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Westerdahl, Christer

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SOZIALGESCHICHTE DER SCHIFFFAHRT

► CHRISTER WESTERDAHL

Shipyards and Boatbuilding Sites

Features of the Maritime Cultural Landscapes of the North

Introduction

“In any preindustrial society, from the upper palaeolithic to the nineteenth century A.D., a boat or (later) a ship was the largest and most complex machine produced.” This is an often-quoted statement, found at the beginning of the introduction of Keith Muckelroy’s classic *Maritime Archaeology* (1978). If this statement were true, it would bring in its trail certain wider repercussions. For example, it could be assumed that even without the actual vessels, aspects such as the social position of boat and shipbuilding and the technological level of the societies in question might be studied by way of the building sites themselves and their contexts. In this way, it may even be possible to illuminate ships, their technology and their social landscape from a new perspective. This text thus endeavours to plead the case of these sites as an integral part of maritime archaeology and the maritime cultural landscape.¹

One of the most time-consuming tasks in charting the maritime cultural landscape is the precise localization of countryside shipyard sites where wooden sailing ships were built in specific historical times. The main independent material to be reported on here, is the Northern Swedish survey of 1975–82, covering the period from around 1750 to 1900, most of it published only in Swedish to date.² The sources of the survey include oral traditions as an important part. The material found comprises around three hundred shipyards and smaller shipbuilding sites. In 2003 I managed to publish another extensive survey of Lake Vänern over a period of thirty years, but unfortunately without any concentrated opportunities in the field.³ So far, this survey has turned up approximately 150 yards and building sites. It has been included to a limited extent for the sake of comparison; accordingly, these two original sources form the basis of evidence. In this case, they have been supplemented by general considerations of the archaeological significance of such sites, not only their physical remains and related indications of their organization, but also their cognitive qualities in the social landscape and in the local context of landscape economy and resources.

Before doing so, we will briefly recapitulate the archaeology of shipyards in prehistoric times and the Middle Ages. In order to understand what we can expect from and make of historical times, we have to review the significance of those records.

It seems that one can follow up on historical shipyard sites most successfully by means of dynamic interaction between the historical source material (including maps) and the field archaeology of historical times. However, from time to time, prehistoric or early historical building sites are found more or less by chance, in the latter case with fragmentary and historical

sources, which are irrelevant in this case. Ship and boatbuilding is then likely to be referred to in more general terms, but too often without any reference to past experiences, possible principles of localization (sometimes apparent ones) or any other previously identified sites. This is a good argument for recognizing the entire time span and width of studies of maritime archaeology, thereby bringing them closer to the general orbit of maritime cultural history.

It seems, however, that the maritime aspects of societies have been so neglected in the past that it is imperative to *find a strategy to include them systematically – therefore not only shipbuilding sites – in any study or project of coastal archaeology*. From its very inception, one of the foundations of the archaeology of a maritime cultural landscape is the integration of land and sea (underwater) relics. Thus, the archaeological source material of the shipyards is manifested by remnant material on land, including the constructions and cultural layers of the building system, as well as in sunken or at least, submerged, ship details. These include large timber and even intact shipwrecks to a certain extent (in areas without *Teredo* and its cousins) along the shore, illustrating their partial and intentional second-hand use in new ships. Parts of the building and launching processes, such as wood refuse, chippings, shavings, iron details, iron slag (see figs. 23–25) may be better or more easily studied from underwater remains than terrestrial traces, at least those that are invisible above ground. In a number of cases, it is obvious *that the precise localization of a particular (historically known) shipyard sometimes depends only on finds in the waters outside of it*. Others are unknown in any historical source but can be proven only by way of the underwater remains. A correct interpretation of these items has to rely on preceding analysis, knowledge and field experience of such concrete cases.

Prehistorical and Medieval Building Sites

In prehistoric maritime societies, the production of means of transport must have been vital. This would also have been true for any communities living and exploiting other watery surroundings inland. However, this production would have involved the entire community and accordingly an entire range of aspects.

It is the functional sphere, however, and in particular the process of hollowing out a log, that has primarily interested archaeology. In the absence of actual building traces, researchers have referred to the discovery of particular artefacts and implement types. As an example, a discussion of discoveries in Northern Scandinavia of different types of stone axes and chisels and of other kinds of rock than flint, related to the making of log boats and lashing holes for them, has been carried out by several archaeologists, for example in recent times by Noel Broadbent (1982). Broadbent forward ethnographic analogies, such as some recent Hawaiian axe types used for such purposes.⁴

Hollowed axes are certainly likely to have been used for certain tasks in woodwork. There is a wide range of sophistication in the treatment of the cutting edge (figs. 1–3). However, this appears to have been the case with various other types of stone axes as well.⁵ Their uses would have been rather manifold and it is probably impossible to pinpoint boatbuilding in particular. In any case, no building sites have been localized by such means alone.

Even in anthropological literature, a glimpse of the problems of identifying remains may be found. It is most appropriate to reintroduce the authors of holistic descriptions in such a myopic theme as this one! We are salutarily reminded of another important theme, often forgotten: the *decoration* of a thing of beauty and status.

“An examination of one of the sites on which the Maori used to build and ornament their canoes, would produce a collection of stone flakes, among which it would be possible to match any of the palaeolithic types of Europe.” “Apparently, no flake could be produced of a size or

shape however unusual but that it could be and was used in some way in the carving of the intricate designs."⁶

Moreover, one should never believe that interpreting relics is an uncomplicated process. To which social and gender aspect do these flakes belong? At "Rossel Island, four distinct types of single outrigger canoe are made. One of these, the *parano*, or *ndap* canoe may be used only by a chief and is an essential emblem of high rank; another, the *piano*, or female canoe, is the only one that is not taboo for women; the third and fourth varieties are used for ordinary purposes, but in different places"⁷ Perhaps we should be reminded that gender is also not a product of outrigger log boats. The largest skin boat of the Inuit of the American Arctic, is the *umiaq*, the (Dan.) *konebåd*, women's boat, "the only one that is not taboo for women..." Yes, the entire society can be involved.

The social role of boatbuilding is in itself a complicated matter. Returning to the Maori, we are introduced to the significance of the entire process, from the forest to the first journey undertaken. In the following quotation, I have put the sections relevant to the building site in italics:

*"To make a Maori canoe, only men of rank were employed. The Tohunga (chief) of the tribe directed the work, and each stage was accompanied by the appropriate "karakias" or ceremonies, as for instance: 1) when the trees were felled, 2) to give power to the axe to shape the canoe, 3) when the canoe was drawn out of the bush, 4) to propitiate the heavens on embarking on a long voyage, 5) to calm the sea, 6) on arrival in a strange land, 7) to enable the paddlers to keep time, 8) at the naming of the canoe, when the priests sprinkled the canoe with water, and a slave was sacrificed."*⁸

However, what about the social role of the boatbuilder himself in Nordic prehistory? To illuminate some of the problems involved in answering such a question, I have to return in some detail to a subject that has fascinated me in particular.⁹

T-formed Neolithic red slate implements (fig. 4), of clearly combined functions to a certain extent, were mostly found in coastal



Fig. 1 A small hollowed axe, moderately modified, in the author's possession. Find from central Sweden. (Photo: Christer Westerdahl)



Fig. 2 Hollowed axe, with exquisitely modified edges, found at Hamptjärn, Ömsköldsvik, Sweden. (Photo: Christer Westerdahl)



Fig. 3 Hollowed axe, of chisel proportions, Pite river valley, Norrbotten, North Sweden. Private collection. (Photo: Christer Westerdahl)



Fig. 4 T-shaped implement found in Dombäcksmark, Grundsunda, Ångermanland. Länsmuseum Västernorrland no. 4121. (Photo: Christer Westerdahl)



Fig. 5 A Skolt Sami boatbuilder in Nuotjaur (Notozersk) on the Kola peninsula wields a mallet-like tightening instrument lashing his boat planks together. (Photo: Gustaf Hallström, 1908 / Nordiska museet, Stockholm)

seal-hunting settlements in Ångermanland in Northern Sweden from around 3000 BC, but they spread inland as well, and I have compared them¹⁰ to a recent mallet(or hammer)-like tightening device of wood for sewn planked boats in the same area (fig. 5). This more recent implement was used in boatbuilding by Saami boatbuilders who are among the latest users of such boats in Europe. This comparison appears problematic, not least owing to the awesome time gap of five thousand years. Nevertheless, a tightening device is imperative for lashing or sewing in wood. A possible example could have been an implement found at the North Ferriby site with its four boat fragments from around 1400 BC at the Humber estuary in England.¹¹

There is an array of analytical aspects, referring to metaphors and symbols in illiterate and pre-modern societies, which could be mobilized in this case. Yet the problem of the time lag is still apparent. The T-form of the Neolithic slate implements also seductively connects these implements to recent shaman antler-drum accessories.¹² Interestingly, the material properties of slate have been deemed almost identical to those of antler (and to some extent bone) by Nordic archaeologists.

There are two with different functions. The "hammer", a reindeer antler fork (fig. 6), of the drum was used for the séance of the shaman (*noaite*, Swed. *nåjd*) and the smaller, slightly different "pointer" (fig. 7) serves divinatory purposes by its ultimate position on the drum skin. The shaman's drum (Saam. South: *gievre* or north: *guobde*) was metaphorically identified as one of his technical "helpers" or "vehicles". In fact, it was explicitly *his boat*, during journeys between the world elements – water, air, earth – in his ecstatically engineered soul absence. Among the Evenks of Siberia, the shaman was "floating down the shamanistic river into the lower world – the *khergu*. His drum served him in this case as a boat, and his shaman's drumstick as a paddle".¹³

The time lag between these items can presumably be reduced considerably, perhaps to two thousand years (still a daunting gap), due to rich finds, including these implements, in a Proto-Saami settlement in Kjelmøy, in the Varanger area of northernmost Norway from around 800 BC and onward. One such item was also found in a grave a little further south, apparently

female, from the first century AD.¹⁴ The same Saami term for the drum hammer, translated as “reindeer antler hammer”, is in fact used in recent times for the mallet-like implement for tightening lashings, although it is made of wood.¹⁵ For this reason, there is a cognitive connection between the tightening of boats and forms for ecstatic divination. It could have meant a parallel cognitive transformation and transmission of all three forms as metaphors and symbols. This also has a bearing on the materials used.

The shaman was not a “king” because he was a boatbuilder, but because he was a shaman. The status of a boatbuilder as well as a shaman as a metaphorical “bridge-builder” (the term of the Roman priest, Lat. *pontifex* means ‘bridge-builder’) across waters (and other elements) could have affected society as a whole. However, the boatbuilder’s status was certainly variable in different societies and contexts. To some extent, particular social groups, maritime or not, may have been specialized as boatbuilders and their status may accordingly have depended entirely on their group status. Saamis were indeed boatbuilders for the Norse in historical times, but their status in the recent Norse communities appears to have been low. Nevertheless, it may have been quite another story in the past. This is definitely the case in the *Heimskringla* by Snorre Sturlason, of the pretender king Sigurd, called *slembadiækn(e)*, who wintered in a Saami camp close to present-day Narvik and had them build him two large galleys in AD 1138.¹⁶ It also appears to have been thus in the high-status grave in Norse tradition of an elderly, apparently Saami male in Lekanger, in Northern Norway.¹⁷

Group coherence is another variable. In India, the West Bengal boatbuilders, *biswakarmas*, do not as a whole constitute a particular step in the caste system but certainly a special group (oral statement, Swarup Bhattacharya). Numerous references to and indications of the positive significance of boatbuilding and the status of the boatbuilders in illiterate and pre-modern societies could be adduced from ethnographic literature, see above, and notably Malinowski’s famous account of Melanesian New Guinea.¹⁸ Still, their status may be based more on their general position, not necessarily referring to boatbuilding itself in the first place as a socially important activity.

In medieval Norse literature of the twelfth and thirteenth centuries AD, an obsession chiefly with galleys, purportedly applying as well to the preceding centuries (the Viking Age), is obvious. The master shipbuilder of such a vessel will have been praised highly for his work, and



Fig. 6 The “hammer” of a shaman drum. (After Ernst Manker)



Fig. 7 The “pointer” of a shaman drum. (After Ernst Manker)

accordingly must have acquired high status.¹⁹ In a male status grave at the fortress camp *Trelleborg* on Danish Sealand, a silver-inlaid broadaxe was found, an archetype in ship and boatbuilding, and also an item indicating leadership, perhaps for such a process.²⁰ The graves of other farmers/craftsmen, especially smiths, refer to at least a cognitive intermediate status, and several of them could have been boatbuilders as well as smiths.²¹ Production of iron nails and other fittings was one of the most important elements at a boatbuilding site from the Early Iron Age onward. The grave of a well-known medieval smith appears to have been found at Hérouvillette, Normandy.²² There are quite a number of such graves in Scandinavia, not least in Norway.²³ An itinerant boatbuilder and smith may have lost (or sacrificed?) his complete equipment in the well-known Viking Age chest in the lake of Mästermyr, Gotland.²⁴

The site of the North Ferriby Bronze Age boat finds from around 1200–1400 BC, already mentioned, is very probably a boatbuilding and maintenance site for planked boats. It is situated partly in an intertidal zone and so this interpretation may not be self-evident. However, it has recently been interpreted in the following way: “The only known prehistoric boatyard in Western Europe.”²⁵ Accordingly, among the finds was a possible tightening device, along with wooden chips and probable scrap wood (above).²⁶

The oldest boatyard found so far in Northern Europe appears to date from the Mesolithic period, around 5000 BC, in this case showing signs of log boat production. Reflections on the nearby resource landscape are likewise interesting:

“In the very last years, new and interesting information on the production of such vessels has been found. There is every reason to assume that trees normally suitable for boat construction did not grow on the settlement sites. The ordinary method must have been to locate a tree in the forest – probably not very far from home. The primary production step – the hewing out – took place where the tree was felled. This explains why definite indications of boat production are extremely rare. However, at a newly excavated Ertebølle settlement, *Agernæs* on Funen, we have found a regular Stone Age boatyard.²⁷ The frontal waste contained an area of 2 x 10 m, covered with an approximately 10-cm-thick layer of wooden chips and splinters – all of linden. The chips were of an oval or rectangular shape, 25 to 30 cm in length and with a triangular cross-section...”²⁸

At present, it is not possible to say for sure if this is also the oldest boatbuilding site in Western Europe. In fact, the underwater excavations at the Solent in Southern England, in the area of *Yarmouth* on the Isle of Wight, has already presented a case of such a site from around 6000 BC, including a wooden platform and wood chippings.²⁹

Very few shipyard sites of Classical Antiquity have been identified. However, numerous boat-houses and sheds may have served this purpose. In Egypt, the opposite of a shipbuilding site – a “shipbreaking” site has been found at *Mersa Gawasis* on the Red Sea. This site is situated close to a harbour where imported ship construction kits of Lebanese cedar were transported overland via the Wadi Hammamet from the Nile. Recycled timber, including steering gear, have been accounted for. The analysis therefore presents us with yet another type of building site, the ship-breaking and recycling site, certainly bearing social implications.³⁰

Considering the large time span which I will allow myself in the North, it might seem curious not to include, for example, the medieval ship sheds in Barcelona, the *tersane* of Alanya, Turkey, or the huge Arsenal of Venice, all fairly well preserved. The focus here, however, is on rural areas, not on urban milieus. Besides, there is no ambition here to cover all indications of shipyards and possible sites. In certain contexts, there will be references to towns even in this text, but mostly those of the North.

Some global glimpses are inevitable. The colossal depression of the fifteenth-century shipyard, the Treasure Shipyard of Cheng Ho’s (Zheng He) fleet in Nanjing, China, is of course without peer in the West. There were originally thirteen basins along the Yangtze River, but

several were destroyed during construction work rather recently. One is 421 metres long and 41 wide. However, the outcome of excavations conducted at Dock No. 6 does not seem to present a clear picture of these huge constructions, despite the recovery of at least , artefacts. The fleets of Cheng Ho (Zheng He) were sent out from 1403 to 1433.³¹ Very likely, the ships were launched by letting the river water into the basins, like in the tidal basins of medieval England (below).

So far, I have only seen one boatbuilding site published in the Pacific. There must be scores of them. At *Huahine* in French Polynesia, several boat finds were dated by 14C analysis at around AD 700–1150.³² It is perhaps typical that the boat finds necessitated an interpretation as a boatyard. Other indications are generally not taken at face value. However, perhaps I am being unfair in this case. Other instances are very rare in any case. In general, the level of preservation appears to be worse in the South than in the North.

Late Prehistoric and Medieval Periods, Northwest European Building Sites

As in the preceding cases, only some representative examples will be given in this section. The traditional lapstrake or iron-clenched vessel of the Nordic countries required huge amounts of iron nails. This is a category of finds represented quite commonly at boathouses. A rare example from Sweden is *Snäckhus* ('the house of a *snekkja*') in Burs on Gotland.³³ There are a few others in Sweden and Denmark.

The greatest reservoir of knowledge is constituted however, by the Norwegian boathouses, called *naust*, of which at least eight hundred have been identified from prehistoric and early historical times.³⁴ The earliest *naust* appears to have been dated from the second century AD.³⁵ Several of these early *naust* had already attained a length of approximately 25 metres. Together with the fairly well-known Iron Age harbour, market and handicraft site of Lundeberg on Funen, Denmark³⁶ these comprise the earliest evidence of iron-clenched vessels of the North. According to actual boat finds, the transition from sewn boats to iron-clenched vessels seems to have occurred during the first few centuries AD.³⁷ They were similar to the well-preserved oaken Nydam ship of 23 metres length from Als, Southern Denmark, dated dendrochronologically approximately at AD 310.

All these *naust* sites were obviously maintenance sites for the ships as well as the original building site of certain vessels. Apart from the iron nails, implements and traces of pottery, tar and pitch production are also mentioned.³⁸ Nevertheless, all the possible aspects of boatbuilding sites have not been explored here, nor anywhere else so far. Very probably, these sites could often have been considered *centres of maritime culture* in their particular Iron Age context. Research has, reasonably enough, concentrated on the power strategies and patterns: *leidang* levy systems and the power landscapes of chiefs and feudal lords.³⁹

The first indication of a transition between paddled to rowed boats also stems from a boatbuilding site, if a minor one. This complex is known as the *Mangersnes* find. This site was found on a small island, Radøy, in Hordaland, Norway, north of Bergen. There is a lake on the island called Nesvatnet, and it drains into the sea via a small brook. There is a small bog at the lakeside part of the brook, where boat parts were found, together with thick layers of branches and pine shavings, and to some extent oak chips. The branches are of birch, hazel and juniper. It seems likely that the latter

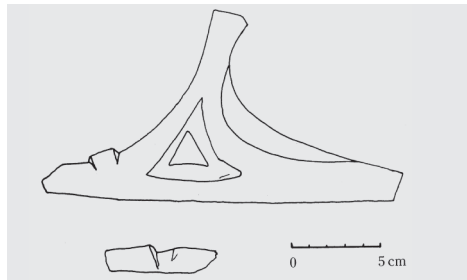


Fig. 8 The oldest rowlock from the find of Mangersnes, West Norway, dated ca. 50 BC – AD 250. (After Christensen 1995)

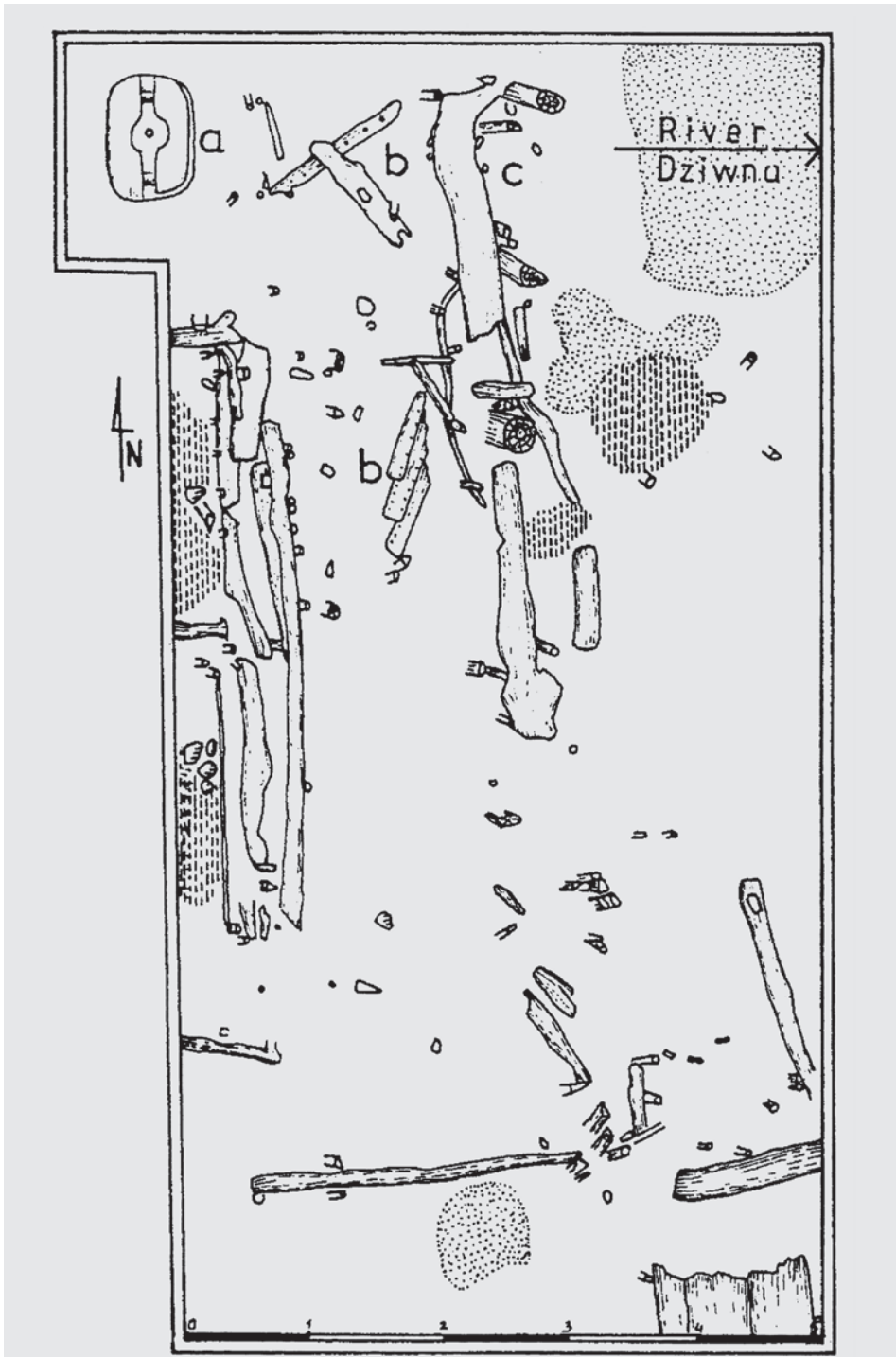


Fig. 9 Fragments of boatyard at Wolin dating from the end of the ninth century AD, including a winch. (After Filipowiak 1994)

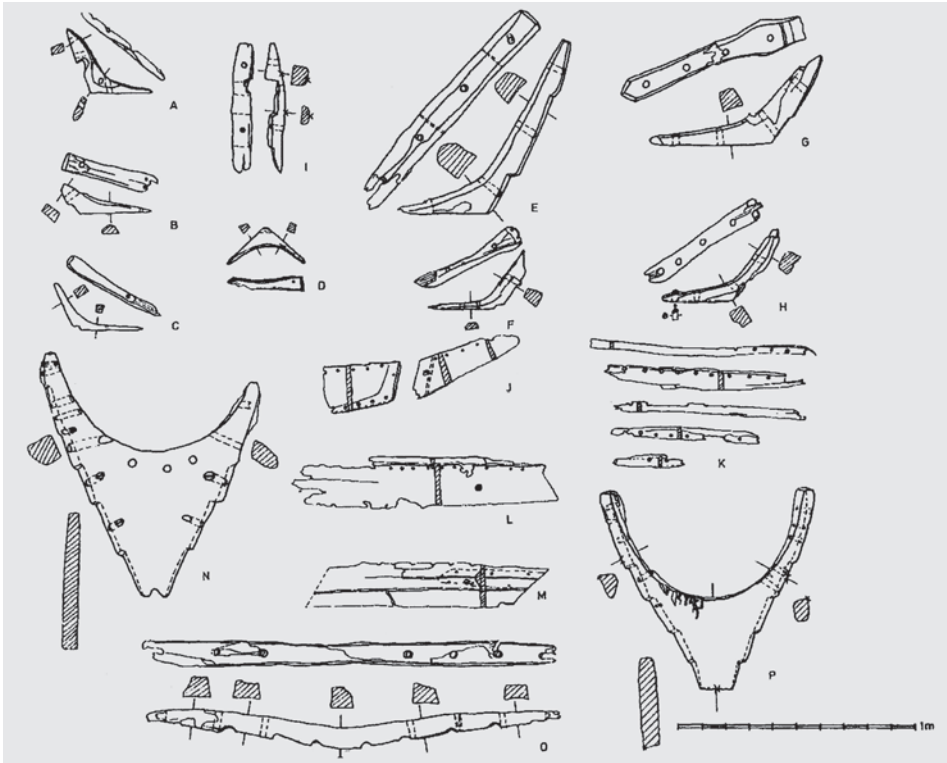


Fig. 10 Wooden ship parts from the breaking yard at Maglebrænde, Falster, Denmark. (After Skamby Madsen)

were material for fish weirs in the lake, of which some remains can still be seen. The ship parts are worn. The general impression is that boats were repaired at the site and some replaced parts were left there. Several fragments of ribs have holes for lashings and one has a trace of a clinker nail in its upper part. There is also a boat plank and a fragment of a plank cleat for lashing to the rib. On the other hand, there is no direct proof of sewing. The presence of lashed ribs does not offer any relevant dating. It is a feature that extended well into the Viking Age.

However, what is truly indicative of the transition is found among the five rowlocks. The oldest and thus the most interesting find is dated by 14C at the interval 30 BC to AD 250⁴⁰ (fig. 8). The earliest find of an actual boat with its rowlocks preserved, the Halsnøy find of Southwest Norway, is dated at AD 335.⁴¹ Comparing the fragmentary lashing cleat from Mangernesnes with the finds of Halsnøy and the earlier, from Valderøy AD 245⁴², has led to other significant insights – the diagonal splitting of logs to prevent a cleat from breaking off of the plank.⁴³ The other datings of rowlocks comprise the period from AD 560–670. There are parallels with the Nydam ship, around AD 310 (as above), as well as that of Kvalsund, 14C dating from around AD 690.⁴⁴

In West Slavonic shipbuilding during the Viking Age and the Nordic Early Middle Ages, the predominant fastening materials were treenails (oak), in contrast to the ever-present iron nails in the North. At the Viking Age urban settlement *Wolin*, at one of the mouths of the Odra (Oder), large numbers of treenails of varying sizes have been found. Many have been cut to repair or replace damaged planks. There are also ship parts and remains of a wooden winch for hauling boats up onto land, with a similar construction that was known from the area in fairly recent times⁴⁵ (fig. 9).



Fig. 11 The nail “seeker”, “*spiksökare*”, of the Viking-Age Paviken site on Gotland (broken) compared to a modern variant. (After Lundström)

Another large site with similar material is at the *Fribrodreå* River, close to Maglebrænde on the Danish island of Falster. It has been carbon-dated to the late Viking Age and the early 1100s. There are huge quantities of loose details of tree-nailed ships (fig. 10) indicating a place of vessel repair, shipyard or break-up place, perhaps even a combination of all three functions. The intention of recycling parts for other, possibly new, ships is likely. The ships, as well as other finds, appear to be West Slavonic in shape and construction technique. Another striking fact is that the place-name element *Fribrodre* is obviously derived from the Slavonic *Pri brody*, ‘at the ford.’⁴⁶ More follows below on the other place-name flora, in this case of Nordic origin, at the site.⁴⁷ No final interpretation of the site has been presented thus far, but attempts have been made.⁴⁸ It thus appears to have been at least a breaking site in the same sense as that on the Red Sea (above), although indeed with local wood resources at hand.

Stray finds of boat fastenings of any kind would be an obvious indication of a ship or boat-yard. However, there are other implications of such artefacts. The study of treenails (cf. fig. 45)⁴⁹ and clenched nails of different types⁵⁰ could possibly give important information on ship sizes as well as cultural connections in shipbuilding. This is a field of study still sorely needed. There is a slight possibility that the square legs of clinker iron nails were partly an eastern phenomenon,



Fig. 12 Sewn boat fragment from Suojoki in Keuruu, Central Finland. (Photo by way of J. Viikuna)



Fig. 13 Oar from Suojoki in Keuruu, Central Finland. (Photo by way of J. Viikuna)

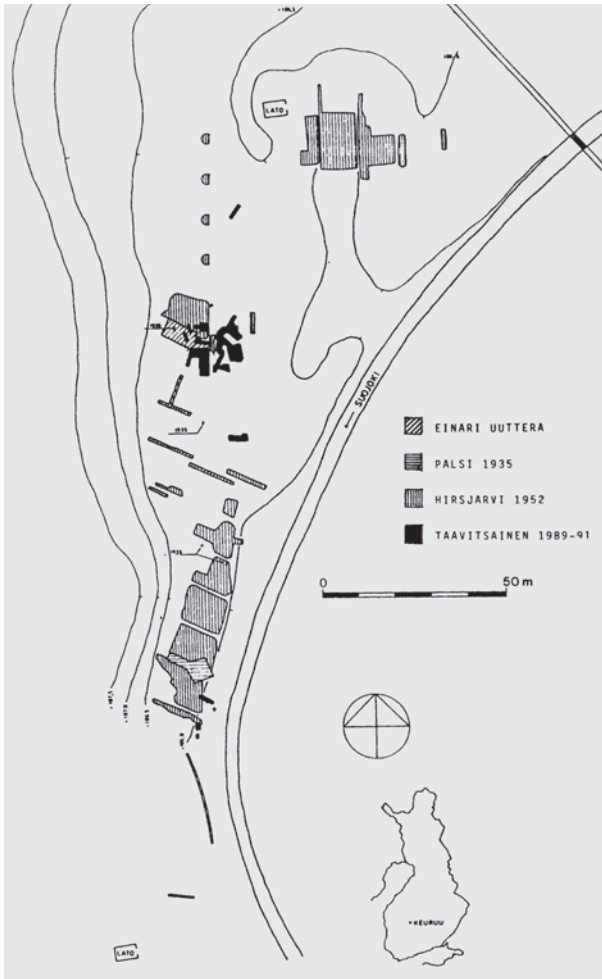


Fig. 14 Excavation areas at the site of Suojoki in Keuruu, Central Finland. (After Vilkkuna et al. 1993)

kind of discovery, found casually or in an identifiable context, seems to point to repair rather than new vessel construction. However, these functions were rarely separated geographically, even in later times. Most of the sites mentioned were not only shipbuilding sites but also harbours, or were incorporated into larger areas with potential as havens for shipping.

It is not uncommon to find iron clinker nails, even in inland areas, on the shorelines, ancient or still existing. Per Hansson has excavated such a site⁵⁶, in a drained wetland, formerly a lake, at *Skeppsta* (Swed. 'skepp' means 'ship' or – dialectally – 'boat') in Närke, Central Sweden.

If we move on further to the East, in Central Finland, the remarkable find of the *Suojoki* brook at *Keuruu* from around 1300 AD may be relevant in this connection. During the medieval period, this part of Finland was part of the interior wilderness, although a sparse population of hunters and fishermen did exist. No permanent settlements are known. A considerable amount of sewn boat parts (fig. 12), oars (fig. 13), sledges, skis and wooden blanks at least for three of them, were preserved in the wetland. Some of it was excavated in several stages (fig. 14). The interpretation has vacillated between several hypotheses – harbour, deposit, or construction site, among others.

in Finland, the Baltic region and Russia, whereas Nordic nails seemed to be round in cross-section.⁵¹ The material of the study derives from boat graves in the areas concerned. However, boats are indeed mobile objects. There are also many "exceptions", which makes these attributions doubtful.⁵² At boat-yards like Wolin, blanks for several iron roves were found, with holes for the nails, forged together to be cut up later into individual pieces.⁵³ The nails between the planks used in cog-like ships (further below) are easy to distinguish from the others. They were not clenched against a rove, a nail-plate, and were usually much bigger than regular clinker nails.

To be able to cut iron nails for repair of a plank in later times, a particular implement was used, a kind of chisel, Swed. *spik-sökare*, 'nail seeker.' An almost identical artefact was found at the Viking-Age trading place *Paviken* on Gotland (fig. 11).⁵⁴ Another was unearthed at the Danish fortress of Trelleborg mentioned above in connection with the grave equipped with a silver-inlaid broad-axe.⁵⁵ This

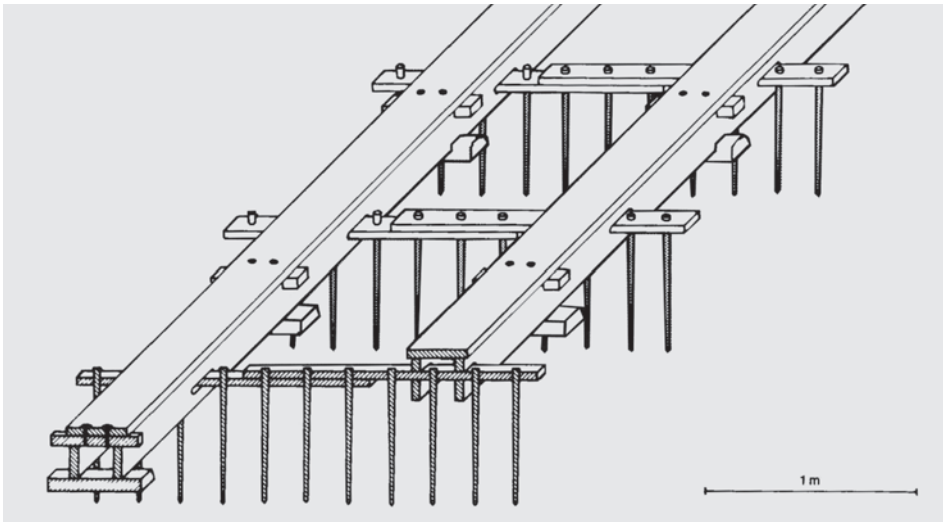


Fig. 15 A reconstruction of a possible slipway at Wurt Hessens, Wilhelmshaven, North Germany. (After Ellmers 1972)

The deposition could have been made in water, which may have meant a preparatory stage for building vehicles or vessels, but it could also have held other implications. If deposited during the transition periods to other means of transport during the annual cycle, returning to the same site several times, the combination of boats and snow vehicles may have meant visits in autumn or at the beginning of winter and in late spring. The deposition then would have been made with covers on the surface, and not in the water. The site itself marks a transport zone transition from river valleys to large lake systems on the terrace of Central Finland.⁵⁷

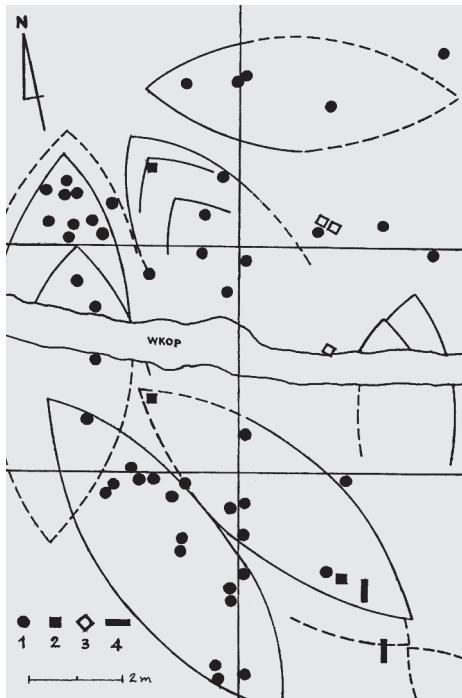


Fig. 16 Boat "shadows" at Janów Pomorski, Poland. (After Jagodzinski & Kasprzycka 1991)

Detlev Ellmers has given several indications of shipyard sites dating from medieval times, some of them mentioned here, in his monumental work on early medieval merchant shipping.⁵⁸ The actual shape of a slipway for a medieval shipyard is rare if indeed not non-existent. Ellmers identified a wooden slipway of the eighth century AD, in this case for a flat-bottomed, cog-like vessel, at Wurt Hessens close to Wilhelmshaven in Northern Germany (fig. 15).⁵⁹ Ellmers was looking for evidence of this type of vessel rather than for a shipyard. The interpretation appears to be problematic. Today, it seems, rather, that this construction belongs to a second stage of construction and it is to be considered a sophisticated stabilizing device for slippery manure in a stable on the terrace surface of the Wurt.⁶⁰

At Janów Pomorski in Northeastern Poland,

probably *Truso*, mentioned as a port around AD 890, numerous boat-formed – including numerous pointed-end – colourings of the excavated area (fig. 16) may have had something to do with boatbuilding but they could not have been actual slipways. These features are in fact rather puzzling.⁶¹

During the analysis of the Viking-Age settlement at the harbour of Haithabu, Hedeby in Schleswig, two marked concentrations of shavings, clinker nails and treenails were detected. In the vicinity, secondary, used, keel-like wooden blanks were found. However, there were still no traces of anything like a slipway. After the middle of the eleventh century, this port site was abandoned in favour of Slesvig across the bay. Another area with shavings and a single find of a wooden ship's knee was discovered⁶² in an area suggested as a potential harbour for the royal mansion at Holmer Noor in the Northeast of the growing medieval town.

In the West, the tidal range in the lower reaches of rivers provided excellent conditions for dry docks. During the Middle Ages, ships were apparently built in basins dug out on the shores and floated by the inlet of water during high tide. Such tidal docks are known in historical sources from at least AD 1295 to around AD 1500 (fig. 17).⁶³ Today, the archaeological traces (depressions) of such basins are rare. None has been excavated. To maintain a geographical focus but in a more urban setting: the shipyard preserved with its shaped ship timber, some recycled, on the ground, dating from about 1400, in Poole, Dorset, England, appears to be unique (fig. 18).⁶⁴

Other archaeological finds at shipyard sites of the Middle Ages may include materials for luting and/or caulking. In the West Slavonic area, the traditional moss stuffing used was of the *Drepanocladus* species group, as in Wolin, Poland; in the North, cattle or other animal hair was the usual material, if any of it has survived at all. Implements such as axes (broad-axes and special, socketed, axe types), special chisels (often socketed), augers and profile (section) irons could also be relevant to identifying a site.⁶⁵

The resource landscape has a wider range than the individual site. Damian Woodburn has attempted to reconstruct the forest landscape of Southern Roman Britain by way of timber of ship finds such as Blackfriars of around AD 200.⁶⁶ For later periods, the production of textiles and, to some extent, rigging material has come into focus. Parts of medieval sails have been preserved in churches, and they are invariably of wool. In any case, wool was almost the only

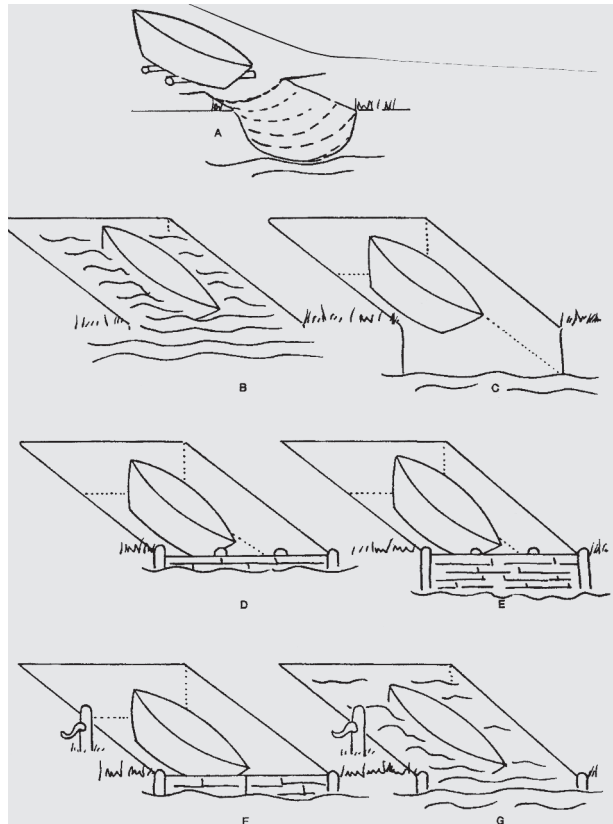


Fig. 17 Reconstruction of shipbuilding and launching in a tidal dock on the Thames. (After Friel 1995)

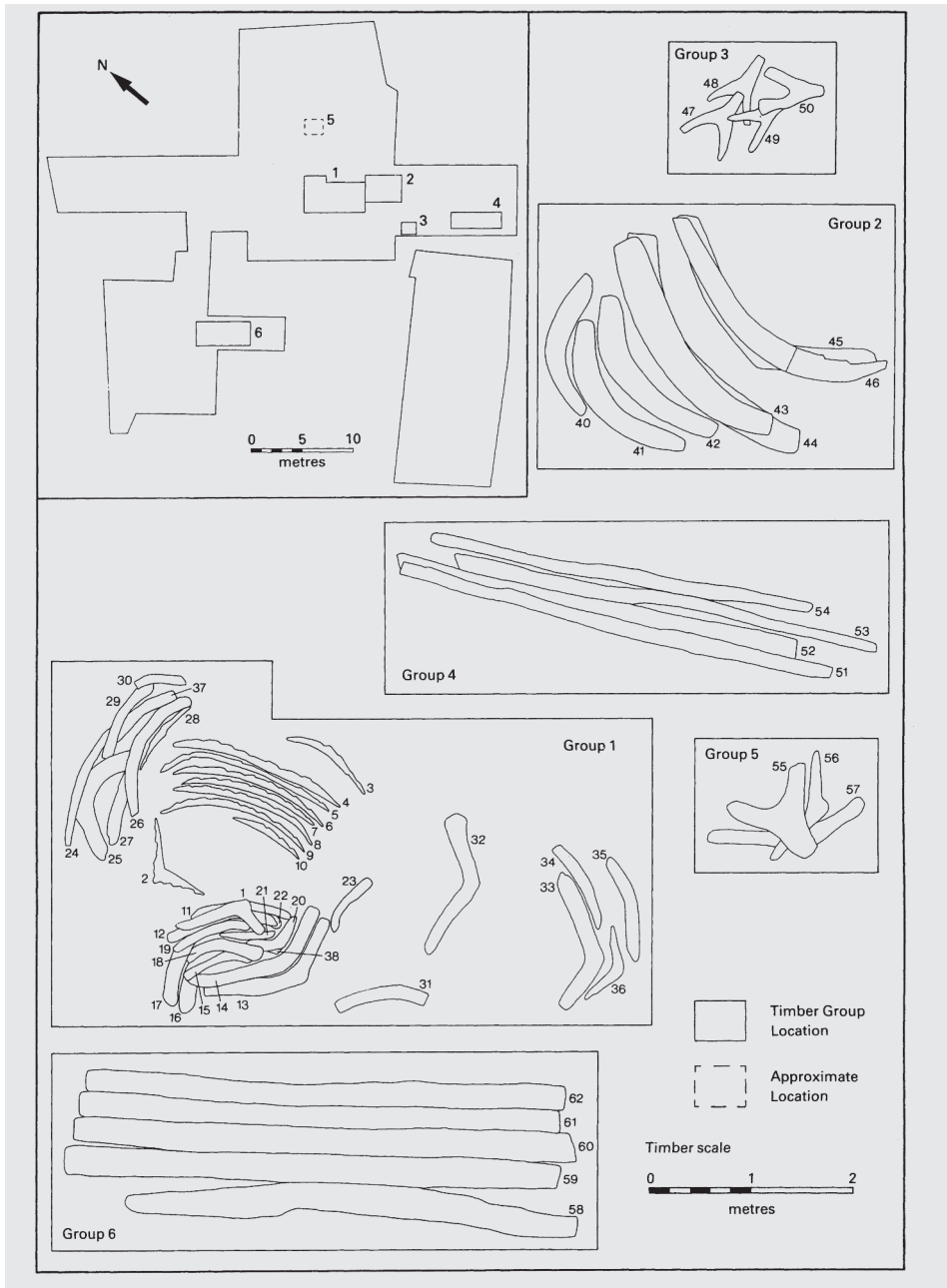


Fig. 18 Ship timbers preserved in an urban environment in Poole, Dorset. (According to Hutchinson 1994 and Watkins 1994)

material to be produced in such amounts as to be feasible. To weave such coarse woollen material as sailcloth, larger loom weights are needed than those for normal clothing. Such finds have been discovered for example at the Viking-Age harbour and trading places in Skåne, Southern Sweden, in particular in Löddeköpinge and Åhus. This material has been analyzed by Eva

Andersson.⁶⁷ During the later Middle Ages, linen sail cloth and hemp linings intruded in earnest on this traditional material, and subsequently came to replace it.

The rigging in the North during the Middle Ages has been shown by the professional Danish rope-maker Ole Magnus to consist almost exclusively of lime bast.⁶⁸ Hemp only appeared in earnest in the sixteenth century. The study is based on analyses of wreck finds, such as those of Roskilde in the 1990s. However, lime bast is better preserved in wet conditions than most other materials, in itself perhaps an argument for its use. Nevertheless, an element of source criticism might of course be applicable.

Another discreet find in Northwestern Europe pertaining to shipbuilding is the rectangular, oval or butterfly-shaped iron fittings for caulking lathes

holding the caulking or luting, in this case moss.⁶⁹ In this instance, particular ship types could be indicated from the foundation. Studies of these fittings show that a cog-like vessel is the mainstay of this technique. The traditional Dutch name is *sintels* (fig. 19). Ellmers has already pointed out their significance.⁷⁰ The most thorough treatment of this subject yet is that by Karel Vlierman.⁷¹ The Bremen-type archaeological cog is a combination of carvel (bottom) and clinker (sides). *Sintels* were used both inside and outside the hull. They appeared in the Rhine area, quite early, in the ninth century. A great number from different periods have been found at the large river barge centre of Duisburg.⁷² Later they were found not only in inside wreck structures, but also in shipyard areas outside the town walls of Lübeck along the river Trave (here, 1180s), at the Elbe close to medieval Hamburg, as well as in other inland areas, e.g. along the Peene and its tributaries in Pomerania, a well-known shipbuilding district even in later times⁷³ (more on this area below). These kinds of fittings have also been used in traditional clinker vessels for repair, e.g. in the thirteenth century wreck of Asker/Sjøvoll, Southern Norway.⁷⁴ The application of similar fittings was obviously not uncommon in other parts of Central Europe (along the Danube to the Black Sea) and the East, especially in river systems, from the Baltic area to Russia. However, it is unclear whether this was the result of diffusion or a partly independent development. Possibly, it is both.

So far, little of the social landscape of shipyards and boatbuilding sites has been discussed. Let it suffice to remember here that, like transportation (for Denmark, see Bill 1997: 9ff), *ship and boatbuilding were part of the feudal obligations of many dependent peasants and crofters of Europe during the Middle Ages.* Waldemar Ossowski of the Centralne Muzeum Morske at

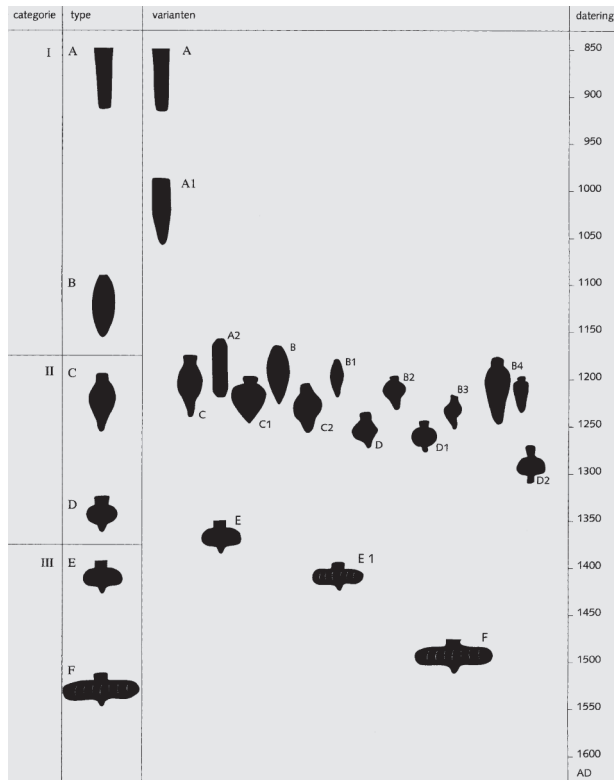


Fig. 19 Dating *sintels*. (From Vlierman 1996)



Fig. 20 The naval shipyard area of Slotø, Lolland, Denmark. The building site was between the two brick and stone walls with traces of stone paving in the ground, but without any slipway-like pattern. The picture was taken from the tower. (Photo: Christer Westerdahl)

Gdansk recently reminded us of the *ius ducale* in Poland and apparent traces of communities of explicit “log boatbuilders” in *Korablniki*, three identical settlement place-names along river systems.⁷⁵

At the end of the Middle Ages, the first royal shipyard of the North was established by the Nordic union king Hans (Johannes) in AD 1509 on an island called Slotø in the Nakskov fiord in Lolland, Denmark.⁷⁶ It was efficient for only a few years, and was subsequently moved to Copenhagen permanently. This marks the final entry of an industrial production of large-scale carvel-

built warships. The central part of this shipyard was enclosed by preserved walls and a round tower designed for artillery, clearly revealing its military importance (fig. 20). It is now a protected historical monument. In connection with this, it is interesting to know that heaps of coarse timber lie in the waters immediately outside of the shipyard, illustrating the importance of combining the land and underwater features outlined above.

Somewhat later, in the 1550s and after the secession of Sweden from the Nordic union in the 1520s, the Swedish king Gustavus Vasa ordered several shipyards built. The remains of the cultural landscape of what was apparently one of the largest of these yards in rural areas is found at Björkenäs near Kalmar, dates from the 1550s, and can still be seen in part. No serious excavation work has been possible so far.

Conclusions Thus Far

It can be demonstrated that the ship and boatbuilding sites, without being widely recognized as a particular analytical category, have already yielded important information, for example on such early periods as that of the transition between sewn and iron-clenched vessels and between the propulsion methods of paddling and rowing. Importantly, they appear to confirm changes in the technology of ships and shipping in localized places, otherwise only known in shipwrecks, i.e. the mobile objects built at such sites. Furthermore, multifarious kinds of maritime activity areas have been identified in the vicinity of such sites. The transport landscape inland has been implicated. In the social field, the reflection of the landscape of power and feudal duties, of cultural patterns and traditions has been enriched. Social and symbolic patterns have been indicated as having bearing on the status of the boatbuilders.

The field therefore contains enough dynamism to be of great interest, not only for prehistoric but also for early historical researchers. It is to be expected that the fields of historical archaeology generally and maritime landscape archaeology in particular can benefit in the future from studies of this type of remains.

Shipyards of the Northern Baltic: Some Reflections

From here, we move on to the material available during the Norrland survey of Sweden 1975–82. As mentioned above, it covers the period from approximately 1750–1900, but the exceptions include some excursions backward in time.

Geographical Setting

Let us begin with a few general geographical facts. These coasts are part of the Bothnian Sea (Swed. *Bottenhavet*) in the South and the Bothnian Bay (Swed. *Bottenviken*) in the North. They are part of the larger unit of the Baltic. Swedish *Bottniska viken* is the common name for them, in English, both together would be called the *Gulf of Bothnia*, in German, they are called *der Botnische Meerbusen*. The natural division between them, the Bothnian Sea then being to the South, is the narrower passage called (Norra = North) *Kvarken*, approximately between the towns of Umeå and Vasa (Vaasa) on the Finnish side, where we find archipelagos on both sides, including Holmön, which was mentioned recently. The natural dividing line between the Baltic proper and the southern part of the Gulf, the Bothnian Sea, is the Sea of Åland (*Södra* = South *Kvarken*) and the extensive archipelagos of Stockholm in Sweden, Åland and Åboland in Finland proper. Since the last Ice Age, the land upheaval or uplift in the Bothnian area on the Swedish side is the greatest in the world. It has not been entirely linear but, generally speaking, it can be estimated for the recent centuries as 1 metre in the Northern part of the area and about half, 0.5–0.6 metres in the southern part of the area. For the shipyards referred to here, this means that in the period from 1700–1900, the remains of those situated on the actual shore of the mainland or on islands (not uncommon), and not in the lower reaches of rivers – which is in fact fairly common – will be found within the range of at least 1.5 to 2 metres above the present sea level. In many places, especially in the shallower areas of Norrbotten, Västerbotten and in the South Uppland, Gästrikland and Southern Hälsingland, their rural features largely appear to come from the sea, in present-day forested areas, where they may even have been damaged by the machinery of modern forestry (cf. figs. 35–36).⁷⁷ Even more difficult to localize are earlier shipbuilding sites from the Middle Ages and even earlier times. On the other hand, the land uplift is an excellent ally of archaeology in all periods, in the sense that it can help to date remains previously on the ancient shores.

Beyond the Dalälven River in Sweden and the southernmost coast of Finland, no oak grew. Pine was used for large ships for the crown, even during the sixteenth and seventeenth centuries, but the superior quality of the subarctic pine was not generally recognized. This recognition belongs to the eighteenth century (below).

In this area there was a working minimum of roads, and only winter meant unlimited access to easy ice and snow transport, not only inland but also close to the coast. However, up until the last part of the nineteenth century and even today, for the export of raw materials, such as iron ore and planks, the bulk of heavy transportation was carried out by way of shipping. Thus the need for ships and shipbuilding was fundamental.

Across the Gulf of Bothnia

From time to time, the Bothnian shipyards have been among the most productive in the Baltic. In the eighteenth century, it could roughly be computed that at least one third of the Swedish ships were built in Finland and Norrland, perhaps one third in Swedish Pomerania and the remaining third would have been either foreign-built or built in the southern part of Sweden. However, Finnish Österbotten (Ostrobothnia) was by far the greatest single ship production



Fig. 21 Detail of the *Carta marina* of 1539 by Olaus Magnus. The depiction of a ship is accompanied by the text *Hic fabricantur naves*, “here ships are built.” It seems likely that Olaus Magnus wanted to indicate South Österbotten (a river somewhere upstream from present-day Närpes, *Nerpis*), but it should not be taken as a geographically correct statement.

This activity coincided neatly with the regional agrarian profile and its labour cycle during the year. In Österbotten, shipbuilding was the most important local industry before industrialization started in general. The Finnish peasants, harking back to a tradition from the Middle Ages, used a set combination of many different ancillary and seasonal lines of industry, fishing, trading, sealing and exploitation of the inland areas (Swed. *ärjemark*, Finn. *erämaa*).⁷⁹

The maritime aspects are thus apparent in several of these: fishing (even inland), trading and sealing. If we add the production of ship timber and tar for ships together with shipbuilding, the agrarian element seems minor – as in fact it was. The authorities were reproachful, but since they benefited from the other activities of the Ostrobothnians, the lack of interest of the latter in agriculture had more or less to be tacitly accepted. To some extent, the same versatile economy existed on the Western side, especially at the Bothnian bay (ancient Västerbotten), but in a much more restricted sense. For example, trading and sealing were less important. As to the significance of fishing, it is remarkable that burghers from southern towns could carry out the main large-scale fishing activity, almost to the present-day Umeå, esp. Gävle, from the sixteenth century onward. In a way, the two sides of the bay may have been complementary, with one side compensating for the deficiencies of the other. The Westerners generally grew more crops while the Easterners depended more on animal husbandry. Moreover, the Easterners as part-time sailors always had recourse to the attractive barter items of the others. Unfortunately, we do not know the scale of the barter traffic across the bay, but it certainly existed, in varying degrees.

A Bothnian connection is apparent in most cultural aspects at any rate, including languages. Along the inner Bothnian coasts, people were bilingual in Early Modern times, presumably mostly Swedish-speaking but with considerable knowledge of Finnish. As to the direct connections in shipbuilding, they are obvious immediately before our period. Master shipbuilders are known to have been summoned from Österbotten to lead (and teach) construction in the Norrland towns after the Great Northern War (1720s) and at the end of the eighteenth century.

centre.⁷⁸ If I were to compare Norrland with Finland, just to give an indication, I could mention that my preliminary list of ships built in Norrland contains at most around five thousand ship names from 1750–1900, but Pekka Toivanen has around twenty thousand in Finland during roughly the same period, most of them presumably built in Österbotten. However, there were great fluctuations over time. The significance of Finnish shipbuilding was acknowledged by Olaus Magnus on his ethnographic map, the *Carta marina*, in 1539. A river is depicted, apparently placed by him, somewhat upstream in the southern part of this shipbuilding region. The text says *hic fabricantur naves* (“here ships are built”) (fig. 21).

We will see references to the transfer of knowledge below. Nevertheless, other cultural expressions go hand in hand with knowledge.⁸⁰ It is not always necessary to surmise a direct influence from one part to the other. On the whole, the Inner Bothnian cultures had many profound common traits and experiences, not least those of carpentry, timber and other resources. However, in the case of innovations in shipbuilding, such as carvel / full-skeleton construction⁸¹ and (later) the use of the pit-saw – maybe also at suitable locations for shipyards –, the impulses came from the outside and were conveyed by way of the navy, the largest southern shipyards and the Ostrobothnian (Österbotten) shipbuilders.

Shipbuilding was presumably quite important in certain other parts of Finland as well, both economically and cognitively, but also based on other local conditions. Most of this coastline was inhabited by Swedish-speaking maritime groups. During the national awakening of the Finnish-speaking population, many of these groups changed their language. An example of this can be found in the remarkable but little-known novel in Finnish, *Alastalon salissa* by Volter Kilpi (1933). The subject is in fact the planning of a ship in the beginning of the last century, but nothing comes out of it. Accordingly, it is a story of bragging in a society where plans for shipbuilding were the acme of male endeavours. Its main message may otherwise be its narrative technique, close to the “inner monologue” of James Joyce, but independent of it. In this case, the shipbuilding area is that of the author, the archipelago at Kustavi (Gustavs) in Southwestern Finland.

Shipping and Trade: Core and Peripheries

On the other hand, the most important shipowning communities were found elsewhere. The situation could reasonably be described as a classical centre-periphery relationship between metropolitan cities such as Stockholm, Åbo, Tallinn (Reval), all with medieval foundations, and the North. Only these metropolises had the capital needed to buy and use the ships of the North. Both Bothnian coasts belonged to the Swedish realm with Stockholm as the capital city, and in it, this division was partly exacerbated by a centralizing state policy, concentrating capital, traffic and trade to these metropolitan cities, and relegating even the indigenous Bothnian towns, founded from the 1580s to 1650, to a second-rate trading role. They were forced to gain customs clearance and offer their goods in these southern cities before being able to leave for other destinations. During shorter periods, however, they sometimes had opportunities to bypass them legally through ad-hoc special privileges. Nor was any foreign traffic allowed directly into these cities, only by way of Stockholm. This complex network of laws, privileges and regulations was summarized in the concept of the *Bothnian Trading Compulsion* (*Botnischer Handelszwang*, Swed. *bottniska handelstvånget*) with its roots in the High Middle Ages. From the Bothnian point of view, it has been described as an unfair system. However, this mainly concerned the constraints of the local cities. The peasants/farmers, the local producers of goods like timber, sawn planks, tar and fur, would have found better prices in the metropolises than in the town nearby. Nonetheless, they were ordered by the authorities to go only to their own town. This also meant that a merchant from a certain town could only trade with a farmer within the borders of his own district. Stricter rules for this were encouraged by lobbying carried out in Stockholm by the magistrates of the local towns. However, some of the producing farmers, especially those in the far North, were allowed to go to Stockholm and Åbo, for example, with certain restrictions on the size of their vessels and cargoes, including the rule that the vessels must be open and undecked.

A famous speech (Serenius) in the clerical estate (*prästeståndet*) in the *riksdag* of sixteenth October 1762 is quoted here:

“The Norrlander cuts the logs in his own forest, saws them in his own sawmill, to have the planks loaded onto his own ship, which he has constructed from his own timber and coats with

his own tar. One owner is a rope-maker, another brews and bakes the ship food, a third is the skipper, mate or sailor on board and his son the mess boy, and all live on a frugal diet" (my translation).

The conflicts inherent in the system led to its abolishment in stages. Export from the cities directly to their foreign destination was allowed in AD 1766, but fully implemented in 1767. Characteristically, preparation for this often started with the building of new, local cargo ships. They became a symbol of newly won urban freedom (see the caption of fig. 55). This meant an upsurge of modern shipbuilding in general. To be sure, carvel building had earlier been privileged with export customs freedom in 1681, but to an area from which one could not legally sail directly abroad, it mattered little as an encouragement. *Kommerskollegium*, the central authority in Stockholm, invited shipbuilding cities in the North to send suitable persons to learn carvel building in the capital. In many places, like Piteå, we know that carvel building was introduced in 1718, but ceased later, the peasants building in clinker the entire time. Unfortunately, the method of skeleton building in carvel was poorly understood. In Luleå, two vessels built in carvel acquired a particularly bad reputation, the *Elisabeta* of 1739 ("unsteady") and *Nyckelen* 1743 ("worthless"). Some were built with some success in a combined clinker/carvel style, i.e. with a carvel bottom, a method, which continued well into the nineteenth century. The first fully carvel-built ship in the far North seems to have been the frigate *Norrland*, built in Luleå in 1759. It is true that certain other ships were built this way during that period but they were few and far between. Only when the direct sale of ships abroad was possible, from 1767 onward, did the carvel method become interesting to the town merchants of the North. Initially, the dominant types were smaller *galeaser*, ketches, and three-masted *krejare*, without topsails, in ca. 1780 the *barque* ships took hold in earnest. In Luleå, the *snaubrigg*, snow brig, became a local brand. During wars, the *brig(g)* and the *brigantin(e)* were the most important vessel types. A popular rig after 1800 was that of the *fregatt*, frigate. However, the peasants were still not allowed to build decked ships (more below).

An important journey to the far North by the famous Swedish navy shipbuilder *Fredrik Henric Chapman* or, ennobled, *af Chapman*, in 1759–60 led to the recognition of the excellent qualities of North Bothnian pine, not only in Sweden.⁸² It is remarkable that such an apparently "fresh" area as Österbotten could adopt a new ship type, the *barque*, to be widely spread in the Western world, and start almost immediately on the opposite, "Swedish" side. Of course, the drawings were those of Chapman.⁸³ However, it is in fact no wonder against this longstanding backdrop of profound maritime experience. The close social relationship between sailors, ship-owners, shipbuilders – sometimes one and the same – and the small scale of units deployed was an excellent precondition.

The North American War of Independence (1774–76), the Napoleonic wars (1798–1815) and the Anglo-American war (1812) meant excellent conditions for the export of large ships from the North, including the Bothnian area as a whole (Nyström 1982). In 1809, Finland became a part of the Russian Empire and, to a degree, other regulations were in effect there. Yet the old connections were still upheld. In the Swedish area, international traffic was finally allowed directly to the Bothnian cities in 1812. Of course, this circumstance alone could not be expected to encourage local production of ships.

On the other hand, the loss of Finland (1809) and soon afterward (1815) the important shipbuilding areas in Swedish Pomerania, forced Sweden to develop its own resources in this field. The Bothnian area may have produced as least half of all the larger ships built on Swedish territory in the years that followed, sometimes considerably more.

The Bothnian peasants were soon allowed to build larger, decked vessels. A revolt by the peasants of Nedertorneå in Norrbotten in 1783 may have been instrumental in creating an excep-

tion to the rules.⁸⁴ The circumstances are illustrative of the situation. Unfortunately, the sources pertaining to this event have been partly destroyed. Nevertheless, we know enough to sketch the story:

During the winter of 1782–83, a large ship with two decks, and a keel of 12–13 fathoms, approximately 22 metres, was built in carvel by local carpenters on Seskarö (Finn. *Seitsenkari*) in the archipelago of Torneå. It was described as a snow brig, *snaubrigg*, or a “ship”. The town burghers of Torneå reported to the authorities in the spring of 1783, and the latter ordered sequestration of the vessel, but the local police were unable to do anything. A military squad of twenty-four was sent with a sloop to the shipyard. The ship was then fully loaded and ready to sail. According to later reports, a company of peasants defended the ships, armed with stones and guns. They were assisted by “the entire male population of Nedertorneå with a strength of eight to nine hundred people”. Warning shots were fired. One of the defenders was shot in the leg when he cut the painter of the larger vessel to let it sail. The ship went to sea in a storm and sailed to Stockholm. The county municipality of Västerbotten in Umeå informed the authorities in Stockholm that the ship must be caught there. It was now a question not only of sequestration but also of punishment for resistance to the local authority. The ship was taken and part of the crew was sent to Umeå. It seems, however, that the owners had indeed duly informed the central authorities (not the locals) and that all other papers were in order. The following trial, which was held in Haparanda, seems to have resulted in a verdict advantageous to the crew. It seems that they encountered a great deal of sympathy on the part of the judge and other people.⁸⁵ Again, we do not know the details.

Therefore, the building of a ship could also mean *an act of defiance*. The revolt at Seskarö was a reasonable reaction to a blaring injustice. In this period, local people all over the North were afflicted by serious famine. They could not earn enough with their own work or the sale of their resources to acquire grain and other necessities. Even though the town merchants had to compete with other cities, including the capital, the peasants only received a negligible share of the earnings from the sale of such important commodities as tar, which they produced themselves. It has been computed that merchants improperly could earn more than twenty times more in pay for one barrel of tar than the producers.

It is understandable that the shipyard of Seskarö and other shipbuilding locations must have *symbolized freedom from this yoke of restrictions* under the circumstances. Moreover, many other communities of the inner Bothnian area shared the conditions of Nedertorneå. The fact that the ship was of considerable dimensions and built according to modern standards must have been an additional source of pride in the area. Oral tradition still points out the shipyard site, and at least parts of the story were known during the last century. However, the later industrial development of the island Seskarö had a negative effect on traditions before around 1900.

Nevertheless, most of the farmers and local producers of the country were still restricted to exporting their own goods only in undecked vessels up to 1825.⁸⁶ Only in the far North were exceptions allowed. The abolishment of this constraint led to a sizable production of small vessels and rural shipowning plummeted. Local towns also built their own ships, often in rural areas. Both shipbuilding and shipping exhibited growing professionalization.

The next leap forward in shipbuilding was in fact motivated partly by famine, the same factor that probably directly provoked the conflict at Seskarö. Between 1830 and 1838, another series of crop failures occurred in the North. The area from Nordmaling to Övertorneå, roughly the coasts of the provinces Västerbotten and Norrbotten, were implicated in a central effort to provide interest-free loans to entrepreneurs. Not only carpenters would be needed but also timber, which could be bought from destitute farmers. The shipbuilding enterprises of Carl Fredrik Liljevalch (1796–1870) in the Luleå area are particularly well known.⁸⁷

The last century of sailing witnessed the emergence of quite a number of maritime enclaves outside of the cities, especially in the archipelagos, where farming had always meant some kind of combination of fishing and hunting (fowl and seal), small-scale seafaring and part-time agrarian pursuits. The skippers of these enclaves in the North also built their own wooden ships, often quite large, with their own material and employing their neighbours as labour. From a Bothnian perspective, it is interesting to see that the most active of these enclaves, in the archipelagos of Stockholm and Åbo, still relied on their vicinity to the cities of the South, the metropolises of the past. Part of the Northern Stockholm archipelago was also within my survey area.

As an afterthought with a larger perspective, the policies pursued helped to establish the metropolises in international trade to the benefit of the whole realm. The capital needed in this context could not be acquired by the smaller towns in fact.⁸⁸ This helps to explain why the classical term for high-quality tar was *Stockholm tar*, in spite of the fact that the producers were found in Northeastern Finland and to some extent on the Swedish side, present-day Norr- and Västerbotten. In other sparsely populated areas of Scandinavia, the same type of centralizing policies were enacted, inspired by mercantilist ideology. This was true especially in Norway, where Bergen was, by law, the metropolis of Northern Norway in the same way as the Bothnian Trading Compulsion worked for Stockholm in Sweden and also in fact to some extent in Denmark, where Copenhagen could be said to represent the whole realm, at the time (up to 1814) including Norway.

Main Survey Area

The survey area (cf. fig. 54) covered the coast between the border of Finland with the towns Haparanda (Swedish) and Torneå (Finnish) in the North along the outskirts of Stockholm, the town of Norrtälje and its archipelagic area (Björkö-Arholma). Only the area around Gävle still belongs to Norrland, as seen from the North. The southern parts of the survey are drawn into the survey for maritime reasons. The intention was to follow the maritime cultural landscape of the sailing routes of the Swedish side down into the area where the international routes are deflected into the Gulf of Finland. The Swedish sailing route to the North has been called *Norrlandsleden* ('the route of/to Norrland'). This is accordingly the title of my published reports.⁸⁹ Another term covering the same route would be the traditional *Västvallen* ('the Western coast'). On their way to Österbotten, both Swedish and Finnish skippers chose this route but left it at Holmön, crossing Norra Kvarken to their destinations on the Finnish coast. After the Great Northern War, around 1720, the Finns preferred this route⁹⁰, which was perhaps partly less dangerous than the other with its abundance of tricky shallows.

There is a route called *Östvallen* ('the Eastern coast') as well. It starts or ends at the same place. The route network thus forks off in different directions at its southernmost end. At Simpnäsklubb near Arholma, the route across (Södra) Kvarken, the Sea of Åland, begins, toward Österbotten, marked as "Österbottens Leden" on maps, for example that of AD 1726, or the "Lilla Ålandsleden", e.g. AD 1695, in order to reach Åland at the channel of Marsund and continue on the Finnish side to Österbotten.

In the beginning, the primary aim of the survey was above all an antiquarian one: to register shipwrecks, and secondarily harbours and loading places. The main method was interviews and oral statements on positions. Yet other oral material was followed up on as well, such as that on shipyard sites. Already in 1975, when parts of Norrbotten in the extreme North were covered, it was found that wrecks and separate ship parts were often found close to former shipyard sites. This was noted as a particular advantage in assessing the motives for future surveys. A further analysis revealed that ships which ran aground out at sea and sustained damage to their hulls were often

towed in from the sea to a shipyard or a slipway for repair. Sometimes they sank and it was then no longer possible to salvage them. Other ships stayed afloat for a while and were plundered for valuable timber and special details to be reused in new ships being built in the yard. Condemned ships were also sometimes sunk to provide a foundation for a careening site at the shipyard, where ships were to be overhauled for caulking.⁹¹ Oral tradition was instrumental in providing an interpretation in almost all known cases of shipwrecks at shipyards. Even in our time, ships overwintering near land (Swed. *vinterligger*) are anchored close to a slipway in anticipation of a possible frost-induced leak or damage from ice floes during the spring. A prerequisite would be that such sites, shipyards or slipways are permanently located. This may have been a rather late occurrence. Nevertheless, in some cases it could easily be seen that the ships need not always rot in dry ground when the land-uplift had raised their remains above sea level. There is always a fair chance that they have been at least partially well preserved in a present-day wetland.

Slipways were small in any case. In his history of the shipping of Gävle, Percy Elfstrand mentions the instructive story of the frigate *Gustaf III*, which was built in Gävle in 1776–77, which was, by its 430 lasts (Swed. *svåra läster*: 1 svl = 2.5 tons; i.e. 1,075 tons) one of the largest vessels of the Swedish commercial navy. *Gustaf III* returned to its hometown from Alicante in Spain in the summer of 1778 but ran aground in the bay of Öregrundsgrepen, not far from Gävle. The ship was too big to be repaired in any facility so far constructed in this town. It has to be remembered that Gävle was not in any way an insignificant town for shipping in those days, although its importance was to grow significantly during the next century. In the 1830s, it was sometimes second only to Stockholm in its ownership of tonnage within Sweden. The owners of *Gustaf III* now persuaded the town to sell centrally placed ground for the establishment of regular shipyards. This investment was the beginning of the large-scale production of large sailing ships in Gävle during the nineteenth century.⁹² This meant in turn that some skilled labour had to be recruited in a permanent way, i.e. for year-round work, for the future. A consequence of this was the professionalization of the work. This affected all kinds of other related types of production as well: smithing, rope-making, sailcloth production, production of caulking materials.

In rural areas it had always been possible to recruit lumberjacks and carpenters for temporary jobs, often with variable locations for the shipyards. Ships were always built during the winter. The agrarian cycle permitted other activities besides farming during the winter, when ships were usually built. Most of the workers were smallholders and crofters. Some of them may have been full-blown or only part-time sailors who signed on for the summer now and then.

The timber was taken out in the forests (fig. 22) owned by local farmers in autumn and brought to the building site on the snow. In fact, important aspects of forestry consisted in manipulating trees for shipbuilding purposes over several generations. The need for sawn timber is in no way unconditional. On the contrary, it seems that the pit saw (Swed. *kranståg*) was mostly used for ship's planks in the nineteenth century. However, even at rather advanced shipyards in Finnish Österbotten, this innovation was only introduced in the middle of the eighteenth century. The carpenters then had recourse to instruction from the naval shipyards in Stockholm. In Norrbotten, it has been noted that the pit saw was introduced even later, during the 1830s.⁹³ Before that, only cloven and broad-axe-shaped boards were used in "normal cargo" (i.e. not in naval) ships. Such material is in fact superior to any other kind, but it is extremely time- and labour-intensive.

This processing technique is also the reason why there is so much waste, which makes it possible for us to discover remains of shipyards before the nineteenth century. Tradition refers to the use of cloven planks for much longer, especially in smaller vessels and at domestic boatbuilding sites. The pit saw could also be used out in the forests. Even before the First World War, extensive exportation of pit-sawn planks was carried out by the district of Haparanda close to the



Fig. 22 The remains of woodcutting for a shipyard nearby, at Iggön in Gästrikland. These yards were active into the 1880s. A dead pine retains its shape for a long time due to its high tar content. (Photo: Christer Wester Dahl)

Finnish border. In any event, shipbuilding demanded other and much greater scantlings of timber than normal planks sawn at a regular sawmill. The first steam sawmills, which did not have to be located somewhere inland near running water, appeared in 1848 in this area⁹⁴, but many water-driven saws lived on into the next century. Notwithstanding, the steam mills were located right beside the coast, and determined how large-scale industrialization connected to international shipping.

At a rural yard, the iron nails, spikes and fittings were forged in the smithy of a well-to-do farmer in the vicinity. Bar iron and other iron materials, including anchors, may have been procured at a local or a specialized iron foundry. Such foundries (Swed. /*järn/bruk*) existed in many places along the coast in Norrland from the end of the seventeenth century. Ropes, trusses for the standing and running rigging and sails could be made in many dispersed places in rural areas as well as in a town. In the spring, the ship was launched and rigged, probably by labourers other than those who had built it.

For a part-time repair yard, another conditional feature was a separate slipway from the place where the building of new ships took place. There is little historical material to consult on this feature. The sites surveyed do not provide any reliable information. There is a possible example of separate installations at a site in Ångermanland.⁹⁵ On the other hand, a strict differentiation of pure building yards and pure repair yards was apparently not common, but did exist in naval yards. In my archival material on individual ships, some sites are only noted for rebuilding ships, *förbyggnad*, the intentional transformation of ships' hulls, i.e. new planking, replacing clinker entirely with carvel planking, or alternatively only in the lower hull, or lengthening the hulls by inserting a newly built section between the severed stem and stern parts. This kind of extensive work would not distinguish the yard clearly from a regular shipyard.

The part-time peasant skippers may have started with a private slipway, where a single ship was built and laid up during winter. Generally, shipwrecks found in such contexts would be at their home harbours as well as at their building place, which is a unique spatial combination for such mobile objects, underlining their intimate relationship with the history of the landscape and the people, often on the family level. It may be of interest to the reader that the survey of Lake Vänern confirms most of these considerations from a small-scale, Southwestern Swedish perspective.

A fixed location for a shipyard may in fact have only been found close to a town during these centuries. There were exceptions, but they were connected with other large-scale operations such as sawmills, iron foundries and glassworks. They had harbours of their own and the owners tried to minimize transport costs both for materials, such as ore, sand, building stone for foundry ovens, potash, and timber, and finished products, such as glass, bar iron, anchors, other iron objects, and planks, by building ships in their own shipyards and managing their own shipping activities.

According to a preliminary estimate, of those shipyards and building places which I have registered myself, only about forty percent have meaningful geographical relationships with

known loading places or town harbours.⁹⁶ On the other hand, there may be close connections in other ways. To compare quantities, there are at least five hundred harbours of different types in the area, but only around three hundred shipbuilding sites. Town-dwelling merchants may have ordered the ships, but they were built in rural areas. However, this kind of relationship is not my particular focus. As I have pointed out, I am still dealing with the sites mainly as a part of the landscape itself.

The connection, where it exists, may be explained by the ready access to sawn timber, bar iron, etc. Many of the early industries had complementary works in the vicinity under their own control, in fact often the whole range.

The wreck finds are, as mentioned, instrumental in indicating small, dispersed shipyards in rural areas. These cannot be determined or, more specifically, localized, in any other way. Town harbours with shipyards certainly contain many wrecks, but there is seldom exclusive knowledge in this sense to be gained by the study of the underwater landscape. As has been pointed out before, there are other remains likely to be deposited in the water, some of which may be invisible in the ground, e.g. iron slag, spikes, nails (figs. 23–25), implements, shavings with tar concretions which have preserved them even better, the constructions lining or supporting the slipway, etc.

Not a large number of ships were built at each of these pre-



Fig. 23 Iron slag protruding slightly in a shipyard area in Norrbotten. Almost nothing else is visible above the ground. (Photo: Seth Jansson, Tierp, 1988)



Fig. 24 Iron slag extracted from the smithy area of the shipyard on Björkön island, Dalsland, Southwest Sweden. (Photo: Christer Wester-dahl, 2007)



Fig. 25 Iron nails and other details from the slipway of the shipyard on Björkön island, Dalsland. (Photo: Christer Wester-dahl, 2007)



Fig. 26 Remains of tar pile, Skåne, Southern Sweden. This type is only found in the South. This area supplied the naval shipyards of Karlskrona with tar. (Photo: Christer Westerdahl, 1996)



Fig. 27 Pitch oven, Skåne, Southern Sweden. (Photo: Christer Westerdahl, 1996)

industrial building sites in rural areas. In some cases, we know of only one or two ships having been built there. Nevertheless, they are interesting because of their local structure, their connections with the landscape, the social landscape, the people who lived there, as well as the landscape of resources, materials and maybe manipulated forests and individual trees for the purposes of tar and pitch production, among other things (figs. 26–27). Their first prerequisite is access to timber and moderately skilled labour in carpentry and timber, thus their *material and social geography*. Furthermore, they may indicate how shipyards looked in what are effectively prehistoric times. While prehistoric and medieval shipyards may indicate the potential of remains without written sources, the historical shipyards could interactively provide models for elements at such a yard in previous periods.

The geographical and archaeological approach requires exact information on the sites. Analysis should be directed toward questions about particular sites. Why was a particular site chosen? The answers derived from such a study will help us to look for other, similar places. As previously noted, an extensive general background of the scales of shipbuilding can be found in economic history. However, the material offered by such studies seldom covers the site itself.

The sources used here have been place-names and oral statements and traditions, maps of ownership, preferably collective common land in certain cases, and the careful scrutiny of the area on the ground and in the water beyond. Perhaps one should start with an underwater survey, or maybe with a ground survey. This is contextual. At the beginning of my survey, there was little interest for such discrete remains during the official Ancient Monuments Survey.⁹⁷ However, this changed rapidly, along with the development of historical archaeology and a new appreciation of remains of later centuries, such as minor workshops and industries, charcoal and tar piles (which also occur at shipbuilding sites), etc. Even though they do not enjoy the same protection from the law at every site as prehistoric and medieval remains, they are now being marked on survey maps.



Fig. 29 Foundation of a building outlined on the ground, for a spantlave, to lay out the sizes of the frames. Björkö, Dalsland. (Photo: Christer Westerdahl)

Fig. 28 (left side) Slipway, v-shaped with rocks on both sides supporting props for the vessel. Björkö, Dalsland. (Photo: Christer Westerdahl)

Nevertheless, as has been pointed out so emphatically, the only way forward may be to go underwater and neither this nor diving skills, nor the provision of the necessary equipment are the task of a surveyor on land. However, this author has received a great deal of valuable help from official land surveyors, in particular in Norrbotten, in northernmost Sweden.⁹⁸

Since this survey was carried out, material has also been collected on shipyards in Lake Vänern. After 1799, these ships could reach Gothenburg and the ocean – and of course vice versa. In the lake, at least 137 shipyards and shipbuilding sites could be documented, *most of them in rural areas*, but only a few with precise locations. The overwhelming majority were used during the nineteenth century, but ships were being built, even for the crown, from as early as the sixteenth century onward. There is certainly potential for determining further such sites in place-names and oral traditions. Along the river Göta älv there were around twenty, and in Lake Vättern, first connected to the sea in 1822, initially around sixteen.⁹⁹

The Sites Themselves, Detailed (Spot) Localization

It was often alleged in oral statements that shipbuilding sites could be located everywhere: “At that time (the heyday of shipping), ships were built in every bay.” This appears to be an assertion both too careless and too rash¹⁰⁰ to be corrected immediately by concrete cases. The common lands of shoreside villages, used as fishing harbours with landing sites and net racks, were important. The collective character of such sites allowed – to a certain extent – rather extensive works to be erected. The other factor is topographical. According to the same oral material, the site of the slipway was chosen according to careful considerations based on age-old experience. The usual method of launching, either perpendicular to the shoreline, stem or stern first or from the side would be decisive. Besides, there are a number of standard positions, chosen from general principles of size and factors such as a channel/sound, islands, spits of land, calm bays and riverbanks, all well protected or sheltered. In my northern material, there seems to be indications that part of the experience was parallel with that of Österbotten, in line with an early innovation process starting there. Thus far, however, this is just an impression, with



Fig. 30 Map of the Brändön area, the archipelago of Norrbotten, north Sweden, with shipyards and names. (Drawing: Christer Westerdahl)

not as decisive for location, were the sites of tar and charcoal piles – charcoal for the smithy (cf. fig. 26), pitch ovens (cf. fig. 27), boat landing and wintering places, which were rather far away, often seasonal and not connected with regular village commons. As referred to earlier, the “archaeological” remains of such sites alone have indicated shipyards with an imprecise location in other material.

Apparently, the most decisive factor for smaller yards was simply local access to the most important timber resources, straight-grown wood for planking and naturally grown crooked “roots” for ribs or frames. Ownership of land could be important. A network of good personal connections might have meant a reasonable price in far-away places, if the builder did not own the forest himself. This seems to be the principal background of the sites where only one ship was built. If the forest had been used up in one hull, the site was moved, perhaps immediately after completion. If timber resources were not available in the immediate vicinity, there were several other possibilities, such as spring floating on a river. However, this might produce a poorer quality, given the long time in the open air for the laid-up logs during summer and autumn¹⁰³, winter transport on the ice, i.e. during the shipyards’ usual phase of operation, or by way of shipping during the regular sailing season, a means of transport which was comparatively expensive and also outside the normal building season.

These factors and numerous others guided the expedition into the inner Bothnian area by the

analogies in the introduction of master shipbuilders.

Although I have already qualified this statement, it should be emphasized that a geographically favourable connection was chosen in many cases, often with a fairly accessible loading place or harbour (of any kind) at least. In later times, the site was preferably close to a foundry and a local sawmill.¹⁰¹ However, this does not mean that these localities always were close by. As mentioned, the owners of such industrial establishment invested in their own ships and preferred their own production. Iron ore from the archipelago of Stockholm¹⁰² could be shipped in the foundry’s own ships. In those days, the huge iron ore resources of inland Lapland were known but could not be used on the coast due to the insurmountable problems of land transport. The foundry products, especially bar iron, were distributed and exported only via ship.

Other local resources, although

naval architect Fredrik Henrik af Chapman in 1758–59.¹⁰⁴ This voyage was originally a starting point for me in the effort to determine reasonable principles for the localization of shipyards. The demands of the eighteenth century were different from those of recent representatives of boatbuilding or oral informants, and I moreover had no previous relevant experience myself. Perhaps af Chapman's diary, preserved in the naval base of Karlskrona, can give some tangible advice by way of his proposals to the crown? Were the sites proposed for shipyard locations actually used as such?

Three interesting sites pointed out by Chapman were *islands*, which was often a preferred type of site at any time. At first, a site will be mentioned which is located entirely in rural areas. On the crown-owned island of Bergön in the archipelago of Kalix, Norrbotten, (map fig. 30), which was in the process of being settled at that time, Chapman pointed out the extraordinary quality of the wood; huge primeval pine trees in large

quantity, and also a potential shipyard site, *Brändavan* (*Brändavaviken*), fig. 31. It was later documented that several large ships had actually been built there after his visit. Probably his report inspired their construction. Still, the initiative appeared to be rather private. Local people had known about this long before him. Besides, there is an "old" shipyard ("*gammalt Skjeps-Varf*") explicitly marked on the map of Malmström dating from 1770.¹⁰⁵ In our own time, this site is known in oral tradition as *Bynningsplatsen* ("the building place"; see below for more on place-names). It is likely, since it was "old", that it was used even before Chapman. Moreover, it certainly must have taken some time before Chapman's ideas took root.

According to Arvid Moberg¹⁰⁶, the first large ship built in Norrbotten was indeed built on Bergön in the winter/spring of 1776. It was the *Gustaf*, 300 lasts (Swed. svår last, 2.5 tons = 750 tons). Unfortunately, it was lost on October 10 of the same year in a storm between Skellefteå and Umeå. Those who ordered it were burghers of Torneå but they had sold it to the English merchant Thomas Gilbert. The precise building site on the island is not known. The building site of the ship *Solide* in 1778 is recorded as *Siksund*, which is the channel between the mainland and Bergön. Thus, it could have been on either side.

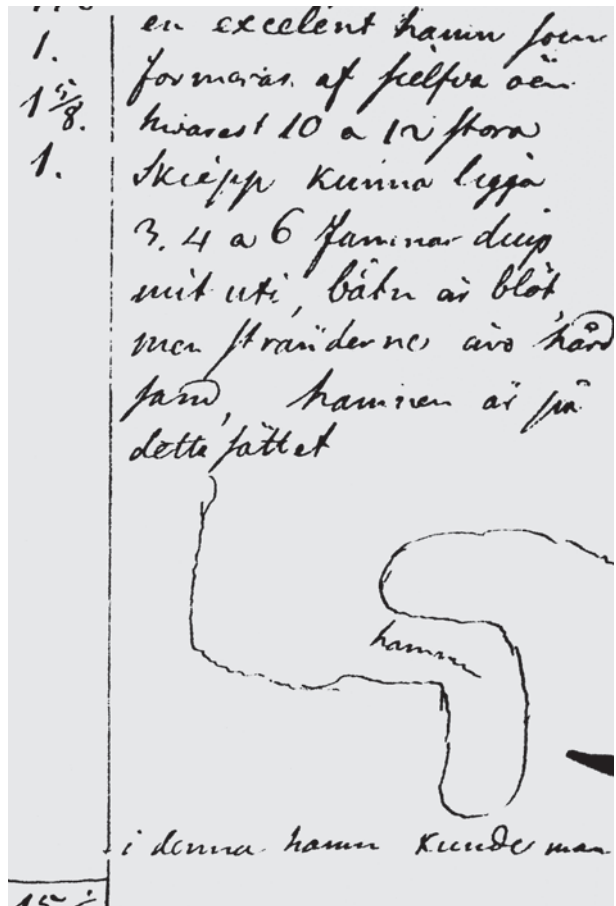


Fig. 31 Chapman's 1758 sketch of Brändavan bay, Brändön, in his diary, where he indicates the position of a future slipway. (Copied by the author from Örlogsmannasällskapet, Karlskrona)



Fig. 32 The present-day bay of Brändavan. (Photo: Christer Westerdahl)

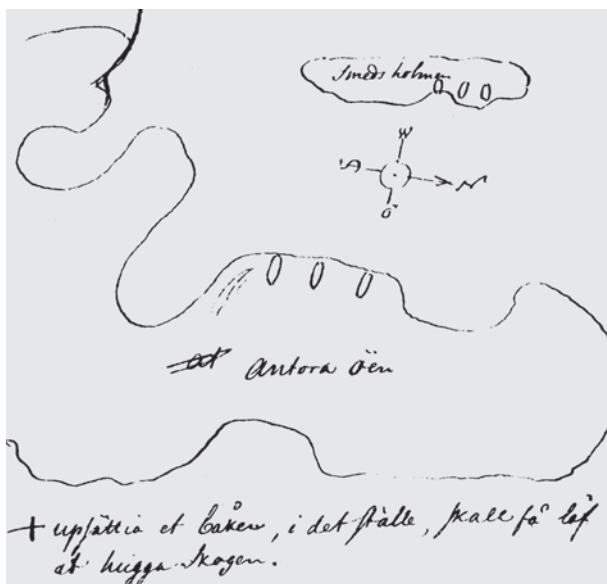


Fig. 33 Chapman's 1759 sketch of three possible slipways on Anttora island near Björneborg/Pori. (Copied by the author from Örlogsmannasällskapet, Karlskrona)

were mostly found inside or fairly close to the town area of Björneborg/Pori. The oldest was in the town proper, a second was found at Sandudden dating from 1652, which, due to land-uplift, also later became the official port in the 1770s. A shipyard owned by the family Wallenstråle was established in 1814 in Varvi, Lyttylä, in the parish of Ahlainen. The town harbour was moved once more to Råfsö, in the vicinity of Anttora.

The burghers of the town Björneborg/Pori also built their ships in other parts of the rural surroundings (map fig. 34), in the yard at Kellahti, in the parish of Ahlainen, on Laitakari¹⁰⁹ in Verkhholm (Verkkoranta), Sädö in Luvia or Brändö in the Merikarvia parish. The most important of these shipyards appears to have been Laitakari, around 10 kilometres south of Björneborg/Pori. In addition, we must consider the fact that the Swedish crown already established a shipyard at Björneborg in 1552, which was also active during the years 1572–1609, and another

According to oral statements, at least four building sites can be established (cf. fig. 30) on Bergön or in the Siksundet area: *Brändavan*, *Byggningsplatsen* (above), *Drugges*, which is the name of the settlement of Brändön close to Siksundet, and *Platsen* (an abbreviation of *Byggningsplatsen*; see below), which was situated on the mainland, north of Siksundet. On the other hand, there is very little activity documented so far at *Brändavaviken*, fig. 32. A further site for shipbuilding was pointed out on *Bodörsgrynnan*.¹⁰⁷

The second of the island locations for a shipyard was "*Anttora-Öen*" (fig. 33), now Anttora, close to Björneborg/Pori in Satakunta, Southwestern Finland.¹⁰⁸ This is partly a site of urban or semi-urban character nowadays. No shipbuilding has taken place on Anttora or the adjacent island Peräkari (*Smedsholm* is the Swedish name used by Chapman). The villages of the Kumo (Kokemäki) river valley used Anttora initially as a fishing site after the Great Northern War (1700–21), during which Finland was occupied by Russia and many Finns fled to Sweden. After around 1790, a pilot lived here. The shipyards of the area

at *Louvia* (Luvia; above), called *Nedre Satakunda bankstad* (for the term “bankstad”, see below), during the years 1588–92 and in 1604.¹¹⁰ Chapman undoubtedly knew this and it may have influenced his decision to include the area in his inspections.

Chapman’s third island proposal for a shipyard site was *Kattisholmen*, close to Frostkåge in Västerbotten. It appears that his advice was not taken there. On the other hand, ships were built on the adjacent islands, *Bergskäret* and *Bastuholmen* (see below).

The fourth proposal did not concern an island but a spit of land, *Byggnäsudd* in Burvik, Northern Västerbotten. On this site, ships were in fact built, and the place-name is apparently a testimony to that fact (see below).

Consequently, Chapman’s recommendations for shipyard locations do not seem to have been followed to any great extent. Nor is it possible – partly due to this circumstance – to determine which principles were relevant in the choice of such sites. Perhaps the reason was that Chapman was an advanced naval architect and the Bothnian shipbuilders simply had other experience, presumably adapted to the local conditions.

I would venture a similar conclusion when it comes to my own impression of the sites recommended by Chapman. There is nothing really striking about the sites, except that they give space on a slope for one slipway (and up to three slipways in the case of Anttora above, see fig. 33). Chapman was thinking of considerable investment in levelling the ground and erecting wooden furrows with sledges as in medium-size naval shipyards (he could not, for obvious reasons, have been thinking of large-scale naval shipyards). However, the local entrepreneurs presumably only built on the natural ground, on the sand, literally speaking, and perhaps with timbers (Swed. and Norweg. *lunner*) laid parallel to the water line as the only construction. They needed little else in wintertime, when the ground was frozen and covered, perhaps intentionally, with ice on the slipway itself.

During the field survey, many coastal informants expressed the view that ship experts, including old sailors and able seamen (on sailing ships) would be much better at judging the terrain for a possible shipbuilding site than mere landlubbers (like myself, or most of us). It was pointed out that the angle of the slope was especially significant. It could be expressed in actual degrees.

This was simply not true. To some extent, one could even say that it was a myth. The variations in slope gradient of actual shipbuilding sites were indeed extremely variable. Even tanned veterans in sailing ships shook their heads when observing the facts (which of course was highly gratifying to a landlubber). However, this does not exclude inherent principles in the past. The

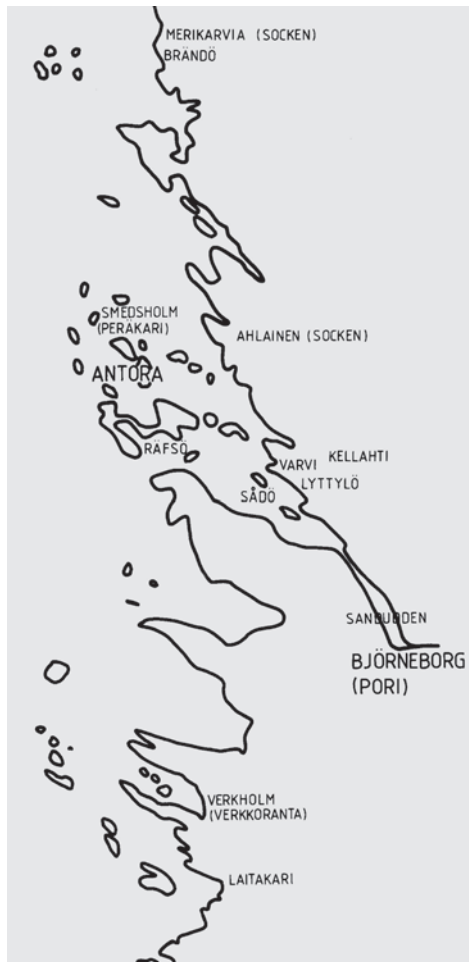


Fig. 34 A sketchy map of the area around Björneborg/Pori with some relevant place-names/shipyard sites mentioned. (Drawing: Christer Wester Dahl)



Fig. 35 Shipyard site in Norrbotten, Northern Sweden. No traces visible due to cumbersome vegetation! (Photo: Seth Jansson, Tierp, 1988)



Fig. 36 It is difficult to imagine that this hidden stone heap is a dam to provide water power for the bellows at the smithy of a shipyard. Björkö, Dalsland. (Photo: Christer Westerdahl)



Fig. 37 The stony ground of an eighteenth-century shipyard (shore line 3 metres higher than today) in Norrbotten, Northern Sweden. Did they build on the ice or directly on the ground? (Photo: Christer Westerdahl, 1979)

main problem was the distance in time and experience. Most of the old-timers only knew the fairly recent shipyards and understood their launching techniques.

It could of course be said, in the most general terms, that the shore should display some kind of sloping ground, long enough to be of use for a slipway. In some places where shipbuilding had demonstrably taken place, the terrain was extremely uneven and stony. How can this circumstance be interpreted? Was it possible that the construction only started after a period of snow and a layer of snow and ice had settled on the slipway-to-be? Or was the space and support of the most important part, the keel, presumably supported by a furrow of large wooden pieces neatly balanced, the only important element? Was it possible that the ship in fact had been built entirely upon the ice of the sea? At the very least, it has been reported in some cases that the rebuilding (*förbyggnad*; below) of a ship took place on the ice.¹¹¹ In Papenholm on Ösel (Saaremaa), a peasant ship was built on the ice before the First World War, since the shores were too shallow. The hull was tugged out on a cradle-like sledge.¹¹² There is an isolated oral record of such building on the ice in Norrland, but too unspecific to be of any use. I have come no further. Nevertheless, I think it is necessary to surmise that this happened now and again.

Summary of Discrete Traces

The material remains for pinpointing the precise location of a rural shipyard are always discrete, to repeat something that has been previously pointed out from time to time. The shore location, ancient or modern, is obvious. However, one may encounter serious problems in finding the location on a coast characterized by strong land upheaval. An important rule is that the waters immediately adjacent – presently possibly dried out completely – must on no account contain boulders. The terrain on land need not be particularly even. Still, since a lot of the area will have been drenched several times with quantities of tar and pitch, the vegetation may deviate from that of the surroundings. Usually the ground is very dry and naturally drained, which may have been part of the motive for the original choice of location. The slipway may be marked by humps, supports which can be natural as well as artificial, in a line, preferably in an elongated depression in the ground (see fig. 28). The keel-line, if not a furrow (cf. fig. 56), may be marked by a ridge. The launching principle of two wooden tracks for sledges on both sides may be indicated (cf. fig. 55). Another variant is a natural V-shaped formation where rocks on both sides may have been used to support wooden props for the scaffolding or for the hull itself (cf. fig. 28).

Generally, there is surprisingly little preserved of the implements used at shipyards, apart from certain naval shipyards. Nonetheless, in cultural layers of these dispersed sites, there seems to be a potential for local varieties of all kinds of tools and other artefacts used as tools. I can remember one such case where the chance find of a caulking iron immediately showed me the correct site and told me that this was a place where carvel-built ships had been caulked. We may take carvel building for granted but in my material at least five percent, perhaps even ten percent, of all cargo ships were clinker-built, even fairly large ones, up to the latter part of the 1800s. Clinker is often a social indication of small-scale peasant shipping. In many cases, these ships were cheaper to build. If the ship was successful, it could be converted to carvel later on.¹¹³

In the ground would be, as mentioned, slag and wood refuse, some of it no doubt impregnated with tar and pitch, which would preserve it almost indefinitely. The same also applies for other materials such as iron. A mine detector could reveal all kinds of fastenings such as bolts, spikes, nails, caulking clamps (Kalfatklammern). Peculiar variants revealing a local or cultural identity of such details may be found, even inland (e.g. Zetterholm 1938). Upon closer analysis, all finds are informative in some way, indicating sizes of vessels, technology, tradition, social milieu, etc.

Iron rings in rocks may indicate a mast-crane or a careening site. In the vicinity, the remains of a hearth of a smithy, a tar pile, or a pitch oven may be found. The smithy may have demanded water dammed and lead in a lined canal to provide power for its bellows (cf. fig. 36). House foundations could indicate the size of a *spantlave*, with the large timbered floor designed to make out the moulds and frames in natural sizes from a half-model or possibly a formal design drawing (cf. fig. 29). Possibly, if we are in a lonely place far from home, a normal set of local settlement remains has become stuck in the ground. It would include household tools and implements, containers, pottery, glass, etc.

A few sites provide an example of what is to be found underwater. In some cases we know little more than just the fact that there are large worked wooden pieces out there. All over the bottom of the small bay at *Snäcke* at the canal of Dalsland adjacent to Lake Vänern, there is a thick layer of chippings and a variety of mixed ship details (planks, frame parts) from the yard nearby. There are wrecks and coherent wreck parts. In the route beyond the bay, there are several wrecks from later times, along with a number of oblique wooden posts, probably for mooring or careening to coat vessels with pitch or tar.¹¹⁴ Not far away are the caissons for careening and mast crane establishments of the productive shipyard on *Björkön* island, Uppered, together with other well-preserved remains and numerous leftovers on the lake bottom as well (cf. figs. 24–25, 28–29, 36, 51–52).¹¹⁵

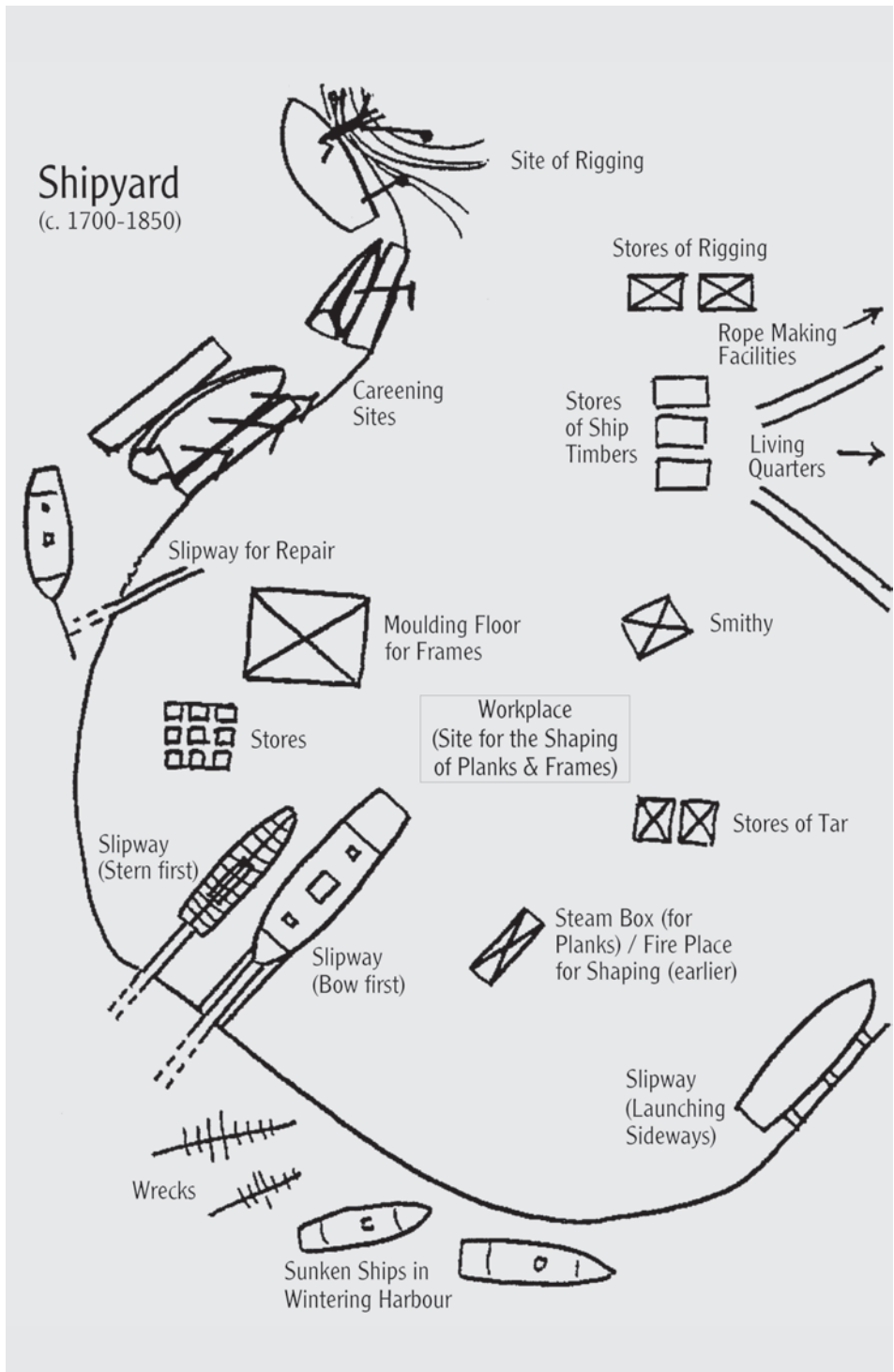


Fig. 38 Exemplary layout of a shipyard, c. 1700–1850. (Drawing: Christer Westerdahl & Erik Hoops)

Material Geography of Shipbuilding Sites

The only certain result of Chapman's undertaking is that it became known in some Swedish naval circles that there were unexploited resources of first-class timber in the far North. This pinewood was on a par with oak: excellent, clean and closely grown (with very narrow year-rings) because of the harsh climate. As this is indeed a chief factor for the localization of shipbuilding, it could be expected that naval yards would have been set up in the area. I am not going to offer any suggestion as to why this did not happen. The naval field is of little concern to the present subject. Apparently, this "discovery" spread to private investors.

There were several good reserves of pine in Norrbotten. Chapman pointed this out and also potential yard sites in their vicinity on the islands of Bergön (above) and Rånön in the archipelago of Kalix. There were also heavy and straight timber reserves inland in this parish. There were also similar areas recorded on the coast at Alskatan south of Luleå, where private shipyards were indeed located in the neighbourhood at Alhamn/Vibbonäset, Långviken, Dravelsviken and Mannön, where at least some ships were built on the so-called *Varvsudden* ("shipyard spit").¹¹⁶ However, all three reserves mentioned by Chapman were only used after 1800, i.e. with a considerable delay.

In the same way, the forest chosen in Ostvik in present-day Northern Västerbotten (map fig. 39) may have provided the impetus for the shipyard sites of Öhn, Bergskäret and Bastuholmen in Kåge from the 1830s onward (mentioned above). This is also true for the forest of Burön for the shipyard at Bureå (1775–1810), where the establishment is closer to Chapman's visit. In the same way, this applies to the resources of the promontory of Skallören for the future yard at Byggnäsudd, mentioned here several times, in Burvik and for the Wahrendorff shipyard on Bergskäret in the inner archipelago of Uttingen in the bay of Risbölefjärden, used from 1779 to 1794.¹¹⁷

One of the first ships with a modern *barque rig*, called *Åkers bruk*, was built here in 1782 for the same buyer as the very first, *Hertiginan af Södermanland* (1775). These ships were indeed built according to Chapman's design.¹¹⁸ From this point of view, it is interesting that Chapman also mentioned the area around Ratan, the primary harbour of upper Norrland during the last decades (from 1767 onward) of the Bothnian Trade Compulsion. In this place, the smaller vessels actually built in the 1820s were of the same size – around 50–60 lasts (Swed. *svår last* = 2.5 tons; 125–150 tons) – that Chapman anticipated. At Björneborg in Finland, Chapman only pointed to timber reserves on *Stormaloöen* and *Stora Enskär* in the vicinity of Anttora (above). As expected, however, the forests of coastal Österbotten had all been cut down, mainly for the extensive

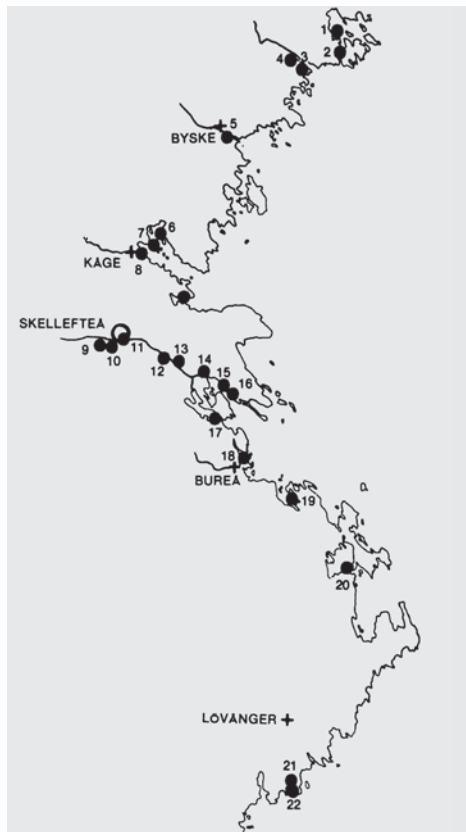


Fig. 39 Map of the shipyard sites of northern Västerbotten. (Drawing: Peter Gustafsson, Skellefteå, 1980)

production in shipyards. Only some areas far inland in northern Finland could possibly be used. At any rate, this indicates intense shipbuilding activity in Finland in the past when compared to the other side.

The advantage of Chapman's expedition was that it collected knowledge known before in the local areas in question – not for the navy/the crown but obviously for private venture capital. The peasants must have known of the resources for a long time, without having the potential to exploit them in earnest. However, even for private investors, mostly burghers of the local towns, there was a conspicuous delay in using them. Only for Bergön/Rånön and possibly some other minor places in Norrbotten and for Bergskäret in Västerbotten is there a reasonable connection in time with Chapman's visits. Despite the fact that the timber on those islands, which were owned by the crown, had been placed under protection to the privileged benefit of shipbuilders, the obstacles to exploitation were many. The main problem was the lack of capital in the region. Due to the Bothnian Trade Compulsion, these obstacles would persevere for a considerable time, even after the loss of Finland to Russia. The distance to metropolises like Stockholm could be overcome easily, but knowledge of the area was sparse and irregular. The consequences of Chapman's expedition are mainly associated with the "discovery" of the excellent timber resources, but the outcome was almost irrelevant for the main protagonists: the crown, the burghers and the peasants. The profits went abroad.

Here we see next to no results for my bold attempts to come to grips with localization factors for shipyards! On the other hand, we do get a certain idea of a kind of innovative process, rather more for materials (timber) than for shipyard sites.

The Social Geography of a Shipyard Site

Maurits Nyström discovered the only presumed example of a preserved shipyard bill from this area of Northern Sweden during the period 1760–1812.¹¹⁹ He provided the survey with the original documents. Since the general conditions of a rural yard must have resembled those of this place in many respects, it is worth a closer look. The ship which was built was a brigantine, called *Castor*, Lat. "beaver", after the arms of Härnösand, of 85 lasts (Swed. svår last = 2.5 tons, 212.5 tons). It was ordered by a consortium of eight burghers of Härnösand¹²⁰, all fairly well-known in the commercial annals of the town in the latter half of the eighteenth century. However, even the famous mayor and chief judge Mattias Körning was financing the ship in some obscure way that I have not managed to discover.¹²¹ For some reason, Nyström (1982: 150) erroneously calls the ship *Carl* and gives its size as 132 lasts (330 tons). The snow (*snau*) *Carl* was indeed built the same year as the *Castor*, but according to all available source material (*fribrev, mätbrev*), it was built in the town itself. A mistake is possible in the sense that the *Carl* may have been built close to the *Castor*, but registered the usual way (see the text on studies of archival material) in the town. However, our bill only concerns the construction of the *Castor*.

Thus, what is particularly interesting is precisely that the *Castor* was built in a rural area, the main theme in this text. The building site was owned by the farmer Olof Persson in the village of *Klovsta* (here fig. 40; Nyström: *Klossta*) in Ångermanälven about forty kilometres from the mouth of the river at Hammar, Nyland. It was situated on the small and fairly shallow sandy island of *Klovstaören*, nowadays with a copse of deciduous trees, in one of the main rivers of Norrland, Ångermanälven. The island is separated from the land by a shallow channel, almost overgrown in places (fig. 41). The main current is beyond the island. The river itself has very steep banks and it is not possible to find any moderately even ground here (fig. 42). As far as we know, *Klovstaören* was a yard for the construction of a single ship.

There are vague oral statements pertaining to ship or boatbuilding on other small islands in this part of the river, which are so far unsubstantiated, except possibly in the case of *Holmshol-*



Fig. 40 The farm of Klovsta, Ångermanland, at the 1782 shipyard of the *Castor*. (Photo: Christer Westerdahl)



Fig. 41 The steep banks of the river Ångermanälven at Klovsta. (Photo: Christer Westerdahl, 1984)

men on the southern bank at the mansion of Holm, on the opposite side, if this actually was an island at the time. The place-name indicates that it was, for at least some time during its history. The mansion had a considerable shipyard from around 1774 to around 1838. On the other hand, in the case of *Kvarnören*, the foundry shipyard of Sollefteå, we know this for certain. This shipyard also had considerable output in spite of its being the highest point in the river before the falls make any further continuous transport from the sea impossible.¹²² Sollefteå was in fact the most productive shipyard site on this river according to our sources, at least in the period from 1729 to about 1865. Theodor Hellman mentions¹²³ that the *Castor* was built at the shipyard of *Skedom* in Multrä parish, another site far upstream, but this is patently wrong. However, the *Skedom* yard did indeed exist and in the same year as the *Castor* another brigantine, the *Gustava* of 96 lasts (240 tons) was built there (Hellman loc. cit.). In the following year, it was succeeded by the snow (snauskepp) *Ångermanland* of 116 lasts (290 tons). About ten other shipbuilding sites have been noted on the banks of Ångermanälven.¹²⁴

Vessels were in fact built far upstream many rivers in the Bothnian area and transported by the current down to the mouth in the spring. The woodcut of the Finnish Southern Österbotten by Olaus Magnus on the *Carta marina* of 1539 was referred to earlier. Nikander mentions this tendency¹²⁵ and is quoted by Moberg¹²⁶ in connection with the ships built on banks or bars close to present-day Boden at Luleälven: see below on the place-names Sävastgränden and Råbäcksgården. The furthest possible distance from a river mouth is probably displayed by ships like



Fig. 42 Klovsta-ören, the island in the river Ångermanälven, where the building of the *Castor* took place in 1782. (Photo: Christer Westerdahl, 1984)



Fig. 43 The rapids of Kamlungeforsen in the river Kalixälven, Norrbotten, through which several timber floats were sent with new-built ships standing on them. (Photo: Christer Westerdahl, 1976)

considerable rapids at Kamlungeforsen (fig. 43), to the mouth at Kalix on the Bothnian Bay. According to oral tradition, this was possible by means of a large float of timber on which the ship had been built.¹²⁸ The *Norrlandsstrand* was not alone. In 1856, a sloop called *Schamyl* was ready to sail, by means of another float, from the building site at Gyljen, with its foundry, in the same parish. In any case, both survived their adventures as rapids-shooters – the *Norrlandsstrand* was sold immediately during her first visit to Copenhagen and the *Schamyl* was active for many years in the Bothnian. Additionally, some building sites for small ships are known to have existed upstream the shallow river of Torneälven, such as *Niemis* and *Pello* (around 1800).

The riverside building sites were also well known in the southern oak forests, e.g. in Swedish Pomerania, along the Peene and its tributaries in the eighteenth and nineteenth centuries. However, we may see a Bothnian connection in this northern area.¹²⁹ Certainly, there may be even a very distant connection to Chapman's journey, since he mentioned the excellent forest resources of Kamlunge in Överkalix eighty-seven years before the schooner *Norrlandsstrand* was built. On the other hand, these works were realized in the midst of a settlement area populated by experienced lumberjacks and carpenters accustomed to floats of both timber bundles and tar barrels over the course of centuries.

The Building Process

The rent for the site received by the farmer David Persson¹³⁰ in January 1782 was 40 (Swed.) *riksdaler*. His neighbour David Olofsson provided bricks for a steam oven (Swed. *basugn*) and steam pan (Swed. *baspanna*), together with the crofter (*torpare*) Jon Ersson, also in Klovsta village, and Olof Nilsson in Månggrav on the opposite side of the river. The steaming of planks to shape them was to be an important element. To produce the steam itself, a large cauldron was rented from another farmer, Abraham Johansson in the village of Bjursta. David Olofsson, who was just mentioned, was also the smith's assistant together with Måns Rahm from the village of Strinne.¹³¹ The official shipyard smith was Eric Johansson from the neighbouring village of Bjursta. Probably this work was performed in a regular farmer's smithy, possibly that of Olofsson himself. The neighbours Ersson and Olofsson went by horse to procure bar iron at the foundries of Graninge and Sollehtëå upstream. David Olofsson was also paid for a house where O. Hellberg, who seems to have come from the outside as a combination of foreman and book-

the ketch (Swed. *galeas*) *Charlotta*, skipper Petter Laurin, of 31 lasts (77.5 tons) which¹²⁷ was built at "Kemi träsk" (Kemi-järvi), a lake 150–200 kilometres upstream the Kemi river. There seem to be other ships built in the same area, including one named after the lake. Another interesting case is the schooner (*skonert*) *Norrlandsstrand* of 98 lasts (245 tons) which was built in the village *Svedjan* in the parish of Överkalix on the river Kalixälven. It had to go down the river through sixteen stretches of rapids, including the

keeper, was kept in board and lodging. Several men of the temporary labour force were also kept in board and lodging.

As early as October 1781, the preparations started with a contract agreement with the farmers of the villages of Klovsta and Bjursta. Together with other farmers, e.g. in Tunsjön in the parish of Dal, they were to provide specified types of timber. Probably they went out on the first snow in autumn to reconnoitre in their forests. According to the testimonies from other Bothnian areas, the timber was cut at the felling sites to the extent possible to minimize transport costs.¹³² The deliveries to the building sites took place during the winter:¹³³

Crooked pines (for framing), small and big, 277 pieces

Spruce knees

Spruce *band* (bow frames, *Bugband*)

Other roots

Berghålt (berghult, *Bergholz*), half logs for strengthening the planking

Some details were more specific:

Spelstock/spelbeting, *Beting des Bratspills*, windlass for the anchor

Hjärtstock, *Rolle/rowl*? between the tiller and the *whipstaff/Kolderstock* of the rudder

Stävstock (stempiece, Stevenstock)

Stävband (stem frames, Stevenband)

"Lestång på acterändan"

Klysstock (hawsehole/Klüsen timber)

The dowels (*trähälar*; fig. 44) were delivered by six people working at home, altogether at least 2,500 pieces. These wedges (*ärättor*) were made of birch wood. The categories of planking were called simple (*enkla*) *bräder*, 14, 16 and 19 inches wide, and for the lower hull/the bottom "*särskilda*" *botn bräder*. Nyström (1982 loc. cit.) has computed a consumption of 109 *tolfter* (twelfths) of which 31 were simple (*enkla*), 43 whole (*helbottenbräder*) and 35 half (*halvbottenbräder*).

For the positioning of the hull on the slipway, *Center trä*n, *Senten*, moulding boards to give the form and location of the frames, running roughly parallel to the future running of the strakes, logs for the slipway and its attendant timber, *täcksbjälkar*, *skärgångsspiror*, *ställningsspiror*, *stockar till Galga* (lit. "gallows") and *styltverke* (most of these later for the scaffolding) were delivered. Planks for moulds are mentioned. The consumption of tar was considerable,



Fig. 44 Dowel and its wedge from a wreck of a ship built on the river Ångermanälven, probably a *haxe*, a local river barge type of the eighteenth century. (Photo: Christer Westerdahl, 1984)



Fig. 45 Treenails for plank fastenings from medieval shipyard layers of Lödöse, at the river Göta älv, Western Sweden. (Photo: Regionmuseet, Vänersborg)

according to Nyström 19 barrels (of 125 l each). Among the implements mentioned are a grindstone (slipsten), a pitch ladle (beckskopa) of copper and tar brushes and some for the steaming of planks. One barrel of hair and oakum was used for the caulking (Kalfatierung) and 5 *lispund*, slightly more than 40 kg, of hemp, spun to ropes on the spot for the cordage at the yard. The quantity of bar iron for bolts, pins, etc. is not mentioned but the cost was 770 (*riks*)*daler*, with everything bought from the foundries in the river valley. Only 3-inch and 2-inch nails were used, but they were imported. The larger items of iron were produced by the smithy in the village. For the launching, an amount of tallow was used, obviously for the sledges (cf. fig. 55), along with particular wedges. It appears that the ship had been filled with water to some extent, intentionally or unintentionally (snow precipitation), the intention being either to facilitate the launching, or to make the wood expand after the caulking of the bottom, or possibly both. Both these motives have been pointed out in oral tradition. Several working days were used for bailing out the water.

How the ship was launched remains a mystery. Probably it was launched directly into the current of the river, since the channel of the bar/islet appears to be too shallow. The *Castor* was taken, for a sum of 54 *daler*, by the experienced *haxe* (barge) skipper Garneij¹³⁴ down to the mouth at Nyland, 40 kilometres downstream. It is possible that the ship carried a jury rig, but it might also have been carried out by partial punting and towing by an auxiliary *haxe*. However, this function could also have been fulfilled by a *verckflotta* (a float of bundled timber) known to have followed the ship downriver. Why was it not brought in the ship itself? The answer is probably that the hull was to lie as high – i.e. have as little draught – in the water as possible to avoid shallow passages among the sandbanks downstream. At Nyland, the brigantine was provided with masts and spars and most of the rigging. There is no mention of this at Klovsta. Probably the final touch of the rigging was made in the future home town of Härnösand before she sailed with cargo on her first commissioned voyage.

The Social Geography of a Shipyard

The communal character of this pre-industrial undertaking is obvious. Some hints can be gleaned from the bill:

The deliveries of the ship timber were made by farmers from the northern side of the river (fig. 46):

Strinne (Väster Strinne?), 4 farmers

Öfoer Strinne (a part of Väster Strinne), 2 farmers

Öster Strinne, 1 farmer

Hakesta, 1 farmer

Mångräv, 6 farmers

Para, 1 farmer, but also all the households (*byamän*) together

The following numbers of farmers participated from the neighbouring villages/hamlets on the southern side of the river:

Klovsta itself, 2 farmers

Tjäll., 9 farmers

Gårdnäs, 5 farmers

Bjursta, 3 farmers

Some timber also came from the neighbouring village of Nyland (one farmer) and somewhat more from the more distant hamlets of Väster Granvåg, beyond Sollefteå, and Tunsjön in Dal

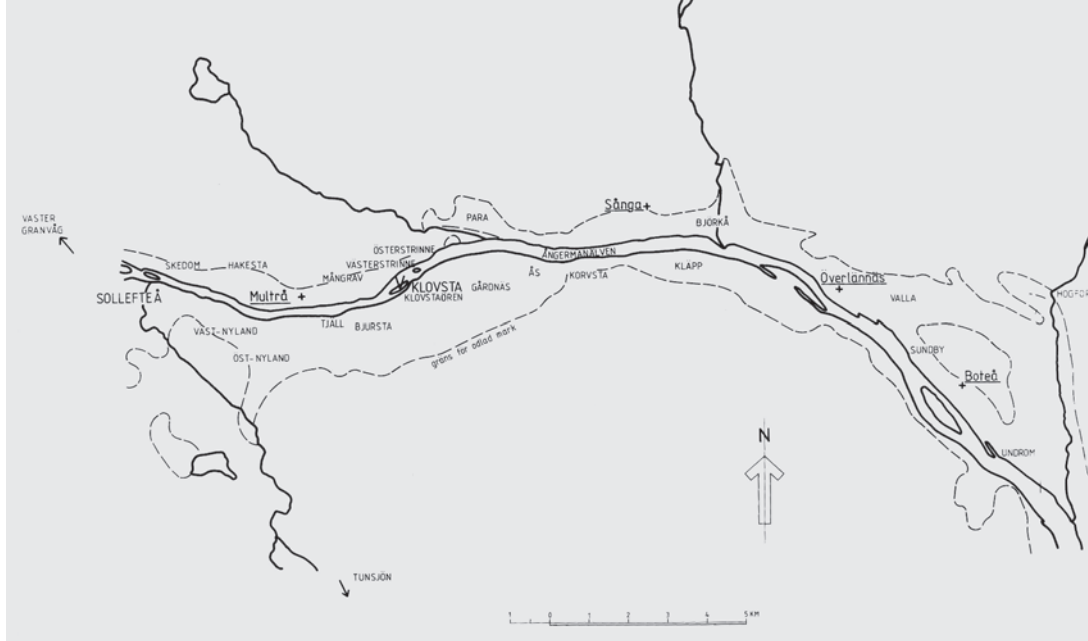


Fig. 46 Sketch map of the shipyard and the other places/settlements on the river Ångermanälven mentioned in the 1782 bill of the *Castor*. (Drawing: Christer Westerdahl)

parish (one farmer) but also from all households together. Consequently, the procurement of the timber alone engaged at least thirty-seven farming households directly, apart from all the households (*byamän*) in two hamlets more or less indirectly.

The carpenters/workers were distributed somewhat differently. Four to five people, all crofters (*torpare*) came from Klovsta itself – where, accordingly, only two farmers took part in the building of the ship. Other workers were from Strinne (five) and Bjursta (*sic*). These sixteen men from the vicinity of the yard constituted a stable working force over a period of three to five months.

About thirty workers were recruited from a greater distance, some of whom worked only for a few days. Most of them represented villages or hamlets in Ådalen, the river valley, such as Åsa, Kläpp, Björkån, Valle in Boteå parish, Remsle in Sollefteå, Överlännsås, Ytterlännsås and Hällsjö in Dal parish. The most distant origins were those of the town of Härnösand and the inland province of Jämtland. Five of the carpenters were *båtsmän* (naval soldiers), two able seamen and, interestingly, one appears to have been a *sockenlapp* (locally settled Sami) or of similar Sami origin.

Therefore, a total of close to fifty individuals were directly employed as workers. The daily wages varied between 1 *riksdaler* and 3, the most common being $2\frac{2}{4}/2\frac{3}{4}$ dalers. After two months of service, the wages were raised according to these levels. The master shipbuilder Johan Renmansson, a well-known expert in shipbuilding of this time, connected with the town of Härnösand, appears to have worked at the site for only one of the six to seven months of the overall construction period. According to Nyström¹³⁵, 2,328 working days were paid all told. He compares this with Finland, where a certain ship of 117 lasts; 292.5 tons – and thus slightly larger than the *Castor* – consumed around 3,000 working days. Unfortunately, we can never be sure that all the work paid has been included. In total, 18,458 dalers were spent, of which 6,150, i.e. around thirty percent, were wages. The cost of the timber transport was 4,000 dalers, of which approximately 2,400 dalers were for sawn planks, i.e. close to twenty-five percent. In this sum, no mention is made of mast or rigging.

Conclusion

The unique bill pertaining to the ship constructed at Klovsta in Ångermanland paints a fairly detailed picture of a pre-industrial shipbuilding enterprise. A great deal of relevant information on the material and social geography can be drawn from such a source. In this case, however, we have little to compare it with. Nevertheless, fragments of documentation from other sites and ships make it likely that the building of the *Castor* and its yard site are fairly representative of the conditions relevant to many small rural shipyards. As to the social geography, it seems to be duplicated to some extent in other enterprises of the time, such as in the case of the early sawmills, some of them also seasonal.

The fairly high percentage of wages and of timber may “quantitatively” indicate that recruiting skilled people and finding high-quality timber is a decisive factor in the localization of shipbuilding sites. However, it appears that the social factor may have been even more important, *the communal networks in the local milieu*. For the male part of the population, this may have functioned as a kind of “working feast”, where all kinds of experience were exchanged between levels and groups. Traditions of such communal undertakings in shipbuilding were still numerous in the 1970s. The southern parish of Kalix in Norrbotten was an area where this was a particularly dynamic part of the stories passed down. It is a very shallow area. Nowadays the shipbuilding sites are far inland from the water’s edge, which makes it more difficult to “fix” the tradition of the places themselves. The main content of the stories is rather the work, drama and worries of the commonality. An example is a ship built in 1797:

“Tradition says that there were great difficulties in launching and in getting the ship out to open waters. Many people were engaged in this work. Possibly apochryphally, it was told that the ship was so big that they had to haul it out to Vånafjärden (a bay) to be able to turn it (perhaps this means that the vessel was launched stern first).”¹³⁶

Due to these difficulties, the ship was named *Folkets Bekymmer*, “The Anxiety of the People”, perhaps better interpreted as the “headache of the people”! It was a moderate-sized barque of 148 lasts and 362 tons. Two years later, in 1799, the *Folkets Bekymmer* was sold in Lisbon. It seems reasonable that it was given another name along the way!¹³⁷

It should be pointed out that the communal character of such an enterprise extends to other temporary networks in the North, such as tar burning and, in later times, elk hunting. Shipbuilding was, in a local sense, an efficient way of bringing together neighbouring settlements, certainly kinfolk and friends, but not only these circles. Tradition conveys a sense of intense communal pride in the building of large ships.

It was also certainly advantageous for the recruitment efforts if other ships had been built recently and successfully in the same area without too much waste. On the other hand, the resources may also have been used up by previous projects. To avoid this, it seems that most of the material was cut intentionally at a certain distance from the site to enable further construction projects at this or other sites in the vicinity. Out in the forests, tree growth was increasingly manipulated to serve the needs of future shipbuilding. Accordingly, the farming of the landscape, the natural environment, and the social feeling for the communal and kinfolk networks were drawn into shipbuilding. This is part of the background for the rally of the “illegal” ship revolt of Nedertorneå (above) during the years when the *Castor* was built and sailed for the first time.

Place-Names Indicating Shipbuilding

There are a quite a number of place-name types in the Nordic languages which indicate shipbuilding sites in the survey area, apart from the obvious element *Varv-* (Swed. “yard”) or

Skeppsvarv- (Swed. “shipyard”). However, as always, the place-names constitute a difficult category where above all the earliest occurrence of spelling, the forms of the local dialect and the most informed knowledge of conditions in the area have to be taken into consideration. The critical points of interpretation will be illustrated here with the aid of a few examples. The material was verified at the Place-Name Archives (Ortnamnarkivet, SOA, Uppsala).

The general principles for the name-giving of shipyards for wooden vessels are similar in many languages. This study may therefore serve as a recipe for such surveys in any rural region where people moderately skilled in carpentry and boatbuilding are accessible and forest resources are close by. The importance of a continuous oral tradition is obvious. The demands for shipping and shipbuilding are largely international, although local idiosyncrasies may exist, some dependent on cultural patterns. The natural peculiarities of the area studied here are mainly those pertaining to the harsh but in many ways advantageous winter, when most of the ships were built. Another is of course the rapid land-uplift, which may present a serious problem for identification in the field. Given these conditions, the survey has been remarkably successful in establishing links between archival material, oral tradition, place-names and field-work.

Place-Name Research

In the Northern provinces of Norrbotten and Västerbotten, the sites often carry the general meaning of a ‘building process’ – of any kind. For example, the element *Bygg-*, with various versions in various dialects, such as *Byggningsplatsen* (or dialectally, *Bynningsplassen*, “the building site”) on the island of Bergön in Kalix, Norrbotten, on the map of 1779¹³⁸ marked as “*gammalt Skjepsvarf*”, “ancient shipyard”. *Byggnäsudd*, approximately “building spit of land”, is found at Burvik, Bureå, Västerbotten, and still understood this way in tradition, although this name may have been corrupted since it was spelled *Bynääs Skathan* in 1701; and the bay outside *Bynääs Sladan*, *Bynääs* instead meaning “the village point”. In this latter case, the name may have been misunderstood by the map surveyor, if it actually points to shipbuilding. However, no such early activity is known in the seventeenth century before 1701, only in the latter half of the eighteenth century. This may be due to lack of sources. We also have *Byggvallen* and *Byggården* (for short “Bygges”) in Avan, Hortlax, at Piteå, Norrbotten.¹³⁹ Even in Roslagen, in the southernmost part of the survey area, i.e. the Vätö district in Uppland, this place-name simplification is known as *Bygget*, “the building”, with approximately the same possible denotations as in English.¹⁴⁰ Another form of simplification is *Platsen* (also pronounced and known as *Plassen*), simply “the place”! – but reasonably derived from *Bygg/nings/plats/en* (above). This is found in *Platsen* at Siksundet (cf. fig. 32) and as *Platsudden* (“the place spit”) at *Båtskärsnäs*, both in Norrbotten. The forms in the Finnish (dialect)-speaking part of Norrbotten are *Plassi*, which is just a corruption of the Swedish name type, and its neighbour *Plassinokka* in Säivis in Tornedalen (Torne valley), Norrbotten.

Otherwise, this generalized concept *Platsen* (“the place”) seems to denote an important meeting place, such as the church, where the alternative *Vallen* is more common. *Vallen* is another contraction of *Kyrkvallen* (“the church field or bank”) and *Plassen* is probably created as a parallel. However curious, this may also point to an interesting social aspect, the very likely communal character of shipbuilding in these settlements, even to the point of comparing it to church holidays.

The same type of name-giving is known from Österbotten in Finland, probably not only due to the intimate contacts between Swedish-speaking parts – in fact, this is an area where people knew at least a smattering of other languages spoken (including Saami) – but more tangibly also to the recruitment of master shipbuilders in Finland, mentioned above. For the shipyard at



Fig. 47 *Byggningsplats* marked on an eighteenth-century map from Österbotten, Finland.



Fig. 48 The smithy hearth of the naval yard at Jouxholmen/Kronholmen, Österbotten. (Photo: Christer Wester Dahl, 1984)

Östensö close to Jakobstad (Pietarsaari), Toivainen has noted the term/appellative (not a place-name) “*byggningsplats*” on a map of 1761 (fig. 47).¹⁴¹ In another form, as “*Byggnadsplats*” it is found on a map of the approaches to Gamlakarleby (Kokkola) dating from 1766.¹⁴² There are several other such localities, illustrating the types known from Sweden, including ones with actual place-names such as *Byggningsplatsen* and even *Platsen*, in Österbotten.¹⁴³ Both the common nouns and the place-names appear to derive from the building activities of vessels, not from the other possible meaning, from buildings erected at the site. Besides, it is very uncommon to find traces of any more permanent constructions at these sites. In most cases, there are only the stone foundations of a forge to be seen (fig. 48), at least above ground, coupled with smithy slag (cf. figs. 23–24). Although there is another possibility for derivation, i.e. from “bygg” meaning “barley”, this does not seem relevant in any of these cases.

The place-name *Byggningsplats/en* conforms well to the official term for a crown shipyard, *skeppsbyggning*, already during the sixteenth century.¹⁴⁴ Many of these early scattered crown yards from the Vasa dynasty era (around 1550–1650) were in Finland. On the other hand, the most common term in Southern Sweden for such an early crown yard is “*skeppsgård*”, where “*gård*” corresponds with the Engl. “yard”. The place-name *Skeppsgården* is found in present-day settlements in the parishes of Östra Ed and Misterhult in Småland. As a field name we also find a settlement *Skeppsgårdsgårde* – originally, as the name says, for a meadow (*Skiepzgälsängen* 1700), on Nedre Gränsö, S:a Annæ parish, Östergötland. Present-day *Skeppargården* (“skipper’s farm”), an island in Svärta parish, Södermanland, spelled *Skeppsgård* in 1728, is thus a corruption of *Skeppsgården*. The main naval base for the Vasa dynasty fleet of Sweden and Finland was at the capital, *Stockholms skeppsgård*.¹⁴⁵ Most of these places can be found in naval records.

Another appellative for a naval yard in Finland could be *bankstad*, e.g. *Österbottens bank-*

stad, which is known today as *Kronholmen* or *Jouxholmen* close to Jakobstad: "There were two types of these shipyards. The regular yards only had to build ships. The others were mainly only sites for the camps of the ship crews during the autumn and winter where shipbuilding was undertaken suitably to occupy the people. Such a temporary shipyard was called 'bankstad', a term that was transferred in Finland to any place where a keel was laid."¹⁴⁶

The background of this common noun is not quite clear. If *bank* (approximately the same in English) means the building berth or perhaps rather its topographical character, one might compare it with the local term Swed. *grand* (see Swed. *grund*, Engl. "shallow bank") for at least two known shipyards in Norrbotten, *Sävastgranden* and *Råbäcksgarden*, both on the banks of the river Lule älv (close to present-day Boden). A site called *Granden* is also situated on the lower reaches of Skellefte River, North Västerbotten. The topographical advantages of locating a shipbuilding place to a bank on, or even – as an islet – in the river are natural in a region where all wooden ships were built during the winter. In the Ångermanälven river in Ångermanland, further south, such a bank was called "ör", which conveys the impression of a sandy place. Two shipyards here were called "ören": *Klovstaören* and *Kvarnören*, both mentioned above. The first was probably only used once, but the other was a major shipyard at Sollefteå, forty kilometres from the estuary. On the other hand, the element of *bank(stad)* could possibly indicate some kind of fortification with earthwork, since the Finnish examples were naval camps.

Naval shipyards could also absorb the element *Kron(o)-*, referring to the crown (the navy): *Kron(o)holmen* at Härnösand, Ångermanland and *Kronoholmen* (alt. *Jouxholmen*) in Kronoby, Österbotten¹⁴⁷ (see fig. 48).

The most easily interpreted of these types of names is of course *Varv-* (defin. *Varvet*), exclusively used in the sense of "shipyard". The survey registered quite a number of such names, some found on maps, some only known through oral tradition. A few of them may also be found in place-name archives. A town district of Örnsköldsvik, Ångermanland, is called *Varvet*, a shipyard site during the 1850s. The same name is applied to a part of the village *Lövvik* in Nora, also Ångermanland, where ships were built in 1857, and on a spit in Buskösundet in Västerbotten (at the border to Norrbotten), where a shipyard is recorded between 1828 and 1866. At Killingholmen, Tåme (Byske), Västerbotten, there is a site which is not recorded in any historical source, but according to oral tradition at least two ships were built there, one of them possibly as early as the sixteenth century.¹⁴⁸ Another was found at Gumboda, Nysätra, recorded around 1840–1860. In the South, this place-name is found south of the town Öregrund, Uppland, south of Bergkvara, a major site, and at Vinö, both in Småland, in Southern Sweden.

Place-name compounds with *Varv-* are almost as common as the definitive form *Varvet*. *Varvsudden* (a spit) is found at Bäck, Nätra, Ångermanland, a shipyard known from the 1850s; on Mannön island in the archipelago of Luleå, Norrbotten, used in 1836 and 1877; and at Västra Sikvik south of Gävle. Outside the survey area, it is known from the area south of Skäggenäs and on Hamnö island, Misterhult, both Småland. *Varvsrevet*, a sandbank spit, is located at Buskösundet (above) and several *Varvsholmen* (islands) are known from my survey area. *Vivs-tavarv*, the major shipbuilding site at Wifsta in Medelpad in the nineteenth century, is now mainly a huge pulp mill and the original name-giver to an industrial combine (now part of the SCA). In Lake Vänern, at least seven sites bear the name *Varvet* and at least one site is called *Varvsholmen*. The other categories of indicative names found in Norrland, mostly denoting ships, are also represented.¹⁴⁹

Apart from the larger ships, more local varieties, including fishing vessels, have been built at a large number of sites in the survey area. They seldom seem to have place-names of their own. The only place-name form that I have found relevant in this connection is *Verkan* in Roslagen, Uppland, in particular in the archipelago of Vätö.¹⁵⁰ It denotes a place where you

put vessels onto land, on a slipway, to repair, or keep the vessel accessible and under control, even during the winter. Another term with a similar meaning is “båtdrag” (roughly translated, “boat haul”).

Ship Type Names

If a ship type or, more generally, a “ship” is pointed out in place-names, it could denote a shipyard where such ships were built. However, this interpretation should only be suggested if other alternatives are unlikely, such as harbours, loading places, foundering and wreck sites. *Skutviken* (“ship’s bay”) in Ytterbyn, Kalix Nyborg¹⁵¹ and *Skutviken* in Ryssbält, both in the parish of Kalix (Nederkalix), are in fact, according to oral tradition, shipbuilding sites, although no direct record has been found so far. In Norway, a certain shipyard site is found, e.g. *Skuteviken* at Bergen.¹⁵² Some others are *Skutudden* in Boviken, Kåge, Northern Västerbotten, with shipbuilding recorded in 1810, and *Skuthällan* in Bäckfjärden, Lövånger, in the same region, which is still somewhat vague.

We know that *Skeppsholmen* (“ship holm”) in the delta of the river Indalsälven in Medelpad, nowadays Lövggrundsholmen, was the site of the crown yard *Medelpads varv* in operation from 1666 to 1680.¹⁵³ The area was thoroughly altered by a human-induced catastrophe in 1796. Large ship timbers have been found here, on land, originally probably belonging to this site. Another *Skeppsholmen* at Levar-Flasen, Nordmaling, is a major private site, recorded as having been in existence from 1785 to 1881. The unique site at Maglebrænde, Falster, Denmark, dating from around AD 1100, mentioned before, is surrounded by two ship-type name sites, two small hills at the small river, *Norre Snekkebier(g)* and *Søndre Snekkebier(g)*. To the Southeast, a field is called *Snekkefølter*. This is the most concentrated occurrence of *Snekk-* names in Denmark, although about a hundred such names exist. The (Norse) *snekkja* is a medieval galley ship type, very likely to have been used for naval purposes. There is therefore a possibility that other Scandinavian occurrences of these names may denote shipyards or repair yards.¹⁵⁴

A locally concentrated name type, the *Skeppshus* or *Skepphus* (“ship house”) names found especially in Åland¹⁵⁵ also seems to have a certain distribution in Uppland on the Swedish side.¹⁵⁶ Some of them may denote early shipbuilding and maintenance sites. Some of them may also be interesting in an early naval sense.¹⁵⁷

In recent times, barges were built in many places in Norrland due to the need for large-scale transportation of wood beyond the condemned hulls of old sailing ships. Their building sites bear such names as *Pråmudden* and *Pråmviken* (*pråm* = “barge”).

Other place-names denote particular installations at a shipyard. There is a small islet called *Baspannharen* in Trödjefjärden, north of Gävle, telling us that there was once a “baspanna” here, a steam chest for forming ship planks. *Basviken*, which is found for example in Småland, has the same background. In both cases, they indicate shipyards in their immediate vicinity. The forming of plank-strake ends using direct fire was a method at least around 1700, and probably considerably later.¹⁵⁸ Probably the first steam chests were introduced in this area by naval shipyards during the eighteenth century. However, in 1782 AD, a “steam oven” (*basugn*) with a “steam cauldron” (*basgryta*) was used at the purely civilian shipbuilding site of Klovsta in Ångermanland (above).

Tälja is one of the old verbs for “dubbing cloven planks with a broad-axe.” There is a field name at Snäckmorsfjärden in Njutånger parish, Hälsingland called *Tälje*. This may perhaps indicate a boatbuilding site, since oral statements exist relating to a concentration of wood shavings in the ground.¹⁵⁹

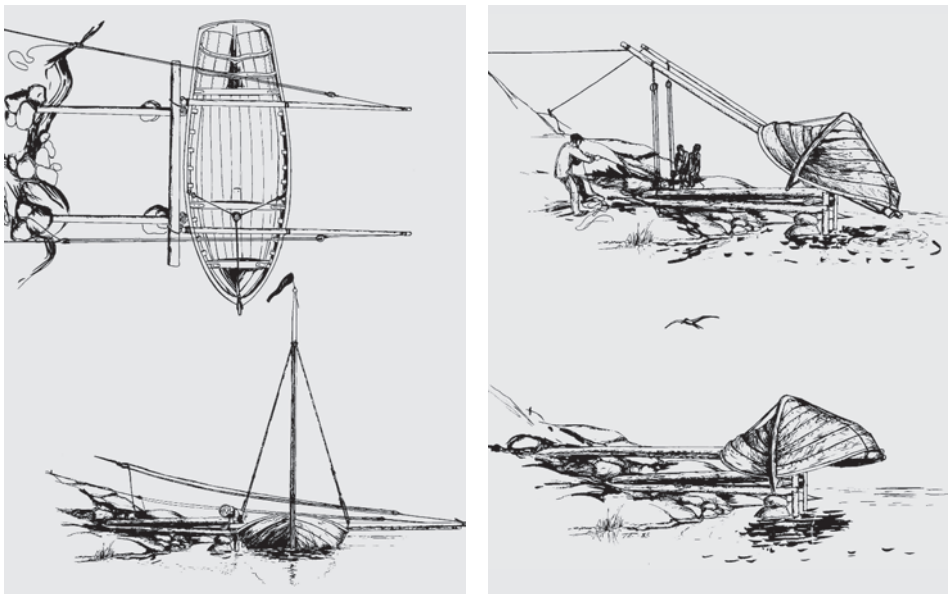
Careening Sites

The shipyard had to obtain, store and have immediate access to large quantities of tar (Swed. *tjär/a*, Finn. *terva*) and pitch (Swed. *beck*, Finn. *piki*). The careening of ships also took place regularly at repair yards. Several known shipyards are called *Tjärholmen* or *Beckholmen*.¹⁶⁰ Most of these names should be interpreted as transshipment sites for such cargoes. This explanation for several *Tjäruskär* or *Tervakari* is obvious.

The careening sites themselves would often be called *Bråbänken* in Swedish, although in Stockholm it was called *Bråddebanan*. The verb “brå” means the application of tar and pitch to the lower hull. This name is a regular occurrence at larger shipyards, esp. naval yards, Dan. *Brad-bænken*¹⁶¹, e.g. in Holmen naval docks, Copenhagen; Norw. *Bradbenken*, e.g. in Bergen. Since they rarely belong to rural areas, it seems that in Norrland it is only the shipping town of Gävle which had this place-name, which was corrupted to *Brobänken*.

On the other hand, a simple type of careening caissons, Swed. *krängkista*, *stälpkista*, were constructed at many locations in rural areas (fig. 51). They may have produced field names like *Stälphagen* (abbreviation of *Stälpbrohagen*) on Åland.¹⁶² They were used also as winter storage for minor vessels, which had been turned upside down.¹⁶³ The traces of such a site may include iron fastenings bored into the rock with rings attached. These later may also have been referred to in place-names (e.g. *Ring-*). The *Stälp* sites of Åland correspond to the *Verkan* sites of Roslagen, Uppland (above).

The need for a point of attachment is obvious in all these cases. An important term for such in international sailor language is in English a *deadman*. “A deadman is a term for a rock, a tree, or any stable, heavy object that a rope or a cable can be attached to and then connected to a vessel



Figs. 49–50 The simple constructions in the countryside to turn boats to caulk and repair and also to keep them turned upside down in an ordered way for the winter are illustrated by these drawings by Torbjörn Eckerman. They inform mainly on conditions in Åland, Finland and on the small cargo vessel *storbåt*, but inevitably, similar demands were found elsewhere among skippers of the North who at the same time were farmers and fishermen. The function of such constructions is often missed by archaeologists detecting remains from historical periods. (From Högnäs & Örijans 1985)



Fig. 51. Remains of a stone and timber caisson, *krängkista*, for careening ships at Björkö, Dalsland. (Photo: Christer Westerdahl, 2007)

mainland coast. According to tradition, a British naval ship, possibly HMS GORGON, was repaired during the Crimean war on the barren, outlying skerry Tålingen in the Gräsö archipelago in 1855.¹⁶⁶ Was the uncomfortable location chosen due to the declared (official) neutrality of Sweden/Norway at the time?

Mast and Rigging

The sinking of a mast into the hull and the application of standing rigging was a sensitive procedure. Afterward came the full running rigging and the sails. This presented problems which may have been difficult to solve at small building sites in rural areas. Nevertheless, people tried. Some of them cooperated in finding and using suitable steep rocks, often called *Mastberget*, "mast rock", where they could lower the mast directly into the mast step. To be able to do so, a jib or derrick boom was attached by means of hawsers to large iron rings fastened into the rock. It is illustrative, also for the conditions of rural shipbuilding and ship ownership, to retell what oral tradition says about *Mastberget* in Ormsösundet between Hargshamn and Hallstavik in Uppland. Here, masts were rigged by the shipyard in Järsjö, Harg, known in the 1870s, but most likely also by others.

Once the newly built hull had been successfully anchored to the rock and the mast was swinging down high from the jib, when suddenly the hawser came loose from the mast. It was apparently the mainmast, and it was so heavy that it went all the way through the ship and cut down with tremendous force beside the keel. The planking was cut wide open and the ship sank immediately to the bottom. It is rather deep at *Mastberget*, around twenty metres. The owners of the ship, skipper/farmers of Roslagen had nothing to invest in a regular salvage so they gave up the ship and started building a new ship that was rigged more successfully. If this was done at *Mastberget* we do not know, but probably not. According to my notes, there is still a wreck at that place with a hole in the bottom!

In fact, at first I thought that this was a migrant tale in connection with shipyards. Maybe it is after all. However, this method has been used in several suitable places with steep rocks. It is the reason why we know of countless stories recorded mostly in the beginning of last century of rings high up on rocks, which purportedly indicate harbours dated back to the Iron Age (or even further!). The rings are then interpreted as moorings, in analogy with rather recent times. Many stories mention rings which do not exist. In 1908, the archaeologist T. J. Arne substantiated the

in order to heave the ship onto land for careening."¹⁶⁴ *Deadman* could be translated to any language. In Scandinavia it would be *Dödman*. This first element is profusely distributed as *Dö(d)-manskär*, something similar, or in fact only *Dödman*, in maritime localities. Most researchers have so far interpreted it as the site where a corpse has been found.¹⁶⁵ It is about time to consider this alternative in suitable contexts.

It seems that in an emergency, such sites might be arranged in exposed localities far from the

statements on iron rings high up a rock at Fällnäs, Södertörn, south of Stockholm. In fact, he explained them correctly, but incredulously.¹⁶⁷ He should have known about the shipyard at Fällnäs, already in operation in the middle of the eighteenth century, but largely forgotten in oral tradition. A solitary statement even mentions that the rock was called *Mastberget*. Södermanland lies in the same province, but in Tystberga parish further south, and *Mastberget* on the island of Högholmen has the same background.



Fig. 52 Iron rings for the mast crane hold at Björkö, Dalsland. (Photo: Christer Westerdahl, 2007)

Still, within my survey area, there are several more *Mast-* names. If they are not found out in the forest or on a solitary skerry far out, they usually mean the same as those. On the present-day peninsula (formerly an island) called *Mastskäret* (“mast skerry”) in Norrbotten, was once the mast jib for the shipyard at Norrbrändön, recorded in 1808–17 and 1826.

In any case, it was not necessary to rig the hull at the yard itself. It could be towed for a short distance. On the other hand, quite a few building sites were upstream on rivers. It seems, therefore, that, after being launched in the spring, the ship was punted downstream with the current, perhaps using a jury rig. Special skills were certainly required and the demand in the Ångermanälven River was met by skippers of the local river barges, called *haxe*. At the distal steep of the river, where its current dies out and the fresh water meets the brackish water of the Bothnian Sea, it could be caught and hauled on to land. The ships built at the Ångermanälven River were thus rigged at Nyland at the mouth, at about forty to fifty kilometres downstream, at the furthest possible point from the shipyards. In Österbotten, they were often sailed with a jury rig from the inner archipelago of Larsmo to Jakobstad by local transport skippers.¹⁶⁸ In other, similar cases, it was still part of the tradition that the ships were built on wooded islands in the archipelagos, towed by steam or sail, and then rigged at the regular yards.¹⁶⁹ At the Lövänger coast of northern Västerbotten, the place-name *Tackelkammarviken* (“tackle store bay”) can still be found. Standing and running rigging, and possibly even masts, were stored here in a building, according to oral statements. Two of the shipyards at Gladaviken/Avan, “Olov-Annarsa” and “Kjellerstedtska”, known from the years AD 1811–36, or possibly somewhat later, are found in the vicinity. However, the locality is not entirely suitable for rigging a ship. It is not calm enough, it seems. Another instance of a similar name is *Ta(c)kelklippan* in Blekinge, recorded in 1666.¹⁷⁰ In fact, there may be several other explanations for such names, but it is enough here just to mention the possibility of referring to wreckage finds made there, for example, or to navigation.

The Resource Landscape

This is a significant part of the contextual analysis of shipyards in the landscape. Contrary to expectations, I found it breathtakingly interesting. The occurrence or the taking out and cutting of ship timber has been pointed out by a large number of extremely localized place-names. It is not self-evident, however, that these localities can be connected to particular shipyards, espe-

cially where the yards occur frequently. The crown authorities eagerly sought lumber for ships and they always encouraged surveyors to observe such resources when describing new settlements or forest tracts. In particular, this would concern *Maste- eller Spireträn* ("masts and spars").¹⁷¹ F. H. af Chapman was in no way alone, but only he could have made a large-scale concentrated expedition for this purpose in 1758–59. As already mentioned, this investigation concerned the hitherto largely overlooked resources of slow-growing large pines in the inner Bothnian Gulf. The South was running out of suitable oaks.

The occurrence of roots or crooks of windswept pines are reported by the place-name element *Rot-*. These naturally grown, crooked timbers have always been considered the best suited for ribs and knees in ships. Any size can be of interest in this connection. If they are found near the sea, the harsh environment has made them grow very slowly and hardened them, but not tempered their elasticity, since their turpentine (tar) content is extremely high, especially in the roots in the ground.

In some cases, localities named in this way became shipyard sites, especially islands. The shipyard *Elfkarleby varv* was located on *Rotskär* in the mouth of the Dalälven River in Uppland. Like its comparable successor *Harbovik* further south in Roslagen, it had a market site and harbour close by. "Skeppsbyggningen" (the yard) on *Rotskär* was a naval yard in 1564–93 and in 1609.¹⁷² If private shipbuilding took place there at any other time, it is not known, but probable. Another shipyard was situated on the opposite side of the mouth of the Dalälven River during the first part of the eighteenth century. It was discovered during the survey on a detailed map of AD 1749 (fig. 53).¹⁷³

A repair yard for the Swedish navy was also located on *Lilla* (Little) *Rotholmen* in *Ornö* parish, *Södermanland*, in 1565–70.¹⁷⁴ In its vicinity, *Stora* (Big) *Rotholmen* can of course be found. Several other terrain names clearly possess the same denotation. *Rotsidan* is a natural



Fig. 53 Map of the area east of the mouth of river Dalälven, Uppland, in 1749. Due north of the settlement of Sägabo, a shipyard, "Skiepsvarfvet", has been marked, more or less unknown in records, but a local tradition still lingered on in the 1970s. (Photo: Lantmäteriverket [LMV], Gävle)

reserve of barren rocks beside the sea and provided with precisely those wind-swept crooked pines (Swed. *martallar*) that we are looking for here, in Nordingrå parish, Ångermanland. The last place-name element contains the ancient denotation of *sida* in Norse (or Swedish), meaning “coastal stretch”. In this case, we should perhaps ascribe these resources to the building of fishing vessels, since the parish in question possessed a significant number of fishing farmers and well-frequented seasonal fishing harbours, of which at least two, (Sör)fällsviken and Barsta, were directly adjacent to *Rotsidan*.

In the Häverö parish in Roslagen, Uppland, we find *Rotholma* east of Herräng. These are all well-known shipbuilding districts. The same deliberation as for *Rotsidan* in Nordingrå parish above applies to *Rotskären* in the Möja archipelago and for *Rotnäs* with *Rotören*, north of Grossgrunden in the archipelago of Holmön in Västerbotten. On *Rotholmen*, Stranda, Småland “pines were rooted out, i.e. broken up pine roots were used to make ribs for vessels”.¹⁷⁵

Another important, albeit straight, ship element would have been beams, Swed. *balk*, *bjälke*, which can also be found in place-names. *Balkholmen* (now spelled *Barkholmen*) in the same area as the preceding *Rotholmen*, may be a case in point.¹⁷⁶ *Skutvedharen* is a fairly small skerry south of Maråker in Southern Hälsingland, marked on a map of AD 1817, which may have been used for procuring ship timber, dialectal Swed. *skutved*.

Straight, yet resilient masts of pine are imperative for efficient sailing. Normally these timbers are only found far inland, since they have to grow in forests protected from storms. On the other hand, they must not grow too quickly either. Preferably, they are taken from very dry (heath-like) terrain, indeed not found everywhere, especially not in the more accessible South. During the period of the English protector, Oliver Cromwell, in the 1650s, Sweden was allied with England and, according to the terms of the treaty, Sweden would deliver masts for the British Navy. They were cut in the forests around Lake Vänern, shipped across the lake and exported by way of Gothenburg. Scores of place-names denote resource areas (*Masthugget*, *Mastviken*) and harbours (*Masthamn*) for this product. The most favoured forest area during the nineteenth century was Fägre, more significantly in the neighbourhood of the Göta Canal, cutting across central Sweden, the canal being finished in this part, and Västergötland in AD 1822.¹⁷⁷ The Norwegian *Mastrevik* has been interpreted in this way¹⁷⁸ and Modéer has got¹⁷⁹ *Mast träs holmen*¹⁸⁰ in the archipelago of St. Anna, Östergötland.

It should be noted that an impressive number of Norwegian place-name indications for forestry in general, and including ship timber, were collected in a unique work by Alexander Bugge.¹⁸¹ There is, for example, a *Mastterud* (1585) in Bamle, Southern Norway, possibly of thirteenth-century origin. Bugge reminds us that the word “mast” is a foreign import in Norse. The earlier term was *sigla*, which is found in *Seglerudt* (1587). Mast wood could also be called *skatviðr*, as in *Skatviðató* in Østfold, also recorded in the sixteenth century.

In the absence of other material, there are, as always, critical source problems for any kind of indicated wood. For example, such names in the skerries may be a memory of wreckage from a foundering or constructions for fowl hunting.¹⁸² In a forest, however, they could have only one meaning.¹⁸³

Early Timber Floating Inland in the South

The resource landscape inland reveals itself sometimes in names which are of a more general character but still refer to ships. Sometimes they denote settlements that must have had their inception during the Middle Ages. The last element is usually *-hult*, meaning wood, copse, or small forest. It therefore seems likely that they are of medieval dating.¹⁸⁴ At least twenty localities exist in Southwestern Sweden with the name type *Skeppshult*, *Skeppshult*, *Skipshult*, *Skipalt* – the last a less easily recognized dialectal form. Moreover, in at least a few cases, they

seem to have been reduced from an original *Skipvidahult* (*skipvidher* = “ship timber”), which is a place mentioned in the oldest provincial law of Sweden, *Västgötalagen*, dating from around AD 1230. This place is the present *Skeppvidahult* in the parish of *Skepphult*, Mark, Västergötland. Bugge records a Norwegian occurrence, *j skipwidadale*, *Skipviðadalr*, from the end of the fourteenth century, a place-name that has since disappeared, but it derives from the same word.¹⁸⁵

A series of parallel rivers run to the province Halland – an area belonging to the Danish realm during the period in question – from the large inland plateau in Västergötland where most of these localities are situated, and accordingly to the coast of the Kattegat. An interesting and very likely conjecture is that these oaken timbers were floated downriver and can be found in medieval Danish shipwrecks. There are a few possible dendrochronologically dated wreck finds, for which the origins of the main timbers in Western Sweden have been established by research. It is not known if the respective vessels were built upriver or only at the mouths of the rivers, in this area often the sites of medieval towns – or possibly of monasteries.

A comparable group is possibly constituted by the *Skeppsmor*- names in Eastern and Northern Sweden. Some may refer to oak, but not north of the Dalälven River. Oak was felled for ships in later times in the West, up the Göta älv river, to such an extent that large, once thickly forested areas still appear as open heaths called *Svältorna*, approximately “the starved or starving places”.

Thus the dynamic of the resource landscape of shipyards appears to be not an isolated ship-oriented observation but also constitutes a vital part of forest history.

Archival Research

To be able to pinpoint ship and boatbuilding sites, it is always necessary to study archival material, including maps. In addition, works on urban and local history were used, some of them with scientific ambitions. In my case, most of the archival work on wooden sailing ships was carried out during the years after the conclusion of the survey in the field. This work ultimately developed into a card register of almost four thousand ship names initially, although in the analysis of each entry (ship name) there may be quite a few cases of duplication and other mistakes. Many difficulties, thus far unsolved, pertain to the identification of individual ships, despite fairly detailed descriptions. No other register or statistics existed for the whole period from the beginning, but certain periods and areas were covered by way of generous internal copy and note material, e.g. from Maurits Nyström.¹⁸⁶ However, this did not help much in site localization, which was a primary aim.

The building sites could only be registered by following the course of individual ships. The source material usually studied is that of registers for the exemption of Swedish-owned (but not necessarily Swedish-built) ships from customs duties, but only those destined for sailing abroad. This appears in tables in the form of an extensive diary (*fribrevsdiarier*) from AD 1759 to 1891 at the National Archives (*Riksarkivet*) of Stockholm. Length, width and height (not draught) are registered briefly. Many ships reappear here when the first exemption has expired or the ship has been rebuilt (*förbyggnad*, above) or changed rigging, i.e. changed its type (i.e. from ketch or schooner to brig or brigantine). Here the place of building is usually mentioned, but only in an elementary geographical form, such as the town. The shipbuilding sites were registered according to their customs district, which bore the name of the closest town. Thus, if one were only to study this diary, a huge percentage of the ships would seem to have been built in towns. Attached to this material is even more extensive documentation, with files for each individual ship (*fribrevshandlingar*). These files included details on the ships and more reliable identifications of building sites, mentioned above all in the *bilbrev*, the document declaring that the ship’s

builders had been paid properly and that the owners were accordingly not in debt. This document pinpoints the site quite accurately, often in rural areas. Since the signatures of these are often those of the people who built the ships, it may even be possible to trace the site by looking for these names in other (demographic) material. One should also point out that in any of these source materials, foundering and total loss may be mentioned.

However, small-scale ships destined solely for operation within the borders of Sweden are found here only if they changed their destinations for overseas transports. Some obviously could not. I found the most important complement regarding such ships in material largely overlooked at the time, in the Town Archives of Stockholm. It is the ship's measurement books of the principal customs office (*Stora Sjötullen*) in Stockholm, called *skeppsmätareböcker*, and it is very likely that most ships passed this examination during their existence, even those that sailed overseas. This covers the period from 1779 to 1866. However, it was possible to show that many ships may have escaped this control, only to be found in the measurement documents (*mätbrev*) issued by the local town magistrate. If this is the case, then we may have a real problem, since this local material could be poorly preserved (war, accidental fires, etc.). However, what still exists is most reliable and to the point. Pekka Toivanen has also used the material from the Town Archives of Stockholm extensively in registering Finnish-built ships.¹⁸⁷ Once again, it must be said that a large number of the ships in both registers were built in Swedish Pomerania, which remained Swedish until 1815. Other material can be found – in some cases only – in the archives of sailors' associations or shipping offices (*sjömanshus*). This and other local material is usually preserved in the Regional Archives, *landsarkiv*; in this case primarily in Härnösand, Ångermanland. The information for the Western Swedish Vänern area is found in Gothenburg. The latter has, however, not been studied very actively by the present author.¹⁸⁸

There is earlier material as well, especially *Attester för sjöexpeditioner* at the National Archives, but not entirely complete, dating back to the seventeenth century. It has been studied to a certain extent.

A preliminary number of ships has been registered in the following counties/provinces:

Norrbottnens län (adm. county), around 1,200

Västerbottnens län (adm. county), around 550¹⁸⁹

Västernorrlands län (adm. county), around 1,100 (around 600 in the province of Ångermanland, and around 400 in the province of Medelpad)

Gävleborgs län (adm. county), around 1,600 (around 500 in the province of Hälsingland, around 400 in the province of Gästrikland without Gävle, and perhaps 700 in the town of Gävle?)

For Norrland proper, then, a total of 4,450 ships would seem to be covered preliminarily. Nevertheless, I wish to repeat that this is a marginally imprecise result. In addition, it should be noted that for the province of Österbotten in present-day Finland, about twice this number of ships might be registered as were built there.¹⁹⁰

The survey covered a part of the province of Uppland as well, but this has not been recorded in the same way.¹⁹¹

A note on the boundaries of the units cited above: The administrative counties of Norrbotten and Västerbotten correspond approximately to the old province of Västerbotten, which is identical to the administrative county of the same name before 1809. There are some losses in the North (to Finland), which was transferred to the Grand Duchy of Finland, now a part of the Russian Empire, when peace was made at Fredrikshamn in that year. However, the loss of land in the North does not mean that the part of the customs district of Torneå, now inside Swedish Norrbotten, has no shipyards registered. The Swedish part of the Torne valley and the parish of Kalix belonged to this district. It is from here that the best traditions of the communal character of rural shipbuild-



Fig. 54 The main survey area of the author.

ing were derived. This was an active shipbuilding area during certain periods. In the same way, it might be difficult to distinguish between the area of the older town of Piteå (1621) and its district and the later town of Skellefteå (1845) in the South. Before 1809, Skellefteå belonged to the district of Piteå, down to the parish of Lövånger, with the landmark spit of Bjuröklubb. Furthermore, Skellefteå now belongs to the administrative county of Västerbotten whereas Piteå belongs to Norrbotten. The ships that were built in Skellefteå before the division, and which formally belonged to the district of Piteå, have undoubtedly been covered to a large extent by several authors.¹⁹² In the South of Västerbotten, we have the additional problem that the parish of Nordmaling belonged to the province of Ångermanland, but since 1810 has belonged to the administrative county of Västerbotten. This parish has been documented in the context of Ångermanland, by Hellman (1947). Here, it is a part of Västerbotten (Västerbottens län).¹⁹³

Town and Countryside

What were the proportions between pure urban yards and others? A preliminary answer will be given here, but with some reservations for ships only registered for the county or province without any further specification. It is much more likely, however, that such ships were built in rural areas than close to a town. The town would surely be mentioned, since this was the usual attribution. On the other hand, there are quite a number of ships which have been registered with a town as its origin, but can be demonstrated to have been built entirely in rural areas (sometimes even rebuilt there). As we have seen, numerous factors may influence the location of shipyards. The work of Ian Layton should be consulted on the progressive displacement of town (and other) harbours due to land upheaval and other factors.¹⁹⁴

Judging from Boberg's catalogue (Boberg 1977: 12), there were 235 ships built in Umeå (the town was founded in 1588 and refounded in 1621), but the rural areas of the county contributed altogether 262. Skellefteå became a town in 1845 in the old district of Piteå, as mentioned above¹⁹⁵ (map of northern Västerbotten by Peter Gustafsson, see fig. 39).

In Ångermanland, according to preliminary calculations, around 300 ships were built in the town of Härnösand (founded in 1585). The countryside must have contributed at least 250. Other towns in the area were established rather late and date back to the industrial era: Örnköldsvik, founded in 1894 (*köping* 1845), Sollefteå in 1916 and Kramfors in 1920.¹⁹⁶

At least 250 ships were built in the town of Sundsvall (founded in 1621) in the province of Medelpad. The rural area appears to have produced considerably fewer, only around 150 ships. Here, however, one of the most concentrated and productive of the shipyards outside of urban areas could be found in Norrland, the *Wifsta varf*, where there were between at least 65 and as many as 185 registered original ship constructions.¹⁹⁷ However, this was a regular industrial enterprise, like several others in the area.

At the moment, the other areas have not been calculated in the same detail. However, Norrbotten in the far North exhibits similarities with Västerbotten. Here, the towns of Torneå, Luleå and Piteå were all founded in 1621.¹⁹⁸ However, at first glance, 800 ships appear to have been built in the urban areas and around 400 in rural areas at a number of very minor sites. The areas of Piteå and Luleå produced at least 300 ships each, Luleå rather more, and Torneå so far around 100. There were therefore three older towns compared to one in present-day Västerbotten (but two in 1845). As previously noted, all four towns belonged to the old province of Västerbotten.

It seems obvious that the tendency already found in Medelpad of a significant predominance of urban ship construction prevails southward. The towns in Gävleborg administrative county were in the province of Hälsingland, from the north: Hudiksvall (1585), Söderhamn (1620) and, in the province of Gästrikland, Gävle (before 1446). In a separate work, I was rather surprised to find that a considerably larger number of ships were built in Söderhamn – 234 – than in Hudiksvall, with only 104.¹⁹⁹ Probably the reason for this difference is that a large number were built in Söderhamn in fulfilment of orders from the nearby metropolis of Gävle. Still, this is of little significance in our connection. Quite a number of small shipyards existed in rural areas, even adjacent to Gävle.²⁰⁰ The early crown-built ships of the sixteenth and seventeenth centuries have been left out of this survey of ships, even though, interestingly, some yards were found in rural areas.²⁰¹

There is in fact a slight “formal” predominance of urban production in comparison to rural shipyards. As a conclusion, one must remember that quite a number of ships were registered as having been built in cities anyway. Some of them could not be attributed any other way, as the primary sources are lost. As has been pointed out above, only insufficiently available local source material may give a finally correct answer.

In the early days, where no regular documentation exists at all, it appears that most of the ships owned by a town were in fact built in rural areas. A government commission with mercantilist ambitions, led by Daniel Behm, visited Härnösand in 1646 to explore *lastadier* (harbours including shipyards) in its neighbourhood and to encourage shipbuilding, among other things.²⁰² It was then found that no ships were built in the town at all. Almost all the ships owned by townspeople were built in rural areas of the province, in spite of the fact that a crown shipyard was already located close to the central part before the foundation of the town in 1585.²⁰³ In a way, this situation was natural, since the burghers of the city were recruited as rural merchants (*landsköpmän*) by the crown.²⁰⁴ Nevertheless, it was highly unnatural according to the policies pursued by the crown, with its generally sceptical attitude toward non-agrarian ancillary industries in rural areas. It was in line with this attitude that the rural merchants had been brought into the cities more or less by force. A further complicating factor is, as mentioned, the Bothnian Trading Compulsion, which directed all traffic to Stockholm. The development of the towns in Norrland was curbed. They essentially remained large villages with divergent professional structures.

During the survey and the subsequent years, the following numbers of shipbuilding sites were registered in the provinces under scrutiny:

Norrbotten 114
 Västerbotten 44
 Ångermanland 68
 Medelpad 31
 Hälsingland 30
 Gästrikland 14

The sum for Norrland proper, including cities, is 301.



Fig. 55 The wooden tracks and sledges of a reconstruction of *Jakobstads Wapen*, launched in 1994 in Jakobstad. A ketch (*galeas*) with this name dating from 1767 was the first to be built and sail from the town after the partial abolishment of the Bothnian Trade Compulsion. The design was that of F.H. Chapman.



Fig. 56 The slipway of the shipyard at Alderholmen, Ursviken, in the mouth of the river Skellefteälven, north Västerbotten. It is still comparatively easy to discover. Tradition is alive. The remains of the smithy can still be seen close to the slipway. The last tall ship built here was the *Antoinette* of 908.8 tons in 1880. (Photo: Seth Jansson, Tierp, 1979)

amounting to more than half the total number. They have been published with certain later additions in *Norrlandsleden II*.²⁰⁷ Conversely, a smaller number would have been built in the remaining provinces of Västerbotten, Hälsingland and Gästrikland. However, the comparison is a bit flawed, since the town of Gävle in Gästrikland has the greatest individual production of all sites north of Stockholm.

Thus, ships continued to be built in rural areas until the very final phase of wooden sailing ships. It appears that the northernmost part of the survey area preserved this somewhat old-fashioned structure somewhat longer than the southern part. The structure in the North presumably reflects traditional values in coastal shipping and social structure. Corresponding tendencies were already found in the late fifteenth and sixteenth centuries.²⁰⁸ Maurits Nyström

Uppsala län 20 (northern Uppland down to and including Öregrundsgrepen 5).

Stockholms län 25 (excluding cities and an uncertain number of rural sites; another more extensive local survey of only Vätö skeppslag in the very south [Stockholms län] lists as many as 65 sites).²⁰⁵

Accordingly, altogether 400 shipyard and building sites were registered during this particular survey, with a potential for considerably more, at least in the far South. How many of them have been precisely localized? A qualified guess would be less than 170. My experience clearly states that, due to their highly differing state of preservation and variable antiquarian relevance, it would seem that a choice among them for establishing historical monument status should be made only *by combining what is above water and what is under water*.²⁰⁶

These are minimum numbers, yet there seems to be a clear relationship between the number of ships built in each province and the number of sites. About half of the registered ships, around 2,300, were built in Norrbottens and Västernorrlands län (administrative counties) and there are no fewer than 213 building sites,

comes to the same conclusion as that found here: "The total number of shipbuilding sites argues in favour of a majority of the shipyard enterprises being located in rural areas."²⁰⁹ His material covers the period from 1765 to 1812. In any case, during the whole of the period of the survey, there would have been at least fifty to sixty shipyards located in or very close to towns, i.e. up to fifteen/twenty percent, depending on how distance is measured. The pivot from the predominance of the countryside to that of the town is found in the province of Medelpad. There, urban-based shipbuilding took over successively. The urban influence is filtered above all by the active shipping town of Gävle. Nevertheless, it should be remembered that maritime enclaves active to the very end of the sailing era also existed in parts of the southern area and on the opposite side of the Baltic, in Åland and Finland. These enclaves were not only found in this area, but also in Britain, Estonia, and Anglesey, etc. At least until well into the 1880s, the economic family structure of peasant / skipper / part ship-owner presupposes not only second-hand tonnage, but also some new ships built more or less in their own backyards.²¹⁰

The Cognitive World of Shipbuilding

To be able to understand the cognitive significance of ship and boatbuilding and of the localities where they were carried out, I believe we have to listen attentively to tales and other oral tradition. By "cognitive" I mean beliefs, on boats in general, on the metier of ship carpentry, details of construction, shipbuilding, the daily work, fellowship, conflicts, and how the drama of the launching and sitting on the shore were generally perceived and interpreted by people nearby.

I am not entirely convinced that it is relevant today to talk of a particular category of preserved shipyard tales or legends. I know some that could be relevant, but I also know that the bulk of the stories associated with shipyards is not preserved, so it is likely that old people would have easily referred to them more or less in terms of a category. Thus, to be exact, there are only fragments.

In my survey context of Swedish Norrland, the last period of the wooden ships of the late nineteenth century was the first period when field research on local folklore and ethnography was established. Yet the focus was entirely on the life of the agrarian countryside, apart from some excursions into the exotic life of the colourful Saamis, the reindeer herders in the mountains. To be sure, shipyards were one aspect of the countryside, but maritime culture was not interesting at that time. It entered through the backdoor of bourgeois leisure time out in the archipelagos, living among picturesque fishermen's villages. Sailors and industrial workers were not interesting in this sense. Shipyards could be related to both, in terms of employment in harbours and loading places, size, intensity and connections to sawmills.

We have included a selection to give an indication of the range of past stories and beliefs:²¹¹

The primary school teacher, Artur Olofsson, remembered the summer of 1891. He was twelve years old and lived in Degerfors, Västerbotten, where he herded sheep and goats. At that moment, he was trimming his toenails. An old man, Karl-Anton, passed him and exclaimed, "Are you making boat planks for *snöjven* (the devil)? Pick up those pieces of nail and burn them. If you are throwing them around like that, *snöjven* will come by and take them, and you may be in for some real trouble."

This was an unreasonable idea to young Artur. His father explained to him that people in the old days were afraid that anything once belonging to the human body, like hair, nails, or, indeed, even the dirt that was washed off, could fall into the hands of trolls and evil people. They might use them to cast a spell of illness and other bad things on the original owner.²¹²

Having interviewed a large number of people during the last century, this is not an unknown idea to me. I have heard several varieties. In the church of *Hjembæk* on Sealand, Denmark, a small box is displayed in the form of a coffin. In it, all such kinds of personal bodily refuse was

supposed to be preserved. When the individual died, the small coffin went into the larger one. The text informs us that if the dead person did not receive the box, he would walk the earth and demand it back. Apart from possible injury when he was alive, even the dead person could be damaged by magic using his bodily refuse. Another reason was that the corpse should always be complete at the time of the burial.

To anyone familiar with the practise of black magic, the technique of using something associated with a person or an object is known all over the world.

However, the local flavour reveals itself in the reference to the boat planks. As Olofsson himself²¹³ points out, the association with the ancient Norse representation of the ship of the dead or the ship of death is obvious. This ship has a specific and illuminating name, *Naglfar* (Norse *nagl*, “nail”). According to the *Voluspá*, “the prophecy of the *völva*” (sorceress), *Naglfar* contains the tribe of Muspell (the fire) on their way to Ragnarok, the end of the present world. The trickster Loki is the skipper. Snorre Sturlason, who has conveyed this pagan belief to us, gives the advice precisely about the nails of dead people. They should always be trimmed in order to delay the *Naglfar* as long as possible. When Ragnarok, doom, is imminent, the ship appears together with the raging monster wolf, Fenris. Detlev Ellmers has proposed that *Naglfar* is actually depicted on Gotlandic picture stones and is shown together with the cosmic wolf on the rune stone of Tullstorp, Skåne.²¹⁴ This representation may be a long-continued, prehistoric Nordic tradition. In fact, the Danish archaeologist Flemming Kaul proposes that the crew markings on razors depict the souls of the ancestors in a similar way.²¹⁵ It is not a far-fetched thought for this author to suggest a similar idea behind crew markings of ships, the main motive depicted on rock carvings of the same period.

Not only nails are interesting for the coming battle. Snorre tells us that when people make the heels of shoes they cut and throw away small pieces of leather. They should be saved, in order to make a shoe that Vidar, one of the gods, has on his foot when he puts it into the jaws of Fenris.

In July 1976, I was interviewing the Holmön islanders in Västerbotten, Northern Sweden. I think that most of the people there gave valuable information on maritime life in this unique community. One particular story that was told to me stood out. It was sensitive information, since it was intimated to me that some living people might be offended by it. In what way, I never found out. In view of the fact that I am now aware of its character as a migrant tale, I strongly doubt what I was told, especially due to the fact that it had been quite some time before that this islander had heard the story from an old ship or boatbuilder.

“There was once a woman in town [Umeå] called Branska. She used to wash for people and was allowed to get her firewood from the refuse at the shipyards of Teg. People were a little afraid of her. If anything happened that seemed untoward [probably this even meant under a spell], they used to say, “Shall we send for Branska?” Well, in those days a new foreman came to the shipyard. Starting out in a new position, he of course tried to be tough. He told Branska that she would no longer have the privilege of using their wooden refuse for firewood for free.



Fig. 57 *Branska* alive. (Sketch: Christer Westerdahl)

The shipyard needed it for its own purposes [in this context it probably means that steam machines were introduced]. Branska grew angry and was overheard muttering something like, “They will pay for this ...”

Now, there was a large vessel on the slipway about to be launched. However, when they had moved it just a short stretch,

it stopped. All kinds of tricks were tried to move it further down the slipway but they all failed utterly. Then there was a fellow in the working team who suggested that maybe they should send for Branska. They did and she came. Branska was informed that she could continue to take her firewood for free if she succeeded in lifting the spell, or whatever it was.

As soon as she arrived, she lifted her arms. The team then saw something they had never seen before: on each side of the ship was a large man putting his weight against the hull. Branska said something to the men; they went away from the ship, and it slid down into the water by itself. The two fellows disappeared with it into the river.“

As mentioned above, I realized early on that there might be traits of a migrant tale in this story, having recorded a similar story from another part of Sweden, Lake Vänern in the southwest.

In the 1830s, on the island of Hökön, in the very centre of this lake, there was a shipyard for *blockskutor*, a ship type peculiar to Vänern, used for the transport of *block/ar*, unbarked logs. The lake had its greatest forest resources on the northern shores in Värmland, and it was almost impossible to transport the timber to the South in sailing ships, floating across these wide expanses of water. Some of these craft were, according to tradition, so large that they could not enter the canals, and thus they were confined to the lake.

“During this time, there was also a sea-inn on the island. Another was the well-known inn of Pirum, quite close to the southern side. The carpenters of the yard always went over to the latter, to the “wrong” place. The innkeeper on Hökön was a woman. At last she decided to take revenge. She was reputed to use sorcery and was in no way innocuous. A new *skuta* was standing on the slipway. When it came to launching the vessel, the undertaking failed utterly. These fellows could not move the *skuta* an inch. Depressed, they had to console themselves at Pirum the following night. They also had to confide their secret. The advice they were given was to try the following Sunday. During the mass, no spells would work. They sailed back. In spite of the fact that working on a holiday was prohibited, they managed to push the ship into the water without any difficulty, at exactly the point in time when the parson was preaching in the church of Eskilsäter (which is the relevant parish church).“

The original version of this tale was transmitted to me by Iwan Schyman, a local historian on Värmlandsnäs (d. 1969). Other versions have varied somewhat in the details but basically contain the same principal structure.

An obvious comparison should of course be made with a well-known motif in Nordic tradition as transmitted by the *Edda* of Snorre Sturlason:²¹⁶

The god Balder was such a likable and gentle person that the other gods took a pledge from all living creatures (things) that they would not damage him. However, they forgot the unassuming mistletoe (if this really is what *mistelten* means here). The trickster Loki realized this and presented an arrow made from mistletoe to the blind god Höder. He directed the bow shot himself, and the arrow went straight into the heart of Balder. Afterwards, however, everybody wanted him back from the realm of the dead. The condition would be that everybody in the world – gods, men, giants – would mourn him. But one giantess, called Thökk (who was Loki in disguise) refused to do so.

The gods now had to prepare a burial ship for Balder and his consort Nanna, whose heart had burst with grief over Balder. However, they could not get it into the water, not even the athletic Thor. A spell must have been cast. Then a grotesque giantess arrived, called Hyrrokin, who was mounted on a wolf and used vipers as her reins (this was Loki once more, in a new disguise). She pushed the ship so hard that it caught fire and the earth trembled. Thus, the ship went out into the sea in flames.

This is, accordingly, a myth, which epitomizes the relationship between launching a ship, the sea, land, fire and a woman. Loki may not be a real woman, but he is not real anyway, he is a trickster, an ungendered in-between. If there ever was a liminal agent of myth, it is he.



Fig. 58 Different kinds of maritime sorcery were exercised by men and women alike, according to Olaus Magnus in his *Historia* 3:15 of 1555. A ship is seen foundering in the sea in the background, possibly at the instigation of the witch pouring water from a kettle turned upside down to the right. The man on the shore in the foreground seems to wield a staff with a seal cranium on it. According to ancient folklore, not least in the Bothnian region, the skeleton of a seal was particularly powerful on land.



Fig. 59 The power of the Finns to master the winds by way of knots as described by Olaus Magnus in his *Historia* 3:16 in 1555.

According to tradition, Finns and Saamis were supposed to be the most efficient sorcerers at sea. With relish, even the cleric Olaus Magnus mentions in 1555 with pride²¹⁷ that Scandinavians have as powerful magicians as any (fig. 58). Above all, they can catch the wind.²¹⁸ The Finns were already feared in the thirteenth century in a European orbit. I have suggested that the basic component in this position is that both peoples were supposed to live entirely inland. On the sea, they would thus serve as liminal agents.²¹⁹ In the two stories recounted, only the Väner woman, *finnkäringa*, was supposed to be Finnish. On the other hand, they represent a gender with another liminal power.

Nevertheless, the notion that the two newly built ships had been stopped on their slipways is closely related to the traditional ability of Finns to “place” or “set” (Swed. *ställa*) ships, as well as to give them wind and make them sail (fig. 59):

“Once, a Finn came sailing to Härnösand. He and his captain had quarrelled with each other during the journey, and the captain refused to give him his

pay. The Finn threatened him by saying that “he would regret this”, whereupon he recited (Swed. *las= läste*) something. At that moment, no one, neither the captain nor the rest of the crew, paid any attention to him. However, when they were about to leave, it was impossible to make the ship move. It was as if they had driven onto a rock. Then the captain had to yield and pay off the Finn, as he understood that this was his work, and then everything was all right.”²²⁰

Of course, it must have seemed a nightmare if the ship could not be launched. Simplistically, fear of such a situation could certainly have produced stories of this kind. There are many dangers inherent in traditional shipbuilding. The everyday, small-scale variety meant design by eye, without any drawings or any kind of mathematics. There were several colonizers in Lapland, who built their boats indoors during the winter. One of them had built a boat, which was too big to haul out of the entrance or the window, which had been his intention from the beginning. I heard a story contemplating the fact that the cottage that I studied had had half of its shorter log wall cut away and replaced. The measures taken to ensure that the launching

would go well were traditional: mostly by way of the eye and simple calculation, depending on the natural context, launching from the side, launching stem first or stern first, even building on the ice (which required particularly intimate knowledge of the foundation).

However, there are quite a number of other deliberations to be carried out, as there are indeed a structural world to explore and transcendent functions to understand.

There is a clear gender motive in these stories. The sorceress is reputed to be a woman, and as everybody knows, a woman should ideally be present anyway, although in the form of the ship-owner's wife or daughter, to name the ship at the launching. Does she represent the antithesis? In the opposition between land and sea, the normal master of the sea is a mistress. It has been thought auspicious to give a female name to most vessels. However, here we meet women in dual roles. Why? The loaded content of females at sea is the most striking feature of maritime cosmology. Some of the strongest and most well-known taboos in maritime culture pertain to women, but at the same time certain females, supernatural or real, are extremely good to meet or use at sea.

They are what I have called *liminal agents*. Precisely because they are identified with land, they are strong and fickle but generally favourable at sea. This strength they had acquired by passing the liminal border of the shore.²²¹ This could be transferred to the launching of a ship into its new element.

The migrant motifs of these stories do not need a woman. Magic could be connected to the Catholic Church in medieval times. Referring to miracles ascribed to St. Thomas of Canterbury, the obvious example is that of Schleswig dating from the end of the twelfth century:

A wealthy man in Denmark, a citizen of the town of Schleswig, had a large ship (*navis magna*) built at great expense. The king of the country decided to join a trading company and take part in the gains. As he had provided half of the capital, he became the owner of a corresponding part. When the ship was built and ready to be launched, it could not be moved because of the huge size of the hull, and even when it was pushed all the time, runners placed underneath, and ropes for pulling were applied, the efforts were in vain. Then it became clear to everybody that the ship would have to be scrapped. To avoid wasting his endeavours and financial expenses, the despondent owner of the ship decided to make the new martyr Thomas of Canterbury his spokesman. He turned to him with the words: "If you ensure that this vessel reaches deep water, martyr, I promise you 100 pounds of wax from each of its trading voyages." Moved with the pressure of bare hands and with much less strength than before, the ship then slid (as if) over a slippery surface in an easy glide into the waves. And the commitment established through the promise is continued into our times.²²²

Magic was obviously necessary in shipbuilding, and not only at the launching. It always runs parallel to function, which may make it difficult to discern and distinguish. Nevertheless, magic

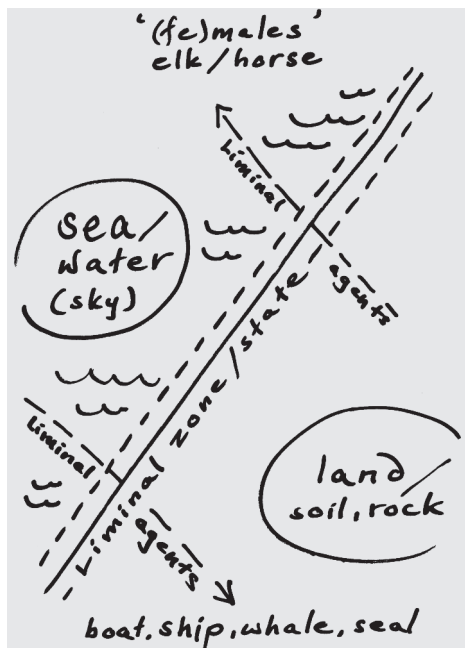


Fig. 60 A sketch by the author to illustrate the liminal zones and various liminal agents of sea and land bringing their power to the respective other element. A shipyard is always situated at the dividing line, hence the ceremonies of launching.

is there and often there are material traces of it. Rituals accompany the entire process. The first thing done at the boatbuilding site is the laying out of a keel. There is documentary as well as archaeological evidence of the widespread custom of placing a coin under the heel of the mast.²²³ The keel is fastened to the stem and stern pieces. Here, we find coins in scarves between the keel and the stem or stern. All these magic customs were common at the shipyards of the Swedish-speaking part of Finland, with unusually accessible source material.²²⁴ These coins were supposed to be especially efficacious during launching – and all the more so if they had been minted in the year in which the ship was launched. This rule is so important that it seems to be a complementary possibility to dating and even identifying shipwrecks. In my previous work, I recount a particularly illuminating example of how problematic this can be, even though one might possess a large number of reliable sources.²²⁵

The earliest archaeological records of such coins concern ships in Roman times, not least the famous *Blackfriars* find of London in the third century AD. Nowadays, it comes rather late in the series. In fact, the *La Chrétienne* wreck of southern France, dating from around 150 to 100 BC, had a mast step coin (punic) and there are several others dating from the first and second centuries BC.²²⁶ In other contexts and times around the world, the object inserted could have been a phial of quicksilver, a silver goblet or nail, cowries, blue beads or a bone of a protective animal, e.g. a bird – a spirit of the ship – which would warn against storms. Something of even less distinct value to the archaeologist was the excellent properties of wood that was anomalous



Fig. 61 Detail of the Bayeux tapestry dating from the 1070s, illustrating the two main processes of shipbuilding, the cutting of the trees in the forest and the building on the shore.



Fig. 62 The barren islet Kummelbådan at Söderboda, a shipyard site at Gräsö island in Uppland. (Photo: Christer Westerdahl, 1977)

in some way, especially if it was stolen and then would suffice for protection, preferably at night.²²⁷ Since Nordic ships often contain intermediate wooden pieces in their keel area, (the *kri*) the potential space for magic charms is there. Most of the material I collected on ship timber concerns the cognitive qualities of the origin of the wooden parts and the circumstances in procuring them, e.g. that the timber should grow in a certain way and a certain place and always be cut at new moon. Thus, even the resource landscape for shipbuilding is not without transcendental aspects, even though it may appear only as function. Obviously, the crucial importance of the first and central component of the ship was marked by a ritual act.

Otherwise, the sacred space of a late Iron-Age Nordic sailing ship was *the portion closest to the mast*. All ritual acts took place here. The classical Viking galley has a beautifully carved

mastfisk, “mast-fish”, reminding us that this portion might have been thought of as the micro-version of the entire ship, another pars pro toto swimming in the ship as in the water. Yet what would be the meaning of a fish placed on the back of a boar, the *kölsvin*, “keelwine”, the keelson? Is the desired effect that of a *liminal agent*? Such a taboo phenomenon is taken from one element, and acquires a particular magical power by transgressing the border (Lat. *limen* = “threshold”) to the other element. The prejudice against naming swine at sea is one of the strongest and most persistent in recent times.²²⁸

It may not be preposterous to consider even the caulking or luting (the latter term for lapstrake/clinker) material in the light of the contrast between sea and land. So far only ethnic or functional significance –if any – has been proposed for the fact that West Slavonic ships during the Early Middle Age are luted with moss of a very particular species, *Drepanocladus*²²⁹, and Nordic ships with animal hair, presumably cow hair for the most part. Could it be that they were supposed to give better protection because they represent inland environments as opposed to the shore?

The secondary use or recycling of certain ship parts at shipyards has been referred to above. Is it just the functional properties that are relevant to the builder? Would it not be reasonable to assume that part of the attraction would be the possible transfer – from an old ship to a new one under construction – of the luck, heroic deeds and other favourable associations connected with the old ship?²³⁰

In a circular moment, we have returned to the elementary fact that a vessel must always be solemnly and ceremoniously transferred to its new element by an agent, be it a woman of high status²³¹ or a Maori priest.²³²

A Brief Conclusion

In conclusion, it can be said with some confidence that pre-industrial shipbuilding sites epitomize not only the ritual, cognitive, technological and functional character of the building and launching process itself. As temporary microcosms, they are also a part of the maritime natural and cultural landscapes, the social and resource landscapes and geographies of the local people, the river landscapes included. As a reflection of society as a whole, they may be a metaphor of power and wealth, but they may also symbolize revolution and freedom. They are definitely worth more than a passing glimpse in the annals of maritime history, apart from their obvious ties to distant economies outside of their areas, which intrude on them perhaps only temporarily.

In the Bothnian area, I imagine that the communal character of shipbuilding is a particularly interesting aspect, for which, however, we will forever be compelled to refer to secondary and sparse historical sources. No oral material exists anymore. The available sources cannot provide more than a glimpse of it. As always, archaeology is the only science capable of creating its new source material.

In the old days, ships and shipping were much closer to human beings than they are today. This is a fact that must be understood in order to interpret the cognitive landscape of human beings of the past. Shipbuilding was part of many individual lives. Accordingly, the places where the ships were built took on a particular interest for ordinary human beings, in fact not only males, as can be seen in some stories illustrating the relationship between sea and land in gender fashion.

These sites concerned people deeply, especially those which were situated in the forested countryside, the main interest in this study. The ships built there were often remembered for a long time. Their individual destinies were also followed up in oral tradition, however augmented and

improved over time. Remembrance petered out with industrialisation and concentration to urban milieux, although fragments do exist in genuine traditions.

The shipbuilding sites had humanised the landscape, encultured it, and individualised place in one of many possible ways. Together, they form an inalienable aspect of the maritime cultural landscape.

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Archive materials:

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- Hälsinglands museum, the archives of the local, partly provincial museum of Hudiksvall.
- Krigsarkivet, the Military (War) Archives, maps and materials pertaining to crown authorities dealing with shipping formerly organized as part of the Swedish Navy, e.g. Förvaltningen för sjöärendena (FSÄ).
- Lantmäteriverket (LMV), map archives of the Swedish national land-surveying agency (LMV), Gävle (now moved).
- Länsmuseet Gävleborg, the archives of the regional museum of Gävleborg, Gävle.
- Länsmuseet Murberget, the archives of the regional museum of Västernorrland, Härnösand.
- Malmö museer, Malmö, the archives of the maritime museum, sjöfartsmuseet, file on shipyards in Skåne by Peter Skanse.
- Nordiska museet, Stockholm, folkminnessamlingen, folklore archives.
- Norrbottnens museum, the archives of the regional museum of Norrbotten, Luleå.
- Ortnamnarkivet, SOA, the Central Place-Name Archives, including Norrland, Uppsala.
- Riksarkivet (National Archive, Stockholm): Kommerskollegium: Huvudarkivet, Fartygshandlingar, Fribrevshandlingar (diaries 1758–1812, fribrevshandlingar 1768–1832).
- Stockholms stadsarkiv, City Archive of Stockholm: rådhusrätten, mätareböcker 1779–1866.
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- Svenskt Marinarkeologiskt Register (SMR), Statens sjöhistoriska museum, Stockholm.
- Västerbottens museum, the archives of the regional museum of Västerbotten, Umeå.
- Örnsköldsviks museum, the archives of the local museum of this commune., Örnsköldsvik

Other materials:

- Christer Westerdahl, private card archives of ships built in Norrland 1690–1925.
- Private archive papers of Erik Wickberg, Gävle (†).
- Oral material from almost countless local people (the list of survey names contains around 1,500 individuals for the years of the Norrland survey 1975–82, around 300 intermittently for Lake Väner) and for particularly valuable information in connection with this text Olof Hederyd, Vuono, Haparanda, Norrbotten, Olov Isaksson, Stockholm (†), Rolf Lundberg, Upperud, Håkan Ottosson (Nihlman); Stockholm, Peter Skanse, Skärhamn, Bohuslän, Pekka Toivanen, Jakobstad/Pietarsaari, Finland, Anton Englert, Roskilde, Denmark, Capns Thore Granath, Lidköping and Simon Granath, Gothenburg (†), interviews with Iwan Schyman, Värmlandsnäs, Värmland (†), Johan Edlund (†) & Karl Edlund (†), Holmön, Västerbotten, prof. Olof Hasslöf, Malmö (†) and Svante Hwarfvinge, Karlskrona.

Notes:

- 1 Westerdahl 1986, 1992.
- 2 Westerdahl 1978, 1987a, c, 1991, 1993b, 2004; but for a general overview of Nordic shipyard areas the best anthology is still *Sjöhistorisk årsbok 1947*.
- 3 Westerdahl 2003.
- 4 Buck 1957.
- 5 Broadbent 1982, loc. cit.
- 6 Sayce 1933: 51, referring to *Journal of the Polynesian Society*, vol. XXXIII.
- 7 Sayce, loc. cit., quoting W.E. Armstrong: *Rossel Island*.
- 8 Sayce, op. cit.: 6, quoting A. Hamilton: *Maori Art*; see below and Malinowski 1922.
- 9 Westerdahl 1987b, 1993a, 1995–98.
- 10 Westerdahl 1985: 31, 1993a.
- 11 Wright 1984, 1990.
- 12 Santesson 1941, later criticized precisely for the huge time span of his comparison by archaeologists like Gustaf Hallström. It was reasonable at the time, but we are slowly coming to realize the profound continuities in certain cosmologies.
- 13 Anisimov 1963: 86 (my italics in the last sentence).
- 14 Støren Binns 1987of
- 15 Westerdahl 1987: 14; 1995–98, referring to Olavi Korhonen, inst. of Saami languages, University of Umeå.
- 16 Westerdahl 1987: 38; 1995–98.
- 17 Based on physical anthropology; Stenvik 1980.
- 18 Malinowski 1922: 105ff.
- 19 One of the iron smiths in myths, Volund, was a chief of the alfs and a son of a Saami chieftain (Volundarkviða; the poetic Edda (Den poetiska Eddan 1972: 126f: transl. to Swed. by Collinder). Saami boatbuilders have been recorded as having built boats for the medieval and later Norse in Northern Norway; see above.
- 20 Nielsen 1991: 131f.
- 21 Interestingly, the term ‘smith,’ Norse *smiðr*, could mean any kind of craftsman, e.g. a *stafnasmíðr*, the ‘stem smith,’ i.e. a ship or boatbuilder.
- 22 Decaens 1971.
- 23 For recent references see Samdal 2008.
- 24 Arwidsson & Berg 1983.
- 25 Van de Noort 2004; Van de Noort & O’Sullivan 2006: 16.
- 26 Wright 1984, 1990.
- 27 Jæger 1988.
- 28 Andersen 1994: 10.
- 29 Paper by Garry Momber at Poseidon’s Reich, Kiel 2009.
- 30 Oral comm. Cheryl Ward.
- 31 Communication in 2008 at the Annual Meeting of the Society of Historical Archaeology, Albuquerque, New Mexico, by Sally K. Church; Cambridge.
- 32 Sinoto 1988.
- 33 E.g. Östergren & Varenus 1985; Westerdahl 1989: 252ff.
- 34 Rolfsen 1974; Myhre 1985; Westerdahl 1989: 246ff; Grimm 1999, 2001, 2003, 2006.
- 35 Myhre 1985.
- 36 There are no other signs of boatbuilding here; Thomson 1991.
- 37 Datings in Myhre 1980.
- 38 Rolfsen 1974; Westerdahl 1989: 251ff.
- 39 Myhre 1985; Grimm op. cit., Westerdahl op. cit.
- 40 See Ekroll 1988; Christensen 1995.
- 41 14C, calibr.; Myhre 1980; with margins AD 390–535, Fasteland 1996.
- 42 14C, calibr.; Myhre, loc. cit.; with margins AD 240–420, Fasteland op. cit.
- 43 Fasteland op. cit.
- 44 Calibr. Myhre op. cit. For a later (Merovingian) possible shipyard see Sylvester 2009.
- 45 Filipowiak 1994.
- 46 See Zschieschang for the Elbe area 2007: 219f.
- 47 Holmberg & Skamby Madsen 1998.
- 48 Skamby Madsen, 1984a, b, 1987a, b, 1989, 1991.
- 49 Christensen 1996, mostly from wrecks.
- 50 See Virtanen 1983 on nails from boat graves.
- 51 Bill 1994.
- 52 Stalsberg & Le Beau 2006.
- 53 Filipowiak 1994.
- 54 Lundström 1981: 74ff.
- 55 Nielsen 1991: 131.

- 56 Hansson 1985.
- 57 Vilkona/Taavitsainen/Forsell 1993; Taavitsainen 1999; Taavitsainen/Vilkuna/Forsell 2007; Westerdahl 1996, 2004b.
- 58 Ellmers 1972; 171f.
- 59 Ellmers op. cit.: 172, fig. 103, p 130.
- 60 Personal comm. Hajo Zimmermann; and Weski 1997: 364.
- 61 Jagodzinski/Kasprzycka 1991.
- 62 Crumlin-Pedersen 1997: 177ff.
- 63 Friel 1996.
- 64 Hutchinson 1994: 23ff, based on Watkins 1994.
- 65 See Ellmers 1972: 172; Arwidsson/Berg 1983; Christensen 1982; Westerdahl 1982; Crumlin Pedersen 1998; McGrail 1987; Samdal 2008; Vadstrup 1993, 1994.
- 66 E.g. Goodburn 1999.
- 67 Andersson 1996, 2003.
- 68 Oral comm. Ole Magnus. Lime bast is also used in prehistoric lashing/sewing of planks.
- 69 Very likely *Sphagnum* sp., not the West Slavonic *Drepanocladus* sp., note 220.
- 70 Ellmers 1972: Kalfatklammern, passim.
- 71 Vlierman 1996, 1997.
- 72 Krause 1997.
- 73 Paper at Poseidons Reich, Kiel 2009 by Ralf Bleile, Landesmuseum, Schloss Gottorf.
- 74 Christensen 1968. They are also fairly well-known finds in medieval urban excavations, e.g. in Skåne, Southern Sweden, e.g. Thun 1967.
- 75 Paper by Ossowski at Poseidons Reich 2009 in Kiel.
- 76 Hansen 1948, Strunge Andersen 1991.
- 77 In cases where the vegetational sequence has had time to switch from deciduous alder in the immediate beach zone to more profitable fir (pine) or spruce trees.
- 78 E.g. Toivanen 1983.
- 79 Friberg 1983; Jern 1980; Nikander 1942, 1947.
- 80 At one time I thought this included the migrant tale type from shipyards that I registered at Holmön, Västerbotten, and in Lake Vänern (below). The contact between Österbotten and Vänern could possibly have been direct, without any intermediary. After the loss of Finland, the Swedish general Adlercreutz who had been successful against the Russians in the battle of Siikajoki in AD 1810 got the large castle of Läckö, centrally placed in Vänern, as a reward from the crown. The castle even received the new name *Sijkajocki*, but it never stuck. However, this remains speculation. Neither can it be confirmed that shipbuilding that far south was included in the possible transfer from Finland. However, it is an example of how one has to proceed in tracing connections of this kind.
- 81 The first carvel ships were not always of prime quality as to their form. In 1739 a ship, *Elisabeta*, was built in Luleå, Norrbotten, in carvel technique, but proved to be terribly unsteady (Swed. *rank*). The shipyards of this town were to become one of the major reliable establishments precisely in carvel building in the area. On the other hand, clinker-built ships were also built to the very end, often in rural areas, and often rebuilt fairly rapidly.
- 82 Toivanen 1985, 1987.
- 83 Svensson 1944; Boberg 1977: 15, suggesting another sequence. Chapman was himself a part owner of the first barque ship, *Hertiginnan af Södermanland* in 1775. *Amphion* was built in Uleåborg in Österbotten in 1778 and *Åkers bruk* in Västerbotten in 1783.
- 84 Moberg 1961. A modern novel on this theme, partly including oral traditions, is Hederyd 1989.
- 85 Interestingly, a burgher of Uleåborg, Zackarias von Bonsdorff, was one of the owners of the Seskarö vessel. Possibly this is a reflection of the intense competition between Bothnian towns.
- 86 A law on peasant shipping called *allmogeseglationsförordningen*.
- 87 Moberg 1971: 96f, 124. Some of the numerous vessels built during this period not only used timber for their own construction but also exported local timber on their maiden voyages. The brig *Edward*, built in Sikeå, Västerbotten in 1835, carried a dismantled schooner in its hold to Australia. Another brig, *Oscar*, built in Luleå 1840, was sold in Argentina in 1842 with another schooner as cargo. In fact, it was sold to the dictator Rosas himself. It is possible that a wreck containing another dismantled ship has been located at Holmön in Västerbotten (AC 407; possibly Gustaf 1776, in Westerdahl 1987c).
- 88 Alanen 1956.
- 89 Westerdahl 1987c, 1989.
- 90 Nikander 1944: 152.
- 91 E.g. Berg 1987: 89.
- 92 Elfstrand 1946: 375ff.
- 93 Shipyards of G. F. Liljewalch in Luleå; Fahlgren et al., Eds, 1961: 18; Moberg 1971: 96f.
- 94 The first was Tunadal at Sundsvall.
- 95 Hartelius 1982: 176.
- 96 See Byström 1875.
- 97 Swed. *forminnesinventeringen* for economic mapping.
- 98 In particular the maritime archaeologist Seth Jansson, now Tierp.

- 99 Westerdahl 2003: 112, catalogue: 173ff. In comparison with the Northern Baltic, very few building sites were found along rivers in the lake Vänern area. Interestingly, the exceptions were the most productive yards of all, along the important canal, Dalslands kanal (Upperud) and Göta kanal (Sjötorp at Vänern, Motala Verkstad [workshop] at Vättern, the latter only steamships with machinery). A small but fairly productive yard was situated a short way upstream along the river Lidan at the town of Lidköping. Those along Göta älv also contributed greatly to the prosperity of Gothenburg.
- 100 See Berg 1987: 87.
- 101 Later steam-powered mills on the coast: but see above on cloven planks and pit-sawn planks.
- 102 Utö Island in the South and other places.
- 103 It has been noted by some that this might have been more relevant for oak than for pine. Nonetheless, even shaped planks could be floated in the area.
- 104 See Toivanen 1985 on the Finnish side.
- 105 Lantmäteriverket, map archives.
- 106 Moberg 1971: 48.
- 107 Statement from the Ancient Monuments Survey.
- 108 Information by Jouko Rätty at the regional museum of Satakunta, Björneborg/Pori.
- 109 Ill. in Nikander 1947: 326.
- 110 Zettersten 1890 I: 314f.
- 111 Nikander 1944 II: 213.
- 112 Papp 1987: 60.
- 113 As mentioned elsewhere, a combination of clinker and carvel, with the latter as a base, possibly conforming to a shell technique with clamps, is well known in Norrland. The reverse might be possible: clinker at the bottom (see Svenwall 1994 on a wreck of a Baltic vessel of ca. AD 1550). A preliminary analysis of archival material concerning Norrbotten shows combined clinker-carvel ships of up to 120 svl (300 tons), such as the snow ship *Fortuna* of 1779, and 106 svl in the she ship *Solen* built the same year (265 tons). Considerable numbers of smaller vessels were built in the 1870s, the last in 1885. Not surprisingly, they were built in smaller yards in rural areas, but also in urban milieus, the latter during a somewhat earlier period, up to the 1850s. Altogether I have only about 80, perhaps even 100, ships in clinker registered as built in Norrbotten during the period, of a likewise approximate total number of 1100.
- 114 Westerdahl 2000, on statements by Roland Peterson, Vänermuseet, Lidköping.
- 115 In this case I owe particular thanks to Rolf Lundberg, Upperud, Dalsland. The extensive pictorial material from Norrland was largely destroyed in a house fire in Önsköldsvik in July 1983.
- 116 Moberg 1971: 68f, 110f.
- 117 Boberg 1977: 15.
- 118 See Svensson 1944. As mentioned, Chapman was a part owner of this vessel.
- 119 Nyström 1982.
- 120 E. Nordström, I. Nordeström, E. Bergstedt, E. Walanger, S. Norbin, J. M. Lindström, V. Söderberg and H. Löfstedt.
- 121 Possibly there was some kind of “clearing” transaction.
- 122 Westerdahl 1984, 1989: 210f.
- 123 Hellman 1947: 221.
- 124 Westerdahl 1984, 1989: 210ff.
- 125 Nikander 1944: 208
- 126 Moberg 1971: 62.
- 127 According to the Stockholm mätarebok 1789: 5.
- 128 Hederyd 1986.
- 129 See the illustration of Olaus Magnus in AD 1555, fig. 21.
- 130 A little confusing since the owner was given as Olof Persson above.
- 131 This is incidentally the original home village and name-giver of the Strindberg family, including the author August Strindberg.
- 132 On similar procedures in Österbotten, see Nikander 1944: 207.
- 133 I have not checked equivalents for all the terms, since this is not important in this context, but they are similar in time to those of the European dictionaries of Röding (1793).
- 134 From a well-known family specialized in haxe barges; Westerdahl 1984: 35, 1989: 219.
- 135 Nyström op. cit.
- 136 Thanks to Ernst Lundbäck, Kalix, 1987.
- 137 The building site is called *Skutviken*, “ship’s bay”, but on a map of 1782–86 *Skjöpaviken* or *Skjåpaholmen*, which may mean the same, then possibly indicating former shipbuilding (section on place-names). It is situated in Holmen, Inre fjärden, Ytterbyn, Kalix.
- 138 Lantmäteriverket (LMV), map archives, Gävle
- 139 Forsberg 1965: 84.
- 140 According to oral information from Kerstin G:son Berg, Stockholm.
- 141 Toivanen 1983: 297.
- 142 Nikander 1944: 151.
- 143 Oral comm. Pekka Toivanen, Jakobstad.

- 144 Zettersten 1890: 287.
 145 See Cederlund 1966.
 146 Zettersten 1890: 312; transl. by the present author.
 147 Records of 1673. On Kronholmen in Härnösand (Ångermanlands varv), see note 177.
 148 Karlsson 2006.
 149 Westerdahl 2003: 117.
 150 Berg 1971: 13, 1984: 44.
 151 See note 132.
 152 Sandnes & Stenshaug 1976: 286.
 153 Zettersten 1903: 201.
 154 In Denmark they are recorded by Holmberg & Skamby Madsen 1998, see maps of Eastern Sweden in Westerdahl 1989: 143ff & passim.
 155 Andersson 1969.
 156 Westerdahl 1989: 254f.
 157 Medieval levy fleets? See above on the Norwegian *naust*.
 158 Illustrated by Rålamb in 1695.
 159 Oral comm. by Per Bodén, Mössön, d. 1985.
 160 Stockholm, Åbo (Turku), Uleåborg (Oulu), also see Westerlund, Kasper: 2003. Beckholmen i Åbo. Ett maritimt lokalsamhälle och dess omvandling. *Medd. från Sjöhistoriska institutet vid Åbo akademi nr 23*. Åbo.
 161 See Harboe 1839/1979.
 162 Andersson 1969: 137, 156.
 163 Lindholm 1984: 15, and e.g. 2009; Högnäs & Örjans 1985: 18f, ill.; Alopæus forthcoming.
 164 Jordan-Greene forthcoming.
 165 E.g. Westerdahl 1989: 98f.
 166 Registered in Westerdahl 1987c. There are traces of a related activity on the island.
 167 Arne 1908.
 168 Oral comm. Pekka Toivanen, Jakobstad.
 169 E.g. in Luleå; Moberg 1971: 158.
 170 Ohlsson 1939: 186.
 171 See Ericsson 1987: 35.
 172 Zettersten 1890: 308f.
 173 Lantmäteriverket (LMV), map archives.
 174 Zettersten op. cit.: 298f.
 175 Modéer 1933: 13.
 176 Modéer loc. cit.
 177 Rollof 1981: 96f, Westerdahl 2003: 97, passim.
 178 Sandnes & Stenshaug, Eds, 1976: 17.
 179 Modéer op. cit.: 214.
 180 Around AD 1700, but in AD 1808 it is called *Skuteviksholmen*. Modéer, loc. cit.
 181 Bugge 1925 I: 68ff, esp. 70ff.
 182 Stahre 1952: 71.
 183 However, a slight possibility exists that some denoted a landmark in the form of a mast, e.g. in a visual telegraph system (Wennström 2005).
 184 Lindén 1938: 510f.
 185 Bugge op. cit.: 70.
 186 See Nyström 1982.
 187 E.g. Toivanen 1983.
 188 Most of it was collected by Captain Simon Granath (since deceased) and generously made available to me.
 189 After Boberg 1977: 12 with additions by the author.
 190 Personyl comm., but with reservations, Pekka Toivanen, Jakobstad.
 191 Some interesting material can be found in Berg 1984, 1987; for Björkö in the very south of the survey area, also Ljungström/Nordlund 1968.
 192 Berggren/Bergstedt 1988, Boberg 1987 and Forsberg 1965.
 193 The number of ships built in the parish was, according to Boberg (1977), at least thirty-one.
 194 Layton 1976, 1979, 1981.
 195 For this area, one could refer to work by Boberg (1977); Boethius (1921); Hedman (1933); Hülphers 1789, 1797; Westerdahl 1980: 16.
 196 For this province, the following works have been consulted: Bucht 1935, 1944; Fogelberg 1968; Hartelius 1982; Hellman 1947; Hülphers 1780; Nordén 1975; Nordlander 1896; Söderlind 1981; Wik 1981; Ålund 1992.
 197 Althin 1948 on Wifsta varf. Other literature used includes Ahnlund 1921; Hjulström et al. 1955; Humble 1921; Hülphers 1771; Nilsson 1943; Nisbeth 1968; Olsson 1970; Tjernberg 1940 and Westerberg 1948. The latest contribution with a number of significant additions for the whole of Västernorrland, Ångermanland and Medelpad, is Westerdahl 2004b.

- 198 References include Berggren/Bergstedt 1988; Forsberg 1965; Hülphers 1789, 1797; Moberg 1961, 1971 and the regional museum archives (Norrbottnens museum: Olov Isaksson 1960).
- 199 Westerdahl 1991.
- 200 For small yards in Gävleborgs län (Gästrikland & Hälsingland), see e.g. Westerdahl 1993b. Literature on Hälsingland include Burman 1972; Brun 1947; Hammar 1970; on Gästrikland there is surprisingly little published material, in view of the maritime importance of the town Gävle, except Elfstrand 1946, to some extent Björkström 1927; Hülphers 1793; Hasslöf 1961; Wikberg (ed.) 1970.
- 201 Zettersten 1890, 1903, on Västerbotten Nordlander 1905.
- 202 Hellman 1947: 192.
- 203 Zettersten 1890 I: 311 on Ångermanlands varv (Kronholmen), in operation 1577–87, 1598–1602, 1614–17.
- 204 However, the local capacity may have been insufficient. In 1582 the authorities gave instructions that the northernmost province of Västerbotten, then consisting of present-day Norrbotten and Västerbotten, would help Ångermanland with shipbuilding (Hülphers 1797: 289, referring to resolutions passed by the *riksdag*).
- 205 Oral comm. Kerstin G. son Berg 1987.
- 206 It must be remembered that the land-uplift does not necessarily destroy wooden remains. In a case where the wood was originally in the water outside of the shipyard it would very probably be preserved in a wetland environment today.
- 207 Westerdahl 1987c; additions above all in Westerdahl 1993b & 2004.
- 208 Friberg 1983.
- 209 Nyström 1982: 149; author's translation.
- 210 Berg 1984, 1987.
- 211 Initial versions found in Westerdahl 1979, 2001.
- 212 Olofsson 1947.
- 213 Olofsson op. cit.
- 214 Ellmers 1995: 168.
- 215 Kaul 2005.
- 216 Here Snorre Sturlason 1970 is used, but without a quotation.
- 217 Olaus Magnus, *Historia* 3: 14–22, on Finns 3: 16.
- 218 Toivanen 1995/1993.
- 219 Westerdahl 2006.
- 220 Recording from Resele, Ångermanland, 1912, Nordiska museets folkminnessamling, my translation.
- 221 Westerdahl op. cit.
- 222 Radtke 1981: 458f, not 146, s 475, with translation from the Latin version, English according to Crumlin-Pedersen 1997: 196.
- 223 Henningsen 1965, Carlson 2007.
- 224 Finlands svenska folkdiktning part 2: 1, Kulturhistoriska sägner. Skrifter utg. av Svenska Litteratursällskapet i Finland CCI (201), Helsingfors 1928, part 2: 2, Historiska sägner SSLF CLXXIV (174), Helsingfors 1924.
- 225 Westerdahl 1989: 220ff.
- 226 Carlson 2007.
- 227 Henningsen op. cit.
- 228 Westerdahl 2006, 2008.
- 229 Filipowiak 1994. See note 68.
- 230 Westerdahl 2008.
- 231 Our version of that may actually be a comparatively recent one, from not long before 1800; Henningsen 1983.
- 232 As quoted above.

Schiff- und Bootsbauplätze. Merkmale der maritimen Kulturlandschaften des Nordens

Zusammenfassung

»In jeder vorindustriellen Gesellschaft, vom Jungpaläolithikum bis hin zum 19. Jahrhundert nach Christus, war ein Boot oder (später) ein Schiff die größte und komplexeste Maschine, die sich herstellen ließ«, so in Übersetzung die viel zitierte Aussage am Beginn der Einführung zur klassischen »Maritime Archaeology« von Keith Muckelroy, 1978. Wenn dem wirklich so war, würde dies gewisse großflächigere Auswirkungen nach sich gezogen haben. Beispielsweise ließe sich annehmen, dass sogar ohne die Fahrzeuge selbst Aspekte wie die soziale Stellung des Boots- und Schiffbaus oder das technische Niveau der betreffenden Gesellschaften anhand der Bauplätze und ihrer Zusammenhänge untersucht werden könnten. Auf diesem Wege ließen sich die Schiffe, ihre Technologie und die sozialen Landschaften, denen sie zuzurechnen sind, mit einem zielgerichteten Streiflicht beleuchten. Dem entsprechend versucht der vorliegende Beitrag eine Lanze für das Verständnis dieser Plätze als wesentliche Bestandteile der maritimen Archäologie und der maritimen Kulturlandschaft zu brechen.

Eine der zeitaufwendigsten Aufgaben bei der Nachzeichnung der maritimen Kulturlandschaft ist die präzise Ortsbestimmung der ländlichen Plätze zum Bau hölzerner Segelschiffe historisch gesicherter Zeiten. In diesem Zusammenhang wird vor allem von den Erkenntnissen einer in den Jahren 1975–1982 durchgeführten Studie zu Nordschweden berichtet, die sich auf eine Zeitspanne von ca. 1750 bis 1900 bezieht und bisher im Wesentlichen nur auf Schwedisch erschienen ist. Einen wichtigen Aspekt der Quellen für diese Erhebung bildet die mündliche Überlieferung. Das erschlossene Material umfasst rund 300 Schiffswerften und kleinere Schiffbauplätze. Eine weitere umfassende, über einen Zeitraum von 30 Jahren durchgeführte Studie zum Vänersee, die jedoch leider ohne die Möglichkeit zu ausgedehnter Feldforschung vor Ort blieb, wurde 2003 vom Verfasser veröffentlicht und konnte etwa 150 Werften und Bauplätze nachweisen. Sie findet hier in beschränktem Umfang für Vergleichszwecke Berücksichtigung und bildet zusammen mit der erstgenannten Studie die Basis der Betrachtung. Beide wurden um allgemeine Überlegungen zur archäologischen Bedeutung der betreffenden Plätze ergänzt, nicht nur bezogen auf deren materielle Überreste und, damit zusammenhängend, Hinweise auf die Arbeitsorganisation, sondern auch in Bezug auf ihre kognitiven Eigenschaften im Rahmen der sozialen Landschaft sowie im örtlichen Kontext von Landschaftsökonomie und Ressourcen.

Der Hauptabschnitt bezieht sich auf die laufende Untersuchung. Ihm sind jedoch zwei Abschnitte zu archäologischen Funden vorangestellt, von denen der erste den Schwerpunkt auf einige mutmaßliche Bauplätze aus prähistorischer Zeit sowie dem Mittelalter, vor allem in Nordeuropa, legt. Sie werden zusammen mit einer Reihe von Betrachtungen über Schiffbauer – auch der Samen im hohen Norden – und ihren sozialen Status vorgestellt. Um das Bild zu erweitern, werden auch Beispiele aus diversem globalen Material unter Einschluss kurzer Hinweise auf die klassische Antike herangezogen. Das Untersuchungsgebiet selbst ist von nun an Gegenstand der Betrachtung, jedoch versehen mit häufigen Verweisen auf einschlägiges Vergleichsmaterial. Dargestellt wird der Verlauf der Suche nach den Bauplätzen, gegründet auf vorbereitende Studien zu Ortsnamen, auf mündliche Aussagen und Material aus umfassenden Archivrecherchen. Beispielsweise findet der Bauprozess der Brigantine *CASTOR* am Fluss Ängermanälven im Jahre 1782 Widerhall in schriftlichen Unterlagen und tritt dieses Material mit der sozialen Geographie des Bauplatzes in einen vielgestaltigen Zusammenhang. In vielerlei Hinsicht sind nicht nur die Bauplätze, sondern auch die für den Schiffbau benötigten Materia-

lien (Holz, Teer, Eisen usw.) und die entsprechende Ressourcenlandschaft von Interesse. Abschließend wird die kognitive Welt der Schiffswerften erkundet, die ihren Niederschlag in Erzählungen, Überbleibseln der Mythologie und dem Wahrnehmungsbereich des am Ufer gelegenen Stapellaufplatzes findet.

Im Ergebnis der Betrachtung kann mit einiger Gewissheit festgestellt werden, dass vorindustrielle Schiffbauplätze nicht allein Inbegriff des rituellen, kognitiven, technischen und funktionalen Charakters des Bau- und Stapellaufprozesses sind. Als vorübergehende Mikrokosmen sind sie auch Teil der maritimen Natur- und Kulturlandschaften, der sozialen und Ressourcenlandschaften sowie Geographien der umgebenden Bevölkerung, die Flusslandschaften eingeschlossen. Als Spiegelbild der Gesellschaft können sie als Metapher für Macht und Reichtum stehen, zugleich aber auch Auflehnung und Freiheit symbolisieren. Abgesehen von ihren offensichtlichen Bezügen zu fernen Ökonomien außerhalb ihres eigenen Gebiets, die möglicherweise nur vorübergehend in sie eindringen, sind die Schiffbauplätze in jedem Fall mehr wert, als ein flüchtiger Blick in die Annalen der Seeschifffahrt zunächst vermuten lässt.

Ich kann mir vorstellen, dass der kommunale Charakter des Schiffbaus im Bereich des Bottischen Meerbusens ein besonders interessanter Gesichtspunkt ist, bei dessen Betrachtung wir jedoch für alle Zeiten auf sekundäre und spärliche historische Quellen vertrauen müssen, da kein mündliches Material mehr existiert. Die vorliegenden Quellen können jedoch nur einen vagen Eindruck dieses Aspekts vermitteln. Wie immer ist die Archäologie die einzige Wissenschaftsdisziplin, mit deren Hilfe sich neues Quellenmaterial erschließen lässt.

Einst standen Schiffe und Schifffahrt den Menschen viel näher als heute. Diese Tatsache gilt es sich vor Augen zu halten, will man die kognitive Landschaft des Menschen in vergangenen Zeiten deuten. Schiffbau war selbstverständlicher Bestandteil des Lebens vieler Einzelner. Dementsprechend waren Schiffbauplätze für normale Menschen von besonderem Interesse, und zwar nicht nur für Männer, wie sich an einigen Erzählungen ablesen lässt, die das Beziehungsgeflecht zwischen Land und See als Geschlechterbeziehung darstellen.

Diese Plätze, besonders die in einem bewaldeten Gebiet befindlichen, die den Schwerpunkt der vorliegenden Studie ausmachen, waren für die Menschen von großer Bedeutung. Die dort gebauten Schiffe blieben oft lang in Erinnerung. Ihre Schicksale wurden mündlich überliefert, wenn auch im Laufe der Zeit in der Wiedererzählung übersteigert und verändert. Die Erinnerungen verblassten im Zeitalter der Industrialisierung und der Konzentration der Bevölkerung in städtischen Milieus, obwohl in authentischem Brauchtum noch Erinnerungsfragmente vorhanden sind. Schiffbauplätze haben die Landschaft vermenschlicht, sie sozialisiert und den betreffenden Ort individualisiert. In ihrer Gesamtheit bilden sie einen unabdingbaren Aspekt der maritimen Kulturlandschaft.

Chantiers navals et lieux de construction d'embarcations. Caractéristiques du paysage culturel maritime septentrional

Résumé

« Dans chaque société préindustrielle, du paléolithique supérieur jusqu'au XIX^e siècle après Jésus-Christ, une embarcation ou, plus tard, un navire, était la plus grande et la plus complexe machine qui puisse être construite », selon la déclaration traduite, souvent citée, qui figure au début de l'introduction de l'ouvrage classique *Maritime Archaeology* de Keith Muckelroy, 1978. S'il en était vraiment ainsi, cela impliquerait certaines répercussions touchant de grandes superficies. On pourrait par exemple convenir que même sans les véhicules, des aspects tels que

la position sociale de la construction soit de l'embarcation, soit du navire, ou le niveau technique des sociétés concernées, pourraient aussi être analysés d'après les endroits où avait lieu la construction et les contextes de ceux-ci. De cette façon, les navires, leur technologie et le paysage social auxquels ils appartiennent pourraient être éclairés de manière ciblée. L'article présent tente donc de briser une lance pour la compréhension de ces endroits comme étant des éléments essentiels de l'archéologie maritime et du paysage culturel maritime.

L'une des tâches qui prend le plus de temps en reconstruisant le paysage culturel maritime est la détermination précise des endroits ruraux destinés à la construction de voiliers en bois à des époques historiques certaines. Dans ce contexte, ce sont avant tout des résultats d'une étude menée dans les années 1975–1982 dont il sera question ; étude qui s'est déroulée dans le nord de la Suède, portant sur une période allant d'environ 1750 à 1900, et qui n'est parue pour l'essentiel qu'en suédois. L'un des aspects des sources pour cette levée des données est la tradition orale. Le matériel exploité comprend 300 chantiers navals et de plus petits lieux de construction. Une autre étude importante sur le lac de Vänern, menée sur une période de 30 ans, restée malheureusement sans possibilité de l'étayer par une enquête sur le terrain, a été publiée en 2003 par l'auteur, et a pu prouver l'existence d'environ 150 chantiers navals et de lieux de construction. Elle est ici prise en considération de manière limitée à des fins de comparaison, et forme avec la première étude citée la base des observations. Toutes les deux ont été complétées par des réflexions générales de la signification archéologique des endroits concernés, non seulement en rapport avec leurs artefacts et avec les indications sur l'organisation du travail s'y rapportant, mais aussi en rapport avec leurs qualités cognitives dans le cadre du paysage social, ainsi que dans le contexte local de l'économie du paysage et des ressources.

Le paragraphe principal se rapporte à l'analyse en cours. Toutefois, il est précédé de deux paragraphes sur les trouvailles archéologiques, le premier mettant l'accent sur quelques places de construction éventuelles de l'époque préhistorique et médiévale, avant tout dans le nord de l'Europe. Elles sont présentées avec une série de réflexions sur les constructeurs et leur statut social, incluant également les Lapons dans le Grand Nord. Afin d'élargir l'image, des exemples de matériau divers et global, incluant de brèves remarques sur l'Antiquité classique, sont également évoqués. La région analysée, à présent, est elle-même l'objet de l'observation, toutefois flanquée de fréquents renvois au matériel de comparaison correspondant. Le déroulement de la recherche de lieux de construction est présenté, reposant sur les études préparatoires portant sur les noms des lieux, les déclarations orales et le matériel résultant d'importantes recherches en archives. Par exemple, le processus de construction de la brigantine *CASTOR*, se déroulant sur la rive du fleuve Ångermanälven en 1782, trouve une répercussion dans des documents écrits et ce matériel se rapporte sous de multiples facettes à la géographie sociale du lieu de construction. Sous de nombreux aspects, ce ne sont pas uniquement les lieux de construction qui éveillent l'intérêt, mais aussi les matériaux nécessaires à la construction (bois, goudron, fer, etc.) et le paysage des ressources correspondant. Pour finir, le monde cognitif des chantiers navals, dont on trouve des retombées dans les récits, les vestiges de la mythologie et la façon dont est reçue la cale située sur la rive, est exploré.

Dans le résultat de l'observation, on peut retenir avec quelque certitude que les endroits de construction navale préindustriels n'étaient pas l'unique incarnation du caractère rituel, cognitif, technique et fonctionnel du processus de construction et de mise à l'eau. Microcosmes éphémères, ils faisaient aussi partie des paysages naturels et domestiqués, des paysages sociaux et de ressources tout comme de la géographie des populations environnantes, paysage fluvial compris. En tant que reflet de la société, ils pourraient faire office de métaphore pour le pouvoir et la richesse, mais également symboliser le rejet et la liberté. À l'exception de leurs relations apparentes avec des économies lointaines en dehors de leur propre territoire, qui les ont éventuellement pénétrés de manière uniquement passagère, les endroits de construction de bateaux ont en

tout cas bien plus de valeur qu'un regard furtif dans les annales de la marine le laisserait tout d'abord supposer.

Je pourrais m'imaginer que le caractère communal de la construction de bateaux dans la région du golfe de Botnie représente un aspect particulièrement intéressant, dont nous devons toutefois, pour son analyse, ne retenir que les maigres sources historiques secondaires, car il n'existe plus aucun matériel oral. Les sources présentes ne peuvent toutefois communiquer qu'une vague impression de cet aspect. Comme toujours, l'archéologie est l'unique discipline scientifique avec l'aide de laquelle du nouveau matériel de sources se laisse déchiffrer.

Il fut un temps où les bateaux et la navigation étaient beaucoup plus proches des hommes que maintenant. Il s'agit de ne pas perdre de vue ce fait, si l'on veut interpréter le paysage cognitif des hommes des temps passés. La construction de bateaux faisait tout naturellement partie de la vie de nombreuses personnes. Par conséquent, des lieux où l'on construisait des embarcations émanait un intérêt particulier pour les gens normaux, et pas seulement pour les hommes comme on peut le relever dans certains récits, dans lesquels l'entremêlement de rapports entre terre et mer est raconté comme une relation amoureuse.

Ces endroits, surtout ceux qui se trouvaient dans des régions boisées et qui sont le point fort de l'étude présente, revêtaient une grande importance pour les hommes. Il n'était pas rare que les navires qui y étaient construits restent longtemps en mémoire. Leurs destins furent transmis oralement, même si, au cours du temps, le récit répété était augmenté et transformé. Les souvenirs pâlirent à l'époque de l'industrialisation et de la concentration de la population dans les milieux urbains, bien que des fragments existent encore dans les mœurs authentiques. Les endroits où étaient construites des embarcations ont humanisé le paysage, l'ont socialisé et individualisé. Pris dans leur ensemble, ils forment un aspect indispensable du paysage culturel marin.