Henrik Asplund and Irmeli Vuorela

SETTLEMENT STUDIES IN KEMIÖ – ARCHAEOLOGICAL PROBLEMS AND PALYNOLOGICAL EVIDENCE

Abstract

An attempt was made to obtain material concerning Iron Age land use outside the central settlement areas in SW Finland by means of a brief archaeological survey and palynological studies on Kemiö Island . Despite the fact that all efforts to locate Iron Age archaeological remains have so far proved unsuccessful, pollen analysis shows evidence of continuous cereal cultivation in the northernmost part of the island, beginning in the late Merovingian period or in the Viking Age. This result is compared with the distribution of Finnish place names on the island, which has been inhabited mainly by Swedish speaking people from the early Medieval period onwards. Evidence of human impact in the study area preceding the Iron Age was also revealed by the pollen analyses, thus throwing light upon the cultural history of the area in the Late Neolithic and the Bronze Age.

Henrik Asplund, University of Turku, Dept. of Archaeology, SF-20500 Turku.
Irmeli Vuorela, Geological Survey of Finland, SF-02150 Espoo.

INTRODUCTION

Iron Age settlement in SW Finland is mainly concentrated in the river valleys of the mainland. These river valleys, together with their surroundings, seem to form the central areas of settlement from about AD 50 onwards, being characterised by the appearance of dwelling sites, hillforts and – above all – cemeteries (Fig. 1). These centres evidently form the cores of the later parishes in the region (Tallgren 1931, 91–92; Oja 1955, 123–126; Meinander 1980, 13). Outside of the river valleys Iron Age sites and finds occur only sparsely and the lack of cemeteries is especially obvious. The actual distribution of dwelling sites still presents a problem, because until recently they have seemed difficult to locate even in the vicinity of cemeteries in the central settlement areas. It can, however, be stated, that those areas lacking cemeteries have most probably been settled and used in a somewhat different way from the settlement areas in the river valleys.

The use of land outside the Iron Age central settlement areas is an interesting subject for archaeological investigation but, so far, it has scarcely been dealth with. One recent exception is an article by J.-P. Taavitsainen (1987), in which the Iron Age colonization process of the province of Savo is discussed. The study is a promising analysis of the development of settlement and land use in eastern Finland, despite the fact that the archaeological material in the study area is relatively sparse. The lack of archaeological finds is a common problem concerning most studies on settlement in marginal areas. New material relevant to land use in such a context might possibly be obtained, at least in some cases, just by focusing archaeological field work and other means of investigation on areas with few or no known Iron Age sites or only stray finds. An attempt was made in the case of Kemiö to combine a brief archaeological survey with palynological studies in order to obtain material concerning land use and settlement in an area almost entirely lacking in Iron Age archaeological remains.

The author Asplund is responsible for the archaeological data and the author Vuorela for the palynological results.

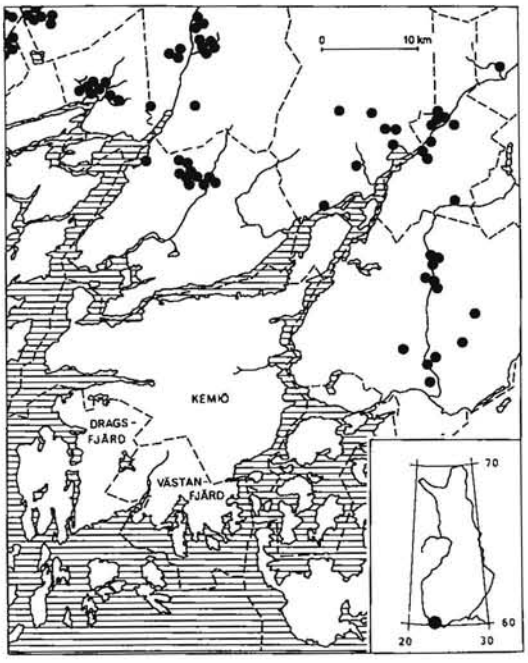

Fig. 1. Distribution of Iron Age cemeteries in the vicinity of Kemiö Island AD 50–1150.

ARCHAEOLOGICAL FACTS AND PROBLEMS

Kemiönsaari is an island of approximately 550 km^2, separated from the mainland by a bifurcating water system. Kemiö is the northernmost of three communes (Dragsfjärd, Västanfjärd, Kemiö) on the island, the northernmost promontory of which belongs to the mainland-commune Halikko (Fig. 1). Archaeological investigations in the region have mostly been focused on the numerous Bronze Age cairns, but in the 1980's Stone Age settlement sites have also come under consideration. In the light of new discoveries in Dragsfjärd the settlement history of the Stone Age more and more resembles that of the mainland. All the important stages of Stone Age material culture since the Late Mesolitic seem to be present. The continuation of land use in the Bronze Age and earliest Iron Age is reflected in a huge number of graves, but dwelling sites belonging to this period are still missing.

The most problematical period with respect to settlement history on Kemiö Island is the Iron Age. Tapani Tuovinen (1985, 58, 74) has convincingly shown that graves of the cairn-type still occur in the archipelago in the Early Iron Age. From the Early Roman period (50–200 AD) onwards, however, the stone cairns can be regarded as a diminishing grave type and other (mainland) types could also be expected on Kemiö Island. The reason for the lack of such cemeteries might be that they have not been found or – more probably – that the land use on the island has been of such a kind that cemeteries do not occur. A total lack of interest in the area and a total lack of use of the area during the Iron Age does not seem likely.

At present, however, there are not even any stray finds on Kemiö Island that could indisputably be connected with the Iron Age. In the village Berga, in northern Kemiö (number 1 in Fig. 2), a possible cupmarked stone (a supposed sacrificial stone) was described in the late 19th century (Högman 1886, 183–185). In SW Finland cup-marked stones often occur close to Iron Age cemeteries and they are thus generally dated to the Iron Age. The oldest one might have been in use as early as the Roman period (Kivikoski 1966, 80, 82) but, especially in eastern Finland, they have also been connected with post-Iron Age settlement (Hautala 1960, 114). More recently the eastern Finland cup-marked stones have also been considered as belonging to the Iron Age (Simola et al. 1985, 530; Taavitsainen 1987, 222–223). As the cup-marked stone from Berga has since disappeared, the reliability of the find and its interpretation can not unfortunately be verified. A Viking Age sword (KM 7011) of the X-type (Petersen 1919, 158–166) possibly found in the neighbouring village, Kila (number 2 in Fig. 2), is also doubtful because a remark in the museum-catalogue indicates some confusion concerning the circumstances of the find.

South of Kemiö Island, in the archipelago of Dragsfjärd two Iron Age objects have been found, a small wheting stone (number 8 in Fig. 2), and an iron axe (KM 2503A:3; number 9 in Fig. 2) of type C (Petersen 1919, 39), both of which can be dated to the Viking Age (Cleve 1942, 16; 1948, 502; Wuolijoki 1972, 6–7). These finds, together with one (yet unpublished) Late Iron Age or Early Medieval ceramic vessel recently found at the historical anchor bay, Jungfrusund (number 7 in Fig. 2), are probably rather to be connected with seafaring than with permanent or semipermanent settlement.

The nearest cemetery on the mainland is the Kokkila cemetery in Halikko (Koskimies 1955, 14–15; number 4 in Fig. 2), where one Viking Age belt detail (KM 2435:4; Kivikoski 1951, picture 836) has been found. One stray find from

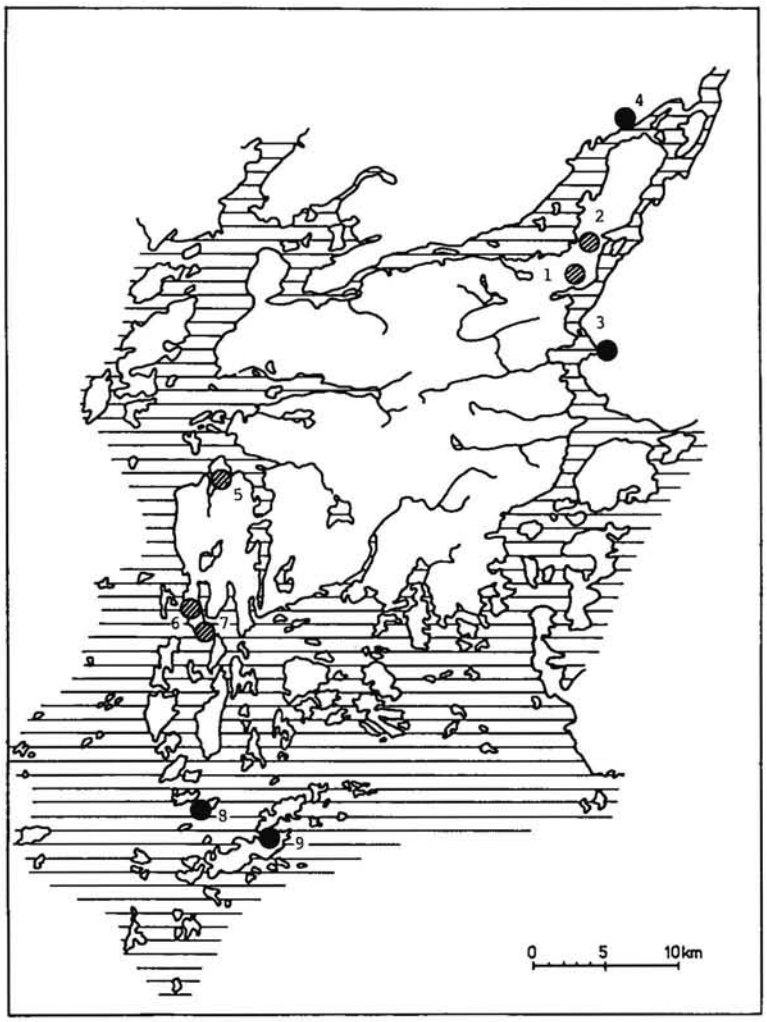

Fig. 2. Iron Age finds and sites AD 50–1150 in the Kemiö Island area. Objects of uncertain location or of indistinct dating are marked with lined dots.

the vicinity of Kemiö Island which also must be mentioned is an oval fire-striking stone (KM 23042) found in Strömma in Perniö (number 3 in Fig. 2). The stone has incorrectly been considered as coming from Kemiö, but it was in fact, found east of the waterstrait between Kemiö and Perniö. Oval fire-striking stones were in use in Finland from the Early Roman period (Salo 1968, 169; Salo 1970, 77–78, 82) to the Merovingian period (Cleve 1943, 150–151; Kivikoski 1973, 39).

The archaeological evidence for Iron Age land use in Kemiö is so far sparse. Despite efforts to find evidence of Iron Age settlement in the northeastern part of Kemiö there is nothing to add to the archaeological record of the Iron Age in the area. Although the possibilities for archaeological field work have been limited, the negative results suggest that the lack of finds is not just a question of a lack of investigations but something more complex. In this situation the results obtained by pollen analysis in this same area are important. This means of investigation has proved to be far more successful than the archaeological field work in that the samples contained new information on farming and evidently also on the Iron Age settlement history of the northern part of Kemiö. The pollen analyses also revealed evidence of farming prior to the Iron Age, thus throwing light on the cultural history of the Stone Age and Bronze Age in the area.

SITES FOR THE PALYNOLOGICAL ANALYSES

The investigation areas and sampling sites were chosen in 1985. The southern study area comprises the northern shore of the former gulf Reku, which later (as a river) formed a waterway to the medieval church and center of Kemiö. The area was probably suitable for different types of economic activity throughout the Iron Age. The sampling site, Mossdalen (60°11'N, 22°8'E; 33 m a.s.l.) is a mire situated about 1,5 km NNE of the village Reku and about 1,5 km NNW of the village Viksvidja, both of which have been the focus of archaeological interest (Fig. 3). As yet, however, no thorough archaeological survey of the area has been made.

The northern study area is situated north and west of the gulf of Orrnäsviken, where archaeological field work has been concerned with the village Rugnola and Kalkila. Both these villages were according to land uplift chronology (Glückert 1976, Appendix I), situated in the immediate vicinity of the shore in the Early Iron Age. Their location was probably suitable for both maritime activities and agriculture during the whole of the Iron Age. A brief archaeological survey of the villages has been made but no finds indisputably connected with Iron Age land use have been found. The palynological sampling site is the mire Isokärret (Basic Map 2012 06; 60°13'N, 22°8'E;16 m a.s.l.) about 800 m west of Rugnola and about 800 m north of Kalkila (Fig. 3).

Pollen analysis concentrated on the peat and gyttja layers of the two mires. The ground water level at Mossdalen was far below the core sampled (cf. water content of the peat, Fig. 5); and at Isokärret only the early stage of mire development with a high groundwater level was reached. The present vegetation at the sites investigated is as follows:

Mossdalen, trees: *Pinus* 95 %, plenty of small *Betula*. Field layer: *Vaccinium myrtillus* 95 %, *Ledum palustre, Vaccinium vitis-idaea, Calluna.* Isokärret, trees: *Betula* and *Pinus* 50/50%, field layer: *Vaccinium oxycoccos, Menyanthes trifoliata, Equisetum palustre, Potentilla palustris, Epilobium palustre, Ledum palustre, Sphagnum sp.*

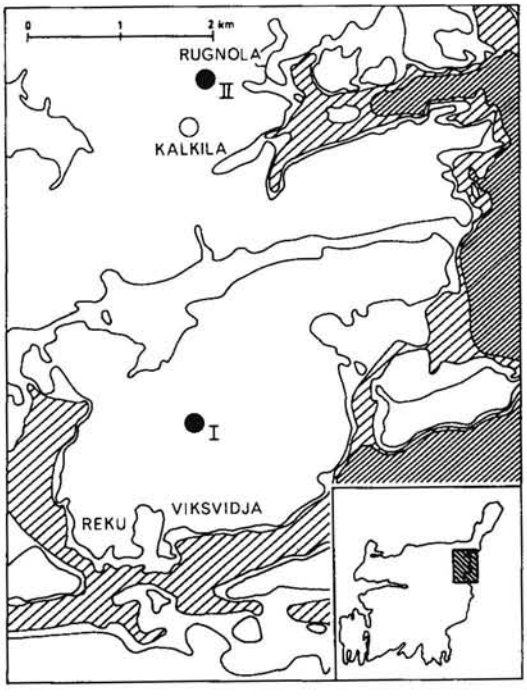

Fig. 3. The research areas and their relationship to various shore lines at approx. AD 100 (curve), AD 1100 (sparse shading) and recently (dense shading). The sampling sites Mossdalen (I) and Isokärret (II) are marked with dots, and the Bronze Age or Early Iron Age cairns with a circle.

MATERIAL AND METHODS

The stratigraphy of the peat core from Mossdalen consists of well humified *Carex*-peat with an abundance of wood fragments, especially at the 40 cm level and in the lower part of the profile. Because of these wood fragments, the lowermost layers of the site were not reached. At the 45 cm level a clear charcoal dust layer can be distinguished.

At Isokärret the stratigraphy is as follows:

0	– 40	cm	*Sphagnum* peat
40	– 70	cm	*Sphagnum* peat with *Equisetum* remains increasing downwards.
70	– 75	cm	A hard and dense layer of *Phragmites* roots
75	– 100	cm	Coarse detritus gyttja with Equisetum remains
100	– 130	cm	Fine detritus gyttja
130	– 150	cm	clay gyttja
150	–	cm	clay

At Mossdalen the whole profile was cored using a small Russian peat borer (Eronen 1976); at Isokärret 0–70 cm was sampled using a peat knife (Vuorela 1986) and a metal box of 50×10×10 cm. For 75–150 cm a small Russian peat borer was used.

The subsamples of the terrestric material and the gyttja were treated by the KOH and acetolysis methods (Faegri & Iversen 1975), while those of the clay gyttja and clay were additionally treated with HF. The basic pollen sum for the relative pollen frequencies is 1000 AP for the trees and shrubs and the total pollen sum for the rest of the pollen flora.

DATING OF THE PROFILES

From Mossdalen three and from Isokärret four C14-datings were determined (calibrated dates after Stuiver & Pearson 1986; fig. 2 and Pearson & Stuiver 1986, fig. 2).

The dates obtained show that both profiles cover the Sub-Atlantic and the Late Sub-Boreal chronozones (Mangerud et al. 1974) the local vegetational differencies thus being easily comparable. In archaeological terms the Mossdalen profile covers the timespan starting from the early Bronze Age while that of Isokärret reaches the deposits of the late Stone Age. The dated levels also form the boundaries of the local pollen assemblage zones which reflect the vegetational succession and settlement development.

POLLEN RESULTS

The pollen data of Mossdalen (Figs 4–6)

Pollen assemblage zone a (95–115 cm) represents the Early Subboreal chronozone. It is characterized by high *Pinus* and QM values (Fig. 4), the former phenomenon being connected with local pedological conditions (sand), and the latter still reflecting the Late Atlantic vegetation. The relatively high *Tilia* pollen frequencies and increasing *Picea* frequencies give information of the local forest structure. The somewhat open character of the forest in the upper part of pollen assemblage zone a, is shown by the presence of pollen of *Pinus, Acer, Sorbus, Sambucus* and *Juniperus*. The herb pollen flora (Fig. 5), however, shows no indications of anthropogenic activity at this level.

In the lower part of p.a.z. b (65–95 cm) settlement indicators increase and together with the indicators of natural mineral soil vegetation they may indicate slight human activity – probably grazing in the vicinity of the site. The more or less natural vegetational development continues with *Picea* reaching 20 % at the 75 cm level before decreasing sharply. According to the C14-datings this took place at c. 2850 BP and was preceded by a corresponding decrease in QM-pollen. The simultaneous increase in *Betula* and *Alnus* also indicates human activity, as do the ruderal pollen types, especially *Epilobium* and Lamiaceae. The rapid decrease in the spores of Plypodiaceae (Fig. 6) also seems to reflect changes in the forest composition.

The p.a.z. boundary b/c is drawn mainly on the basis of the herb pollen data, which show an increasing intensivity of human activity. At the 65 cm level, which has been dated to 2530±110 BP, the earliest Cerealia pollen find (C°) occurs. This is also the lower boundary of increasing herb pollen frequencies (especially those of Poaceae and Rosaceae coll.; most probably *Rubus idaeus;* Fig. 5), and of increasing settlement indicators (e.g. Polygonaceae, Caryophyllaceae and *Plantago lanceolata*). On the basis of the relatively low pollen frequencies of *Rumex* and other weeds and the increasing frequencies of *Filipendula* type, agricultural activity in the area seems to have remained at a relatively low level, while grazing was more important. This is also reflected in the rising values of Ericaceae and shrubs. The 45 cm level, with the charcoal layer, has modest indications of agricultural activities (Cerealia, weeds, Poaceae and Rosaceae).

Even though agricultural activities are poorly

Mossdalen

	42.5–46 cm	(Hel–2421)	1960±100 BP	cal AD 40	= 2030–1820 BP
Cer^{0+}	62.5–67.5 cm	(Hel–2422)	2530±110 BP	cal 780 BC	= 2770–2390 BP
	92–97 cm	(Hel–2423)	3070±100 BP	cal 1380 BC	= 3400–3180 BP

Isokärret

	65–70 cm	(Hel-2407)	300± 90 BP	cal > 1600	= c.300 BP
Cer^{++}	75–85 cm	(Hel-2408)	1130±100 BP	cal AD 920	= 1180– 950 BP
Cer^{+}	100–110 cm	(Hel-2409)	2420±110 BP	cal 445 BC	= 2720–2340 BP
Cer^{0}	127–137 cm	(Hel-2410)	3360±100 BP	cal 1660 BC	= 3720–3480 BP

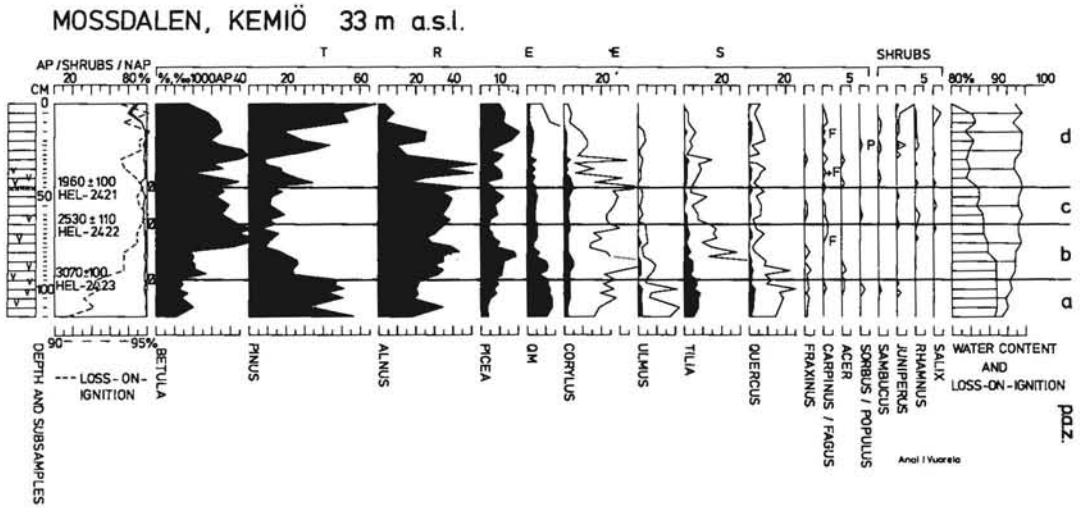

Fig. 4. Relative tree pollen diagram and radiocarbon dates from Mossdalen, Kemiö. For sediment symbols see text.

represented in the diagram from Mossdalen, the loss-on-ignition values, the *Picea* values and the sharp fluctuations in the three pollen (*Alnus, Corylus, Betula* and *Pinus*) clearly show human influence on the forest in the lower part of p.a.z. d (Fig. 4). The final decrease in QM-pollen at this level also seems to be in connection with land use for agriculture, as has been proved earlier (cf. Miettinen & Vuorela 1988). The low Cerealia pollen values in this connection are most probably the result of the dominant crops in the area being *Triticum* and *Hordeum* while in the surroundings of Isokärret *Secale* seems to have been cultivated. The reason for the weak reflection of human impact could thus be the filtering effect of the forest boundary between the site itself and the cultivated fields (Vuorela 1973; 1986). This can also be true in the upper part of p.a.z. d, where modern agricultural activities only show a modest indication, the high Poaceae and *Rumex* pollen frequencies being the most distinct phenomena in the diagram (Fig. 5).

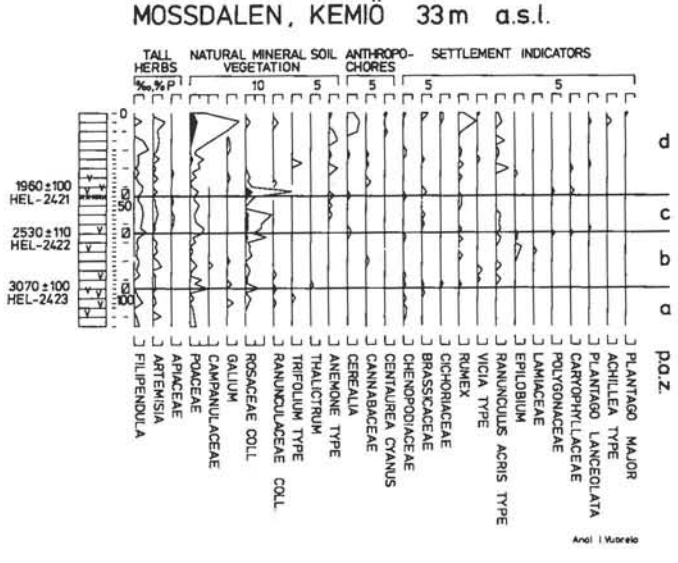

Fig. 5. Relative herb pollen diagram and radiocarbon dates from Mossdalen, Kemiö. For sediment symbols see text.

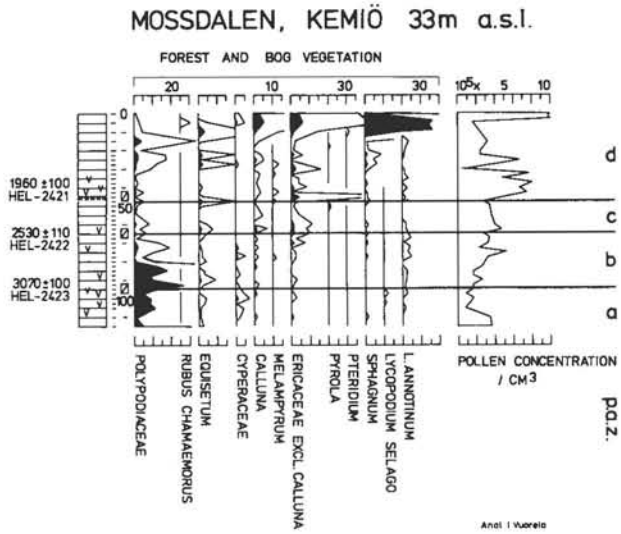

Fig. 6. Relative pollen diagram for forest and mire vegetation in Mossdalen together with radiocarbon dates and pollen concentration values. For sediment symbols see text.

The pollen data of Isokärret (Figs 7–9)

The stratigraphy of Isokärret starts with marine deposits and turns into lacustrine ones at approximately the 125 cm level which corresponds to 3200 BP (Fig. 7). Thus the pollen assemblage zone a covers the period that precedes the isolation phase of the former lake. This marine stage is characterized by sharply decreasing *Pinus* pollen frequencies and increasing values for *Betula, Alnus* and the QM-species. These phenomena should, however, be considered as being very local and affected by coastal factors such as differential pollen accumulation, wave action, erosion and redeposition. – The high values of charcoal dust particles in p.a.z. a could indicate human activity in the late Stone Age and Early Bronze Age, but they could also indicate natural forest fires over a wide area for a long period. The later part of the profile reflects the more stable vegetational development in the surroundings. With reference to

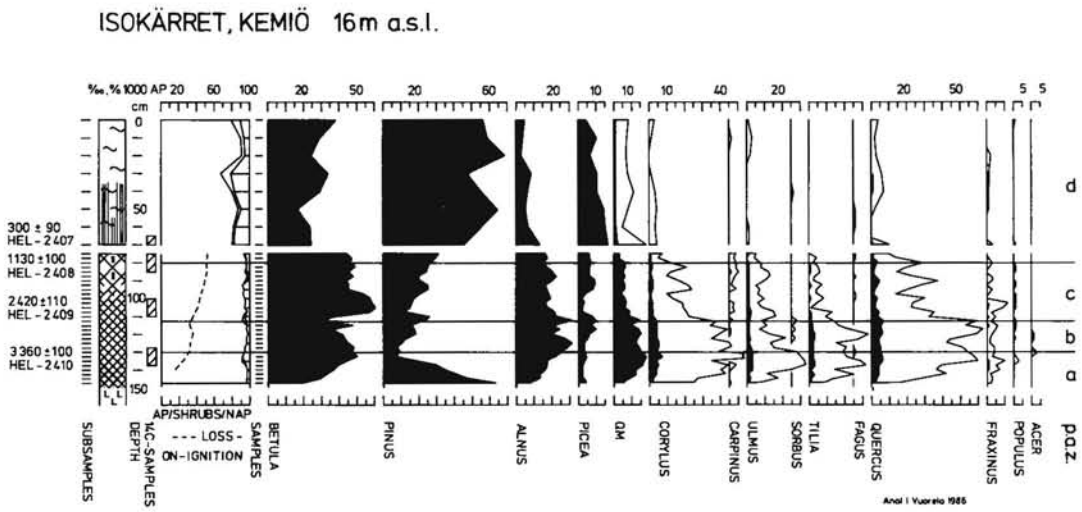

Fig. 7. Relative tree pollen diagram and radiocarbon dates from Isokärret, Kemiö together with the loss-on-ignition values of the limnic sediments. For sediment symbols see text.

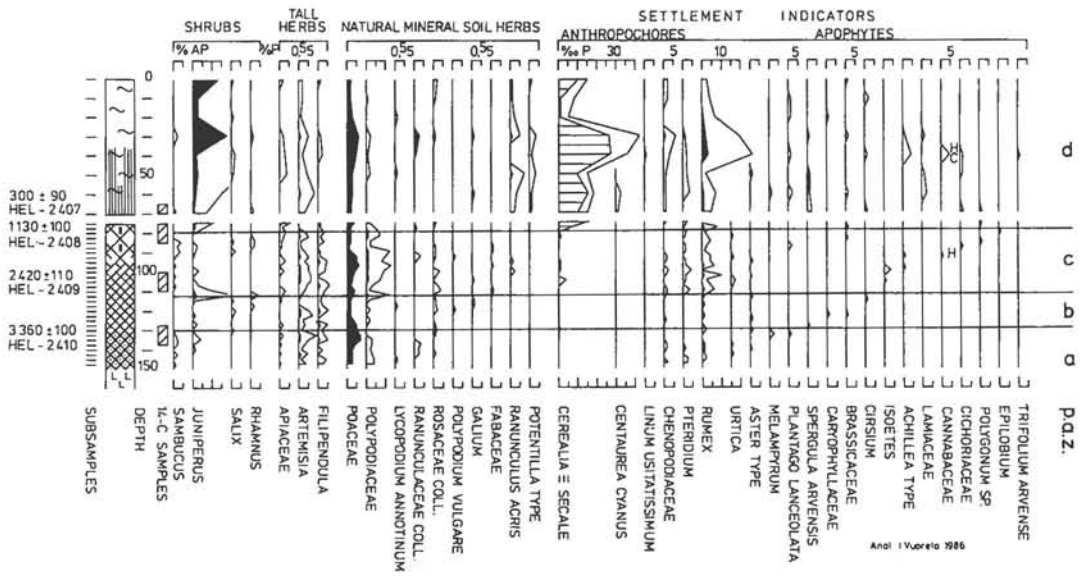

Fig. 8. Relative herb pollen diagram and radiocarbon dates from Isokärret, Kemiö. For sediment symbols see text.

marine coastal deposits the most interesting indicator pollen type, the Cerealia pollen grain at the p.a.z. boundary a/b (Fig. 8) could also be of secondary origin. In this case, however, it is accompanied by other indicators (high Poaceae frequencies, *Spergula, Plantago lanceolata* and *Rumex*) and is found at a level where the ruderal pollen taxa increase. These phenomena together may indicate a short-term late Stone Age / early Bronze Age settlement in the area even though more convincing indication appears some one thousand years later in the Pre-Roman Iron Age (Fig. 8). Thus pollen assemblage zone b represents a period of very vague human interference, mainly indicated by shrub pollen and by a number of apophyte pollen types. This, however, is the level of local isolation, which may also influence the natural vegetation.

In p.a.z.c a distinct increase in the hemerophilous pollen flora is seen (Fig. 8). It starts with an increase in *Juniperus* and Polypodiaceae indicating an opening up of the landscape and is followed by rising values of the most important indicator pollen types: *Rumex, Pteridium* and Chenopodiaceae. The start of more effective land use for agriculture is reflected by the Cerealia, an increase in NAP and the spores of *Isoëtes* (Vuorela 1986) and also in the tree pollen values (*Betula, Picea* and QM-species) at the 110 cm level (Fig. 7). This phase covers the period up until the early Viking Age.

Pollen asemblage zone d covers the upper part of the diagram (80–0 cm) which chronologically represents the time from the early Viking Age to the present. The C14-datings show that the present *Sphagnum* cover of the mire (Fig. 9) is very young and that the hiatus represented in connection with the hard, dense layer in fact corresponds to a period of nearly one thousand years.

The tree pollen data of p.a.z. d reflect great changes in the local forest composition, obviously connected with the development of the site itself into a pine-dominated mire. The relatively high *Picea* frequencies which date from the end of the hiatus exceed those recorded earlier in the profile. The lower frequencies for *Betula* and the higher ones for *Pinus* also reflect great ecological changes.

In p.a.z. d the intensity of human acitivity increases sharply (Fig. 8). The start of rye cultivation dated to 1130±100 BP, i.e. the Viking Age is synchronous with pollen of *Epilobium* and with an increase in apophytes, such as *Rumex, Spergula,* Chenopodiaceae and *Pteridium.* Indicators of grazing such as *Ranunculus acris* type, *Potentilla* type, *Juniperus, Plantago lanceolata* and Poaceae also increase. Among the anthropochores in this part of the profile Ce-

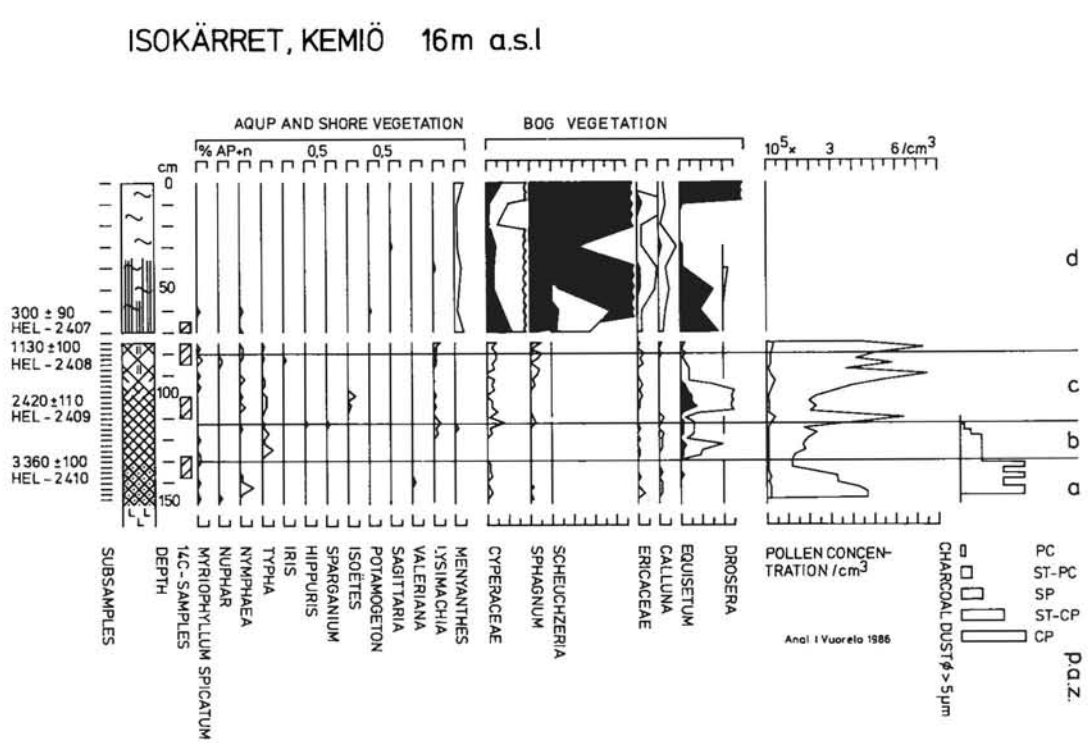

Fig. 9. Relative pollen diagram for forest and mire vegetation at Isokärret, Kemiö, together with the radiocarbon dates and pollen and charcoal dust concentration values.

realia, *Centaurea cyanus* and *Linum usitatissimum* are recorded. The single *Cannabis* pollen grain at the 40 cm level may also be regarded as an anthropochore, even though it may not represent local hemp cultivation.

The local mire vegetation is strongly represented in the pollen data of p.a.z. d. Among these pollen of Cyperaceae, Ericaceae and *Calluna* and spores of *Sphagnum* and *Equisetum* should be mentioned.

PALYNOLOGICAL EVIDENCE AND SETTLEMENT HISTORY. DISCUSSION

The earliest pollen of Cerealia in the Isokärret sample indicates, that cultivation may have been practised at the time of the late Kiukainen Culture (2000–1300/1000 BC) or in the earliest Bronze Age (cf. Figs. 8, 10, 11). This result correlates with pollen and paleobotanical evidence from the mainland (Vuorela 1972; 1975; Tolonen 1978; Siiriäinen 1981; 1982; Donner 1984; Vuorela & Lempiäinen 1988), where cultivation seems to have been practised at the time of the Kiukainen Culture. However, cereal cultivation at that time must be regarded as one component of a complementary subsistence pattern, because the Kiukainen Culture dwelling sites tend to be situated in habitats rich in aquatic and low in terrestrial productivity (Zvelebil 1981). Charred cereal grains have so far been found only at the Niuskala dwelling site in Turku (Vuorela & Lempiäinen 1988), but this site also has a maritime character. Burned bone fragments mainly from seal and fish suggest that the site is a mixed sealing-farming site (Asplund et al. 1989).

In the vicinity of the Isokärret sampling site no Kiukainen Culture sites have as yet been found. Settlement belonging to this stage of the Stone Age is however represented in Kemiö, since a site belonging to the Kiukainen Culture was found in the village of Östermark in 1985 (Asplund 1985a; 1985b). As the site is situated about 12 km SSW of Isokärret no immediate connection between the pollen and this specific site is to be expected. Of importance, however, is the fact that both archaeological and palynological investigations picture a similar develop-

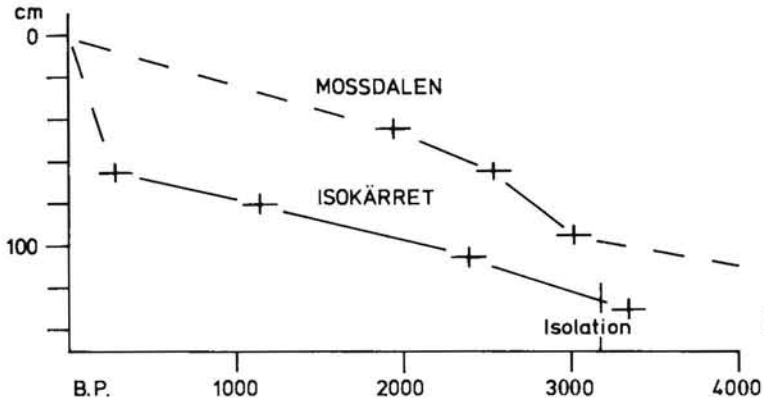

Fig. 10. Age/depth curves for Mossdalen and Isokärret based on uncalibrated C14-dates.

ment in Kemiö in the Late Stone Age / Early Bronze Age to that on the mainland.

According to the pollen results obtained by Glückert (1976) *Picea* arrived in Kemiö around 3200 BP. In the present material this stage can be found in p.a.z.. b of Isokärret and in p.a.z. a of Mossdalen. The diagrams do not, however, show the length of the "tail" of the *Picea* curve which at Slätmossen and Stormossen (Glückert 1976), for instance, continues as far as the Early Atlantic chronozone (the VI pollen zone; Donner 1963). In both diagrams (Figs 4, 7 and 11) the start of the anthropogenic phenomena is simultaneous with or preceded by a decrease in relative *Picea* and QM frequencies (Fig. 11; cf. Vuorela 1986).

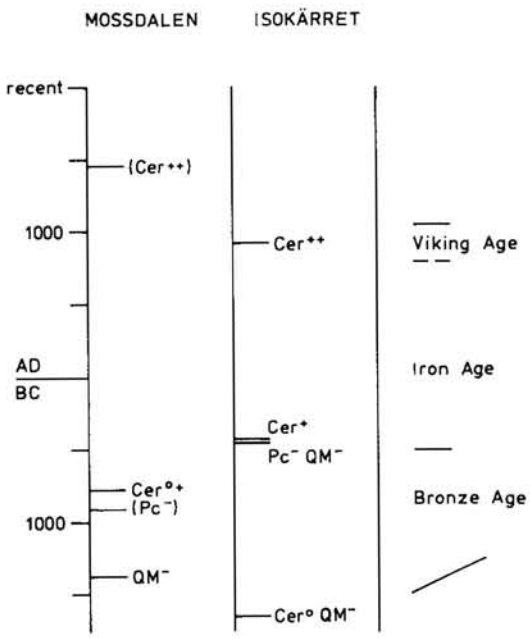

Fig. 11. Chronology of the anthropogenic events at Mossdalen and Isokärret based on calibrated C14-dates (Stuiver & Pearson 1986; fig. 2 and Pearson & Stuiver 1986; fig. 2). The estimated ages of Pc^- and Cer^{++} at Mossdalen are based on Fig. 10.

The empirical Cerealia limit (C^+) interpreted here as increased agricultural activity (Vuorela 1986) instead of the introduction of rye cultivation (Donner 1984), is practically synchronous at both sites, dating to around 2500 BP (= 2770–2390 cal BP = 780 BC). As a result of the local ecological differencies of the two sites clear evidence of human influence on the vegetation – both grazing and agricultural – is seen at Isokärret throughout the profile to the surface layers, while Mossdalen seems to have been isolated from these activities (cf. Vuorela 1973). At Mossdalen only a weak reflection of the rational Cerealia limit (C^{++}) is recorded, dating back to only around 500 BP, the corresponding stage at Isokärret being about 600 years older. The latter age corresponds to the C14-date obtained for the start of rye cultivation in Tenala, situated only some 10 km NE from Isokärret (Tolonen & Tolonen 1988).

Thus the pollen evidence from both sites suggests (Figs 5, 8 and 11) that cereal cultivation was also practised during the Bronze Age and the early Iron Age. No settlement sites from those periods have so far been found but the cairn-type graves prove that this was a period in which the territory was actively in use. At Isokärret the nearest cairns are situated about 500 m south of the sampling site (Fig. 3). There is evidence that cultivation was practised, but the small number of pollen grains suggest that the growing of cereals was not the most important

feature. The indications in the pollen diagrams (Figs 5, 8) of grazing suggest that animal husbandry was practised, but marine hunting probably still formed the basis of the economy in the coastal area in the Bronze Age (Siiriäinen 1981, 28; Tuovinen 1985, 49). The pollen evidence, however, gives more reason to believe that Bronze Age and Early Iron Age settlement sites could be found in Kemiö. Locating Bronze Age dwelling sites is still a problem in SW Finland and has also proved difficult on the coast of the mainland in those regions rich in graves.

The lack of archaeological finds from the Iron Age proper (AD 50–1150) seems to indicate a different development of settlement and land use on Kemiö Island from that on the mainland. Although the total lack of finds can still be (at least partly) due to the limited extent of archaeological field work, the lack of cemeteries must probably be interpreted as indicating a lack of permanent settlement. The development is perhaps easiest understood as a broad shift from an economy partly based on marine hunting to one based predominantly on farming. During this process permanent agriculturally based settlement was formed in the river valleys on the mainland and Kemiönsaari was left as an area for hunting, fishing and possibly semipermanent dwellings.

In the Isokärret pollen diagram permanent farming is indicated as early as the Late Merovingian period or the Viking Age. The Cerealia curve remains unbroken from that period onwards, which suggests that permanent settlement in the area is prehistoric despite the fact that no archaeological evidence has been found. This dating of permanent settlement does not, however, have to be accepted for other areas of Kemiö Island.

Kemiö Island and large areas of the SW Finnish archipelago was inhabited by Swedish immigrants in the Medieval period. Somewhat different datings have been presented concerning the start of these immigrations (Nikander & Gardberg 1942, 2–3; Kerkkonen 1945, 251–252; Oja 1955, 77; Meinander 1983; Orrman 1983, 293–294; Orrman 1986, 21–23), but the 12th century seems to be the most reasonable. Eljas Orrman (1983, 293–294) has made one of the most recent comments on the matter, stating that Swedish settlement started during the 12th century, although the most vigorous growth of settlement took place during the period from the 13th century to the middle of the 16th century.

Since the Swedish settlement dates back to historical times, earlier land use by Finnish

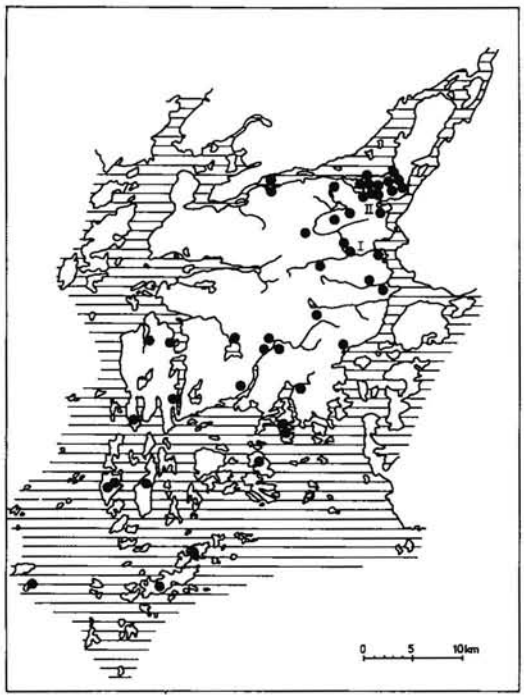

Fig. 12. Place names of Finnish origin on Kemiö Island (the northernmost part belonging to Halikko excluded) according to Ritva Liisa Pitkänen (1985, map 4). Location of the sampling sites shown by numbers (Mossdalen I and Isokärret II).

speaking people could be reflected in place names with a Finnish character. Ritva Liisa Pitkänen has, in a recently published work on this subject, presented results that might help to explain the early permanent farming in northernmost Kemiö. According to Pitkänen's study (Pitkänen 1985, map 4) it seems obvious, that Finnish place names form a light cluster in the northern part of the commune (Fig. 12). This is probably due to the area having a somewhat different history of settlement and land use than the other parts of Kemiö Island.

Permanent agriculturally based settlement seems to have started in the northernmost part of Kemiö Island in the Late Merovingian period or in the Viking Age. The Kokkila cemetery in Halikko (number 4 in Fig. 2) also indicates an expansion of permanent settlement in this direction in the Viking Age. The problem concerning the lack of archaeological evidence, however, still remains, and so does the question of the character of prehistoric land use in the other parts of the island.

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