2 Archaeological research in the Saimaa district and in the Karelian Isthmus in 1992–1999

Mika Lavento

Department of Archaeology, P.O. Box 59, FIN-00014 University of Helsinki, Finland

Abstract

The River Vuoksi connects Lake Saimaa and Lake Ladoga. It has been the outlet for the Lake Saimaa water system since the 4th millennium BC, thus from the Early/Middle Neolithic. This water connection has been given central importance when tracing cultural influences between the Karelian Isthmus and South-East Finland. It seems evident that the Karelian Isthmus was also a central passage transmitting impulses to Finland from east and south-east since the Early Holocene. This is one of the central results of the long-term archaeological work in the Lake Saimaa area.

The purpose of this article is to introduce the background of the Saimaa-Ladoga project by presenting the results of the large scale archaeological work made in the Ancient Lake Saimaa area. This is because central methodology, many basic objectives and viewpoints of the Ancient Lake Saimaa project have been transferred only with small changes to the fieldwork in the Karelian Isthmus. In the article, the most important concepts and their meanings are discussed. Also the role of the history of Lake Saimaa as a water basin is briefly discussed, because it is essential when trying to understand the basic assumptions of the Ancient Lake Saimaa project. The research history of the Lake Saimaa area and the questions and results obtained in the project are still in the main role.

The Department of Archaeology at the University of Helsinki has carried out several research projects particularly in the southern part of Lake Saimaa since the early 1990s in co-operation with the National Board of Antiquities and the Savonlinna Provincial Museum. The surveys have increased information and uncovered hundreds of new sites. Surveys and excavations have brought knowledge of sites dating to different prehistoric periods. Excavations at different sites from different periods have been central in receiving knowledge about dwellings and settlement history. In total, the picture of the prehistory in the area has essentially changed as a result of the archaeological activity.

The investigations in the Saimaa area have been important also in developing survey and excavation methods in Finnish archaeology. Research carried out in the Saimaa area is a kind of prelude for the natural step forward to extend studies to the Russian side of the contemporary border.

2.1 The Ancient Lake Saimaa project 1992–1996

In the early 1990s the Department of Archaeology at the University of Helsinki decided to take a considerable step eastwards by choosing the south-east region of Finland as one of its focuses of research interest. The enterprises were directed in eastern Finland under the name 'Habitation and contacts in the Ancient Lake Saimaa Area project (1992–1996)' (hence the Ancient Lake Saimaa project or Saimaa project). The project was carried out first of all in the Great Lake Saimaa area, on the southern part of the water basin (Fig. 2.1). The Ancient Lake Saimaa project was organized in co-operation with the University of Helsinki, the National Board of Antiquities and the Savonlinna Provincial Museum (see Kirkinen 1997, and articles in Helsinki Papers in Archaeology 8 and 9, ed. by T. Kirkinen 1996b&c).

The main topics of the Ancient Lake Saimaa project comprised five questions and subprojects:

1. Shore displacement data was updated to make it more appropriate for archaeological purposes. Its accuracy was also sharpened. This subproject got an advantage from the geological research made by Aaro Hellaakoski (1934), Veikko Lappalainen (1962) and Matti Saarnisto (1970). During the Ancient Lake Saimaa project over 150 sites in the Great Lake Saimaa area were leveled and mapped to the data base. Timo Jussila (1995; 1996) was in charge of this subproject and several groups of students and specialists took part in the work in the field. The result was a time/gradient model (T. Jussila 1999) which can be used in dating sites and planning future surveys in the area.

2. The study of ceramics comprised particularly Early Combed Ware, Neolithic Asbestos Ware and Early Metal Period Textile-impressed Ware (Pesonen 1995b; 1996a; Lavento & Hornytzkyj 1995; 1996). Because of the large number of pottery found during the project, only these ceramic groups could be chosen for detailed analysis. For instance, the Typical Combed Ware and the later phase of the Neolithic Asbestos Ware (Kierikki, Pöljä and Jysmä types) were touched upon on a more general level (Karjalainen 1993; 1996; Lavento 1996; Lavento & Hornytzkyj 1996; Pesonen 1995a; 1996a–c).

3. The main emphasis of the project was on the environmental studies and palaeoecology of the Great Lake Saimaa area. The work was carried out by using multidisciplinary methodology including GIS studies (Vikkula 1994; Kirkinen 1994a; 1995; 1996a), zoology (Ukkonen 1996), geography (Maaranen 1996; Wilhelms 1995) and palaeoecology (Vuorela 1995; 1996a&b; P. Jussila 1996). The focus of these studies was in the development of methodology, particularly with the help of GIS. Later several of these methods such as measuring finds *in situ* using total station, models for shore displacement, taking into account the soil types or other environmental factors etc. were quite quickly adopted into the archaeological fieldwork elsewhere in Finland. Today they are in frequent use. The interdisciplinary methodology was applied in the investigation of sites and environments from all prehistoric periods. (Lavento 1997a; Maaranen 1996; Pesonen 1996b; Räihälä 1996; Wilhelms 1995.) However, in environmental studies the emphasis was on Iron Age milieus and the applicability of soils and environments for slash-

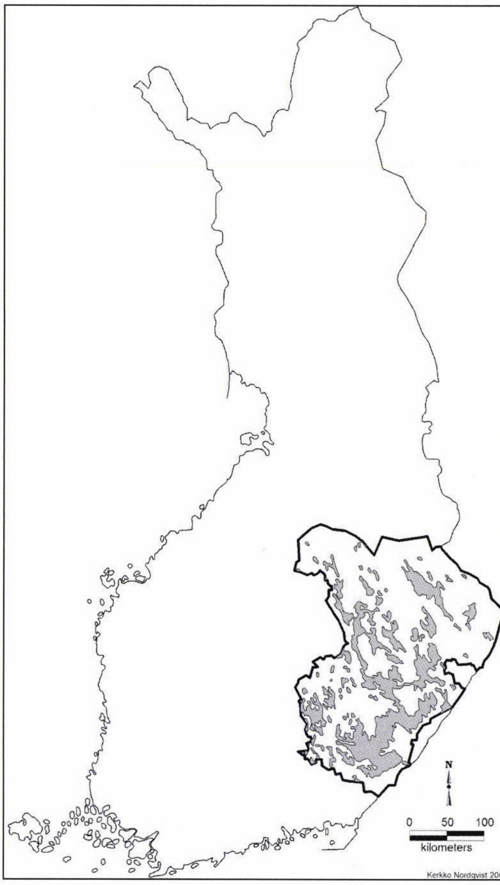

Figure 2.1 The Lake Saimaa and the research area of the Ancient Lake Saimaa project. (Map: K. Nordqvist)

and-burn or field cultivation. Particularly rewarding were the studies made by Tuija Kirkinen (1994a; 1995; 1996a). Also the impact of human influence during the Neolithic (Vuorela 1996a&b) and agriculture dating to the beginning of the Early Metal Period was recorded (Saastamoinen 1996; 1999).

4. The development of survey methodology was the focus of the project. The essential novelty was the shift of interest from an inventory of previously known sites and stray finds into modeling and forecasting of potential areas in advance with the aid of maps, and the surveys were carried out in less prospective types of environments of prehistoric activity (Sepänmaa 1993; Lehtinen & Sepänmaa 1995; Pesonen 1996b). This proved to be a successful strategy to find new sites also in the surveys made by the Savonlinna Provincial Museum, the National Board of Antiquities and in seminar surveys made by small groups of students of the University seminar courses – although, naturally, the methodology is evolving year by year. Many types of measurements and soil sampling were carried out at selected sites (P. Jussila 1996; Pesonen 1996b; Lavento 1997a). The goals of the project changed in the course of active fieldwork and new tasks were included in the project program. As a result of the surveys the number of dwelling sites known in the area grew almost three times as large it had been before the project.

5. The project also aimed at modeling various kinds of data implying natural scientific, archaeological and linguistic data in order to understand the routes of technological innovations. The target was to research the area and the origin and spread of the technological innovations of the past, and to connect them with the development of subsistence strategies. This enterprise proved to be difficult on the basis of the material at hand. Still, some plain models for the directions and routes for innovations in Finland, in the Karelian Isthmus and in the Karelian Republic were suggested. One of the most fruitful efforts was connected with analyzing the beginning of the use of asbestos in the phase of the Early Asbestos Ware (Pesonen 1996a). Interesting results were also obtained concerning the study of sources of different asbestos minerals and their spread. This long tradition comprised a period from the Early Asbestos Ware until the Early Metal Period, the period of Luukonsaari and Sirnihta Wares in the 3rd century AD (Lavento & Hornytzkyj 1995; 1996).

The Ancient Lake Saimaa project collected a large data base which included the basic knowledge of all sites found not only in the project but also included the earlier available information. Its data base comprised a large number of stray finds in the area as well. By the end of 1999 more than 3000 sites and over 10 000 stray finds were recorded altogether.

The surveys in the project covered the south-eastern part of the Lake Saimaa water system relatively well but regrettably it was not possible to survey all the municipalities. Still, the state of research is considerably better than in the northern part of the Saimaa water basin where surveys have been carried out in some municipalities only.

As a result of the Saimaa project four M.A. theses, two Lic. Phil. theses and one doctoral (PhD) dissertation were written[1]. At least 45 articles, books or theses have been written on different research topics[2].

Some municipalities or their parts first surveyed in the Ancient Lake Saimaa project have later been more fully investigated. Sites of special interest have been excavated by the Savonlinna Provincial Museum, the National Board of Antiquities and the University of Helsinki.

Seminar excavations for the students of archaeology at the University of Helsinki were carried out together in co-operation with the National Board of the Antiquities at the Neolithic dwelling site of Pörrinmökki in Rääkkylä between 1992 and 1994 (Pesonen 1995a; 1996b). The excavations were led by Mika Lavento (1990) and Petro Pesonen (1991–1994). The Early Metal Period excavations at Kitulansuo in Ristiina were carried out by the Department of Archaeology under the leadership of Mika Lavento in 1994–1995 (1996; 1999a) (Fig. 2.2). Several large excavations in the region of the municipality of Outokumpu in northern Karelia belonged to the Ancient Lake Saimaa project (Karjalainen 1993; 1996; Räihälä

Figure 2.2 Professor Valerij Patrušev and students from University of Joškar-Ola (Mari-El, Russia) discussing about the ongoing of the excavations with Derek Fewster at the site Ristiina Kitulansuo D in 1995. (Photo: M. Lavento 1995)

1996). Excavations were carried out until the late 1990s, at the end under the name of the Martinniemi project.

2.2 Archaeological research made in the Saimaa area between 1996–1999

In 1996 continuation of the Ancient Lake Saimaa project was planned but financing was modest. Due to the diminishing resources, because the Ancient Lake Saimaa project was finished, emphasis was then laid on the seminar excavations. Excavations were first made on Iron Age and Historical Period sites.

In 1996–1997 the multi-period site of Multavieru in Polvijärvi by Lake Höytiäinen was chosen as the site for seminar excavations (Lavento 1999b; Kouki 2000) (Fig. 2.3). The water level of the lake is several meters above the contemporary mean water level in the Saimaa water system and thus the site was expected to yield Early Metal Period material. It soon turned out to be a large dwelling site complex implying the remains of settlement from the Stone Age, the Early Metal Period and the Historical Period.

In addition to the excavations at Multavieru, fieldwork was carried out in Sotkuma, in the eastern part of the same municipality, Polvijärvi. The first year excavation at Sotkuma was conducted by the National Board of Antiquities (Pesonen 1998) and the fieldwork was done together with the Department of Archaeology at the University of Helsinki and the Museum of North Karelia in Joensuu. After 1998 a successful research of the historical sites at Sotkuma was conducted by Esa Mikkola between the years 1999 and 2001. The work was done only by the National Board of Antiquities.

During the surveys of the Ancient Lake Saimaa project Timo Sepänmaa identified a large dwelling site concentration at Martinniemi, in the municipality of Kerimäki to the north of the city of Savonlinna. During the 1990s a large number of dwelling depressions were found in surveys there. Similar depressions had been

Figure 2.3 Documentation of a profile underway at the Polvijärvi Multavieru site in 1997. (Photo: M. Lavento 1997)

proved to be of great interest in Outokumpu (Karjalainen 1996; Räihälä 1996) and thus the largest ones in Martinniemi were chosen for excavation. Intensive surveys in the region situated in the bordering areas of Kesälahti, Savonranta and Kitee municipalities were fruitful, too. The area and question framing were restricted to a small area and the fieldwork was done there in 1998 and 1999.

The Martinniemi project surveys were extended into the neighbouring municipalities of Kesälahti, Kitee, Savonranta and Rääkkylä. The survey area included six basic map (1:20 000) sheets, an area of 20 x 30 km in size (Mökkönen 2000: 92). The central objective of the Martinniemi project (Halinen *et al.* 2002; 2003; Mökkönen 2000; 2002) was to excavate the largest dwelling depression as a whole and to continue the research in its 'front yard'. The depression was chosen first of all because of its size and also because of its location in relation to shore terraces. The third important criterion was that several depressions seemed to be connected with each other by a corridor. It is remarkable that the heath of Martinniemi includes several dwelling sites with a large number of dwelling depressions. According to shore displacement data at least six different settlement periods on different levels asl can be discerned in the region (T. Jussila 1993). A survey by Teemu Mökkönen (2000) aimed at clarifying settlement patterns and the change of habitation during the Neolithic Stone Age and Early Metal Period in the area between the breaching of the Vuoksi (Ru. reka Vuoksa) outlet a little before the emergence of the Typical Combed Ware and the end of the Early Metal Period. As a result of the Martinniemi project three M.A. theses were written[3]. The final publishing of the project is still pending.

After the end of the Ancient Lake Saimaa project, also the seminar surveys were included in the curriculum of advanced studies in Archaeology at the Department of Archaeology in Helsinki. During the pilot year it became evident that in making a survey a lot of know-how was needed by the archaeologists doing much survey work in the field and wanting to actively find new sites. The chain to gather preliminary information, make models, carry out the fieldwork and finally prepare a report is also essential. In the seminar surveys students were given an active role and responsibility (Mökkönen 1997). The first survey in 1996 was organized in the municipality of Ristiina, the second in Kesälahti in 1997 and the third in Nurmes in 1998 (Fig. 2.4). The forth was already a continuation of the tradition and it was carried out for the first time abroad, in the municipalities of Kaukola and Räisälä in the Karelian Isthmus (see Nordqvist & Lavento 2008, this volume).

Figure 2.4 A cairn found during the Kesälahti survey in 1997 in Kesälahti Pahatsu Viitaniemi. Picture taken from south-southwest. (Photo: M. Lavento 1997)

Seminar surveys have proven to be an effective way of teaching because students prepare the survey strategy in groups under the leadership of teachers. The survey starts with reading all the cartographic material available including e.g. topographic, geological and agrogeological maps as well as collecting all of the archaeological information available: earlier surveys, stray finds and notes of all kinds in the topographic archives of the National Board of Antiquities. Also peculiar toponyms in the survey area are looked for. A necessary part of the preparation is putting all of the earlier information regarding the municipality on the map also. An important part of the preparation is calculating ancient shore levels for different periods between the outbreak of the River Vuoksi and the Historical Period. This kind of basic preparation also formed the basis of the survey strategy used in the Saimaa-Ladoga project.

2.3 Some theoretical viewpoints on terminology of sites and finds

2.3.1 Terminology

One of the salient points of the projects carried out in the Ancient Lake Saimaa area was to locate new sites in environments which had previously escaped the archaeologist's eye. This was the central interest because in a few municipalities included in the project program an archaeological survey had been carried out before the 1980s. In these early surveys sites were most usually looked for and found in the vicinity of stray finds. The survey methodology was built on shore displacement, geological and environmental data. The methods as such were not new; what was new was their systematic use when preparing the survey. As a consequence of the change in strategy, surveys generated a large number of different kinds of sites. This led to a discussion about the interpretation of the sites and terminology.

In Finnish archaeology artifacts and their fragments which cannot be connected with sites are called stray finds (Fi. irtolöytö) or loose finds (Fi. hajalöytö). The basic difference between these two groups is only the accuracy of the information regarding their find place.

Stray finds can get feasible coordinates or find contexts. For instance, in the area where only old maps are available – what is the situation in the Karelian Isthmus – their coordinates are not known beforehand. In favorable cases they can be located with the help of find description and by finding old structures such as a road, a building, a boundary mark etc. which can be connected to the find place, although often no longer very exactly. Still, they belong to some kind of context which is roughly known. A typical example of this is a stone axe found by a local farmer in his field some decades ago. His field or farm gave the find a place name but today the field does not exist any more and its exact location is unknown. Still, it is possible to put onto a map the place where the object was found, as a site. It gives a surveyor the possibility to examine if the site can be located again and define its borders by other surface finds, test pits or simply on the basis of topographic factors.

Loose finds cannot be pinpointed on a map. On the basis of second-hand information a rough assumption can be made where an archaeological object was uncovered. In practice, an archaeologist only knows that the artifact was probably found in a certain village or municipality. It means that we have acceptable reasons to suppose that the finds had been uncovered in a certain area such as a village or near a house. Finds may today be stored in some kind of 'collection' of a small school, a local museum of a municipality or some such facility.

Archaeology has a tradition to fix even the find locations of stray or loose finds as sites. However, making interpretations about the status of these finds on the basis of survey reports in the archives is difficult. Still the most stray finds without exact coordinates, but having an assumption where it might have come from, can be finally scouted out. What is needed is the suitable elevation for the finds and coarse information about some identifiable contemporary structure (road, name of a house) which has been mentioned in the verificate, old publication, article etc.

Artifacts which came to museum collections before World War II often lack adequate information about the find context. This is common for the sites found in the Lake Saimaa area in the late 19th century and at the beginning of the 20th century although also later objects without adequate context can be met in the main catalogue of the National Board of Antiquities (referred with NM-numbers). In the Karelian Isthmus this problem is even more evident although a number of excavated and reported sites have now been checked and their coordinates have been traced.

In this publication a site is an archaeological entity which implies finds, some structures or remains of settlement. In addition, it can be located well enough. In practice it means that the accuracy is defined by the capacity of GPS (Asplund 2002). It has a context which is known or which can be verified and revised later by making test pits, soil analyses, or, for instance, an excavation. Stray finds do not bring verifiable information and surveys made in the most promising areas have not been able to uncover the remains of a site any more. A surveyor may even know the name of the site with a considerable number of archaeological objects and the former owner of the place, but is not able to locate the site itself today. The site excavated or researched earlier in the field by test pitting is not necessarily to be discarded although it has been totally destroyed later. Anyway, it is necessary to know the rough coordinates and the general type of site for locating it later.

The concept of site is both easy and complex. For some reason Finnish archaeologists have appropriated the use of the concept 'dwelling site' for any find place where prehistoric finds have been unearthed. Without excavations the functional interpretation may not be accurate. Thus it would be more preferable to report such places just as archaeological sites. The convention is difficult to change but in the project which is published here the writers do not feel themselves obligated to continue it. The simplest definition for such an entity would be that any place where the remains of prehistoric or historical activity have been recognized is a site. We use the term 'site' for all places which satisfy this requirement. If being able to say something more specific about a site, this information will be added to the definition (e.g. dwelling site, burial site etc.).

2.3.2 Continuity and discontinuity on prehistoric sites

The period when the site was used varies greatly. Many dwelling sites were in use for a long time although in many cases not continuously. A place may have been abandoned and later reused by a new population. Three groups can be separated according to the accuracy by which the length and continuity of the use of a site can be defined:

1. In the areas where shore displacement is very rapid the periods of use and abandonment of a place can be dated precisely in decades. These kinds of conditions prevail, for instance, on the lower run of the River Kemijoki in northern Finland (Kotivuori 1993).

2. In a site used for centuries it is not possible to separate accurate resettling periods at the site (Karjalainen 1996; Räihälä 1996). This is normally the case in the areas which were isolated from the Baltic Sea. This is also the case in many large dwelling sites in the Lake Saimaa area. It is also substantial in the large lake conditions to be accurately familiar with the local shore displacement history of the area.

3. In inland in the supra-aquatic areas, the same sites were in use for thousands of years (see Huurre 1983). This is normally the case in North-East and North Finland where the water level remained static for a long period. It is common that longer or shorter periods without settlement cannot be separated in stratigraphy.

Types 2 and 3 are close to the environmental conditions of the Stone Age and the beginning of the Early Metal Period on the shores of the Ancient Lake Ladoga. By the Gulf of Finland conditions are closer to type 2.

Favorable environments are likely to be reused after abandonment. The attractiveness of the location may depend on traffic conditions, natural resources such as game or soil, shelter, etc. In addition to the environmental criteria, recent research puts forward the concept of collective memory. Knowledge of the tradition of previous generations may be an important reason for returning to a place.

2.3.3 Environment and culture

The subsistence of prehistoric peoples depended on the environment on the one hand and on the means of exploitation of resources on the other. One has to accept also other factors when trying to understand past cultures. Accordingly dwelling sites can be categorized in two ways. The problem of the specification of the sites was the topic of active discussion as late as in the 1980s and 1990s.

Evidently, a large number of cultural factors which are often difficult to trace have also been in charge of the culture and its changes. In the Ancient Lake Saimaa project the main weight was still in reading the material data. Perhaps the time in 1990s was not ripe enough for discussing the role of human being as much as what it should have been done.

One way of approaching the question is to characterize sites according to their relation to the sea and inland. Ari Siiriäinen (1981a; 1987) separated locations according to distance from the seashore: 1) outer archipelago, 2) coastal archipelago, 3) sheltered bays and river estuaries and 4) inland lakes. This model was applied also by Heikki Matiskainen (1989: 56–58) in the investigation of Mesolithic conditions by the Gulf of Finland. Minna Sartes (1994: 107–110) suggests a somewhat austere grouping into 1) islands, 2) coastal zone and 3) inland sites.

The alternative approach is based on the interpretation of the function of a site in the annual movement of a prehistoric population. Following the ideas presented by Fitzhugh (1972), Binford (1980) and Forsberg (1985) Sanna Kivimäki (2002: 32–34) built a five-category model: 1) base camps, 2) exploitation camps, 3) light exploitation camps, 4) transient camps and 5) specialized camps. The last-mentioned group includes hunting places, quarries, butchering places, collecting places, camps for making artifacts etc. Although practical in explaining coast/inland differences, this kind of classification was not used in the Ancient Lake Saimaa project. Instead, it might be of special importance in the Karelian Isthmus where both Lake Ladoga (Fi. Laatokka, Ru. Ladožskoe ozero) and the Gulf of Finland can be considered as areas which correspond to a coast/inland relationship. Anyway, the model suggested by Siiriäinen has been in the mind of many Finnish Stone Age archaeologists when thinking about the location of sites on a large scale.

Changes in the environment led to changes in the function of the subsistent strategy. The impact of environmental factors such as shore displacement, variables in climate, vegetation, the amount of prey, soil etc. on human behavior have lived and been emphasized in Finnish archaeology since the 1970s. Ari Siiriäinen (1974; 1981b; 1982) and Marek Zvelebil (1981) emphasized relatively straightforwardly the role of the resources and the changes they played in explanation. Recently the point of view changed again. Teemu Mökkönen (2000) and Petri Halinen (2005) see cultural innovativeness as a more important factor in the dialogue between man and his environment. This represents a new viewpoint compared to the tradition of the 1980s.

Soils have been a focus in the research of the environmental factors in regard to Iron Age sites. Favorable soils have been seen as a decisive reason for the development of Iron Age settlement based on agriculture (Orrman 1991). The southern part of the Lake Saimaa region has been one of the main areas in Finland where these models have been tested. The analysis has been done not only with the help of historical records but also by using geological and agrochemical methods (Kirkinen 1996a; Lavento 1997a).

In the 1990s this environmental research developed by using variables and analyzing information using GIS methodology (Kirkinen 1995; 1996a). In some cases this type of approach was also applied to Stone Age research (Vikkula 1994). Soil has been used as a central factor in researching where some site types are the most likely to be found. The relationship with soils and bedrock came also into discussion in the Ancient Lake Saimaa project; Päivi Maaranen (1996) adapted methods of natural geography in her study of the location of Early Metal Period cairns.

The environment around a site can also be seen through site catchment models. The objective of a scholar is to carry out a detailed investigation of different factors inside circles reflecting a 'walking distance' of the dwelling site and other types of site. These kinds of studies have been done but not very often according to their original manner. As an example Jyri Saukkonen's (1994) study of the resources during the Stone Age by the estuary of the River Närvijoki running into the Baltic Sea south of the city of Vaasa can be mentioned. Resources have also been in a central role in many other analyses (cf. Zvelebil 1981; Sartes 1994 etc.).

Site catchment analysis has been in the background of several archaeological investigations in the Lake Saimaa region. The key for the research has most often been not in walking distances but particularly in different kinds of activities around sites in a small area (Pesonen 1996b, d; Mökkönen 2000; Lempiäinen 2002; Falck 2005). This means that the multi-component dwelling sites with a large number of dwelling depressions (Halinen *et al.* 2003) is favorable for investigating different kinds of activities dating to different periods.

2.3.4 Settlement patterns

The concept of settlement pattern is problematic, too. At least the following different approaches can be separated. The classification is based on the model suggested by Colin Renfrew and Paul Bahn (2004: 182–186):

A settlement pattern can refer to the location of sites in relation to each other. These patterns have been suggested by looking at the geographical distances and location of sites.

Sites can also be classified into hierarchical groups according to their size, structure etc. It follows that there obviously emerge sites which seem to represent central places and several others representing different categories. This approach is connected to the central place theory.

Sites can also be examined in relation to the environment and natural conditions of the region. In this model a scholar is particularly interested in the question where sites can be situated and which areas are optimal for their placing. Also flora and fauna around sites are important factors when using the model.

Settlement patterns can be built with the help of the central/periphery -model which distinguishes the most important regions from the less important ones.

Settlement patterns have also been distinguished on the basis of political relations. Power and its manifestation is the key in understanding the meaning of sites. Here it is essential to see that a site which is the largest in size is not necessarily on the top of the power hierarchy.

Finally, a very important way to apply a settlement pattern is to examine the sedentary or the semisedentary settlement strategies of societies. Different models are suitable for illustrating seasonal movements. It has often been the case that in the Finnish Stone Age and in the Early Metal Period the way of life has been interpreted according to this settlement pattern.

A few more approaches could be added to the list. The simple way is to divide sites into sedentary or mobile ones which were, however, already discussed in different ways in the six models before. Sedentary settlement types have often been connected with highly organized agricultural societies whereas the mobile type of living represents hunter-fishing societies. Semisedentary and even sedentary living is typical for pastoral societies. It is evident that to connect the economy, the settlement and structure of the society does not follow this simple distinction and that societies and groups are all but homogeneous (Khazanov 1994: 40–69).

It might be practical to approach the problem in more detail with the aid of variable analysis. Variables might include characters in nature, environment and changes in living conditions but on the other hand in cultural entities. The approach resembles the methodology applied by archaeologists relying on the possibility to construct closed systems which are all the time changing when a character changes inside it (Clarke 1968; Renfrew 1972; Renfrew & Bahn 2004).

In our research area all sites belong to semisedentary or mobile types. The research period of the project does not reach the Late Iron Age or the Middle Ages. During the Iron Age one possible central area for sedentary habitation is situated in the contemporary city of Mikkeli and its neighborhood or in the Savonlinna area. Large sedentary sites dating to various periods exist also in the Karelian Isthmus (Uino 1997; Lavento 2001). Because the question framing is the Stone Age and the Early Metal Period, they did not belong to the objectives of the Saimaa-Ladoga project.

Perhaps a more up-to-date approach to the problematic when thinking about the conditions in the Saimaa and Ladoga areas would be to discuss the active role of the human being. Settlement patterns and social structures are dependent on individuals and their influence on archaeological remains. Although this aim was recognized at the beginning of the Ancient Lake Saimaa project, the discussion became weightier later, at the turn of the 20th and 21st centuries.

In my estimation the theoretical and practical approach of the Saimaa project in general was close to the applied Middle-Range -theory of the mid-1990s which was based on using many variables. It was still essential that the theory accepted much more human influence in the way of living than the straightforward processualism (Carr & Neitzel 1995). An extreme type of the freedom given to human beings in influencing the course of prehistory comes up in several kinds of reconstructive theories. These theories were not adopted into use in the projects presented in this book.

GIS-based methodology refers to the modeling and highlighting variables in nature (Kirkinen 1996a). On the other hand, modeling has also been made in a less definable way by conducting a careful empirical analysis of sites, their dating and location in relation to each other. Interpretation still does not represent any easily definable theory or methodology; what is central is to know much of details and to give material to other researchers to do their own analyses in a different way later. It is still common for approaches to pay attention to the changes in the environment in the long run. In any case shore displacement and the location of a site in relation to its environment have been accepted as important factors which are necessary to be observed. They are also one key in trying to understand the changes in populations, their social structures and the relations with each other. Still a considerable problem is that analyses regarding the last-mentioned questions have remained superficial. Although very time-consuming, the research remains on the first step and does not proceed forward from the material itself. The reasons for this will be briefly discussed later.

2.4 The Ancient Lake Saimaa, the Great Lake Saimaa and the River Vuoksi

The Lake Saimaa water system is the largest water basin in Finland. Its southern part comprises an area from the Salpausselkä I end moraine in the cities of Lappeenranta and Imatra to Joensuu and Iisalmi. The uneven land uplift of the Fenno-Scandian shield had a large affect on the shore displacement history of the Lake Saimaa water basin. According to calibrated chronology the Ancient Lake Saimaa separated from the Baltic Sea during the Ancylus phase already c. 8000 calBC and the southern part of the lake formed an isolated basin some hundreds of years earlier (T. Jussila 2000: 16). In this early phase the waters of Lake Saimaa were running to the Ancient Lake Päijänne, its discharge channel situated in the municipality of Kiuruvesi. Matti Sauramo (1940: 181) assumed that the water level was the same in the Ancient Lake Saimaa and the Ancient Lake Päijänne at that time forming the 'Great Lake of Central Finland'.

In the southern end of Lake Päijänne the transgression caused the outlet of the Lake Päijänne to break the esker of Heinolanharju c. 5000 calBC. The geologist Matti Saarnisto (1971a&b; 16.11.2004 pers. comm.) dated the origin of the River Kymijoki to c. 5000 calBC, when the water level in Lake Päijänne suddenly sank and isolated Lake Saimaa from Lake Päijänne.

The later history of the southern part of Lake Saimaa was particularly researched by Aaro Hellaakoski (1922; 1934) and by Matti Saarnisto (1970). As a result of the advancing transgression in the south-eastern end of the basin the outlet in Pielavesi in the north-western end of the lake dried out. Finally its influence came to an end after the formation of the River Vuoksi.

The geographer Hannu Pajunen (2005) recently calibrated the datings given by Saarnisto (1970) for the different phases of the outlet channels of Lake Saimaa. He presented the age for the outbreak of the River Vuoksi at c. 3700 calBC (5700 years ago, see Pajunen 2005: 33). This calibration differs from the one suggested by the archaeologist Timo Jussila (1999: 120). He gives the calibrated dating of 6030±50 calBP (C. 4030±50 calBC) for the outbreak of the River Vuoksi. Also this information is based on the data by Saarnisto (1970). This evident discrepancy in datings is caused by the use of different calibration methods. From archaeological point of view the difference is considerable and therefore it has been taken into a consideration.

Although the general lines of the history of Lake Saimaa are relatively well-known, the detailed and complicated shore displacement history of the water system in its different parts is still awaits study (cf. Pesonen 1999: 194–196). Considerable changes took place in the water basin during the Holocene. The change in the water level and the environment much influenced the displacement of settlement in the area. An important observation based on archaeological information is that the uppermost shoreline of the Great Lake Saimaa system (Hellaakoski 1922) was metachronous (Meinander 1948). For this reason the north-western part of the Great Lake Saimaa was not on the same level as the Great Lake Saimaa in the south-eastern part of the water system (see also Hellaakoski 1949).

After Saarnisto's thorough research (1970; 1971b) the development of the Ancient Lake Saimaa and the Great Lake Saimaa has not been considerably investigated by geologists or geographers. Hannu Pajunen (2005) particularly concentrated on the flooding of the south-eastern part of the basin with the help of carbon/nitrogen -ratio. On the other hand the history of the Great Lake Saimaa has been investigated in detail by archaeologists (T. Jussila 1995; 1999; 2000; Koivikko 1999; 2000; Mökkönen 2000; 2002). The interests have concentrated on both the Preboreal period and the history of the southern basin after the formation of the River Vuoksi. The discussion of the 'post-Vuoksi' period has concentrated on observing the elevations of sites and the leveling of prehistoric shorelines (T. Jussila 2005) to find out how Neolithic Stone Age and Early Metal Period sites followed regressive shore lines (Mökkönen 2000; Lavento *in press* a&b).

The discharge of the River Vuoksi had an extremely important influence in the development of the prehistory of Neolithic and Early Metal Period habitation, particularly on the north-western side of the basin. The water system consisted of separate basins on different elevations and this implies probable temporary fluctuations. It is possible to reconstruct the phases of regression in the Great Lake Saimaa despite all these mixed factors. The outlet by the Vuoksenniska which caused the formation of the Imatrankoski rapid had its beginning during the transition period of the ceramic types from the Early Combed Ware 2:2 to the Typical Combed Ware 2:1 (Saarnisto 1970) together with the development of the Early Asbestos Ware (Pesonen 1996a). After this began a smooth regression which makes it possible to date dwelling sites to the period from the Early Neolithic to the end of the Early Metal Period (Fig. 2.5).

Because the glacial isostasy of the Baltic Shield regularly retards, the environment which changed quickly during the Early Neolithic did not change quickly any more during the Iron Age. Although there are problems caused by temporary fluctuations already with the shore displacement dating of Neolithic sites (Mökkönen 2002), during the Early Metal Period the shore retarded so slowly that a separation of different ceramic periods from each other is difficult. This can be seen when comparing the elevations of shore terraces between Textile-impressed Ware, Luukonsaari Ware and types of Säräisniemi 2 Ware (Lavento *in press* a&b). The Iron Age sites are not connected with shore lines. (Lavento 2001: 97–99; Mökkönen 2000: 35–37.)

The outbreak of the Vuoksenniska and the formation of the Imatrankoski rapid may have caused a sudden fall of water and the water level dropped in the southern Saimaa area by c. 2–2,5 m (Hellaakoski 1922: 95–99; Saarnisto 1970: 59). This phase is also well recorded by

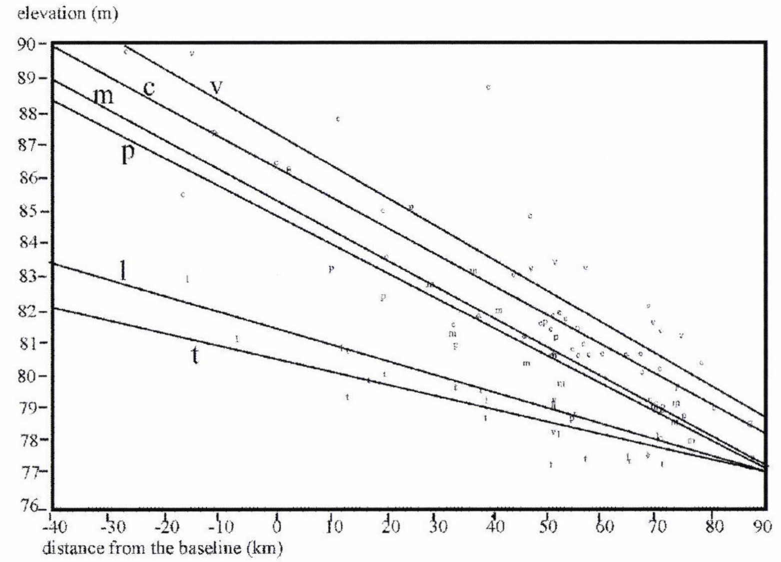

Figure 2.5 Distance diagram of the Great Saimaa area after the outbreak of the River Vuoksi. Legend: v = Early Asbestos Ware, c = Typical Combed Ware, m = Middle Neolithic Period (includes Late Combed Ware and Organic-tempered Ware), p = Middle and Late Neolithic Asbestos Ware (Kierikki and Pöljä types), l = Luukonsaari and Sirnihta Wares, t = Textile-impressed Ware.

pollen stratigraphy (Lappalainen 1962; Saarnisto 1970), the sedimentation of the delta in the municipality of Jääski (Ru. Lesogorskij) (Hellaakoski 1938) and at prehistoric sites (Pesonen 1996a; T. Jussila 1999; Mökkönen 2000). Although maybe not so important for geologists, a more detailed dating of it could be valuable for archaeologists. The sudden increase in the amount of water also influenced the shore displacement of Lake Ladoga (see Saarnisto 2008, this volume). Despite the relatively smooth land uplift, shore displacement was still not necessarily a linear process. The reasons can be found not only in the hinges of the earth's crust but also in the short period fluctuations in water level which prominently influenced the formation of the bases of shore terraces (Hellaakoski 1940; T. Jussila 1999). The annual water fluctuations of Lake Saimaa must also be taken into consideration (Mökkönen 2000). In the water basin of the Great Lake Saimaa the difference in elevation between the Early Neolithic and the Early Metal Period sites varies between 4 and 16 m depending on the isobases (distance from 0-isobase)[4]. It means that there is a considerable difference between environments of settlement also.

What has been said before about the shore displacement history of the Stone Age and the Early Metal Period chronologies for the Great Lake Saimaa area can be also applied to the situation particularly in the western part of the Karelian Isthmus (Saarnisto 2003).

2.5 Short evaluation of the fieldwork done in the southern Lake Saimaa region in the 1990s

The question as to why it is important to elucidate the research history in the region of Lake Saimaa becomes understandable when accepting that it played an important role in developing methods and a way of thinking regarding surveys and investigating sites in general. Areas which belong to Lake Saimaa and River Vuoksi have an evident connection with each other. It is therefore natural to assume that also in this case water connects areas and cultures. To what extent this connection becomes visible through sites and material has been of particular interest for those participating in the research projects in the Saimaa region. The interest evidently reaches areas on the eastern side of the border, in the Karelian Isthmus.

Until now no general evaluation of the Ancient Lake Saimaa project and later fieldworks on the sites surveyed during the project has been made in the public domain. In short, the main achievement was the systematic and comprehensive survey of several areas of interest in the southern Saimaa region. As a result not only the number of known sites increased considerably but sites of previously unknown types were discovered. It is of particular interest to pinpoint the number and size of the sites with dwelling depressions (e.g. Karjalainen 1993; 1996; Pesonen 1995a; 1996b; Halinen *et al.* 2002). The excavations of dwelling depressions were made in several areas and they influenced and changed the conception of the Neolithic in South-East Finland considerably. Large sites with over ten depressions were a clear indication of some kind of semisedentary settlement during the Neolithic. Interestingly the dwelling depression systems do not seem to belong to the settlement model during the Early Metal Period. This comes out in the fact that a dwelling pit with Textile-impressed Ware or types belonging to Säräisniemi 2 groups is exceptional (Lavento 2001).

The large number of surveyed and excavated sites now enables us to evaluate the size and social structure of prehistoric populations in the research area. In several M.A. and Lic. Phil. theses under preparation both questions concerning the inner organization of the groups and the interaction between them are still discussed. This kind of research was not possible earlier because of the defective survey situation and the small number of excavations.

An essential step forward was the introduction of computer aided analysis of the archaeological material during the project. Especially GIS methodology proved to be useful, because it was possible to use in many phases of the research. The careful planning of surveys became easier because different kind of geological and archaeological information became possible to combine on the basic maps of scale 1:20 000, for instance. GIS methods were also applied to both collecting many kinds of archaeological data and when doing analyses of the material collected in surveys and excavations (Fig. 2.6).

Statistical tests (Kirkinen 1994a&b; 1995; 1996a) supported the interpretation essentially. The impact of environmental factors and availability of resources on the choice of location for permanent settling can be demonstrated by combining different types of data.

GIS applications and preparations of maps for analyses are usually very time-consuming, because almost all data had to be digitised from maps. Despite this, a complicated methodology in GIS was quickly adopted by several young scholars during the second half of the 1990s. Time was also ripe for beginning to use the tachymeter (i.e. total station) in the field. The first tachymeter measurements in Finnish archaeology were carried out at the excavation of Kitulansuo in Ristiina in 1995. Within the project the maps originally drawn by hand in the excavation were redrawn by computer for the first time. Today this is a normal practice in most excavations in Finland.

The natural sciences and their methods of approach to environmental studies were in the key position in the project. This is explained by the general interest to use methods and also by the need to work with a large amount of new material. Comprehensive bone analysis was done for the material excavated in the Ancient Lake Saimaa region (Ukkonen 1996). Previously collected bone material from the research area was included in the osteological work of the project. Pollen profiles were made both in the frames of the project and by other scholars working in dif-

Figure 2.6 Survey crew inspecting a logging area at the site Rääkkylä Lappalaissuo 1 in 1993. (Photo: M. Lavento 1993)

ferent disciplines at the universities or research centers. At the same time, but also belonging to the project, the Geological Survey of Finland in Helsinki and the Karelian Research Center in Joensuu directed resources to the research of the Lake Saimaa area. Much activity was directed to the southern and northern Lake Saimaa by the Karelian Research Center in Joensuu, particularly pollen analyses (Simola *et al.* 1985; Grönlund *et al.* 1990; Grönlund 1995).

Pollen analyses yielded interesting information about cultivation during the Early Metal Period in the northern part of Lake Saimaa, in Outokumpu (Vuorela 1995). Simultaneously at the Early Metal Period dwelling site in Kitulansuo in Ristiina we found a corn of barley in the macrofossil samples. Stimulated by the promising results, the Ancient Lake Saimaa project decided to seek evidence of possible early cultivation in the Stone Age as well. The question framing also included investigation of land use of the other kind in the surroundings of sites dating to the Neolithic (Vuorela 1996a&b; Saastamoinen 1996; 1999). The enquiries did not uncover Late Stone Age slash-and-burn cultivation but despite this the influence of man on his environment became evidently visible in pollen curves. At the excavations conducted by the project macrofossil samples as well belonged to normal routine. Pirjo Jussila was responsible for the concluding synthesis (P. Jussila 1996). Macrofossils produced at least one interesting detail in the dwelling site of Kitulansuo in Ristiina. The dating of a barley corn gave the AMS-dating to the Early Metal Period (Lavento 1998).

To summarize, the Ancient Lake Saimaa project can be described as a very optimistic and encouraging working environment which also promoted the beginning of several specific enterprises not originally planned by the project. At the Department of Archaeology in the University of Helsinki new projects were introduced with new people. Co-operation with experienced specialists in the natural sciences which had begun already in the 1970s was now successfully continued in the Saimaa region.

In the Savonlinna Provincial Museum the archaeologists Leena Lehtinen and Timo Sepänmaa acted as effective motors in the project. They carried out effective surveys in twelve municipalities not earlier surveyed. Also efforts made by the archaeologist Timo Jussila were very important because he was able to develop both field investigation and computer methods, Anne Vikkula and Tuija Kirkinen were particularly in charge of GIS methodology at the

Department of Archaeology in the University of Helsinki. Furthermore, large Stone Age excavations were financed by the Ministry of Labour in northern Karelia as part of the policy against unemployment. In this way a local work force was available which enabled fieldwork conducted by Petro Pesonen, Taisto Karjalainen and Oili Räihälä in the National Board of Antiquities, and Mika Lavento in the University of Helsinki.

All in all the Ancient Lake Saimaa project began a series of investigations in South-East Finland which was fruitful. During the project several new methods regarding both survey and excavation strategies were applied for the first time. In addition, the large number of new sites and new site types was of particular importance, too, because they in practice brought visible views of a new kind on the prehistory of the area. Still, the most important result was that it cast new light on the area itself where even basic surveys were missing. In this way and in some municipalities, the situation was close to the Karelian Isthmus where sites are still so far waiting for their uncovering.

2.6 Conclusion

The Saimaa-Ladoga project 1998–2003 is in its way a continuation of the Ancient Lake Saimaa project and the Martinniemi project. The working methods in the field are quite similar but in the Karelian Isthmus certain modifications have been necessary because in the coastal areas by Lake Ladoga and the Gulf of Finland environments differ from the environmental conditions in Lake Saimaa. Finding suitable ways to prepare and to conduct an effective survey in the Lake Saimaa area was a learning process which continued in the environment in the Karelian Isthmus. In addition, it has been necessary to rediscover and revisit a large number of the sites originally documented by Finnish archaeologists before World War II.

To briefly sum up the results of the projects at least the following issues can be uplifted. New field methods were adopted. Finds were measured *in situ* by the tachymeter at the excavation and field maps drawn in the field by hand were redrawn by computer afterwards, methods which become soon normal convention in preparing survey or excavation reports. The ceramic investigation was successful and the material was compared with corresponding material from other areas in Finland with the result that also the peculiarities of ceramic types were investigated more detailed than before. The ceramic investigation was successful and the material was compared with corresponding material from other areas in Finland with the result that also the peculiarities of ceramic types were investigated more detailed than before. Maybe still the most prominent result is the considerable increase of the number of new sites of all kinds which were found during surveys. Together with new sites the view on settlement pattern changes. Since the experience gathered during the project large sites with dwelling depressions have been attested the Stone Age settlement more sedentary than assumed before. In addition, the field experience together with GIS modeling has been a tool for preparing field research and interpret the results.

In this chapter the goals, theoretical starting points, methodology and work of the Ancient Lake Saimaa project was discussed in quite a detail in order to offer the reader a sufficient background for the critical reading of the results. It also forms the basis for estimating the practical methodology, results and publications of the Saimaa-Ladoga project.

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Endnotes

1 Mika Lavento 2001 (doc. diss.), Petro Pesonen 1996d (Lic. Phil.) and Mika Lavento 1997b (Lic. Phil.), Tuija Kirkinen (1994b), Päivi Maaranen (1995), Petro Pesonen (1995b), Sari Saastamoinen (1995) (M.A. studies).

2 See Kirkinen 1996a, http://www.helsinki.fi/hum/arla/wwwsaima.html.

3 Jutta Joensuu 2000, Lotta Martio 2000 and Teemu Mökkönen 2000.

4 In Jussila's diagrams the 0-isobase represents 4 mm/year land uplift.