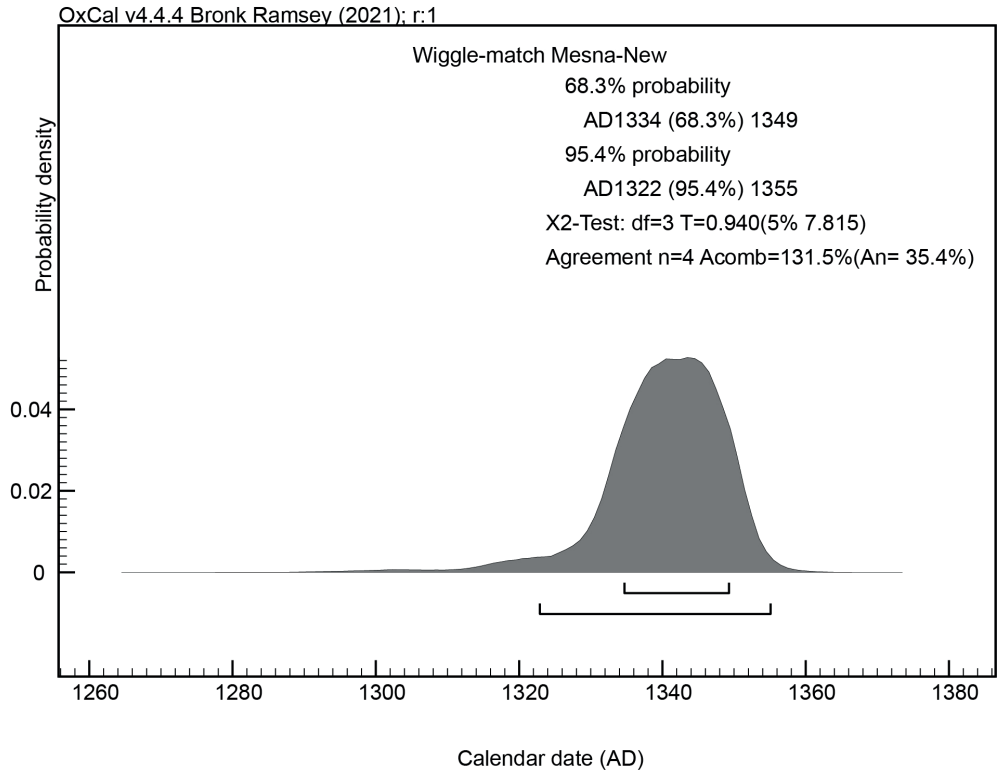


Fig. 6. Øverst: Uttak av prøver til C14-wigglematching. Skjermbilde fra årringmålinger vha. CooRecorder (cybis.se). Nederst: Resultatet av C14-wigglematchingen av staur MSN176. – Top: Extraction of samples for C14 wiggle matching. Screenshot from annual ring measurements using CooRecorder (cybis.se). Bottom: The result of the C14 wiggle matching of pole MSN176.

nedbrutt slik at den eksakte registreringen av årringsbreddene, spesielt ved meget smale ringer, kunne være vanskelig.

Innbyrdes kryssdateringer

Ulike treslag må i utgangspunkt analyseres adskilt. Den enslige *Salix*-prøven kunne pga. det lave antallet årringer ikke dateres. Furustaurene var noen flere, og her var det også flere årringer. Likevel førte dateringsforsøkene ikke fram, verken innbyrdes eller mot tilgjengelige referansekurver. Hos gran derimot kunne middelseriene for 17 staurer kryssdateres innbyrdes (fig. 5). Disse ble suksessive slått sammen til en 209-årig middelserie (MSN_GRAN). Dette var en stegvis prosess hvor også serier kunne ekskluderes igjen. Noen serier oppnådde statistisk signifikant og overbevisende visuelt samsvar med MSN_GRAN, men ble forkastet pga. kort serielengde og fare for tilfeldig opptredende, dvs. falske dateringer.

Radiokarbondateringer

Innledningsvis lyktes det ikke å datere MSN_GRAN absolutt. Granstauren som var gravd opp i 2019 var C14-datert til 1295–1415 e.Kr., og dermed kunne kattisa være eldre enn de tilgjengelige grankronologiene i Sørøst-Norge.

MSN_GRAN og staurene som inngår i denne ble derfor tidfestet ved hjelp av radiokarbondateringer. For å øke presisjonen ble det tatt ut vedprøver av fire individuelle årringer fra en staur som hadde forholdvis mange årringer (MSN176, jf. van der Plicht et al. 2020, s. 1101). Måleserien er den nest lengste i MSN_GRAN og godt korrelert med de øvrige seriene. De valgte ringene måtte være brede og uttaket nokså jevnt fordelt på skiven. Valget falt på årringene nr. 76, 97, 111 og 122, relativt datert i forhold til den 209-årige middelkurven. Avstanden i antall år mellom prøvene var dermed kjent (21, 14 og 11 år, se fig. 6).

Sannsynlighetsfordeling av de fire C14-dateringene sammenholdt med den kjente absolutte avstanden mellom årringene (såkalt *wiggle-matching*) forteller at treet MSN176 må være hogd i årene 1322–1355 e.Kr. (95,4 % sannsynlighet, 2 sigma). Toppen i sannsynlighetsfordelingen for hogståret ligger ved 1334–1349 e.Kr. (68,3 % sannsynlighet, 1 sigma). Middelkurven MSN_GRAN slutter seks år senere, og det siste treet som inngår i denne, er dermed mest trolig felt i tidsrommet 1328–1361 (1340–1355) e.Kr. (fig. 6, se vedlegg 1 for ytterligere detaljer).

Absolutte dateringer

På nytt ble MSN_GRAN forsøkt dendrokronologisk datert, nå innfor tidsvinduet gitt ved C14-dateringen og mot den nylig publiserte 2126-årige grankronologien fra Håckren i Jämtland, Sverige, 115 f.Kr.–2012 e.Kr. (Rocha et al. 2021). Denne er bygd opp av levende trær og subfossile stokker fra tjern fra ulike lokaliteter mellom 520 og 830 moh. Den laveste høyden tilsvarer altså den av Nord-Mesna (520 moh.). Begge lokaliteter befinner seg, med 260 km avstand, på østsiden av de sørnorske høyfjellsområdene. Mesna ligger ved sørvestgrensen av feltet med maksimal korrelasjon ($r > 0{,}6$) mellom Håckren-kronologien og juni- og julitemperaturer. De to kronologiene kunne derfor forventes å inneholde et felles regionalt årringsmønster, og en 209-årig middelserie burde være tilstrekkelig lang til å kunne dateres.

Dateringsforsøket ga et entydig resultat: Den siste årringen i MSN_GRAN er dannet i året 1343 e.Kr. Resultatet er statistisk signifikant (Glk 64 % med $p < 0{,}001$; t_{BP} 6,7) selv om Håckren-kronologien er med færre enn 10 trær noe tynt belagt tidlig på 1300-tallet. Dette er alternativet med høyest Glk og t-verdi de siste 2100 årene og ligger samtidig innenfor tidsrammen gitt ved C14-dateringen (fig. 7, se vedlegg 2 for ytterligere detaljer).

Hogstår

Bare seks av de gjennom MSN_GRAN daterte prøvene har sikker barkkant. Der barkkanten er vurdert som usikker/mulig (åtte staurer), gir den siste målte årringen enten hogståret, eller hogståret ligger bare noen få år etter den siste målte ringen. Der barkkanten ble vurdert som manglende (2 staurer), dvs. at overflaten var nokså nedbrutt eller de siste årringene svært smale, må det sannsynligvis legges til et større antall år.

Forutsatt at staurene er hogd og satt ned på våren etter at isen har gått, kan man tenke seg følgende bruks- og reparasjonsfaser: A) tidligst

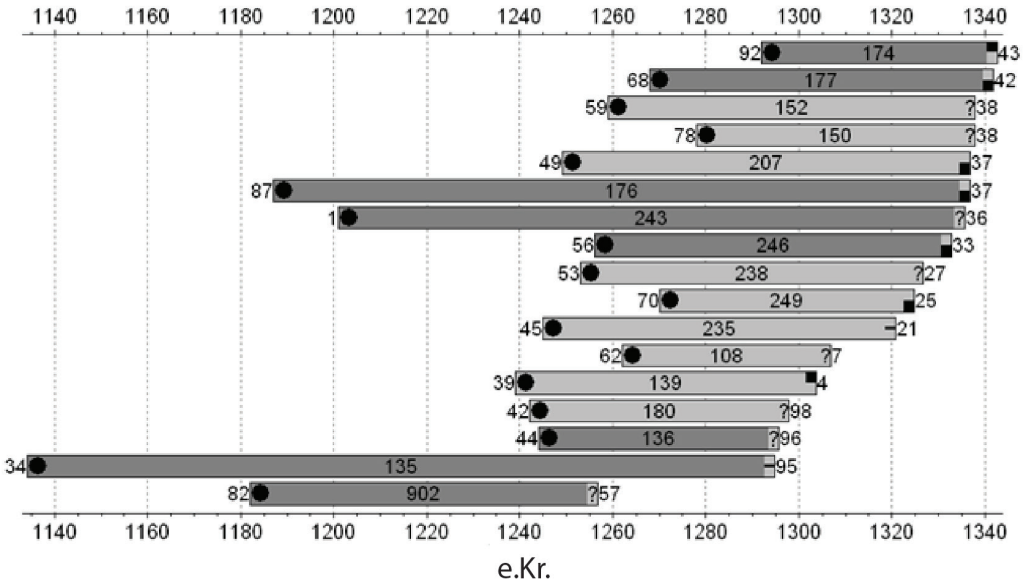


Fig. 7. Prøvene. Stolper: målte årringer med kortdato for første og siste årring. Mørk: prøver som også enkeltvis er datert mot Håckren-kronologien; lys grått: innbyrdes datert. Punkt: marg på prøven. Barkkant firkant nede = sommerved, firkant oppe = vårved,? = usikker/mulig, strek = mangler (slitt/nedbrutt). – The samples. Bars: measured annual rings with short dates for the first and last annual rings. Dark: samples with individual dating towards the Håckren chronology, Jämtland; light grey: mutually dated. Point: pith preserved. Waney edge: square below = latewood, square above = earlywood,? = uncertain/possible, dash = missing (worn/broken down).

1297 til tidligst 1308, B) 1326 til tidligst 1328, C) 1334, D) tidligst 1336 til tidligst 1339 og E) 1343. Tydeligst er de to siste aktivitetsfasene, med henholdsvis opp til fem og to samtidige staurer.

Bustokkelva

Av de to staurene fra Bustokkelva er MSN902 dendrodatert gjennom MSN_GRAN. Denne er hogd i 1257 eller kort tid etter, dvs. rundt 50 år før de eldste daterte staurene av kattisa i Nord-Mesna. Den andre stauren (MSN901) ble C14-datert til 101±28 BP. Treet ble sannsynligvis tidligst hogd på slutten av1600-tallet (se vedlegg 1 for ytterligere detaljer).

Tolkning og diskusjon

Dateringen var helt avhengig av de tre stegene; innbyrdes kryssdatering av staurene, C14-wigglematching og datering mot den 2126-årige grankronologien fra Håckren. Innbyrdes kryssdatering resulterte i en udatert 209-årig middelkurve (*floating chronology*) og 17 staurer var dermed relativt datert. Dette åpnet allerede for tolkninger angående brukstid, reparasjoner og endringer av fellens utforming. C14-dateringen av MSN176 bekreftet den tidligere C14-dateringen og tidfester samtidig de øvrige 17 staurene som inngår i MSN_GRAN. *Wiggle-matching* ga her en økt nøyaktighet (2 sigma 34 år) sammenlignet med de individuelle AMS-dateringene av fire årringer i samme stauren (2 sigma hhv. 96, 96, 113 og 178 år). Til slutt var Håckren-kronologien helt avgjørende for å tidfeste Mesna-kronologien med årets nøyaktighet innenfor det 34 år brede tidsvinduet gitt ved C14-dateringen. I etterkant ser man også at individuell datering av enkeltstaurer direkte mot Håckren-kronologien ikke hadde gitt like overbevisende resultater. I praksis var det dog bare staurer som allerede tilhørte MSN_GRAN som ble oppfattet som troverdig datert.

Blant de åtte granseriene som kryssdaterer individuelt mot Håckren i samme relative posisjon som internt i Nord-Mesna, finner vi de tre lengste (136–162 år), men også to nokså korte (52–53 år). Seriene som bare kryssdaterer innbyrdes i datasettet fra Nord-Mesna, er 46 til 89 år lange. Sånn sett kunne man si at de 15 staurene med færre enn 46 årringer i utgangspunktet var lite sannsynlig å få datert. På den andre siden kunne 20 staurer med mellom 46 og 102 årringer i tillegg ha vært mulig å datere. Suksessraten i denne aldersklassen er 14:20 (41 %).

Det ble også vurdert å tidfeste flere av de kortere årringseriene ved visuell synkronisering, såkalt *dendrotypologi*, som for eksempel anvendt hos fiskefeller i Sør-Tyskland (Billamboz 2014) og Irland (Daly 2014). Dette forutsetter imidlertid at det er tydelige indikasjoner på at et større antall staurer tilhører samme hogstår. Det er da en fordel at det analyserte trevirket i fiskefellen kan knyttes til enkelthendelser, slik som etablering av risgjerder. Med et tidsspenn av minst 50 år og staurer i en mer kompleks romlig organisering ble dette i denne omgangen ikke forsøkt. Det ble heller ikke gjort forsøk på å datere på tvers av tresorter, her gran og furu, på grunnlag av *heteroconnection* (Billamboz 2008).

Hvordan var fellen utformet?

Detaljerte beskrivelser i bygging, navnsetting av ulike deler og anbefalinger om bruk av kattiser finnes fra 1700-tallet og fremover i tid (jf. Virtanen 1963). Ifølge disse beskrivelsene ble fellene etablert på løsbunn ved bruk av båt, på isen eller ved vading (f.eks. Sirelius 1908, s. 300). Som alt omtalt var det stor variasjon i utformingen av denne type fiskefeller, men et fellestrekk var altså at kattisa ble laget av trespiler som ble bundet tett sammen med vidjer. Trespilene kunne lages av rette furutrær som ble hugget på ettervinteren og straks barket, kløyvd og tørket før bruk (Schultze 1778 [1968], s. 114). Spilene ble satt tett sammen til et palisadelignende gjerde, og dannet veggene i ett eller flere fangstkamre, fra bunn og til overflaten. Til ei kattise trengtes også slike tette gjerder laget av spiler som ledegjerde fram mot selve fangstkammeret. Gjerdene ble festet til staur/påler som man slo ned i bunnen. Gjerdene kunne med fordel tas inn om vinteren og brukes flere sesonger mens pålene stod vinteren over. Ødelagte spiler ble byttet ut med nye.

Ved vår undersøkelse i Nord-Mesna manglet spilene. For at fiskefellen skal ha vært tett og dermed kunnet holde fisken innesperret, må det imidlertid ha vært slike trespiler, flettverk eller andre former for «vegger» mellom staurene. Ut fra praksisen vi kjenner de siste århundrene er det mulig at disse «veggene» ha blitt tatt inn etter siste gangs bruk. Dette var imidlertid svært dårlige bevaringsforhold for alt som har stått over innsjøbunnen, så alternativt kan slike konstruksjonsdeler ha blitt brutt ned før vi fikk anledning til å undersøke dem.

Under feltarbeidet ble det forsøkt å påvise fangstrom og ledegjerder blant staurene, uten at dette har lyktes helt. Som fig. 8 og 9 viser er det mulig å ane konturer av flere tomme områder eller områder med mindre staurer i fiskefellen som er omkranset av tettere plasseringer av staur. Disse tommere områdene er runde eller ovale i formen og med en bredde på ca. 2–4 m, og kan representere fangstkamre. Enkeltstående staurer i ytterkanten av det avdekkede området, kan være deler av ledegjerder eller ledearmer som går inn mot fangstkammeret. I både sørvestre og sørøstre hjørne av fiskefellen, samt på midten, sto det staurer med 2,6–3,7 meters avstand fra nærmeste staur. Dette er betydelig større avstand enn i hovedkonsentrasjonen av staur. Ut fra den midtre delen av fellen ble det i tillegg funnet ytterligere en staur 4,2 meter sør for dette igjen.

Dendrokronologien kaster noe mer lys over utformingen, og vitner om omstruktureringer. Samtidig tydeliggjør årringanalysene hvordan summen av flere faser skaper uoversiktlighet. De to yngste staurene fra 1343 står sentralt i anlegget. Staurene fra bruksfasen rundt 1338 ser ut til å være plassert langs en sørvest-nordøst-akse nokså parallelt til dagens dybdelinjer (fig. 8, jf. fig. 3). De tre staurene fra perioden rundt 1327 sto nordvest for denne (dvs. lengre fra land), mens de fleste fra perioden 1297–1308 ligger sørøst. Den sørlige retningen til de mulige ledegjerdene innebærer at de går inn mot land eller mot munningen av Bustokkelva.

I mange vann var det viktig å få gjort klart for fiske rett etter isen gikk. Dette muliggjorde

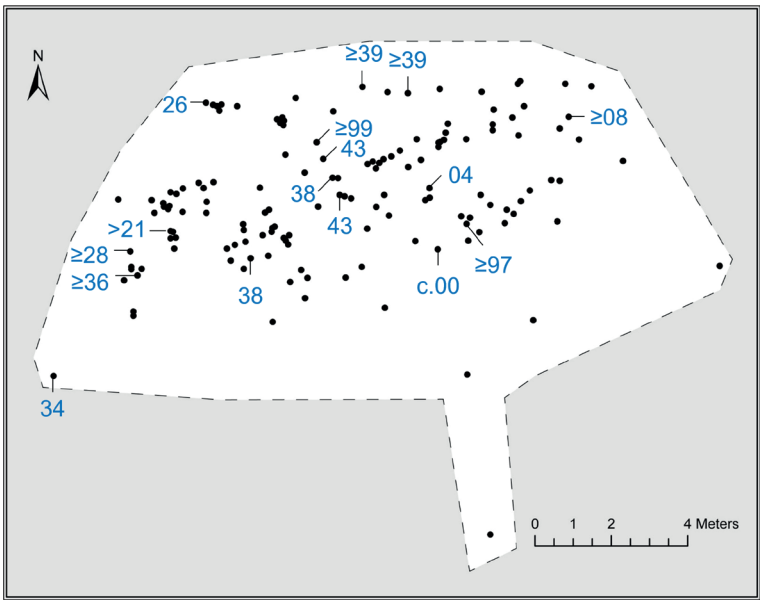


Fig. 8. De daterte staurene. Dateringene (1297–1343) er justert til hogsttidspunkt vår og angitt i kortform. Kart: Ellen K. Friis, KHM og Andreas J. Kirchhefer. – Dated poles. The dates (1297–1343) indicate that the trees were felled in the springtime and abbreviated to the two last numbers.

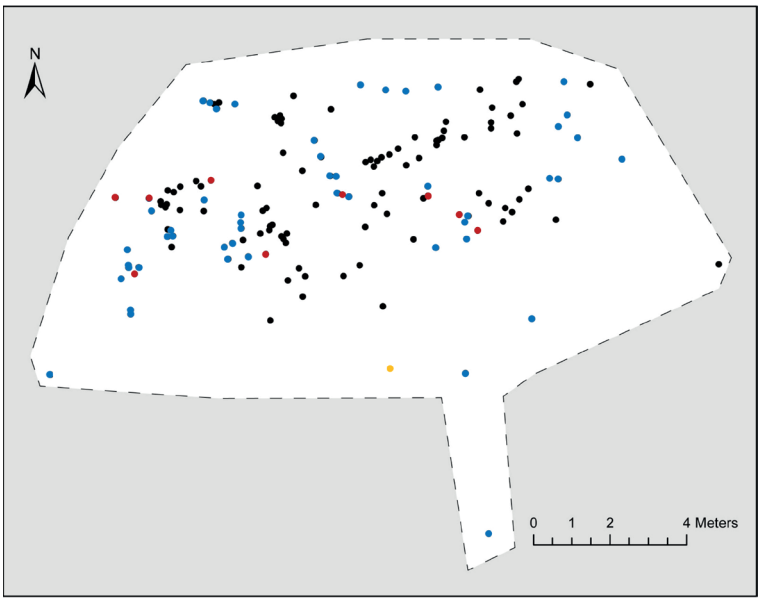


Fig. 9. Treslagene benyttet i fiskeanlegget. Blå = gran, rød = furu, orange = Salix sp. (vier/selje), svart = ikke artsbestemt. – Identified wood types in the fish trap. Colours indicate species of the identified poles. Blue = spruce, red = pine, orange = Salix sp. (willow), black = not determined.

en effektiv fangst av vårgytende fiskearter, som blant annet brasme (*Abramis brama*), gjedde og abbor (Gyllenborg 1770 [1979], s. 23–24; Schultze 1778 [1968], s. 112–117). På 1600- og 1700-tallet ble kattiser brukt spesielt for å fange brasme og gjedde i Norge (Virtanen 1963). Det mangler derimot nedtegnelser som forteller om bruken av denne felletypen i vann hvor det utelukkende var ørret. Siden ørreten gyter på høsten og stiller krav til strømmende vann, kan det ikke utelukkes at et eventuelt kattisefiske etter denne arten kan ha vært organisert noe annerledes. Som omtalt over var det kun ørret og/eller abbor i middelalderens Nord-Mesna.

Dendrokronologien viser imidlertid entydig at fellen ble reparert på våren, slik tradisjonen også har vært i nyere tid.

Kattiser og den skogfinske innvandringen

Anlegget som ble undersøkt i 2021 er det første entydige holdepunktet for at prinsippet med å fange fisk ved bruk av ledegjerder og fangstkamre også ble anvendt i århundrene før skogfinnenes ankomst i Norge. At slike feller var i bruk i middelalderen kan imidlertid ikke betegnes som helt uventet. Slike stasjonære fangstredskaper, både til lands og til vanns, utnytter nemlig helt grunnleggende trekk ved dyrs adferd. Vandrende dyr ledes inn i et fangstkammer, hvor de vanskelig unnslipper og dermed lett kan fanges/avlives. Prinsippet kjennes fra massefangstanleggene for reinsdyr, en type fangstanlegg med dateringer til jern- og middelalder som det finnes flere eksempler på i innlands-Norge (f.eks. Amundsen & Os 2015). Bruken av stengsler og fangstkamre ved fiske er også et prinsipp som har vært anvendt i mange deler av verden (Brandt 1984, s. 163–165), og Norden er ikke noe unntak. Som redegjort for innledningsvis har et slikt innstengningsfiske blitt praktisert i ulike former i disse områdene fra steinalderen til nyere tid. Også i dag regnes de å være blant de beste fiskemetodene for kommersielt ferskvannsfiske i skandinaviske innlandsvann (Taugbøl et al. 2004). I tillegg gir middelalderens lovtekster holdepunkter for bruk av fiskesperrer ved ørretfiske, selv om utformingen av disse konstruksjonene ikke er spesifisert. Blant annet heter det at den som volder skade på *garðar* til laksefiske måtte bøte 1 mark sølv til konge og eier, mens straffen for å ødelegge stengler for ål og ørret var det halve. Uansett om redskapen var satt opp for laks, ørret eller ål måtte skadevolder også erstatte påførte tap av utstyr til fangst (L VII, 48-5).

Fisket – avkastning, bruksrett og pest

Når anlegget var i drift ble fisken løftet ut av fangstkammeret med hov, typisk flere ganger om dagen på våren og forsommeren, og et par ganger per uke senere på sommeren og høsten (Sirelius 1908, s. 302; Valonen 1953:56). Utbyttet varierte, men det rapporteres om at fellene på sitt beste kunne fange 50 kg fisk på én dag (Valonen 1953, s. 56). De finske fisketradisjonene er ikke direkte overførbare til Mesnavannene, blant annet fordi fellekonstruksjonene neppe har vært identiske og fordi Mesna-fisket, i alle fall til dels, var rettet mot andre arter.

Erfaringer med storruser i fra nyere tid kan kaste ytterligere lys over avkastningen. I Hjälmaren ble storruser (storryssjor) av og til kalt for kartsor (Alm 1942). Dette kan skyldes at den på mange måter er en moderne utgave av kattisa, da den bygger på det samme fangstprinsippet (Ekwall 2023). Erfaringer med bruk av bare én storruse til tynningsfiske i Hornsjøen (817 moh.) 16 km nord for Mesnali, var at det lyktes å fange ca. 26 000 individer av abbor i tidsrommet siste halvdel av mai og første halvdel av juni 2002. Innsjøen har både ørret og abbor. I Gålåvannet, 66 km nordvest for Mesnali, ble ca. 1 700 individer abbor fanget i en storruse i 2003, noe som var ca. 15 år etter at abbor ble ansett som helt borte fra innsjøen. Slike erfaringer viser at storrusa har potensiale til å fange abbor effektivt i gytetiden på våren. Tilsvarende viser erfaringer at ørret lot seg fange enten mer jevnt utover sesongen eller at den økte på høsten som er dens gytetid (Taugbøl et al. 2004).

Disse tallene synliggjør avkastningspotensialet til fellene, men også behovet for å føre tilsyn med anleggene. Man var følgelig helt avhengig av at noen med tilhold i området har kunnet drifte anlegget, gjerne i store deler av den isfrie sesongen. Dendrokronologianalysen viser at det har blitt drevet vedlikehold og tilsyn med anlegget i nær 50 år, fra før år 1300 til 1343, noe som utvilsomt må ha krevet en betydelig og vedvarende arbeidsinnsats. En slik drift har neppe latt seg gjennomføre uten at noen har hatt ansvar for driften og rett til å ta hånd om fangsten. Den undersøkte fellen ligger i en allmenning i dag, noe den også kan ha gjort i middelalderen (jf. Iversen 2021). Et hovedprinsipp i den norske allmenningstradisjonen er at bygden skulle ha lik tilgang til godene, noe som blant annet er uttrykt i bestemmelsen om at «Alle fiskevand i almenningene er alle jevnhjemlet» (LVII 62-7, jf. F XIV 8). Konflikter rundt prinsippet om lik rett kunne imidlertid oppstå i tilfeller der det var investert betydelige ressurser i å sikre avkastningen fra utmarken (Solem 2003, s. 251), slik som

ved etablering av fangstsystemer til lands og til vanns. Lovverket tok imidlertid delvis høyde for dette, gjennom en unntaksbestemmelse for dyregarder og dyregraver (L 63-1, jf. F XIV 9). Om slike fangstinnretninger for landdyr heter det seg nemlig at disse kun kan føres opp om de ikke forringer andres dyregard (L VII 63-1). Videre het det seg at dyrefangstanlegg som lå ubrukt i mer enn ti vintre kunne bygges opp og anvendes av hvem som helst. Det er nærliggende å tenke seg at reguleringene av fiskefellene kan ha blitt praktisert på samme måte. Man kan imidlertid heller ikke helt utelukke at allmenningsgrensen var trukket annerledes, og at gården(e) som drev fisket hadde eiendomsrett helt ned til Nord-Mesna i middelalderen. I så fall sier Landsloven klart at fisket var en eksklusiv rett som tilhørte gården (L VII 48-1, jf. F XIII-9). Uansett organisering viser undersøkelsen et vedvarende og omfattende vedlikehold av fellen, og det er det svært nærliggende å knytte fellefisket til fast bosetning i området. Tunene til de nærmeste av gårdene i høymiddelalder lå 2–3 kilometer sør for det undersøkte anlegget (Ormøy 1992, s. 73–77), og kanskje var det beboere her som driftet og vedlikeholdt anlegget?

Usikkerheten rundt plasseringen av gårdstunene i høymiddelalder er imidlertid stor. Noe som til dels skyldes et knapt tilfang av samtidige skriftlige og arkeologiske kilder, og delvis omleggingen av bosetningsmønstret som en følge av nedgangstider, blant annet forårsaket av et forverret klima (Jordan 1996), og svartedaudens herjinger i 1349–1350 (Benedictow 2016). Det har nemlig blitt beregnet at minst 60 % av landets gårdsbruk ble fraflyttet som følge av pandemien (Lunden 2002, s. 28), enten fordi de som bodde på gården døde, eller fordi det ble ledig jord i områder der forholdene lå bedre til rette for landbruk. Nærområdene til Mesnavannene var trolig ikke noe unntak fra denne utviklingen. På 1600-tallet omtales de gårdene som trolig lå i området i høymiddelalder som gjenryddede gårder (Ormøy 1992, s. 76). Dette er gårder som med stor sannsynlighet ble lagt øde omkring år 1350.

Uansett hvem som sto for fiskefelledriften, er det imidlertid nærliggende å peke på nedgangstidene som rammet regionen på 1300-tallet som medvirkende årsaker til at fisket opphørte rundt 1350. Vi kan dokumentere nær 100 år med aktivitet, med ca. 50 års sammenhengende drift av anlegget, og et forutgående fiske i Bustokkelva (tidfestet til 1257 eller kort tid etter). Deretter følger ca. 300 år uten spor etter fiske, før det igangsettes et omfattende fiske samtidig med den skogfinske innvandringen. Resultatene av felleundersøkelsen kan derfor tolkes som et sjeldent og svært konkret arkeologisk holdepunkt for konsekvensene av krisetiden i det indre av Skandinavia.

Vedlegg

Vedlegg 1 og 2 kan lastes ned fra https://doi.org/10.5281/zenodo.10157277.

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Summary
Fishing in rivers and lakes has traditionally yielded predictable and substantial returns in inland Norway. However, the written sources that shed light on inland fishing in pre-modern times are fragmented and lack details. At the same time, archaeological source material has been sparse. There has therefore been a shortage of knowledge about how this fishing was practised and organized. However, several recent excavations of medieval fishing traps are now changing this situation. Among these an investigation of an enclosure system for fish trapping in the lake Nord-Mesna in the inland of southeast Norway stands in a unique position.

Every year, the waters of the lakes Nord-Mesna and Sør-Mesna are drained for hydropower production. At low water levels, 23 areas with standing poles have been identified in shallow water. These poles are the last remains of enclosures for passive fish trapping. The tradition of this fishing method in eastern Norway has commonly been linked to the westward migration of people from Southern Finland in the 17th century. Five poles from traps in the Mesna lakes have been proven to be from recent times by radiocarbon dating, and it is likely that these constructions were operated by people with a Forest Finnish ancestry. However, a pole from a sixth trap was unexpectedly determined to be from the Middle Ages (1295–1415 AD (590±35 BP, LuS 14869)) in 2019. The dating raised questions about the origin of this trap tradition and medieval fishing traditions in the Scandinavian inland.

In 2021, the medieval trap was entirely uncovered by hand and excavator. 145 poles were documented within an area of 13 x 6 metres. The poles were 2.2–10.1 cm in diameters and 15–180 cm in length. The investigation showed that the facility had several repairs and overlapping phases, which made it difficult to distinguish significant structural elements. Additionally, two poles of what were likely to have been parts from trap fences were brought in from a nearby river, about 550 m from the excavation area.

A stepwise dendrochronological examination of 51 spruce (*Picea abies*) and nine pine (*Pinus sylvestris*) poles and one willow/willow (*Salix* sp.) pole offered significant additional information. First, it was possible to cross-date 17 posts of spruce. These formed a 209-year mean series (MSN_GRAN). Initially it was not possible to date MSN_GRAN absolutely. Four growth year-rings were therefore radiocarbon dated (*wiggle matched*). Four year-rings (MSN_GRAN, years 76, 97, 111 and 122) from one of the logs were collectively dated to cal. AD 1322–1355 (95.4% probability). Afterwards, a 2000-year spruce chronology from Håckren in Jämtland in Central Sweden was published (Rocha et al. 2021). A new attempt at absolute dating based on the Håckren curve gave an unambiguous result. The last complete year ring in MSN_GRAN was formed in the year 1343 AD. The logging years are spread over a period of up to 48 years, from ≥1297 to spring 1343. Furthermore, the analyses provides evidence for phases of maintenance and repair in the spring/early summer: A) ≥1297 to ≥1308, B) 1326 to ≥1328, C) 1334, D) ≥1336 to ≥1339 and E) 1343. One of the logs belonging to the probable fishing fence in the nearby river was also successfully dated to ≥1257.

Nordic descriptions of the operation of traps in the 18th, 19th and 20th centuries report that such traps had a potential for large catches. They also record that the fishing commonly started as soon as the ice melted in springtime, and that they required extensive supervision throughout the summer. The traps were therefore most likely operated by people living nearby. There is no comprehensive information about the distribution of farms in the vicinity of the Mesna lakes in the Middle Ages. However, the nearest settlements were most likely located 2–3 km from the excavated trap before it was abandoned in the mid-14th century.

The excavation clearly shows that fishing was an important resource for medieval farms in the area, and gives a unique insight into fishing traditions in this period. Based on the results, it

is also evident that enclosure systems for trap fishing were practised in the region centuries before the 17th century Finnish immigration. Furthermore, the cessation of fish trapping can also be interpreted as being a direct result effect of the 1300s recession caused by factors such as climatic deterioration and the bubonic plague.

Medieval groove plane

A wood-carving tool from the archaeological excavations in Elbląg

By Przemysław Michalik

Michalik, P., Medieval groove plane: A wood-carving tool from the archaeological excavations in Elbląg. *Fornvännen* 119. Stockholm.

The author focuses on explaining the way of using and the function of an iron-and-wood object found during archaeological research of a site at the back of a town plot in the Old Town of Elbląg. The object is dated to the 1240s. A search for analogous archaeological finds in combination with the study of other categories of sources, including ethnographic and iconographic ones, made it possible to establish that this was a tool for cutting grooves in wood. It served to produce long, relatively narrow and not very deep grooves, mainly in shingles.

Keywords: archaeology, ethnography, late Middle Ages, Elbląg, woodworking

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In 1992, during archaeological excavations conducted in the rear part of an urban plot in Mostowa 13 Street, the Old Town of Elbląg (Poland), the cultural layers dated dendrochronologically to the 1240s revealed an unusual item made of wood and iron (fig. 1). In the course of inventorying, it was provisionally labelled as 'unidentified item' and marked with the inventory number of XXIV/1969. The early dating of the aforementioned layers enables linking this find to the very beginning of the Teutonic Order's settlement in what is now Elbląg. Although the town was chartered in the year 1246, it is known that the first houses of this new urban organism were erected a few years earlier – already in 1237 (Czaja & Nawrolski 1993, pp. 63, 70).

The discussed artefact consists of an iron part and a wooden handle (fig. 4A). The preserved length of the iron part is 248 mm, which includes a completely-preserved arm measuring 225 mm in relation to the artefact's axis of symmetry. The handle is 258 mm long, with the maximal width of 41 mm and thickness of 39 mm. The iron part is visibly damaged, with about a half of it missing, and has a form of a rod-like element with the cross-section resembling a square (maximal dimensions of 14.4 x 12.8 mm) but with rounded, gently-formed edges. The ending of the arm, the so-called quill, has been forged into the shape of a knife with triangular cross-section. Its end is bent in a hook-like manner, resembling the letter J. The length of this particular hook is 4 mm and width – measured between the outer walls of the quill – approximately 8 mm. The maximal width of the quill is 25 mm. The sharp edge is present on the bottom side of the quill (figs. 2–3).

According to the dendrological analyses, the handle of the Elbląg tool was made of high-quality, flawless, "fine-ringed ash wood, most likely

Fig. 1. Groove plane from Elbląg. Photo: M. Dąbski.

common ash (*Fraxinus excelsior* L.)" (the dendrochronological analysis of the artefact was performed by Prof. P. Kozakiewicz, EngD, from the Department of Wood Science and Wood Preservation, Faculty of Wood Technology at the Warsaw University of Life Sciences, Kozakiewicz 2011, p. 5). This wood is characterised with considerable hardness as well as resilience and

Fig. 2. Groove plane from Elbląg, detail 1. Visible are the hooked endings of the arm of the tool and the line of the edge. Photo: M. Dąbski.

Fig. 3. Groove plane from Elbląg, detail 2. Visible are the hooked endings of the arm of the tool and the line of the edge. Photo: M. Dąbski.

flexibility (hardness is the "resistance offered by wood to solids pushed against it"; resilience is the capacity of the material to return "to its original shape and dimensions after the deforming forces cease to be applied"; and plasticity (flexibility) is a feature of the "material consisting in its capacity to absorb and permanently maintain deformations caused by a deforming force") (Milewski 1970, pp. 73, tab. 3, 81, 82). Therefore, the fact that this specific type of wood was used for the handle might be legitimately seen as a testimony to a sort of material knowledge derived from practice rather than theory; it may be a manifestation of conscious adjustment between the type of raw material and the method of handling the related tool. Not so long ago, the usefulness of this kind of wood for tool handles (Galewski & Korzeniowski 1958, p. 210; Milewski 1970, p. 381) and the tools themselves was still recognised (Galewski & Korzeniowski 1958, p. 210) and remains a living tradition in certain communities even today. Dendrochronological analyses of archaeological finds from cultural layers (e.g. Polish sites of Ostrów Lednicki, Opole-Ostrówek, Wrocław, Kołobrzeg, or Szczecin) indicate clearly that ash wood was commonly used for various everyday items (handles or hafts of tools, such as awls, knives, spears and axes, but also wedges, turned vessels – mostly bowls, plates, carved vessels, incuding troughs – as well as hoops of stave-built vessels, dippers, spoons, small shovels, spindles, wheels and their elements, or other implements) (see Cywa 2018 for a detailed literature overview). In Western Europe, this type of wood was also widely used for making elements of weapons,

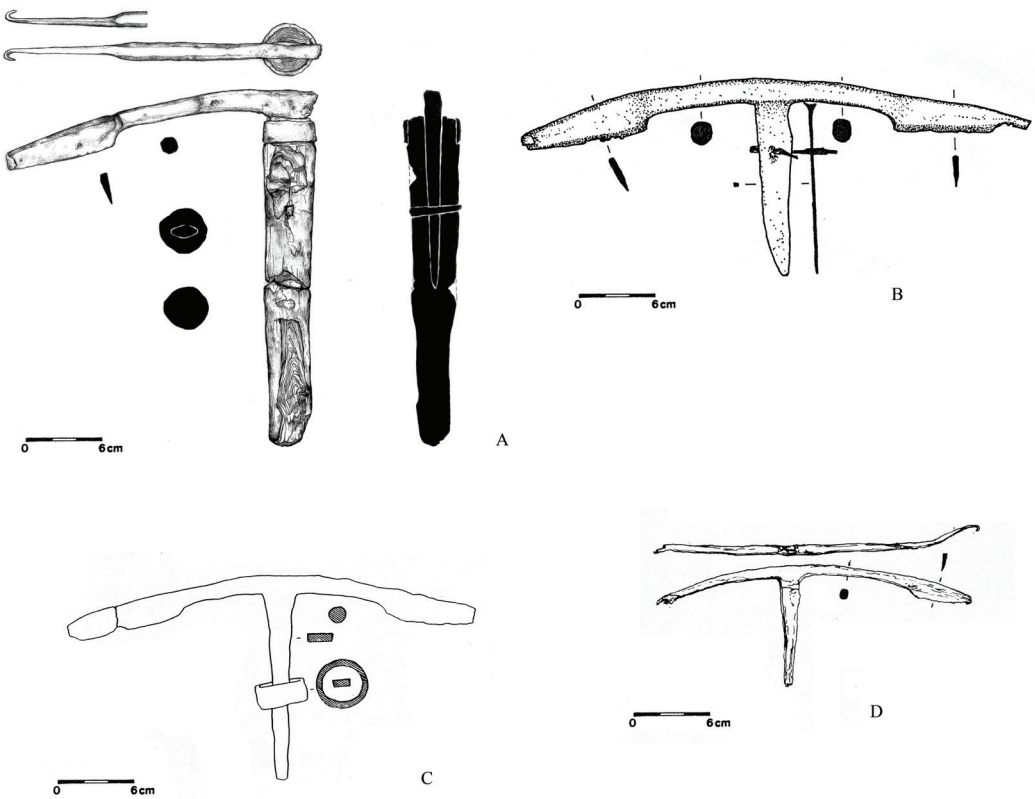

Fig. 4. Finds of groove planes from the area Poland and Europe: A) Elbląg. Drawing: B. Mydlak; B) Plemięta. After Kola 1985; C) Szczerba Castle. After Francke 1993; D) Sezimovo Ústí, the Czech Republik. After Krajíc 2003b.

including the spears and axes mentioned above as well as arrows, scabbards, swords, shields, and even bows (Haneca & Deforce 2020).

The iron part is mounted in the handle with a shank. In addition, both elements were bound at the base with a massive iron band and an iron nail, or rather a rivet. The band is up to 17.1 mm wide and 3.1 mm thick. The length of the iron rivet – passing somewhat diagonally through the handle and shank of the tool and protruding slightly on both sides of the shaft – measures c. 40 mm. Such construction of the artefact indicates clearly that it was intended as a tool.

The above description shows that the state of preservation of the artefact is not homogeneous: the iron parts are in excellent condition – the cutting edge remains sharp; at the same time, the wooden part is in a worse state – its surface is damaged, while the handle is currently composed of two bound elements with cracks running along them and passing through the riveted spot.

Apart from the Elbląg specimen discussed here, only five more artefacts of this kind have been obtained during archaeological excavations up to date: two from Poland and three from Czechia, Lithuania, and the Netherlands. The above statement is based on a survey conducted in fifteen Polish museums and a systematic review of relevant Central-European archaeological literature.

The first of the aforementioned artefacts (fig. 4B) was found during excavations conducted in the years 1974–1977 within the motte-and-bailey in Plemięta (Grudziądz district, Kuyavian-Pomeranian Voivodship) (Kola 1985, p. 156 and tab. XX:2; Boguwolski et al. 2005, p. 68 and photograph on p. 65), that is, in the remains of an old residential tower burned by the Polish-Lithuanian forces at the beginning of the 15th century, most likely in 1414, during the Hunger War (Nadolski 1985, p. 10). Such mottes are interpreted as residences of middle-class knights. The Plemięta artefact is preserved in a relatively good state. Similarly to the Elbląg specimen, it consists of a massive transverse arched rod measuring 398 mm in length, with ends hammered into quills (c. 100 and 106 mm), and a shank mounted perpendicularly to it. Both cutting edges are jagged. The ending of one of the quills is damaged, while the other one has preserved the characteristic hooked bend. An aperture in the flat shank contains a rivet. However, the wooden handle was not preserved, although the tool must have been mounted. It is also unknown whether the handle was originally reinforced with an iron band at the base, that is, in its upper part. Kola pointed out that at the time it was the first such artefact known in "the archaeological record from Poland" and labelled it as a groove plane – a tool for carving grooves (Kola 1985, p. 149).

The second of the published groove planes comes from the archaeological investigation conducted in the years 1986–1991 in the castle of Szczerba, near Gniewoszów (Kłodzko district, Lower Silesian Voivodship) (Francke 1993, p. 356 and fig. 11b) (fig. 4C). The castle buildings, erected most likely in the first half of the 14th century, were ultimately destroyed and abandoned already in 1428, during the Hussite Wars (Francke 1993, pp. 339–340). The author of the publication interpreting the specimen addressed only its morphology and described it – quite aptly – as an "item shaped like a crossbow" (Francke 1993, p. 356). Unfortunately, due to a very sketchy drawing, suggesting that the artefact was illustrated before conservation, it is impossible to precisely determine its state of preservation or, much less so, its morphological details. However, it undoubtedly has a massive rod widening on both ends, presumably hammered flat into the form of a knife. A relatively wide and thick band is preserved on it, once binding together its wooden and iron parts. The span of the arms of the groove plane currently amounts to c. 317 mm.

Another groove plane obtained during excavations comes from the Czech town of Sezimovo Ústí, also destroyed during the Hussite Wars in 1420 (Drda 1978, p. 14 and fig. VI:8; Krajíc 2003a, p. 163 and 2003b, p. 40 and tab. 132) (fig. 4D). This specimen also has two arms preserved, although the left one lacks a quill. Its iron band, however, was not preserved, similarly to its wooden handle. The drawings do not specify the exact place on the shank in which the rivet aperture is located, if it is present at all.

Fig. 5. Groove plane from Klaipėda, Lithuania. Photo: E. Ubis. After Zabiela et al. 2011.

The preserved spread of the arms is 360 mm and the length of the quill is 60 mm (Krajíc 2003a, p. 40, tab. 48).

The next of the analogous artefacts was retrieved from the 15th-century cultural layers in the castle in Klaipėda (Lithuania) (fig. 5) and labelled as an iron object of unclear function (Zabiela et al. 2011, p. 208). It is known, admittedly, from just a single photograph of its find-spot, but its state of preservation can still be considered as good. And in this case, again, there is an arched and quite massive rod with ends shaped as knives. The description indicates that their endings have hook-like bends. The shank perpendicular to both arms has a clear aperture for a rivet. Sadly, the wooden handle did not survive. It also lacks the iron band-shaped fitting resembling a wedding ring. The authors provide the following dimensions of the artefact: spread of the arms – 422 mm; height – 175 mm; and length – 85 mm.

The last of the groove planes, dated broadly to the medieval period, was found in the Dutch town of Dordrecht (Janse 1989, p. 1 and fig. 1; Janse 1990, p. 29, fig. 8) (fig. 6). Unfortunately, in both publications only black-and-white illustrations were provided, and without a scale. They also lack drawings with cross-sections. The artefact is preserved in its entirety, in a very good condition. It consists of a two-armed iron part, apparently quite massive, mounted in a wooden handle. The endings of both quills are characteristically bent. Both parts are reinforced with a metal band. The handle of the tool does not seem to be bound to the iron part with a rivet. The handle, however, bears three incisions: a vertical line and two diagonal ones crossing the former and not parallel to each other.

It bears emphasising here that there are terminological problems related to naming the particular part of the tool. In order to solve them, I borrowed some of the terms from ethnographical publications, especially the paper by Maśliński (quill, handle) (Maśliński 1963, p. 94). Others, unknown in the literature, I had

Fig. 6. Groove plane from Dordrecht, the Netherlands. Photo: ROB, Amersfoort. After Janse 1990.

to invent myself, fully aware of their sometimes debatable accuracy (arm, band, shank).

The term "groove plane" (Polish: *nutownik*) was introduced by Kola (Kola 1985, p. 156) – following the paper by Pilarski (Pilarski 1972) – in his publication of the specimen from Plemięta. It is, to the best of my knowledge, one of the very scarce, or perhaps even the only, Polish ethnographic study using this term. In Polish ethnographic publications, other terms prevail: "double scorp" (Polish: *skoblica podwójna*) (Szacki 1981, pp. 7, 10), "double-sided" (*dwustronna*) (Szacki 1981, pp. 7, 10; Pokropek 2019, p. 300), "little scorp with a double-sided edge" (*skobliczka o dwustronnym ostrzu*) (Skuza 2005, p. 41), "plane" (*struh*, *fugownik* or *fug*) (Brylak 1965, p. 153; Maśliński 1963, p. 94 and Nowicki 1913, p. 60; Maśliński 1963, p. 94 and Pilarski 1972, p. 174), or different devices for making grooves in shingles ("*wyciągacz czyli wyskrobek do fugowania gontów*" (Dekowski 1960, pp. 168, 169), *fugacz do gontów* (Gawron 1967, fig. 16:13), sometimes clarified by referencing the shape of the given implement ("a T-shaped scorp with a double-sided edge" [Polish: *Skobliczka o dwustronnym ostrzu w kształcie litery T*], Skuza 2005, p. 41; "a T-shaped tool – double-sided scorp [*narzędzie w kształcie litery T – dwustronna skoblica*] and "a special, double-sided scorp shaped like the letter T" [*specjalna, podwójna skoblica w kształcie litery T*], Szacki 1981, pp. 7, 10; "'Plane'. It is a T-shaped tool ["*struh*". *Jest to narzędzie w kształcie litery T)*, Brylak 1965, p. 153]. These names reflect the work done with the tool – scraping, whittling, routing, grooving (with the latter two denoting a very narrow, specific type of actions) – as well as its shape. Both Polish terms, *nutownik* (groove plane) and *fugownik, fug, fugacz, fugulec* (this name can be found in the 19th-century sylviculture textbook, Thieriot 1856, p. 78), derive etymologically from German (German *Nut* means a rabbet or groove, while *Fuge* denotes a joint, a slit, but also a hollow or groove, Słownik 1993, part A–O, p. 338 and part M–Z, p. 88; similarly in other dictionaries: Chodera & Kubica 2000, pp. 285, 578; Piprek

& Ippoldt 1994, pp. 183, 629), but of those two only *Nuteisen* is used in German publications dealing with the discussed tool (Engel 1907, p. 29; Phleps 1942, p. 96, fig. 123; Stülpnagel 2000, e.g. pp. 19, 20, 22, 23). Obviously, it is not the only name used for this tool in German. In 1861 (Historische Werkzeugkataloge) and the early 20th century, namely in the year 1909 (Handplane Central…), it was on offer – as Schindel-Zieheisen (Schindelzieheisen) – by the Viennese company Joh. Weiss & Sohn, manufacturing woodworking tools, yet another name is *Nutreißen* (in historical Galicia, i.e. today's Ivano-Frankivsk Oblast in Ukraine (Engel 1907, p. 9). Not being in a position to offer a similar analysis in the Swedish language, I must limit myself to noting that, as pointed out to me by the Editors, the Swedes call similar carving tools *skölp* or *gröpjärn*. Obviously, there is no way to be sure that any of these terms, attested in texts from the 16th century, refers specifically to the groove plane (SAOB).

The main research question is not to determine the general function of the tool, as it has already been explained in the description of the find from Plemięta (it was meant for cutting grooves), but to clarify how it was handled – which part was the working one (cutting, carving): the hooked ending of the quill or rather the flat part? And if so, then what was the point

Fig. 7. Fragment of the stained glass window from the Notre Dame Cathedral in Chartres (France), depiction of a craftsman working with a groove plane. Photo: Vassil, Public domain, via Wkimedia Commons (accessed 28 January 2024).

in bending the endings? Or why two arms were needed? Was not one enough to fulfil the same goal? Authors of archaeological works, as well as some ethnographers, seem to ignore the above questions. In result, few people now know the exact function of this tool, as reflected by the previously-discussed difficulties with interpreting such finds. Even less is known about the way in which these tools were handled.

Answering the questions thus posed is, however, impossible on the basis of archaeological data alone. Hence, it is necessary to consult other categories of sources: iconographic and ethnographic (including visuals, such as photographs and video documentaries showing skilled crafts people at work).

I am aware of but one medieval image of a groove plane, from France. It is depicted on a stained glass window in the Cathedral of Our Lady of Chartres showing a carpenter's workshop of some kind (fig. 7). This refers to the stained glass window no. 21 (according to the current numbering) depicting the life of St Julian the Hospitaller located in the northern, left side of the ambulatory of the cathedral, or rather its lower part showing – as per its interpretations – the founders of the artwork (panel 3). The window is dated to between 1210 and 1225 (over the last several decades, its dating changed multiple times: in the current database of the French ministry of culture it is dated to the years 1210–1225: Ministère de la Culture, whereas in another database it is dated to 1215–1225: ULS Digital Collections, University of Pittsburgh; the same, slightly narrower dates, the years 1215–1225, can be found on the cathedral's own website: Les vitraux de la cathédrale de Chartres); therefore, it may be assumed that it was created somewhere between 1210 and 1225; regardless of the exact date, the discussed groove plane and the stain glass window come from roughly the same period). Among the tools depicted there – a frame saw, two hatchets, a plane, and a hand borer hanging from the workshop wall – there is also a groove plane. It is shown being used by one of the two craftsmen depicted there, who is leaning over a short beam or plank with clearly visible parallel lines. He is holding the handle with his right hand, whereas with the left he is grabbing the iron part in a characteristic way, so that the iron arms are positioned vertically. And this is all the information provided by the image.

Much more productive in this regard seem to be results of ethnographic studies, not only Polish but also Czech, Slovak, and even first and foremost – Hungarian and Romanian. They bring not only information on the functions but also the handling of these tools, as well as data on various differences in their construction and sizes.

Undoubtedly, the most common function of the groove planes was manufacturing shingles (fig. 8). The relevant ethnographic accounts of them being used to carve grooves in shingles come from south Poland (Pilarski 1972, p. 174; Maśliński 1963, p. 94; Dekowski, 1960, pp. 168–169; Szacki 1981, p. 7; Gawron 1967, p. 48, fig. 16:13; Brylak 1965, p. 153), Slovakia (Zajonc 2014–2023), Czechia (Starý 1925, p. 102), Romania (Haáz 1942, pp. 13–15), and Hungary (Csilléry 1982); however, these tools may have served other functions as well.

The groove planes were used also to make household items or, more generally, utility objects. This is attested by a Hungarian documentary showing the traditional process of manufacturing a wooden chest (Keszi-Kovács 1955). The same method was described also slightly earlier, in a Hungarian publication on woodworking (Haáz 1942, pp. 45–48). In both cases, the groove plane was used not only to carve grooves in the edges of boards, such as shingles for building side walls, but also in laths making up the frame in which elements of the walls and lid were later mounted. The same use of a groove plane was described also by Csilléry (1982). Without going into the genesis of chests of this construction, it should be stated that they were certainly known and used in the Middle Ages. Evidence of the age of this carpentry tradition are fragments of two chests found during excavations in the German city of Schleswig. One is dated to the 12th century, the other to the beginning of the 13th century (von Stülpnagel 2000, pp. 308–309). Many more similar chests, but preserved in their entirety, are in museum collections, e.g. an artefact dated dendrochronologically to the year 1174 or slightly later (von

Fig. 8. Grooving shingles, the region of Východné Slovensko, Slovakia. Encyclopedia of Slovak Folk Culture 2. https://www.ludovakultura.sk (accessed 12 September 2021).

Stülpnagel 2000, p. 236) and the other ones to: the year 1230 or slighty later; first half of the 13th century; the year 1260 or slighty later; and the year 1261 or slighty later (von Stülpnagel 2000, pp. 205–208). It should be noted, however, that it is impossible to clearly determine what tools were used during their manufacture. The mentioned video (Keszi-Kovács 1955) shows that the same tool could be used to decorate the outer side of the manufactured chest (see also Krajíc 2003a, p. 163; Csilléry 1982). After painting it uniformly in one colour, the groove plane and another groove-carving iron apparatus (*fuzek*) attached to a compass were used to make shallow, surface, and relatively short grooves, thus creating a decorative pattern. Such ornamentation technique, called insculping (Polish: *ryzowanie*), used to be quite common and well-known, also in Poland (Maśliński 1963, p. 108).

Ethnographic studies revealed one more function of the discussed tool. It could serve to make slits in basins (Maśliński 1963, p. 94) and flax-brakes (Szacki1981, p. 10, photograph 10) (fig. 9). In those cases, it required even greater amount of work than carving grooves in shingles, because the longitudinal slit would have to be carved all the way through. It is difficult to unambiguously decide whether and to what extent these tools could find use in traditional wooden construction, which relied on tongue and groove connections. Such opinions have been voiced in Czech and German scholarship

(Štajnochr 1983b, p. 216; and after him: von Stülpnagel 2000; Krajíc 2003a, p. 163).

It appears that the aforementioned examples do not exhaust the subject of potential functions of the groove plane. The tool could be used wherever it was necessary to make relatively narrow grooves of various depths – from shallow ornamental ones to those going all the way through, as seen in scutching devices.

The archaeological and ethnographical analogies discussed before enable a preliminary conclusion that, contrary to appearances, the discussed tool is not as mysterious as it initially seemed. Information about it is, however, dispersed in expert literature of niche character, mostly ethnographic, and usually a few decades old. Hence, it comes as no surprise that it is not widely known by non-experts. Nevertheless, the presented data allows for reconstructing the incompletely-preserved artefact from Elbląg. With considerable confidence, it may be stated that it was a tool with two identical and symmetrical arms.

A question that poses itself then is how this groove plane was handled? What purpose was served by the knife-like endings of the two arms or the hook-like bends? Were both arms equally indispensable? Perhaps one would suffice for it to work as intended? In answering these questions it seems justified to have a closer look at the whole manufacturing process in which it took part. The relevant information comes, first and foremost, from ethnographic studies, albeit of certain use in this regard is also the aforementioned fragment of the 13th-century stained glass window (fig. 7).

Primarily, a piece of wood selected for further reworking (e.g. a wedge-shaped board) would have to be immobilised so that the surface in which the hole was to be made faced upwards. Such arrangement was necessitated by the fact that the groove plane was operated with two hands (figs. 8–9). The exact way to work with it would differ, depending on the technological advancement in a particular time and place. In general, simple benches were used for this, with a pair of pegs mounted in them, incised vertically in the upper part, or two pairs of specially-arranged little boards. Sometimes, a single massive bolt of wood with a slit was enough, often tied around with a cord to prevent it from cracking (Zajonc 2014–2023).

Fig. 9. Carving of grooves in a flax-brake, Rakszawa, the Podkarpackie Voivodship. Photo: U. Gmachowska, 1975. Archive, National Museum of Ethnography, Warsaw.

In the Kielce region (Poland), a bench of somewhat more complex construction, with a mounted peg (Polish: *trzymacz*), a block with a V-shaped notch for the worked board (*stępka*), and a raw hook protecting the craftsperson during work (*kulka*), was known as 'router' (*fugowanka*) (Maśliński 1963, p. 96, photograph 4). In the Gorlice district, "the bench in which shingles are immobilised with chock placed between

four pegs impaled into the board which mark its length and thickness" was called "a stool for grooving" (*stolec do paszenia*) (Brylak 1965, p. 153). On the other hand, Skuza quotes yet another name for the grooving stool: "a pony" (Polish: *konik*) (Skuza 2006, p. 41). In some areas, for instance in Romanian central Transylvania, the Harghita district, a simple massive log-bench was used, with a vast carved cavity in which several dozen (up to 60–70) shingle boards could be stacked. However, they were arranged crosswise, while the rabbets were made by two persons sitting on the opposite sides of the bench (Haáz 1942, pp. 13–14 and fig. 17). There is also a kind of a special frame attested for Czechia – it was mounted on trestles (two pairs of crossed wooden bars) stuck into the ground, which enabled arranging and carving several dozen shingles in a single manufacturing cycle (Starý 1925, p. 102 and ill. 5).

Another, much more complicated, device for immobilising worked pieces of wood was a shaving bench (Polish: *kobylica*). However, up to the second half of 20th century it was used in traditional folk craftsmanship for smoothening the surface of wood with a draw-knife (for instance: Maśliński 1963, pp. 95–96; Brylak 1965, p. 152; Dekowski 1960, p. 169; Pilarski 1972, p. 173; Keszi-Kovács 1955; Kaucký 1955) rather than to carve grooves. Maśliński noted, nevertheless, that "the ingenuity of particular craftsmen turned it into a universal tool" (Maśliński 1963, p. 96), which led to the shaving bench being used also for making grooves in shingles. Nowadays, it finds use during historical craftsmanship shows or in contemporary workshops employing old or slightly modified traditional manufacturing methods (e.g. Region Vysočina; Blanenský deník or the film: Idnes TV). I am not aware, however, of any considerably older cases of this particular device being used for grooving. The quoted examples may be, therefore, considered a purely modern attempt at adapting the shaving bench for new purposes. In effect, it is doubtful that it was used in the latter way a few centuries earlier, especially since it remains uncertain whether this device was at all known in 13th-century Elbląg or when exactly it was invented. Mentions published in the archaeological literature, already quite old, are not very helpful in that regard (Barnycz-Gupieniec claims, referencing the opinion of two other scholars, that "shaving benches are thought by ethnographers to be a relatively late invention", Barnycz-Gupieniec 1959, p. 51).

However, the simplest, most primitive way to immobilise a piece of wood – and thus the most easily-available one – is to chock a vertically positioned or dug-in wood block in a crevice (Phleps 1942, p. 96, figs. 123.9 and 123.13; Dekowski 1960, p. 169; as well as a contemporary photograph: Die kleine Seite…), between two furcate tree branches impaled or dug into the earth close to each other (Štajnochr 1983a, p. 169 and tab. XII:1), or in one or two incised or partly-split (cracked) massive pegs (posts) also dug into the ground (in this case, the pegs would sometimes be protected from further cracking by tying them below the cracking point, see: Štajnochr V., 1983a, tab. XII:2; for instance, a bast band may have been used for binding, Štajnochr V., 1983a, p. 169) – the last method can be seen on the 13th-century stained glass window (fig. 7). The immobilising with two pegs was practiced for a few centuries, both in Western Europe and in Central-Eastern Europe, where it remained in use well into the modern times. This method was also used for making shingles by the Lemko People from the Gorlice area (Poland) (Brylak 1965, p. 153). The same way to immobilise the worked board, but with addition of wedges, is known also from the Kielce region (Poland). It was used for making flax-brakes or, more precisely, for carving grooves in them; in this case, *kule* (solid beams measuring about a dozen centimetres in diameter, incised in the upper parts) were dug into the ground c. 80–100 cm from each other (Maśliński 1963, p. 96 and photograph 5); similarly about manufacturing flax-brakes in the Rzeszów region (Poland) (Szacki 1981, p. 10 and photograph 10). For more examples, see: Štajnochr 1983a, p. 169 and tab. XII:2 and Keszi-Kovács 1955.

Depending on the manufactured item as well as the available workshop, this work was performed either while sitting – e.g. grooving shingles (Starý 1925, p. 102) or parts of chests (Keszi-Kovács 1955) – or standing – e.g. making

(Janotka 1963, unnumbered photograph after p. 160 [p. 160c, photograph 2]) and ornamenting chests (Keszi-Kovács 1955), manufacturing flax-brakes (Maśliński 1963, p. 96, photograph 5 and Szacki 1981, p. 10 and photograph 10) or shingles (Starý 1925, p. 102 and ill. 5). Grooves could be made separately on each of the worked elements or "en masse", after immobilising several pieces (for instance: Phleps 1942, s. 96, Abb. 123.9) (fig. 8) or – as mentioned earlier – even several dozen boards at once (Starý 1925, p. 102 and ill. 5; Haáz 1942, pp. 13–14 and fig. 17). In either case, further work proceeded in the same way. The grooving was performed by a single person, but sometimes – to make the work more efficient – also in pairs. Paired work was possible when the bench (or arm) had at least several boards attached at the same time and the craftsmen could sit on it or next to it, opposite each other. Then, one would carve the groove up to a certain length of the board and the other – the rest. Meanwhile, the first one would already carve a groove in the next board (nowadays teams of two could also be observed, with one person preparing wedge-shaped boards on the shaving bench, while the other was carving grooves on another bench, e.g. Maśliński 1963, photograph 4; Such work division is also mentioned in a Hungarian publication by Petercsák 1984, p. 77). Such procedure shortened the time necessary to carve the grooves and eliminated the need to flip the boards and re-attach them to the bench each and every time.

The tool was operated with both hands: one hand was always placed on the wooden handle, while the other held the iron part at the junction of both elements (four bent fingers on the metal part; handle between the fingers and the thumb) (Szacki 1981, photograph 10; Maśliński 1963, photograph 4; Keszi-Kovács 1955; Haáz 1942, fig. 14) or only the iron arm (Janotka 1963, unnumbered photograph after p. 160 [p. 160c, photograph 2]), sometimes, the work would be performed with the groove plane held with two hands on the shaft, so that the arms of the groove plane were positioned vertically (figs. 8–9). It seems that this method ensured strong and secure grip and thus allowed for applying greater force (both in parallel and perpendicularly to the carved groove) during carving, improved control over the tool, and resulted in better precision. At the same time, it prevented the iron part from disconnecting from the handle, as the tool was drawn simultaneously by the handle and, with the other hand, by the iron part. This was important, because the key elements of the tool were not always connected as strongly as in the Elbląg specimen, reinforced with a rivet and an iron band. Such reinforcements are missing from some tools, e.g. those published by: Dekowski 1960, p. 168, fig. 4b–c; Haáz 1942, p. 45, fig. 69; Gawron 1967, p. 48, fig. 13:6; Nowicki 1913, p. 60, fig. 45.

The grooves were made along the wood fibres (Szacki 1981, p. 10), except for making decorations (Keszi-Kovács 1955), and the carving would begin from approximately the 2/3 (for instance, a film documenting the work performed with a groove plane – Keszi-Kovács 1955) or, sometimes, 3/4 (Starý 1925, p. 102) of the length of the worked element, although it must have depended on its size and the reach of the arms of the craftsman himself. He would draw the tool towards himself, once or several times, with the hooked ending of the quill across the surface of wood, thus removing some of it in the form of wood shavings, and next turned the tool by 180 degrees in his hands to repeat the same action with the other ending of the groove plane. But what was the point of this procedure? What purpose was served by the turning of the tool? As explained by Maśliński: "Each time the tool is drawn, the groove gets deeper and slightly wider, since the whole edge of the tool is at work, bent like the letter J (…). Both [edges – P. M.] work alternately, thus widening and deepening the groove together from the right and then from the left side" (Maśliński 1963, p. 107). Such gradual deepening of the groove and its alternate, left- and right-hand widening was also noted by Szacki and Krajíc (Szacki 1981, p. 10; Krajíc 2003a, p. 163). The described actions can also be observed in the documentaries showing manufacturing of shingles and elements of a wooden chest (Kaucký 1955; especially: Dorňák 2022; Keszi-Kovács 1955). The craftsman would repeat this procedure until the groove reached the desired depth and width and then he would turn

the worked piece of wood by 180 degrees and apply the method again to carve a groove on its opposite side. This way, a groove with a V-shaped cross-section and slightly rounded bottom was achieved. The right wall of the groove was formed with the left arm of the groove plane (since the J-shaped cutting edge would then gradually remove wood on the right side and the bottom) and the left – with the right one (Phelps 1942, fig. 123:13).

Such two-stage grooving was necessary, because, for many reasons, it is difficult to make a groove running along the full length of the product in one go. It is much easier to simply start this process, which is quite obvious, at some distance, even if small, from the upper edge. In this situation, the edge, or rather its tip, enters the wood gently and somewhat diagonally. It has to be noted that the worked pieces of wood could measure more than 50 cm in length (the bolts of wood used for riving shingles usually measured 50 cm, Brylak 1965, p. 152; or 60 cm, Starý 1925, p. 99; according to H. Phleps, shingles could be 25 to 100 cm long, Phleps 1942, p. 95; a slightly shorter range is indicated by A. von Engel: 30–70 cm, Engel 1909, p. 29; archaeological finds of shingles would also imply considerable differences in length, e.g. 40 and 65 cm, Bagniewski & Kubów 1977, p. 26; 69–81 cm, with the prevailing range of 70–71 cm, Prusicka–Kołcon 2001, p. 142; 70–80 cm, Bojęś-Białasik & Zaitz 2011, p. 109; and 64–80 cm, Krajíc et al. 1998, pp. 121, 122, 192–3), whereas the convenient reach of a groove plane operator in the sitting position does not exceed 30 cm, as can easily be verified in practice. Secondly, even when the entire surface in which a groove was to be made was within the reach of the craftsman, it would still be difficult to carry out the work. It would require permanent meticulous measuring not to remove too thick a shaving, since this could make the work extremely hard and even impossible by chocking the tool in the wood. Therefore, only by turning the tool by 180 degrees free access to the remaining uncarved surface was ensured, thus making it possible to complete the task.

Working with this kind of tool generated variously-directed forces applied to the handle and the rest of its elements. This is presumably what necessitated reinforcing the structure of the tool (with the iron fitting on the handle and a rivet) and manufacturing it from a suitable kind of wood. Carving a groove required applying certain pressure on the handle and the iron part, that is, forces directed both perpendicularly and in parallel to the tool and the worked surface (in motions drawing the tool "towards oneself").

The groove plane is, obviously, not the only groove-making tool used by medieval craftsmen. However, this question would require a separate study and cannot be addressed here. It should nevertheless be noted that larger grooves could be carved in wood with a combination of mallets and ordinary flat chisels (e.g. Krajíc 2003a, p. 155; Krajíc 2003b, p. 36 and tab. 125, p. 115). Carving with this method would be time-consuming and labour-intensive but still possible. Another tool used to the same end was the gouge, that is a "curved blade of uniform width with square cutting edge and straight tang of rectangular section" (Arwidsson & Berg 1999, pp. 13, 35; pl. 26:59; for a schematic depiction of the tool at work, see fig. 5c on p. 36). More efficient (easier and faster) grooving could be achieved with a different tool, namely a hooked knife with a J-shaped longitudinal cross-section (pulling chisel; e.g. the exhibit from the Swedish Mästermyr in Gotland, no. 55; Arwidsson & Berg 1993, pp. 13, 35 and pl. 28:55) attached to a long shaft (how it had been used was shown in a movie by: Almevik et al. 2021). Yet another interesting tool is the moulding iron, very similar to the drawknife but with cavities along the edge line which allowed it to be used to make a series of parallel, decorative notches (exhibit no. 57 from Mästermyr; Arwidsson & Berg 1999, pp. 13, 35; pl. 27:57; for a schematic depiction of the tool at work, see fig. 5d on p. 36).

Having examined how the groove plane would be handled, it is possible to return to the questions posed earlier. Making a relatively symmetrical groove would be very problematic, if at all possible, with a single-armed tool with just one J-shaped ending. By necessity, one side of the groove carved with an edge measuring a few centimetres would be formed differently

from another, carved with an edge measuring a few millimetres. The rabbet achieved this way could prove incompatible with the angular edge (tongue) of the neighbouring shingle. This, in turn, would lead to difficulties in arranging the shingles into a water-proof roofline. Similarly, in the case of carving particular elements of chests, incompatibility between grooves and edges of the subsequent parts would be a major obstacle: assembling a chest required maintaining right angles between the four corner posts and the walls; the walls themselves had to create a more or less even plane, just as both sides of the slanting lid. A two-armed tool, such as the groove plane, facilitated avoiding these difficulties. I also believe that the intended effect – grooves with symmetrical cross-sections – was obtained quicker with the use of such a tool.

Finally, it needs be asked what the exact function of the groove plane was? Which of the aforementioned tasks were actually performed with it? Perhaps it was used in yet some other way? Does the current, in my opinion underdeveloped, state of research on this category of archaeological finds allows for answering the above question at all, if we simultaneously include information on the medieval realities of Elbląg? First of all, can this particular find be a sufficient ground for determining the materials and methods used at that time for making rooflines of newly-erected residential and commercial buildings in Elbląg?

Given the lack of unambiguous data, such as at least a single shingle with a groove in the local archaeological record or a relic reliably interpretable as one, conclusions need to remain tentative (archaeological shingles are not common, but they are, nevertheless, known, e.g. Zaitz 2006, pp. 80, 90 and fig. 56 and Bojęś-Białasik & Zaitz 2011, p. 109 and ill. 17; Krąpiec et al. 2006, tab. 1, p. 185; Prusicka-Kołcon 2001, pp. 142 and 145; Prusicka-Kołcon 2012, p. 230; Kubów 1977, p. 259; Wysocka 2001, pp. 147, 162, and tab. II, p. 190 and fig. 17a, p. 165; Kozłowska 1998, pp. 105, 107; Bagniewski & Kubów 1977, p. 26 and fig. 21; Krajíc et al. 1998, pp. 121, 122, 192–193, 212, 216, and ill. 56, 60–63, and 67; Kochan 2012, pp. 767, 769, 781 and tab. 1, p. 783; other Czech finds have been listed in the extended version of the paper, Kochan 2011, p. 56). On the other hand, it is hardly surprising that these finds are missing. Old unneeded shingles could be removed from the roof and re-used, for instance as firewood. Therefore, it may be assumed that the Elbląg groove plane could have been used for making shingles, but it seems equally probable that it would find use in carving other wooden items (e.g. construction elements, household and domestic equipment). However, in order to confirm the use of such tools in this particular purpose one would need to find wooden relics with specific, almost V-shaped grooves measuring c. 4–5 mm.

What seems least likely is that the Elbląg groove plane was used for decorating wooden objects. Nevertheless, its size, although it is one of the largest known, do not render it entirely unthinkable as an ornamentation tool. It is true that a chest-making craftsman could use the same tool, even a large one, first for carving grooves and then for applying decoration (Keszi-Kovács 1955). It seems, therefore, justified to reject the assumption that decorative insculping was performed only with smaller tools, additionally fitted with quill endings bent in the opposite directions, as suggested in some ethnographical studies (for instance, the photographs of a contemporary workshop and an insculping craftsman: Fotoarchiv Muzeum regionu Valašsko and Šenfeldová 2021). A question remains, though, whether this ornamentation technique was known in our part of Europe in the Middle Ages. Again, it is beyond the scope of this paper to deliver an answer on this matter with any authority.

Minor research questions include the provenance of the artefact. When it comes to the concept of this type of tool, currently I would be largely confident – although, admittedly, mostly based on intuition – to assume a Western European origin. Firstly, this is corroborated by the lack of similar finds from today's Poland and – more generally – the neighbouring lands which would predate the 1240s and whose context of discovery would frame them clearly as local products. Secondly, there exists at least one slightly older indirect piece of evidence witnessing the use of groove planes in Western Europe

– the aforementioned stained glass window from the cathedral in Chartres, dated to between 1210 and 1225 (fig. 7). I am aware, nonetheless, that this is not a particularly strong basis for the proposed hypothesis.

As for the Elbląg specimen, its origin cannot be determined with any certainty, especially given its dating which coincides with the very beginning of the town, i.e. its earliest organisation phase. Was it brought there by German settlers along with other belongings from their homeland, or rather manufactured by one of them already in the new town, only based on an older design? What is certain is that ash wood, used to make the handle, was at the time available both near Elbląg and in the homeland of the settlers.

It bears mentioning the use-wear analysis, often overlooked by scholars, as a research avenue potentially fruitful in future analyses of the discussed categories of artefacts. A good example of this approach applied to archaeological studies on craftsmanship can be a recent Swedish publication on investigating traces left by medieval tools. Wood processing with accurate replicas of archaeological tools left specific traces on the worked materials. These traces were then compared to those found on wooden items dated to the Middle Ages (Almevik et al. 2021). In the light of such contributions, it would be interesting to apply an analogous procedure to the groove plane in order to determine the kind of traces its use leaves on wood. Perhaps it would allow – provided that the tool would indeed produce characteristic traces – to identify tools used to make particular grooves, maybe even differentiating between chisels, groove planes, and others implements.

Engaging different categories of sources (archaeological analogies, ethnographic studies – photographs, films – and medieval iconography) allowed for determining not only the range of tasks performed with the tool but also the way in which it was handled. The dendrological analysis performed on its handle ascertained that its maker deliberately selected the wood used for it. It has to be added that future museum searches are presumably going to reveal more groove planes. It may be supposed that some of them are simply unidentified or misclassified as, for instance: "unidentified object", "T-shaped object", etc. Beyond doubt, the difficulties in identification of these artefacts stems not only from their state of preservation but also from the fact that they were not very popular. These tools were used only in some regions and were later replaced by newer types of planes, employed not only for smoothening the surfaces of wooden objects but also for carving grooves and tongues (hollow and tonguing planes).

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Korta meddelanden

A spectacular sword pommel from Gamla Ingla, Uppland

By Ny Björn Gustafsson

We live in a world of ever-increasing access to digitized museum collections, where photographs of artefacts are passed on both fast and wide via various social media platforms. In the following, some light will be cast on a spectacular find of which pictures has circulated for several years, without many details: A stray sword pommel from Sweden, with possible ties to the British Isles.

In November 1943, three fragments of a runestone were found when a fireplace was torn down in Gamla Ingla in Skogs-Tibble parish, some 20 kilometres west of modern Uppsala. The fragments fitted together, and the original stone had been carved on both sides. It was recorded as U 886 (Wessén & Jansson 1951, p. 587). Gamla Ingla ('Old Ingla') is the remnants of an original hamlet dispersed in the late 19th century through agricultural land reforms. In its immediate vicinity are two other runestones – U 884 and 885. Several Iron-age burial cairns are also to be found close by and during a small excavation in 2021, a hearth was exposed south of runestone U 885 and subsequently radiocarbon dated to the Vendel Period (590–640 CE; Frölund 2022, p. 67).

But these are not the only objects of antiquarian interest from Gamla Ingla, it is also the find site of a most spectacular Viking-period sword pommel.

The artefact

Today, the pommel is cared for by Upplandsmuseet (Uppsala County Museum, inventory no. UM20271). It was brought to the museum in June 1946 and a short note state that it had been found during demolition of a house some two years earlier, in a layer of redeposited soil under a floor. Nothing connects it to the U 886-fragments, but it must be seen as likely that they came from the same building.

The pommel (fig. 1) is cast from copper alloy and quite large, 75 mm long, 45 mm high and 30 mm wide. It weighs 102 g and is partly broken along the base. What sets it aside, besides its size, is its general design. It is cast in a genuine Ringerike style with advanced openwork details. The ornamentation dates it firmly to the first part of the 11th century CE and mainly consists of a central Fleur-de-Lys and five interjoined spiralling scrolls – two large, mirrored on each side of the centre and three along the base. All this can be seen in great detail through Luciano Pezzoli's conceptual reconstruction (fig. 2).

The middle- and top element of the Fleur-de-Lys is somewhat deformed and features a hole, 9x4 mm, for the sword's tang. The pommel's under- and inside reveal several interesting traits, such as two cast pins which once matched holes in an upper hilt fitting. Like other contemporary, hollow copper-alloy objects, it was cast via the lost wax method (*À cire perdue*) over an inner clay core (cf. Gustafsson 2016). In figure 3, one of two inner bridges can be seen. These connects and supports the tips of the large, openwork scrolls, but were also instrumental in the casting. They helped to stabilize the wax model during the creation of the mould and held the core in place. Later, when the wax had been melted out, they allowed the metal to flow more easily out to the outermost parts of the openwork scrolls. The inner surface has been left untraced and minute pieces of vitrified clay from the core cling to angles and corners.

Fig. 1. The pommel from Gamla Ingla. Photo: Olle Norling, Upplandsmuseet (CC BY-NC-ND).

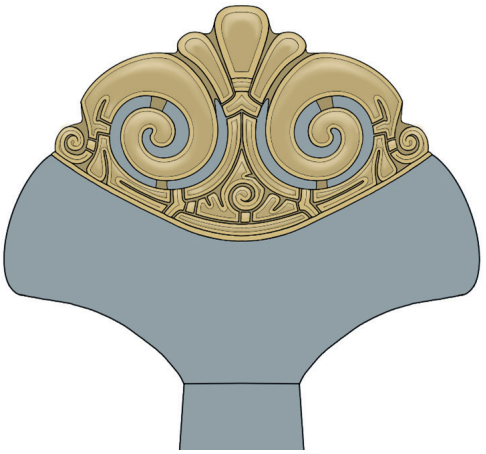

Fig. 2. Conceptual reconstruction of the pommel. Illustration: Luciano Pezzoli/Children of Ash ©.

The outer surface is worn and affected by corrosion, but faint traces of crosshatching, e.g., on the larger scrolls, might indicate that they were originally fitted with soldered-on ornaments, possibly of contrasting silver sheet. Along the lower base, there are hook-like protrusions, one in the middle of each face. These probably served to secure an intermediate ornamental cord which covered the joint between the pommel and the upper hilt fitting.

Parallels

The central motif does occur elsewhere in late Viking-period art, e.g., on the lower frame of the lost Cammin casket (Goldschmidt 1918, No 192L, Taf. LXV111). The pommel from Gamla Ingla is, as far as it has been able to establish from literature and accessible museum catalogues, without parallels in Sweden. Neither is it included in Signe Horn-Fuglesang's corpus over the Ringerike style (1980). However, there are other extant Nordic swords with pommels featuring somewhat related, opposing large scrolls. One of these is an unprovenanced sword in Moesgaard museum, Denmark (Inventory no AM0224; Fuglesang 1980, p. 42 & plate 112D). It is quite damaged, but from the preserved ornaments two opposing scrolls can be distinguished. A second sword with opposing scrolls

Fig. 3. Inside view of the pommel from Gamla Ingla. Photo: Olle Norling, Upplandsmuseet (CC BY-NC-ND).

on the pommel was found recently in Grave 8 at Langeid in Setesdal, Norway (Wenn 2016, p. 50). Additionally, the Langeid sword features single scrolls on the cross-guard, as does the Moesgård sword – on the haft fittings. None of these two swords are fitted with cast pommels though, and they belong to a distinctively different type than the Gamla Ingla pommel. Its hitherto closest parallels are instead to be

found in England, also as loose pommels. Like a growing number of other artefacts, these have been recovered through public metal detecting. According to the legislation in England, finders are normally allowed to keep finds not deemed as "Treasure". This brings that some scientifically important artefacts from England will not enter public collections. Thankfully though, a great many of these are "kept" accessible via the British Museum and Amgueddfa Cymru's "Portable Antiquities Scheme – PAS". They register finds recovered by the public and reported to their network of Finds Liaison Officers (Leahy & Lewis 2018, p. 6).

One of the pommels, PAS-id LEIC-9158C3 (fig. 4a), was recovered in March 2009 at Ravenstone, Leicestershire, while another, PAS-id LIN-9468E7 (fig. 4b), was found in Tilney All Saints, Norfolk, in January 2012. A third pommel, allegedly found near Brigg, Lincolnshire, in 2004 was unfortunately not registered with the PAS. Evidently, the three English pommels are very similar to each other. They all feature paired scrolls on each side of a domed middle, creating a crude Fleur-de-Lys design. The scroll ornaments on the Brigg pommel appears not to be openwork, otherwise it is almost identical to the pommel from Tilney All Saints. Alas, as it has not been examined by the PAS, its authenticity cannot be fully ascertained; it is only known from a single photograph in an on-line listing of lots up for auction in September 2014 (LotSearch). The Ravenstone pommel was donated to the Charnwood Museum in Loughborough by its finder (inventory no. 2750588), but the current whereabouts of the Tilney All Saints and Brigg pommels are unknown.

Fig. 4a. Pommel from Ravenstone, Leicestershire, PAS-id LEIC-9158C3. Photo: Wendy Scott/Leicestershire County Council (CC BY-SA).

Fig. 4b. Pommel from Tilney All Saints, Norfolk, PAS-id LIN-9468E7. Photo: Adam Daubney/Lincolnshire County Council (CC BY-SA).

Conclusion

The closest stylistic parallels to the Gamla Ingla pommel are thus to be found in England. The developed Ringerike style dates it to the first half of the 11th century CE, a period of dynamic interaction between Denmark, but also other parts of the Norse cultural sphere, and the British Isles. Even though the Ringerike style is named after a Norwegian district, objects adorned in it are common in many areas of Britain and Ireland (cf. Kershaw 2011). It is therefore hard to establish if the pommel was produced within modern day Sweden or somewhere in the west. However, it should be noted that another sword fitting in an elaborate Ringerike style, a sub-hilt mount, was recovered in the 1950's at the royal Anglo-Saxon manor in Old Windsor, Berkshire (Hilberg 2022, pp. 170–173). Such mounts occur in several distinct types, but a second and somewhat less elaborate hilt mount, also in Ringerike style, was recovered at Haithabu in 1936 (Jankhun 1936, Taf. IIb; Geibig 1989, Taf. 7:2). They both feature central Fleur-de-Lys motifs.

All in all, it is evident that the Gamla Ingla pommel must have been fitted to a sword of

elaborate design, intended for a high-ranking person, possibly with westward connections. Via the runestones, several of Ingla's early inhabitants are known by name. Thus, U 884 was made by Holmgeir and Sigrid to commemorate a certain Vig, Holmgeir's father (Wessén & Jansson 1951, pp. 583–586) while U 885 commemorates a Sigvat (Wessén & Jansson 1951, pp. 586–587). His stone was erected by his three sons, Vig, Sigsten and Karl. The first son might be identical with the Vig on U 884 even though the spelling differs (UikR on U 885 and Uih on U 884). The name Sigvat, Sighvatr and versions thereof, is known from 14 runestones, 10 in Uppland (Peterson 2007, p. 191). It also occurs throughout the Norse cultural sphere, both in Iceland and – according to the Doomsday Book – in 11th-century England. There, the name Sighvatr appears in connection to one or possibly two landowners at Boothby in Lincolnshire, more or less halfway in between the find sites of the two PAS-registered pommels (Open Domesday). The fragmentary Ingla stone, U 886, does not include any name of a person. All the stones have ornaments carved in the Urnes-style and can thus be considered as younger than the pommel, and even if the Sigvat of U 885 lived during the middle of the 11th century CE, it might already have been antiquated by that time.

As the pommel was found in redeposited soil it is not possible to speculate further concerning its original context, it could have been part of a grave's inventory or some kind of other deposition. Lastly, it should be noted that to date, no matching finds have been reported from the area of Gamla Ingla.

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Debatt

Kan samhällets rätt till ett kulturarv upphöra på grund av stöld?

Av Nanouschka Myrberg Burström, Annica Ewing, Ragnar Hedlund, Birgitta Hårdh, Gitte Ingvardson, Kenneth Jonsson, Christoph Kilger, Linda Lundberg & Jens Christian Moesgaard

Den 29 april 2023 såldes en medeltida brakteat präglad för kung Erik Eriksson (1222–1229, 1234–1250) på auktion i Stockholm (MISAB 42, nr 4), ett mynt som tidigare stulits från Varnhems kloster. Av auktionskatalogen framgick att myntet tidigare sålts på Karlstad-Hammerö Auktionsverk (2017-02-11, nr 372923), och att det möjligen var identiskt med ett exemplar, som härrör från Varnhems kloster. Det är emellertid inget tvivel om att det rör sig om samma exemplar. I artikeln ”Myntstöld på museum” i *Skandinavisk Numismatik* från 1975 är myntet avbildat och dess vikt angiven (SN 1975, mynt nr 4). En brakteat från kung Valdemar (1250–1275) som stals vid samma tillfälle (SN 1975, mynt nr 7) blev likaledes såld på auktion (MISAB 40, nr 6, 2022-04-30). Också detta mynt hade tidigare sålts på Karlstad-Hammerö Auktionsverk, år 2017 (2017-02-11, nr 372923).

De båda mynten påträffades i samband med utgrävningar i Varnhems kloster åren 1920–1928. Vid utgrävningen framkom totalt 165 mynt, vilka bidrar med viktig kunskap om liv och levnad vid klostret. Mynten tillfördes Kungliga Myntkabinettet (SHM/KMK 18393), men vissa av dem lånades ut till en utställning på Varnhems kloster, varifrån 19 av dem stals den 10 juni 1975 (SN 1975).

Fallet med de två mynten som såldes på auktioner 2017, 2022 och 2023, och vilka klart kan härledas till de 19 stulna mynten, är allvarligt på två sätt. För det första handlar det om en stöld från ett museum, som å hela samhällets vägnar bevarar och åskådliggör vårt gemensamma kulturarv. För det andra handlar detta dessutom om två mynt med väl känd fyndproveniens. Fyndplatsen gör dem unika. Man kan inte bara ersätta fynd från en känd kontext med två andra mynt av samma typ. Det är nämligen just dessa två exemplar, som hittats i Varnhems kloster, som vittnar om livet där. Detta gör dem oersättliga. Förutom det forskningsmässiga värdet är autenticiteten hos äkta och ursprungliga föremål en kvalité som de flesta intuitivt förstår, och som genererar intresse och upplevelsevärden hos en betraktare, bortom det rena kunskapsinnehållet.

Mynt med känt ursprung har – liksom andra arkeologiska föremål – ett betydligt större vetenskapligt värde än provenienslösa mynt. De sistnämnda ger den information man kan få utifrån deras inskrift, motiv och metall, men ett väldokumenterat arkeologiskt fyndsammanhang ger kompletterande information om till exempel när, var och hur myntet användes. Här kan numismatiken ge väsentliga bidrag till vår förståelse av det forntida samhället.

Tyvärr är långt ifrån alla mynt väldokumenterade. Av de 19 mynt som stals i Varnhem 1975, är endast 15 avfotograferade. De övriga fyra är enbart kända genom en summarisk beskrivning i museets katalog. När ett föremål stjäls kan man aldrig komma tillbaka och undersöka det, kontrollera detaljer eller pröva nya idéer. Det är dessvärre långt ifrån alla mynt på museer och från utgrävningar runt om i landet, som är väl beskrivna och dokumenterade med foto, även

om det för närvarande görs en stor insats med att digitalisera museernas samlingar. Nya fynd dyker upp och det tar tid innan de har registrerats. Vi måste därför även ha tillförlitliga sätt att skydda kulturarvet mot stöld och försäljning!

Även i sådana fall då kryphål i lagen tillåter försäljning av stulna föremål, bör man av etiska skäl alltid avstå från att sälja stulna föremål. Den internationella sammanslutningen av mynthandlare, IAPN, föreskriver detta i sina etiska riktlinjer: "members pledge […] never knowingly to deal in any item stolen from a public or private collection or reasonably suspected to be the direct product of an illicit excavation" (https://iapn-coins.org/iapn/association/ hämtat 2023-05-04).

När stulna föremål likväl juridiskt sett kan säljas, beror detta på att fallet anses preskriberat. Kulturarv kan ju olagligt komma ut på samlarmarknaden på två sätt: vid stöld, som i exemplet Varnhem, eller vid otillåtna rovgrävningar av arkeologiska platser. Båda fallen är naturligtvis olagliga men Varnhemsfallet är bara det senaste exemplet på, att om man bara har tålamod att vänta ut preskriptionstiden, så förfogar man över föremålet. Det har tidigare rått oklarhet om huruvida preskriptionstiden ska beräknas från stöldtillfället eller från tidpunkten för försäljningen, som ju kan ligga flera år senare. Högsta domstolen har nyligen fastslagit att det är försäljningstillfället som gäller. Detta bör ge kulturarvet ett något bättre skydd framöver.

Kulturarvet består av vår gemensamma egendom. Det är ofta unikt och kan inte utan vidare ersättas med andra föremål eller försäkringspengar. Den grundläggande frågan är hur man ska undvika att föremål som i detta fall alls kommer ut till försäljning? När det gäller rovgrävningar eller andra tillfällen, där fynd av en eller annan anledning inte rapporteras till myndigheterna, kan man låta sig inspireras av den danska lagstiftningen kring fynd av föremål av värdefulla metaller eller som besitter ett kulturhistoriskt värde, så kallat *danefæ*. I lagen står klart och tydligt att "Danefæ tilhører staten. Den, der finder danefæ, og den, der får danefæ i sin besiddelse, skal straks aflevere det til Nationalmuseet" (Museumsloven, LBK nr 358 af 08/04/2014 § 30 stk 2). Detta innebär att också en samlare eller mynthandlare, som får ett fynd i handen är förpliktigad att rapportera det. I Danmark händer det regelmässigt att Nationalmuseet får in fynd som påträffats för länge sedan (Moesgaard 2017). I Sverige har det däremot förekommit flera fall av fynd som inte inlösts på grund av preskribering. Den så kallade Everlövskatten finns fortfarande i färskt minne, men man kan också nämna den skånska Hjärnarpskatten. Den bestod av 66 mynt från 1200-talet som hittades på 1890-talet och fritt kunde säljas omkring 1980 (Golabiewski 1982).

Beträffande stöld kunde en möjlighet vara att man skiljer straffaspekten från egendomsaspekten, så att straffansvar har preskriptionstid i överensstämmelse med allmän rättspraxis. Det skulle innebära att staten aldrig mister sin egendomsrätt till kulturarvet, och att det finns ett krav att återbörda föremålen till sin rätta plats på museerna. Också här kan man låta sig inspireras av lagstiftning utomlands. Om man i Schweiz uppmärksammar att ett stulet föremål ska säljas kommer det att återlämnas till den som har bestulits. Ett exempel på detta var när en folkvandringstida guldbrakteat våren 2001 hade inlämnats till en auktion i Schweiz av en privatperson i Värmland. Av lyckliga omständigheter råkade en av de undertecknade befinna sig i Schweiz och fick se brakteaten. Efter kontakt med en expert stod det klart att brakteaten var identisk med den som hittats i Vinköl år 1895 och som stals från Västergötlands museum i Skara samma vecka som stölden i Varnhem och av samma person. Auktionsfirman kontaktade därför svensk polis. Brottet var redan preskriberat i Sverige, men enligt schweizisk lag skulle det stulna föremålet skickas tillbaka till sin ursprungliga ägare. Museet fick därefter tillbaka brakteaten i april 2003.

Om stulna föremål säljs utan att man kräver tillbaka dem, betyder det att de helt lagligt kan säljas på nytt i all oändlighet. Detta kommer att påverka allmänhetens synsätt på kulturarvet då det uppenbarligen är lagligt för privatpersoner att äga och sälja kulturföremål som hittas i eller vid en lagskyddad fornlämning. Försäljningen av mynten från Varnhem visar att kulturarvet fortfarande inte har tillräckligt skydd. Därför vill vi på det kraftigaste uppmana till att detta åtgärdas å det snaraste!

Tack
Författarna riktar ett varmt tack till Västergötlands Museum, Skara, för kompletterande uppgifter.

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Recensioner

Ethan Watrall & Lynne Goldstein (eds.), *Digital Heritage and Archaeology in Practice: Data, Ethics, and Professionalism*. Gainesville, University Press of Florida, 2022. 338 p. ISBN: 9780813070070.

The anthology is part one of a two-volume set. The volume being reviewed here is subtitled "Data, Ethics, and Professionalism". It contains an introduction by the editors and twelve papers organised within the themes "Digital Methods and Computational Approaches for Archaeological Analysis and Interpretation", "Working with Digital Data in Heritage and Archaeology", and "Engaging with Ethics and Professional Issues in Digital Heritage and Archaeology". The other volume is focused on engagement, presentation and teaching and will be reviewed separately.

As the editors Watrall & Goldstein point out, there are no clear distinctions between the overarching themes, and several contributions could fit in either volume. Even so, the overall impression of volume 1 is that it is cohesive, and that the papers complement each other by offering varied perspectives on the issues of digital practice. The authors use instructive examples from their own experiences doing digital archaeology, which leave a more lasting impact than the obligatory theoretical overviews. The latter offer good reading lists for further studies, and help highlight both how quickly technology has changed, and how slowly practice. For instance, sticking with 2D over 3D when studying topographical environments (Opitz), or the extensive work needed to make use of legacy digital documentation, due to messy and deficient data practices (Jolene Smith).

As Sobotkova & Hermankova point out in their excellent chapter "Emergent archaeological realities and reusable datasets", this is partly a generational issue as senior supervisors rarely have a lot of experience in this field to pass on to their students. As a result research projects may have to spend a lot of time developing better field methods and cleaning up data to be able to achieve the goals set out in the beginning. See also Smith's chapter on "Practical approaches to managing messy data in archaeology".

Some digital archaeological methods require specialised research and development to work, Heath offers an example using JSON and Python programming to study Roman amphitheatres. However often it is simply frustrating cases of reinventing of the wheel, as good practices for digital data have been established by many disciplines already. Archaeologists cannot ignore this issue any longer. Watrall & Goldstein point out that there is hardly an area of archaeology today that is untouched by digital methods, so we are all digital archaeologists whether we like it or not. Which begs the question of why publish a physical book on something that is both omnipresent and also changing so rapidly any publication is liable to have a short shelf life? Apart from the fact that it is important to document and reflect on methodological changes, practices are clearly not changing fast enough and a lot in this book is still highly relevant.

Watrall & Goldstein want the publication to highlight that digital heritage is not just complex software and opaque workflows done by specialised researchers. By assembling writers from museums and archaeological companies as well as universities, representing both early career researchers and seniors, they have mostly succeeded in that aim. However, since the anthology is based on workshops organised by Michigan State University the contributors are predominantly from the United States and Canada, with the rest coming from Northern Europe or Australia. While the contributors' current affiliations obscure wider areas of research experiences, the practices highlighted in the chapters very much belong to "the global West". To what extent these are universal or not is up to the reader to keep in mind.

A common thread in many chapters, regardless of theme, is the importance of digital archaeological information being usable long-term, through preservation, interoperability, and openness. As noted by Ross & Ballsun-Stanton

in their chapter on research design, the scientific method rests upon the notion that it should be transparent and reproducible. This is becoming even more important when researchers are using complex software to analyse large amounts of data, so that the processes leading up to the results are not transparent to the human mind. In their chapter they argue for preregistration of research design and methodology. This is a time consuming and arduous process more suitable for laboratory and computational research projects, and I am not convinced it should be implemented broadly in archaeology.

Openness and sharing of data is definitely something archaeological research must become better at. Figures of diagrams or distribution maps without publication of all the underlying data means results can neither be tested for accuracy, nor added to through subsequent research by others. In analogue times this was sometimes the result of lack of space on printed pages, but in digital times with trusted digital repositories there is no excuse. This anthology offers a lot of good advice on how to plan for and prepare data for sharing. Done right, using controlled vocabularies and standardised data models, data from a large number of excavations and research projects can then be used to develop complex databases and information infrastructures that span time and space. The possibilities this opens up is shown in Buckland & Sjölander's chapter on "Approaches to Research Data Infrastructure for Archaeological Science". The same principles can be applied on smaller datasets as well, such as the coins from Sardis presented by Theresa Huntsman in her chapter.

Openness is not without its ethical issues however, and the final theme admirably focuses on this from several different aspects. Ethical challenges raised by the capture, preservation and publication of large 3D datasets is discussed by Heather Richards-Rissetto: from energy required for storage, to how far we should go in purportedly "realistic" recreations made from a fragmented material. Marwick & Wang give an excellent deep dive into Open Access, Open Data and the CARE data principles in their chapter. They highlight the gap that often exist between organisations' stated ideals and the reality in everyday work.

The CARE principles are a complement to the FAIR data principles. Whereas the latter outline how data can become accessible and reusable, the former set down principles for ethical and responsible practices – especially with regards to data from indigenous communities. This is definitively an important consideration, if we are not to recreate the mistakes of past generations in the rush to collect and analyse data. Carrie Heitman's "Theorizing the Archive and Ethics of Open Access Archaeology" is an interesting exploration of evolving ethical practices at Chaco Canyon, New Mexico and the digital Chaco Research Archive in the 2000s, trying to balance the needs of researchers with sensitivity towards different indigenous groups.

Another thought-provoking example is given in the chapter by Gupta, Nicholas & Blair on commercial archaeology in Canada, where publicly funded databases have been used by the government to develop costly proprietary and mandatory digital tools for archaeologists. This has created a gap between professional (primarily White) consultants and First Nations' community archaeologists. As they point out, digital technology can be used as a means of gatekeeping against disempowered and marginalised groups. Training opportunities as well as open source software is important to counteract this.

The anthology is concluded by Jeremy Huggett's chapter "Archaeological Practice and Digital Automation", a very interesting reflection on what is sometimes called the 4th Industrial Revolution being brought on by nanotechnology, biotechnology, machine learning, and artificial intelligence. Huggett divides the ways in which technology will aid – or even replace – humans within the field of archaeology: augmentation (assistance doing tasks, i.e. underwater robots, drones), automatization (doing human information work – i.e. data mining, automated identification), heteromation (tech devices doing the main work with human assistance, e.g. checking AI results). He asks if we are moving towards a practice with automated cognitive devices doing most of the work, and archaeologists mostly relegated to observer status?

Huggett points out that it is important for archaeologists to not abandon our responsibilities of critical engagement with technology which is in no way neutral. It is certainly something for all archaeologists to ponder as they sit in front of their computer or are standing in a field with a digital device: Am I in control – or is it?

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Matthias Friedrich, *Image and ornament in the early Medieval West: New perspectives on post-Roman art*. Cambridge 2023. 211 pp. ISBN 978-1-009-20777-5.

This book is about art and visual culture in western and northern Europe from the 5th to 8th century, covering Merovingian Francia and its fringes in central and north-west Europe (roughly equivalent to modern France, Germany, Benelux, Switzerland, Austria, northern Italy, England, and southern Scandinavia). The author Matthias Friedrich applies a broad concept of art that includes figural and non-figural images and ornaments, and that also encompasses 'minor arts' in form of decorated metalwork like e.g., dress-accessories and weapons, as well as other ornamented objects like vessels and instruments. Both in choice of topic and geographical area of research it unites areas that previously have tended to be divided by national and/or linguistic as well as academic boundaries and represents as such a welcome addition to this field of study. The book is a revised version of a doctoral dissertation in archaeology submitted in 2019, and parts of the book have also previously been the subject of an MA dissertation in History of Art. This background from two academic fields that often have been practiced separately, is reflected in the author's approach to his topic through a combination of archaeological and art historical methods which is central to the book. It constitutes what the author himself calls 'an archaeology of art' that he employs to bring in new perspectives to the study of post-Roman art in Merovingian Europe, which is another valuable contribution of this publication.

Friedrich has two main aims with the book. One is to scrutinize certain political, ethnic and religious categories that have exercised – and still have – a profound influence on our understanding of early medieval art and archaeology. This concerns the binary labels of 'Roman' and 'Germanic', and 'Christian' and 'pagan'. By criticizing the notions embedded in these categories, Friedrich wants to pave the way for asking new questions. This is the other main aim of the book: introducing new perspectives to the study of Merovingian art and material culture "beyond the paradigm of the 'Germanic'", as the author phrases it. The book is structured in accordance with these aims and has two main parts, each with two chapters. The first part addresses how the scholarly discussion on the art and archaeology of the early medieval period has been focused on the contradictions between Roman–Germanic and/or Christian–pagan, and as the author argues, consequently got caught up in and side-tracked by these dichotomies. The second part of the book is devoted to new perspectives on the art of the period based on contemporary theory. It is noticeable, however, that there is a slight imbalance in that the first part outweighs the second. This means that more than half the number of pages is used mainly on discussing previous interpretations, perhaps, as I will return to below, at the expense of the author's own contribution.

In the first chapter Friedrich scrutinizes the concept of the 'Germanic' and argues that three categories commonly regarded as the main characteristics of a pan-Germanic identity, *Heilsbild* (healing image), *Sakralkönigtum* (sacral kingship), and *Gefolgschaft* (retinue), are outdated. He further questions the dichotomies of Roman–barbarian and Christian–barbarian and argues that it is essential to introduce more subtle nuances than these simple binaries in the interpretations of post-Roman art if one is to engage with the topic in new ways. This is a refreshing perspective that lays the ground for the introduction of Friedrich's new approach. In chapter two the author substantiates his critique

through a discussion of renowned artefacts/works of art from the period with an emphasis on the scholarly discourse around these. Albeit allowing for some variance between the British, Scandinavian, and German/continental traditions, the critique nevertheless comes across as somewhat undifferentiated in the emphasis on the overriding importance of the 'Germanic paradigm' in all the previous research cited, and this reader ends up questioning if the ultimate aim of the author, i.e., bringing in new perspectives, really warrants such a detailed account. Also, if the author does not unintentionally "throw the baby out with the bathwater", in accepting the simplistic one-dimensionality of concepts like ethnicity and (social and political) identity as an underlying premise in the critique and in the subsequent rejection of almost every aspect concerning these phenomena in earlier interpretations. Friedrich demonstrates that many images frequently labelled pagan, Germanic or Christian can be traced back to Roman imperial iconography and argues that they represent the transformation of a Roman Imperial imagery that persisted into the early medieval west as symbols of power and authority.

In chapter three the theoretical framework for the author's own approach is presented, where he draws on newer anthropological and sociological theories concerning material agency and relational subjectivity. Friedrich adopts a comparative perspective based particularly on Alfred Gell's theories concerning the agency of art, with the intention to uncover the core principles of how specific works of art functioned, and to explain how art acted on the recipient. Interestingly, he links this to the "bewilderment principle", the principle of "varietas" or variety, which is central to his interpretation of the artwork of the period. In chapter four Friedrich further develops this principle as it functioned in the early Middle Ages creating an effect through complex mixtures of styles, colours, and materials. He presents four main components of varietas in the art and material culture of this period: technology and craft, form and style, surface and texture, colour and contrast, and exemplifies this through a series of interesting case studies. His main argument is that variety constituted "a basic aesthetic principle shared across late antique and early medieval Europe and the Mediterranean", representing a cross-cultural phenomenon that served to bond the various ethnic and religious fractions in these areas through blurring the boundaries between them. On this point his approach is systematic, clearly presented and well argued, and credibly opens up for new ways of understanding the art of the European post-Roman world.

The book is richly illustrated with both black and white pictures and drawings as well as coloured plates that serve their purpose well in helping the reader along and at the same time substantiating the author's argumentation. The inclusion of illustrations of the replicas/reconstructions of the pattern-welded sword from Beckum as well as the Trossingen lyre and the Unterhaching disc brooch are particularly effectful in demonstrating the now lost complexity of these objects in colours, materials and form, displaying their "varietas" in all its splendour and as they were conceived by their contemporaries. The book is also convincingly argued when showing how the artwork captivated and "'bewilder[ed]' its viewer through intricate and skilful artistry". This part of the text is credible, and the author makes an important observation when demonstrating how the art in the post-Roman West shared significant characteristics with contemporary Mediterranean and/or Byzantine art. In this regard, Friedrich succeeds in bringing the discussion on beyond the categories of the 'Roman–Germanic' and the 'Christian–pagan'. Paradoxically, though, he still ends up devoting rather a large number of pages in criticising the same categories through a detailed "deconstruction" of works by earlier researchers, especially since the "new perspectives" part of the book also includes a review of research concerning animal art styles that mostly represents a repetition of the critique raised in the two first chapters. In my opinion, the book would have merited on reserving more space for Friedrich's own contributions, which really are both interesting and important. Key points in the author's argumentation are only raised during the last four pages that constitute the concluding chapter of the book. Here Friedrich finally engages

in a discussion of the impact of the art in the widely different societies that existed within the examined area. Here he also returns to the hinted connection between the enduring Roman imperial imagery, as argued in chapter two, and the "varietas" principle/phenomenon, but this is only treated in a summary form. Thus, this part of this otherwise interesting contribution now stands more as an outline of the unexplored potential of the art in question than as a conclusion of the present work. Hopefully, we should see this as a promise of further future contributions by the author on this fascinating theme.

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Monika Stobiecka, *Theorizing archaeological museum studies: From artefact to exhibit*. London/New York 2023. 172 s. ISBN 9781032356532.

I *Theorizing archaeological museum studies* tar Monika Stobiecka ett brett teoretiskt grepp. Bokens abstract beskriver det så här: "The central focus of this book explores the relationship between museums and their dominant paradigms, on the one hand, and new approaches and theories in archaeology, on the other". Stobiecka vill förstå arkeologiska museer genom ett tätt filter av teorier, företrädesvis sådana som diskuterades livligt under perioden från sent 1980-tal till 2010-tal. Det handlar alltså om välkända teoretiker för en svensk arkeologisk publik – Hodder, Olsen, Witmore, Shanks m.fl. – inom tankeområden som "interpretative archaeology", "social archaeology", "symmetrical archaeology" och "the material turn".

En sak behöver sägas direkt – bokens titel är missvisande. Den lurar läsaren att tro att boken ska handla om arkeologiskt inriktade museer, och innan läsningen såg jag därför framför mig museer som exempelvis Historiska Museet i Stockholm eller Moesgaard Museum i Aarhus. Det gör den inte. Den handlar om andra typer av museer, väldigt specifika sådana. Föreställ dig en huvudort på någon av öarna i Kykladerna i grekiska Egeiska havet. På det lokala museet visas fynd från utgrävningar på ön. Se framför dig montrar och piedestaler som visar föremål som en halv marmortorso, keramikfragment, ett skulpterat marmoransikte med skadad näsa, metallfragment från vapenuppsättningar, klädesdetaljer, reliefer från något gravmonument och fragment av oljelampor. Föremål på rad, uppvisade som konsthistoriska objekt. Vid varje föremål finns en liten skylt som anger sakord i fyndkatalogen, inventarienummer, fyndplats och, ibland, datering. Det är sådana museer som boken handlar om. Fast, egentligen inte. Det är sådana museer som författaren målar upp som sin illustration av museer som hon ser behöver utvecklas. I boken diskuterar hon hur hon ser att detta kan göras: genom att museerna omfamnar och engagerar sig i den arkeologiska teoretiska diskussion som nämnts i stycket ovan.

Arbetet presenteras i tre delar under rubrikerna "Artefacts", "Exhibits" och "Artefacts and Exhibits". Som framgår av rubrikerna står utställda arkeologiska föremål i fokus. Diskussionen är mångfacetterad och bred – emellanåt konkret och nära museer, föremål eller utställningar, andra gånger flyende och vinglig med utvikningar som Stobiecka har svårigheter att tydligt återkoppla till bokens huvudtema. Några av de många aspekter av föremål och utställningar som diskuteras är arkeologiska definitioner av artefakter, nya sätt att förstå materialitet, konserveringspraktiker, tolkning, temporalitet, utställningsrummets visuella och känslotriggande upplevelser, digitala teknologier och konstnärlig forskning.

Den för mig finaste läsningen i boken är de kapitel som ryms i delen "Exhibits". Här redovisar Stobiecka sina analyser av två museer: Akropolismuseet i Aten och Museo dell'Ara Pacis i Rom. Stobiecka går i närkontakt med båda museerna. Hon undersöker detaljer i utställningarna, vad som ställs ut och vad som förmedlas. I Akropolismuseet hittar hon berättelser som inte bara förmedlar konsthistoria, utan också pekar framåt. Detta gör hon i de delar av utställningen som fokuserar på framtiden genom att de berättar om planerna för hur Akropolisklippan ska rekonstrueras genom konservatorers och antikvariers arbeten. Stobiecka menar att

genom att blanda dåtid i form av utställda föremål från Akropolisklippan, nutid i form av utställningsupplevelsen och framtid i berättelser om kulturarv i en process av förändring, konservering och återuppbyggnad, blir museet till en levande upplevelse i linje med vad hon ser att andra museer kan bli. Själv har jag inte riktigt sett samma saker i Akropolismuseet de gånger jag varit där. Jag tycker personligen att återuppbyggnadsivern är oförklarad i utställningen. Valet att i utställningen inte gestalta den tidsperiod då Parthenontemplet på Akropolisklippan var en moské ser jag som framtidsfrånvänt, som ett instrumentellt raderande av det förflutna i en upplevd samtidspolitisk omöjlighet att inkluderande gestalta muslimsk historia i relation till en kontext som ses som Europas vagga. Detta ser inte Stobiecka. Men, samtidigt får hennes blick på museet mig att se saker jag inte sett tidigare.

I Museo dell'Ara Pacis hittar hon tvärvetenskapliga ingångar i utställningsarbetet. Då museet byggdes nytt och invigdes 2006, ersatte det ett tidigare fascistiskt monument tillägnat Augustus fredsaltare. Stobiecka visar hur det nya museet, både i sin arkitektur och i utställningens gestaltning, erbjuder ett tydligt alternativ till det gamla museet. Speciellt nyfiken blir jag på de delar av utställningen där en botanisk forskare och curator återskapat floran på altarets reliefer till en årstidsberättelse om natur och kultur i symbios och växters betydelse för Roms befolkning åren efter vår tideräknings början. Detta är intressant läsning.

Stobiecka driver sin text med hjälp av teoretiska diskussioner, så pass mycket att jag som läsare ibland undrar om det jag läser verkligen handlar om museiutställningar analyserade med hjälp av teorier? Eller, läser jag *de facto* i stället om teorier illustrerade med hjälp av museiutställningar? Som texten presenteras nu är den intressant läsning för teoretiskt intresserade. De som letar efter museologiska analyser har lite svårare att hitta rätt i boken. Här hade en aktiv redaktör som ägnat tid åt texten kunnat göra underverk genom att hjälpa författaren med att, ur en intressant, faktarik men något rörig och omständlig text, tydligt skriva fram de teoretiskt intressanta analyser som görs och bättre knyta dessa till museistudier.

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