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## AMPHIBIAN TRANSPORT SYSTEMS IN NORTHERN EUROPE

### A survey of a medieval pattern of life

#### Abstract

'Amphibian transport' in this article is used to refer to *various ways of using vessels – in some contexts the same vessels –, in water, on ice, snow and on land*. The difference between summer and winter ground conditions is thus a fundamental element for consideration. The cognitive or cultural transport space is bounded by amphibian transport methods which are related to a particular northern life-style in the coniferous forest lands. The vessels concerned reflect fundamental ways of *adapting to subarctic transport conditions in a practically road-less landscape*. In this connection some new concepts have been introduced by the present author, such as *transport zones* and *transition points*. The transport zone of this inland amphibian system can fittingly be called *Zavoloshe* (Russian: 'the Land beyond the Portage') in this text.

The three basic adaptations of boats in the north reflect the same number of *longitudinal* (i.e. parallel to the coast) transport zones, 1) *waterfront*, 2) *coastal* and 3) *inland or interior*. The *transverse* transport zones mostly concern the waterfront (sailing routes along the coast). One case in point will be treated briefly below.

Wide areas are involved in the Fennoscandian region and further east where no obstacles have been too great to be overcome for the sake of the *far-range exploitation of resources, fishing, hunting – and raiding one's far-off neighbours*. In Finnish the extensive inland forests and moorlands are by tradition called *erämaa* ('the wilds, desert lands'), in Swedish *erämark, ärjemark*. The implications of these terms, however, are not adequately explained by a reference to a 'desert'. The associations are instead those of tremendous unspoiled resources for a (part-time) hunting and fishing society (for ethnological perspectives cf. Campbell 1948, for an archaeological view of transportation Clarke 1952).

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#### OTHHERE AND THE CWENAS

The earliest mention of amphibian procedures is found in the Viking Age report made by the Norwegian Ottar (Anglo-Saxon form *Oththere*) who visited King Alfred of Wessex the decades before AD 900 (Lund 1983, 1984; new dating according to J. Batley; Valtonen 1992). The *Cwenas* mentioned there is possibly a Fenno-Ugrian-speaking Bothnian group or trade organization, later Finn *kainulaiset*, with its homestead in the West Finnish areas, and in the inner Bothnian Bay:

*Tha Cwenas hergiad hwilum on ða Nordmen ofer ðone mor, hwilum tha Nordmen on hy & thaer*

*sint swiðe micle meras fersce geond tha moras, & berath tha Cwenas hyra scyppu ofer land on ða meras & thanon hergiad on ða Nordmen: hy habbað swyde lytle scyppa & swyðe leohte.*

"Sometimes the *Cwenas* make raids on the Norwegians across the mountains, and sometimes the Norwegians make raids on them. There are very large fresh-water lakes throughout these mountains, and the *Cwenas* carry their boats overland on to the lakes and from there make raids on the Norwegians. They have very small, very light boats." (translation after Lund 1983, 1984).

The 10th century boat find of *Laivajärvi*, on the Finnish/Swedish border is very probably an exam-

ple of this boat type. It was between 5 and 7 m long and had sewn planking (Forssell 1983). The site where it was found was a bay in the Viking Age and is now a lake, at the mouth of Tornionjoki/Torneälven river. This water system extends to the present Norwegian border by way of the large Torne träsk lake. Boat finds of the same character, but obviously considerably later in date (Forssell 1983) have been found on the lake- and river-routes from the White Sea to the Bothnian Bay which were explored by Ingemar Calonius (1929).

## THE NORTH NORWEGIAN COAST

At this time the north Norwegian sea-board, and particularly the islands, were rather densely inhabited by Norse (Germanic-speaking) farmers, but the inner areas of the fiords were settled or used by Saamish reindeer hunters and maritime hunters and fishermen (or Lapps, called Finns in Norse, with a Fenno-Ugrian language). It appears, since the Saamis controlled the forest resources in the fiords, that the latter group built boats for the Norse islanders – a tradition which was maintained until much later times. The earliest mention of this commissioning of work is from the late 1130s AD when a Norse king, *Sigurd Slembadiækn*, had two fast ships built by Lapps. The Icelandic chronicler, Snorri Sturlason, explicitly mentions that the boats were sewn together. He praises their exceptional qualities, quoting a poem which refers to their speed (Sturlason 1951 in *Islenzk fornrit*: 312):

*Fátt eitt fylgir  
furu háleyskri  
Svipar und segli  
senbundit skip.*

“Only few can follow  
the Halogian ship  
when bound with sinews  
it flies with the wind.”

(Author’s translation; the English adjective ‘Halogian’ is derived from the name *Hálogaland*, the northernmost Norwegian agrarian province at that time).

A number of boat finds from the area indicate that this fastening method was in general use among the Saamis (e.g. the *Øksnes* boat, probably a sacrificial find, 8th–9th century AD, ship fragments from town layers of *Trondheim*, 12th century AD, grave boats without any iron fastenings, 10th century AD; Westerdahl 1985, 1987).

The northern Norse thus grew acquainted with

Saamish vessel types of which some were suitable for inland use. The sewing of the planks may to some extent have been the result of constructive adaptations to inland conditions, as we shall see below. On the other hand the Norse had particular demands which influenced Saamish boat-building. The Saamish boatbuilders carried on well into the 19th century, but sewing went out of use in larger craft around 1700 (Gjessing 1941, Westerdahl 1987). Boats built on the Norwegian side, however, continued to be hauled on the winter snow across the mountain chain to be used for fishing by Swedish Saamis in the same big lakes mentioned by Ohthere in the 10th century (cf. a picture taken by Ernst Manker in the 1940s, Manker 1947: 353). The reason for this import was the same as in the case of the afore-mentioned Norwegian islanders; there were no suitable wood resources available in the mountain area.

The tradition of hauling boats across isthmi was also found along the south Norwegian seaboard, as attested by place names. Possibly an adaptation occurred in ship construction here as well, especially in the survival of the practice of lashing the ribs to the planking (e.g. Morcken 1980 with predecessors, e.g. Brøgger & Shetelig 1951). Material remains exist of several boat-hauling sites (*Drageidet*) in north Norway according to Simonsen (1970) and Nymoen (1995). Even in south Scandinavia there are indications of such procedures (below; e.g. Crumlin-Pedersen 1991: 188f).

## TRANSPORT ZONES INLAND

The cultural criteria used to describe the cultural borderline zone in northern Ångeřmanland, Sweden (Westerdahl 1989a, 1990, 1994), suggest that the land could in general be divided along its longitudinal axis, roughly parallel to the coastline (Fig. 1):

1) The waterfront zone, which is conventionally extended 1 km inland from contemporary beaches. Generally speaking, this zone displays approximately the same cultural pattern along the whole coast of Norrland. It is furthermore to be expected that there would be common cultural traits for the whole of Scandinavia and the Baltic region. This is roughly the Iron Age sedentary colonization zone.

2) The coastal zone, interpreted as the agrarian colonization zone of the Middle Ages. This extends to a general transition line approximately 40–50 kms from the coastline, as the crow flies. This area is covered by the villages and hamlets of the first complete land registers from the 1530’s etc. At the fringes the semi-nomadic elements take over and

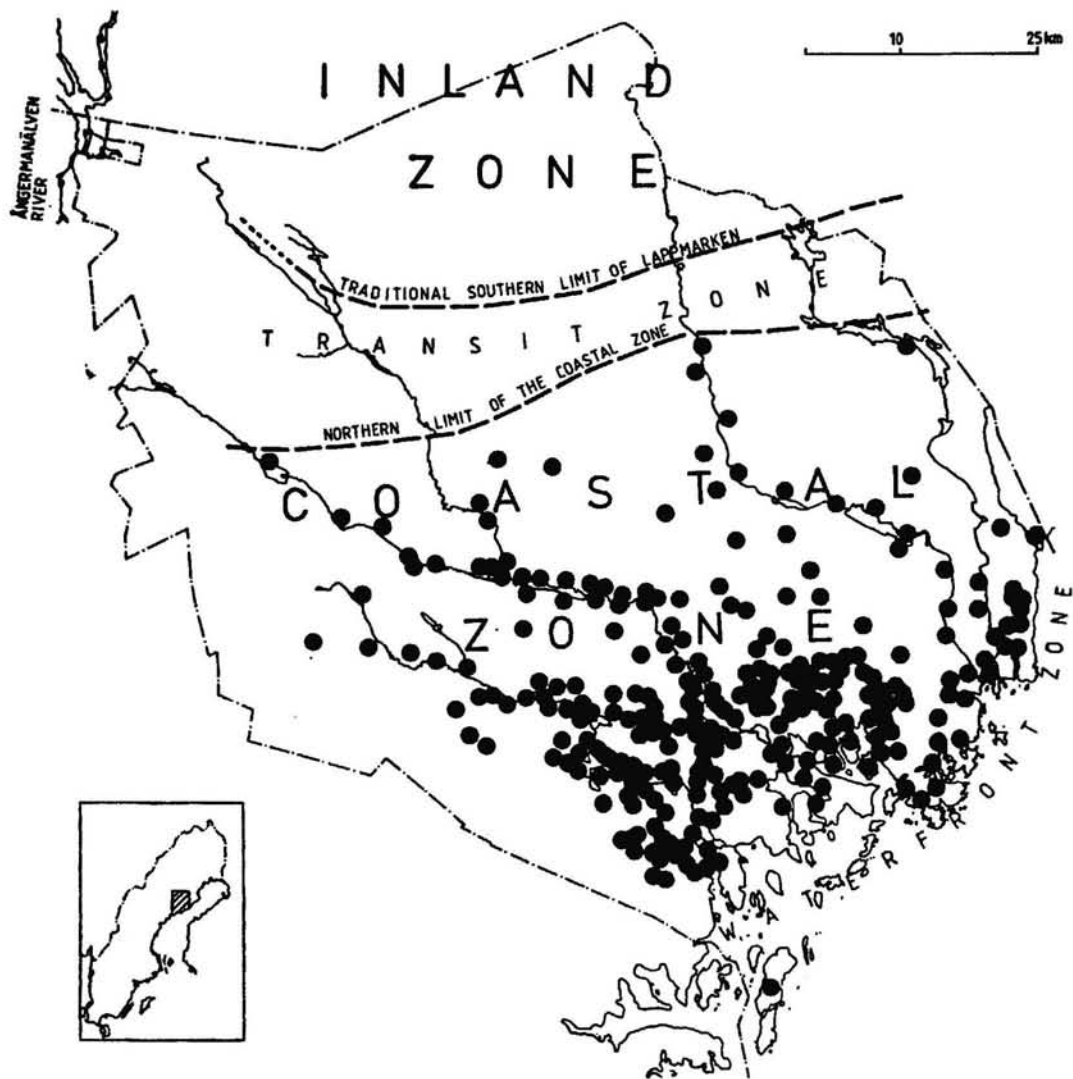


Fig. 1. The transverse transport zones of a chosen district, the commune of Örnsköldsvik, northern Ångermanland, Sweden. The dots illustrate the documented extent of agrarian settlements during the later part of the Middle Ages. In the upper corner to the left can be discerned part of Ångermanälven river, also mentioned in the text. Prod: the author.

form the ethnic transition between north Germanic-speaking settlers and Saamis.

3) The inland zone, which is an immense area with a depth of about 400 kms across Scandinavia. This zone seems to incorporate cultural elements otherwise found much further northward and eastward. It is accordingly to be interpreted as a counterpart to the long-range relationships of the waterfront zone. My term for it is Zavoloshe (below). In this zone, the unifying factor must be interpreted as

traffic on snow and ice during the winter. In summer waterways were mostly utilized in a transverse pattern, i.e. following the rivers and lake systems. This interpretation is valid except along the mountain ridges between present-day Norway and Sweden, where the longitudinal crossings from one river valley to another reappear from the pattern of the waterfront zone.

The inland Saamis were used to travelling on snow in winter. The interior of the North consists

largely of *almost continuous chains of wetlands*. The technique of travelling along such frozen highways from autumn to spring was well developed among the Saamis, who navigated on land by the stars. Their transhumance-like migration (expedition, Saam *raiddo*, Swed *rajd*; the same term is used in seal hunting in the Baltic; below; cf on the interesting etymology Sköld 1991) brought them in historical times 400 kms as the crow flies from coast to coast across the Scandinavian peninsula. This in fact presupposed both skis and boats (according to Schefferus, 1673, the second art of the Saamish males was boatbuilding, the first being hunting). Considerable quantities of boat finds, although mostly undocumented or in a fragmentary state, have been made in the area. The famed Lapland sleigh is fundamentally a *cut-off boat*. In recent times it was carvel-built, i.e. with flush planking and treenails, but earlier it seems to have been clinker-built with sewn fastenings. However, the material for this evaluation is rather meagre. The earliest known find was 14C-dated already in the 1950s to the 13th century (oral communication, Erik Wahlberg, Soukolojärvi). I refer to the *Soukolojärvi* Lapland sleigh which was found in the Torne river valley (Wahlberg 1956). The form of the vessel is *a priori* a boat used on land, but there are also other relevant details. The boat origin of

the sleigh can be clearly seen in the *limber holes* of its ribs, which do not have any function whatsoever in a sleigh (Fig. 2 and below).

Nevertheless, as far as we know, the Lapland sledge proper emerged during the Middle Ages. The only other dated *ackja/pulka* find in Sweden, apart from the Soukolojärvi find (above), seems to be the hollowed-out log vessel from the Ruotesjiekna glacier in the national park of Sarek, which has been given the following 14C analysis data: St 4523: 436 BP ± 105, calibrated AD 1440 (Sigma 1 1410–1520; ref Norrbottens museum, Luleå; Westerdahl 1987: 47, footnote, with calibrations added).

The concept of a boat on land is of course even more revealing when seen as a part of northern transport systems (pointed out already by Wahlberg, *op cit*). Inland, continuous river transport and extensive waterways in lake systems were broken at certain *transit points*, rapids or water-falls. All the northern languages have developed particular terms for such places, which are reflected in numerous names (with e. g. the Swedish name elements 'hovde', 'lusp', 'spänne' etc). The linguist Karl Hampus Dahlstedt illustrates their use and function in his dissertation on the dialects of Vilhelmina parish in Swedish Lapland (Dahlstedt 1950:1 B map 13). In Finnish the general expressions for 'a journey, travel' and suchlike are derived from the concept of a passage between two waters, more specifically a portage, 'matka/ muotka' (the latter derived from Saamish 'muorka'; Swedish 'märka'), 'taipal' ('taival'; also found in Estonian place-names, called 'ed, eid' in Norse languages, explicitly a portage or rather hauling-place, 'drag', in the composite 'drag-eid/ 'draged' and related place names. The Nordic 'skede' ('watershed', originally 'skaida/s') has been taken over by Saamish as 'skaite' and by Finnish as 'keidas' (Pellijeff 1967; Finnish avoids double consonants), one of the great *erämaa* concepts, of which the Finnish language is still full. In Finnish the elements *Kannan-* (*Kantaan-*; 'carrying') and *Veneheitto*, 'throwing of a boat', are also found. In later times the carrying or hauling of boats was a recurrent feature in timber-floating in the Nordic rivers. These boats seem to be *functional survivals* from the Saamish river boats (Westerdahl 1987, 1988). Wooden hauling stands are still preserved at some rapids and were used up to the 1950s as was documented in Norrbotten by the author in the early 1970s).

This pattern was once general further south, as testified to by place names in Central Middle Sweden with the element 'bor' ('carrying place'), like *Borlänge* ('the long portage', Hesselman 1930/35, Widmark 1957). In Russian we even find the group name 'burjagi', 'the people who live at a bor' (Falk

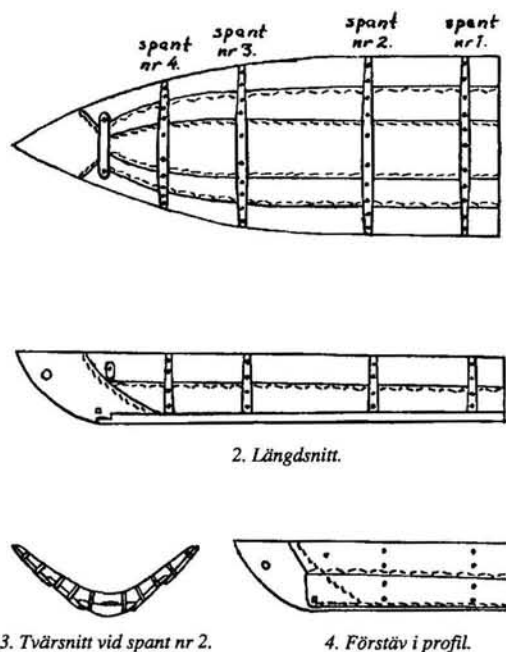


Fig. 2. A reconstruction of the Soukolojärvi Lapland sleigh, as illustrated by Wahlberg (1956).



Efter Olaus Magnus 1555.



"Bonden lämnar mig mina saker, sin matsäk lägger han på ryggen och wänder om håpen, läggandes bägge roderne öfwer tvärstratum, så att hwartehra komer på hwartera armen och springer så med den öfwer både berg och dalar, att raggen knapt honom följja skulle" (Linnés Lapplandsresa efter Th Magn Fries 1913, s 41).

Fig. 3. Illustrations from Olaus Magnus 1555 and Carolus Linnaeus in 1732.

1951: 146f). Several finds of long, low and narrow Iron Age rowing boats provide further evidence. They are adapted to the extensive watery lowlands of this region (Hesselman 1930/1935; *Björke*, Hille parish, 5th century, grave boats of *Vendel* and *Valsgårde*, Uppland, *Tuna of Badelunda*, Västmanland, of Merovingian or Viking Age dating, and *Vik*, Söderby Karl parish, 12th century; the coastal finds are marked on Fig. 6). Place names with Iron Age connotations can also readily be found in the island archipelago of Denmark (e.g. the *Ladby* ship find of Funen island and possibly related hauling stretches in the vicinity; Crumlin Pedersen 1988: 188f).

#### SURVIVALS AS CATALYSTS OF UNDERSTANDING

The study of recent conditions in the north may therefore be a fundamental contribution to the understanding of how a formerly much more extensive system once functioned in its entirety. The north was a tremendous discovery to the southerner Olaus Magnus at the beginning of the 16th century. His experiences are retold in his magnificent "History of the Nordic Peoples" (1555, in Latin "Historia de gentibus septentrionalibus") and his "Carta marina" (1539). In the words of his learned eth-

nological commentator, John Granlund (Olaus Magnus 1972: 9, translation by Peter Foote, Granlund 1976/ 1972):

"In his history Olaus Magnus dwells on nothing with so much pride and affection as the things he met on his Norrland travels. There is every reason to suppose that by 1518 when the journey began, he had a deep and detailed knowledge of ...other authors given a new lease of life by the nationalism and humanism of the age in Europe. His great experience was to find that the farther he travelled northward in space, the farther he travelled backward in time."

Often this confrontation revealed conditions that were "hardly known to his own countrymen." The present author experienced to some extent the same presence of the past in the 1970s.

If Olaus Magnus is read with this holistic approach – considering the entirety of systems – we meet in him an incarnation of the Nordic Middle Ages. In fact his work in its diversity is unique in all of Europe. One of his most exciting experiences was precisely the encounter with northern transport systems, the Saamish sewn river boats, probably on the river Ångermanälven (Westerdahl 1989b ); he also described the Russians and Carelians carrying and hauling their boats by way of the lake and river systems of the Finnish interior to the midsummer market in Torneå (Fig. 3).

For those of us concerned with the dating of transport patterns, the boat archaeology of the Viking Age (800–1050) together with the 16th century journey of Olaus Magnus (1518–19) offer excellent testimonies. Even the cleavage in transport patterns between winter sledges and summer boats in Norrland (below) is reflected in the routes of Olaus Magnus (Westerdahl, op cit). As stated above, however, there is no reason to discount an earlier dating for these patterns. The intensification of the structure nevertheless belongs to the Middle Ages proper, the time of mature statehood of the north.

## TRANSITION POINTS

In the north the fundamental factor in historical transport techniques is the difference between summer (autumn) and winter conditions in a roadless country – i.e. the existence or non-existence of snow on the ground and ice on the water. Late autumn and the beginning of winter is also the season of the best free time available in the annual rhythm of agrarian settlers. Their prey animals are at the fattest and provide the best furs and skins in preparation for the winter. In this season the ani-

mals are moreover perpetually on the move, which makes them easier to catch, whatever method one chooses. Since winter conditions always start earlier inland, the nomads progressively move towards the coast following their prey (and the instincts of the reindeers) in this seasonal phase. This means inevitable contact between cultures, creating exchange. During January/ February all the historical fairs/ markets of the inland zone are found. Sailing was normally interrupted during the winter, but amphibian seal hunters may have pierced through open *polynya* (Swed *råk*, pseudo-stable ice channels) to trade furs in the south (e.g. in Stockholm).

If we accept the zonal division above, the transitions/ points of exchange would largely be found – almost by definition – at the extremity of the coastal zone or at the beginning of the inland zone, corresponding to what is the second transit point of a river. It will be remembered that the first transit point is found at the mouth or estuary of the river.

As far as natural transport geography is concerned, these areas would be confined to the uppermost stretches of continuous river and lake systems, where watersheds obstruct further transport by water-routes. The transition would sometimes consist of hauling the boats across the watershed to the next waterway. In rivers the same rule would apply to rapids and waterfalls, which would have to be by-passed on land. In this hypothetical reconstruction, however, the watershed case is by far the most interesting for the pinpointing of transit sites. The traditional winter lanes on ice and snow have always followed low-lying lines in bedrock which are filled with lakes and bogs, rather than river valleys. These lanes are identical with the reindeer herding paths of the mountain Saamis in later times. It could thus be surmised that at precisely these transit points in late autumn one would find not only transport vehicles from the coastal zone using the still unfrozen waterway system, but also the connecting snow craft from the inland zone. It is tempting to imagine that some time was spent waiting at the site for the contacts and for the snow and ice to arrive.

There are in fact some archaeological assemblages against which this reconstructed picture of transit points may be tested. The relevant finds consist of sewn boats, of skis, Lapland sledges and parts of these amphibian means of transport at approximately the same sites. The vessels have not been wantonly destroyed as they would have been in a sacrificial deposit; instead they were buried in wetland conditions at a shallow depth. They have been preserved because of the surrounding humidity. It may very well be that they have been left on the frozen ground in the snow close to a beach or

river bank and that their preservation is unintentional. Since they were left in an area where the melting of the snow and ice and natural drainage provided the necessary preconditions, they survived, often under rapidly growing moss.

Why these vessels were abandoned remains partly a mystery. A possible explanation is that the users returned from their voyage by other means, presumably in fully developed winter conditions and never collected the boats which had been hauled up on the beach. This could mean that their vessels were not meant to be used for more than one or just a few voyages (possibly only for one season), a situation not entirely unrelated to their fastening technique (cf Litwin 1985 on Boguslavski's sewn Russian river craft in the 19th century). Three sites can so far be considered in this light (Fig. 4).

#### SOUKOLOJÄRVI, NORRBOTTEN, SWEDEN

In 1953 on the Nuorajoki river in Soukolojärvi village, in the parish of Övertorneå (Finn. *Yli-Tornio*) in the Torne (Tornio) valley, Sweden, fragments of two sewn boats (stems) were found during plowing. There were also ski fragments and one sewn Lapland sledge, fairly well preserved, obviously originally a boat or thought as a boat (with limber holes in the rib bottoms; Fig. 2). The finds were about 200 meters apart. The terrain for most of the find is limited to a meadow, once the river bed of Nuorajoki (Wahlberg 1956 on the Lapland sledge). According to the excavator and publisher, Erik Wahlberg, a very early 14 C-dating was made in Stockholm to the 13th century, but no registration of this analysis is preserved (Westerdahl 1987: 47).

#### TJAUTJER, NORRBOTTEN, SWEDEN

The second find, made in 1924, was at the small lake or tarn of Tjautjer, Gråträsk, parish of Piteå landsförsamling, Norrbotten, Sweden. It consisted of sledge details, such as runners, a rib of a boat, a probable ski detail (a point) and other wooden fragments. It did not have the appearance of a closed find. It seems that at least some of the finds had been brought to the outlet of the lake by the current. The boat rib was, furthermore, found at different site from the remainder of the finds. The rib, made for lacing to cleats of the boat bottom or keel log, carried ornaments which might well be medieval in origin (Oldeberg 1956). Just a few hundred metres from the principal finding site a find had been made in 1897, consisting of a deposit of metal ornaments, which has been dated to the 14th century (Zachris-

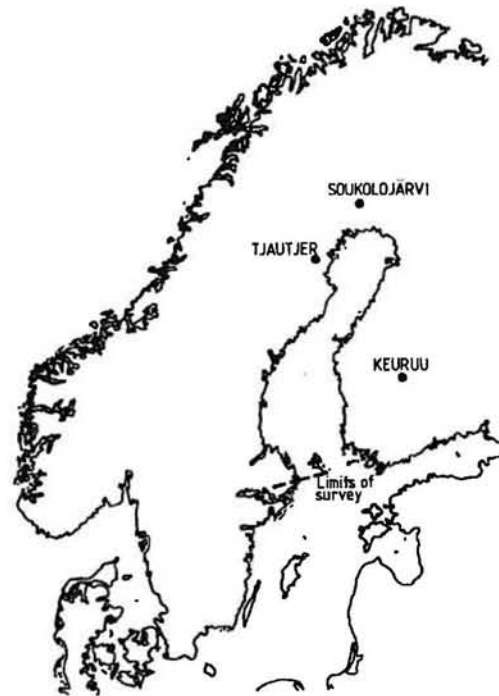


Fig. 4. The amphibian find sites referred to in the text.

son 1984; the latest comment on the depot find from Tjautjer/Gråträsk see Wallerström 1995). Traditionally this is supposed to be a sacrificial find (the lake is a hallowed *sajvo* site in Saamish tradition) but Zachrisson (op cit) puts forward other hypothetical explanations, such as deposits of loot. The high probability of there being a connection between those two finds seems not to have been taken into account, however, by any of those authors who have treated the material. Zachrisson never even mentions the other (wooden) find at the lake, but Oldeberg, who describes the wooden finds, at least notes the other (metal) deposit in passing. Some new information on remains of human activity in the area was lately supplied by Hedman (1989: undated hunting pits, cooking pits and hearths). However, this site does not seem to display the same obvious connections with waterways as the other sites. This does not imply any deviation from the 'amphibian' principle, rather the opposite. The closest river is that of the Byske valley in the south, displaying settlement traces from the later part of the Middle Ages/ 16th century at the unique site of Lappviken (Sundquist, undated report: Wallander 1990). Gråträsk with its early 17th century chapel is obviously a central place in

its region and a potential contact point during the Middle Ages between the Saamis and the coastal colonizers.

#### OTHER SITES IN SWEDISH LAPLAND?

Many other finds of the same kind have been made in the lower part of Swedish Lapland (in the inland zone), but they are often separate: sewn boat details, sledges and skis, and invariably neither documented nor preserved. Information is particularly bad on the location of the finding sites (cf Westerdahl 1985 and 1987 on finds of sewn boats). There are in fact a number of oral statements on separate finds making up possible assemblages of the same kind as above.

#### KEURUU OF FINLAND

The model site, however, is situated at the Suojoki brook, Keuruu, central Finland (near to the present university town of Jyväskylä). Here several boats were excavated in 1932 and 1952, although without proper recording and documentation. The biggest preserved boat seems to have been about 8 m long.

At least twenty boats (some newspaper articles say 50), more than 20 oars including steering paddles, some skis, unfinished planks and details of Lapland sledges have been observed. The 14C dating is late 13th century for some of the boats (Forssell 1983: 11). With a calibration their dating could probably be placed in the early 14th century. There is still more to be excavated at this site. In Sept. 1989, Henry Forssell and Janne Vilku were able to demonstrate some uncovered details to the international conference on sewn boats in Keuruu. The area appears to have been uninhabited during the Middle Ages, and is situated at the end of a long water system (a chain of lakes), leading up to the very point, close to the finding site, where the Suojoki brook runs out into the lake of Suolahdenjärvi. The ground is water-logged, but has been cultivated rather recently as a meadow for grass (hay) production. Inland or upstream from Suojoki there is no consecutive river or lake system.

This find, which is at present unique in size, may offer an explanation which can also be applied to some of the other finds of similar assemblages and geographical settings. However, this conclusion means that the present author finds it difficult to accept the explanation of the site as a wood depot, as put forward by Vilku et al (1993; on the Keuruu find see also Forssell 1995: 30–39).

#### LATER PARALLELS

The finds are all reminiscent of another economy, that of the Mountain Saami reindeer herders of later times. In their yearly transhumance pattern one of the transit points was particularly important, the so-called *höst- och vårvisten* (Swed. 'autumn and spring settlement sites'), which were located in the area immediately beneath the mountain ranges or on their spurs to the east. In the spring the winter implements, such as skis and sledges, were left at a stable *kåtaplats* (Swed. 'the site of one or several Saamish huts') with booths where reindeer were kept under intensive guard while they calved (in southern Lapland this is called the *tjärro* lands). There were also boats found at the site for summer fishing in the lakes of the area and for transport along the adjacent river valleys. In the autumn, when the lakes and bogs were frozen the *rajd* set out from here with its long caravan of reindeers and sledges, travelling without stopping for any significant time until the coastal zone of the Bothnian Sea was reached, 250–300 kms from the mountain range. Thus, at these *höst och vårvisten* the Saamis kept both summer and winter equipment together at one site. Although not comparable in any other sense they may share this seasonal character with the amphibian sites that we have mentioned.

I would thus propose that the arrangement of these three sites brings us a key to the understanding of the transport systems of the subarctic inland north during the Middle Ages. My proposal is that they should be interpreted as transit points for the transportation of men and goods to the inland zone, the *Zavoloshe*, or rather *erämaa*, Swed. *erämark*, *ärjemark*, the immense exploitation zones of the interior (see Fig. 5). It is possible that the relative contemporaneity of the sites (13th–14th centuries) reflects a certain stage in the process, but it would indeed be curious if this pattern did not extend as far back as at least the Viking Age (AD 800–1050) and as late as the 17th century in some parts. It is possible also to give this transport pattern a distinctively ethnic character. It is interesting that the distribution of the hitherto known amphibian sites could be assumed to represent the exploitation lands of the West Finns, as the assumed first agrarian colonizers of Norrbotten (Fjellström 1987, 1988).

#### HUNTING ON THE BALTIC ICE

On the Baltic winter did not bring to an end the exploitation of marine resources. Seal hunting (mainly grey seals) among the drift ice of the Bothnian





Fig. 5. The Zavoloshe zone and the Fennoscandian inland zone.

bay is illustrated by Olaus Magnus. But the great impetus for long hunting expeditions was provided when light firearms started to be used for shooting ringed seals during the later part of the same century. Climatic reasons were decisive during this time (Kvist 1988). For months on end the Ostrobothnian seal hunters lived in their boats among the icebergs and ice plains of the early spring. Thousands of males went out leaving their farms in the care of the

women and the old folks. This way of life later spread, as an innovation, to the Swedish side (Bonns 1988; Gustafsson 1988). Living on the margin of agrarian culture and at the point of transition to the *erämaa* (*ärjemark*) meant dependence on specialization to obtain ready barter or money for taxes. This specialization therefore to a certain extent reflects the crown taxation policies. In the Middle Ages there was still barter exchange and in-

kind taxation in this area, as illustrated by Olaus Magnus (and in fact by the conscious efforts of the first Vasa king, Gustavus I).

The boat type, the *fälbbåt* (Swed. *färdbåt* =lit. 'travel boat') used for seasonal seal hunting expeditions is highly specialized. It is designed for sailing in ice and for being hauled up on the ice. At the beginning of the *raitta* (local Swed. 'expedition' from Finnish and Saamish *raitto*, *raiddo*; the same word applies to the transhumance pattern above) the vessel had to be hauled on its keel by horses from the land ice to open water channels which were often to be found tens of miles away from the shore. The horses were then led back to the farms by the landsmen. At night the crew slept in the vessel, covered by the square sails and put up on the largest ice floe. In daytime the hunters went out to hunt from this base hauling a couple of small boats of a particular type (Swed. *själjulle*), in which they collected their prey. It was a risky life, especially if the ice broke up in storms. The base vessel could be crushed between ice floes or the hunters might stray too far while following the seals and be cut off from their mother boat.

Numerous hut foundations from the Middle Ages in locations unsuitable for fishing illustrate the extent of the Bothnian autumn and winter sealing (Broadbent 1988; Lindström & Olofsson 1993).

If one is looking for a truly significant picture of an amphibian economy, the far-range seal hunting culture of the Bothnian Bay can provide it (Bonns 1988; Gustafsson 1988), especially when the landward ways of life of the same people are taken into account.

## AMAZONS, HUNTERS AND SHIPBUILDERS

This seasonal life in a figurative sense reflects even better the *amphibian character of the entire annual cycle*. The same agrarian people who hunted and fished in the interior (late autumn, beginning of winter) also hunted and fished in the open sea (late winter/spring, early autumn). This life-style, which left the women-folk alone at home during the harvest period, is the ingenious explanation put forward by Helmer Tegengren for the curious references in medieval literature to amazons in precisely this part of the north (e.g. with Adam of Bremen; Tegengren 1965).

It is rather amazing that they found time or energy for another important winter occupation which was typical of Ostrobothnia (and later also typical of north Sweden), i.e. *ship building*. Even here Olaus Magnus provides the first written source. On his *Carta marina* (1539) the text relating to the mid-

dle reaches of one of the Finnish rivers near present-day Närpes reads "hic fabricantur naves" ('here ships are built'). The resources, material and probably also human, for boat building in the vast Finnish interior, were illegally exploited by "Moscowites" or Carelians, considered as inimical by Olaus Magnus, who records their presence in his comments to the *Carta marina*. Sewn boats, presumably belonging to the Carelians, have been found along the waterways from Ladoga, by way of Lake Pielinen to the Oulu (Ule) river (Naskali 1980).

## THE AMPHIBIAN CHARACTER OF BALTIC INNER ROUTES

Amphibian *portages* are found not only in the north of the Baltic but also along the coast. From Scania in the south to Torneå in the north of Sweden the present author has listed at least 22 important portage localities (Westerdahl 1989c: 195). According to my analysis of medieval sailing routes there can be said to be three principal kinds of routes: 1) *shore/interior routes*, 2) *coastal routes with overnight harbours*, 3) *sea routes, for continuous sailing day and night*. These portages belong to the shore/interior routes.

Largely, these types of routes are associated with certain corresponding vessel types. The first type of route hugs the coast, very close to land, and crosses promontories and peninsulas on land by way of portages. It is compatible with rowing. The portages carry the same kind of toponyms as the inland cases mentioned before. The best preserved instances are found between Hudiksvall and Söderhamn in southern Norrland, Sweden. The boat-finds are small and accordingly designed for rowing, partly in a stage and ferry system organized by the crown and the Catholic church. There may have been larger rowing ships in the Norwegian style. It seems that these boat types are a feature of the southern transport zone, partly adapted to intermittent stage traffic consisting of travellers, or at least not consisting mainly of goods.

The second type of route is associated with the use of ships of 12–14 m length provided with a square-sail, such as those found as wrecks at two places, dating from the middle of the 15th century, *Avaffjärden* of Västerbotten, *Kallviken* of Norrbotten, Sweden; ships of this type may have continued to be built until some time in the 18th century, cf Wallin's drawing of his crossing of the Bothnian in 1707 (Friberg 1951 I: 321). Probably this is the origin of the *fälbbåt* -see above- when adapted to ice conditions.

It seems probable that these boats went directly from their home port to their destination. There is probably only one recorded case where reloading from river transport to a river estuary port is implicitly referred to, in the mid-16th century record of a boat type called *haxe* in the Ångermanälven river (another functional survival still in use and illustrated by a photo c AD 1900; Westerdahl 1989c). The downstream part of the river can thus form a transport zone of its own, with an adapted vessel type. Otherwise the general method appears to have consisted of transport on winter snow and ice down to the spring accumulation at coastal estuary centres. When the ice had melted sea transport followed from those sites.

#### DIFFERENTIATION IN TRANSPORT ZONES ALONG THE NORRLAND COAST

The transition between transport zones at the coast was also partly seasonally based. On the Swedish coast the difference between southern Norrland and the inner Bothnian is striking. South of the cultural border-line of northern Ångermanland (Westerdahl 1989a, 1990, 1994) the farmers carry their own produce for sale in the southern cities (Stockholm, Uppsala etc) by way of sledges during the winter. In summer a limited boat traffic went on in a local, rather restricted, area. But in the north all heavy traffic to the metropolises of the southern Baltic took place during the summer, in large boats designed for this purpose (Olaus Magnus' sewn *scutha*, in later times e.g. the clinker-built *Tegelvraket* 'Brick Wreck' probably 18th century, from Bjuröklubb, Västerbotten, report with drawing in the Museum of Skellefteå; the *Kallviken* wreck, also of Löfvånger parish, possibly late 17th century, map of finds, Fig. 6). The probable vessel types for these Norrland transport zones may be named after the vernacular *fälbåt* in the north and in the south after the *haxe*. But the meanings of words change. What interests us here is the functional significance of boat types.

The ships of the medieval metropolises would certainly have had features in common with cog-like vessels such as that found in the *Selångersån* river (Sundsvall), dated c AD 1350, calibrated c 1400 (14C; Fig. 6) – no doubt a standard contemporary type in the Baltic transport zones.

The southerners, e.g. the medieval archbishops of Uppsala, follow the same pattern when going to the north (Friberg 1951, 1983). The lower part of Norrland could be traversed in winter, but in order to reach the northern part the ships would sail directly to their destination, by-passing the southern

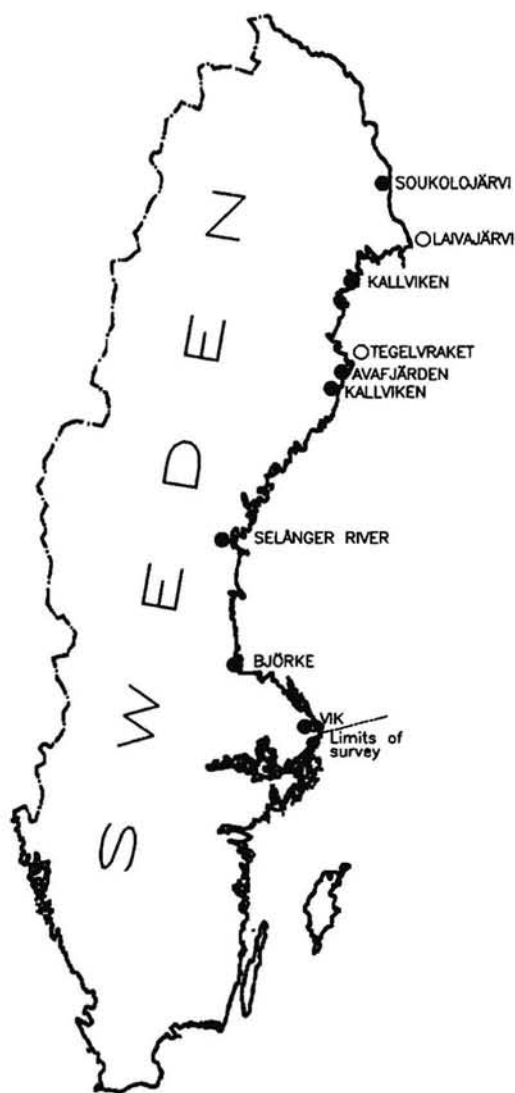


Fig. 6. Find sites of vessels along the Swedish Norrland coast; in chronological order *Björke*, Hille parish, 5th century AD, *Laivajärvi*, Ala-Tornio parish, 11th century AD, *Vik*, Söderby-Karl parish, 12th century, *Selångersån* river, Sundsvall, *Avafjärden*, Löfvånger parish, *Kallviken*, Nederluleå parish, all 15th century AD, *Kallviken*, Löfvånger parish, probably 17th century *Tegelvraket*, Löfvånger parish, probably 18–19th century AD.

coastline. The pattern changed slightly with the foundation of cities at the end of the 16th century and the beginning of the 17th, but the tradition of farmer trade carried on well into the 19th century. Tradition dies hard, especially within an estab-

lished pattern marking prestige and status in the local sphere.

## RUSSIA AND THE ZAVOLOSHE ZONE

In the Russian interior the extensive system of *portages* between waterways and rivers has been well illustrated by Kerner (1946); he demonstrated that it is actually appropriate to call Moscow "the capital of Five Seas!". The Rus principalities during the early Middle Ages seem to have been organized largely according to the pattern of the watersheds (Nozov 1992).

The archaeological material of the portages was presented for the first time in this journal by Makarov (1994). The maintenance of the portage clearings into modern times was obviously greatly helped by the fact that these passages were also used as *winter* routes. Corresponding maintenance of clearings at portages is well known from the Swedish north, and has been to some extent revived in our time by the development of snowmobiles, the descendants of the Lapland sleigh.

The resemblances between Fennoscandia and Russia have thus led the present author to propose a Russian term for the inland zones of the whole of the European north (Fig. 5). The *Zavoloshe* is the name of a Novgorodian taxation area. It means 'the lands beyond the Portage' (Russian *Volok*, in other Slavonic languages with related, but lightly different meanings; Polish *włoka*, 'hauling /stretch of/ a boat in a river'). The watershed implied is situated between the rivers floating to the north (to the White Sea and the Arctic Sea) and the sources of those emptying their waters ultimately in the Black Sea and the Caspian Sea. Although the topography of the portages of Fennoscandia is different from those of Russia, the fundamentals of amphibian transport are typical for both. Even the Neolithic past of the inland communication zone across the Russian north from the Ural mountain chain to the Bothnian Bay is of current relevance in the form of a Finnish find of a Uralic-looking sledge-runner made of *cembra* pine, a species growing only in northeastern Russia and Siberia, and a number of other finds (Kivikoski 1964: 58; cf for a survey Kerner 1946, Tegengren 1968).

My evaluation of the present source material shows that the tradition of sewn boats in Russia goes back at least to the last part of the Iron Age. Boats – some surprisingly large – were built as aspen dugouts, expanded by the use of fire and assembled with sewn or lashed washstrakes (Forsell 1983). Sewing persisted for smaller craft because of the need to dismantle the boats when carrying

them across a portage. While building the copy of a *salui* longboat of Borneo in Roskilde in 1984, the boatbuilder retold its traditional use at the watershed. The boat was taken apart into its component pieces. The dugout keel was carried by two men, each of the washstrakes were carried by two others, and the cargo was taken over by the remaining crew. This is probably how the system worked in Russia and the Zavoloshe zone in ancient times. But the continuance of the sewing tradition in historical times could certainly be interpreted as an adequate adaptation to the long portage journeys in the *erämaa* wilderness. The considerable wear and tear on fastenings in such circumstances could easily be repaired, since the material was at hand almost everywhere (mainly spruce and pine roots; although normally dried for a long time before use in regular sewn boatbuilding or for fastenings in other contexts, e.g. small containers; Granlund 1940).

The boat sewing technique of the Finnish tradition is the single, discontinuous seam, Finnish *nide*, Swedish *näst*, well illustrated by Henry Forsell (1983). The linguist Olavi Korhonen (1982) has extended the argument by pointing out the technique in finds from Novgorod and by analyzing the philological arguments for Slavonic boat terms in Northern Fenno-Ugrian languages. Recent surveys of archaeological boat material confirm Korhonen's views (cf Sorokin 1994). The Viking Age Scandinavian expansion into Russia adapted to these local transport systems, which were not entirely unknown at home, but by this time were probably rather old-fashioned in relation to mainstream developments.

Finally, there exists an excellent written source by the Byzantine Emperor *Constantinus VII Porphyrogenitus*, who describes the coming of the *rhos* (Varangians) in dugouts to Constantinople in the tenth century. His description of the portage at the rapids of the Dniepr is particularly well known; the names of the rapids are given both in Slavonic and Scandinavian (Moravcsik-Jenkins 1955, Falk 1951). This route has been described by Crumlin Pedersen (1988, 1989), who points out the importance of the Zaporozhe Cossacks who navigated these rapids in specialized boats during the 17th century. The tradition of sewn river boats in Russia has continued well into this century (cf Litwin 1985). The sophisticated transport techniques applied and their context in internal appropriation have been judged a stage in Russian state formation (Westerdahl 1992, 1993).

## CONCLUSION

The amphibian character of the economy and of transportation is thus inherent in the topography, climate and culture of northeastern Eurasia. Well-developed amphibian methods of transport have been used over centuries to allow the inhabitants of the region to hunt inland, to travel along the coast and to travel out to the seal hunting ice of the Bothnian Gulf or the White Sea. A fundamental element is the watershed, which defines the cognitive divisions of space, and the concomitant portages, the model of transit points from one zone to another. Further implications of this amphibian way of communication, including the principles of the structure of the transport zones, may well be relevant elsewhere as a contribution to the understanding of transport patterns in prehistoric and early historical times. The way of life depicted constitutes a northern transport-related illustration of the principle of *la longue durée* known from the Annales school of French historiography.

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