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L I E T U V O S

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# SETTLEMENTS OF COASTAL ESTONIA AND MARITIME HUNTER-GATHERER ECONOMY

AIVAR KRIISKA

## ABSTRACT

The author analyzes the changes of the Stone Age hunter-gatherer economy and its territorial and temporal differences. The analysis is based on the Number of Identified Specimens method and the environmental conditions of the period of the existence of the settlements, as a factor determining the trends of the hunter-gatherer economy. Both the location of the settlements and osteological material enable us to discern inland settlement and economic type from coastal one. In the first type, hunting of wild animals and fishing on inland water bodies dominate. In the latter, hunting of marine animals and marine fishing were also known. The coastal type of economy was formed by the end of the Mesolithic, with two discernible trends: the economic basis was either (1) specialised seal hunting, or (2) hunting of marine as well as wild animals, and fishing.

## SETTLEMENT OF COASTAL ESTONIA

The coastal areas of Estonia of the Stone Age formed a specific economic, and partly also cultural unit. This area is clearly discernible almost throughout the whole Stone Age as an original technocomplex (with the only exception of the Pulli settlement site with its wide use of imported flint), where quartz dominates as the material for small tools in splitting technique. Among the three basic rocks-quartz, flint and Baltic red quartz-porphry (typical of the islands) – the share of quartz is over 50%, mostly even over 80%. Like the use of rocks, the basis of economy was also determined by environmental conditions. Adaptation to them made life possible on coastal areas.

Coastal Estonia was inhabited already in Early Mesolithic. The oldest discovered settlement site of Estonia, Pulli (Southwest Estonia, fig. 1), dated to 8800 cal BC (Kivimäe et al., 1998, 29), was evidently a

summer habitation site, situated on the Pamu River only a few kilometres from the Yoldia Sea (Raukas et al., 1995, 121–122; Rouk & Vuorela, 1992, fig. 140). The second oldest monument, the settlement site of Kunda Lammasmägi (North Estonia) was located near the Ancylus Lake, on a small island within the wetland (Moora, 1998, 65). Relying upon the  $^{14}\text{C}$  analyses of the found charcoal and animal bones, its Mesolithic settlement traces are dated to 8350–6850 cal BC ( $^{14}\text{C}$  datings published in Akerlund et al., 1996). The wide range of the datings and the development of environment indicate that Lammasmägi has been inhabited repeatedly, and presumably only seasonally, over a long period.

The first traces of habitation on the seashore of mainland Estonia and on the islands date from the second half of the Mesolithic. Considering the general development of the Baltic region, it is possible that these areas could be inhabited somewhat earlier. For instance, the island of Gotland, in the distance of 90 km from the mainland, was inhabited in Early Mesolithic (Larsson, 1997, 14), and the boat equipment – fishing net and other objects from Antrea, Karelia, sunk to the bottom of the strait of that time in about 8300 cal BC – could also be connected to the Kunda culture (Carpelan, 1999, 160–161). In Estonia, only one settlement site, Soitme I, has been hitherto discovered, which could have been situated on the coast of the Ancylus Lake (Vedru, 1998, 62). The formation of the coastal settlement has taken place mainly at the beginning of the Litorina Sea. In about 6500 cal BC ( $^{14}\text{C}$  datings published by Iivessalo et al., 1974) the Narva Joaoru settlement site (Northeast Estonia) was inhabited, not immediately on the seashore, but on the riverbank, a few kilometres upstream. To the end of the Mesolithic belong the settlement sites Vihasoo I and II (North Estonia), and near Valge-Risti (West Estonia). In Vihasoo, the settlement was located at the ancient mouth of the river, and with the regression of the sea the site was also moved. The Valge-Risti



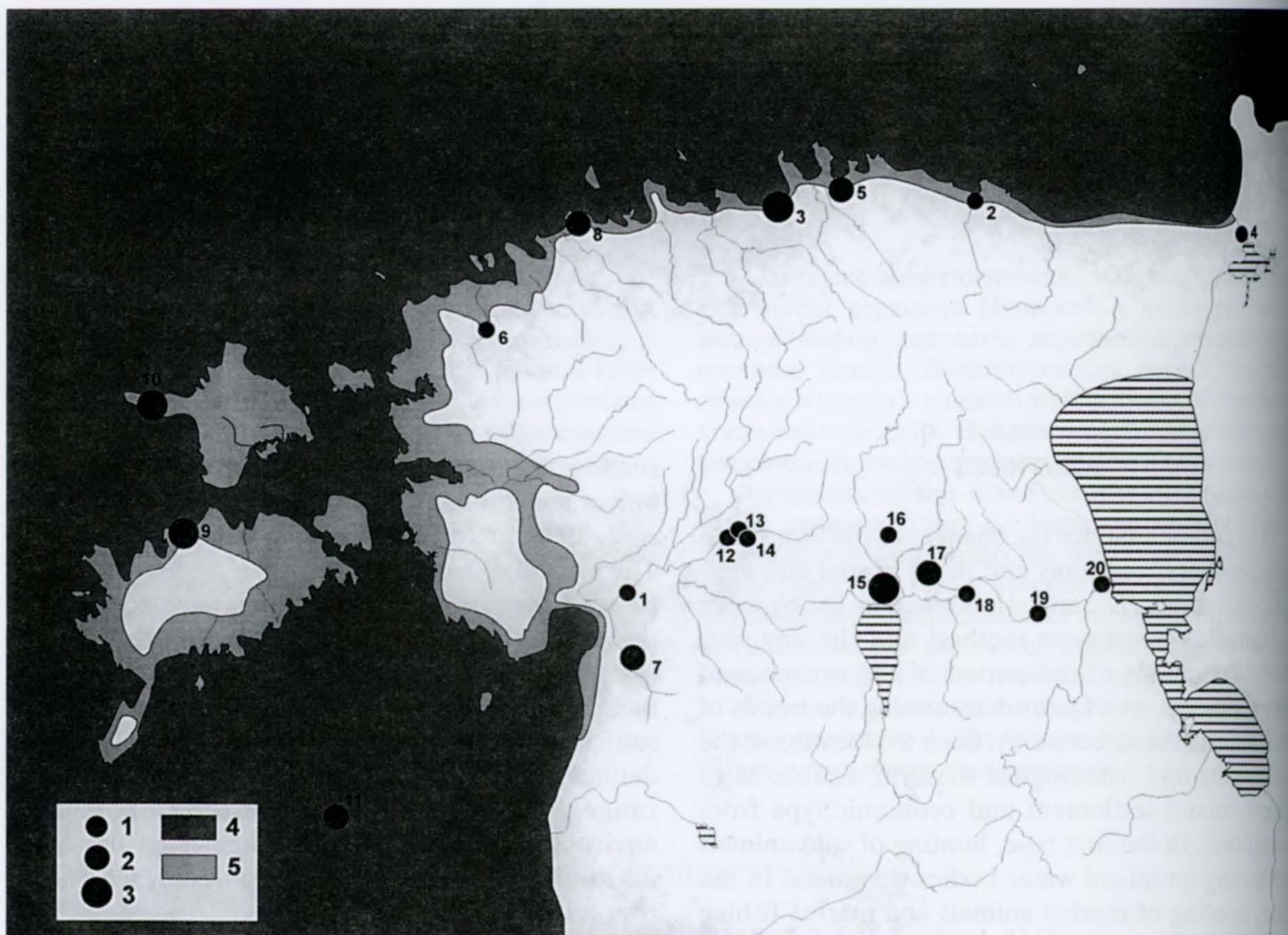


Fig. 1. Mesolithic settlements. 1 – one settlement site, 2 – 2–5 settlement sites, 3 – 6 or more settlement sites, 4 – present Baltic Sea, 5 – the maximum of the Litorina Sea. Monuments: 1 – Pulli; 2 – Kunda Lammasmagi; 3 – Soitme I, Soorinna, Seta, Uuri-Saki, Miiurissepa, Aabrami, Tooma-Hansu; 4 – Narva Joaoru; 5 – Vihasoo I, II; 6 – Valge-Risti; 7 – Metsaare I, II; 8 – Suurupi, Liikva I, II, III; 9 – Vohma I, II, III, IV, V, VI, VII, Pahapilli I, II; 10 – Kopu II, III, IV/V, VI, VII/VIII, IX, XIV, XVII; 11 – Ruhnu I, II, III, V, VI; 12 – Lepakose; 13 – Tamme; 14 – Jalevere; 15 – Siimusaare, Leie, Moksi, Laisi I, II, III, IV; 16 – Umbusi; 17 – Laeva I, II; 18 – Metsavahi; 19 – Ihaste; 20 – Akali.

settlement was located on the shore of a spit in the Litorina Sea. In Southwest Estonia, the settlements of Metsaare I and II, presumably also from the Mesolithic, are situated on the coastal area, but they are most likely connected with the Reiu River, not with the seashore. The Suurupi and Liikva I–III settlement sites (Northwest Estonia) date probably from the Mesolithic, too (Lang, 1996, 420), but their palaeogeographic situation has not been determined yet. In a wider sense, the Mesolithic settlements on the ancient shores of Lake Kahala also belong to Coastal Estonia (Vedru, 1998).

The oldest traces of settlement on the islands are mainly connected with the transgression of the Litorina Sea and the period following it. Nine Mesolithic settlement sites have been discovered in the NW part of Saaremaa, in the vicinity of the villages Vohma and Pahapilli (Vohma I–VII and Pahapilli I–II). Only

the Vohma I settlement site, which had once stood on the shore of a small cove, has been archaeologically investigated. The charcoal samples gathered from the fireplaces were dated to 5800–5000 cal BC (Kriiska, 1998, 18). Eight Mesolithic sites are known from the Kopu Peninsula, Hiiumaa (Kopu II, III, IV/V, VI, VII/VIII, IX, XIV and XVII), of which the Kopu IV/V and VII/VIII sites on the SE coast of the ancient island have been excavated. On the basis of the samples of charcoal and hazelnut shells the sites have been dated to 5600–5000 cal BC (Kriiska, 1996b, 401, 407). In the Late Mesolithic the Ruhnu island in the Livonian Bay has also been seasonally inhabited. Relying upon the finds and geographic location we may assume that the settlers of the islands came from coastal regions of West Estonia. Unfortunately, we know little of the Mesolithic of that area. Only a part of the finds from the bottom of the Pamu River



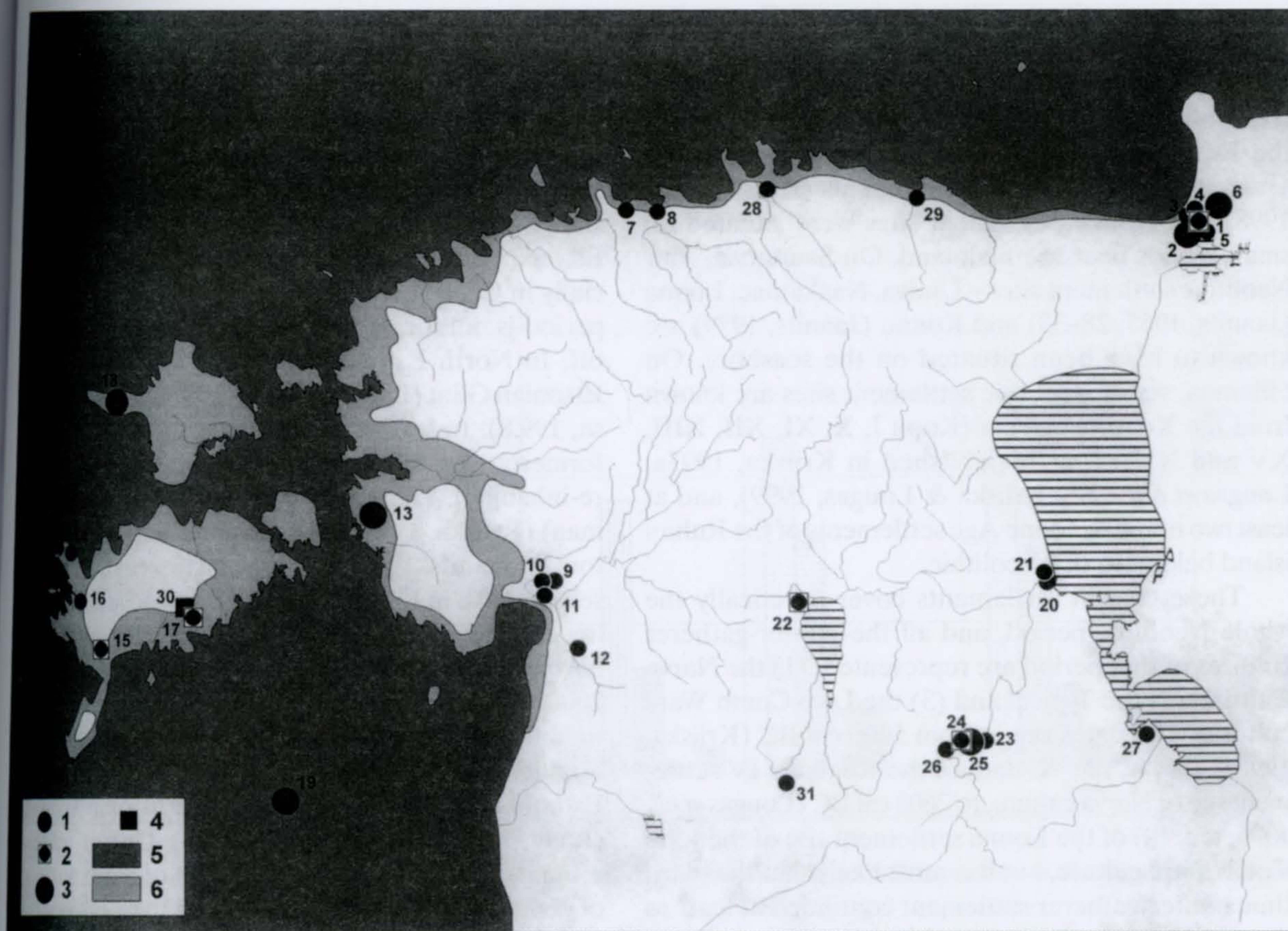


Fig. 2. Neolithic hunter-gatherer settlements. 1 – one settlement site, 2 – one settlement site with graves, 3 – 2 or more settlement sites, 4 – cemetery, 5 – present Baltic Sea, 6 – the maximum of the Litorina Sea. Monuments: 1 – Riigikiila I, 2 – Riigikiila II, III, IV, V, VI, VII, VIII, IX, X, XI, XII, XIII, XV; 3 – Kudrukiila; 4 – Vaikula; 5 – Narva Joaoru; 6 – Lommi I, II, III; 7 – Kroodi; 8 – Jagala Joesuu; 9 – Lemmetsa II; 10 – Malda; 11 – Lemmetsa I; 12 – Metsaare III; 13 – Kasekiila, Rouste; 14 – Undva; 15 – Naakamae; 16 – Loona; 17 – Konnu; 18 – Kopu I, X, XI, XII, XIII, XV, XVI; 19 – Ruhnu II, IV; 20 – Akali; 21 – Kullamagi; 22 – Valma; 23 – Kaapa; 24 – Tamula; 25 – Villa I, II; 26 – Vagula; 27 – Vaike-Rosna; 28 – Vihasoo III; 29 – Kunda Lammasmagi; 30 – Koljala; 31 – Valgjarve.

date from the period between the early Mesolithic Pulli settlement site and the site of Valge-Risti, probably contemporaneous with the early settlements on the islands. In the earlier days the islands were probably only temporarily inhabited, they offered the possibility to erect a camp, find firewood and raw material for making tools, and to leave a part of the supplies behind. Later, but possibly still in the Mesolithic, the settlement on the islands became permanent. The first area of permanent settlement must have been the largest island of this region, which was located in the western and northern part of the present-day Saaremaa. The similarity of the finds with those from Hiiumaa and Ruhnu leads to the conclusion that the people who settled on Saaremaa used other islands and islets of the region also for obtaining food.

More numerous are the Neolithic (Stone Age with ceramics) settlements of hunters and gatherers on the coast and the islands (Fig. 2). On the mainland they were often located on the islands and spits forming lagoons. In Riigikula (Northeast Estonia), fourteen hunterfishermen's settlements have been found on a spit of a lagoon of the Litorina Sea (Kriiska, 1999). In the same region, Lommi I, II and III, Narva Joaoru, Kudrukula and Vaikula settlement sites are known to have been with maritime economy (Indreko, 1948, 298–299; Kriiska, 1995b, 58–60). In North Estonia, Kroodi (Kriiska, 1997b) and possibly also Jagala (Spreckelsen, 1925) were connected with lagoons. In Southwest Estonia, Lemmetsa II and Malda settlements were situated on small islets forming a lagoon near the mainland. Later, when the uplift of the land had closed the connection to the sea and the relict



lake was formed, the settlement was shifted to the mouth of the river flowing out of the lake (Lemmetsa I settlement site). In Southwest Estonia, Metsaare III Neolithic settlement site on the middle course of the Reiu River also belonged among the coastal settlements. In West Estonia, Kasekula (Kriiska *et al.*, 1998) and Roustu settlement sites were situated on small islands near the mainland. On Saaremaa, four Neolithic settlement sites – Undva, Naakamae, Loona (Jaanits, 1965, 28–33) and Konnu (Jaanits, 1979) are known to have been situated on the seashore. On Hiiumaa, seven Neolithic settlement sites are known from the Kopu peninsula (Kopu I, X, XI, XII, XIII, XV and XVI) (partly published in Kriiska, 1995a; Lougas *et al.*, 1996; Kriiska & Lougas, 1999), and at least two of the six Stone Age settlements of the Ruhmi island belong to the Neolithic.

These coastal settlements cover practically the whole Neolithic period, and all the hunter-gatherer cultures of that period are represented: (1) the Narva Culture, (2) the Typical and (3) the Late Comb Ware cultures. The dates range from 5000 cal BC (Kriiska, 1996a, 416) of the <sup>14</sup>C date of the Riigikula IV settlement site of Narva culture, to 2600 cal BC (Lougas *et al.*, 1996, tab. III) of the Loona settlement site of the Late Comb Ware culture, but it is most likely that the maritime hunter-gatherer settlement continued at least to the end of the Neolithic period. But hunting of marine animals played an important role in the economy even of the inhabitants of Asva (Saaremaa) fortified settlement of the Late Bronze Age (Lougas, 1994).

### MARITIME ECONOMY

Indubitably, a drastic change of economic and settling strategies was brought along by the prevalence of agriculture. Though possibly known on Estonian territory to some extent already earlier (Lang, 1995), spreading of agriculture as the economy altering everyday life and settlement pattern was connected here with the Corded Ware Culture (introduced a few hundred years before 3000 cal BC). From that period date the numerous pieces of evidence proving the spreading of agriculture. Bones of goat, sheep, pig and cattle, as well as artefacts made of them, have been found from graves (Jaanits, 1992, 48). From the settlement of Iru (North Estonia), a fragment of the Corded Ware pottery was found with a charred grain of barley on it (Jaanits, 1992, 49). Still more significant are the pollen diagrams of bog and lake sediments. Pollen of cultivated plants of the stone Age, from the period 3900–1600 cal BC, has been found from 13

places on the coasts of mainland Estonia and on the islands as well as inland (Kriiska, 2000, tab. 1). Wheat, oats and barley were cultivated.

The settlement pattern of the Corded Ware culture was different from that of the hunter-gatherer society of the Stone Age. The choice of the dwelling sites is based on quite different criteria than in other Estonian Stone Age cultures. It strikes the eye especially in Coastal Estonia where the settlement of that period is not located on the seashore but a little way off. In North Estonia it concentrates on the North Estonian Glint (Lang, 1996, fig. 101, 120; Lang & Kõnsa, 1998). In several places the areas known already formerly, now far away from the seashore, have been re-inhabited. The settlement sites of Vohma I (Saaremaa) (Kriiska, 1998, 18) and Siimusaare (Central Estonia) (Jaanits, 1959b, 161) reveal traces of Mesolithic settlements, in Kopu (Hiiumaa), and Riigiküla on the lower reaches of the Narva River, new settlements have been established on Early Neolithic sites (Kriiska, 2000, 72). Small settlements and burial grounds seem to indicate the formation of the communities of single families, typical of (at least) the farmers of Coastal Estonia in the Bronze Age and the Roman Iron Age (Lang, 1995, 136; Kriiska, 2000, 74). Unfortunately it is impossible to determine the share of grain and meat of domestic animals in the diet of the people, compared to the products of gathering, hunting and fishing. Relying upon the Late Neolithic and Early Bronze Age bone material of Latvia and Lithuania, the share of domestic animals was not very large (Ostrauskas, 1998). Still, agriculture determined the choice of the sites for settlements.

Some changes affecting the settlement pattern have occurred earlier. In the Baltic Stone Age, considerable shift in the hunter-gatherer economy took place due to the climatic changes at the end of the glacial period. The warming of the climate caused changes in fauna and flora and reindeer as the main game was replaced by other species. Icecap regressed from Estonian mainland in about 11000 cal BC and evidently natural conditions already rendered the human settlement possible (Moora, 1998, 54). The nearest hitherto known camp sites of reindeer hunters have been discovered on the banks of the Daugava River, Latvia (Zagorska, 1999), but it would be precipitate not to consider the possibility of their hunting trips extending to Estonian areas as well.

The Early Mesolithic traces of human activities on Pulli settlement site are clearly connected with forests and hunting wild animals. Such type of economy, lasting throughout the Stone Age, could be called the inland economy. It was based on hunting wild animals,



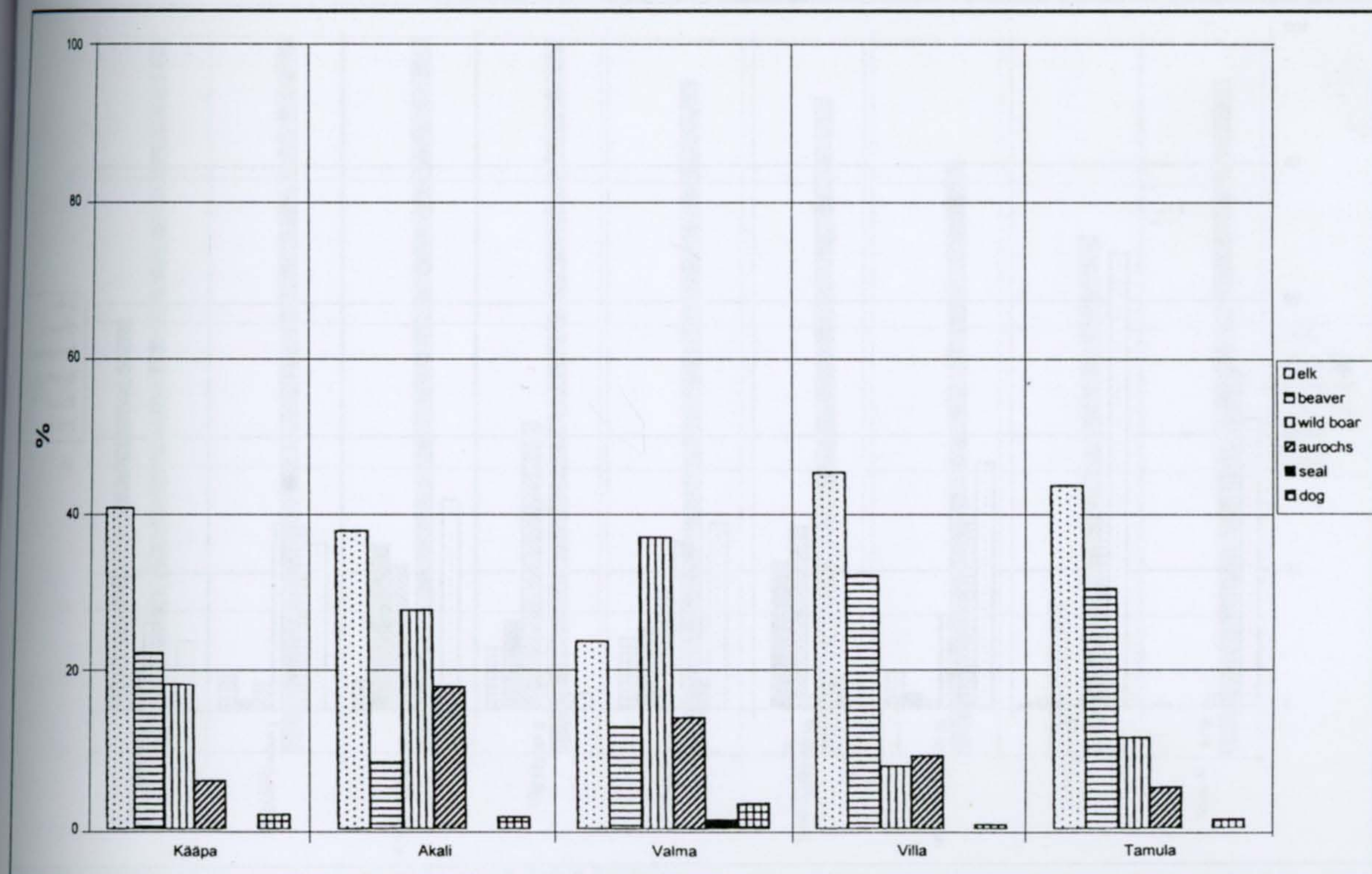


Fig. 3. The share of the five most represented animals among the bones determined to species in the Stone Age inland settlements (based on Paaver 1965, Lougas 1997).

fishing on inland waterbodies, and gathering. At the present state of investigation we may say that one of the central areas of Mesolithic inland settlement was in the Central Estonia, on the northern shore of Lake Vortsjarv and on the banks of the Navesti River. Twelve settlement sites are known there: Tamme, Jalevere, Moksi, Siimusaare, Umbusi (Jaanits, 1981) and Laisi I-IV, Laeva I-II and Leie (Kiristaja *et al.*, 1998, 214–216). Several Mesolithic settlement sites are known from the banks of the River Emajogi. Inland Neolithic settlement sites are known from the banks and shores of several rivers and lakes in East Estonia (Akali, Kullamagi), Central Estonia (Valma) and Southeast Estonia (Kaapa, Tamula, Vagula, Villa I, II and Vaike-Rosna (Jaanits, 1959a, b; Jaanits, 1976; Kiristaja *et al.*, 1998, 222, 227). The main game throughout the Stone Age were elk and beaver, wild boar (in the osteological material of Valma outnumbering even elk, and ranging second in Akali), and auroch (Fig. 3). The list of fish is long, but in the bone material pike, perch, common bream and vimba bream dominate (Lougas, 1997, tab. 2).

In the coastal areas a different type of economy developed, with hunting of marine mammals playing an important part in it. The time of its emergence is

not clear yet, but in Late Mesolithic, since the beginning of the Littorina Sea it is clearly discernible in archaeological and especially in palaeozoological material. Two trends can be observed in the formation of coastal settlement and economy: 1) specialized seal hunting, 2) hunting of marine and wild animals. Both these trends survived for a long time and disappeared only with the spreading of agriculture.

In mainland Estonia, economy was determined by the jointed coastline rich in lagoons. As I have said before, coastal settlements are known from several regions of Estonia, the lower reaches of the Narva River being the most thoroughly investigated of them. The first archaeological excavations took place there already in 1931, and the excavations and inventory trips have continued intermittently up to the present day (survey of the research history see Kriiska, 1996c). Besides archaeological finds, rich osteological material has been collected there, giving a good survey of the fauna of Northeast Estonia in that period and enabling us to draw conclusions about the areas with analogous natural conditions. Osteological material indicates that different animals were hunted, elks, aurochs and wild boar being most represented (Fig. 4). The share of wild boar has increased during the period of the Comb



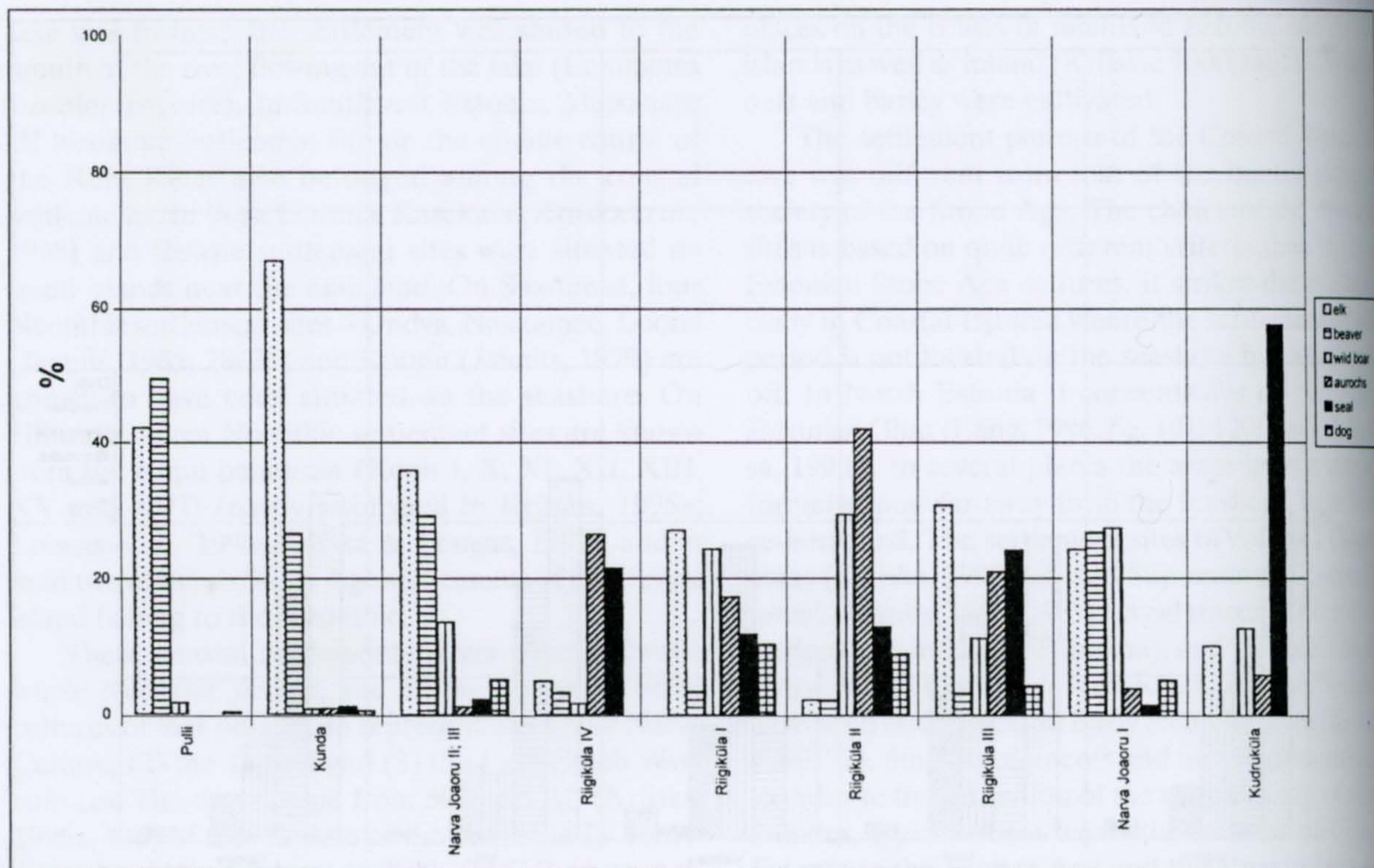


Fig. 4. The share of the five most represented animals among the bones determined to species in the Stone Age coastal settlements of mainland Estonia (based on Paaver 1965, Lougas 1997).

Ware Cultures, when the lagoon at Riigikiila had become marshy and the settlement had shifted to the banks of the Narva River in the eastern part of the former spit. Considerable changes in the share of different species have taken part on the settlement site of Narva Joaoru. In the Mesolithic (layers II and III) elk dominates over beaver and wild boar, while in the Early Neolithic (layer I) their share was practically equal. A specific trait of the settlements of the Narva region is the great share of dog bones, and dog meat has evidently been used for food also. In the material of the Riigikiila IV settlement of the Narva culture, 35% of bone finds belong to pine marten, which might indicate hunting of fur animals in winter (Kriiska, 1999, 177; Lougas, 1999).

Seal has been an important game on the lower reaches of the Narva River as well as elsewhere on the coastal areas. Their share in the material of Riigikiila settlements was 12–24.5%, in Kudruküla even 57.8% (fig. 4). Such a share of seal bones equals the latter settlement with those of the islands of West Estonia for their economic base. In the early phase of the Neolithic, ringed seal and grey seal were hunted, since the Middle Neolithic harp seal appears in the bone material. The latter has been found on the main-

land from Kudruküla, Riigikiila, and from the bottom of the Pamu River together with bone artefacts of the Stone Age (Lougas, 1997, tab. 3). A new species of marine mammals appearing in the Neolithic was the only species of *Cetacea* in the Baltic, porpoise, the bones of which have been found in the material of Kudruküla (Lougas, 1997, tab. 3), Riigikiila I, III and IV settlements (Lougas, 1999, tab. 1).

Fishing and fowling also played an important role in the economy. Among fish, pike dominates in coastal settlements, too, but the second one is pike perch instead of perch (Lougas, 1997, tab. 2; 1999, tab. 1). Unfortunately, only a few bird bones found from coastal settlements have been hitherto determined. Relying upon bone finds, different ducks, whooper swan, common scoter, etc. were hunted of waterfowl; of forest birds, black grouse and capercaillie were represented (Gliick, 1906, 275–276; Lougas, 1999, tab. 1).

As it has been mentioned above, the earliest traces of settlement on the islands date from the Late Mesolithic. It is possible, that the more remote islands were discovered only during the long trips for hunting seals, when hunting for marine mammals became the important source of living of the communities of the coastal settlements of mainland Estonia. Anyway,



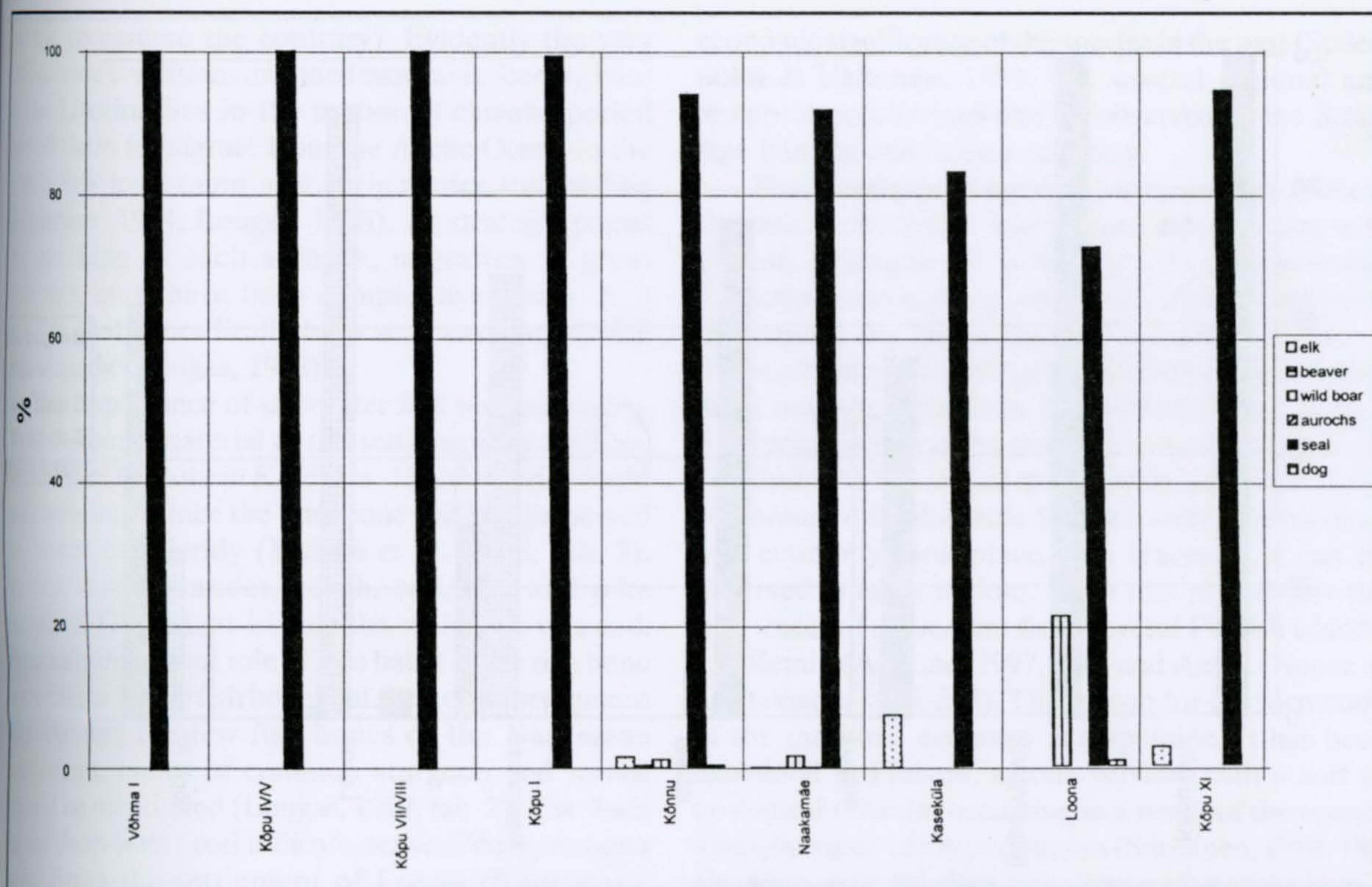


Fig. 5. The share of the five most represented animals among the bones determined to species in the Stone Age coastal settlements of (ancient) islands (based on Paaver 1965, Lougas 1997).

hunting of marine animals was one of the main means of livelihood on the islands. In all Mesolithic and Early Neolithic settlements that have been hitherto investigated, the share of seal bones is remarkably large. In the Mesolithic settlements (Vohma I, Kõpu IV/V and VII/VIII) all the bones determined to species belong to seals (Fig. 5). In the Kõpu I settlement (Hiiumaa) of the Narva Culture, only four fragments of a hedgehog's mandibula have been found besides the seal bones. This is very interesting since the hedgehog is not able to populate the islands isolated by the sea, so they must have been brought along by the people. Naturally it is possible that they were taken as food supplies but relying upon ethnological parallels we may presume that the hedgehog bones rather possessed religious than economic importance (Lougas *et al.*, 1996, 206–207). Seal bones had a large share (93.8%) also in the osteological material of Kõnnu settlement site (Saaremaa) of Narva Culture. But there, stray bones of elk, beaver, wild boar, pine marten and fox were also found (Lougas, 1997, appendix II, A.). Small amounts of birds' bones – eider, long-tailed duck, cormorant, merganser, goldeneye (Kriiska & Lougas, 1999, tab. 6) and a few fish bones – pike, roach, perch, cod and turbot (Lougas, 1997, tab. 2) have also been

found. Fish bones are so few that these may come from seals' bowels. Fowling may have occupied quite an important part in the early economy of the islands, likewise the gathering of birds' eggs. In connection with the early settlement of Åland, an interesting phenomenon of the Baltic Sea has been discussed: polynia – iterative spaces of open water in the midst of ice, often used for living and feeding places by fowl and marine animals. Such places offered possibilities for successful hunting for the Stone Age men (Nunez, 1996, 29–32). From the Kõpu I settlement site, hazelnut shells (Kriiska, 1995, 413) have been found – one of the few traces of gathering from Estonian Stone Age settlement sites.

In many aspects, the oldest investigated settlement sites of Northwest Saaremaa and Kõpu peninsula (Hiiumaa) are very similar. In both areas it has been customary to use local rocks for making tools. The dominating raw material was quartz and white, grey and beige local flint of inferior quality. In processing the stones, splitting technique was often used. More thoroughly processed were only 1–2% of the tools, mostly scrapers. The small number of chopping tools is also common in these areas. Only a few fragments or blanks of chisels and axes were found (Kriiska, 1998,



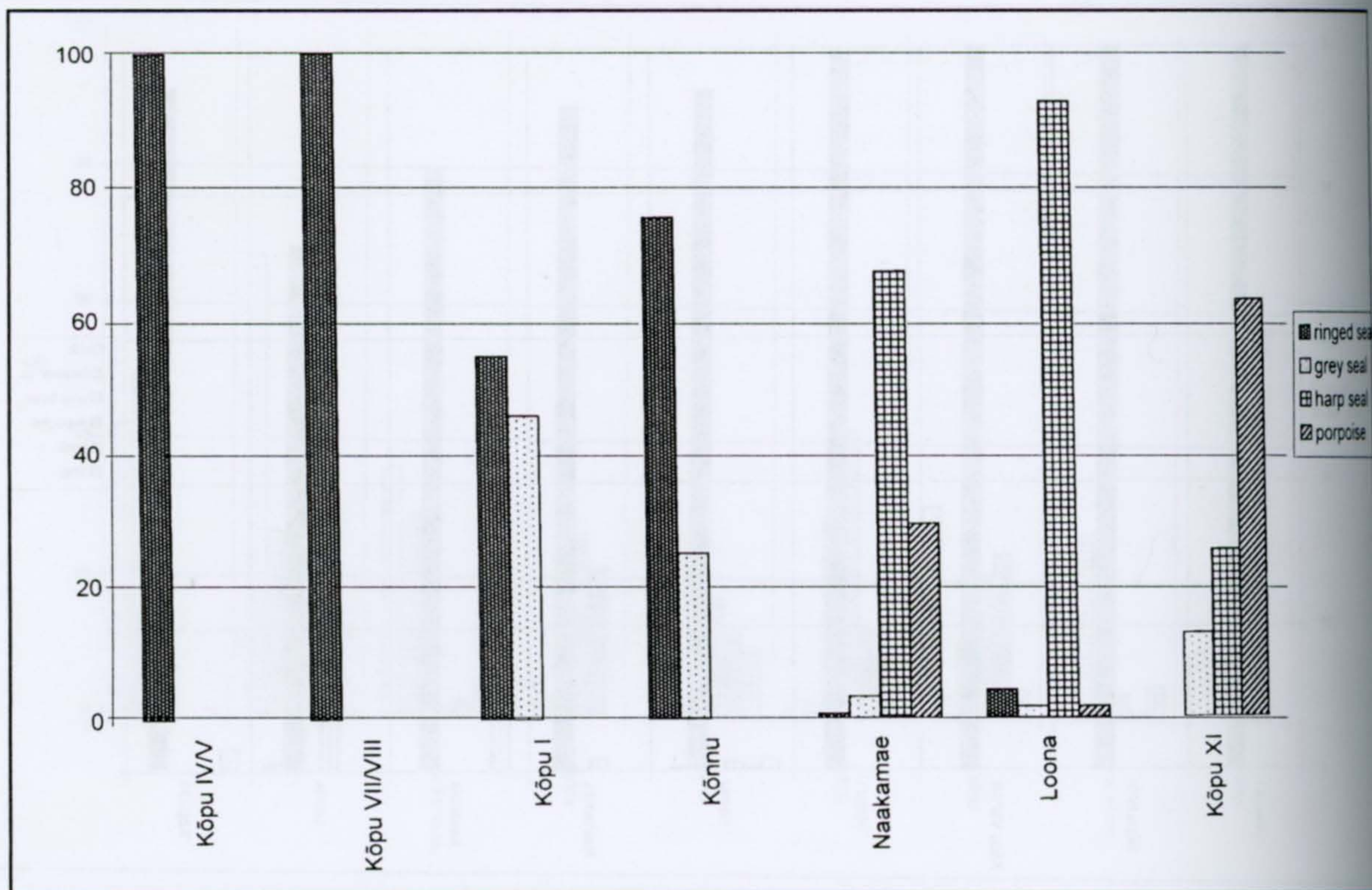


Fig. 6. The share of marine mammals in the bone material of the Stone Age settlements of the islands (based on Lougas 1997).

19). Bone material and the small variety of artefacts in early settlements of the Baltic islands have been interpreted as the indicators of seasonality (Moora & Lougas, 1995, 479; Nunez, 1996, 27; Kriiska, 1996d, 3). Still, it is possible that seasonality on the islands did not mean – from the end of the Mesolithic already – the iterative arrivals and returns to the mainland, but the moving of a community (communities?) permanently living on the islands, inside their hunting territories which may have comprised several islands and islets. This may be indicated by the singularity of the culture group on Saaremaa, Hiiumaa and Ruhnu at the beginning of the Neolithic, since about 5000 years BC. Since it differs considerably from the local groups of the Narva Culture on mainland, it must have been formed somewhat separately. It is very likely that the regional peculiarities of pottery reflect the cultural differences which had formed already during the Mesolithic (Kriiska, 1997, 17). The find material of the Early Neolithic settlement of Kõnnu (Saaremaa) also indicates more permanent presence. Here, unlike other early habitation sites of the islands, the finds of chopping tools are numerous – nearly 500 stone axes and chisels (Kriiska, 1998, 19).

The presumable period of residence in the early settlements of Vohma and Kõpu was early spring –

the best time for hunting ringed seal and grey seal. In February and March these species migrate, up to the present day, to our waters to give birth to their young, and so they are easy targets. The ringed seal pupping mainly at the end of February, the grey seal in March (Aul *et al.*, 1957, 268–269). Although both species can be hunted to some extent all the year round, early spring has always been the best and most productive time for hunting seals (Kalits, 1963, 136; Art, 1988, 13). The direct proof of puppying time hunting is the bone of a ringed seal, maximally a week old, found from the Kõpu I settlement (Moora & Lougas, 1995, 479). The close stone settings of the fire-pits, accumulating heat and keeping the dwellings warm longer, might also indicate the habitation of the site in cold season.

In the second half of the Neolithic the hunting economy of the islands had undergone considerable changes (Fig. 6). The main game was still seal with its share among the bones of mammals 72.3–94%. Besides the grey seal and the ringed seal, harp seal and porpoise also appear among the game. Of the bone finds from Naakamae, determined to species, 67% belong to harp seal. The respective % in Loona is even 92.4%. Presumably there has not been the local population of harp seal in the Baltic (hitherto no finds



permit to assume the contrary). Evidently the very difficult ice conditions and the favourable feeding base in the Litorina Sea in the subboreal climatic period forced them to migrate from the Arctic Ocean to the Baltic Sea in autumn and early winter for feeding (Lepiksaar, 1964; Lougas, 1998). At strategic points the catching of such animals, migrating in great numbers, must have been comparatively easy. It is possible that sporadically harp seal was caught with nets already (Lougas, 1998).

The importance of salt-water fish was increasing. From the bone material of the settlement of the Late Comb Ware Culture in Kasekiila, 11 fish species could be determined, since the limestone soil had preserved the bones excellently (Kriiska *et al.*, 1998, tab. 3). Among them flounder, perch, cod, eel, and pike prevailed. On distant islands the main fish was cod. Especially important role (97%) had it in the rich bone material (ca 10 000 fish bones) of the Loona settlement site. Among the few fish bones of the Naakamae settlement, bones of common sturgeon and turbot should be mentioned (Lougas, 1997, tab. 2). The finds of the deep-water cod indicate active fishing on open seas. From the settlement of Loona (Saaremaa), relatively many bones (20.8 %) of wild boar were found, and from the settlement of Kopu XI (Hiiumaa) and the Kasekiila settlement which was then located on a small island near the mainland, eel bones were found. Among the numerous pig bones from Loona, 30 pieces have roused suspicion that they belonged to half-domesticated young animals (Paaver, 1965, 440).

Considering that the best time for hunting grey seal is early spring, that harp seal could be hunted only in autumn and early winter, and that porpoise appears in the Baltic Sea mostly in summer and autumn, we can presume that the mentioned Late Neolithic settlements were lived in at least in those periods, but possibly all the year round. The archaeological find material, containing more specific tools and more tools with the traces of secondary processing, also indicates more stabile and long-lasting permanent settlement.

## CONCLUSIONS

It is clear that the resources depended on the natural environment of the Stone Age communities. So the choice of the settlement sites reflects the type of economy, and the type of ancient landscape helps to determine the nutritional base. The animal bones found from the monuments hold still more information about the Stone Age economy. Presuming that the share of the determined bone fragments reflects the

economic significance of the species in the past (Soderholm & Ukkonen, 1999, 47), several regional and temporal peculiarities can be observed in the Stone Age hunting and fishing economy.

The inland type of hunting-fishing economy, where the main subsistence was obtained by hunting wild animals, fishing on inland waterbodies, and gathering, formed already in the Early Mesolithic and continued throughout the Stone Age. At the present state of investigation we can talk of the maritime coastal settlement only since the Late Mesolithic, though people lived relatively near the seashore already in the Early Neolithic. At the end of the Ancylus Lake and at the beginning of the Litorina Sea, the shift of settlement and economy took place. The traces of it can be observed in many regions. From that period date the first traces of settlement from several Finnish islands, e.g. Kemio (Asplund, 1997, 218) and Aland (Nunez & Gustavsson, 1995, 223). The reason for the formation of the maritime economy is disputable. It has been explained in Finland, as one version, with a sort of ecological restraint occurring as a result of the remarkable decrease of elk population (Siiriainen, 1982, 18). Estonian material does not allow such conclusions. I would rather agree with the other Finnish researcher who presumes that the sea became more productive (Nunez, 1996, 24). The Litorina Sea was more brackish and evidently also more favourable for the increase of biomass in the sea and herewith also for the seal, increasing their populations.

The hitherto oldest traces of settlement on Estonian islands date from the Late Mesolithic. In all the investigated Mesolithic settlements, all bones determined to species belong to seals. It is also possible that permanent settlement appeared on the largest island, ancient Saaremaa, already in the Mesolithic. This would explain the development of the singular group of the Early Neolithic Narva Culture on the islands of West Estonia. The similarity of finds, especially pottery, on Saaremaa, Hiiumaa and Ruhnu indicates the mobility of the early seal hunters. Since the Middle Neolithic, the hunting economy on the islands changed. The main game was, as before, seal, but new species of marine mammals – harp seal and porpoise – appeared. The amount of fish, especially cod, increased, considering the best and possible hunting seasons of different seals, these settlements must have been inhabited at least in autumn and winter, if not throughout the year.

On the coastal areas of mainland Estonia the means of livelihood were more varied. Here met the zones of occurrence of different animals, birds and fish. Well jointed coastline with numerous lagoons was



favourable for fishing, water-fowling and seal hunting, the adjacent forests favoured game hunting. This ecological margin effect was skilfully used by the Stone Age people. It afforded people subsistence on a relatively small area, and also a rather settled habitation inside the hunting territory. The osteological material proves that different animals were hunted. Elk, auroch and wild boar prevail in the bone material. The share of wild boar

increases since the Middle Neolithic. Seals occupy a remarkable place in the bone material of the coastal settlements; sporadically, their share even exceeds 50%. Ringed seal, grey seal and, since the Middle Neolithic, also harp seal are represented. In the Neolithic, a new species of marine mammals – the porpoise – appears in the bone material. Fishing and fowling have also played an important part in the economy.

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## PAJŪRIO MEDŽIOTOJŲ IR RINKĖJŲ VERSLAI BEI GYVENVIETĖS ESTIJOJE

Aivar Kriiska

### Santrauka

Osteologinė medžiaga iš Estijos akmens amžiaus gyvenviečių rodo, kad to meto pasisavinamajame ūkyje buvo daug chronologinių ir regioninių skirtumų. Žemyninio tipo pasisavinamasis ūkis, paremtas miško gyvūnų (daugiausia briedžių, bebrų, taurų ir šernų) medžiokle, gėlavandene žvejyba ir rinkimu, susiformavo dar ankstyvajame mezolite ir vystėsi per visą akmens amžiaus laikotarpį. Jūros pakrančių gyvenvietės, kurių ūkinė veikla buvo orientuota į jūrą, visų pirma į jūros žinduolių medžioklę, Estijos archeozoologinėje medžiagoje išsiskiria tik vėlyvajame mezolite. Susiformavusi sūriavandė Litorinos jūra sudarė palankias sąlygas padidėti jos vandenų biomasei, o kartu ir žymiai išaugti maitinimosi grandinės pabaigoje buvusioms ruonių populiacijoms. Šiuo laikotarpiu datuoti patys ankstyviausi radiniai Estijos salose.

Tyrinėtose salų gyvenvietėse visi gyvūnų kaulai priklauso ruoniams (pav. 5). Galbūt didžiausioji sala, Sarema, pastoviai, visus metus buvo apgyvendinta jau vėlyvajame mezolite. Ši prielaida paaiškintų atskiros lokalinės neolitinės Narvos kultūros grupės susiformavimą vakarų Estijos salose. Surinkta archeologinė medžiaga, ypač narviška keramika, Saremos, Hijumos ir Ruhnu salose yra labai panaši ir, matyt, atspindi ankstyvųjų ruonių medžiotojų mobilumą. Nuo vidurinio neolito pradžios pasisavinamasis ūkis salose pasikeičia. Nors

pagrindiniu medžiojamuoju gyvūnu išlieka ruonis, tačiau greta jo atsiranda naujos jūros žinduolių rūšys: grenlandinis ruonis ir delfinas (pav. 6). Žymiai daugiau buvo gaudomos žuvys, ypač menkė. Sėkmingiausios medžioklės metais, matyt, šiose gyvenvietėse buvo gyvenama bent jau rudenį ir žiemą, jeigu ne visus metus.

Žemyninės Estijos pakrančių gyvenvietėse pasisavinamojo ūkio verslai buvo daug įvairesni todėl, kad pakrantės zonoje kirtosi daugelio gyvūnų, paukščių ir žuvų rūšių paplitimo arealai. Raižyta pakrantė su daugybe pusiasalių ir įlankų buvo patogi žvejybai, jūros paukščių ir gyvūnų medžioklei. Apylinkių miškuose buvo medžiojami miško gyvūnai (pav. 4). Akmens amžiaus žmonės sėkmingai naudojo taip vadinamą „pakraščio ekologiniu efektu“. Šios aplinkybės jiems suteikė galimybes prasimaitinti nedidelėje teritorijoje, taip pat leido palyginti sėsliai gyventi savo medžioklės plotuose. Osteologinė medžiaga atskleidžia medžiojamųjų gyvūnų įvairovę. Tarp jų gausiausi buvo briedžiai, taurai ir šernai. Pradedant viduriniu neolitu pastarosios rūšies reikšmė vis augo. Ruonių kaulai sudarė žymią dalį, kartais netgi daugiau nei pusę visų gyvūnų kaulų pakrančių gyvenvietėse. Nerpa, pilkasis ir grenlandinis ruonis buvo medžiojami viduriniojo neolito pradžioje. Neolite taip pat buvo medžiojami delfinai. Svarbiomis ūkio šakomis taip pat buvo žvejyba ir paukščių medžioklė.

### ILIUSTRACIJŲ SĄRAŠAS

1 pav. Mezolito gyvenvietės. 1 – vienos gyvenvietės archeologinis paminklas, 2 – 2–5 gyvenviečių archeologinis paminklas, 3–6 ir daugiau gyvenviečių archeologinis paminklas, 4 – dabartinė Baltijos jūra, 5 – maksimalus Litorinos jūros plotas. Paminklai: 1 – Pulli; 2 – Kunda Lammasmagi; 3 – Soitme I, Soorina, Sepa, Uuri-Saki, Miiurisepa, Aabrami, Tooma-Hansu; 4 – Narva

Joaoru; 5 – Vihasoo I, II; 6 – Valge-Risti; 7 – Metsaare I, II; 8 – Suurupi, Liikva I, II, III; 9 – Vohma I, II, III, IV, V, VI, VII; Pahapilli I, II; 10 – Kopu II, III, IV/V, VI, VII/VIII, IX, XIV, XVII; 11 – Ruhnu I, II, III, V, VI; 12 – Lepakose; 13 – Tame; 14 – Jalevere; 15 – Siimusaare, Leie, Moksi, Laisi I, II, III, IV; 16 – Umbusi; 17 – Laeva I, II; 18 – Metsavahi; 19 – Ihaste; 20 – Akali.



2 pav. Neolito laikotarpio medžiotojų ir rinkėjų gyvenvietės. 1 – vienos gyvenvietės archeologinis paminklas, 2 – vienos gyvenvietės archeologinis paminklas su kapais, 3 – dviejų ar daugiau gyvenviečių archeologiniai paminklai, 4 – kapinynas, 5 – dabartinė Baltijos jūra, 6 – maksimalus Litorinos jūros plotas. Paminklai: 1 – Riigikiila I, 2 – Riigikiila II, II, IV, V, VI, VII, VIII, IX, X, XI, XII, XIII, XV; 3 – Kudrukiila; 4 – Vaikula; 5 – Narva Joaoru; 6 – Lomi I, II, III; 7 – Kroodi; 8 – Jogala Joesuu; 9 – Lemetsa II; 10 – Malda; 11 – Lemetsa I; 12 – Metsaare III; 13 – Kasekiila, Rouste; 14 – Undva; 15 – Naakamae; 16 – Loona; 17 – Konnu; 18 – Koppu I, X, XI, XII, XIII, XV, XVI; 19 – Ruhnu II, IV; 20 – Akali; 21 – Kulamagi; 22 – Valma; 23 – Kaapa; 24 – Tamula; 25 –

Vila I, II; 26 – Vagula; 27 – Vaikē-Rosna; 28 – Vihasoo III; 29 – Kunda Lamasmagi; 30 – Koljala; 31 – Valgjarvė

3 pav. Penkių daugiausiai sutinkamų gyvūnų dalis tarp kaulų, rastų akmens amžiaus gyvenvietėse vidinėje krašto dalyje (pagal Paaver, 1965 ir Lougas, 1997).

4 pav. Penkių daugiausiai sutinkamų gyvūnų dalis tarp kaulų, rastų akmens amžiaus pajūrio gyvenvietėse žemyninėje Estijos dalyje (pagal Paaver, 1965 ir Lougas, 1997).

5 pav. Penkių daugiausiai sutinkamų gyvūnų dalis tarp kaulų, rastų akmens amžiaus gyvenvietėse, esančiose salose (pagal Paaver, 1965 ir Lougas, 1997).

6 pav. Jūros žinduolių dalis tarp kaulų, rastų akmens amžiaus gyvenvietėse, esančiose salose (Lougas, 1997).

## ПРИБРЕЖНОЕ ЗАСЕЛЕНИЕ И ПРОМЫСЛОВОЕ ХОЗЯЙСТВО ЭСТОНИИ

Айвар Крииска

### Резюме

Из остеологического материала, собранного со стоянок каменного века Эстонии, следует, что в тог-  
дашнем промысловом хозяйстве имелись многие  
региональные и временные различия. Уже в раннем  
мезолите сформировался и в течение всего камен-  
ного века продолжался тип промыслового хозяйства  
в глубинных районах страны, где довольствие доста-  
вали охотой на дичь (в основном – лоси, бобры,  
туры и кабаны), рыболовством на внутренних водах  
и собиранием даров природы. Прибрежное  
заселение, ориентированное на море и в первую  
очередь охоту на морских млекопитающих,  
выдвигается в эстонском археозоологическом  
материале только с позднего мезолита. Соленое  
нынешнее Литориновое море, очевидно, предлагало  
вполне хорошие условия для увеличения биомассы  
в его водах, а также благоприятствовало на конце  
питательной цепи расположенным тюленям, спо-  
собствуя значительному увеличению их популяции.  
От того времени происходят и пока самые ранние  
находки от островах Эстонии

Во всех пока исследованных стоянках, все кости  
млекопитающих, вид которых удалось определить,  
принадлежат тюленям (рис. 5). Вполне возможно,  
что постоянное, круглогодное заселение на самом  
обширном острове Сааремаа тоже возникло уже в  
мезолите. Такое обстоятельство объяснило бы обра-  
зования в неолите нарвской культурной группы на  
островах западной Эстонии. Сходство между обно-  
руженным материалом и особенно нарвской  
керамикой на островах Сааремаа, Хийумаа и Рухну  
указывает на подвижность древних охотников на  
тюленей. С начала среднего неолита изменилось  
промысловое хозяйство на островах. Главным

промысловым животным остался по-прежнему  
тюлень, но к нему прибавились новые виды морских  
млекопитающих – гренландский тюлень и морская  
свинья (рис. 6). Существенно больше ловили рыб,  
особенно трески. В годы наиболее успешного  
промысла люди в этих поселениях жили, по крайней  
мере осенью и зимой, а то и круглый год.

На морском побережье континентальной Эсто-  
нии способы добывания средств существования  
были заметно разнообразными, потому что на  
побережной полосе пересекались ареалы распрос-  
транения разной дичи, птиц и рыб. Извилистая  
береговая линия с многочисленными небольшими  
заливами и лагунами была приспособлена для  
рыболовства, охоты на морских птиц, а также для  
тюленебоя. Окружающие леса были благоприятны  
для охоты на дичь (рис. 4). Люди каменного века  
удачно пользовались т.-н. экологическим эффектом  
окраины. Это обстоятельство давало им возмож-  
ность прокормиться на сравнительно маленькой  
территории, а также и вести вполне оседлый образ  
жизни в пределах охотничьих угодий. Остеологи-  
ческий материал указывает, что водились разно-  
образные промысловые животные. В костном мате-  
риале наблюдается больше всего лосей, туров и  
кабанов. Удельный вес последнего начал расти со  
среднего неолита. Тюленьи кости образуют значи-  
тельную часть, местами даже более половины отбро-  
сов в прибрежных заселениях на континенте. Из  
видов упоминаются нерп, серый тюлень и с начала  
среднего неолита гренландский тюлень. В неолите  
возникается еще один вид морских млекопитающих –  
морская свинья. Значительную роль в хозяйстве  
также сыграли рыболовство и охота на птиц.



## СПИСОК ИЛЛЮСТРАЦИЙ

Рис 1. Поселения периода мезолита. 1 – археологический памятник с одним поселением, 2 – археологический памятник с 2–5 поселениями, 3 – археологический памятник с 6 и более поселениями, 4 – Балтийское море в наши дни, 5 – максимальная площадь Литоринского моря. Памятники: 1 – Пулли; 2 – Кунда Ламмасмяги; 3 – Соитме I, Соорина, Сепя, Уури-Саки, Мииури-Сепя, Аабрами, Тоома-Хансу; 4 – Нарва Йоаору; 5 – Вихасоо I, II; 6 – Валге-Ристи; 7 – Метсааре I, II; 8 – Суурупи, Лииква I, II, III; 9 – Вохма I, II, III, IV, V, VI, VII; Пахапилли I, II; 10 – Копу II, III, IV/V, VI, VII/VIII, IX, XIV, XVII; 11 – Рухну I, II, III, V, VI; 12 – Лепакосе; 13 – Тамме; 14 – Ялевере; 15 – Сиимусааре, Лейе, Мокси, Лайси I, II, III, IV; 16 – Умбуи; 17 – Лаэва I, II; 18 – Метсавахи; 19 – Ихасте; 20 – Акали.

Рис 2. Поселения охотников и собирателей периода неолита. 1 – археологический памятник с одним поселением, 2 – археологический памятник с одним поселением с погребениями, 3 – археологические памятники с двумя и более поселениями, 4 – могильник, 5 – Балтийское море в наши дни, 6 – максимальная площадь Литоринского моря. Памятники: 1 – Риигикиила I, 2 – Риигикиила II, II, IV, V, VI, VII, VIII, IX, X, XI, XII, XIII, XV; 3 –

Кудрукиила; 4 – Вайкула; 5 – Нарва Йоаору; 6 – Ломми I, II, III; 7 – Крооди; 8 – Йогала Йоесуу; 9 – Леметса II; 10 – Малда; 11 – Леметса I; 12 – Метсааре III; 13 – Касекиила, Роусте; 14 – Ундва; 15 – Наакамае; 16 – Лоона; 17 – Конну; 18 – Коппу I, X, XI, XII, XIII, XV, XVI; 19 – Рухну II, IV; 20 – Акали; 21 – Куламаги; 22 – Валма; 23 – Каапа; 24 – Тамула; 25 – Вилла I, II; 26 – Агула; 27 – Вайке-Росна; 28 – Вихасоо III; 29 – Кунда Ламмасмяги; 30 – Колъяла; 31 – Валгярве.

Рис 3. Доля наиболее часто встречающихся животных среди костей, найденных в поселениях каменного века во внутренней части края (по Паавер, 1965 и Лоугас, 1997).

Рис 4. Доля наиболее часто встречающихся животных среди костей, найденных в прибрежных поселениях материковой части Эстонии (по Паавер, 1965 и Лоугас, 1997).

Рис 5. Доля наиболее часто встречающихся животных среди костей, найденных в поселениях каменного века на островах (по Паавер, 1965 и Лоугас, 1997).

Рис 6. Доля морских млекопитающих среди костей, найденных в поселениях каменного века на островах (по Лоугас, 1997).

A. Kriiska  
Chaire of Archaeology  
University of Tartu Lossi 3,  
550090 Tartu,  
Estonia