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TEXTILE CERAMICS IN FINLAND AND ON THE KARELIAN ISTHMUS

Nine Variations and Fugue on a Theme of C. F. Meinander

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CONTENTS

PREFACE 9

I GENERAL INTRODUCTION AND QUESTION FRAMING 13
1.1. Introduction 13
1.2. Questions 14
1.3. Typological method from a phenomenological point of view 16
1.4. General theoretical approaches of the study 18

II RESEARCH HISTORY OF TEXTILE CERAMICS 20
2.1. Introduction 20
2.2. Definitions of basic concepts 20
2.3. Textile ceramics in Finland 22
2.3.1. Late Neolithic Period: first observations of textile-impressions in Finland 22
2.3.2. Early Metal Period: Textile ceramics 25
2.4. Textile ceramics in Sweden and Norway 31
2.5. Textile ceramics in Estonia, Latvia and Lithuania 32
2.6. Textile ceramics in Russia 36
2.6.1. Textile ceramics in the Upper and Middle Volga 37
2.6.2. Textile ceramics in the Karelian Republic and Leningrad region 40

III STUDY MATERIAL AND CERAMIC TECHNOLOGY 44
3.1. Introduction 44
3.2. General statistics of the material under investigation 44
3.3. Numerical classification 45
3.4. Technological aspects 45
3.4.1. Clays 45
3.4.2. Tempers 45
3.4.2.1. Quartz and feldspars 48
3.4.2.2. Asbestos 48
3.4.2.3. Talc and soapstone 49
3.4.2.4. Mica 50
3.4.2.5. Amphiboles 50
3.4.2.6. Organic tempers 50
3.4.2.7. Other tempers 51
3.4.3. Hardness and porosity 51
3.4.4. Surface finish 52
3.4.4.1. Textile-impression 53
3.4.4.2. Observations on textile-impression in Siberia 56
3.4.4.3. Observations on Finnish Textile ceramics 57
3.4.4.4. Hatching in Finnish Textile ceramics 58
3.4.5. Smoothing and painting 59
3.4.6. Firing 60
3.4.7. Function of ceramics 61

IV OBSERVATIONS ON SHAPE AND DECORATION 62
4.1. Introduction 62
4.2. Shape 62

4.2.1. Source criticism 63
4.2.2. Earlier observations 64
4.2.3. Observations on the shape of Textile ceramics in Finland and on the Karelian Isthmus 65
4.2.3.1. Observations of the rim 65
4.2.3.2. Body 65
4.2.3.3. Base 65
4.3. Thickness and size 68
4.4. Decoration 68
4.4.1. Rim 69
4.4.1.1. Elements 69
4.4.1.2. Motifs 70
4.4.2. Body 70
4.4.2.1. Elements 70
4.4.2.2. Motifs 72
4.4.2.3. Design types 73
4.4.2.4. Density of ornamentation 74
4.4.2.5. Implements of decoration 74

V MULTIVARIABLE ANALYSIS OF TEXTILE CERAMICS IN FINLAND 76
5.1. Introduction 76
5.2. Question framing for statistical analysis and comparison of ceramics 77
5.3. Methodology of multivariable analysis of Textile ceramics 77
5.4. Textile ceramics among Late Neolithic and Early Metal Period ceramics in Finland 79
5.4.1. Subgroups of Textile ceramics 80
5.4.2. Tomitsa ceramics and Kainuu ceramics 82
5.4.2.1. Tomitsa (Varaslampi) ceramics 83
5.4.2.2. Kainuu ceramics 84
5.4.3. Sarsa ceramics 85
5.4.4. Kalmistonmäki ceramics 86

VI DATING 88
6.1. Introduction 88
6.2. An overview of the chronologies for Late Neolithic and Early Metal Period ceramics in Finland, Sweden, Norway, Baltic countries and Russia 88
6.2.1. Finland 88
6.2.2. Sweden and Norway 91
6.2.3. Baltic countries 92
6.2.4. Russia 93
6.3. Dating of Textile ceramics in Finland 97
6.3.1. Shore displacement dating 97
6.3.2.1 Ancient Lake Saimaa area 97
6.3.2.2. Shore displacement chronology in other areas in Finland 99
6.3.2. Absolute datings and their problems 101
6.3.2.1. AMS-datings 101
6.3.2.2. TL-datings 104
6.3.2.3. Carbon-14 datings from dwelling sites; context datings 104
6.3.2.4. Interpretation of results 106
6.3.3. Internal chronology of Textile ceramics in Finland and the Karelian Isthmus 107

VII THE RELATIONSIP OF TEXTILE CERAMICS AND ITS NEIGHBOURING TYPES 108
7.1. Introduction 108
7.2. Comparison of Finnish Textile ceramics with Textile ceramics in the neighbouring countries 108

7.2.1.Estonia 108
7.2.2. The south and the east coast of Lake Ladoga 109
7.2.3. Dwelling sites on the east and west side of Lake Onega and the northern part of the Karelian Republic 109
7.3. Ceramics preceding Textile ceramics in South Finland 112
7.4. The Bronze Age and the Early Metal Period 113
7.5. Ceramics following Textile ceramics in northern and southern Finland 114
7.5.1. Säräisniemi 2 types 114
7.5.2. Epineolithic ceramics in South and Southwest Finland 117
7.6. Relationship of Textile ceramics and Late Bronze Age ceramics in southern Finland 117
7.6.1. Results of factor analysis of Finnish Textile ceramics 118

VIII ARCHAEOLOGICAL MATERIAL RELATED TO TEXTILE CERAMICS 119
8.1. Introduction 119
8.2. Early metal objects 119
8.3. Bronze Axes 120
8.3.1. Seima axes 120
8.3.2. Maaninka axes 122
8.3.3. Ananino celt 122
8.3.4. Mälar axes 123
8.3.5. Flanged and socketed axes 123
8.4. Casting moulds and crucibles 124
8.5. Iron 127
8.6. Straight-based arrowheads 128
8.7. Shafthole axes 130
8.8. Flint 130
8.9. Asbestos 130

IX DWELLING SITES OF TEXTILE CERAMICS IN FINLAND AND ON THE KARELIAN ISTHMUS 133
9.1. Introduction 133
9.2. Field research concerning the Bronze Age and the Early Metal Period sites in Finland and on the Karelian Isthmus 133
9.3. Dwelling site clusters involving Textile ceramics in Finland 135
9.4. Characteristics of the dwelling sites of Textile ceramics in Finland and on the Karelian Isthmus 137
9.5. Textile ceramics and slash-and-burn cultivation 139
9.6. Sedentary versus mobile populations 141
9.7. Sedentary versus mobile settlement in the Northern Scandinavia during the Bronze Age 143

X FUGUE 145
10.1. Prelude 145
10.1.1. Introduction 145
10.1.1.1. Why does style tell us more about prehistory than type? 145
10.1.2. Style in ceramics 146
10.1.3. Why is style theory needed in archaeology? 147
10.1.4. Theories on style in archaeology 148
10.1.5. Levels of style 155
10.1.6. Individuals behind style 157
10.1.6.1. Who made ceramics? 157
10.1.6.2. Message in ceramics 158
10.1.6.3. Bridging theories between ceramic groups and social groups 159

10.2. Fugue 164
10.2.1. Introduction 164
10.2.2. Material objects related to Textile ceramics 164
10.2.3. Communication through sherds 165
10.2.3.1. Interpretation of the ceramic network 169
10.2.4. Communication through metals 171
10.2.5. Exchange and trade 171
10.2.5.1. Models of exchange from the Ural Mountains to Fennoscandia during Textile ceramics 172
10.2.6. Diffusion, migration and convergent development 175
10.2.7. Sites of Textile ceramics 177
10.2.7.1. Classification of dwelling sites 177
10.2.7.2. Central locations versus peripheries 177
10.2.8. Textile ceramics and linguistics 180
10.2.9. Textile ceramics and genetics 182
10.2.10. Coda 182
10.2.10.1. The beginning of Textile ceramics 182
10.2.10.2. The end of Textile ceramics 184
10.2.10.3. Textile ceramics in Finland on and the Karelian Isthmus 185

REFERENCIES

APPENDICES 211

APPENDIX 1 Sites with Textile ceramics in Finland and on the Karelian Isthmus. 211

APPENDIX 2 2a+b+c Sites with Textile ceramics in the Karelian Republic, Leningrad region and Estonia. 282

APPENDIX 3 Profiles of Textile ceramics in Finland and on the Karelian Isthmus. 293

APPENDIX 4 Coding of attributes used in the statistical analysis of ceramics. 304

APPENDIX 5 Coded observations of ceramics in Finland, on the Karelian Isthmus, the Karelian Republic, Leningrad region and Estonia. 307

APPENDIX 6a+b Chronology of the ceramic types related to Textile ceramics in Russia. 360

APPENDIX 7 Distance diagrams and regression lines for the dwelling sites involving Textile ceramics in Finland. 362

APPENDIX 8 AMS and carbon-14 -datings for Textile ceramics and types related to Textile ceramics. 365
8a – AMS -datings 365
8b – Carbon-14 datings 369

APPENDIX 9 9a Bronze Axes in Finland and on the Karelian Isthmus. ... 373
9b Casting moulds and crucibles in Finland and on the Karelian Isthmus. ... 375
9c Straight-based arrowheads in Finland and on the Karelian Isthmus. 379

APPENDIX 10 Plates (1–25). Textile ceramics in Finland and on the Karelian Isthmus, the Karelian Republic, the Leningrad region and Estonia. 383

PREFACE

In Finnish archaeology ceramic typology and chronology have traditionally occupied a central position. They have provided the skeleton on the basis of which periodization and interpretation of cultures, populations and ethnic groups have been built. Detailed chronologies and chorological investigations have been the main emphasis in these studies.

In Finnish archaeology the study of Textile ceramics or Sarsa-Tomitsa ceramics got its beginning in the works of early experimental archaeology conducted by Sakari Pälsi. As early as 1916 Pälsi hypothesised that it would be possible to make textile-impressed ceramics in moulds with the help of textiles. However, not until the mid 1950's was Sarsa-Tomitsa ceramics separated as an independent ceramic group. Aarne Äyräpää first described it in his farewell article (1953) and soon after this C. F. Meinander (1954b) updated the group as the Sarsa-Tomitsa type by separating both eastern and western components in it.

Since the 1950's Sarsa-Tomitsa ceramics has not been thoroughly studied in Finland. Mirja Miettinen (1968) and Timo Miettinen (1972) discussed it in their pro gradu – theses. Christian Carpelan (1965) suggested new viewpoints to Sarsa-Tomitsa ceramics in his unpublished licentiate dissertation. He also continued to develop these ideas between the 1970's and the 1990's, but a synthesis of these studies has not been published.

My own studies of Textile ceramics began at the end of the 1980's through the studies of the rich and versatile ceramic material from the dwelling sites of Kalmosärkkä and Kellolaisten tuli in Suomussalmi, Kainuu. The majority of this material dates back to the Early Metal Period referring to an increase of settlement activity during that time. I carried out the first ceramic studies concentrating on Sarsa-Tomitsa ceramics in the archives of the National Board of Antiquities in 1993. The licentiate dissertation "Sarsa-Tomitsa ceramics in Finland and Karelian Isthmus" (1997) was the result of one time-consuming period of these studies. Still it was evident that a larger study was needed involving not only a comparison of Sarsa-Tomitsa ceramics with its preceding and following types but also its existence in the neighbouring countries, Russia and Estonia. For this reason also the term Textile ceramics, which better suited the larger context, was needed.

In addition to Sarsa-Tomitsa ceramics in Finnish collections, comparison material was collected from other ceramic types. Particularly important are Western Bronze Age ceramics, Kiukainen ceramics and even Corded Ware. In eastern and northern Finland the subtypes of Säräisniemi 2 ceramics are of central importance.

During the 1990's I had the possibility to make several short visits to Russia and Estonia. These excursions essentially enlarged my viewpoint of Textile ceramics not only in these countries but also in Finland. Further, they made it possible to carry out the comparison between ceramic types and to see their differences.

Many colleagues have essentially influenced the development of this work. Since the beginning of my ceramic studies at the end of the 1980's, Christian Carpelan, Lic. Phil., has been the key person behind my investigations. This is not only because of his own interest in Early Metal Period ceramics in Finland but also because of his large knowledge relating to prehistoric ceramics in general. Also the many contacts he has with archaeologists in Russia have been valuable in becoming acquainted with material in different areas. Therefore, I would like to present my deepest thanks to him for his friendly willingness to discuss different kinds of problems relating to ceramic studies and archaeology in general – in very different conditions and under varying viewpoints.

I also want to thank professor Ari Siiriäinen, professor Jussi-Pekka Taavitsainen, professor Matti Saarnisto and assistant Tuija Kirkinen, M.A., for reading and commenting on this manuscript. Their constructive criticism led me to write a condensed and updated version of this study during the spring of 2000. I am also grateful to Dr. Kimmo Vehkalahti for his plentiful advice relating to multivariable analyses in general and particularly to the use of the SURVO program.

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Colleagues abroad have played an important role in developing my view on Textile ceramics. Particularly valuable were my visits to Petrozavodsk, where Dr. Mark Kosmenko, and Igor Manyukhin, Candidate in the Historical Sciences, helped me in many ways to obtain the possibility to investigate material in the Institute of History, Language and Material Culture. Their knowledge of the Early Metal Period culture was of special importance in trying to understand relations and common links between Finland and the Karelian Republic during the using period of Textile ceramics. I also wish to thank Dr. Svetlana Kochkurkina, Dr. Juri Savvateev, Nadezhda Lobanova, Mark Zahnovits, Alexandr Zhulnikov and Jurij Systra, Candidates in the Historical Sciences, in Petrozavodsk for their comments and information related to my work.

St. Petersburg is also an important centre of knowledge for the researcher interested in Textile ceramics. Dr. Vladimir Timofeev, Dr. Alexander Saksa, and Dr. Alexander Shumkin, gave their information about the Early Metal Period ceramics in general and made it possible to become acquainted with the concrete material in the RAN/Institute of History and Material Culture. I am grateful to Dmitri Gerasimov, in the Museum of Anthropology and Ethnography named after Peter the Great, Kunstkamera and Sergej Mazurkievich, in the collection of State Hermitage, Candidates of Historical Sciences, for the possibility to research Textile ceramics excavated from the dwelling sites in eastern and southern parts of Lake Ladoga.

Academician Valerij Patrushev had a major influence in my work particularly during its early phase and it is perhaps not too much to say that during the early 1990's he was the primus motor in my becoming a researcher of Textile ceramics. Excavations in Kostroma and Mari-EI and also visits to universities, museums and research centres in Joshkar-Ola, Kazan, Tseboksary, Nizhnyj Novgorod, Kostroma and Jaroslav gave me the perspective of Textile ceramics in the Upper and Middle Volga area. Although these visits lasted only few weeks, they – together with many discussions with academician Patrushev in Mari-EI or Finland – were still of particular importance to my studies.

Estonian Textile ceramics opened doors for understanding in particular the development of the earliest phases of Textile ceramics. Professor Valter Lang, Dr. Aivar Kriiska, Andres Tvauri, M.A. and Ülle Tamla, M.A. in Tallinn, Tartu and Pärnu guided me towards a better understanding of the problematics of the Late Neolithic Period and the Bronze Age in the Baltic countries. In addition, they showed me that there exists also Iron Age Textile ceramics – an open study question – which, unfortunately, had to be left out of this study. I would like to express my deepest thanks to them for their help and friendly attitude towards my work.

I also want to thank the colleagues in the international Besov Nos project (1994–1997) for the possibility to conduct AMS-datings of Textile ceramics and for getting much information relating to textile-impressed ceramics in Sweden, Norway and Russia. Professor Lars Forsberg deserves special thanks for his interest in my work from as early as the processing of my licentiate dissertation. In this connection I would also like to thank the project Early in the North for the possibility to have several AMS-datings of Early Metal Period ceramics.

The manuscript of the dissertation was finished in Jordan during the 2000 field season of the Finnish Jabal Haroun Project and sent via e-mail to the University of Helsinki. I thank the leaders of the project, professor Jaakko Frösén and Zbigniew T. Fiema, PhD, for this possibility and I also thank the participants of the fieldwork season for their understanding attitude towards my work. The office secretary at the Department of Archaeology, Tuovi Laire, has all the time played a special role in taking care that all parts of the work were delivered either to language checking, my opponent or the Faculty of Arts in time. To her I wish to present my special thanks.

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Mika Lavento

I GENERAL INTRODUCTION AND QUESTION FRAMING

1.1. Introduction

Archaeology becomes post-modern by approaching prehistory from innumerable different viewpoints. Contemporary archaeology is not a solid processable discipline with a coherent theoretical framework. Defining one's position among sciences and disciplines is more important now than before, because researchers today have many kinds of approaches available. An archaeologist is not only responsible for presenting grounds for choosing methods and sources, but also for choosing presuppositions and frames of reference. Contemporary archaeology utilises many other disciplines. Archaeology is anthropology, but it can be history or science as well.

An archaeologist may carry out research from new perspectives, but not independently of earlier research. Also this study has its roots in the history of Finnish archaeology. It begins with a large introduction to the study history of Late Neolithic and Early Metal Period ceramics in Finland and continues with a detailed typological investigation of Textile ceramics in Finland and its neighbouring areas. It not only utilises statistical methods and scientific dating procedures for testing earlier results, but also seeks spatial and chronological differences in the material. It also tries to discuss theoretical questions related to typology by linking their philosophical basis to the perspective of philosophical approaches in contemporary archaeology.

Instead of giving a description of a particular period of prehistory and uncovering a precise division of material into types, this study presents several suggestions or hypotheses by which these ceramics could be related to other types or divided into subgroups. It also explains how the relationship between past populations could be interpreted through ceramics, and creates models that interpret changes in prehistory. Sarsa-Tomitsa ceramics, which C. F. Meinander (1954b) defined in the 1950's, is a starting point and the main theme of this work. In this work however, this ceramic group will be called Textile ceramics, because it better covers the ceramic group of the study.

One starting point of the study is the ceramic material of the Finnish Eastern Bronze Age, the core of which belongs to Sarsa-Tomitsa ceramics. The most basic studies of technology, shape and decoration of these ceramics have already been conducted in the licentiate dissertation "Sarsa-Tomitsa ceramics in Finland and the Karelian Isthmus" (Lavento 1997b). These studies have been reproduced with essentially larger material in this work. The new material covers Finnish Bronze Age ceramics and also Kiukainen ceramics where textile impression is common. A large amount of textile ceramics from the Karelian Republic, Leningrad region and Estonia has also been investigated. Textile ceramics from northern Norway and northern Sweden have not been included, because many observations suggest that they do not represent to the same culture as Eastern Textile ceramics (Forsberg 1996).

Defining Textile ceramics and separating it from *fabric-impressed ware* – sherds involving textile or pseudo textile-impression but sharing no other typological characteristics of Textile ceramics – is one of the main aims of this work. This is not possible without a well-working typology and chronology of ceramics. Although Finnish archaeologists have already built a working typology for the Stone Age and Early Metal Period, there are still a lot of details that need updating. In particular, material from the Late Neolithic and Early Metal Period has been separated into small ceramic groups, which are poorly defined or based on little material only. Thus, traditional typological studies are still topical. A considerable part of the study is devoted to conducting a large comparison of Textile ceramics with earlier and later types in Finland and the Karelian Isthmus and also in some cases in neighbouring countries.

An investigation of sites and their inventory is also important, because it is the basis for the discussion of relations between populations behind ceramics. The last chapter brings together the results and discusses the Early Metal Period as an interaction of continuity and discontinuity reflected by the archaeological material.

The main purpose of the large overview of the development of style theory in contemporary archaeology is to show how an archaeologist can proceed from classification and typology to hypotheses concerning individuals and populations. The approaches presented in the beginning of the study will be tested with Finnish Textile ceramics. Descriptions of related finds, and sites where they were found, give a larger perspective when elucidating over a thousand-year-long period in the prehistory of eastern and northern Finland and making a model of the relations between populations using Textile ceramics.

1.2. Questions

This study will present different points of view on Textile ceramics in Finland and the Karelian Isthmus. The following questions are especially elucidated here.

1. To analyse Early Metal Period ceramics, which can be included in Textile ceramics, fabric-impressed ware or ceramics immediately preceding or following Textile ceramics. Although many new Textile ceramics have been found in excavations, surveys or as stray finds after the 1950's in Finland, only a minority of this material has been published. Therefore, one of the first aims of this study is simply to present this material, construct its chronology and present the description of dwelling sites where the material was found.

2. Textile ceramics and its origin. Aarne Äyräpää (1953:85–90) and C. F. Meinander (1954b: 182–183) defined Textile ceramics or Sarsa-Tomitsa ceramics on the basis of a small amount of archaeological material (Figs. 1.1. and 1.2.). Although Meinander's typology has been assumed to be mainly valid still today, an essentially larger material has uncovered new characteristics and details. The definition of Textile ceramics has been tested to determine if the ceramics emerge out of the Early Metal Period material as an independent type with its special characteristics or if it is, instead, necessary to make changes to its definition.

There are at least two relevant ways to define Finnish Textile ceramics. The first definition begins with the polythetic approach, involving Sarsa-Tomitsa ceramics and also Kalmistonmäki ceramics, the latter of which is chronologically late subgroup, which Meinander separated from the material of Kalmistonmäki at Räisälä, on the Karelian Isthmus (Meinander 1954b:189–190). The other, the monothetic definition, states that all fabric-impressed ware should be placed into this group. Accepting the second alternative enlarges the material under study essentially: chronologically earlier types than Sarsa-Tomitsa ceramics – the textile-impressed sherds in Corded Ware, Kiukainen ceramics and even Pöljä ceramics – should be included in the material. As sherds of Bronze Age and Epineolithic ceramics can sporadically have textile-impression, they should also be included in the group. In northern Finland there are also ceramics with pseudo textile-impression (any kind of fabric-impression) in Imitated Textile pottery (Arponen 1992; 1994). In addition to this there is also fabric-impressed pottery in northern Norway and Sweden (Jørgensen & Olsen 1987; 1988; Hulthén 1991).

This study accepts the first alternative; thus the starting point is Sarsa-Tomitsa ceramics and its subtype, Kalmistonmäki ceramics (Meinander 1954b; 1969). Although many ceramic groups with textile-impression have been left out of the original definition of Textile ceramics, they have not been left out of this study. They have been used for comparison and typological analysis and, if necessary, for updating the definition of Textile ceramics.



Fig. 1.1. Professor Aarne Äyräpää in the beginning of 1950s. Photo: University of Helsinki, Department of Archaeology.



Fig. 1.2. Professor C. F. Meinander at the 100th anniversary of the Finnish Antiquarian Society in 1970. Photo: National Board of Antiquities.

Archaeologists have put forward several hypotheses for the origin of Textile ceramics in Finland. Its eastern character has usually been accepted, but in some cases hypotheses have accepted a western influence also, thus suggesting two independent origins. On the basis of these hypotheses it is reasonable to speak about two separate ceramic groups: the western Sarsa and the eastern Tomitsa group (Lavento 1997b; Carpelan 1999). These ideas will be further developed in this work.

3. Methodology for studying ceramic types: statistical vs. phenomenological approach. The relevant archaeological material for understanding Textile ceramics from a large perspective has been coded for carrying out a multivariable statistical analysis. The benefit of statistical analysis lies first of all in its heuristic value when trying to see new combinations in the material, e.g. new types or subtypes. It serves also as a testing

procedure for trying to find out whether the earlier classifications made by Äyräpää, Meinander and Carpelan will hold true in the light of new material and in the light of those variables chosen for analysis.

Numerical methods have been much used in typological studies in Finnish archaeology since the late 1970's (Kokkonen 1978; Linturi 1980; Vikkula 1987; Ruonavaara 1988; Lavento 1989; Pesonen 1995a). All taxonomic analyses utilising multivariate statistics in Finnish archaeology have been carried out by cluster analysis. One might ask whether there are some other methods of multivariable statistics that might be even more appropriate analysis tools for typological studies of ceramics. Trying to develop a method and testing the results is one goal of this study.

Originally, archaeologists have not made their typologies with the help of statistical methods. Types have been constructed as a combination of stratigraphy, chronology, chorology and the archaeologist's intuition. Types have not necessarily been combinations of well-defined elements or motifs; instead they have been characterised by picking out the most conspicuous features in them. Exact rules cannot be given for finding types. Decorating a vessel and also understanding its typological characteristics needs an artistic eye.

Besides intuition these studies should also have a comprehensible basis. This process of interpretation has been tried to be made as clear as possible by suggesting and developing phenomenological (Lavento 1998a) and hermeneutical approaches, which represent theories of humanistic studies and provide the basis for interpretation. In a similar way to an art historian who aims to understand the style of a particular painter, an archaeologist also tries to understand a particular ceramic style. Research is not a statistical analysis of features of the style, but an understanding of the key characteristics of a certain style – understanding the *eidos*.

The concept of *eidos* comes from the phenomenological philosophy of Edmund Husserl. In practice, *eidos* means an entity, which is known to all archaeologists seriously concentrated on typological studies. After understanding an *eidos* of a ceramic style, an archaeologist is able to not only copy ideas but also create new vessels within the framework of the style. Because the concept of *eidos* has an essential role in trying to understand Finnish Textile ceramics it will also be briefly discussed from a philosophical point of view (cf. also Lavento 1998a).

4. Chronology and chorology of Textile ceramics. Chronology is also an essential part of the study. Traditional chronology is mostly based on existing dated material from the dwelling sites and shore displacement studies. AMS (Accelerating Mass Spectrometry) -datings of ceramic sherds still plays an important role in this study,[1] because they are thought to be more reliable than context dates of the dwelling sites.

Chorological and spatial aspects are of great importance in trying to elucidate Textile ceramics. In this study spatial aspects mean mainly a macro-spatial point of view, a distribution of finds between sites and site complexes, not distributions of ceramics in single dwelling sites. The latter questions have only been posed either to try to understand the context of a find or to apply shore displacement dating for different terraces of a site.

One important purpose of this study is to compare the ceramic material of Early Metal Period dwelling sites in Finland. Detailed ceramic study is a basis for further analyses of communication and cultural relations between territories and finding local subtypes or chronological subphases within Textile ceramics (Fig. 1.3.).

[1] Acceleration datings have been made together with the project "Household and Settlement during the Mesolithic and Early Metal period at Lake Onega" carried out by the universities of Tromsø, Umeå, Turku, Helsinki and the Russian Academy of Science, Karelian Scientific Center, Institute of Language, Literature and History. Part of the datings have been made in the project "Early in the North" carried out by the University of Helsinki (Carpelan 1998:9). Three datings have been made by the project "Viipurin läänin historia."



Fig. 1.3. Distribution of Textile ceramics in Northern Europe.

5. Theoretical discussion on style and its applicability in interpreting relations of groups of people and individuals. Chronology and typology is not the end of an archaeological study, but a starting point for solving more interesting questions. Textile ceramics can be a sign of a new culture in eastern Finland, but it can indicate also something else. It can help in trying to determine the spread of impulses into Finland or the change of culture. Archaeologists base these hypotheses on a large-scale comparison of finds – making a typology and connecting it with chronology and chorology.

Archaeologists have very often interpreted similarity and dissimilarity of finds by relating them between populations. The more common features there are in ceramics the closer is also the chronological and chorological relationship between their makers.

From the late 1970's and early 1980's typological problems have again come up for discussion in archaeology (Klejn 1982), not in the form of a traditional typology but, instead, as a study of style (Wobst 1977; Sackett 1977; Conkey 1978; Plog 1980; Adams & Adams 1991). During the 1980's and 1990's much concern has been devoted to understanding style in archaeology (Braun & Plog 1982; Wiessner 1983; Conkey 1990). Style studies have close connections with approaches to both processual (Carr 1995a; Carr & Neitzel 1995a) and post-processual archaeology (Hodder 1986; 1990; Shanks & Tilley 1987).

These new approaches have also helped the author to apply typology in solving problems in style and societies. The problems will be thoroughly discussed in the last chapter, which also concludes the results of this work.

1.3. Typological method from a phenomenological point of view

Most archaeologists have carried out the typological division of material intuitively without any coherent background theory, without a detailed separation of attributes or any kind of statistical analysis. In this study these approaches to typology have been called traditional typology. If separation has been conducted with the help of statistical methods, the procedure has been called numerical classification. Both approaches have played an important role in the classification of Textile ceramics.

Statistical typology starts from a detailed observation of attributes. Statistical multivariable analysis not only gives suggestions for further analysis, for the division of the whole material but also for the division of single attributes and their correlations in different types. Still, statistical analysis cannot be the decisive test for the existence of types. Reliance only on statistical typology may cause a situation where research moves away from practical life and everyday experiences. In the worst case, methods create a pseudo-reality out of common sense experiences. Questions are asked just for the sake of methods. The human experience is important because it separates the essential characteristics from the unessential. This knowledge increases when working with material and it separates the specialist from the amateur.

One advantage of traditional typology is its flexible and practical way to the approach of problems. An archaeologist involved with material is an expert, who can tell such details about ceramics, which cannot be grasped by any multivariable classification. The major problem still is how to verify this classification.

In this study traditional intuitive typology is important but it will be approached from a slightly different point of view than usually. The philosophical framework behind this approach is phenomenology (Lavento 1998a). One purpose is to show that other human sciences have also discussed the same kind of problems, which are topical in typology. There are still essential differences between them and archaeology. The following short introduction tries to model the manner in which an archaeologist proceeds when conducting practical studies. Because these issues have been more carefully discussed on other occasions (Lavento 1998a) no far-going philosophical discussion will be presented here.

Phenomenology. Phenomenology presents one possibility to develop further the idea of how to find the essential qualities in types. It offers a means to find such results (types) which are intuitively acceptable, but which are too complicated to be discharged analytically into single attributes. Ceramic style is an example of an entity, which cannot be described by referring only to its attributes. Many important characteristics can be approached through reductions, which separate essential characteristics and eliminate the unessential.

In archaeology the phenomenological way of thinking has been mentioned in passing as one possibility (Shanks & Tilley 1992), but only seldom has it been discussed in practical conditions (Lavento 1998a:134–141). The theoretical ideas of phenomenology presented in this study are based on some philosophical studies (Husserl 1954;1995; Edie 1987; Føllesdahl 1970; Miller 1984). Familiarisation with the practical methodology of seeking ceramic types in archaeology shows many points in common with phenomenology. Phenomenological approaches have been applied in archaeological ceramic studies although archaeologists themselves have often been reluctant to formulate their ideas into a theory.

Instead of a detailed description of analytical qualities the purpose is to understand variation inside a type, the range of possible characteristics and their combinations. The phenomenological approach does not aim to describe all imaginable attributes of the type but to find the most essential entities – an *eidos* of a particular ceramic type. The validity and reliability of an *eidos* is not in simple proportion to the amount of material the researcher has at his disposal.

The *eidos* of a certain ceramic type is an entity that has many points in common with the concept of style. An artisan making ceramics follows rules – consciously or unconsciously – which control his work. Following rules connects the work to a particular style. Some of the rules are personal and reflect the individual's own

views. It would be impractical to think that an artist should at all times be wholly conscious of all motifs and variations of style. An artisan has a prototype in his mind. In addition to this he has some freedom to vary some characteristics in shape and decoration.

Eidos can also be approached from our (an archaeologist today) point of view. Although C. F. Meinander separated Kalmistonmäki ceramics by discerning only two attributes, this was still not all that he knew about the Kalmistonmäki type. He had already separated it from the Early Metal Period ceramic groups in southern and southeastern Finland. He defined its geographical distribution, and he was also able to place it into a certain chronological period between Textile ceramics and Sär 2 ceramics. Meinander would have been able to extend the description of Kalmistonmäki ceramics by taking into account new characteristics and details in technology, shape and even in decoration. With more material he would have been able to give a more detailed description of the type.

In a way Meinander carried out reduction by separating unessential attributes from the essential ones and ended up with the hypothesis that two main attributes separated Kalmistonmäki ceramics from other types. We can criticize Meinander for an over interpretation from little material and few attributes but this procedure still represents the beginning of reduction. Meinander said that what was particularly important was the corded ornament (Wickelschnurabdrucken) which is neither known in Sarsa nor Tomitsa ceramics but which sometimes occurs in the material from Gorodische, in northwestern Russia, and first of all in the hillfort of Asva in Estonia (Meinander 1954b: 189–190).

"Zu den jungen Ornamenten können wir auch das Grubenornament auf....rechnen; die obere Reihe besteht aus gewöhnlichen runden Grübchen, während die unteren Grübchen schräg durch den Stoff, der das Gefäss während einer gewissen Arbeitsphase umgeben hat, eingestochen worden sind...In Sarsa und Tomitsa kommen Grübchen dieser Art in typischer Ausführung nicht vor."(Meinander 1954b:190.)

This kind of description of the attributes of a ceramic type is common in archaeology. The central question is whether we have here all that is needed for understanding what is Kalmistonmäki ceramics. Meinander has separated one principal criterion (cord impression) and another less important one (pits).

It is natural to assume intuitively that there is some sort of a correct typology, which corresponds with a style in the past. The style is still not the same entity as *eidos*. The most essential qualities of style, *eidos*, are not easy to approach. We can say that Finnish Textile ceramics has *eidos*, but we can also say that Textile ceramics found at an individual site of Varaslampi in Joensuu has an *eidos,* too. These two have much in common but they are not the same. *Eidos* is, in a practical situation, dependent upon the observer's point of view, his aims and preconditions, intentions and the material at his disposal.

One should not forget the frame of reference when speaking about *eidos*. We should not speak about Textile ceramics without taking the context into consideration. We should always make clear the geographical and chronological frames of our study material. This should be made in all studies, but deciding these frames is often a problem. For instance, it is difficult to say why we will not include all Textile ceramics from western Russia or from northern Norway into our analysis.

Ceramics is an example of archaeological material that is almost always fragmentary. Relying only on the attributes, which can actually be seen in the material, is not enough to construct a uniform picture of the object under study. In practice, the shape of a vessel becomes almost always understood by extrapolating observations, because no vessels have been preserved in their original condition. Although we see only small sherds of Sär 2 pottery, we can very probably infer that in every vessel belonging to this type, ornamentation has been made only on the upper part of it.

The crucial difference between empirical, inductive studies and *eidos* can be illustrated by an example. Let us suppose there is a researcher who relies only on empirical observations. He makes a natural inference by virtue of observation data that only such elements that he has actually seen have been used in Sär 2 ceramics. Although he would have observations from 10 000 vessels at his disposal, he would not be able to predict with certainty the attributes in the next vessel. Inductive reasoning increases our knowledge by assuming that all observations that follow must belong to the set of earlier empirical observations. But, in practice, most archaeologists do not think in this way. They can postulate elements and motifs that have actually been used, but they see also *possibilities,* which have not yet been realised.

The phenomenologist extends his knowledge about Sär 2 ceramics by not only making observations but also by separating essential characteristics of this type. He is also ready to accept for ornamentation such elements that he has not been able to observe directly. Therefore, even from small and fragmentary material he can intuitively understand what is the *eidos* of the style. Larger material may change his idea of the style and make its characteristics more detailed. In the same way an art historian also tries to get a general impression of how an artist had carried out his creative work – catch the *eidos* of this particular artist.

On the basis of this, one could come to the conclusion that *eidos* is a very flexible and idealized concept without a firm basis. *Eidos* is still not a construction made only by a researcher because those people who made the ceramics in the past also had the *eidos* of the ceramic style. Ideally the *eidos* is the same for the researcher and for the people in the past; it is a mediator between the researcher and the artisan.

The way in which phenomenological results are verified is a very serious problem. Contrary to the natural scientific approach there is no simple test that could solve the problem. One essential difference between phenomenology and the scientific approach is that it is not possible to test phenomena in a hypothetical-deductive man-

ner because they do not obey laws or empirical generalizations. Being restricted only to empirical generalizations of a few ceramic sherds leads to a defective view on phenomena and missing a lot of possible information.

Three methods for verifying the results can be presented. 1) New material and its analysis also tests the earlier hypotheses. New data and its interpretation are not necessarily in accordance with the earlier one. 2) New methods will elucidate study objects from different viewpoints. This is a kind of test for the earlier data. New methods will support or disprove earlier results. 3) New research paradigms often challenge earlier interpretation and theories needing correction. Many factors in the paradigm influence which questions come up for discussion in the study situation and also how much a researcher can rely upon earlier results. Although these verifying methods have much in common with the hypothetical-deductive approach the difference is that it is not possible to present laws or even law-like generalisations.

All these types of verification are in accordance with the phenomenological way of thinking, which accepts a large number of different alternatives. This point connects phenomenology also with hermeneutics. No method that can assist in finding the essential characteristics of a style or *eidos* should be rejected (Varto1992: 85). Statistical methods can be utilised because they may give valuable heuristic information concerning the correlation of attributes. This information can also be found intuitively, but it is difficult for the researcher to keep in touch with innumerable details when the material increases in volume.

Multivariable statistical analyses can give results that are not in accordance with direct observations. A particular attribute can have an important weighting in statistical analysis but it may turn out to be marginal or untypical upon closer examination. Statistical analysis cannot be used as a means of verification. Instead, a careful discussion of the results of the statistical analysis is important. This discussion is a phenomenological reduction of the essential characteristics from the unessential ones, but it is also a hermeneutical dialogue between the researcher and the study object.

Many archaeologists apply phenomenological reasoning unconsciously when discerning ceramic types. This means that despite the reluctance to make clear how typological analysis proceeds, they still have principles or an unconscious theory in mind. Phenomenology offers one means to understand how this process takes place in theory. It is nothing that is radically new and it does not aim at rejecting archaeological typological analysis.

The German mathematician and philosopher Edmund Husserl presented the basic ideas of phenomenology almost 100 years ago but still today phenomenology is a developing philosophical approach. This study will not proceed any deeper into the theory of phenomenology, because it would emphasise theory rather than archaeological questions.

1.4. General theoretical approaches of the study

The classical theoretical viewpoints on ceramic study aim to separate the material into attributes, the smallest entities to be included in the analysis, and cluster them again into types. This kind of approach, which is known for instance, in the works of Irving Rouse (1960) or Robert Whallon (1972), characterises an analytical paradigm in archaeology. Although the analytical paradigm is a dream for scientific archaeology it also has many serious problems. Attributes themselves do not carry information, but their importance is in the way in which they are patterned on vessels (Arnold 1989:5). This patterning is usually difficult to put together because of the arbitrary preservation of the material. Even more problematical is the fact that arbitrary units of ceramics are difficult to relate to other aspects of culture (Arnold 1989:5).

Ethnoarchaeological investigations have shown that a large number of details and attributes recorded by archaeologists is not relevant or necessary for ascertaining a good understanding of ceramics or cultural behaviour (Arnold 1989:5). Exactly following the rules of analytical methodology does not solve the problem. The archaeological study of ceramics is "reading" the material again and again, becoming more and more skilled in separating the essential and the unessential, occasional features.

The study process in archaeology and other humanistic sciences, *Geisteswissenchaften,* is movement back and forth between the researcher and his study object – a fight between a snake and a mongoose. During this process the researcher learns to pose more and more relevant questions about the study object. In archaeology understanding is a dialogue between the researcher and the past, interplay between the part and the whole. Understanding is a game (Spiel), in which the researcher plays a part. The researcher enters into a hermeneutical circle with his prejudices. Hans-Georg Gadamer says, a bit polemically, that a researcher should accept the authority of earlier researchers and tradition as the truth. Prejudices are the basis of understanding (Gadamer 1975:261–274). But, what is essential is that during the investigation old prejudices disappear and new ones emerge. Thus the study process is an endless work, because there is no end to the study (Gadamer 1977).

Hermeneutics in archaeology is based on the assumption of two worlds. The world of the past is not totally inaccessible to the present world, because the past and the present have features in common. A theoretical basis for *Geisteswissenchaften*, which differs radically from the hypothetical-deductive approach, has given archaeology one possibility by which to discuss its methodological basis.

The central concept in hermeneutics is intention, which also connects it to Husserl's phenomenology. Although the mentality of a prehistoric person cannot be grasped, it is possible to understand his intentional prod-

ucts (Johansen & Olsen 1992:425). The mind has the capability to bridge the distance between the intentional messages of past individuals and to understand permanently fixed life expressions (Johansen & Olsen 1992:428). However, this assumption is not free from serious difficulties.

A ceramic type represents a mental template, a kind of ideal type, which every potter has in his mind (Deetz 1967:45–49). Because a potter's mental template involves a kind of ideal set of attributes, which can be "read" in the vessel, an archaeologist has the possibility to enter the potter's mind. Mentalism, which has been applied in the study of pot making, has been much criticised. It has been said, for instance, that practical work is more dependent on motor habits than mental templates. Further, mentalism does not take into consideration the ecological variables when over-emphasising cultural-historical and social factors (Arnold 1989:8–9).

Mentalism seems to have many points in common with hermeneutics and phenomenology. The basic difference is that when mentalism finds it possible to enter the head of a person from the past, a hermeneutist admits that the researcher is always carrying out his studies from his own historical perspective. We can find common intentions, but we cannot become people of the past.

According to Ian Hodder (1992:192) the past is organized in a context, which differs from that of our own. An archaeologist can choose between competing hypotheses. Although we are not able to reach the past in terms of its own we can still approach it through understanding issues in the part/whole circle. The third component of interpretative archaeology is the self-reflexive aspect of archaeological writing (Hodder 1992:193). No archaeological idea is accepted as knowledge before it has been presented to an audience, which critically carries out the dialogue between the researcher and his co-workers.

Although the German tradition of *Geisteswissenchaften* has much influenced the post-processual archaeology, Hodder, Shanks and Tilley have only superficially referred to Wilhelm Dilthey's or Hans-Georg Gadamer's thoughts. In the 1990's the situation has changed slightly. Harald Johansen and Bjørnar Olsen discussed hermeneutics and its applications in contemporary archaeology (Johansen & Olsen 1992). Olsen has further developed these thoughts and the use of the methodology of human sciences in contemporary archaeology from a larger perspective (Olsen 1997).

One should not try to see hermeneutics as a method (Lavento 1995d). Rather, it is a way of thinking or an ability to comprehend how the study process goes on. In practice, hermeneutics means a lot of work and a willingness to doubt one's own basic assumptions. An archaeologist begins his studies from books and articles, collecting basic knowledge and accepting the contemporary approaches to the problems. The study proceeds when new data enriches interpretation. New field data from the excavation or survey will elucidate the question from a different point of view.

This study also proceeds in a hermeneutical circle. It begins with some key concepts and hypotheses concerning Textile ceramics from Meinander's definitions and hypotheses concerning Sarsa-Tomitsa ceramics. Hermeneutics does not indicate the way in which the study should be made. It helps to pose more and more relevant questions and to see such things in prehistory, which were neither observed, relevant nor worth discussing earlier.

II RESEARCH HISTORY OF TEXTILE CERAMICS

2.1. Introduction

Research history is a key for understanding Textile ceramics. Because several pottery types called Textile ceramics exist in the large coniferous zone from the River Kama to Fenno-Scandinavia, it is also important to know the study history in Russia, Estonia, Latvia, Lithuania, Sweden and Norway. This means not only comparing typology and chronology, but also familiarising oneself with the development of ceramic types and concepts related to Textile ceramics.

The second step is to familiarise oneself with the ceramic types involving textile-impression, but which cannot, however, be connected with Textile ceramics. These types can be synchronous with the "proper" Textile ceramics, but more often they either precede or follow them. There are a large number of ceramic types involving textile-impression in the Late Neolithic, Bronze Age and Early Metal Period traditions. This often indicates a cultural connection, but just as often no such connection can be suggested. Separating these two basic types – Textile ceramics and Textile-impressed ceramics – is therefore important.

Archaeologists have created ceramic types as a concept to give chronological order to the Neolithic and to the Early Metal Age. These types are also very important because they reflect study history and they are also the basis for separating cultures. This study discusses types in different contexts with the purpose of comparing and updating the concept and the definition of Textile ceramics. Much emphasis is also put on discussing the origin of the concept and its meaning in the neighbouring countries.

2.2. Definitions of basic concepts

The term Textile ceramics refers to either the identification marks – textile-impression on the surface – or the method of making ceramics. In relation to Early Neolithic Stone Age ceramics textile-impression or fabric-impression represents a new kind of surface treatment, which had not been used before in the large area of Fennoscandia and northern Russia. Although textile-impression is an important feature of Textile ceramics, it does not monothetically define the type. It does not cover the surfaces of all vessels belonging to the group as only a part of Textile ceramics has textile-impression on its surface. More often the sherds have different surface treatments, such as different types of hatching or a smooth face. In Finnish Textile ceramics not more than a quarter of all vessels have textile-impressed surfaces (Lavento 1997b:109).

Fabric-impressed Ware has sometimes been used as a synonym for *textile-impressed ceramics*. The first main difference between these two is the term *ware*, which refers to any clay product such as vessels, cups, idols etc. In this study *textile-impressed ceramics* is a concept for all ceramic vessels involving surface treatment made by textile or fabric but only resembling textile-impression. The term *textile-impressed ceramics* refers to a surface treatment only, not to any cultural or chronological connection. *Textile ceramics*, instead, is the ceramic type that has cultural, chronological and chorological meaning. In Finland it has been called Sarsa-Tomitsa ceramics (Fig. 3.1.). In this study the term *Textile ceramics* has been chosen instead, because it is largely known in the neighbouring countries. Introducing new names for old concepts confuses terminology and definitions. *Fabric-impressed Ware* would be such a new concept with these kinds of difficulties.

Finnish archaeologists have called Textile ceramics found in Finland and the Karelian Republic Sarsa-Tomitsa ceramics. *Sarsa-Tomitsa ceramics* – which can involve textile-impression, hatched surface or even a smooth face – is a concept which C. F. Meinander originally defined (Meinander 1954b:182–183) by using two geographically very distinct sites: the dwelling site complex of Sarsa in Kangasala, southern Finland and the same kind of complex of Tomitsa, close to Petrozavodsk, in the Karelian Republic. In the neighbouring countries archaeologists know the concept Textile ceramics, although several other names have also been used (Fig. 2.2.).

Despite evident problems archaeologists acknowledge that textile-impression is the most important distinctive feature of Textile ceramics because it is easy to recognize and although there are some problems, it still roughly refers to one period of prehistory in a certain area. The concept of Textile ceramics is widely used due to the fact that textile-impression has been used not only in northern Europe, but also in many parts of the world. Textile ceramics exists in Central Europe, Siberia, China and North America. This study will mostly concentrate on the Textile ceramics found in Finland and on the Karelian Isthmus. The basic assumption is that in addition to surface treatment the Textile ceramics found in the European part of Russia, the Baltic countries and Finland have strong cultural connections.

Russian archaeologists have called Textile ceramics by a more neutral term, Net pottery (сетчатая керамика), which does not take into account the origin

The River Kemijoki Water System: 1 – Kemijärvi Hietalahti 1, 2 – Kemijärvi Anttila 1 and 2, 3 – Kemijärvi Juuniemi, 4 – Kemijärvi Rajaniemi, 5 – Kemijärvi Neitilä 4, 6 – Kemijärvi Narkiperä, 7 – Rovaniemi Kolpene, 8 – Rovaniemi Säpsäkoski.
The River Oulujoki Water System: 9 – Hyrynsalmi Vonkka II, 10 – Kuhmo Sylväjänniemi 1, 11 – Kuhmo Pajasaari Island, 12 – Kuhmo Vasikkaniemi SW, 13 – Kuhmo Vasikkaniemi N, 14 – Muhos Halosentörmä, 15 – Ristijärvi Likoniemi, 16 – Sotkamo Kiikarusniemi, 17 – Sotkamo Ammonsaari Island, 18 – Sotkamo Palolahti W, 19 – Suomussalmi Kalmosärkkä, 20 – Suomussalmi Kellolaisten tuli, 21 – Suomussalmi Salmenniemi, 22 – Suomussalmi Tormuan särkkä, 23 – Suomussalmi Mikonsärkkä, 24 – Suomussalmi Kumpuniemi, 25 – Suomussalmi Joenniemi, 26 – Utajärvi Pikkarainen, 27 – Vaala Sillankorva.
Southern Ostrobothnia: 28 – Laihia Nikonkallio, 29 – Laihia Viirikallio, 30 – Närpiö Raineåsen, 31– Vöyri Vitmossen 3.
The Lake Saimaa Water System: 32 – Enonkoski Pöytälahti b, 33 – Enonkoski Kotkuinniemi g, 34 – Ilomantsi Syväys I, 35 – Ilomantsi Korpisaari S, 36 – Joensuu Varaslampi, 37 – Kerimäki Vehkaranta, 38 – Kerimäki Kokkomäki, 39 – Kerimäki Martinniemi, 40 – Kesälahti Sirnihta (=Sirnitsa), 41 – Kesälahti Suurenkylänlahti 1, 42 – Kitee Turusenniemi (Naurisniemi), 43 – Kitee Viilniemi, 44 – Kiuruvesi Tuliniemi, 45 – Kuopio Vanha-Koski, 46 – Maaninka Huutoniemi, 47 – Parikkala Kaunissaari Island, 48 – Pielavesi Virranniska, 49 – Pielavesi Meijerinkangas, 50 – Pielavesi Kaatiojoen suu, 51 – Polvijärvi Multavieru, 52 – Punkaharju Kaarniemi, 53 – Puumala Pistohiekka b, 54 – Puumala Kotkatlahti a, 55 – Rantasalmi Lautakangas, 56 – Ristiina Heiniemi, 57 – Ristiina Pulmionlampi, 58 – Ristiina Kitulansuo d, 59 – Ristiina Roinilampi, 60 – Ristiina Akanlahti, 61 – Ristiina Hietaniemenkangas, 62 – Ristiina Ala-Pentti b, 63 – Ristiina Metelinniemi, 64 – Ristiina Mustalahti, 65 – Ruokolahti Karoniemi, 66 – Rääkkylä Mehonlahti 1, 67 – Rääkkylä Pörrinmökki, 68 – Rääkkylä Mehonlahti 2, 69 – Rääkkylä Lappalaissuo 1, 70 – Rääkkylä Huotinniemi, 71 – Rääkkylä Rantala, 72 – Savonlinna Haukilahden pohja, 73 – Savonlinna Suvikangas a, 74 – Savonlinna Käräänkangas (a–c), 75 – Savonlinna Iso-Kankainen, 76 – Savonlinna Hiekkaniemi, 77 – Savonranta Pyyhiekka 1, 78 – Taipalsaari Vaateranta, 79 – Taipalsaari Ketvele, 80 – Taipalsaari Valkeasaari.
The Karelian Isthmus: 81 – Kaukola Juho Paavilaisen kartanopelto, 82 – Kaukola Juho Paavilaisen rantapelto, 83 – Kaukola Olli Paavilaisen Nököpelto, 84 – Kaukola Simo Iivosen nummi, 85 – Kaukola Simo Iivosen tontti ja perunamaat, 86 – Kaukola Pekko Iivosen tontti ja (kartano)pelto, 87 – Kaukola Pekko Iivosen rantapelto, 88 – Kaukola Heikki Teräväisen rantapelto, 89 – Kaukola Heikki Teräväisen kartanopelto, 90 – Kaukola Simo Iivosen vanhan talon paikka, 91 – Kaukola Tiitunmäen kallion vieri, 92 – Kaukola Antti Varv(p)an (= Heikki Laukkasen) rintapelto, 93 – Kaukola Riukjärvi Antti Varvan pihapelto ja koppolipelto, 94 – Kaukola Riukjärvi Antti Varvan maat, 95 – Kaukola Tiitunmäen tienvieri, 96 – Kaukola Simo Lankisen perillisten maat, 97 – Kaukola Aatami Ruuskan Vehnämaanlahden pelto, 98 – Kaukola Olli Kortteen ja Kalle Merosen pellot Piiskunsalmen rannalla, 99 – Kaukola Piiksuonkankaan asuinpaikka, 101 – Kaukola Lavamäen pelto, 101 – Kaukola Ville Pessin Riihipelto, 102 – Kaukola Antti Kaasalaisen Piiskun-, Tossikan-, and Savilahdenpellot, 103 – Kaukola Matti Kaasalaisen niemenpelto, 104 – Kurkijoki Kuuppala Kalmistonmäki, 105 – Räisälä Hovi Kalmistonmäki, 106 – Räisälä Kökkölä, 107 – Tytärsaari Kaunismäki, 108 – Viipuri Häyrynmäki, 109 – Viipuri Krasnyj Holm.
The Lake Päijänne Water System: 110 – Anjalankoski Ahvionkoski, 111 – Asikkala Kotasaari, 112 – Hankasalmi Autioniemi, 113 – Iitti Silamaniemi, 114 – Iitti Koskenranta, 115 – Iitti Keidas, 116 – Jaala Pukkisaari, 117 – Kinnula Häähkäniemi, 118 – Korpilahti Hiirola, 119 – Korpilahti Raidanlahti, 120 – Korpilahti Kotiranta B, 121 – Kotka (Kymi) Töyrylä, 122 – Laukaa Majaniemi B, 123 – Laukaa Juntula, 124 – Nastola Kovalahti, 125 – Pihtipudas Majakaarre I, 126 – Pihtipudas Madeneva, 127 – Pihtipudas Virtala 2, 128 – Pihtipudas Juntinniemi, 129 – Pihtipudas Lylysaari, 130 – Saarijärvi Saarenpää, 131 – Saarijärvi Voudinniemi, 132 – Saarijärvi Jänissaari, 133 – Virolahti Niemistö.

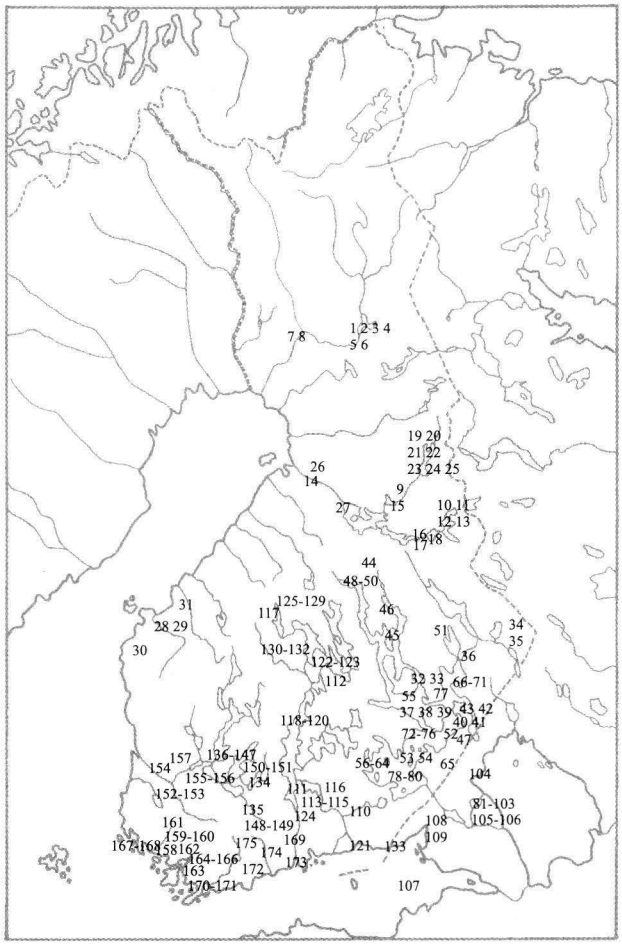

Fig. 2.1. Dwelling sites of Textile ceramics in Finland and Karelian Isthmus.

The River Kokemäenjoki Water System: 134 – Hauho Lentolanmäki 7, 135 – Janakkala Irjala, 136 – Kangasala Autio-Lunden, 137 – Kangasala Sepänjärvi II, 138 – Kangasala Pohtio I, 139 – Kangasala Pohtio II, 140 – Kangasala Pohtio III, 141 – Kangasala Pohtio IV, 142 – Kangasala Tiilitehdas I, 143 – Kangasala Tiilitehdas II, 144 – Kangasala Tiilitehdas III, 145 – Kangasala Sepänjärvi I, 146 – Kangasala Pohtiolampi, 147 – Kangasala Vehoniemenharju 2, 148 - Loppi Kavettula, 149 – Loppi Kuitikas, 150 – Luopioinen Hietaniemenkärki, 151 – Luopioinen Isosaari, 152 – Nakkila Kaasanmäki I, 153 – Nakkila Rieskaronmäki, 154 – Ulvila Peltomäki, 155 – Valkeakoski Hirvikallio I and II, 156 – Valkeakoski Linnosaari, 157 – Vammala Haapakallio.
Varsinais-Suomi: 158 – Kaarina Hulkkio, 159 – Laitila Hautvuori, 160 – Laitila Lalla, 161 – Lieto Vanhalinna, 162 – Muurla Haansyrjänpelto, 163 – Perniö Preitti 6, 164 – Salo Ketohaka 1 (Katajamäki), 165 – Salo Ketohaka 2, 166 – Salo The group of dwelling remains at Ketohaka, 167 – Turku Kotirinne, 168 – Turku Polttolaitoksenkatu.
Uusimaa: 169 – Askola Ruoksmaa, 170 – Karjaa Hagnäs IIb, 171 – Karjaa Östergård, 172 – Kirkkonummi Koivistosveden, 173 – Porvoo Böle, 174 – Siuntio Marsbacken 3, 175 – Vihti Pinolahti.

	English	Finnish	Russian	Norwegian
Type of Textile ceramics	Textile ceramics	Tekstiilikeramiikka Sarsan-Tomitsan keramikka Kalmistonmäen keramiikka	Setsataya keramika "Net-pottery" Tekstilnaya keramika Lozhnotekstilnaya "Mat ceramics" "Reticular ceramics"	Tekstil-keramiikk
Imitated Textile ceramics	Imitated Textile ceramics	Imitoitu tekstiilikeramiikka	Pseudotekstilnaya Imitirovannaya tekstilnaya keramika "Wafer ceramics"	Imitert tekstilkeramikk

Fig. 2.2. Different terms for Textile ceramics in English, Finnish, Russian and Norwegian.

or the technique used in making it (Kosmenko 1991a:156–157; 1996a:194–197). This is practical, because many other material such as grass, a belly of an animal, comb stamps etc. have been used (Patrushev 1989:22–25).

In this study Textile ceramics is a higher concept, which includes Sarsa-Tomitsa ceramics, Kalmistonmäki ceramics and different types of Net pottery. Imitated Textile (hence IT) ceramics (Gjessing 1942:275–276; Carpelan 1970:31–34) has been excluded, although some researchers include it into the type (Kosmenko 1991a:157,166–167; 1993a:24–26, 57–62). Textile ceramics found in northern Norway (Jørgensen & Olsen 1987:15–16; 1988:17–18) also remains outside this work. In Sweden Birgitta Hulthén (1991:32–33) has separated the type as "Asbestos Pottery with textile impression". Although both of these are more or less synchronous with Finnish Textile ceramics and imply textile-impression, they still have many typological differences (Jørgensen & Olsen 1987:32–33; Forsberg 1996:171). Despite the differences in the study history, their characteristic features and the possible connection with Finnish Textile ceramics will be largely discussed.

2.3. Textile ceramics in Finland

The history of textile-impression in the Finnish prehistoric ceramics begins with the Late Neolithic ceramic types, which may have either proper textile-impression or pseudo textile-impression on their surfaces. Ceramics that have typological or chronological links with Textile ceramics have also been included in the analysis carried out in this study. Although the emphasis is on Finnish ceramics, ceramic groups from the neighbouring countries will also be discussed. An overview tries to be as short as possible, because the study history has been more thoroughly presented on other occasions (Lavento 1997b; 2000a).

2.3.1. Late Neolithic Period: first observations of textile-impressions in Finland

Although archaeologists have taken to using a large number of ceramic types dating back to the Late Neolithic and Early Metal Periods, some ceramic types – Sirnihta or Jysmä ceramics – have never been introduced in the literature, and at present they only live in the oral tradition of Finnish archaeology. A considerable amount of this tradition is based on Christian Carpelan's studies. A lot of information of these types presented here is based on Carpelan's lecture (1992) and numerous discussions with him.

The latest phase of Comb Ceramics, Pyheensilta ceramics, belongs to Aarne Äyräpää's classification system as a kind of additional member: Äyräpää never presented it officially as a part of his classification of the Combed Ware in Finland (Äyräpää 1930). Following Äyräpää's lectures Ville Luho (1948:54–55) called the type the "Pyheensilta phase". C. F. Meinander (1940:39–42) described the main features of the Pyheensilta type and divided the ceramic material from Mynämäki, Pyheensilta into two subtypes. The first subtype was characterised by porous temper and a straight rim. The second type was separated from the first by a profiled rim and more solid paste than in the first group. In her studies of Pyheensilta ceramics in the 1980's Anne Vikkula considered it an inhomogeneous group, and divided the material from the dwelling site of Pyheensilta in Mynämäki by cluster analysis into three or even six subtypes (Vikkula 1984:53–54; 1987:44). Common features were found in the east and the west. The discussion concerning the origins of common typological characteristics of Volosovo (Krajnov 1981; Halikov 1986) and East Swedish Pitted Ware (Meinander 1940; Vikkula 1988) has been approached either as a sign of large ethnic connections or as a manifestation of a large-scale technological innovation. It might indicate impulses originating in the upper and middle Volga area but also in eastern Sweden (Vikkula 1988:61–62; Bogenholm 1995:20) as well.

Tempering with organic material already occurs sporadically in Early Neolithic ceramics (Edgren 1966:109). It is important to realize that two different traditions, which are easily mixed, can be separated. In particular Neolithic porous paste is usually caused by lime temper and the distribution area is in Southwest Finland. A large number of porous, organic tempered ceramics, which is ornamented and shaped according to Pöljä or Kierikki asbestos ceramics, particularly from the Late Neolithic Period has been found in eastern Finland.(Huurre 1959:59–60; 1986a:59; Edgren 1964:26; Lavento 1989:107–108; 1992:27–30). It is then most probable that these ceramics belong to the Pöljä group, but for some reason organic material replaced asbestos as temper.

G. Pankrushev (1973) connected organic tempering in the Karelian Republic with Kama ceramics. A. Halikov saw the connection between organic tempered ceramics in North and East Finland and Russian Garino-Bor ceramics (Halikov 1986:40, 49), and some others (Meinander 1954a: 167; 1984a: 28) with Russian Volosovo ceramics. Matti Huurre (1959:58) and Anne Vikkula (1987:139–149) classified this material as belonging to Pyheensilta ceramics. Most researchers have postulated contacts in the large area reaching from the Ural Mountains to Fennoscandia.

Middle and Late Neolithic Asbestos ceramics have been divided into three typological groups that differ from each other in some diagnostic features and chronology. If the organic tempered exceptions are not taken into account, all vessels have been tempered with relatively rough fibres of asbestos. Pöljä ceramics is an example of a type, which has been defined in a monothetic way, on the basis of an inwards-turned rim list. Scant ornamentation implies only zones of comb stamps (Meinander 1954b:162–167; Edgren 1964:25–26). A. Siiriäinen (1967:9–12; 31–35; 1984a:30–32), instead, defined Kierikki ceramics in the polythetic way by referring to light and long comb stamps and to the varied rim form. Jysmä ceramics is usually defined by virtue of a T-form rim and a flat bottom. Its comb stamp ornamentation is similar to Pöljä and Kierikki Ware (Edgren 1964:18–30; Carpelan 1979:15). It is important to notice that textile-impression can sometimes occur in Pöljä ceramics also (Meinander 1954a: 165–166; Carpelan 1979:15; Karjalainen, pers. comm. 3.3.1996). According to my own observations textile-impression does not exist in Kierikki or Jysmä ceramics.

Besides the asbestos ceramics presented before it is possible that there could be one more Final Neolithic/ Bronze Age horizon of asbestos ceramics discernible at the dwelling sites of Salo in Hankasalmi and of Vehkaranta in Kerimäki (Lavento & Hornytzkyj 1996:45). The small amount of material available makes this hypothesis questionable. By virtue of the same kind of clay paste as in the casting moulds, Julius Ailio dated the ceramics to the Bronze Age (Ailio 1909 I: 91, II: 17–18) and Äyräpää compared ornamentation with the ceramics of the Andronovo type found in East Russia (Äyräpää 1953:82, fig. 4b and 5). Later Carpelan (1965:60) connected the asbestos ceramics from Hankasalmi as one subgroup of Sär 2 ceramics.

It may be of considerable importance that this "Andronovo-beeinflusster" ceramics (Meinander 1954b:180) may have represented a transition from the Neolithic to the Early Metal Period. A. M. Tallgren (1937:42–44) suggested this already in 1937. The typology of the Vehkaranta vessel has remained a bit enigmatic so far, although its dating is probably Final Neolithic: the first half of the 2nd millennium BC (Lavento & Hornytzkyj 1996:45).

Julius Ailio was the first to separate the Kiukainen culture (Ailio 1909 I, 93; II: 82–83). Äyräpää (Europaeus 1922:165–169) interpreted it as a fusion of the Late Combed Ware Ka III and the Battle Axe cultures. Meinander took a critical view on Äyräpää's hypothesis and did not put so much emphasis on the role of the Battle Axe culture (Meinander 1954a:172) even though the distribution area of Kiukainen ceramics is on the coastal zone correlating closely with that of the Battle Axe culture. Meinander defined Kiukainen ceramics by including all the ceramics found at the dwelling sites representing a certain chronological period defined by shore displacement – in other words all ceramics found at the dwelling sites that he considered to be of the Kiukainen culture. Textile-impression plays a prominent role in Kiukainen ceramics (Meinander 1954a: 152; Asplund 1997:29–31; Soininen 1990:40–50). It is generally known that mat-impression exists on the bottoms of vessels, textile-impression being common on the walls (Meinander 1954a:175). These observations raise the question of the origin and function of impression along with its relationship to Sarsa-Tomitsa ceramics.

Meinander (1954a:181–184) first dated Kiukainen ceramics between ca. 1700–1200 BC. Siiriäinen (1969:68–69) gave it an earlier dating, between 1800–1300 BC, but nowadays the dating is considerably earlier, between 2300–1600 calBC (Carpelan 1999:273). In Russia in the 1950's Bryusov dated the spread of fabric or textile to the turn of the 3rd and 2nd millennia BC (Bryusov 1950:287), but the amount of Textile ceramics in sites increased not until the II millennium BC (Bryusov 1950:302). With this argument and some observations of textile-impressions of Finnish and Karelian Late Neolithic Asbestos Ware (Äyräpää 1952b: 293; Gurina 1951:133–136; Meinander 1954b:182; Luho 1949:32–33, 55). Meinander, following Äyräpää, came to the conclusion that textile-impression in Kiukainen ceramics should be connected with this eastern influence.[1]

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[1] "Wir können zwar keine östliche Keramikgruppe nennen, die mit der ältesten Kiukaiskeramik gleichaltrig wäre und in der die Textilabdrücke ebenso häufig vorkämen wie bei dieser, aber im Hinblick auf die dominierende Stellung der Textilkeramik im ganzen nordosteuropäischen Raum während der Bronze- und älteren Eisenzeit muss diese Erscheinung doch als östlich aufgefasst werden. In der ostfinnischen Asbestkeramik treten Textilabdrücke in einem Funde auf, der gleichzeitig mit oder etwas älter als die älteste Kiukaiskeramik ist (Pitkäjärvi, S. 161)...Zwischen der Kiukaiskultur und derjenigen ostfinnish-karelischen Kulturphase, deren Überreste die Asbestkeramik vom Pöljä-Typ ausmachen, hat also

Today this argument does not fit well with the archaeological evidence. Carpelan (1992) has pointed out that the emergence of textile-impression in Kiukainen ceramics cannot be explained by referring to eastern impulses, because in Russia Textile ceramics seems to appear some centuries later than in the west. Textile ceramics had already come into use at about 1800–1600 calBC (Lavento 2001, in press; Carpelan 1999:273) but the earliest dates of Textile ceramics in the Karelian Republic are from ca. 1500 calBC (Kosmenko 1991a:160–161). The use of Kiukainen ceramics had already begun at about 2300 calBC.

There is also another possible explanation for the origin of Textile ceramics in Finland. Äyräpää (1933:114) suggested that instead of eastern impulses the southern ones were central in the formation of Textile ceramics in southern Finland.[2] This possibility has only got a few responses among archaeologists although it suggests a new alternative for the origin of textile-impression in Finland (Lavento 2001:in press). Textile ceramics may then have spread here from two directions: from the east and from the south. It is of special importance that in the latter case the impulses seem to have reached Finland earlier than those coming straight from the eastern direction.

In the 1970's Carpelan again discussed Äyräpää's suggestion and explained how textile-impression might have been adopted into Textile ceramics of the Sarsa type. He did not assume that the mediating link would have been Kiukainen ceramics but, instead, a ceramic group partly synchronous with Kiukainen ceramics. He called the type *Middle-zone ceramics* according to the geographical area of its distribution (Fig. 2.3.): the zone between the southwestern coast and the eastern Finnish asbestos ceramics, in Häme and Satakunta.[3]

Carpelan[4] further (1992) suggested that the later phase of the Battle Axe culture, which has been assumed to have migrated to the Finnish coast from Estonia, has been the decisive factor in the formation of Sarsa ceramics.

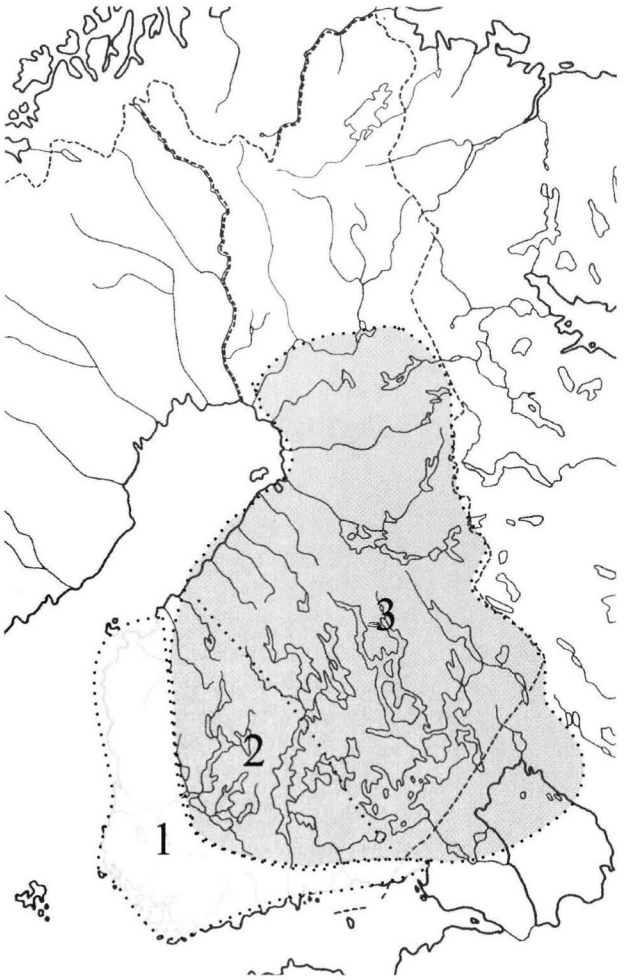

Fig. 2.3. The distribution of Late Neolithic ceramic types in Finland and the Karelian Isthmus. Legend: 1 – Kiukainen ceramics, 2 – Middle-zone ceramics (partly overlapped by Asbestos ceramics), 3 – Asbestos ceramics of Kierikki, Pöljä and Jysmä types.

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ein gewisser Kontakt existiert, dessen Intensität und Bedeutung sich jedoch unserem Urteil entzieht. Allem Anschein nach ist er aber von geringerer Bedeutung für die Entwicklung der Kiukaiskultur gewesen als die westlichen Verbindungen." (Meinander 1954a:175-176.)

[2] In Finnland, wo die Textilkeramik beinahe in denselben Formen auftritt wie in Russland, scheint sie kurz nach der Bootaxtkultur aufzutreten, und wir haben keinen Grund anzunehmen, dass ihre Anwendung in Russland später begonnen hat, trotzdem sie sich dort in der in ihrer Entwicklung zurückgebliebenen Gorodiščekultur sehr lange im Gebrauch erhalten hat (was einigermassen auch in Finnland der Fall war). Unter solchen Umständen stellt sich die Frage auf, ob nicht diese Keramik möglicherweise in mitteleuropäischen spätneolitischen Einflüssen wurzelt. Bei kleinpolnischen schnurkeramischen Gefässen treten nämlich zuweilen Zeugabdrücke auf, welche wahrscheinlich auf die "nordische" Keramik der Tschechoslowakei zurückführen sind. Auch aus Ostpreussen (Zedmar und Kurische Nehrung) ist Textilkeramik bekannt. Da man aber aus dem Zentrum der Fatjanovokultur keine anderen sicheren Spuren kleinpolnischer schnurkeramischer Einwirkungen nachweisen kann, muss die Frage vorläufig verneint werden." (Äyräpää 1933:114.)

[3] The starting point of Carpelan's hypothesis was Ville Luho's observation of the Early Bronze Age "textile-ceramics" in Hungary (Carpelan pers. comm. 19.4. 2000). "Mellan Kiukaiskulturens område vid kusten och den asbestkeramiska kretsen i östra och norra Finland förblir en zon som sträcker sig från det sydösterbottniska kustområdet norr om Kyrö älv genom södra Tavastland till östra Nyland och Karelska näset där det förekommer en särskild, med Kiukaiskeramiken parallell keramikgrupp...I brist på vedertagen benämning kallas denna grupp, vars förebilder bör sökas inom den "sena östbaltiska snörkeramiken" och "tidiga textilkeramiken" (Jaanits 1959; Cimermane 1968) här senneolitisk mellanzonskeramik. Då nämnda östbaltiska grupper vid sidan av skandinavisk keramik även bidrog till uppkomsten av Kiukaiskeramiken är det genom en fullständig frånvaro av skandinavisk påverkan vid uppkomsten av den senneolitiska mellanzonskeramiken som skillnaden keramikgrupperna emellan uppstått." (Carpelan 1979:14–15.)

[4] Carpelan states that this ceramics belongs to Middle-zone ceramics (Carpelan pers. comm. 19.4.2000).

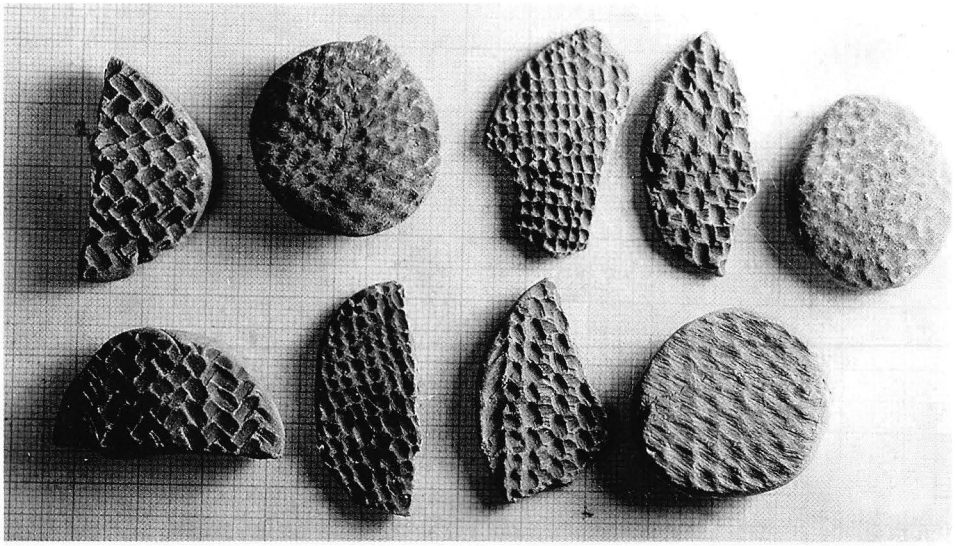

Fig. 2.4. Sakari Pälsi's early works on experimental archaeology. Wax negatives made from the Textile ceramics in Kaukola, on the Karelian Isthmus. Photo: Mika Lavento.

Also Harri Moora (1956) set forth principally the same idea in the 1950's in Estonia. According to Carpelan the Battle Axe culture in Finland branched off into a southern and a northern group: the northern one representing the population which used the before-mentioned Middle-zone ceramics and the southern one representing ceramics made in the coastal area (Carpelan 1992).

It is also important to notice that in the "clean" dwelling site of Corded Ware in Perkiö in Hauho there is textile-impression on some sherds (Edgren 1970:33). Edgren stated, however, that although textile-impression exists sporadically in Corded Ware (Edgren 1959:46), one should not put too much emphasis on this (Edgren 1970:33), because it is in no way essential to the type. Although probably not being important characteristics in defining Corded Ware, these observations may become important when discussing the origin of impression in Textile ceramics. Edgren considered Corded Ware as a homogeneous ceramic group without a discernible middle-zone (Edgren 1970:33).

Along with these studies, Timo Miettinen (1975:129–131) also suggested the notion of the Early Textile ceramics, which would have been of western origin. He discerned the type on morphological grounds and called it "Kangaspainanteinen tekstiilikeramiikka" ("Textile-impressed textile pottery"). He also pointed out that textile-impression had already occurred sporadically in late Corded Ware.[5] As examples he mentioned ceramics from Koivistosveden in Kirkkonummi (Europaeus 1922:135), Ruoksmaa in Askola (Meinander 1954a:152–153) and Irjala in Janakkala (Miettinen 1975:131).

[5] "Rillen" ceramics exists in the eastern Middle Europe. The name is not used anymore. For instance, in Estonia it has been included in the late Corded Ware. In Finland Carpelan has connected it with Luukonsaari ceramics. (Carpelan, pers. comm. 17.4.2000.)

2.3.2. Early Metal Period: Textile ceramics

As early as 1916 Sakari Pälsi published results of experimental archaeology in Finland (Fig. 2.4.). Based on the large and versatile material from the dwelling site complexes of Riukjärvi and Piiskunsalmi in Kaukola, in the Karelian Isthmus, Pälsi (1916) found that some ceramics had a strong textile-impression on their surface (Pälsi 1915:66). He assumed that it was reasonable to connect this observation with a practical method to make pottery in a mould (Pälsi 1916:69–71).

In the 1920's and 1930's textile-impressed ceramics was mentioned incidentally in some publications (Europaeus 1922:135; Pälsi 1915; 1916). At the end of his career, in the 1950's, Äyräpää described a special ornamentation, "refflat" or "Rillenkeramik" which had its roots in the eastern part of Central Europe (Äyräpää 1953:84).[6] He also drew attention to the finds at Tomitsa near the city of Petrozavodsk. The eastern contacts were of central importance for him when seeking the parallels.[7]

[6] Från Olonets leda spåren söderut och mot sydost, till textilkeramikens centrum vid övre Volga och Oka. Här uppträder motsvarande keramik (fig. 9) både på öppna boplatser, dels redan från slutet av stenåldern, och i gorodiščer av Djakovotyp, av vilka de senaste sträcka sig ända fram till yngre järnålder. Denna keramik uppvisar även »Lochbuckeln», som förekommo i fynden från Kangasala och Tomitsa; dessa torde här ha sitt ursprung i Andronovokeramiken; Andronovo- resp. Seimakeramikens inflytande får man även räkna i kamstämpelmotiven. (Äyräpää 1953:85–89.)

[7] Denna textilkeramik, som man helt enkelt även kunde kalla gorodiščekeramik, har hittats på flere ställen i södra och mellersta Finland, t.o.m. så långt västerut som i Laitila (=Letala) socken nordväst om Åbo. De äldsta spåren av den finna vi ju, som sagt, redan i Kiukaiskeramiken. Vår yngsta textilkeramik är framgrävd i Uskela i Egentliga Finland, där den uppträder tillsammans med gravfynd från romersk järnålder och begynnande folkvandringstid (300–400-talen).(Äyräpää 1953:89–90.)

In his synthesis article Äyräpää emphasized the eastern influence, but at the same time saw Kiukainen ceramics as the starting point in the use of textile-impression. Now, when keeping in mind that Kiukainen ceramics spread into Finland from Estonia, we come to a conclusion that Äyräpää had kept his opinion concerning the origin of textile-impression. He assumed that Finnish Textile ceramics had a connection with Tomitsa ceramics, but he did not say that the origin of this ceramics should be explained by this influence. It is also remarkable that Äyräpää dated the latest use of Textile ceramics in Finland as late as the 400's AD.

C. F. Meinander repeated many ideas that Äyräpää had already suggested, but took a different stand on one issue. He emphasised the close relationship between the ceramics of Sarsa in Kangasala, in Central Finland and the ceramics found in Tomitsa in the Karelian Republic and assumed that it was reasonable to look for the origin of Sarsa ceramics in the Volga area, which "die kulturelle Zusammengehörigkeit lässt sich nicht bestreiten" (Meinander 1954b:206). He did not accept the Baltic area as a mediating link between the eastern and the early Finnish Textile ceramics. The connections did not begin until in the Gorodischse period, at the end of the Bronze Age and the Pre-Roman Iron Age (Meinander 1954b:206; 1969:49–50). According to Meinander (1954b:182–183) the main features of Sarsa-Tomitsa ceramics are the following:

"Die Textilkeramik vom Sarsa-Typ...besteht aus Flachbodengefässen mit kegelförmig ansteigender, leicht bauchiger Wandung. Der Hals ist entweder gerade oder S-förmig geschweift, mit nach aussen gebogenem Mündungsrand. Die Wandung ist ziemlich dünn (6–10 mm), was darauf hinweist, dass die Gefässe von mässiger Grösse gewesen sind; kein Gefäss hat so vollständig rekonstruiert werden können, dass die Dimensionen angegeben werden könnten, doch ist die normale Mündungsweite offenbar ca. 20 cm. Das Töpfergut ist mit zerstossenem Quarz und Feldspat, in einigen Fällen mit Glimmer oder kurzen Asbestfibern abgemagert. Die Scherben sind von fester Konsistenz und im grossen ganzen besser erhalten als diejenigen der Kiukais-Keramik. Die missliche Eigenschaft der letztgenannten, die starke Verwitterung der Aussenfläche, kommt bei der Keramik vom Sarsa-Typ nicht vor. Mattenabdrücke auf dem Boden der Gefässe sind nicht beobachtet worden, was jedoch daran liegen mag, dass die Anzahl der gefundenen Bodenscherben recht gering ist. Die Wandung der meisten Gefässe hingegen ist mit Abdrücken eines groben Stoffes in Leinenbindung bedeckt. Eine Ausnahme bilden einige Gefässe, deren Wandung mittels eines unebenen Werkzeuges in wechselnder Richtung gestrichelt ist; eines der Gefässe von Sarsa zeigt Abdrücke, die darauf hinweisen, dass es vor dem Brande mit Heu umwickelt war.

Das Ornament wird öfters aus runden Grübchen und Abdrücken eines Stempels mit scharf ausgeschnittenen Zähnen gebildet. Es umgibt im allgemeinen die Gefässmündung in einer einige cm breiten Borde und erstreckt sich selten tiefer auf die Wandung. Häufig ist auch die Innenseite der Mündung orniert und die eingestochenen Grübchen treten dann auf der Aussenseite buckelförmig hervor...Zuweilen ist die ornierte Borde geglättet, aber oft decken die Textilabdrücke das ganze Gefäss bis an den Mündungsrand. Manchmal ist das eine Ende des Stempels tiefer als das andere eingedrückt..."(Meinander 1954b:182–183.)

Meinander thought that Sarsa-Tomitsa ceramics came into use in the beginning of the Eastern Bronze Age. He also stated – following Äyräpää – that there existed textile-impressed ceramics with a strongly profiled rim, for instance, in the material of Hautvuori in Laitila, in Varsinais-Suomi and Kalmistonmäki in Räisälä, in the Karelian Isthmus. Also peculiar was corded-impression (Meinander 1954b:189–191). He called this younger component of Sarsa-Tomitsa ceramics in Räisälä the Kalmistonmäki group. The term Sarsa-Tomitsa ceramics has remained in use, but the Kalmistonmäki group is less known. The characteristic features of Kalmistonmäki ceramics are the following:

"Einige wenige Scherben weisen eine Beimischung von Asbest oder Talk auf. Es gibt einige zahnstempelornierte Scherben, die nahekommende Gegenstücke in Tomitsa haben..., und wie oben gesagt, sind hier auch Fragmente eines rillenornierten Gefässes, das unter den Sarsa-Funden ein exaktes Gegenstück hat, gefunden worden. Die meisten Gefässe sind jedoch mit Wickelschnurabdrücken in variierenden Mustern orniert...Zu den jungen Ornamenten können wir auch das Grubenornament...rechnen; die obere Reihe besteht aus gewöhnlichen runden Grübchen, während die unteren Grübchen schräg durch den Stoff, der das Gefäss während einer gewissen Arbeitsphase umgeben hat, eingestochen worden sind."(Meinander 1954b:189–190.)

Kalmistonmäki ceramics was, in fact, already presented in Äyräpää's (1953) synthesis article. Äyräpää's notions of its origin and cultural relationship are of special importance.[8] We see how Äyräpää emphasises the southern contacts at the expense of the direct eastern ones. Despite this he never discussed his assumptions concerning the influence of southern impulses in detail.

Meinander stated that Kalmistonmäki ceramics with twisted-cord-impression and fish-bone ornament was a mediating link between Sarsa-Tomitsa and Morby ceramics (Meinander 1969:42–43). One problem with Kalmistonmäki ceramics is that the number of sites where it is found has remained very small. Meinander (1969:42) was able to mention only some sherds from the dwelling sites of Böle in Porvoo and Kalmistonmäki in Räisälä (Fig. 2.5.) belonging to the type.[9]

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[8] Ornamenten på en kärlbit (fig. 10 b), utförda med gles tvärsnoddsstempel, kunde ev. härstamma från ett motiv, som Kiukaiskulturen i sin tid lånat från den svenska hällkistkeramiken. Samma ornament är likväl känt även i Östbaltikum (fig. 13:2) och i mellersta Ryssland från stenålderns slutskede och från gorodiščetiden. Ett fragment av en gjutform av lera för en Ananjinoyxa (fig. 10 m) daterar boplatsen till senare hälften av det sista årtusendet f.Kr., men visar dessutom, att en del av våra östliga bronser har tillhört den textilkeramiska gruppen. – Några föremål i Räisälä-fyndet tyda på kulturinflytande från Östbaltikum och ännu längre söderifrån.(Äyräpää 1953:90–91.)

[9] Only a few archaeological fieldworks relating to the Stone Age and Early Metal Age sites have been conducted in the Karelian Isthmus and Ladoga Karelia since World War II. Field studies have been restricted to surveys of known dwelling site complexes (Timofeev 1986; 1993a; 1993b; Dolukhanov & Timofeev 1996; see also Lapshin 1990; 1995). Some Textile ceramics have recently been found at the multi-period dwelling site of Kökkölä in Räisälä during the survey conducted in co-operation with the Department of Archaeology at the University of Helsinki and IIMK/RAN, Russian Academy of Sciences, Department of Palaeolithic in the Institute of the History of Material Culture, in May 1999.



Fig. 2.5. Kalmistonmäki in Räisälä photographed from the west. C. F. Meinander separated the subgroup of Kalmistonmäki on the basis of material found during A. M. Tallgren's excavation in 1914. Photo: Mika Lavento.

Jukka Luoto (1984) has separated textile-impressed ceramics from the material of Vanhalinna in Lieto, which he dates on typological grounds into the later period of its use (Luoto 1984:111). Unfortunately Luoto's description is unclear and it seems possible that there are textile-impressed ceramics from different periods in the material.

Unto Salo (1981:320–324; 1984:180; 2000) has used the term Sarsa ceramics instead of Meinander´s Sarsa-Tomitsa ceramics, which is, perhaps, related to the fact that he concentrated mostly on the material found in Satakunta and in Southwest Finland. Salo also points out that textile-impression can be observed already in Kiukainen ceramics, but that it is not necessary to interpret this as a sign of continuity between Kiukainen ceramics and Sarsa ceramics (Salo 1981:322). Salo located the origin of Textile ceramics to the upper Volga and Oka and dated the existence of the type between the end of the 2nd and the middle of the 1st millennia BC (Salo 1981:322).

An interesting detail is that Salo has separated a small number of Kalmistonmäki ceramics in Ylä-Satakunta (Salo 1981:323, fig. 135). This cannot unambiguously be included into Kalmistonmäki ceramics because, for instance, an important identification mark, the twisted-cord ornament, is missing.

On the west and southwest coasts of Finland in the Baltic Sea there are ceramic wares, which are synchronous with Textile ceramics but differ essentially from it. Meinander, Carpelan and Salo divided these western Bronze Age ceramics, which were found in southern Finland into two main types. The material from Toispuolojanummi in Paimio is central to this division. In its general appearance this ceramics is coarse, profiled in S-form and its scant ornamentation has been made by round pits (Meinander 1954b:168). Meinander described it as coarse Bronze Age ceramics, but Salo called it Paimio ceramics (Salo 1984:154–155). The second type is named "Fine, Soft-surfaced, Lausitz-influenced ceramics" (Carpelan 1980:189). Ceramics of this type were first made during the fourth period of the Scandinavian Bronze Age, and the latest finds of the type date back to the sixth Scandinavian period (Meinander 1954b: 177–178; Salo 1984:155). Neither of these ceramic types has been carefully studied in Finland and therefore also their definitions have remained incomplete.

In particular in Ahvenanmaa there exists also a third type of western Bronze Age ceramics, Rusticated pottery. It is easily distinguished on the basis of its furrow-decoration and jar-like form (Gustavsson 1997:67–69). The main distribution area of the type is situated on the southern part of the Baltic Sea but, according to Hille Jaanusson (1981:120–121; 1985:45–46), this "Pre-Lusatian ceramic province" also reached the southwest coast of Finland. In the west coast of Finland there are some sites involving this pottery (Luoto 1984:112; Edgren 1993:137). This type has to be considered when

thinking about contacts between the southern and the northern (eastern) parts bordering the Baltic Sea.

In 1969 Meinander (1969) published his important essay in which he introduced a new point of view on the Pre-Roman Iron Age in Finland by criticising the prevailing theory of the immigration of Finns in the beginning of the Roman Iron Age. For the first time he also presented Luukonsaari ceramics, a subgroup of Säräisniemi 2 pottery, and an Arctic ceramics group, also belonging to the Sär 2 group. Although Carpelan (1965) had already presented his licentiate dissertation introducing three geographical subgroups of Sär 2 pottery in 1965, Meinander only incidentally mentioned these subgroups in his essay.

In the 1910's Alfred Hackman had already observed that in southern Finland there existed ceramics, which had some similarity with Neolithic pottery, but which were found in the Early Iron Age context. Hackman called it Epineolithic ceramics, and dated it as belonging to the period from the Pre-Roman to the Roman Iron Age (Hackman 1912:60; 1917:61). Although not exactly defined, this type still lives in the jargon of Finnish archaeology today.

Morby ceramics is without doubt a subtype of the Epineolithic group. In addition to the Morby type Meinander described different types of Epineolithic pottery, which he called "Morby-liknande keramik" and "Epineolitisk keramik med grupper av små gropar" (Meinander 1969:45). The term Epineolithic ceramics remained also in use, because it proved easier to classify ceramics as "not-Neolithic" than to define more precisely its position among other Bronze Age or Early Metal Period types.

Meinander (1954b: 173–179) emphasised the role of Morby ceramics and even "Morby-liknande" ceramics (Meinander1969:40–47) as characteristic ceramic types of the Pre-Roman Iron Age in southern Finland. He proposed in the 1950's, following Äyräpää (1953:93), that Epineolithic Morby ceramics was the successor of Lausitz-influenced Bronze Age ceramics (Salo 1968:176). Carpelan has later continued these discussions by proposing that during the transition period from the Bronze Age to the Pre-Roman Iron Age pit decoration slowly disappeared at the expense of cat's paw ornamentation (Carpelan 1980:189).

Also Salo has discussed the role of Morby ceramics during the Pre-Roman Iron Age (Salo 1968:175–176), the parallels of which he sees in the "Steinhügel" in Muuksi, Virumaa (Vassar 1937:abb.17:4–5). As an example Salo takes up the material from Järnvik in Pohja (Salo 1968:176). In addition to Morby ceramics he separated three other ceramic types dating back to the Pre-Roman Iron Age and the Roman Iron Age (Salo 1968:67–178). These types are no longer used in Finnish archaeology.

Meinander suggested that there were four distinct populations with their ceramics in Finland during the Pre-Roman Iron Age. Morby ceramics was a successor of Western Bronze Age ceramics, and Kalmistonmäki ceramics (Fig. 2.5.) continued the tradition of Textile ceramics (Meinander 1969:67). From the material found in North Finland, he separated the Luukonsaari type and the Arctic type.

As early as the 1880's, in North Finland were found ceramics, which later proved to have a close relationship with Textile ceramics. In his report of the jurisdictional district of Kainuu O.A.F. Mustonen (1892) presented the first characterisation of ceramics found in Nimisjärvi (Fig. 2.6.) in Säräisniemi (nowadays Vaala). The rich and versatile material became known to archaeologists through Julius Ailio's dissertation "Die Steinzeitlichen Wohnplatzfunde in Finland I–II" (1909 II: 194–198). Ailio divided the ceramic material into two main types, between which there was a transitional type, "wermittelnde Gruppe", which he dated chronologically closer to the second than the first group (Ailio 1909:197). The second group was characterised by the context of broken casting moulds (Ailio 1909:198; 1913:15–17). "Die erste Gruppe", which is later called Säräisniemi 1 ceramics (Sär 1) dated to the Neolithic Period (Torvinen 2000). "Die zweite Gruppe", Sär 2 ceramics, was tempered with talc, muscovite and slate. Its ornamentation also significantly differed from the first group. The profiled rim and the flat base were new features. The surface is often smooth-faced (Ailio 1909:195–197). The transitional group was never adopted into the typological system of Finnish archaeology. Mica and greenstone or volcanic rocks refer to the one subtype of Sär 2 ceramics, nowadays separated as the North-Finnish or the Anttila group by Christian Carpelan (1965:215–217).

Äyräpää called Sär 2 ceramics "den bästa keramik, som vi tillsvidare ha från förhistorisk tid i Finland" (Äyräpää 1953:80). When discussing its origin he referred to the contacts with the White Sea, Pechora, Kama, Ural and Andronovo ceramics. Äyräpää spoke about "talkkeramik" and assumed that because talc and soapstone played a central role in Sär 2 ceramics, it probably was of eastern origin (Äyräpää 1953:80).

Carpelan has suggested – as one possibility – that there would exist a particular variant of Textile ceramics in Kainuu, which differs from "proper" Sarsa-Tomitsa ceramics on the grounds of its temper: crushed stone was replaced by asbestos and talc (Carpelan 1992). Carpelan has also paid attention to the way asbestos has been utilised in this ceramics. The fibrous qualities of asbestos have not been used in the accepted way, because asbestos occurs in paste as blunt aggregates. The phenomenon has a parallel with the use of asbestos in the Ka II 2. Kainuu ceramics has never been presented in publications or typologically defined. By using statistical multivariable analysis the author has separated from the Textile ceramics in Kainuu a type, which comes close to this one (Lavento 1997b:167–175).

Gutrom Gjessing (1942:275–276) first recognized Imitated Textile Pottery in Finnmark, Norway, but it was Carpelan (1970), who first separated IT ceramics from the Finnish material from Kemijärvi. He stated that the distribution area of the type covered northern Norway, Norrland, northern Finland (Fig. 2.7.) and the Kola Peninsula (Carpelan 1970:32–33). In the 1970's he



Fig. 2.6. Sillankorva in the dwelling site complex of Nimisjärvi in Vaala. A view towards Nimisjärvi from the contemporary Vuolijoki–Vaala -road to the northwest. Photo: Mika Lavento.

proposed its original provenience area to reach as far as the Trans-Ural region, around the River Lena, Siberia (Carpelan 1975a:9; 1982b:45–46). This hypothesis emerged from the comparison of the Finnish and the Siberian material (Okladnikov 1950; 1955). He also connected the emergence of IT ceramics and the "arrival" of the Saami population in the later phase of the Early Metal Period. This hypothesis has received much criticism (Kosmenko 1993a:85–86). During the 1980's Carpelan seems to have deserted this hypothesis because of the lack of intermediary finds between Scandinavia and Siberia. Instead, he proposed connections between IT ceramics and Risvik ceramics in Norway (Carpelan 1994:35).

It is essential to note that IT ceramics has probably no connection with proper Textile ceramics (Jørgensen & Olsen 1987:32–33; Forsberg 1996:171), but the innovation emerged independently from eastern Textile ceramics in the coastal zone in Norway. IT ceramics has no ornamentation other than its characteristic "waffle-like" surface-impression. Opposite views of the cultural position of IT ceramics have also been presented. In the Karelian Republic it has been considered to be a local subgroup of Net pottery (Kosmenko 1993a:85–86). Kosmenko explained the non-profiled and undecorated vessels with "waffle"-figures due to local factors caused by the periphery of the area (Kosmenko 1996a:214). He

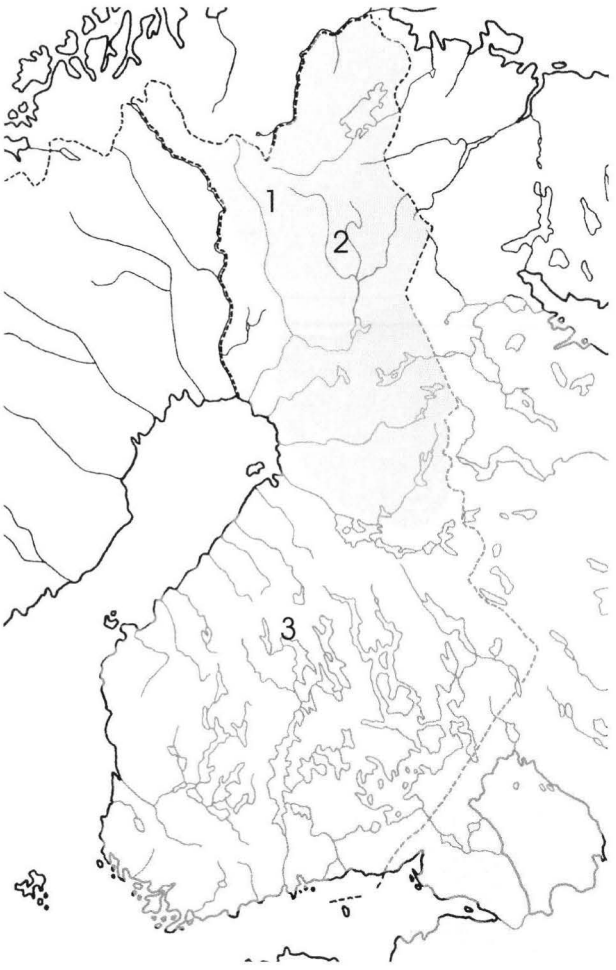

Fig 2.7. Main distribution areas of Lovozero (1), IT (2), and Textile (3) ceramics in Finland and the Karelian Isthmus.

also mentioned that the same kind of "waffle"-figures exist in Karelian Net pottery (Anpilogov 1982: fig. 4).

In the beginning of the1990's more IT ceramics has been found in extensive surveys in Rahajärvi in Inari by Aki Arponen (1992; 1994). Referring to the chronological discrepancy between the Textile ceramics in northern Norway (1880–1100 calBC) and IT ceramics (1450–500 calBC) Arponen finds it likely that they represent different ceramic types, although he also leaves the opposite possibility open to further study (Arponen 1992:13).

Although unpublished, Christian Carpelan's licentiate work (1965) has changed the picture of Early Metal Period pottery more than any other ceramic study in Finland. Carpelan divided Early Metal Period pottery in eastern and northern Finland into three subgroups: the South-Finnish, the North-Finnish and the Arctic group (Carpelan 1965:215–217). This division was made on the basis of technological observations, ornamentation and shape. The South-Finnish group was later introduced in Meinander's (1969:57–63) Dåvits-article as the Luukonsaari group. Meinander's Arctic group (Meinander 1969:63) had also a clear connection with Carpelan's groups, although he seems to unite both the North-Finnish and the Arctic groups into the Arctic group. Later Carpelan himself began to call the North-Finnish group the Anttila group and the Arctic group the Kjelmøy group (Carpelan 1994:34–35). Anttila ceramics is mostly talc, soapstone or mica tempered and the clay paste is quite massive and dense without porosity. The relatively thick rim part is often clearly profiled. Ailio's characterization of Sär 2 (Ailio 1909 II:195–197) ceramics correlates best with the Anttila type, which is most numerous in the Nimisjärvi material. Kjelmøy ceramics is common in the Finnish Lapland, but in Kainuu, for instance, it is quite rare (Lavento 1997b:185).

One important result of the excavation Carpelan (1975e) carried out on the small island of Sirnihta, in Kesälahti, southern Saimaa, was that from the find material he defined one more new subgroup of Sär 2 ceramics, which he called the Sirnihta group (Fig. 2.8.). In particular the vessel form and tempering connected it with the Sär 2 family. Sirnihta ceramics usually has thin walls and fine asbestos fibres temper its paste. One special feature of the ornamentation is low relief lines, or embossed lines, which occur very seldom in other Early Metal Period ceramics in Finland. Ornamentation, which has been carried out only on the upper part of the vessel, imply drawn juxtaposing and crossing lines (Carpelan 1992) – a feature which is typologically close to Kjelmøy ceramics.

In northern Scandinavia and the Kola Peninsula there exists one more Late Neolithic and Early Metal Period ceramic type, Lovozero ceramics. Carpelan has named the type Lovozero ceramics after the large dwelling site close to a Saami village in the middle of the Kola Peninsula. In this type paste is asbestos tempered. The ceramics can be recognized on the basis of its lightness and relatively scant asbestos or mica temper. Characteristic ornamentation details are thin crossing lines, which

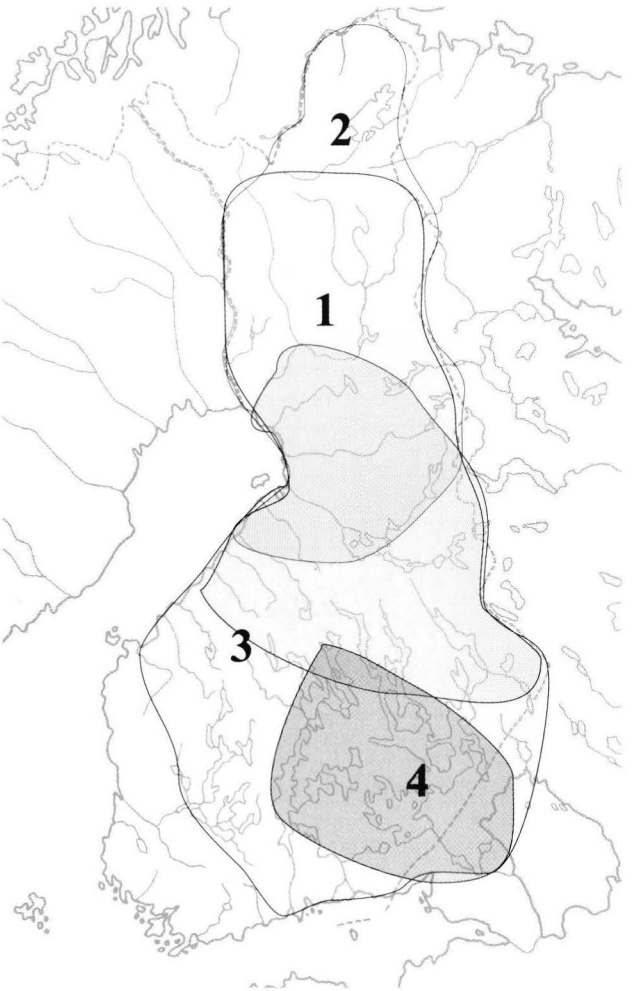

Fig 2.8. Main distribution areas of the subtypes of Sär 2 ceramics in Finland and on the Karelian Isthmus. Legend: 1 – Anttila, 2 – Kjelmøy, 3 – Luukonsaari, 4 – Sirnihta.

form net-patterns (Carpelan 1975c:table 19). Also, a peculiar kind of hatching, which covers large parts of the vessel surface belong to its distinctive signs (Carpelan, pers. comm. 18.12.1996). Like subgroups of Sär 2 ceramics Lovozero ceramics has also been mentioned only briefly in some articles so far (Rankama 1986:28, 39, fig. 18; Jørgensen & Olsen 1987:14–15, 30–31; Carpelan 1994:34–36). Lovozero ceramics has recently been found on several dwelling sites along the Kemijoki water system (Kotivuori 1996:105) and in northern Lapland, and sporadically also in Kainuu (Lavento 1992:30–31, fig. 7) and on the Karelian Isthmus (Uino 1997:395). Lovozero ceramics can be connected in Finland with the spread of straight-based quartzite points – a phenomenon dating back to the Late Neolithic or to the beginning of the Early Metal Period. Essential, however, is that it occurs in some sites in northern Finland together with other Early Metal Period ceramic types.

2.4. Textile ceramics in Sweden and Norway

Although it might be natural to connect the Textile ceramics found in northern Norway and northern Sweden with the Textile ceramics found in Finland, the matter is more complicated. One assumption of this study is that it might be possible to draw the border of Finnish Textile ceramics along the River Kemijoki. The textile-impressed ceramics found on the northern side of this line is either IT ceramics or Textile ceramics of northern Norway and Norrland (Jørgensen & Olsen 1987:15–16).

Povl Simonsen (1961:462), who excavated some textile-impressed sherds in Finnmark assumed that these sherds represented the influence, which spread into northern Scandinavia from the "culture of Textile ceramics" in central and northern Russia. This influence merged into Asbestos ceramics and the result was textile-impressed asbestos ceramics (Simonsen 1982:520).

These northern Norwegian and Swedish Textile ceramics have recently been discussed in articles by Roger Jørgensen and Bjørnar Olsen (1987:15–16; 1988:17–18). According to them this type is known in a large area from Kirkenäs to Mosjöen in northern Norway. Norwegian Textile ceramics has no decoration, and textile-impression is the most important feature in its identification. Paste is always tempered with asbestos and the rim is not profiled. Jørgensen and Olsen have assumed that Finnish and Norwegian Textile ceramics do not represent the same tradition (Jørgensen & Olsen 1987:32–33). Textile-impression seems to have developed in northern Norway and northern Sweden independently from the Textile ceramics in Finland and a large part of Russia.

IT ceramics have also been found in Finnmark. IT ceramics and Textile ceramics are only partly synchronous (Arponen 1992:13), but in northern Norway they occur in the same geographical areas. In some cases the rhomb-form net-figures of IT ceramics have also been found in sherds, which morphologically belong to Textile ceramics. Jørgensen and Olsen present that

> "Det forhold at begge disse uttrykksformene opptrer samtidig og på keramikk fra tildels samme boplasser i Nord Norge, kan tyde på at vi har å gjøre med to distinkte dekorformer og at benevnelsen "imitert" textilkeramikk gir feile assosiasjoner (sml. Huurre 1986[b]:56)." (Jørgensen & Olsen 1988:33).

At the moment it is difficult to say what the cultural-historical relation is between northern Textile ceramics and IT ceramics. It is perhaps easier to make the distinction between the northern types and Finnish Textile ceramics, but the question has to be left still open.

The most numerous type among the asbestos tempered ceramics in Finnmark is Kjelmøy ceramics, which is connected with Sär 2 ceramics in Finland (Carpelan 1979:17) and with the Norrland Asbestos Ware in Sweden. Thin lines and comb stamps belong to the decoration of Kjelmøy ceramics. Lovozero ceramics, Pasvik ceramics, Risvik ceramics and shell and mica tempered ceramics have also been described and dated in Finnmark (Jørgensen & Olsen 1988). However, discussing the nature and cultural connection of these types goes beyond the scope of this study.

Local Textile ceramics has been found more in Finnmark than in Norrland, northern Sweden. In the beginning of the 1920's textile-impressed vessels had already been found in Ångermanland (Santesson 1924:173). The amount of Textile ceramics in Norrland is small, and it has not been clearly separated as an independent ceramic group. It has usually been included in the "norrländsk asbestkeramik" (Linder 1966:145–149) or "Asbestos Pottery" (Hulthén 1991:13–15), which is particularly characterised by asbestos temper. The best-known ceramic vessels from the Early Metal Period in Norrland are the Kultsjö-jar and the Laisan-jar, which have been ^{14}C-dated to the end of the Early Bronze Age (Linder 1966:144, 148)[10]. There is no textile-impression in the Laisan-jar.

Birgitta Hulthén has used the amount of temper as the criterion to classify Asbestos ceramics in Norrland. She distinguishes two types: Asbestos Pottery and Asbestos Ware. A ceramic sherd belongs to Asbestos Ware, which in a technical sense is not pottery, if it contains ca. 90 %, or more asbestos fibres, and ca. 10 % clay (Hulthén 1991:32–33). In Asbestos Pottery the amount of asbestos varies between 50–60 % of the total weight. The chronology of these types is of some interest when discussing the relationship of this asbestos tempered ceramics with different types of Early Metal Period pottery. According to Hulthén Asbestos Pottery dates between 1800–500 BC, and Asbestos Ware was in use during the Pre-Roman Iron Age, between 500–0 BC. Hulthén also assumes that the latter ceramics has been used first of all for reducing iron (Hulthén 1991:34–37). However, this hypothesis has been much criticised.

Swedish archaeologists have separated one more ceramic type from the Late Neolithic and Early Metal Period material. This Hair-tempered pottery may also have textile or imitated textile-impression on its surface (Hulthén 1991:28–32). Hair-tempered Textile ceramics have been found, for instance, in Bjurselet in the parish of Byske, Norrland (Sandén 1995:174). Asbestos Pottery and Asbestos Ware have been found in several dwelling sites in Norrland (Hedman 1993:162–166; Sandén 1995:178). Ornamentation, shape of the rim and soot on the surface of Asbestos Ware are the features connecting it with Kjelmøy ceramics. It is of special interest, that the vessel found in Kakel near Lake Hornavan in Arjeplog parish (Hedman 1993:fig. 8), has on its inner surface the same kind of embossed lines as in Sirnihta ceramics (comp. Lavento & Hornytzkyj 1996:fig. 5).

It must be emphasised that the Textile ceramics in Norrland (or textile-impressed ceramics) differs essentially from the Finnish and the Russian types. As Lars Forsberg has pointed out, it belongs to the group of Asbestos ceramics (Forsberg 1996:171), and the existence

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[10] The datings of "Laisan-jar" are St-1356, 3170±160 and St-1808, 3025±80 (Linder 1966:148).

of textile-impression has probably nothing to do with Finnish and Russian Textile ceramics. Vessels, which have textile-impression, should not automatically be connected with Textile ceramics (Forsberg 1996:171).

In Central Sweden there are some ceramic finds which seem to have something to do with Finnish Textile ceramics. Meinander (1969:47) still pointed out that asbestos tempered ceramic sherds with the same kind of fishbone ornament as on some sherds at Hautvuori in Laitila (Meinander 1969:47) were found (see Ambrosiani 1959, fig. 9e) in Darsgärde.

In Central Sweden there are some Bronze Age sites, where textile-impressed vessels with striated surfaces have also been found. This kind of ceramics, resembling Asvan pottery, has been found in Västertorp at Rimbo and Ekilla, to the west of Darsgärde (Jaanusson 1981:123). On the northern bank of Lake Mälar textile-impressed pottery was found at Enköping in Skälby. Jaanusson (1981:123) and the excavator of the site, B. Schönbäck (1959:100), have interpreted this as an eastern influence. The best-known textile-impressed ceramics in Sweden comes perhaps from Hallunda (Jaanusson 1981:123). Jaanusson ends her dissertation by stating, "in central Sweden contacts with the Asva pottery culture were fairly widespread, in part probably via Asva settlements, such as Darsgärde, in Roslagen" (Jaanusson 1981:123). She assumes that the contacts have also worked the other way round. In addition to this, contacts may also have taken place between Central Sweden and Finland.

According to Jaanusson two different ceramic provinces, the eastern and the western, can be discerned during the Late Bronze Age in the eastern and in the northern regions of the Baltic Sea. On the northern side of these provinces lies the distribution area of Asbestos tempered pottery (Jaanusson 1981:129). It can be pointed out that these provinces give a rough idea of the Late Bronze Age ceramics in the area. At present it is enough to bear in mind that this Late Bronze Age ceramics is divided into six groups in Finland and taking Ahvenanmaa into consideration, there exists seven groups of Bronze Age ceramics in the area. The division into the eastern and the western groups can also be made in Textile ceramics; a division, which is still not the same as Jaanusson's.

Jaanusson has noted a close relationship between Sarsa-Tomitsa ceramics and Dyakovo ceramics: Asva ceramics, Dyakovo ceramics and Sarsa-Tomitsa ceramics belong to the complex, where the connecting factor is the Finno-Ugrian ethnic relationship (Jaanusson 1981:122).

An important, exceptional area is the Ahvenanmaa Archipelago. Some kind of local centre for Rusticated pottery seems to have been in Ahvenanmaa. Much of the ceramics with finger streak decoration has been found in Kökar. This ceramics has been called Otterböte ceramics after the place where it was found (Dreijer 1947:10–19; Meinander 1954b:133–135). The shape of these vessels resembles a barrel. They have a flat bottom and their decoration is scant and coarse. A small number of the vessels found in the site has textile-impression (Gustavsson 1997:67–69).

2.5. Textile ceramics in Estonia, Latvia and Lithuania

As in southern Finland and Sweden Corded Ware characterises the Late Neolithic Period of the Baltic countries together with Late Combed Ware. Archaeologists have traditionally thought that Late Combed Ware represents the aboriginal population, Corded Ware being a sign of migration of a new population into the Baltic countries. New ideas (Lang 1998) have recently been presented concerning the nature and provenience of Corded Ware in the Baltic countries.

The aim of the following presentation is to elucidate the origin of Textile ceramics and in particular its relationship with Late Neolithic organic tempered Combed Ware and Corded Ware in the Baltic countries. As the question concerning the Early Textile ceramics has been thoroughly discussed in other connections (Lavento 2000), only a short overview will be presented here.

Early Textile ceramics and Late Combed Ware occur together on many dwelling sites in the same layers, which refers to their partly synchronous dating. Early Textile ceramics seems to follow straightforwardly the Late Combed Ware in Estonia. Using the material found in the dwelling sites of Akali and Kullamägi by the River Emajogi, Lembit Jaanits separated two chronological phases in the Estonian Corded Ware (Jaanits 1959:300). He dated the earlier phase in Akali to ca. 1800 BC. Soon after this, between the 17th and 16th centuries BC, there also appeared textile-impressed sherds (Jaanits 1959:300). Typologically Late Corded Ware comes close to Trzciniec ceramics, which evolved in Poland from Corded Ware around the middle of the 2nd millennium BC (Sulimirski 1970:160). Äyräpää's "Rillenkeramik" perhaps originally belongs to the same horizon. The finds from the cemetery at Kivisaari (Moora 1935:255) dated the later Corded Ware to between the 13th and 12th centuries BC (Jaanits 1959:300).

During the Middle Bronze Age or at the latest during the second half of the 2nd millennium BC a ceramic type called Villa ceramics developed (Lõugas & Selirand 1977:377). This ceramics has much in common with Kiukainen ceramics and is synchronous with it (Lang 1991:48–49). The Villa type has not been studied much: it has not even been defined in publications, but Vello Lõugas has connected it typologically with Corded Ware.

Jaanusson (1985:46) points out that Late Corded Ware occurs in association with textile-impressed and striated ware in Akali and Kullamägi. She further states that the largest sample of this ceramic type is at the dwelling site of Villa, close to Võru (Fig. 2.9.). She considers the decorative motives "to a large extent the same as in the Kiukais pottery" (Jaanusson 1985:46). Jaanits (1976,

pl 1:7–10) and Lõugas and Selirand (1977:328) have also mentioned this possibility.

The second ceramics group of the Early Bronze Age in Estonia is Coarse Ware (jämekeraamika) (Lang 1991:49), which has some points in common with Kiukainen ceramics. In Jaanusson's classification it belongs to the western group, whereas Textile ceramics belongs to the eastern group. Coarse Ware with an S-formed rim part may have been developed from the Late Corded Ware (Jaanits 1959:170–171; Lang 1991:49).

Jaanits has dated the emergence of Textile ceramics in Estonia as early as the 17th–16th centuries BC (Jaanits 1959:301) or at the latest into the second half of the 2nd millennium BC (Jaanits *et al.* 1982:118). New information suggests the earlier dating. In Riigiküla XIV close to the River Narva estuary, Late Neolithic Combed Ware represents the earliest ceramics at the site. A large amount of Corded Ware was also found together with some sherds of textile-impressed ceramics (Kriiska 1995; 1996a; 1996b; 1998). According to Kriiska (2000:66) textile-impressed and organic tempered sherds can be connected with the Corded Ware.

In the dwelling site of Lemmitsa I, close to Pärnu, Late Neolithic Combed Ware, Corded Ware and Textile ceramics have been found together. All of the ceramics are organic tempered. According to Kriiska (1997) the connection between Corded Ware and Textile ceramics is also evident here. Kriiska has roughly dated the ceramics to between 2500–1500 BC. At the dwelling site of Altküla by the River Pärnu (Lõugas 1992:65) Textile ceramics is probably younger, dating to the 1st millennium BC.

Early Textile ceramics has an evident connection with both Late Neolithic Combed Ware and Corded Ware (Lõugas 1970:164–165). This is a phenomenon, which can be observed not only in the Baltic countries but also in southwestern Russia. Early Textile ceramics is always organic tempered and it clearly differs from the Late Textile ceramics of the area.

There were also textile-impressed ceramics in Central Europe (Gaerte 1927:88; Rosenberg 1931:40), synchronous with Fatyanovo ceramics (Tretyakov 1941:16). According to Rikhard Indreko (1961) textile-impression spread into Late Neolithic/Early Metal Period Estonia from Central Europe, although some common characteristics with the textile-impressed ceramics existed also in the east. This hypothesis has much in common with Äyräpää's, Carpelan's and even Meinander's suggestions of the origin of textile-impression in the Kiukainen culture and the Early Textile ceramics in Finland.

"Die Finnische Textilkeramik mit der Kiukaiskeramik in Verbindung setzend, verlegt Meinander die Anfänge der Textilkeramik in einen der Zeit un 1200 v.Chr. nahestehenden Abscnitt...In Estland ist die Rillenkeramik bekannt. Äyräpää verbindet diese Keramik mit der ost- und mitteleuropäischen Trzcinieckultur[11]. Eine solche Keramik hat man in der oberen bronzezeitlichen Schicht der neolitischen Siedlung von Konsa-Akali am Peipsisee (Peipussee) angetroffen, wo es auch frühere Textilkeramik gibt. Sie kommt in Finnland zusammen mit der Textilkeramik in der Siedlung von Sarsa vor[12], fehlt aber in der Djakovokultur. Am Flusse Emajögi (Embach) am Peipsisee in Estland gibt es in der bronzezeitlichen Schicht der neolitischen Siedlung von Kullamäe Textilkeramik in der Gestalt von kugelförmigen Tongefäßen, die ihre Form und Textilabdrücke wohl von der Fatjanovokultur erhalten haben. Diese Elemente in den genannten Siedlungen erscheinen früh und können in den Übergang von der ersten in die zweite Hälfte der Bronzezeit gehören. Ihnen folgt dann aber die Asvakultur."(Indeko 1961:419.)

The younger Bronze Age in Estonia is characterised by Textile ceramics, which had its roots in the large area in the Northern Coniferous Zone (Jaanits 1959:148–150; Lang 1991:49–50). Indreko shortly discussed these connections together with the ceramic material from the Asva hillfort. He still also assumed that already Kiukainen ceramics had a cultural connection with Finnish Textile ceramics (Indreko 1961:419).

Based on the material found at the Asva hillfort, Indreko (1939; 1961) separated new ceramics and a culture, which he called the Asva culture. He did not see parallels with the Asva culture and the Gorodische or the Dyakovo cultures, which means that he did not considered the Asva culture as a derivative of them (Indreko 1961:420). Asva is an independent culture group which emerged from the Kunda culture and "aus sogenannter Kiukaiskultur in Estland" (Indreko 1961:420). Indreko saw the origin of the Textile ceramics of Asva in the local cultures of Estonia, not in the influence of eastern Textile ceramics. Although Kiukainen ceramics and some other Late Neolithic ceramics in Estonia have many points in common – like textile-impression – Estonian archaeologists have not separated Kiukainen ceramics in the material so far.

According to Lõugas two settlement periods existed at the Asva hillfort. The older period dates to between the 8th and the 7th century BC and the younger period between the 7th and the 6th century BC or even to the second half of the 1st millennium BC (Lõugas 1967:91–92; Selirand & Tönisson 1984:54). Following Indreko (1961) Jaanusson used the term Asva ceramics for the pottery with a grass-impressed surface, the decoration of which is "formed by one or several horizontal rows of circular pits" (Jaanusson 1981:122). The distribution area of this type lies in southwestern Finland, Estonia and northern Latvia (Jaanusson 1981:122).

Two other Bronze Age ceramic types must be mentioned when discussing the cultural relationships during the younger Bronze Age around the Baltic Sea. These types are Lusitanian (Lausitz) ceramics and Nordic ceramics, which were developed under the southern influences in Mälardalen (Jaanusson 1981:121; Lang 1991:50). For Jaanusson both of these represent the western tradition, whereas Textile ceramics and Asva ceramics represent the eastern tradition. Following Jaanusson (1988:173) Valter Lang has suggested the name "Tapiola ceramics" for the Textile ceramics found in Central Finland and Estonia (Lang 1991:49–50).

[11] A. Äyräpää, SMYA-FFT. 52, 1951, Nr. 1, 91.

[12] C. F. Meinander, SMYA-FFT, 54, 1954b.

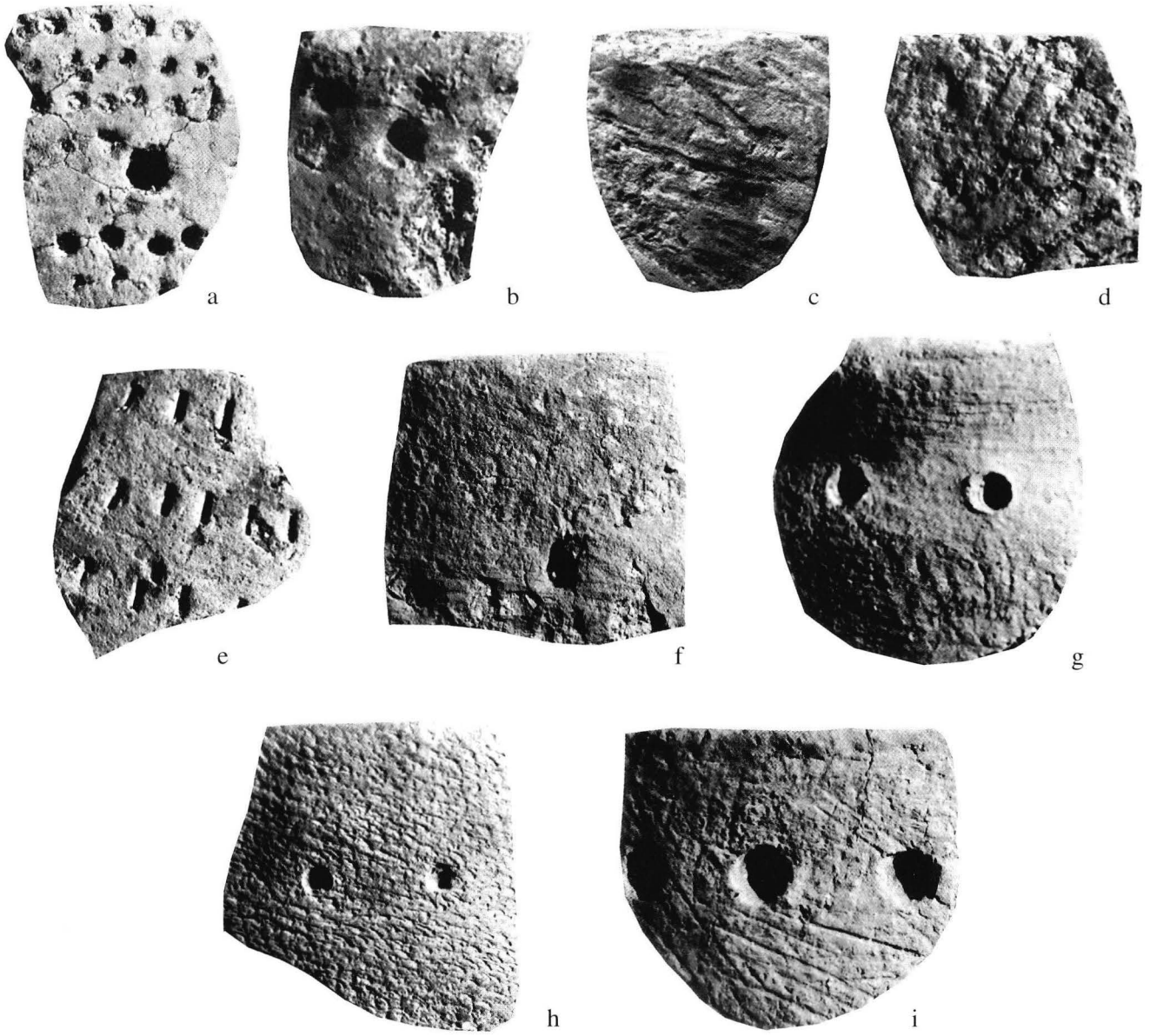

Fig. 2.9. Villa (4037) and Asva (3658) ceramics from the dwelling sites of Villa (a–e) and Asva (f–i) in Estonia. Scale 1:1. Photo: Mika Lavento.

The Late Textile ceramics has been found at the Asva and Iru hillforts in particular. This ceramics has been ornamented with horizontal zigzag comb stamps, but it can also be unornamented, textile-impression being the only decoration. Lang has divided the Bronze Age ceramic material from the Iru hillfort into two main groups (A: peenkeraamika and B: jämekeraamika). The habitation at the hillfort began between 800–600/500 calBC (Lang 1996 1.köide: 51; 73–93) and continued into the historical period. Of particular interest is the coarse textile-impressed ceramics, which was already in use during the Early Bronze Age (Lang 1996:89, Tahvel III–VI), and it continued perhaps until the Early Iron Age. Meinander saw common features between the early ceramics of Iru and Finnish Epineolithic ceramics – even more than with Asva ceramics, which he considered monotonous in comparison with Finnish Epineolithic ceramics (Meinander 1969:49).

Meinander has emphasised the common features between Finnish Morby and Asva ceramics. He also called the Kalmistonmäki group the Kalmistonmäki-Böle-Morby "chronological horizon" (1954b:195). For Meinander the parallel finds in Estonia and Finland were important indications showing continuity during the Pre-Roman Iron Age. Meinander has also connected Asva ceramics with the Late Bronze Age Ceramics in Scandinavia and Central Europe (Meinander 1969:49).

Late Textile ceramics has not been studied much in Estonia. Harri Moora connected the Asva, the Sarsa-Tomitsa and the Dyakovo cultures together and considered their makers Finno-Ugrians (Moora 1956; 1958). Lõugas (1970) wrote his unpublished dissertation on the Early Metal Age in Estonia and its different ceramic types. Further, Silvia Laul studied textile-impression in order to find remains of cloth on ceramics (Laul 1966). She later continued her studies and made a distribution

map of Textile ceramics in Estonia (Laul 1997, Joonis 1). Moora assumed that the connections spread into a large area, not only in southwestern and southern Finland, but also to the shores of the Lakes Ladoga and Onega (Moora 1958:33–35; Gurina 1953a:65–67).

Laul's studies have concentrated on the younger phase of Textile ceramics in Estonia. She has studied Textile ceramics found in the cemeteries of Kääbä and Sobka types, whose period of use began about the middle of the 1st millennium BC. Opposite to Indreko, Laul sees close contacts with the late Dyakovo and Asva cultures. This Textile ceramics differs in many ways from the Early Bronze Age type, but only few studies have so far been conducted on it. The latest dates for the sherds of the Late Textile pottery together with scratched pottery from Kääba, brings its use into the 4th–5th centuries AD (Jaanusson 1981:122; Laul 1997:581).

Harri Moora (1967:295–296) suggested that the use of textile-impression and hatching ceased in northern Estonia during the 5th and the 6th centuries AD. Valter Lang (1996:40–46; 2000:passim) discerned Late Textile ceramics and textile-impressed ceramics from cemeteries and dwelling sites dating to the period from the Late Bronze Age to the Early Iron Age in northwestern and northern Estonia. This ceramics implies not only textile-impression but hatching as well.

In Latvia also Early Textile ceramics is found on Late Neolithic dwelling sites. Late Neolithic organic tempered ceramics, which has many common elements with the textile-impressed ceramics of the Aboras type, also exists on those sites. The common characteristics can be found in organic temper, vessel form and decoration. Loze (1979:81) assumed that the same population was responsible for both ceramic types.

The ceramics of the Sārnate type also belongs to the heterogeneous group of the Late Neolithic organic tempered Ware found in Latvia (Vankina 1970). This ceramics has a hatched surface and its scant ornamentation involves comb stamps and small pits. Vessels are profiled (Vankina 1970:114–116). Of special interest is that the dating of this type is fixed to as early as the middle or the second half of the 3rd millennium BC (Vankina 1970:140). Besides hatched surfaces there exist also a small number of textile-impressed sherds (Vankina 1970, Tab. LXXIX) referring to a possible connection between Late Neolithic organic tempered Ware (here Sārnate ceramics) and Early Textile ceramics. Carbon-14 datings are from the beginning of the 2nd millennium BC. During the 2nd millennium BC Late Neolithic organic tempered Textile ceramics were replaced by Late Textile ceramics, which differs from the earlier type in its temper and scantier ornamentation (Loze 1979:121–122).

On stratigraphical grounds Loze considered Corded Ware to be earlier than ceramics of the Luban type. Chronological reasons do not oppose the hypothesis that the origin of Textile ceramics could be found in Corded Ware. The ornamentation of Luban ceramics and Textile ceramics is very similar. These types are partly synchronous and support the hypothesis that Late Textile ceramics has developed from the influence of Luban ceramics. (Loze 1979:120.)

Janis Graudonis suggests that Textile ceramics is a descendant of Corded Ware, and that Baltic Bronze Age populations are derived from the process, where Corded Ware populations and aboriginal people were in very close contact. According to Graudonis (1997:37–38) hatched pottery did not emerge in Latvia until the middle of the 2nd millennium BC. Sites with Early Textile ceramics in Latvia are Lagaža, Aboras, Ein, Leimaniški and Kreizsi and Sārnate.

According to A. V. Vasks (1991) Textile ceramics has been mostly found in northeastern Latvia. The vessel form of Latvian Textile ceramics varies considerably. There are both clearly and lightly profiled, but also unprofiled vessels (Loze 1979:88–92.) The elements and motifs of ornamentation are simple, and the decoration is almost always restricted to the upper part of the vessel. Small pits and comb stamps are the most typical elements, but also drawn lines with zigzags or crossing lines have been used together with different kinds of simple stamps. A.V. Vasks has dated the period of Textile and hatched ceramics between the fourth quarter of the 2nd millennium BC and the middle of the 1st millennium AD (Vasks 1991:189). According to Vasks, Textile ceramics is a relatively late phenomenon. Loze's and Vankina's datings for Early Textile ceramics are therefore of more interest for understanding the origin of the type, although Vask's contemporary dates represent updated information.

In Lithuania, textile-impressed and hatched ceramics have also been found from some Early Bronze Age dwelling sites (Jablonskyte- Rimantinė 1959; Daugodis 1966). Textile-impressed pottery has not been found in the Late Bronze Age dwelling sites of the area and hatched sherds are also infrequent (Rimantinė 1960:126–127). Early organic tempered Textile pottery is not known in Lithuania either, and the use of Textile ceramics does not seem to begin there until the second half of the 2nd millennium BC (Rimantinė 1962:330; Daugodis 1966:39). This ceramics may represent the later phase of the development of the type where organic temper has already been replaced by crushed sand or mineral particles.

The dwelling site of Eiguliai DI is relatively early in relation to the development of Textile ceramics in Lithuania. The later phase (Daugodis 1966:39) is connected with the appearance of gorodiches. The gorodischse of Aukštadvaris is situated about 60 km west of the city of Vilna and it can be dated to the first half of the 1st millennium BC (Daugodis 1966:39).

Ceramics, which come typologically close to Textile ceramics, have also been found in Poland, in the dwelling site of Jeziorku (Antoniewicz & Okulicz 1958:29). Daugodis has linked this phenomenon with the distribution of Finno-Ugric people during the first centuries AD (Daugodis 1966:40), during the late period of the Dyakovo culture. In general, hatched ceramics seems to be much more typical than the textile-impressed ones in the Bronze Age finds in Lithuania (Rimantinė 1960:126–

127). It seems that there are no early textile-impressed ceramics in Lithuania, but the ceramics have a hatched surface (Rimantinė 2000:205–206).

2.6. Textile ceramics in Russia

From the Russian frame of reference Finnish Textile ceramics represents only a periphery in the distribution of Textile ceramics (Kosmenko 1996d:51–53). The distribution area of the type extends from the lower course of the River Kama, over 200 km to the northeast of the city of Kazan, with concentrations in the Middle and Upper Volga to the Karelian Republic and Finland (Kosmenko 1996a, fig. 44 p. 186; Patrushev 1992a, fig. 1, p. 44).

When speaking about Textile ceramics Russian archaeologists have applied the term "Setsataja keramika", "Net pottery", referring to the regular impression on the surface of the vessels (Bryusov 1950:287). The term is neutral and it does not make a stand to the manner in which an impression has been made (Kosmenko 1991a:156–157). Other terms (Kosmenko 1993a:24) have also been used (Fig. 2.2.). Even more specific terms, such as "ниточная", "псевдотекстилная" and "крапчатая" (Patrushev 1989:23–25), have also been applied. These main types have been divided into even more detailed subgroups (Chernaj 1981:71–76; Patrushev 1989:23–25).

V. A. Gorodtsov (1900) already observed net-impressed pottery in the beginning of the 1900's, and he also divided impressions into two main groups. Gorodtsov conducted his studies not only in European Russia (Gorodtsov 1914), but also by the River Amur in Siberia (Gorodtsov 1936). After Gorodtsov, investigations have been made by different archaeologists in different Research Centres. The most important studies are: in Karelia, Petrozavodsk: A. Ja. Bryusov (1940; 1950), N. N. Gurina (1961; 1963), G. A. Pankrushev (1980) and M. G. Kosmenko (1980; 1982b; 1992; 1993a; 1996a; 1996d), in Moscow: O. D. Bader (1966), A. A. Bobrinskij (1978), P. N. Tretyakov (1966b), V. P. Tretyakov (1975a; 1980), C. A. Cemenov (1982), I. I. Chernaj (1981), I. G. Rozenfeldt (1974), S. V. Oshybkina (1987), K. V. Voronin (1996; 1998), L. S. Andrianova & M. V. Ivanicheva (1996) and in the Middle Volga: A. L. Nikitin (1976), V. S. Patrushev (1989; 1990; 1992a), L. D. Superzhitskij and B. A. Folomeev (1993), and A. V. Zbrueva (1928).

Textile-impressed ceramics are also found in large areas in Siberia, around Lake Baikal and the River Lena in the context of the cemeteries and dwelling sites of the Isakov type (Okladnikov 1950:166–169) and the cemetery of Fofanovo (Okladnikov 1955:198–200). A. P. Okladnikov (1950:166, 169) dated them to the earlier part of the developed (развитои) Neolithic Period. Scant ornamentation comprises small pits in horizontal rows just below the rim. Textile-impression can be lightly or deeply impressed and in some cases it resembles the Imitated Textile ceramics in northern Fennoscandia. It is important to note that these ceramics probably have no cultural connection with the Textile ceramics of European Russia.[13] Kosmenko (pers. comm. 17.7.1996) has suggested an approximate dating of 4000–2000 BC for these ceramics.

The Final Neolithic or "Eneolit" Period, which ended at the beginning of the 2nd millennium BC, was characterised in northern Russia by the Volosovo (Krajnov 1987a), the Garino-Bor and the Jurtinsk cultures. The Early Bronze Age began in the Middle Volga with the appearance of the Fatyanovo and the Balanovo cultures. The Seima-Turbino phenomenon had influence not only along the River Kama but also in the whole large area of the Northern Coniferous Zone of Russia (Chernykh & Kuzminyh 1987:100–105; 1989; Chernykh 1992:215–234).

The large distribution area of the Volosovo culture covers the area from the Upper Volga to the River Kama. The Protovolosovo ceramics already came into use by about 5000 BP (Krajnov 1987a:13). During this phase it was closely related with Pit-Combed Ware and the other Neolithic ceramic types in the Upper Volga. Krajnov interprets this as an assimilation process (Krajnov 1981:19–20). Bader sees its origin, not in Combed Ware, but in the Garino-Bor ceramics. Organic temper, the "wolfstooth" motif and stamp ornament on the rim (рамчатый) are its most characteristic features (Bader 1958:14). Organic temper makes the late Volosovo ceramics porous and fragile. An interesting feature of the late Volosovo ceramics is the appearance of T- or Г-formed rims (Krajnov 1987a:15). Volosovo culture has been divided into four chronological phases, the latest of which has been dated to the first quarter of the 2nd millennium BC.

Volosovo ceramics has an important position in the Late Neolithic Period in northern Russia, and its influence has been assumed to have spread as far as Finland. Organic temper, porosity of vessels and some characteristic motifs in ornamentation are the connecting factors between separate cultures in the large territory during the Eneolithic Period (Chalikov 1986). However, some researchers have assumed that the porosity – for instance in Volosovo ceramics and Finnish Pyheensilta ceramics – is not a cultural but a random phenomenon (Vikkula 1987:165). One should not put too much emphasis on the organic temper of Volosovo ceramics as a cultural link, because the porosity in Pyheensilta ceramics is often caused by dissolved limestone, not organic temper.

Meinander (1984a) paid much attention to the common features between Pyheensilta and Volosovo ceramics. Chalikov emphasised the affinity between Late Neolithic Asbestos ceramics, Pyheensilta ceramics and Garino-Bor ceramics (Chalikov 1986:35–43). Otto Bader separated the Garino-Bor culture in 1961 by dividing it into two chronological periods – early (Garino) and late

[13] Different kinds of Textile ceramics or pseudo textile-impressions have been documented not only in Europe but also in North America, Asia, Africa and Australia (see chapter 3.4.4.1.).

(Bor) – dating from the end of the 3rd millennium BC to the middle of the 2nd millennium BC (Nagovitsyn 1987:28). Organic materials are the most common tempers, but in the Garino phase talc also came into use. Bader (1961:37) interpreted this as contacts with Siberia. Talc tempering has an interesting parallel in the Kama territory and the Early Metal Period ceramics in eastern Finland.

Mark Kosmenko (1991a:148) has suggested that the origin of Textile ceramics can be found in the Pit Comb culture, the Fatyanovo culture and the Pozdnyakovo culture. For instance, it has been assumed that textile-impression made with a comb stamp can be derived from Late Neolithic Combed Ware. The Fatyanovo culture in Central Russia was separated as early as 1914 (Gorodshov 1914). Krajnov suggests that the Fatyanovo populations either pushed the Late Volosovo tribes away from their original territory or assimilated with them (Krajnov 1987b:64). He considered Textile ceramics originating from the Fatyanovo culture (Krainov 1987b: 76)[14].

If Fatyanovo ceramics played the central role in the formation of Textile pottery, its influence was at its greatest during the second half of the 2nd millennium BC (Folomeev 1975:158). Nina Gurina assumed that Textile ceramics can not be derived from the Fatjanovo culture, because temper, burnt, surface treatment and even the form of the vessels are clearly different (Gurina 1963:201–202). Gurina further suggested that the origin of Textile pottery is in the Late Neolithic dwelling sites of the Middle Volga, in Galits and Turbino ceramics (Gurina 1963:202).

The metal implements of the Seima-Turbino industry came into use in the large territory from the River Kama to Fennoscandia during the second quarter and the middle of the 2nd millennium BC. The period was characterised by the distribution of bronze metallurgy to Neolithic cultures in the circumpolar area, and the distribution of bronze alloy to cultures where it was not yet known. Finally, it was the beginning of a new kind of metallurgy for casting celts. The transcultural character is a distinctive feature of the Seima phenomenon, which has been explained by referring to the Seima warriors, who came into contact with the local population. Borders, large dwelling sites or geographical and ethnical areas cannot be found. In particular the Seima-Turbino warriors on the European side of the Ural Mountains formed a social organisation that practised metallurgy and kept horses.(Chernykh & Kuzminyh 1987:103–104.)

The question concerning the Seima phenomenon and its relationship with other cultures has caused much debate. A. M. Tallgren (1931b:88–90) called it the Seima culture. Bader (1961) proposed the term Turbino instead and Chernykh (1970:83–85) suggested the term Garino-Bor for the groups along the River Kama.

[14] Already Julius Ailio mentions that there exists Textile ceramics among the finds of Galič together with Fatyanovo ceramics (Ailio 1922).

2.6.1. Textile ceramics in the Upper and Middle Volga

The development of the early Textile ceramics in the Middle Volga area has been interpreted as a process in which many elements influenced the result. Bader maintained that Pit-Combed Ware, Volosovo, Fatjanovo, Balanovo, Pozdnjakovo and Abashevo ceramics have all left traces in Textile ceramics (Bader 1966). Pit-Combed Ware was the basis of Textile ceramics in Spitsyn's and Shukov's hypotheses (Voronin 1998:309). As already mentioned, also Gurina believed that Pit-Combed Ware was the most important factor in the development of Textile ceramics (Gurina 1963:201–202). She also considered that Fatjanovo, Volosovo and Turbino ceramics were not possible candidates for the origin of Textile ceramics. Again S. V. Oshibkina (1987:148) and some others (Krajnov *et al.* 1991) have sustained the idea of the importance of Pit-Combed Ware in the formation of Textile ceramics.

K. V. Voronin (1998:311) has collected the central criteria for early Textile pottery from the material in the dwelling sites of the Yaroslavl region. According to his criteria early Textile pottery always has a profiled upper part, although the degree of profiling varies. It is typical that the line of the throat in the vessel has a line of pits, otherwise the upper part is decorated with pits and comb stamp ornaments. Sometimes vessel formation has been carried out in an asymmetric way giving an impression of careless workmanship. Temper is always crushed stone.

Voronin (1998:318) has divided the ornamentation into two main types: pit-decoration and pit-comb (-tooth) decoration. The elements of pit-decoration vary and some pits even have inner structures caused by the implement they have been impressed with. Pits form horizontal lines or zones, but they may also be carelessly impressed. Pit-comb ornamentation consisted of oblique, horizontal or vertical lines. Typical is that the space between the pits was filled with 3–5 short vertical comb stamps. Also the upper part of the inside rim is decorated with oblique comb stamps.

According to Voronin there are common features between early Textile pottery and Neolithic Pit-Combed Ware. Comb stamps, uneven and oval pits impressed with a stick, comb stamps forming column-like figures or zigzags are common particularly in Early Textile pottery (Zimina 1968). Voronin suggests that the common characteristics between the Mstinskoe Neolithic Pit-Combed Ware and Textile ceramics are a relatively early phenomenon (Voronin 1998:319). He further suggests that the shape of early Textile pottery has a straight rim, analogous with the Late Neolithic Pit-Combed Ware in Mstinsk. Voronin does not agree with the archaeologists who see Fatyanovo ceramics as a prototype of early Textile pottery. Despite some common characteristics, the shape profiling between the shoulder and the neck is different in Fatyanovo ceramics. In early Net pottery, despite the exaggerated angle, the stretched shape of the whole body of the vessel is conspicuous (Voronin



Fig. 2.10. Sosnovaya griva in Kokshaisk, Mari-El. Eneolithic/Bronze Age dwelling site complex in the Middle Volga. Excavation at the dwelling depression in Sosnovaya griva 3 in 1993. Photo: Mika Lavento.

1998:319). The earliest Net pottery, which is pit-ornamented, is known only in some sites such as Troitsa I, Repivo, Sinjaja Gora and Juhot in the Valdai region. Voronin also emphasises that other archaeological find material – such as stone axes, three-angled and leaf-shaped arrowheads and spearheads, long and gently retouched flint implements – which are characteristic in the dwelling sites of Tihmanga and Ust-Rybezhna 2, occur also in both Late Neolithic and Early Bronze Age sites (Voronin 1998:320; fig. 6).

The second horizon of cultures in the Middle Volga area is even more interesting when trying to understand Textile ceramics. The first period of the Pozdnyakovo culture in the Middle Volga area already began during the 15th century BC. For instance, in the material from the cemetery of Dikariha, Textile ceramics was already in use (Patrushev 1989:17–18). During the second period, in the third quarter of 2nd millennium BC, the Pozdnyakovo culture reached its largest distribution. The third period dates from the end of the 2nd millennium BC to the turn of the 2nd and 1st millennia BC (Bader & Popova 1987:132–133). Pozdnyakovo ceramics is usually tempered with crushed stone or chamotte. The vessels are often profiled. Ornamentation is rich and varied being restricted to the upper part of the vessel. Comb stamps are in zones. Characteristic features are pits inside a vessel (Bader & Popova 1987:132–133). One concentration of dwelling sites involving Textile ceramics lies in the Middle and Upper Volga region, in Mari-El, Nishnyj-Novgorod and Kostroma. Halikov noticed textile- (or pseudo textile) -impressed ceramics in the dwelling sites of the Prikazan culture, and he connected it with the Pozdnyakovo population (Halikov 1987:146). Pseudo-net pottery sometimes occurs with Pozdnyakovo ceramics, the use of which already began during the 15th–14th centuries BC.

The Prikazan culture has been divided into four chronological periods, the earliest of which dates as far back as the 16th–15th centuries BC, whereas the fourth one – the Maklasheev period – dates to the 10th–9th centuries BC. The Prikazan ceramics is relatively thick-walled and coarse, often cylinder-formed, and the ornamentation has been made by drawn lines and pits, which are also inside the vessels (Halikov 1987:142). Textile ceramics or pseudo-net pottery developed in particular during the last period in the western distribution area of the Prikazan culture, in the Volga-Oka area (Bader 1966) and in the Upper Volga (Tretyakov, V.P. 1975b).

The drastic increase in the amount of Pseudo-net pottery did not take place until the turn of the 2nd and 1st millennia BC (Patrushev 1989:27). The first connections of Pseudo-net pottery with Prikazan ceramics took place during the Atabaevsk stage, which dates back to the 12th–11th centuries BC (Patrushev 1989:26). The Late Prikazan ceramics of the Maklasheev stage (10th–9th centuries BC) is smooth-faced and relatively thin-walled (Fig. 2.10). Textile ceramics has often been found together with smooth-faced (гладкостенная) and hatched (штрихованная) ceramics (Patrushev 1989:26–28).

P. N. Tretyakov (1966a:135) saw the formation of Textile ceramics as a sign of the cultural and ethnical integration of Finno-Ugric populations. Patrushev (Patrushev 1989; 1992) has further developed this idea in the 1980's and the1990's. The hypothesis of the

"Finnic-speaking Superethnos" (Patrusev 1992:51) and archaeological culture of Textile ceramics has not received much support in Russia, however.

Patrushev has divided the Textile ceramics in Russia into the textile-impressed and pseudo textile-impressed groups. This "spun-speckled" ceramics has either "spun" (ниточная) or "speckled" (крапчатая) surface treatment (Patrushev 1992:43). The terms Textile ceramics, Pseudo-textile pottery, Net pottery and Spun-speckled ceramics are more or less synonymous in their meaning. On the basis of the large material Patrushev has suggested the following five main criteria for the "spun-speckled" pottery (Patrushev 1992:44): 1) sand and crushed stone temper, 2) spun and/or speckled surface treatment, 3) pot-shaped vessels, with a closed, a straight or an open neck, 4) often rounded but sometimes flat walls, with protrusions on the outside and inside walls, 5) ornaments in horizontal zones with pits, buckles, cogged-stamp impressions etc.

During the second half of the 2nd millennium BC profiling became lighter, but there are also round and straight bodies in vessels (Voronin 1998, figs. 8-10). Also "Lochenbuckel" inside the rim came into use. Stamps and impressions replaced comb stamps. The last phase of Textile ceramics has been encountered in the Volga-Oka area and in the Karelia in sites such as Podsope 1 and 2, Pichevo III (Karelia), Boran or Vatazhka (Kostroma region). Late Net pottery is characterised by alternating comb stamps or smaller pits, horizontal zigzag lines and festoons.(Voronin 1998:321.) It is striking that the use of metals and bronze casting seems to play such a minor role in the Textile ceramic culture. Voronin, for instance, mentions bronze celts without discussing the importance of the Seima phenomenon or later bronze axe types.

In the Upper Volga region there are two sites – Vatazhka and Minskoye Gorodische (Fig. 2.11) – that include a very large amount of late Textile ceramics. The sites date from the 6th century BC to the 1st–3rd centuries AD (Gurina 1963:164, 182). Patrushev agrees with Kosmenko's (1988) hypothesis of the influence of the local Eneolithic, Fatyanovo and Pozdnyakovo traditions in the formation of Textile ceramics, but adds the influence of Prikazan ceramics in the Middle Volga (Patrushev 1992:49.) Instead, he sees only few parallels between Textile and Volosovo ceramics. Patrusev states that also the Seima-Turbino phenomenon influenced the formation of Textile ceramics (Patrushev 1992:50).

Patrushev considers the cogged patterns of the Late Combed Ware as a feature handed down to Textile ceramics. He thinks that the common technology in the surface treatment links these ceramic types together (Patrushev 1992:51). P. N. Tretyakov linked the younger phase of Textile ceramics with the Gorodische culture and dated it to the middle of the 1st millennium BC (Tretyakov, P. N. 1941:19–20). According to Patrushev the early Gorodets culture cannot be linked with the Pseudo-Textile ceramics (Patrushev 1989:60; 1992:51–52), but instead with the Akhmylovo culture (Patrushev 1984; 1992:51). The common features in the surface ornamentation of Gorodische ceramics and Textile ceramics do not automatically prove their close cultural relationship. In Gorodische ceramics where an impression was pressed with comb stamps (Patrushev 1989:71) the dominating type or surface ornamentation is "mat-impression" (рогожной), which does not exist in the Textile ceramics of the Middle Volga.

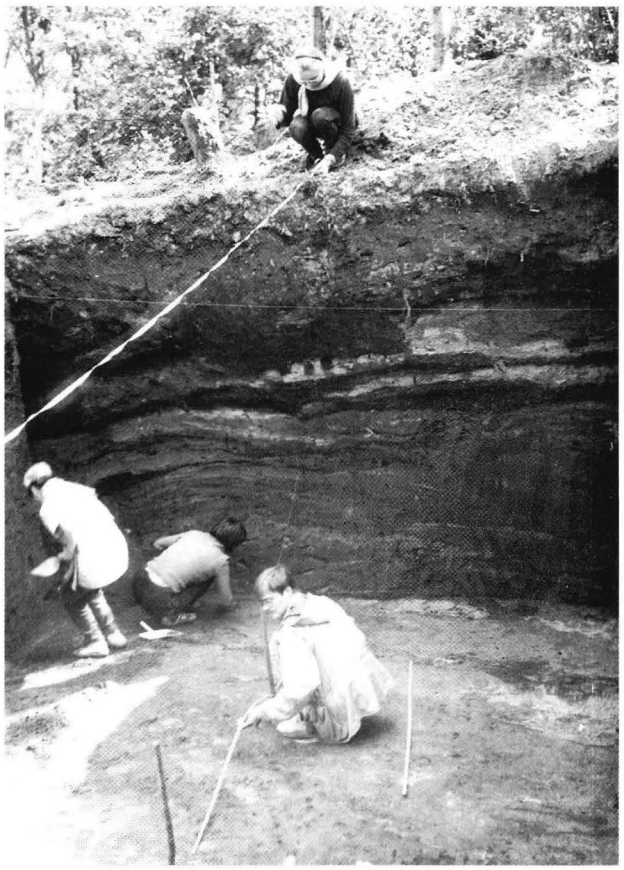

Fig. 2.11. Excavation at the Minskoye Gorodische, Kostroma region in 1992. Päivi Maaranen and Mika Lavento in the excavation. Photo: Mika Lavento.

The Dyakovo culture, in the Volga-Oka area, has been dated to a long period from the 8th century BC to the 8th century AD (Smirnov 1974:17–26). One characteristic feature of the Dyakovo culture is fortified dwelling sites, gorodisches. The beginning of the Dyakovo culture is closely tied with Textile ceramics (Tretyakov 1941). This ceramics includes textile-impressed, hatched, smooth-faced or polished surface impressions. Rozenfeldt (1974) has divided Dyakovo ceramics into four chronological periods. The first period dates between the 8th–4th centuries BC, during which ceramic vessels are smooth-faced, hatched or textile-impressed jars. During the second period – between the 4th century BC and the 3rd century AD – the amount of textile-impression decreases on the surface, then disappears in the course of the third period, between the 3rd–5th centuries AD (Rozenfeldt 1974:189).

According to Goryunova (1961:47) the use of textile-impressed ceramics in the Dyakovo culture ended between the 3rd and 4th centuries AD. Although many parallels can be seen in the surface treatment of Early Dyakovo and Textile ceramics, the ornamentation and

vessel shape differs distinctly. The question of the relationship between proper Textile ceramics and Dyakovo ceramics is an interesting one and needs further study. Some archaeologists do not consider Textile ceramics as a culture at all (Rozenfeldt 1974:186, 196), while others have considered it as a separate culture reflecting Finno-Ugric people (Tretyakov 1941:82–83; Patrushev 1992:51).

2.6.2. Textile ceramics in the Karelian Republic and Leningrad region

The development of Neolithic ceramic groups in the Karelian Republic has parallels with the Finnish one. In the Karelian Republic Rhomb-Pit Ware was in use during the late Eneolithic Period, between 2500–2000 BC (Pankrushev 1984:fig. 7; Vitenkova 1991:124–125; 1996:160–161). Copper was occasionally used, but the economy was still of the Neolithic type. The transition from Pit-Combed Ware to Rhomb-Pit Ware took place during the Early Eneolithic Period (Vitenkova 1991:122).

Gurina (1961) divided the prehistoric ceramics from northwestern Russia into four groups. She called the Eneolithic asbestos tempered ceramics the "classical" type (Gurina 1961:161). This "classical" ceramics and the ceramics of the Turbino type or the Garino-Bor type had many common traits (Bader 1961:267). Halikov (1987) and Savvateev (1984:69) interpreted them as a large culture sphere. Some others (Meinander 1984a:28–29) have thought that connections with the Volosovo culture had been in a central position. Tretyakov and Halikov have assumed that the emergence of organic tempered ceramics in Karelia and Finland was a consequence of the migration from the Volga-Kama area to the west (Tretyakov 1966a:134–135; Halikov 1986:49). Tretyakov talks about ethnic integration of the earlier tribes as a new culture of Textile ceramics (Tretyakov 1966a:139–140). This hypothesis has been much criticised (Pankrushev 1978:88–90; Oshybkina 1978:128–129).

Nowadays Gurina's classical type is called Asbestos ceramics (Pankrushev 1978; Zhulnikov 1991:129). Kosmenko has considered asbestos tempering to be a local technological style, which potters have adopted in the periphery because of the environment and its raw-material potentials (Kosmenko 1992:131–132). His point seems to be that both asbestos and organic tempered ceramics should be considered as belonging to the same tradition.

Alexandr Zhulnikov has separated Asbestos ceramics into five chronological-geographical groups, which are partly synchronous. The use of Asbestos ceramics began in the Karelian Republic already about 2600–2800 BC (Zhulnikov 1991:135–136). Zhulnikov separated his types from three geographical areas in the Karelian Republic: 1) around Lake Sjamozero and the northeastern shore of Lake Onega, 2) around Lake Vodlozero, and 3) on the lower course of the River Vyg. Types I–IV have been found only in some of these sub-areas; Late Asbestos ceramics, group V, dominates Karelia (Zhulnikov 1991:128–147).

For us the most important types are III and V. Group III is concentrated only on the lower course of the River Vyg. Its characteristic features are, among other things, T- and Г-formed rims, which are features in common with Volosovo ceramics (Halikov 1969:167). Group V is interesting because it existed in all three areas in the Karelian Republic before the emergence of Textile ceramics (Zhulnikov 1991:144–146). It is interesting that in this group the vessel rim has been slightly profiled. Zhulnikov has defined Asbestos ceramics in such a way that asbestos is not a necessary condition for belonging to the group. Temper can be asbestos itself, shell or some other organic material; thus the meaning of the term is different than in Finland.

At the end of 1990's Zulnikov changed his typology slightly by separating instead of five four Eneolithic ceramic types: Vojnavolok XXVII, Zalavryga I, Orovnavolok XVI, Palaj-gupa II (Zhulnikov 1999:45–55). It is interesting that Zhulnikov (1999:79) dates the emergence of Net pottery to the middle of the 2nd millennium BC, and suggests that the third and fourth Eneolithic Periods in the Karelian Republic were partly synchronous with the appearance of Textile pottery.

In the Karelian republic the first dwelling sites with Textile pottery became known in the 1930's (Brjussov 1940). As late as 1948 only two sites – Tomitsa and Orov Guba – were known. In the late 1950's the number increased to ten (Gurina 1959:19). Gurina came to the conclusion that early Textile ceramics had a round or a tapering bottom, but later a flat bottom became more typical. She noticed that ornamentation was pressed with comb stamps, and that it was possible to observe weak textile-impressions. Gurina (1963:202–203) stated that some sherds of Textile pottery had been found in Late Neolithic dwelling sites. In Pankrushev's studies sites with textile-impressed ceramics were still of minor importance. It was not until 1991 that the number of dwelling sites with Textile ceramics had grown to 75 (Kosmenko 1991a: 147–148). Since the late 1970's Kosmenko (1978; 1980; 1982b; 1988; 1991a; 1992; 1993a; 1996a, 1996c; 1996d) has made a systematic analysis of the type and the dwelling sites related to it.

According to Kosmenko (1993a:36–62; 1996a:194–203) the most essential characteristics of Textile ceramics are: 1) temper: mostly sand and crushed stones, but in some cases also mica and asbestos, 2) profiled or unprofiled shape with a flat or a round bottom, 3) the diameter of the rim mostly between 15–25 cm, 4) net-impression, made either by comb stamp, cord or textile, and 5) decoration which is almost always on the upper part of the vessel. Comb and tooth stamps, shallow depressions, dots, spots, squares, triangles, oval stamps, "cat's paw", cones, and "knot in the cord" occur as ornaments. Composition is zonal or edging (simple or geometric patterns).

On the basis of shape Kosmenko has divided Net pottery into three groups, which he further divided into two

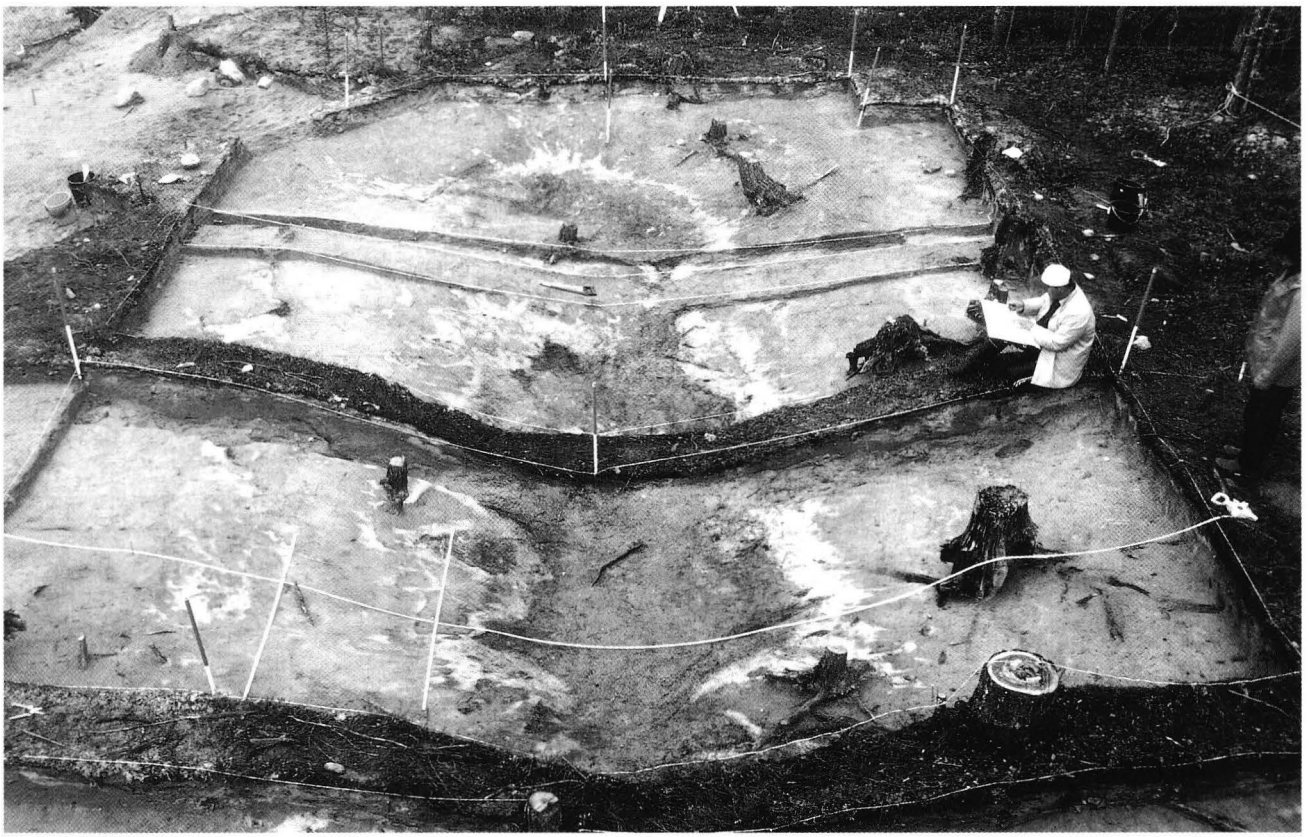

Fig. 2.12. The dwelling site of Sumozero in the Karelian Republic. International excavation of the dwelling depression in 1997. Photo: Mika Lavento.

subgroups. The first division is between profiled and non-profiled groups. Subtype A has a "genetic relationship" with the Fatyanovo culture and it has a round, tapering or flat bottom. Subtype Б has round or flat bottoms with a slightly profiled neck; the second subtype has a more clearly profiled upper part. The genesis of the first subtype in group Б is connected with the Podznyakovo or the Late Bronze Age types (Kosmenko 1991a:149–153; 1993a:36–39). The third main type B includes both round- and flat-based vessels. Prototypes can be found in Pit-Combed Ware (Kosmenko 1991a:153; 1993a:40).

Two main ornament types in Kosmenko's classification are zone and border ornamentation. The first type involves archaic patterns, which is analogous with the ornamentation of the Late Pit-Combed Ware between Karelia and the Volga-Oka area (Kosmenko 1993a:44–57). The second type is characterised by more complex geometrical patterns such as festoons, zones of cord belts, different kinds of cord impressions and rhombs. The most distinctive ornament is the pit belt inside the rim of the vessel (жемчужин). Kosmenko has linked this feature with Podznyakovo ceramics (Kosmenko 1993a:57). Post-Fatyanovo ceramics has comb belts and zigzags, which may form complex ornaments (Kosmenko 1991a:155). Kosmenko finds only few characteristics in common between Karelian Textile ceramics, Dyakovo and Gorodische ceramics (Kosmenko 1993a:57–61). The cultural difference between the Middle Volga and the Karelian Republic is clear: neither fortified gorodiches nor dwelling pits dug into the ground have been found in Karelia (Folomeev 1975).

According to Kosmenko the quality of ornamentation of Textile ceramics degrades towards the north and the west in the Karelian Republic. Further, the vessels have more in common with Podznyakovo ceramics in the eastern part of Karelia than in its western part. Kosmenko has also observed certain geographical differences and even subgroups of Textile ceramics in Karelia. Three areas can be separated: Southeast Karelia, Southwest Karelia and the White Sea area. Differences exist first of all between the Onega-Ladoga and the White Sea areas. The number of profiled vessels is clearly smaller in the north, and also the decorative elements and motifs become poorer there (Kosmenko 1991a: 165–166;1996d: 65–66).

Late Kargopol and Luukonsaari ceramics characterise the Early Iron Age in the area of the Karelian Republic. The influence of the Late Kargopol culture began in the middle of the 1st millennium BC and it continued up to the early Christian era. The distribution area of the Late Kargopol culture covered first of all the Upper Volga, Lake Belozero and Kargopol areas and Southeast Karelia. This new culture developed under the influence of the Ananino culture (Manyuhin 1996:220–221). The Dyakovo culture and the Gorodische culture have played only a minor part in its genesis (Manyuhin 1989; 1991:177). All the dwelling sites of the Late Kargopol culture in the Karelian Republic have been found on the eastern side of Lake Onega.

The ceramics of the Late Kargopol culture have been mostly decorated with cord ornaments involving horizontal zones of small impressions. Typical are also "knots in the string" and ornaments made with a "ski stick" – a stick resembling a miniature ski pole. The Dyakovo components are cones and "knots in the string" and two-toothed "hoof" ornaments (Manyuhin 1989:177–179). Manyuhin has separated two chronological stages in Late Kargopol ceramics. Further, he has divided the material into three local geographical groups: 1) the Belozero, 2) the Kargopol and the southeastern coast of Lake Onega, and 3) the Vodlozero. All these local variants have gone through their own development. In the Lake Vodlozero group Kosmenko has emphasised the influence of local Textile ceramics in its formation, although the Ananino component is the most remarkable. The most important elements are channelures (grooves) and different kinds of stamps (Manyuhin 1991:189–193).

The Ananino culture spread in a large area from the Ural Mountains to Fennoscandia. In Karelia and northern Fennoscandia, in the periphery of the Ural-Upper Volga cultures, it is reflected as a hybrid of the Ananino tradition (Kosmenko 1991b:198). Kosmenko has divided Early Iron Age ceramics into three separate groups: the Luukonsaari group, the Arctic group and the White Sea group (the Belomorsk group). The first two groups represent more or less the distinction presented by C. F. Meinander (1969). In Luukonsaari ceramics Kosmenko has further separated an eastern and a western ornament tradition. The eastern type, which has been decorated with corded zones and short comb stamps, reminds one of the ornamentation in Ananino ceramics. The western type has been decorated with narrow comb stamps, which have been completed with pits in belts, comb stamps in zigzag zones or even a kind of net-figure. Kosmenko (1991b:199) assumes that these types also reflect two cultures: the eastern (Onega) and the western (Baltic). He has also separated Luukonsaari ceramics into two chronological groups, the turning point of which is the beginning of the Christian era.

The ceramics of the Arctic group have been mostly found in northern Fennoscandia, but also in Northwest Karelia (Kosmenko 1991b: 206; 1996b: 253–255) and in the middle of the Kola Peninsula (Anpilogov 1982). The ornamentation in this Arctic group, which has common features with Kjelmøy ceramics, is extremely scant representing impoverishment of the western type of Luukonsaari ceramics, which has its origin in Textile ceramics. The ornamentation represents the most northwestern part of the distribution area of ceramics of the Ananino tradition. (Kosmenko 1991b: 206–208.)

The ceramics of the Belomorsk type dates to the Early Iron Age. The ornamentation in the vessels has been made either using the eastern or the western style: this reflects the contacts between these two directions. Asbestos, slate and organic matter – as in all before mentioned groups – has been used as temper. This ceramic type also has its roots in the Ananino tradition. (Kosmenko 1991b: 209–212).

After the disappearance of Luukonsaari, Arctic and Belomorsk ceramics began a new, aceramic period. The cultures of this period have left very few remains behind. The situation is analogous with the Finnish "vacuum of finds" in northern and northeastern Finland during the Iron Age – between the 4th–11th centuries AD. Kosmenko finds it possible that pot making continued until the beginning of the Middle Ages (Kosmenko 1991:213–214). It is also interesting that despite this, iron smelting from bog ore has been largely conducted throughout the entire Iron Age in the Karelian Republic (Anpilogov 1966:178–180; Gurina 1951:132–134; Kosmenko 1980:113–118; Kosmenko & Manyuhin 1999).

In addition to the ceramic groups mentioned so far in the Karelian Republic and the St. Petersburg region, it is necessary to mention one more interesting ceramic type that emerged during the Middle Iron Age. This type is called Lepnaya ceramics, which refers to the method of making vessels by hand. Lepnaya ceramics follows Textile ceramics in the regions around Lakes Ladoga and Onega (Spiridonov 1986). Gurina (1961:114) roughly dated the type to the 1st millennium AD but emphasised its use particularly during the 8th–9th centuries AD. Lepnaya ceramics is usually coarse and involves hatched and sometimes also even textile-impressed surfaces. Ornamentation is scant: only small pits and comb stamps may occur in the upper part of the vessel (Gurina 1961:114, 507–513).

It seems evident that Lepnaya ceramics exists also in the Karelian Isthmus and in some sites in Finland.[15] The type has been mentioned only rarely in Finnish studies (Uino 1998:395–396; Carpelan 1998:401–402). Vessels are only slightly profiled. Ornamentation is not typical in the vessels found in the Karelian Isthmus but when it occurs it exists particularly on the upper part. In surfaces there can exist either cord-impression or an ornamentation that has been made by drawing on the surface with a sharp comb, thus resembling the ornamentation of Luukonsaari ceramics. It also has many points in common with Kalmistonmäki ceramics.

According to Pirjo Uino (1997:396) the Lepnaya ceramics in the Karelian Isthmus can be divided into two main types on the basis of paste coarseness and wall thickness. The first type represents coarse household ceramics with thick walls. In the second type vessels are thin, paste is fine implying no coarse inclusions in the temper.

Lepnaya ceramics is perhaps better known in Russia than in Finland but comprehensive typological studies have not been made (Kochkurkina 1982; Spiridonov 1986). On the Karelian Isthmus the use of Lepnaya ceramics dates to between 500–900 AD (Uino 1997:396). Alexander Saksa dated its use a bit later, into the Viking Age (Saksa 1998:131–133). Although Lepnaya ceramics was replaced in Staraya Ladoga as early as the middle of 900 AD (Kirpichnikov 1985:20), in the north-

[15] For example in the dwelling site of Karoniemi in Ruokolahti.

ern areas, in the northwestern side of Lake Ladoga, it was still in use in the beginning of 1100 AD (Spiridonov 1986:23–28; Uino 1997:396).

Lepnaya ceramics has some interest from the viewpoint of Textile ceramics because it seems to have developed from Late Textile ceramics – the Kalmistonmäki type – and Luukonsaari ceramics. It is also of interest because this type could fill the gap between the Early and the Late Iron Age. However, at present Lepnaya ceramics is poorly known in Finland. It is interesting that it may have occurred in southwestern Finland even as late as 1200–1300 AD (Pihlman 1982:107–109; 1989:104).

III STUDY MATERIAL AND CERAMIC TECHNOLOGY

3.1. Introduction

The technological aspects of the Textile ceramics in Finland and on the Karelian Isthmus give an important dimension to the typology and the cultural relationships reflected through ceramics. Not only textile-impression itself but also some other technological characteristics separate Textile ceramics from the chronologically preceding and following types.[1]

The starting point of the study is a large primary material stored in museums, research institutes and universities in Finland, Russia and Estonia. Appendix 1 generally describes dwelling sites in Finland and Karelian Isthmus (see also chapter IX). For practical reasons, considerable less detailed descriptions of sites in the Karelian Republic, Lake Ladoga area and Estonia have been presented (App. 2). Because all the material investigated for this study from Finland and the Karelian Isthmus, Karelian Republic, Lake Ladoga area and Estonia can be found in site descriptions no separate tables have been made about this data. In Finland and Karelian Isthmus the material includes all together almost 1000 National Museum (NM) or other museum numbers. In Karelian Republic 187, in the eastern and southern side of Lake Ladoga 30, and in Estonia 27 main museum numbers have been investigated.

To connect Textile ceramics both typologically and chronologically in the right place in the study material implies the use of a large amount of other ceramic types. Neolithic ceramics, particularly from the later period, includes Pyheensilta ceramics, Corded Ware, Kiukainen ceramics, Middle-zone ceramics and Asbestos ceramics of the Kierikki, Pöljä and Jysmä types. The Early Metal Period types are Paimio ceramics, Lausitz-influenced Bronze Age ceramics, IT ceramics, Lovozero ceramics, Sär 2 ceramics of the Anttila, Luukonaari, Kjelmøy and Sirnihta types, Epineolithic ceramics, Morby ceramics, Iron Age ceramics and Slavo-Karelian ceramics. Also some other types exist in the database (see Appendix 4). In addition to the material from Finland and the Karelian Isthmus Textile ceramics from the neighbouring countries, Russia and Estonia, have also been included because they give a background for comparison and make it possible to see, whether Finnish Textile ceramics can be separated from those in the neighbouring areas. The material for this comparison has been collected during ten short expeditions to the collections in institutes, universities and museums in Russia and Estonia.[2]

The database includes ceramic types other than Textile ceramics also from the neighbouring countries. These types were not used in numerical comparison, however, because the material would have become too large. They have still been utilised when separating Textile ceramics from neighbouring types.

3.2. General statistics of the material under investigation

All in all the study material comprises information from 7892 ceramic vessels stored in the PARADOX database (not presented in the study). 2968 of these vessels have been coded into the SURVO[3] database for statistical analysis. All statistics of the ceramics presented in this study were calculated from this database, the condensed form of which is given in Appendix 5. It includes 2532 vessels belonging to the above mentioned ceramic groups.

The most important part of the ceramic material in the study is Textile ceramics from Finland and the Karelian Isthmus. Although sherds from 881 vessels from the Finnish material were separated, it was possi-

[1] The main source of the study is the archive at the National Board of Antiquities in Helsinki (NM=National Museum). Also the find collections of the universities of Helsinki, Oulu and Turku have been investigated. In addition to this some local museum collections have been studied: The Arctic Centre in Rovaniemi, Kainuu Provincial Museum in Kajaani, Häme Museum in Tampere, Museum of Local History and Culture, Rönty, in Taipalsaari, and Vanhalinna Museum in Lieto. See also Referencies.

[2] The following expeditions have been made to the neighbouring countries (see also References): the museum collections at Kostroma, Nishnij Novgorod, Jaroslav, and the find collection at the University of Joshkar- Ola, 1.7.–2.8. 1992; 7.–22.7.1993; the find collections of the Science Centres at Joshkar-Ola and Kazan 1.–15.8.1994; the collection of the Karelian Science Center at Petrozavodsk, 5.–15.11.1993, 14.–30.5.1995 and 9 –27.1.1999; the collection of the Ajaloo Institut in Tallinn (AI), 15.2.–20.2.1999; the archaeological find collections of Tartu university (TÜ) and Pärnu Muuseumi kogu (PäMu), 12.–16.4.1999; the Department of Paleolit and the Department of Slavic-Finnish archaeology, in the Institute of the History of Material Culture, at the Russian Academy of Sciences; the find collection of the State Hermitage, the Department of archaeology of Eastern Europe and Siberia, and the Museum of Anthropology and Ethnography named after Peter the Great, Kunstkamera, 22.2–27.2.1999 and 15.–17.12.1999 in St. Petersburg.

[3] SURVO statistical program, see Chapter V.

ble to use only 339 for statistical analysis (Fig. 3.1.). This is due to the poor preservation and the small number of sherds. The situation is different in the Karelian Republic and Estonia, where only the best-preserved material has been included for analysis.

Area	Finland	Karelian Republic	Leningrad region	Estonia
Number of Textile ceramics	343	700	189	58 161 (Asva incl.)

Fig. 3.1. The number of vessels of Textile ceramics in Finland and the Karelian Isthmus, the Karelian Republic, the Leningrad area and Estonia used in statistical analysis. The number of Textile ceramics used for statistical comparison is all together 1290.

Also other ceramic types were used for comparison and typological separation of Textile ceramics. Figure 3.2. presents the number of the most important types. They all come from Finland or the Karelian Isthmus.

Ceramic type	Kiukainen	Bronze Age ceramics	Morby	Anttila	Kjelmøy	Luukonsaari
Number of vessels	197	54	15	92	24	77

Fig. 3.2. The number of vessels in types related to Textile ceramics in Finland and on the Karelian Isthmus used for statistical comparison.

In addition to the ceramic types in Figure 3.2., several other types were compared with Textile ceramics (chapter 6). For practical reasons and because of the large amount of material available, this comparison material comes only from Finland and the Karelian Isthmus.

3.3. Numerical classification

The purpose of classification is to arrive at a useful description of the sample and to discover unsuspected clusters which may prove to be important (Doran & Hodson 1975:159.)

Despite problems, archaeologists have much resorted to statistical methods in their typologies during the past decades. Real progress has undoubtedly been reached, but still many archaeologists have given up their efforts to create a numerical classification. Although the lack of mathematical knowledge has often been an insuperable obstacle for utilising suitable methods, most of the difficulties are still related to the problem of how to make relevant and reliable observations and how to code this data for analysis – how to transfer this information into Operational Taxonomic Units (OTU) (Sokal & Sneath 1963). The problems with numerical coding and OTUs are both quantitative and qualitative. The main points can be summarised as follows:

1) Numerical coding can reflect only a part of all available information, which can be used in creating typology. Numerical coding simplifies the relevant characteristics of archaeological objects. The problem is how to select the most appropriate variables from an infinite number of possible ones. This becomes evident, for instance, when comparing the way an archaeologist and a ceramic maker approach the question (Doran & Hodson 1975:99). An archaeologist may choose "wrong" alternatives, because he does not know the manufacturing process or because he puts too much emphasis on characteristics that are only of secondary importance in the decoration of the ceramics.

2) The features registered are often not comparable with each other. This is due to several factors:

a) The coding is often made with incommensurable variables: e.g. the variables are not equal in weight (Sokal & Sneath 1963).

b) The variables are not commensurable with respect to their different gradings: continuous, multi-state and binary variables are used at the same time (Baxter 1994:15–22).

c) Comparing unambiguous features (mineral used as temper) with complex features (a motif of ornamentation) may lead to odd results. Recognising minerals in the paste is easy, but classifying ornamentation can be very difficult. Defining the classes is not unambiguous and it may be possible to classify the same object into two or more equal classes (Rasila 1977:76–77). Variables can also be dependent on each other.

3) An archaeologist relying on numerical classification is not necessarily more objective than his colleague who makes his typology without coding characters (Klejn 1982). Coding of motifs is based mostly on the researcher's intuitive and subjective reflection: thus coding implies hidden preconditions and assumptions. It should be possible to verify classification or typology by approaching objects under classification from other points of view.

Only a part of the possible information can be coded. It is usual that some easily recognisable features, like details in surface treatment, can have too much emphasis in relation to some more essential features, which are difficult to discern. Deciding between the essential and the unessential characteristics is a problem, which does not have an unambiguous solution. Errors can be both systematic and random. In the first case they may be in the linear dependence of attributes, increasing with the number of data; in the latter case errors may decrease with the increase of data. The problem of coding is discussed in more detail later, in connection with presenting different attributes. For this reason the question is not discussed more here.

3.4. Technological aspects

Technological aspects play an important role in separating ceramic types. Six main types of technological quali-

ties from collecting clays and tempers to surface finish and function are especially investigated (Fig. 3.3.).

Characteristic features	Subtypes
Clays	Different types of clay
Tempers	Quartz Feldspars Asbestos Talc and soapstone Mica Amphiboles Organic tempers Others
Hardness and porosity	
Surface finish	Textile-impression Hatched surface Smoothing
Firing	Degrees of firing
Function	

Fig. 3.3. Investigated technological qualities of Textile ceramics.

Empirical observations of the technology are an important part of the "vessel unit" (Shepard 1968), which also includes shape and decoration of the vessel. Sherds have been connected if possible with the individual vessels, which were used as a basis for comparison. Applying a vessel unit is more practical than comparing separate sherds, because the latter increases the amount of units for comparison and reduces the number of coded attributes.

The number and the weighting of sherds belonging to each vessel differ much: there can be hundreds of sherds belonging to one vessel, but there can also be only one sherd representing the whole vessel. Rim sherds can be so small or otherwise damaged that they cannot be used in analysis. Vessels, which are not valid for statistical comparison, have value only in comparing the relative amount of material belonging to a certain ceramic group.

Pottery making can be divided into several technological phases. It begins with seeking suitable clays, preparing clays for analysis and adding tempers to the paste. Vessel forming takes place by using different methods. Ornamentation and surface treatment is the next step in making pottery. Drying the vessels and firing them is carried out in the last phase. The following chapter presents the observations of technological aspects of pottery making in this order, using statistics of Finnish Textile ceramics.

3.4.1. Clays

Suitable clays for manufacturing pottery can be found in most parts of Finland. Clays cannot be found in many supra-aquatic areas of eastern Finland and Lapland, where they had not been deposited into the Baltic Sea during its different phases (Eronen & Haila 1981). Glacial clays are normally found in sub-aquatic areas, but post-glacial soils occur in restricted places in supra-aquatic areas, for instance, in mouths of rivers (Virkkala 1954:32; Saarnisto & Peltoniemi 1984:181–183). It seems likely that also post-glacial clays have been used in pottery making. Some diatomaceous analyses support this assumption (Alhonen & Matiskainen 1980). The lack of suitable clays for raw materials has sometimes been used to explain the late emergence of pottery in Lapland.

According to Atterberg's classification (Uusinoka 1981b:11) clay is soil with grain size finer than 0.002 mm. The exact definition of clay is still not without problems. Clays deposited in the Baltic Sea during the Holocene involve also coarser material, mostly silt (Donner 1978:93). Yoldia or Ancylus clays may involve even less clay minerals than silt. From this point of view clays have been considered either as a *stratigraphical* or a *chronological unit* (Sauramo 1958).

Good clays include much clay minerals as their principal component. Clay minerals are hydrous aluminium silicates containing some iron and magnesium in their mineral grid. Some clay minerals have qualities, which greatly influence their physical properties. They can adsorb water into their lattice, which means that their volume will increase. Examples of swelling minerals are montmorillonite, kaolinite and illite (Grim 1962:247).

The most typical clay mineral in Finnish soils is illite, which can be found in nearly all clays (Donner 1978). Typical are also mixed-layer minerals, which can adsorb water between the layers in their structure. Such minerals are smectite-illite or illite-chloride, and they belong to the montmorillonite group.

Archaeologists in Finland have only very seldom studied the suitability of clay minerals for pottery making. The provenience of clay has been investigated by diatomaceous analyses (Edgren 1966:107; Alhonen & Matiskainen 1980; Alhonen & Väkeväinen 1981). Provenience has also been investigated by element analysis, for instance, by Atomic Absorption Spectrophotometery (Alhonen *et al.* 1980). More important than the actual mineral composition are certain technical properties of clays, such as plasticity, dry strength and strength. Plasticity means the clay's ability to withstand deformation. Adding a suitable amount of tempering material changes plasticity essentially. The influence of adding some coarse, non-plastic tempers is discussed together with each temper.

3.4.2. Tempers

The amount of temper used in the clay mass differs in prehistoric ceramics varying between 0–90 % (Hulthén 1991). There are ceramics in which no tempers had been used and in which coarse fragments can be found in the mass only accidentally. Usually the ratio between clay and temper is chosen so that the paste is solid and re-

Temper/area	1	2	3	4	5	6	7	8	9	Total
No temper	0	3 3.9 %	0	0	2 4.2 %	0	0	0	0	5 1.5 %
Quartz	0	9 11.7 %	0	1 1.1 %	0	1 2.6 %	0	0	0	11 3.2 %
Feldspars	0	17 22.1 %	0	26 29.5 %	21 43.8 %	16 42.1 %	29 48.3 %	14 70.0 %	5 71.4 %	128 37.9 %
Asbestos	0	13 16.9 %	0	2 2.3 %	1 2.1 %	3 7.9 %	0	0	0	19 5.5 %
Talc/ Soapstone	1 50 %	14 18.2 %	0	45 51.1 %	0	1 2.6 %	0	0	0	61 17.8 %
Mica	1 50 %	3 3.9 %	2 66.7 %	3 3.4 %	0	7 18.4 %	7 11.7 %	0	0	23 6.7 %
Amphiboles	0	5 6.5 %	0	10 11.4 %	10 20.8 %	0	1 1.7 %	2 10.0 %	0	28 8,2 %
Organic temper	0	12 15,6 %	1 33.3 %	1 1.1 %	14 29.2 %	10 26.3 %	17 28.3 %	4 20.0 %	0	59 17.2 %
Chamotte	0	0	0	0	0	0	0	0	0	0 0 %
Bones	0	1 1.3 %	0	0	0	0	6 10.0 %	0	2 28.6 %	9 2.6 %
Total	2 0.6 %	77 22.4 %	3 0.9 %	88 25.7 %	48 14.0 %	38 11.0 %	60 17.6 %	20 5.8 %	7 2.0 %	343 100 %

Fig. 3.4. The number of vessels with different tempers in different geographical areas. 1 – the River Kemijoki Water System, 2 – the River Oulujoki Water System (Kainuu and Northern Ostrobothnia), 3 – Southern Ostrobothnia, 4 – the Lake Saimaa Water System, 5 – the Karelian Isthmus, 6 – the River Kymijoki Water System, 7 – the River Kokemäenjoki Water System, 8 – Varsinais-Suomi, 9 – Uusimaa.

sistant to deformation. The ratio differs in different tempers depending also on the qualities of clays.

Tempers in ceramics seem to be to some extent chronologically dependent. An example of a long tradition, where potters have used minerals found only in certain restricted areas, is Asbestos ceramics during the Neolithic and Early Metal Period in eastern Finland (Carpelan 1979). Against this background it is conspicuous that almost all tempers used in Finnish prehistoric ceramic types can be found in Textile ceramics. It is also normal that two or even more different materials can be recognised in the paste of Textile ceramics. This is in strong contrast to the monotonous manner of tempering of Asbestos ceramics. In Textile ceramics asbestos is not a typical material but in some areas it occurs exclusively. Choosing the material shows evidently that Textile ceramics represents an abnormal period in the tradition of pottery making in Finland. In the following, the main temper groups is presented by paying attention particularly to understanding why just these may have been chosen.

Looking at the application of different tempers in Textile ceramics in different geographical areas in Finland, one can make some interesting observations. Figure 3.4. presents the number of vessels of different temper groups in nine areas separated by watercourses. Also their percentual amounts have been calculated. It must be remembered that vessel may imply several tempers and only the most important temper in the paste is included in the table. The figures would differ slightly if it had been possible to take all observations of temper into account. Still it gives a rough view concerning the use of tempers in different areas.

Some general conclusions can be drawn from the table. In general, feldspars, talc and organic materials are the most usual tempers in Textile ceramics. Asbestos had been used in tempering particularly in the area of the Oulujoki Water System. Talc (or soapstone) occurs only in the area of the Oulujoki and the Saimaa Water Systems, in northern Karelia; organic tempers exist mostly in central and southern Finland. Amphiboles and mica minerals had been used mostly in Saimaa and on the Karelian Isthmus, although they can also be found in small amounts in all other areas of Finland. Outside the table it must be stated that chamotte has been observed along the Kokemäenjoki and the Kymijoki Water Systems and asbestos had been a secondary temper in the northern dwelling sites of the Saimaa Water System.

Figure 3.5. shows the absolute and relative amount of temper in Finnish Textile ceramics. The scale is based only on macroscopic observations on the temper in each vessel. This method for defining the amount of temper is not exact, but it still gives a general view of the issue. It should be remembered that a potter in prehistory did

Relative amount of tempers in Finnish Textile ceramics	Number of obs. (% of obs.)
0 no temper	5 (1.5 %)
1 very few	7 (2.0 %)
2 few	9 (2.6 %)
3 moderately	55 (16.0 %)
4 abundantly	118 (34.4 %)
5 much	134 (39.1 %)
6 very much	15 (4.4 %)
Total	343 (100 %)

Fig. 3.5. The amount of tempers in Textile ceramics in Finland and on the Karelian Isthmus.

not have the possibility to exactly measure the amount of temper. In general, temper has been used abundantly or much in Textile ceramics. Still even more temper exist in Sär 2 ceramics; in Pöljä and Kierikki ceramics the amount of temper is close to Textile ceramics. Also the grain size of temper was estimated macroscopically using the naked eye. Tempers had been used usually either "abundantly" or "much" in Textile ceramics. No correlations were observed between the amount of temper and the area.

Grain size of tempers in Finnish Textile ceramics	Number of obs. (% of obs.)
0 no temper	6 (1.7 %)
1 very fine grained	2 (0.6 %)
2 fine grained	5 (1.5 %)
3 small	81 (23.6 %)
4 moderate	124 (36.1 %)
5 coarse	109 (31.8 %)
6 very coarse	16 (4.7 %)
Total	343 (100 %)

Fig. 3.6. Grain size of temper in Textile ceramics in Finland and on the Karelian Isthmus.

Figure 3.6. shows the grain size of temper in Textile ceramics. As a general remark it can be mentioned that temper is often conspicuously coarser and the grains are more angular than in many other ceramic types in the Finnish prehistory. This detail sometimes helps to discern Textile ceramics from other types. Coarse mineral fragments are first of all amphiboles, feldspars and quartz. This refers to the manner used to crush fragments from larger mineral fragments just before their use. Correlations of these properties are discussed later.

3.4.2.1. Quartz and feldspars

Quartz and feldspars are the most typical tempers in Finnish prehistoric ceramics. The main reason for their use is undoubtedly their easy availability everywhere. Because of its hardness quartz enriches sands and gravels and its proportion often exceeds 95 % in mature sands (Uusinoka 1981a:21). In immature sands the proportion of feldspars and plagioclase increases to 25 %. Also the number of dark minerals, such as hornblende and mica, increases. All these minerals are easily found everywhere in the area of the Baltic shield.

In normal archaeological terminology quartz, feldspars, amphiboles and mica are classified as sand or crushed stone. Micas, such as muscovite, biotite and phlogopite occur as accessory minerals in granites and granodiorites.

Quartz and feldspars are used as ceramic temper still today. This is because they reduce the plasticity and dry shrinkage of the paste making it hard (Salmenhaara 1983:12–14). The fusion temperature of both minerals is high and depending on element composition ranges between 1150–1300°C for feldspars. The first inversion point of α-quartz is 572°C. At this temperature the structure of the mineral remains relatively stable. The second inversion point is 870°C, where β-quartz changes to tridymite. The quartz volume will change by 2 %, which causes the destruction of the former crystalline structure during the cooling of the mineral. The studies of prehistorical ceramics have proved that the temperature of the second inversion point had usually not been reached and that the structure of quartz remained unaltered during firing (Shepard 1956:29). The thermal expansion of quartz is small which is a considerable advantage in firing (Bøe 1931:207).

Feldspars belong to the large mineralogical family of silicates which means that between subgroups their properties alter considerably. Also feldspars are very resistant to firing. Feldspars have been added into the mass as such or as accessory minerals of granitoidic rocks. In Textile ceramics feldspars have been used often.

3.4.2.2. Asbestos

Asbestos minerals occur only rarely in the Finnish bedrock. The distribution of asbestos deposits known so far clearly shows that it had an important role in making prehistoric ceramics: asbestos deposits may have been situated very far from the sites where ceramics have been found. Asbestos must have been brought from long distances, and it seems possible that some kind of exchange system functioned in a relatively large area in eastern Finland and Lapland particularly during the Early Metal Period (Simonsen 1982:420–421; Lavento & Hornytzkyj 1996:63–64).

Minerals with a fibrous form are called asbestos. On mineralogical grounds asbestos minerals can be separated into amphibole asbestos and serpentine asbestos. Amphibole asbestos includes antophyllite, amosite, crocidolite and tremolite-actinolite. From this group only anthophyllite and tremolite-actinolite occur in the Finnish bedrock. Serpentine asbestos occurs as chrysotile.(Aurola 1964:202–204.)

Anthophyllite, which is white, grey or brown in colour, occurs in magnesium-rich metamorphic rocks, often in association with talc. Asbestos fibres are brittle and their tensile strength is low. Anthophyllite fibres are relatively resistant to heat and their structure does not

begin to change until 820–840°C; above this temperature its structure begins to decompose into quartz and enstatite (Deer *et al.* 1963:220–221). Anthophyllites have been found in several places in eastern Finland (Suomen teollisuusmineraalitiedosto 1980; Lavento & Hornytzkyj 1986; Fig. 3.7.).

Tremolite-actinolite is a mineral group, which often occurs as aggregates of long prismatic crystals radiating from some points. It is often found in low- and medium-grade metamorphic rocks. The amount of iron determines the change of the mineral into actinolite or ferroactinolite (Leake 1978), although these changes in composition do not greatly alter the technical properties. Tremolite-actinolite differs from anthophyllite in that it is even finer grained in its structure. Tremolite-actinolite has been found in Finland in Paltamo, Kainuu. Actinolite has been found in the Textile ceramics along the Oulujoki and Kemijoki Water Systems and it exists also in the Textile ceramics found in the Karelian Republic (Lavento & Hornytzkyj 1996:App. 1).

The second asbestos group belongs to the group of phyllosilicates. Serpentine includes both chrysotile and antigorite. Chrysotile is greatly valued in industry because it has an excellent fibrous structure and low heat conductivity and electrical resistance. Serpentine gives off a large amount of water above 500°C.

Asbestos is not a very common temper in Textile ceramics. It is interesting that a conspicuous break in its use can be seen during the period of the use of Textile ceramics (Lavento & Hornytzkyj 1996:57–60). It was used particularly along the Oulujoki and Kemijoki Water Systems. Worth noting is that the asbestos used probably came not from the Kainuu deposits, but, instead, it seems to have been brought from the Saimaa area (Lavento & Hornytzkyj 1996:63–64). The centre of asbestos deposits is in the northern Saimaa area, in the municipalities of Tuusniemi-Kaavi and Outokumpu (Aurola & Vesasalo 1954; Lavento & Hornytzkyj 1995). In the Karelian Republic asbestos occurs in the Karel-Kola zone (Zoloev 1984:137), in the estuary of the River Vyg and on the western and southeastern sides of Lake Onega (Yu. Systra, pers. comm. 15.5.1994).

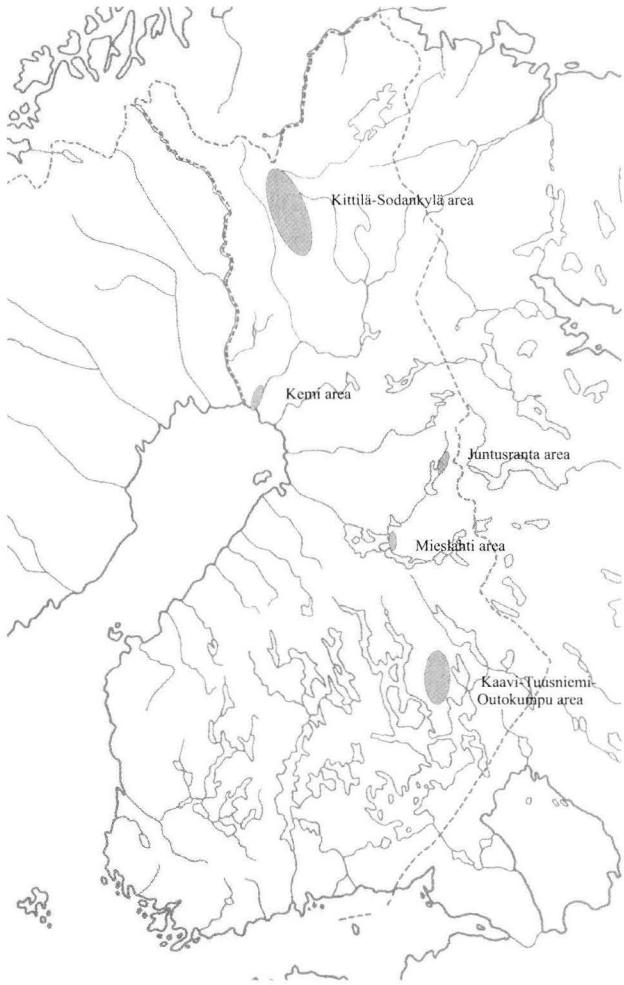

Fig. 3.7. Asbestos occurrences in Finland.

3.4.2.3. Talc and soapstone

Talc is the principal mineral in soapstone. It has often been found in association with asbestos and therefore their distribution is in a large scale similar. In this study talc and soapstone have been classified as the soapstone group, because it is often difficult to determine without a thin section or X-ray diffraction analysis whether the sample is pure talc or whether it also includes some other minerals. Finnish soapstones can be separated into two (Aurola & Vesasalo1954) or even four main groups (Vesasalo 1965) according to their purity in relation to other minerals.

Talc is an unusually soft mineral, which has the value 1 in the Mohs scale of hardness. The mineral is so soft that a fingernail can easily scratch it. Talc is a magnesium-rich mineral, which occurs in ultramafic igneous rocks. These rocks are relatively rare in Finland occurring mostly in eastern and northern Finland. It is important, from the chorological point of view, that talc, soapstone, steatite and asbestos minerals can be often found together in the same mineral associations.

Above a temperature of 780°C talc will decompose (Mason & Berry 1968:446) and between 700–900°C the structure changes into amphiboles. In ceramic pastes this change does not have much practical meaning, because firing temperatures have normally remained below 700°C. Up to a temperature of ca. 1100°C the structure of soapstone will remain relatively stable. For this reason it is still used in making ovens and other items which need a fire-resistant material. Another useful quality of both talc and soapstone is that they can be easily worked. This quality was already used in casting moulds during the Early Metal Period (Huurre 1982).

The use of soapstone and talc is a more local phenomenon than the use of asbestos. Soapstone has been used where it has been easily available, particularly in Kainuu and northern Karelia (Tyni 1988:58–60). Soapstone is easily found on the shores of some lakes. Talc and soapstone occur in a relatively large geographical area from Savo and North Karelia to Lapland (Suomen teollisuusmineraalitiedosto 1980).

Talc and soapstone have been used relatively much in Finnish Textile ceramics in eastern Finland. The existence of talc and soapstone deposits in eastern Finland correlates well with their use not only in Textile ceramics, but also in some other Early Metal Period types. Anttila ceramics is tempered almost without exception with talc and soapstone.

3.4.2.4. Mica

Micas are easily recognised, because of their perfect basal cleavage, which generates thin and elastic plates. The most typical mica minerals are muscovite, phlogopite and biotite. Muscovite is relatively soft and its hardness is between 2.5 and 4 on the Mohs scale. It occurs in a variety of associations – in granites, green schist and amphibole facies. The muscovite structure does not change until temperatures of 600–700°C.

The colour of phlogopite and biotite alters from pale yellow to brown. Phlogopite occurs in ultrabasic igneous rocks, and biotite in igneous and also in metamorphic rocks. Both minerals have high heat resistance – up to 1000°C. Biotite and phlogopite are common and easily available minerals in the Finnish bedrock everywhere.

There may have been many reasons for the use of micas in ceramic temper. Mica flakes are positioned mostly according to the surface of the vessel, which strengthens the paste in the direction of the surface. This gives the ceramic paste a layered structure, causing the easy cleavage. Micas are not decomposed by heat during normal firing conditions. They may also have been used for their lustre (Shepard 1956:30).

It is interesting to notice that although the use of micas for tempering was a widely distributed phenomenon, it seems to have had a central distribution area. Micas can be found in Textile ceramics particularly along the Kymijoki and Kokemäenjoki Water Systems. Sometimes they also occur in eastern Finland, along the Saimaa and Oulujoki Water Systems. It occurs more often in Textile ceramics as a secondary temper, but sometimes this may have been caused by their unintentional entry into the mass, together with some other minerals – with feldspars, quartz and even amphiboles. In conclusion, mica temper does not play a central role in Textile ceramics, although it was still used as a temper from the Neolithic to the Early Metal Period.

3.4.2.5. Amphiboles

Dark minerals were often occasionally mixed in the paste together with quartz and feldspars, but they were put into the paste also intentionally. Dark minerals found in temper are pyroxenes and amphiboles. Hornblende and also two other important asbestos minerals, anthophyllite and tremolite-actinolite (see 3.4.2.2.) belong to the amphiboles. The asbestos minerals are, however, rare in this group, and in practice, the most typical amphibole mineral in Finnish Textile ceramics is hornblende. Asbestos minerals have already been discussed before.

Hornblende is a medium hard (in Mohs scale 6) mineral, which is very common also in plutonic and volcanic rocks, but common also in middle-grade metamorphic rocks. It occurs as hornblendite, but also as an accessory mineral in common rocks, such as granite and granodiorite. In Textile ceramics amphibole minerals are relatively typical. Although feldspars, quartz and even organic tempers were used more often hornblende still characterises the whole group. They are most typical in Kainuu, Saimaa and South Karelia. In the dwelling sites of the Kokemäenjoki Water System and Varsinais-Suomi they emerge sporadically. When reading the table 5.3. one has to remember, however, that the sample is often too small for reliable comparison. It is characteristic that in Textile ceramics they were used as coarse and crushed fragments, in the same way as quartz and feldspars. The use of dark minerals also breaks the tradition of asbestos tempering in eastern Finland. Because it does not belong to the Late Neolithic tempers it clearly represents a new tradition in ceramic technology.

3.4.2.6. Organic tempers

All such organic matter – except calcareous rocks – that disappears from the paste during the firing or post-depositional taphonomical processes in the soil is here called organic temper. The remains of calcareous rock fragments in ceramics have been found in southwestern Finland (Fast 1993:68–69). Nowadays, this can be seen as porosity (Äyräpää 1930:183–186). The remains of calcareous rocks can often be discerned from other material on the basis of the form of mineral fragments and type of porosity. B. Hulthén has therefore proposed that organic and calcareous tempers occur together because a small amount of carbon dioxide is released from the fabric together with organic temper during the process of combustion (Hulthén 1977:25–26).

Organic tempers in Finnish Stone Age and Early Metal Period ceramics can be divided into four groups: 1) hairs and feathers, 2) bones and antlers, 3) shells and eggshells, 4) vegetation, wood, hay, grass etc.

Hairs and feathers burn away during firing. They were used to harden the paste during the formation of the vessel – before the particles in the mass had fused together during firing. Hairs and feathers are often easy to recognise because of their characteristic form (Hulthén 1985a; 1985b). The hollows caused by hairs are very thin and curved and they can be discerned often on both sides of a ceramic sherd. A well-known example of this kind of temper in Kainuu has been presented by Matti Huurre (Huurre 1986a: 59).

Bone occurs in ceramic paste in many forms (Hulthén 1981), from medium to relatively large flakes. Bones often have the same orientation as mica flakes, although the paste does not have so eminent a cleavage as mica tempered ceramics. Sometimes the original, burnt, white bone fragments have been preserved in ceramics. This is due to good firing and favourable post-depositional conditions. If bones had been burnt before adding them to the temper they may be well preserved. Bone tem-

pered ceramics are usually hard and durable but relatively light.

Shells and eggshells constitute a group that is also often easy to recognise (Hulthén 1985b: 334; Huurre 1983:153; 1986a:59–60). Like bones they are flakes with a thin and irregular form. Shells and eggshells have not been found in Textile ceramics in Finland.

Sometimes fragments of plants have been found in the paste. Small fragments of wooden sticks, hay and grass had been added. One might ask, why these tempers had been used although they are very weak. The answer seems to be that their properties give compactness to the temper before firing.

Together with organic material there often exist some other materials in the ceramic paste. This refers to the fact that inorganic material alone has not been durable enough to keep vessels unbroken until firing (Skibo *et al.* 1989:140). These have often been organic tempers – hairs, feathers, hay or grass. Many examples can be found in the material from Kitulansuo in Ristiina (see App. 1).

Organic tempers occupy a considerable position in Finnish Textile ceramics. According to the statistics organic tempers were used in Textile ceramics all around Finland, but most actively they were used in the Karelian Isthmus and along the Kokemäenjoki and Saimaa Water Systems. In northern Finland organic tempers in Textile ceramics did not play as important a role as during the Middle and Late Neolithic Periods.

3.4.2.7. Other tempers

As already mentioned there are also minerals, which have later disappeared due to post-depositional processes in the soil. These tempers have mostly been used in the coastal area, where calcium-rich minerals such as limestone, are available. Limestone temper occurs rarely in Textile ceramics because calcareous minerals are not typical in the Finnish bedrock.

Rare tempers such as greenstones and mica schist were also used in Textile ceramics. They were sometimes used, without intentional choice or purpose, to utilise their special properties in the paste.

Chamotte consists of small pieces of broken and crushed ceramic fragments. The broken pieces are sharp and irregular in form. This quality affects their applicability in strengthening the paste. The grain size is either coarse or very coarse. Chamotte usually has the same colour as the ceramic mass itself, which makes its recognition difficult. Because it behaves in the same way as the paste itself during firing, there are no problems with thermal expansion. Chamotte also occurs together with some other tempers. Although it has not been found as a primary temper in ceramics it was, however, sometimes used in Textile ceramics. Most often it has been found in the ceramic material from Satakunta. In the statistical tables chamotte in Textile ceramics remains underestimated.

3.4.3. Hardness and porosity

The hardness of ceramics is closely connected with the qualities and the amount of tempers in the paste. It can be said in general terms that the harder the temper, the harder the paste. Typical Combed Ware is hard, because of quartz and feldspar temper. Asbestos tempered vessels are softer, but they may still be solid and firm. A certain manner to handle tempers gives a vessel considerable hardness. Luukonsaari ceramics is often hard due to heavy tempering with asbestos. The reason for this is the way in which fine-grained asbestos is used; the amount of temper normally exceeds 50 % of the total weight of the mass.

In this study the relative hardness of Finnish Textile ceramics is coded as relative attributes. The ordinal scale is not based on any determination of hardness, but on macroscopic observations. The scale has five values, from very soft to very hard. The procedure is much the same as that which has been applied in the Mohs scale for minerals (Mason & Berry 1968:171–172). The Mohs scale has most often been used as a reference in studying ceramics (Orton *et al.* 1993:69). Every single ceramic vessel has its own peculiar history. Because of the uneven burning in an open fire the hardness of the vessel can change between hard or soft in different parts of the wall. It would be possible to scientifically determine hardness in the laboratory by applying the dropping test or the pressing test developed in civil engineering and quaternary geology[4]. These tests have not been made, however, because they destroy the sample. Getting reli-

Relative hardness of Textile ceramics	Number of obs.(%) Areas 1–2	Number of obs.(%) Areas 3–6	Number of obs.(%) Areas 7–9	Number of obs.(%) All areas 1–9
0 not determinable	0	1 (0.6 %)	0	1 (0.3 %)
1 very soft	1 (1.3 %)	0	0 (0 %)	1 (0.3 %)
2 soft	21 (26.6 %)	22 (12.4 %)	13 (14.9 %)	56 (16.3 %)
3 medium hard	44 (55.7 %)	99 (55.4 %)	40 (46.0 %)	183 (53.3 %)
4 hard	12 (15.2 %)	55 (31.1 %)	34 (39.1 %)	101 (29.5 %)
5 very hard	1 (1.3 %)	0	0 (0 %)	1 (0.3 %)
Total	79 (18.2 %)	177 (40.8 %)	87 (20.0 %)	343 (100 %)

Fig. 3.8. The relative hardness of Textile ceramics in different areas of Finland and on the Karelian Isthmus. Hardness is compared in three areas: Northern Finland (areas 1–2), Central Finland (3–6) and Southern Finland (7–9).

[4] See Maarakennusalan tutkimus- ja suunnitteluohjeita II, 1974.

able results would require testing every single vessel!

Figure 3.8. shows that there are no great differences in hardness in Textile ceramics between different areas. One should still pay attention to the slightly higher amount of soft vessels in northern Finland. The evident explanation for this is the use of soft tempers – talc and asbestos. Textile ceramics is not as hard as Ka II or Luukonsaari ceramics, but it is harder than Neolithic Asbestos ceramics or Kiukainen ceramics. Already Meinander paid attention to the fact that the hardness and the state of preservation of Sarsa ceramics were essentially better than that of Kiukainen ceramics (Meinander 1954b:183).

Porosity is a quality, which depends on the temper and its amount in the paste. If paste includes organic matter the vessel is porous, but tempering with quartz or feldspars makes it tight. Porosity is easy to classify roughly, but its measurement on an absolute scale requires laboratory tests. One method used to carry out the measurement is mercury porosimetry (see also Ihalainen & Jussila 1998). In this method, the pores in the ceramics are filled with mercury. The sample is weighed before and after the test, which makes it possible to measure the empty pore volume in the sherd. Some preliminary tests to measure the scale of porosity were carried out by the author and geologist Seppo Hornytzkyj in the laboratory of the Microfocus Co, and the results from six test samples showed that it is possible to use the mercury method in studying the porosity of ceramics. The same problem as with hardness emerged also in these investigations: the sample is destroyed in the analysis. Therefore, in this study the porosity of the ceramic vessel was estimated macroscopically by using the relative scale (Fig. 3.9.).

Relative porosity of Finnish Textile ceramics	Number of obs. (% of obs.)
0 not measurable	2 (0.6 %)
1 very porous	1 (0.3%)
2 porous	27 (7.9 %)
3 moderately tight	119 (34.7 %)
4 tight	106 (30.8 %)
5 very tight	88 (25.7 %)
Total	343 (100%)

Fig.3.9. The relative porosity of Textile ceramics in Finland and on the Karelian Isthmus.

The relative porosity does not show any differences between North, South or Central Finland, therefore they are not presented separately in the figure. In general, Textile ceramics are moderately tight or tight, but also a considerable number of very tight vessels have been found.

3.4.4. Surface finish

Surface finish is classified either by making a typology of visible features (Rozenfeldt 1974; Patrushev 1989) or by studying the methods used to make surface finish (Chernyh & Kuzminyh 1987; Glushkov & Glushkova 1992; Bobrinskyj *et al.* 1999). In many cases there are no problems, but often the origin of the impressions is difficult to understand. The emphasis here is on two main types of surface finish: hatched surface and textile-impression, because they have played a central role in the finishing of Textile ceramics. Two other surface finishes – smooth-faced and polished surfaces – are discussed only incidentally.

Figure 3.10. shows that hatched vessels are more common than non-hatched ones in Textile ceramics in all areas. It is worth noting that the number of hatched vessels increases in North and East Finland in relation to Southwest and South Finland. The differences are not very prominent and no far-going interpretations should be made. More detailed discussion about the types of hatching have been presented in chapter 3.4.4.4.

Although the different values of hatching have been presented in an ordinal scale, it would be more realistic to consider them as nominal values. The information involved in the statistics in Figure 3.10. can be compressed so that hatching in Textile ceramics in Finland and the Karelian Isthmus is mostly quite lightly drawn. It has been proposed that only weak and strong hatching (Carpelan 1965:124) have been used. Pictures of different types of hatching are presented in Figure 3.11.

Only one quarter of Finnish Textile ceramics has textile-impression. The number of textile-impressed vessels is most likely bigger, but this does not change the general picture. Clear differences can be seen between different parts of the country.

Hatched and non-Hatched Textile ceramics	Number of obs. (%) Areas 1–2	Number of obs. (%) Areas 3–6	Number of obs. (%) Areas 7–9	Number of obs. (%) All areas (1–9)
Hatched surface	51 (64.6 %)	118 (66.6 %)	38 (43.7 %)	207 (60.3 %)
Non-hatched surface	28 (35.4 %)	59 (33.3 %)	49 (56.3 %)	136 (39.7 %)
Total	79 (23.0 %)	177 (51.6 %)	87 (25.4 %)	343 (100.0 %)

Fig. 3.10. Distribution of hatching in Textile ceramics in different areas of Finland and the Karelian Isthmus. Hatching is compared in three areas: Northern Finland (areas 1–2), Central Finland (3–6) and Southern Finland (7–9).

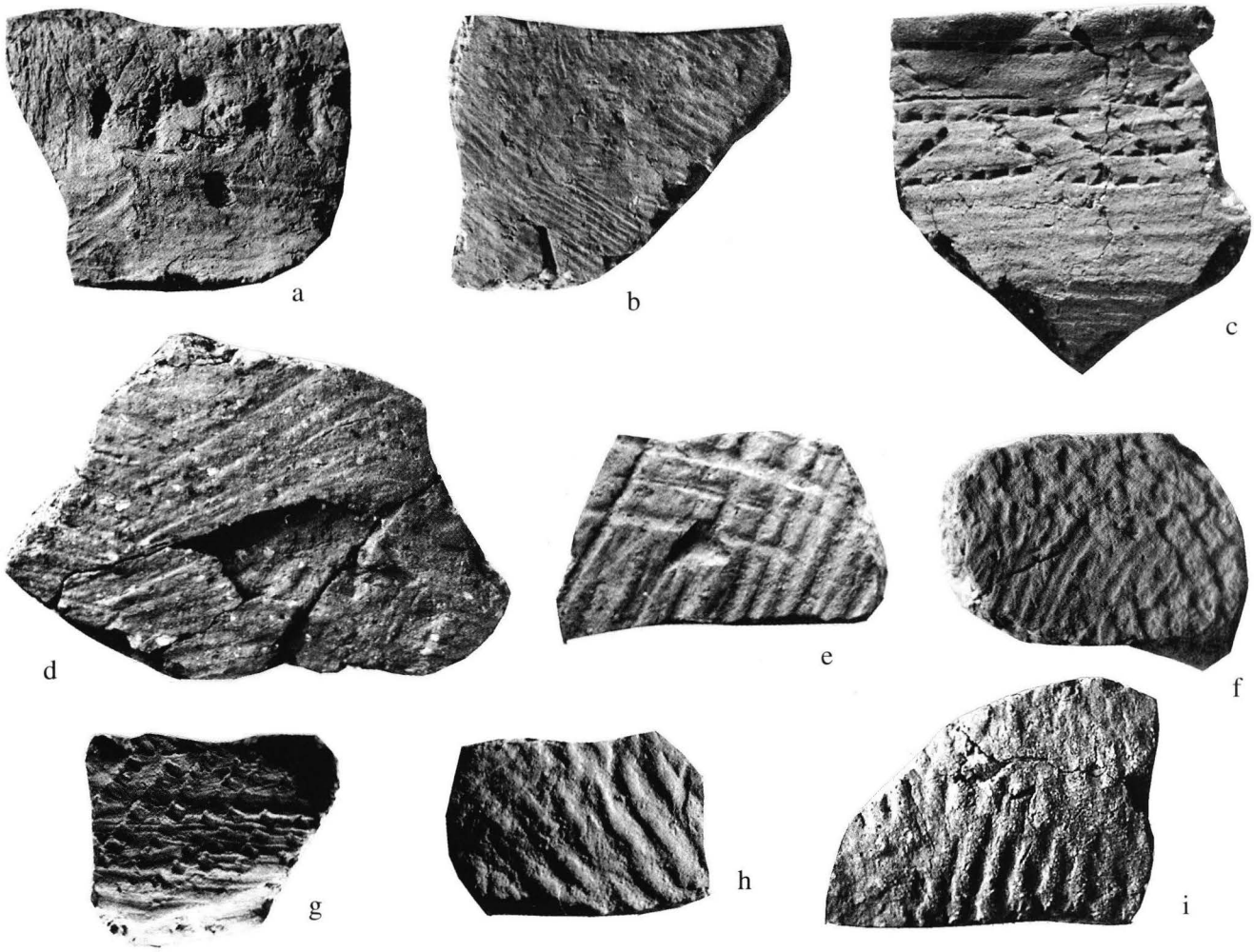

Fig. 3.11. Examples of different types of hatching. Kitulansuo in Ristiina (a – NM 28960:543, b – 28112:58, h – 28960:674) and Varaslampi in Joensuu (c – NM 19471:813, d – 19471:239, e – 19471:988, f – 19471:346, g – 19471:104, i – 19471:611). Scale 1:1.

Figure 3.12. shows that the number of textile-impressed vessels is very small in northern Finland, but it grows essentially in central and southern Finland. More detailed information concerning different types of textile-impression will be presented in chapter 3.4.4.3.

3.4.4.1. Textile-impression

Textile-impressions have been found in different parts of the world: in different countries in Europe (Äyräpää 1933:114), China (Li-Chi 1934; Anderson 1947), Japan (Ohyama 1930), North America (Martin *et al.* 1947; Morris 1927; Bushnell 1937), Africa (Drost 1967:163–164; Siiriäinen 1984b) and even in Australia (Eylmann 1908).

Although the use of textile-impression seems to start roughly synchronously in the large area of northern Europe during the Late Neolithic and Early Bronze Age, there is necessarily no reason to interpret this as a diffusion of a new idea from one place to another. Because many practical studies of how to make textile-impression have been made in Russia, the following discussion presents them in order to get a better understanding of Finnish Textile ceramics.

It seems hypothetically possible that textile-impression could be connected with adopting textiles for clothing on a large scale, and that these textiles would have been needed in making textile-impressed ceramics. This idea can perhaps be supported also in the Finnish mate-

Textile-impression in Textile ceramics	Number of obs. (%) Areas 1–2	Number of obs. (%) Areas 3–6	Number of obs. (%) Areas 7–9	Number of obs. (%) All areas (1–9)
Textile-impressed	4 (5.1 %)	56 (31.6 %)	29 (33.3 %)	89 (25.9 %)
Not textile-impressed	75 (94.9 %)	121 (68.4 %)	58 (66.7 %)	254 (74.1 %)
Total	79 (23.0 %)	177 (51.6 %)	87 (25.4 %)	343 (100.0 %)

Fig. 3.12. Distribution of textile-impressed and non-textile-impressed vessels in Textile ceramics in different areas of Finland and on the Karelian Isthmus. Textile-impression is compared in three areas: Northern Finland (areas 1–2), Central Finland (3–6) and Southern Finland (7–9).

rial because of the existence of flax in the pollen record and macrofossil samples taken from the dwelling sites. This is still hypothetical and one should not put too much emphasis on this. There are many arguments, which also contradict this idea.

In Russia the history of studying textile-impressions began already at the end of the 19th century. Already in the 1880's Count P. A Putyatin (1884:290) observed that fibrous plants were used in making ceramics implying a kind of textile-impression. Also the beginning of pot making has sometimes been connected with the use of a formula made of some fibrous natural material (Agapitov 1881). This hypothesis is essentially the same as that presented by Pälsi (1916).

Despite these early observations of textile-impressions, the first Russian archaeologist who made systematic studies of Textile ceramics was V. A. Gorodtsov. Already in 1901 he found different kinds of impressions with remains of thread, cord, twisted cord, ribbon, fabric etc. in the ceramics (Gorodtsov 1901:582–596; Glushkov & Glushkova 1992:9). His research continued with experimental archaeology in the 1920's in the "ceramic faculty of artistic-technological workshop". Gorodtsov (1922) suggested three methods used to make ceramics: the vessel is shaped 1) from a clay roll with the help of animal skin (impressions inside the vessel), 2) in a pot made of textile (impressions outside the vessel), and 3) by hand with the help of textile (impressions on both sides of the vessel). According to Gorodtsov the first method was in use until the end of the Neolithic Period and the second one from the Late Neolithic to the Early Iron Age. The third method was applied during the Fatyanovo period (Glushkov & Glushkova 1992:10). Ornamentation was taken directly from baskets (Gorodtsov 1923).

B. Je. Petri and N. K. Artyuzov have conducted the same kind of experiments. Artjusov himself made textile-impressed ceramics by using a tow, a comb stamp, a thick thread or a rope (Artyuzov 1926). M. V. Voevodskij (1936:60) considered impressions inside the vessel to be the result of smoothing with comb stamps or a bunch of twigs; the surface outside is covered by textile-impression. M. V. Farmakovskij (1944:4) suggested that textile-impression was made with a bone stamp. A. V. Zbrueva (1928) separated two basic methods for making textile-impression: 1) with textile to produce the shape of the vessel, and 2) with different kinds of stamps to finish the surface. K. F. Salnikov has separated two kinds of textile-impressions on the basis of kurgan material from Lake Alakyl (Salnikov 1952:132). His groups are: 1) pseudo textile-impression, connected with Late Neolithic ceramics, and 2) textile-impression, connected with the Bronze Age. Nina Gurina suggested that textile-impression was not made with real textiles but with a large cord or stamps (Gurina 1963:152). To those archaeologists assuming that textile-impression is primarily made for decorative purposes belongs O. I. Martynyuk (1985), who has shown by experiments that both comb stamps and cord ornaments exist in Siberian Textile ceramics.

Surface-impression is central when considering the many names (Fig. 3.1) Russian archaeologists have given to the Textile ceramics (Rozenfeld 1974:151–153; Kosmenko 1993a:24; Patrushev 1989:23–25; Patrushev 1992:43). Bryusov (1950) paid attention to the availability of suitable fibres – first of all flax. He also paid attention to the poor quality and roughness of textiles used in the Northern Pine Forest Zone. Although textiles had probably been made already earlier, their imprints do not appear in Textile pottery until the turn of the 3rd and the 2nd millennia BC. At the end of the 2nd millennium BC the number of dwelling sites with Textile pottery rose markedly (Bryusov 1950:302–304). It is interesting that according to Bryusov textile-impression already existed in Volosovo ceramics (Bryusov 1950:290).

Wool was already known in the Fatyanovo culture (Chernaj 1981:84), and a spinning wheel came into use during the third quarter of the 2nd millennium BC. Traces of looms do not appear in archaeological material until the middle of the 1st millennium AD in Finno-Ugrian cemeteries (Chernaj 1981:84–85).

Some archaeologists have explained textile-impression as resulting from some "sacred ideas" (Gening 1989:163–164). Impressions were made when smoothing the surface and carrying out decoration of the surface such as hatching or glazing. These were sometimes made in order to give a handsome, aesthetic appearance to the ceramics, but also, on the other hand, as signs of packing joints between clay "sausages". A. A. Bobrinskij (1978:207) interpreted the remains of leather and textile on the surface of vessels as remains of a special technology.

Patrushev (1989) has further discerned subtypes in his two main types of spun-impression and speckled-impression. The spun type of textile-impression was made with the help of textiles giving an impression of a woven fabric. In the speckled type of surface-impression the stamp was solid, not elastic textile.

For instance, Patrushev has divided the spun-impression into "chaotic spun-impression", "parallel spun-impression" and "broken spun-impression". The second main type – speckled-impression – is divided into "arched speckled-impression", "cell-formed speckled-impression", "impression made with a cattle's paunch", "parallel furrow-impression", "square-impression", "wedge- and triangular-impression", "lens-formed-impression" and "rain-impression"[5]. (Fig. 3.13.)

These impressions have been made using different techniques. Patrushev (1989:24) suggests that pressing a soft, wet surface with a beetle or a club has left the cattle's paunch-impression. A club, with a cell-figure in

[5] Translations of terms have been made by the author and they should not be taken as official terms. The Russian terms of spun-impressions are in the same order ниточные хаотичные, ниточные парллельные, прерывистые отпечатки. To the speckled group belong дуговидные отпечатки, ячеистыи отпечатки, парллельные борозды, клиновидные и треугольные отпечатки, дождь. (Patrushev 1989:22–25.)

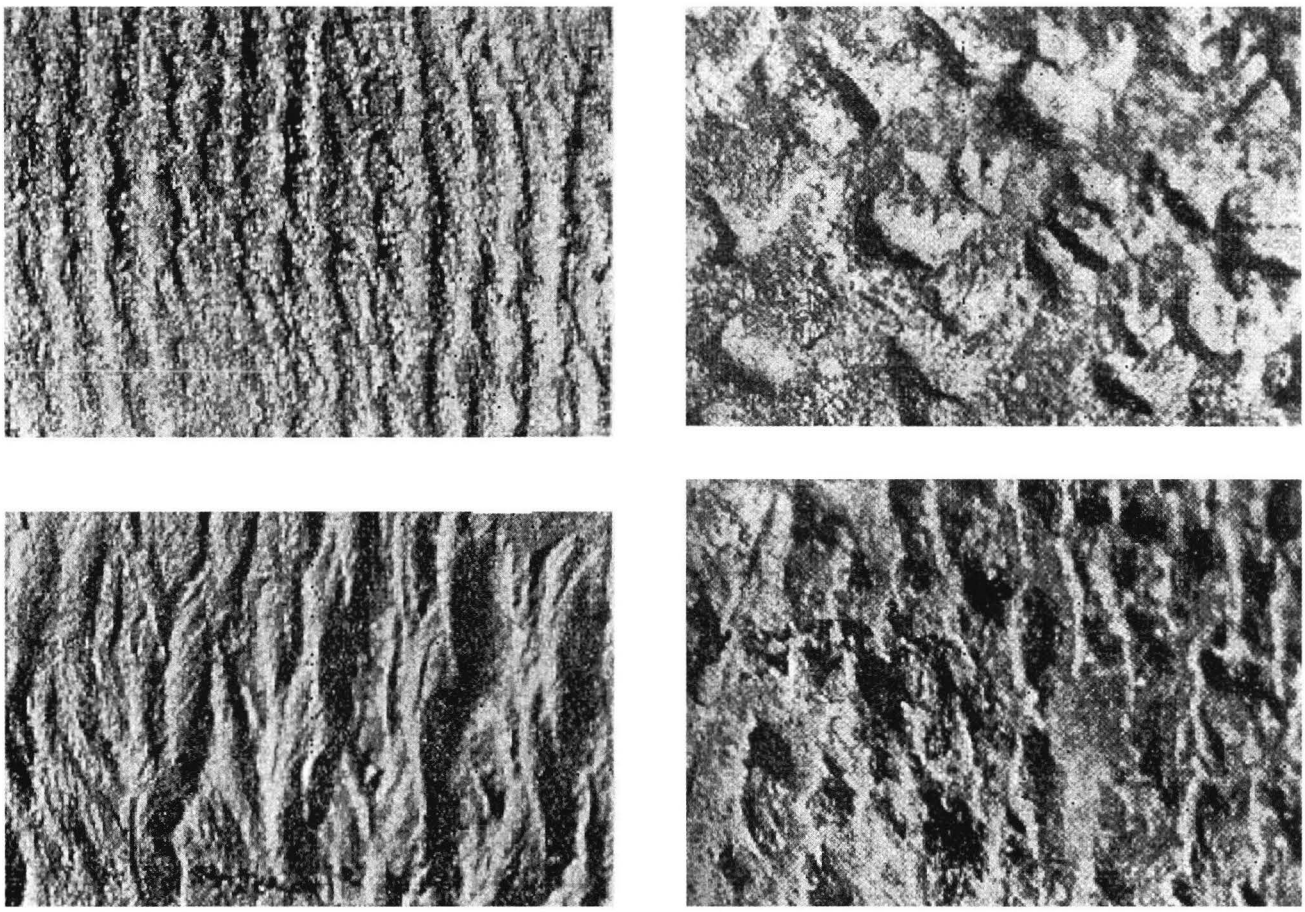

Fig. 3.13. Types of textile-impression according to Patrushev (1989).

its end, has left the cell-formed structure on the surface. Evidently most of these impressions have nothing to do with textiles.

I. Rozenfeldt (1974:151–152) has discerned three types of net-impressions from Dyakovo ceramics. The impressions of the first type have been pressed with twisted threads, a feature that brings it close to Patrushev's spun-group. Coarse braiding is the central feature in the second group whereas in the third group the comb stamps are central. Rozenfeldt (1974:152) says that impression may have been pressed also with a stone. The last-mentioned impression (крапчатый) comes close to Patrushev's speckled type.

Some archaeologists have noted a development in the use of different kinds of net-impressions. In the middle and during the second half of the 1st millennium BC "regular" (правильный) impressions were used; during the 1st–3rd centuries AD the dominating impressions were "irrregular" (беспрядочный) and "spotty" (крапчатый) (Tretyakov 1941:43; Bahder 1947:120–127).

Mark Kosmenko has separated two main techniques in making textile-impression. In the first type, the impression was made with textiles or some other smooth organic material. The second type of impression was made with a comb stamp or even with a hard riffled or flat stamp (Kosmenko 1996a:197). It is of special interest that, according to Kosmenko, in the northern areas of Karelian Republic only hard stamps (vafel'noj) were used. He further suggests that textiles were not used in the "northern periphery". In southeastern Karelia threads were twisted around a bar. Comb stamps were typical in Textile ceramics in the southern areas of the Karelian Republic. They were often utilised not only for making textile-impression, but also for hatching (Kosmenko 1996a:197).

Chernaj (1981) studied the impressions of the ceramics from the Seletskovo gorodische of the Dyakovo culture with a microscope and by comparing impressions with those made with different kind of weaves in textiles. He was able to separate four main types and several subtypes. The first type – "oval cell-form" – has three subtypes: a) even-regular, b) parallel cord, and c) irregular. The second type, a "stitch pattern" (стежковый) represents thick thread, cord or an irregular figure made with string. The third type includes branching "twists" (утовный), which have been made using thick threads. The fourth type – speckled ornamentation – includes different kinds of impressions of parallelograms. In the fourth type Chernaj separated three subgroups: "crescent-form", "double-stroke" and "irregular". In Chernaj's system most impressions had been made with different kinds of textiles. With the help of careful observations he has defined the types of thread

used in impressions. According to his observations both twined and woven fabrics had been used.(Chernaj 1981:71–85.)

Chernaj's hypothesis was that all impressions related to textiles or pseudo textiles were results of the technology of shaping vessels. Glushkov and Glushkova (1992:16) criticised this by stating that despite Chernaj's careful research of the microstructures of impression, he had not discussed enough the technology used to make vessels in the Dyakovo culture. Further, not all imprints had been made with textile. N. V. Trubnikova (1952) made an interesting observation concerning the Textile ceramics in the Gorodische culture: impressions had been made with a stamp and their primary function was not technological but decorative. She further suggested that new textile-impression had sometimes been pressed onto the older one. Trubnikova has interpreted this as a sign of a stamp instead of textile (Trubnikova 1952:126–128). V. I. Molodin and Glushkov have separated two methods used to twist textile: 1) a hand-made, net-like figure, and 2) a special kind of rope, where cords are wound around each other (Molodin & Glushkov 1989).

On the basis of Estonian textile-impressed ceramics Silvia Laul (1966:99) came to the conclusion that potters had used linen and hemp. Laul was able to observe traces of plain weave in the surfaces of ceramic sherds. In Latvia J. Cimmermane (1968:63, Ris. 2:1–2) observed traces of imitated textile-impression in the local Textile ceramics.

E. V. Lamina and N. N. Dobretsov (1990) suggested that textile-impression is a remnant of the forming process of making vessels. They assumed that a special kind of textile was used in making ceramics of the Krohalev type. Practical experiments also have their value in explaining the qualities of clay, profiling and other details of pot making (Semenov & Korobkova 1983:210–211). Bobrinskij's (1978) experiments of outer and inner models provided new information concerning the role of textiles in shaping vessels. In the same way as Pälsi (1916), he was able to show that Textile ceramics can be made in moulds with the help of textiles. Bobrinskij also showed that textile imprints are clear and deeply pressed on the outer surface, but that inside imprints are usually "non-systematic" and "unclear". This is the result of the technique used in vessel forming (Bobrinskij 1978:189). Sofejkov *et al.* (1988:163) have also supported the hypothesis that Textile ceramics had been made in moulds covered with textiles (comp. Pälsi 1916).

G. I. Korbkova (1962), who studied the Lubjanyi culture in Central Asia, came to the conclusion that textile-impression is a result of the use of a soft bag. S. A. Semenov suggested that a stick, which has a wound cord around it, can also produce an impression. He thinks that this can be made by pressing wound cords (Semenov 1955). Semenov made his observations from Neolithic ceramics, from the material excavated by N. N. Gurina in the Karelian Republic. He developed a certain method, trasology, for analysing the origin of ceramics and stone implements on the basis of different kinds of impressions and imprints (Semenov 1955). Also Bobrinskij (1978) paid attention to trasology. He tried to show that careful and systematic microphotography and microscopic analysis can uncover characteristic traces of surface imprints.

In the Early Bronze Age dwelling sites by the River Modlona (Bryusov 1951) remains of hemp and linen have been found in the impressions of ceramic material. Also wool and linen had been in use; perhaps they were used also for packing the walls of four-angled vessels (Solovev 1950:281–286). Textile-impression may also be caused by a textile used for packing (Vinogradov & Muhina 1985).

3.4.4.2. Observations on textile-impression in Siberia

A. P. Okladnikov (1950; 1955) studied Textile and Pseudo-textile ceramics in the area of Lake Baikal and the River Lena. Regarding textile-impression as a series of technological innovations he separated three evolutionary stages of development. By referring to earlier observations of Zbrueva (1928:237–238) Okladnikov assumed that the first "clay vessels" were baskets which had been tried to be made watertight with the help of grease, tar and clay. The second step in the development was the burning of the vessels, which made them hard outside although the vessels themselves remained elastic. The third phase in Okladnikov's classification was the development of ornamented vessels. Okladnikov seems to think that ceramics of the Isakovo type represented the first phase of development: vessels made of smooth clay in a net imply impressions without any ornamentation (Okladnikov 1950:21–22).

Textile-impression is usually on the outside of the vessel. Impressions inside were characteristic of Late Bronze Age Textile ceramics in Central Asia (Sprizhevskij 1958:52; Glushkov & Glushkova 1992:14). There are also impressions made by cord inside the vessels. The material from the dwelling site of Kiprinsk represents an example of this. A bundle made of cord had been used as an "implement" in forming the surface on the inside of the wet vessel (Komarova 1956:96).

Glushkov and Glushkova (1992) have separated two main types of Textile ceramics in the Siberian material. The first type came into use already during the Late Neolithic Period but its application dates mainly to the Bronze Age. Ornamentation involves comb stamps and cord-impressions (Fig. 3.14.). This has been called the Textile-pit tradition. The second type is called the Stamp tradition, because "textile-impression has not been made by textile but with a hard stamp"(Glushkov & Glushkova 1992:109).

Comb- and cord-impressions are known in the Forest and the Steppe zones and the Textile-pit tradition spread mostly in the Forest zone. The Comb-cord tradition had an influence in the southern Taevskij area in southern Siberia. The stamp type is known both in the Forest and the Steppe areas. It has sometimes been found together with comb-stamps, but pits occur only seldom (Glushkov & Glushkova 1992:110.) It is interesting that in the dwelling site of Botaj clay paste was tempered with talc.

Three cultural-historical conclusions can be presented concerning Textile ceramics in western Siberia: 1) the typological difference between two traditions coincides with their chronological horizons, 2) the first type of Textile ceramics (Pit-Comb Textile type) spread from the Forest zone into the Forest-Steppe zone, and 3) the second type of Textile ceramics (Stamp Textile ceramics) spread from west to east in the Forest-Steppe zone (Glushkov & Glushkova 1992:123–124).

Glushkov and Glushkova's experiments. To get a perspective of Finnish Textile ceramics some experimental archaeology related to Siberian Textile ceramics is also worth presenting. Glushkov and Glushkova (1992) conducted large empirical analyses of Western Siberian Textile ceramics. Their starting points were actual imprints (fakturi) and their positives (rapports). They tried to find textiles or stamps with which imprints had been made.

In the first type hard implements had been used. Typical are angular forms – triangles, squares, etc. Imprints are deep and easily discernable and made by drawing an instrument on wet clay. In the second type impression had been made with an elastic implement. The rim imprints are "soft". (Glushkov and Glushkova 1992:62–63.) Although textiles had usually been used in the mould, they had been used even more when forming vessels in the hands. Textile keeps the soft and wet clay paste in the desired form. Textile-impressions exist both outside and inside the vessels.[6]

Three basic methods can be discerned. In the first method a mould gives the desired shape to the vessel, which is lifted from the mould using a textile (comp. Pälsi 1916). In the second method a mould is also used, but only faint textile-impressions are discernable inside the vessel. Textile is used only for compressing the clay paste against the mould. The third method does not employ moulds, but the vessel is formed in the hands. Also here textile is used in compressing the paste. (Glushkov and Glushkova 1992:66.)

In western Siberia small bags have been used in pottery. A vessel is first shaped by hand, then pressed against the wall of an elastic bag leaving the textile-impression on the outside. The bag is either empty – shaping takes place by hand – or filled with sand (Glushkov and Glushkova 1992:68–69). The latter method was probably used in the Neolithic dwelling sites in the Baikal area (Okladnikov 1950; 1976).

An implement used for shaping can be a stick with a cord wound around it, which is turned on the vessel surface (Glushkov and Glushkova 1992:72–73, fig. 20, 21). An implement can also be a rope made of cords wound around each other. A stick inside the cord is not needed. A stamp with a twisted cord can also be used. The impression is quite weak but still visible outside the vessel

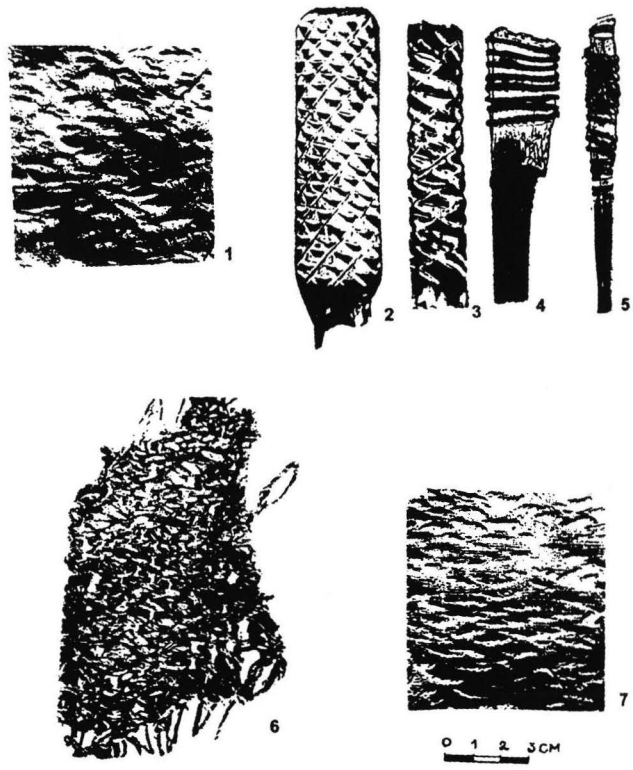

Fig. 3.14. Stamps for making "textile" impressions in Siberia (Bobrinskij *et al.* 1999:220–222).

(Glushkov and Glushkova 1992:74–75). Vessels can also be made inside the bag. Clay paste is pressed with a comb stamp against the textile-covered wall of the bag. Examples of these vessels have been documented, for instance, on the Siberian side of the Ural Mountains (Martynyuk 1985:60).

Chernaj (1985:96) states that the precision and the depth of the impression prove the use of textile. Remains of comb stamp inside the vessel support the hypothesis that it had been used together with a bag. One variant in utilising textile is cord, which radiate from the centre. Another possibility is to use a large, stiff stamp covered with teeth (Glushkov and Glushkova 1992:80–82, fig. 21, 22). In Siberia triangular, sharp teeth forming a chessboard structure is typical.

One typical way to make a vessel is to use a hard stamp. More clay "sausages" are added until the required size has been obtained. A hard stamp is then used to compress the clay paste. The procedure leaves faint impressions inside the vessel. The outer surface is smoothed by pressing or drawing with a hard stamp. This makes the surface hatched or scratched. Stamps have been used for decorative purposes although the purpose can also be functional.

3.4.4.3. Observations on Finnish Textile ceramics

In South Finland textile-impression was first registered together with Corded Ware from the dwelling site of Koivistosveden in Kirkkonummi, by the Gulf of Finland (Europaeus 1922). Corded Ware was found together with

[6] Siberian archaeologists have separated the following types of surface-treatment in textile-impressed ceramics: 1) speckled, 2) twisted, 3) scratched, 4) triangular-egg –formed, 5) textile-impression made by regular hard stamp (Bobrinskij *et al.* 1999:220–223).

Textile-impression in Finnish Textile ceramics	Number of obs. (%) Areas 1–2	Number of obs. (%) Areas 3–6	Number of obs. (%) Areas 7–9	Number of obs. (%) All areas (1–9)
0 not textile-impressed	75 (94.9 %)	121 (68.4 %)	58 (66.7 %)	254 (74.1 %)
1 dim (unclear)	0	12 (6.8 %)	3 (3.4 %)	15 (4.4 %)
2 check	1 (1.3 %)	11 (6.2 %)	8 (9.2 %)	20 (5.8 %)
3 crescent	0	5 (2.8 %)	2 (2.3 %)	7 (2.0 %)
4 needle	1 (1.3 %)	10 (5.6 %)	8 (9.2 %)	19 (5.5 %)
5 round	0	4 (2.3 %)	2 (2.3 %)	6 (1.7 %)
6 wavy	2 (2.5 %)	14 (7.9 %)	6 (6.9 %)	22 (6.4 %)
Total	79 (23.0 %)	177 (51.6 %)	87 (25.4 %)	343 (100.0 %)

Fig. 3.15. Different types of textile-impression in Textile ceramics in Finland and on the Karelian Isthmus. Textile-impression is compared in three areas: Northern Finland (areas 1–2), Central Finland (3–6) and Southern Finland (7–9).

some sherds of textile-impressed ceramics. Carpelan called this Middle-zone ceramics – a mediating type between Corded Ware and Textile ceramics. Äyräpää (1933:114) proposed that textile-impression might have spread into South Finland from Central Europe.

Textile-impression was also found in Kiukainen ceramics (Ailio 1909 I, 93; II: 82–83; Meinander 1954a:139). Because impressions were often found on vessel bottoms, this suggested the possibility that textiles had not been used in the same manner as those found on the walls of the vessels in proper Textile ceramics. Meinander proposed that the vessels were tied up with a cloth (Meinander 1954a:138–139), and he did not agree with Pälsi's idea that the whole vessel had been made *in the mould* covered with a cloth. Meinander also paid attention to Pöljä ceramics, which sometimes have textile-impression. By virtue of this Meinander proposed that textile-impression would have spread into Finland through eastern contacts, via Pöljä ceramics.

After Meinander the existence of separate spread of textile-impression through eastern routes (or through Pöljä ceramics) has not been much discussed in public. Carpelan has further developed Äyräpää's idea of the two origins of textile-impression. One natural reason for the small interest has been the low number of textile-impressed ceramics in the coastal area. Julius Ailio first mentioned eastern textile-impression in his thesis in 1909. The first description was, however, given by Sakari Pälsi in 1916, who soon after the excavations at the dwelling site complexes of Riukjärvi and Piiskunsalmi in Kaukola, conducted practical experiments in order to determine the function of an impression see (Fig. 2.4.). Pälsi (1916) showed that it was possible to make textile-impressed ceramics in a mould. He did not claim that this was the only method of making Textile ceramics.

In Finnish Textile ceramics a textile-impression occurs almost without exception below the angle of the rim, and in those cases when it is just by the rim there is no profiling in the vessels. The rim part has probably been formed by hand after the making of the lower body: textile-impression is not needed in the upper part of the vessel. One reason for the small number of joints between the body and the rim might be that this is a weak point in the vessel and therefore poorly preserved. Although these observations may support Pälsi's idea to apply a mould, they should not be accepted as the sole explanation.

Although it might be tempting to explain the greater prevalence of textile-impression in southern Finland by the cultivation of flax, this should not be considered the main reason. Palaeobotanists have shown that the remains of very early cultivation of flax have been documented, for instance, at Puolanka in Kainuu (Vuorela & Kankainen1991; Vuorela & Kukkonen 1992). One should not forget that only a part of textile-impression was made by cloth.

Figure 3.15. shows the types of textile-impression in the Finnish material in different geographical area. Textile-impressions are often made by soft organic material – most probably cloth – although sometimes also more hard implements seem to have been used. Criticism can be directed towards classifications, which are based on morphological observations only. Figure 3.15. shows that almost all types of textile-impressions were used in Karelian Isthmus and southern and southwestern Finland. In northern Finland textile-impression does not play as important role as in southern areas.

Experimental studies (Chernaj 1981; Glushkov & Glushkova 1992) have not been made in order to determine the genesis of different impressions. On the basis of general observations it can be said that the use of cloth was small in Finnish Textile ceramics meaning that many other organic and inorganic materials were applied. One problem for observations has been the poor preservation of the material.

3.4.4.4. Hatching in Finnish Textile ceramics

Hatching, scratching or other this kind of methods to handle the surface are often closely connected with textile-impression. It must still be remembered that they can also occur in different contexts, independently from each

Hatching in Finnish Textile ceramics	Number of obs. (%) Areas 1–2	Number of obs. (%) Areas 3–6	Number of obs. (%) Areas 7–9	Number of obs. (%) All areas (1–9)
0 not hatched	28 (35.4 %)	59 (33.3 %)	49 (56.3 %)	136 (39.5 %)
1 very light	14 (17.7 %)	20 (11.3 %)	7 (8.0 %)	41 (12.0 %)
2 light	4 (5.1 %)	25 (14.1 %)	7 (8.0 %)	36 (10.5 %)
3 sharp	13 (16.5 %)	35 (19.8 %)	13 (14.9 %)	61 (17.8 %)
4 clear	15 (19.0 %)	29 (16.4 %)	8 (9.2 %)	52 (15.2 %)
5 strong	5 (6.3 %)	6 (3.4 %)	2 (2.3 %)	13 (3.8 %)
6 very strong	0 (0.0 %)	3 (1.7 %)	1 (1.1 %)	4 (1.2 %)
Total	79 (23.0 %)	177 (51.6 %)	87 (25.4 %)	343 (100.0 %)

Fig. 3.16. Different types of hatching in Textile ceramics in Finland and on the Karelian Isthmus. Hatching is compared in three areas: Northern Finland (areas 1–2), Central Finland (3–6) and Southern Finland (7–9).

other. Scratching is very common in Finnish Textile ceramics, but it is also common in those ceramic types, which do not have textile-impression on their surface. Scratching is a typical surface treatment particularly in the Early Metal Period ceramics, not only in Finland, but also in its neighbouring countries (Solberg 1909:57; Pälsi 1916:69; Meinander 1954a:138; 1954b: 171; Carpelan 1965:125; Jørgensen & Olsen 1987:13–14).

These characters are coded into 6 classes varying from a very weak to a very strongly hatched surface. Over 60 % of all Finnish Textile ceramic vessels have hatching on their surface. Figure 3.16. indicates that an opposite phenomenon to that in textile-impression can be seen in hatching: hatching is more common in northern and eastern Finland than in southern Finland. Differences are still relatively small. The most common types in all areas are sharp and clear hatching. The classification of Figure 3.16. is made using a nominal scale, where each attribute either exists or does not exist.

Hatching may have been conducted in many different ways. Gurina has suggested that a bunch of grass was used in the Karelian Early Metal Period ceramics (Gurina 1961:158). Hulthén has stated that in some cases the surface was scratched by brushing (Hulthén 1974:29). The reasons for hatching can be functional and also aesthetical. According to L. Keller (1974:99) in Danish prehistoric ceramics clay walls, which were too thick, were scratched away, which left the surface hatched.

Although both hatching and textile-impression often occur together in same vessels, such cases are also of importance where this is not the case. For instance, the early Textile ceramics in Estonia have been found together with Corded Ware; although there can be hatching in Corded Ware no textile-impressions have been found in it (Jaanits 1959:149). In Latvia A. V. Vasks (1991:119–129) has separated a culture of hatched pottery dating roughly to the Late Bronze Age and the Early Iron Age. In Lithuania there exist scratched ceramics, which come typologically close to Textile ceramics. These ceramic types are at least partly synchronous, but these scratched ceramics differ so markedly from Textile ceramics that they cannot be connected with it (Graudonis 1997:37–38). In Russia hatched pottery has a large distribution and it existed in several cultures during the Late Neolithic and the Bronze Age. In Finland there are also many examples of hatched-faced ceramics, which come close to Textile ceramics, but which cannot be included in it. Examples can be found in Kiukainen ceramics and Bronze Age ceramics (Meinander 1954a: 138; 1954b: 171), in Sär 2 group (Carpelan 1965:125) and even in Morby and other Epineolithic ceramics from southern Finland (Meinander 1969:42).

3.4.5. Smoothing and painting

Smoothed surface also exits in Textile ceramics, although it evidently has a secondary role in this type. The classification of smoothness is based on macroscopic observations and implies six classes. The classes vary from a very coarse to a very fine, smoothed and polished type.

Smoothing was conducted using several means. It has been suggested that, for instance, in Sär 2 ceramics smoothing was made with a stone (Bøe 1931:210). In Textile ceramics it seems evident that wooden implements, turners or spatulas were probably used in finishing the surface. Also bone, grass, leather or even textile may have been used in smoothing (Shepard 1976:66–67).

One method – an engobe – for making a smoothed surface is to coat it with a thin layer of clay. The suspension applies the thinnest clay particles, which make the surface very smooth (Shepard 1976:68–69). This method may have been used in Textile ceramics also, although it is not possible to verify this based on macroscopic observations only.

Figure 3.17. presents the general statistics concerning different types of smoothing in Finnish Textile ceramics. The figure shows that a coarse surface and a surface with light slip are very common. Only minor differences can be seen between different areas. Attention

Smoothing in Textile ceramics	Number of obs.(%) Areas 1–2	Number of obs.(%) Areas 3–6	Number of obs.(%) Areas 7–9	Number of obs.(%) All areas (1–9)
0 no observation	1 (1.3 %)	0 (0 %)	0 (0%)	1 (0.3 %)
1 very coarse	4 (5.1 %)	4 (2.3 %)	2 (2.3 %)	10 (2.9 %)
2 coarse	33 (41.8 %)	71 (40.1 %)	36 (41.4 %)	140 (40.8 %)
3 slip	34 (43.0 %)	46 (26.0 %)	36 (41.4 %)	116 (33.8 %)
4 levelled by a				
wooden implement	5 (6.3 %)	50 (28.2 %)	9 (10.3 %)	64 (18.7 %)
5 smoothened	2 (2.5 %)	2 (1.1 %)	3 (3.4 %)	7 (2.0 %)
6 smoothened and				
polished	0 (0 %)	4 (2.3 %)	1 (1.1 %)	5 (1.5 %)
Total	79 (23.0 %)	177(51.6 %)	87 (25.4 %)	343 (100.0 %)

Fig. 3.17. The classification of smoothness in Textile ceramics in Finland and on the Karelian Isthmus. Smoothness is compared in three areas: Northern Finland (areas 1–2), Central Finland (3–6) and Southern Finland (7–9).

should perhaps, be paid, to the existence of surfaces levelled with a wooden implement in central Finland.

In Textile ceramics less than 3 % of vessels have remains of painting. The most typical is red (1.5 %) painting, which most probably was made by using red ochre. Red ochre was used during many periods in prehistory in painting ceramic vessels. It has been observed in Early Combed Ware (Ruonavaara 1988:44) and Säräisniemi 1 ceramics (Torvinen 1999:229), but in Finnish prehistoric ceramics painting still exists relatively seldom. It is remarkable that all observations of red colour have been made from rim sherds or sherds close to the rim of the vessel. It is possible that the colour is caused by an unequal firing of the vessel. For instance, if the temperature, together with certain tempers, rises above 700°C, the colour becomes red (Hildebrandt, pers. comm. 27.5.2000).

Black colour can be found even more seldom than red. Black painting exists sometimes in Kjelmøy ceramics (Carpelan 1994). Some uncertain observations on black colour have been made in Textile ceramics, but in all cases there have been only small particles of black slip. Black colour may have been caused by the control of reducing and oxidising conditions during firing or by burning hay around the vessel (Hildebrandt, pers. comm. 27.5.2000).

3.4.6. Firing

Firing is the last phase in the vessel making process. The estimation of burning by macroscopic observations only does not give much information of the firing conditions or methods. Therefore, a scale with only three degrees is used. Practically all vessels are either imperfectly or well fired. According to this scale 22 % of all Textile ceramics in Finland and the Karelian Isthmus is imperfectly fired and 76 % is well fired. There are also some very poorly burned vessels.

Although the percentage of imperfectly burned vessels is not very high, one can still come to the conclusion that the number of poorly fired vessels is higher in Textile ceramics than, for instance, in Combed Ware. This assumption has not been tested by laboratory analyses. The high amount of organic material might be one reason for the impression that Textile ceramics was not fired as well as most other types.

The Finnish prehistoric ceramics were fired by non-kiln firing in an open fire. This causes the temperature to be uneven in different parts of the vessel. This may be the reason for the fact that – along with local taphonomical factors – different ceramic sherds were preserved in different ways. Vessels, which were close to the fire were well fired and preserved, whereas sherds, which were not favourably placed have been destroyed.

There are four basic methods used to estimate the maximum temperature of firing: 1) the observation of change in the optical properties of clay, 2) the use of tempers as a pyrometric thermometer to indicate maximum firing temperatures, 3) the observation of the colour of ceramics when it reacts according to the temperature (Hulthén 1977:17–18), and finally 4) the physical change of qualities of paste – the packing of particles, shrinkage – as a function of temperature (Shephard 1956:222–223; Rice 1987:363–368).

In general it can be said that except for organic tempers no other tempers in the prehistoric ceramics in Scandinavia (Hulthén 1977:passim) reached temperatures, which might have led to fusion. In practice, this means

that firing temperatures did not exceed 600–700°C.[7] On this occasion it suffices to say that all Textile ceramics seems to have been fired in an open fire.

3.4.7. Function of ceramics

Birgitta Hulthén (1991:34) has assumed that because of "needle-sharp asbestos fibres" asbestos tempered vessels were not used as food containers. Asbestos Ware, which contains asbestos fibres amounting to about 90 % of the whole amount of paste, was unsuitable for cooking or holding food products. Instead, the inner wall of these vessels contains evidence of iron smelting. There are examples of vessels the inner surface of which has been sintered or even fused. They also have slag on the surface. To prevent the slag being fused to the inner surface of the vessel, sand was put inside before charging the ore. (Hulthén 1991:34–35.) This explanation, however, is not very convincing, because also many other applied tempers can withstand temperatures, which are reached in an open fire. Neither shape nor decoration helps much in understanding the function of ceramics.

The observations concerning iron casting in a ceramic vessel have not been reported in the Finnish archaeological literature. In Finnish Textile ceramics no remains of iron handling have been found so far and the same holds true with Sär 2 ceramics also, although the latter type has been found in the context of iron furnishing.

It can also be said, in general, that the function of Textile ceramics does not differ essentially from the other Neolithic or Early Metal Period types. In some cases there has been found residues, which very probably represent food remains.[8] So far the actual chemical components or animal fats have remained unanalysed.[9] They have been used, instead, as material for AMS-dates.

C. F. Meinander (1984b:16) and U. Salo (1989:17) have linked the distribution of Sarsa ceramics with cultivation in southwestern Finland. In some dwelling sites they occur together. In the dwelling site of Kitulansuo in Ristiina in an unambiguous context with Textile ceramics a macrofossil of barley was found, which was AMS-dated as Hela-167, 2990±60 BP (Lavento 1998b:50).

In has been assumed that in the context of Combed Ware large vessels were used for storing tran oil (Siiriäinen 1981:19). Edgren (1982:50–51) states that hunting seal and fishing were the main means of living during the period of use of Combed Ware, and that late Neolithic Asbestos Ware was used as a "cellar" for animal products. Textile ceramics cannot be connected with a massive hunting of seals. Sites are usually small and they are situated inland by small lakes or rivers (chapter IX).

The shape of vessels has sometimes been used when trying to determine their function. Gunborg Janzon has suggested that the tapering bottom in Middle Neolithic vessels found in Gotland was suitable for cooking meat and fish, round bottom being practical for milk and vegetarian food (Janzon 1974:105). L. Krisevskaya (1977) connects round and tapering bottoms with a hunting and gathering economy whereas flat bottoms would be suitable for animal husbandry. Krisevskaja's observations come from the Bronze Age dwelling sites in western Siberia and the Trans-Ural region. These hypotheses are very general and they should not be accepted without criticism. Finnish Textile ceramics cannot be connected with the preservation of food obtained from animal husbandry or cultivation on the basis of contemporary information. It seems that Finnish Textile ceramics were not as important in the dwelling sites as Combed Ware. Vessels cannot be divided into functional types, and no specific function can be shown for Textile ceramics used in Finland.

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[7] The same observation has been made in the practical experiments of firing ceramics in open-air conditions in the Historical Archaeological Experimental Centre in Lejre, Denmark (Hildebrandt, pers. comm. 27.5.2000).

[8] Kuhmo Vasikkaniemi NM 25302:175 and Suomussalmi Tormuan särkkä NM 18322:997.

[9] There have been some discussions to analyze fats and proteins preserved in the vessels.

IV OBSERVATIONS ON SHAPE AND DECORATION

4.1. Introduction

The shape and decoration of a ceramic vessel plays a central role in all classifications and typologies. Shape can have both aesthetic and functional purposes; decoration serves mostly aesthetic purposes. The following chapter elucidates the most important and clearly visible features of the Textile ceramics in Finland and the Karelian Isthmus. The description aims at separating attributes, which are the basis of the numerical analysis of vessels. Although numerical attributes have an important role in the description, this does not mean that these are the only important features in Textile ceramics. In addition, there is an innumerable number of factors, which might have value in understanding the essence of Textile ceramics. Still it is necessary to raise some characteristics above others, because they are the keys to the description: the key features on the basis of which people recognise Textile ceramics.

Although numerical classification has an important role in the typological analysis of the Textile ceramics in this study, its function is still mainly heuristic. The aim is to separate the essential attributes or features from the unessential ones and to uncover the *eidos* of each ceramic type. It is of special importance to emphasise that *eidos* is always connected with those entities – types or styles – we try to uncover. It can be sought after in all of the Textile ceramics in Finland and the Karelian Isthmus, but we may also aim to find the *eidos* of the Textile ceramics in Kainuu or the Tomitsa ceramics in East Finland: everything depends on our viewpoint and preconditions. This does not mean that *eidos* is irrational and based on intuition only. It is always dependent on certain preconditions and viewpoints, some of which may be in common with the potters from the past. In the same way the attributes, which are presented in the following, have been separated on the basis of preconditions and assumptions presented by Finnish archaeologists during the past 100 years of studies, and thus they belong to the tradition of how and which details of prehistoric ceramics should be taken into discussion.

4.2. Shape

Although the key material of this study is Textile ceramics, also many other types, which are partly or totally synchronous with it, were analysed to make a comparison. It is essential to remember that a considerable change from unprofiled to profiled types seems to have taken place in the vessel shape during the Early Metal Period.

The description of vessel shape has often been made by using a terminology, which leaves possibilities for different interpretations. These problems cannot be entirely eliminated but a short presentation of the terminology tries to diminish these problems. The terminology describing the shape is based on the main types of vessel shape suggested by Christian Carpelan (1965:69–72), Anna O. Shepard (1956:224–255), Hille Jaanusson (1981:67–69), David Clarke (1970:423), Prudence M. Rice (1987:212–219) and the author (Lavento 1989:68–75). It is possible to reconstruct only a minority of all vessel shapes. The description of the shape has been made for such rim fragments, in which the rim and at least 3–4 cm of the upper part from the rim have been preserved, so that the possible curvature can be seen. Because of poor preservation of sherds, rim and neck sherds define the description of the shape of Textile ceramics. The number of bottom sherds is very small. Figure 4.1. gives the terms used in the description of a vessel.

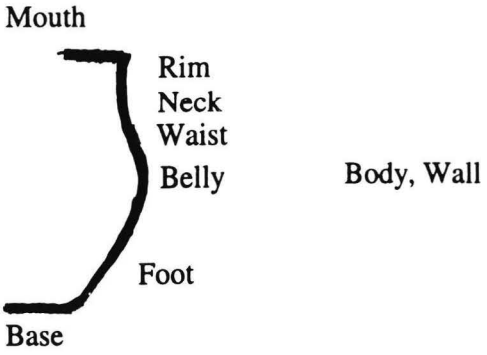


Fig. 4.1. Names of different parts of a vessel.

The concepts of body and wall are used in a general way describing the surface from the neck to the belly. Because the term profiled is central in this presentation, it is necessary to define it here. In a profiled vessel:

1) the angle of the wall in the neck and the waist changes: the upper wall turns first outwards then inwards,

2) the neck turns in a different direction at least twice (e.g. outwards-inwards)

In some vessels the rim turns inwards. This is the case, for instance, in Pöljä ceramics. However, this takes place only in the rim part and because the whole body below

the rim tapers inwards, we do not consider this vessel profiled[1]: the vessel has neither waist nor belly.

In this study the observations concerning the shape of the ceramic sherds are divided into three components. The first component, *rim modification,* aims at describing the upper part of the vessel, the shape of the rim and its relation to the body. The second component, *strength of profiling,* characterises the degree of profiling in the upper part of the body using an ordinal scale. The third component, *wall form,* describes the general shape (neck, waist and belly) of the body. The first and third variables are coded using a nominal scale and the second variable using an ordinal scale.

The first component, rim modification, is ordered hierarchically, and the following figures illustrate its division. In the first division (Figs. 4.2. and 4.3.) a hierarchical rim modification into types has been made (for the rim shapes see Appendix 3).

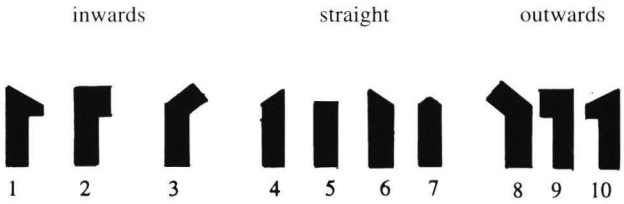


Fig. 4.2. Names and drawings showing rim modification. 1: (Rma) inwards down, 2: (Rmb) inwards straight, 3: (Rmc) inwards up, 4: (Rmd) straight upwards, 5: (Rme) straight, 6: (Rmf) straight sloping inwards, 7: (Rmg) straight round, 8: (Rmh) outwards up, 9: (Rmi) outwards straight, 10: (Rmj) outwards down.

There are three more rim types, which do not belong to these main types (Fig. 4.3.). These types are the following:



Fig. 4.3. Names and drawings showing rim modification.11: (Rmk) straight, thickening down, 12: (Rml) straight, thickening up, 13: (Rmm) T-form.

In Figure 4.4. the first distinction of the upper part of the body divides vessels into a profiled and an unprofiled neck and the second distinction represents the orientation of the neck. Unprofiled vessels, a straight form, have the number 1.The profiled vessels were divided using an ordinal scale between numbers 2 – 5, six representing the strongest profiling. The attempt to code this illustrates the problems of transforming observation data into a numerical form. The scale is relative and not based on any measured quality, which means that some other archaeologist might have constructed the classification in different way. The following drawings (Fig. 4.4.) characterise only one possibility.



Fig. 4.4. Names and drawings showing profiling of the neck. 1: not profiled, 2: slight profiling, 3: medium profiling, 4: strong profiling, 5: very strong profiling.

The third attribute (Fig. 4.5.) is the shape of the upper part of the body. What has been said about the strength of profiling holds true also here. The difference is that also here the classification is nominal.

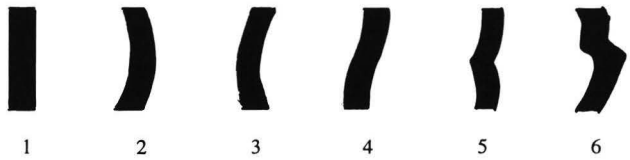


Fig. 4.5. Names and drawings showing the form in the upper part of the body (wall). 1: (Rpa) straight, 2: (Rpb) opening upwards, 3: (Rpc) convex, 4: (Rpd) concave 5: (Rpe) shoulder below the rim, 6: (Rpf) complex.

The shape of the upper part of the body reflects the vessel form in a general level. On the basis of the preserved ceramic material from the Finnish Early Metal Period a more detailed description is often not possible. The classification is open for criticism, because the shape variables can be observed only in a part of the material. Straight, convex and concave forms are often easy to recognise. Attributes 5 and 6 exist more seldom, but on the other hand they are also more difficult to discern: therefore their number in analyses may be too low.

4.2.1. Source criticism

Shape is an indicator of typological characteristics and very often it gives a rough idea of the chronology of a vessel. For instance, it can be used to discern Finnish Neolithic and Early Metal Period ceramics from each other on a very general level. Neolithic vessels usually have no profiling but Early Metal Period vessels are profiled almost always. Although one cannot consider this to be a law-like generalisation it still, when combined with some other characteristics, can be quite confidently used as the first step of typological classification. Al-

[1] In normal archaeological nomenclature the concept 'rim' has often been considered to mean not only the end of the body but also the upper part of the vessel. Therefore, it is difficult to avoid using the term rim when referring to the profiled (or unprofiled) part of the body. In the following, the terms neck and waist are used systematically.

ready Meinander pointed out that both heavily profiled S-form vessels and also vessels with almost no profiling can be discerned in Sarsa-Tomitsa ceramics (Meinander 1954b:182–183). Recently Mark Kosmenko has ended up with the same kind of observations with his studies of Textile ceramics in the Karelian Republic (Kosmenko 1991a:149–153; 1993a:36–39). Although profiling very often appears in Late Neolithic Asbestos ceramic vessels (Zhulnikov 1991:135–136) it is still a character delineating particularly the pottery of the Early Metal Period.

Shaping is a quality, which can easily be seen, in the well-preserved material but still it is difficult to describe exactly. There are many reasons for this. First, because of the state of preservation it is possible to observe the whole shape only in extremely few cases. Observations are fragmentary and the possibility to make wrong interpretations is high.

In this work dividing vessels into four classes according to their liability or state of preservation reflects the relative difference in the amount of information between them. Class 1 represents cases where both the rim and the whole body can be observed. Unfortunately less than 5 % of the material belongs to this class. Class 2 implies vessels, of which the upper part, neck and the majority of the belly can be observed. In practise, in these vessels about 7–10 cm of the rim sherd has been preserved. These vessels cover about 20 % of all the material available. It is notable that the number of well-preserved vessels in class 2 is greatest in the material from the Karelian Republic and smallest in southern Finland. The amount of material explains this partly. In the Karelian Republic only a minority of vessels has been tempered with organic material or limestone: the most typical additional material being feldspar and quartz.

Class 3 describes rim sherds involving less than 5 cm of the preserved surface. This group covers over 60 % of all sherds of the study material. In this class it is possible to observe the profiling of the rim and the neck, but the shape of the belly cannot be seen, which may lead to mistakes in defining the shape. Class 4 is reserved for those rim sherds in which the rim is preserved, but the other characteristics of shape – or even the existence of profiling – is unclear. About 30 % of all vessels belong to this class. This group is largest in the Finnish material, which is not as well preserved as the Russian and the Estonian material. The small fragments from the latter material were usually omitted because of the large amount of comparison material.

One major problem of coding archaeological material is that a neutral method for conducting it does not exist. Coding is often interpretation – creating classes from different alternatives. Results depend on many preconditions relating to methodological approaches, training, experience, traditions etc. One practical difficulty is that even the observations made by the same person do not always remain constant during the whole study process: it is natural to think that observations will also develop and become more detailed in step with increasing experience.

Working with ceramics and creating a typology is a back and forth movement, where one begins the study from one point and proceeds by making new observations from new material and focusing on details. The archaeological analysis usually proceeds into more and more detailed regional and chronological types. This is evident, because material increases all the time and it gives the archaeologist a new possibility to update the classification by observing exceptional sherds and hybrid forms of vessels.

4.2.2. Earlier observations

Aarne Äyräpää did not say much about the shape of Textile ceramics. In one of his latest articles (Äyräpää 1953) most of the information concerning vessel shape came on from pictorial sources. According to C. F. Meinander, who first described the shape of Sarsa-Tomitsa ceramics, vessels are normally cuneiform, upwards widening pots, which have a pot-bellied outlook. The upper part is either straight or S-formed with an upwards bent rim (Meinander 1954b:182–183).

Along with his studies of Sär 2 ceramics Christian Carpelan (1965) briefly discussed also Textile ceramics in Finland. According to him the vessels are upwards widening, slightly curved jars with a relatively small, flat bottom. The mouth of the vessel can be straight, profiled from its neck or the neck may have been bent inwards in such way that it forms a slightly rounded profile (Carpelan 1965:36–37). Profiling of Textile ceramics comes close to that in the different subgroups of Sär 2 ceramics. Some differences still exist: e.g. Luukonsaari ceramics has a very characteristic rim profile, which never occurs in Textile ceramics (see Chapter VII). Matti Huurre has emphasised that profiling in Textile ceramics can even be so strong that the neck-part is almost separate from the rest of the vessel (Huurre 1959:60–61; 1983:249). A famous example of strongly profiled Textile ceramics is the Kalmosärkkä vessel (Huurre 1959:Fig. 9; see also Fig. 4.6.).

Also Mark Kosmenko has divided the Textile ceramics from the Karelian Republic into profiled and unprofiled groups. Kosmenko's system implies three main groups (а, б and в), which all have two subgroups. In most types vessels have round bottoms, but flat bottoms with small diameters also exist (Kosmenko 1991a:149–153; 1996a:198–199). According to Kosmenko the number of vessels without profiling increases in the northern areas. Kosmenko seems to think that the general form of the vessel is simpler in the northern than in the southern and the eastern parts of the Karelian Republic (Kosmenko 1996a:199).

Patrushev has studied Pseudo-net vessels particularly in the Upper and the Middle Volga. Vessels mostly have rounded, but sometimes also flat bodies with protrusions on the outside and inside walls. In the northern areas they have rolled rims but in the southern regions the rims often have collars (Patrushev 1992:44). In northern Nor-

way vessels of the local Textile ceramics are unprofiled (Jørgensen & Olsen 1987:15–17). This observation may be caused by small amount of preserved material, but it can reflect the discerning tradition in making ceramics as well.

4.2.3. Observations on the shape of Textile ceramics in Finland and on the Karelian Isthmus

Observations on shape, which are presented in the following, were made using vessels included in the statistical classification. Except for coding, the most illustrative information concerning vessel shape is collected as profile drawings in Appendix 3. Also these have been used in discussing the shape types of Finnish Textile ceramics.

4.2.3.1. Observations of the rim

Figures 4.7a.–4.7d. present the number of vessels with different rim types in three geographical areas. The majority of rims have no profiling (straight rim, number 5). Typical are also rims, which have been either bent outwards or are outwards straight (number 8 and number 9). Almost all types of profiling occur, although no-one is very typical.

4.2.3.2. Body

The strength of profiling on the upper part of the vessel is illustrated in the pie chart (Fig. 4.8.). The figure shows that there is much variation in the degree of profiling in Finnish Textile ceramics. A large number of vessels are without profiling, but a considerable number of very heavily profiled vessels also exist. Geographical differences cannot be seen between different areas and therefore the detailed tables are not presented here.

In Textile ceramics 25 % of all vessels are without profiling, about 30 % are slightly profiled and about 20 % are heavily profiled (Fig. 4.8.). Figure 4.9. describes generally the degree of profiling in the upper part of the body in different areas of Finland. In the figure 4.5. have been presented classes for the upper and middle parts of body. The classes are idealised interpretations of the material (Appendix 3).

About 25 % of all vessels have a straight profile, 33 % of all profiles are concave and only 12 % represent a convex profile (Fig. 4.9.). If the curvature is very slight, it is difficult to observe. This means that these vessels are easily classified as having no profile. Profiled vessels are usually either concave or complex but in both cases they have a belly. The diameter of the vessel is largest a few centimetres below the rim. The waist is most often concave and profiles have sharp angles only seldom.

The general shape of Textile ceramics differs strikingly in profiling from the Neolithic types. The development, which led to profiled vessels, began still already during the Late Neolithic Period. Slightly profiled vessels can be found in the Finnish Late Neolithic Pyheensilta ceramics (Vikkula 1984:54) in southwestern Finland and in asbestos tempered vessels in Saimaa. Final Neolithic Asbestos pottery has been compared with Andronovo ceramics (Äyräpää 1953:84–91) or with ceramics in the Karelian Republic (Lavento & Hornytzkyj 1996:45), which belongs in Alexandr Zhulnikov's (1991:142–146) classification to the group V, which involves profiled vessels.

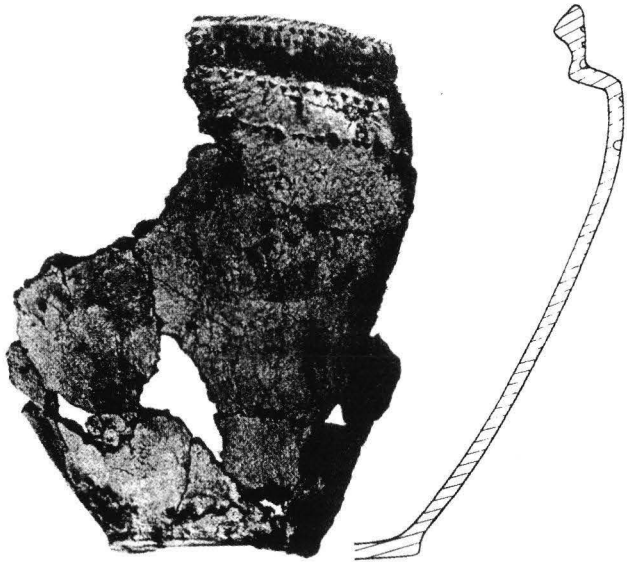


Fig. 4.6. A Textile ceramic vessel from Kalmosärkkä in Suomussalmi. Drawing and picture: Matti Huurre (1959:fig. 9, NM 14504:282).

4.2.3.3. Base

According to Kosmenko and Patrushev the bottom of Textile pottery is either flat or round. Meinander has reported only flat bottoms in connection with Finnish Textile ceramics (Meinander 1954b:182–183). Carpelan has emphasised the small area of the base in relation to the rest of the body (Carpelan 1965:36–37).

There is, unfortunately, not much to say about the observations concerning the bottoms of Finnish Textile ceramics, because only few examples have been preserved. It can be said that so far all vessels belonging to Textile ceramics have a flat bottom and the diameter of the base is small. The best examples of well-preserved vessels with a small, flat bottom come from Kalmosärkkä in Suomussalmi (Fig. 4.6. NM 14504:282) and Valkeissaari in Taipalsaari (NM 17040:1; see also App. 3 and 10). There are, however, some vessels, which might have a tapering bottom (NM 14831:1182). Bases in Textile ceramics are not ornamented.

It is interesting that small, flat bottoms have also been found in Late Neolithic Asbestos ceramics of the Pöljä and the Jysmä types (cf. Rantala in Rääkkylä NM 28 243:1), which might also indicate a slight change of tradition from round or tapering bottoms to flat bases.

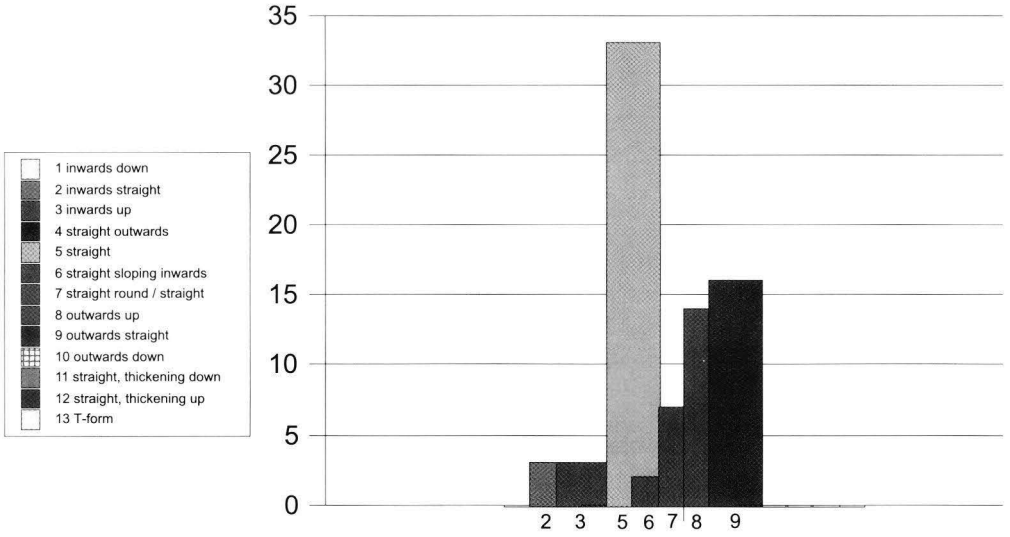


Fig. 4.7a. The number of vessels with different rim types. Northern Finland (the River Kemijoki and River Oulujoki Water Systems).

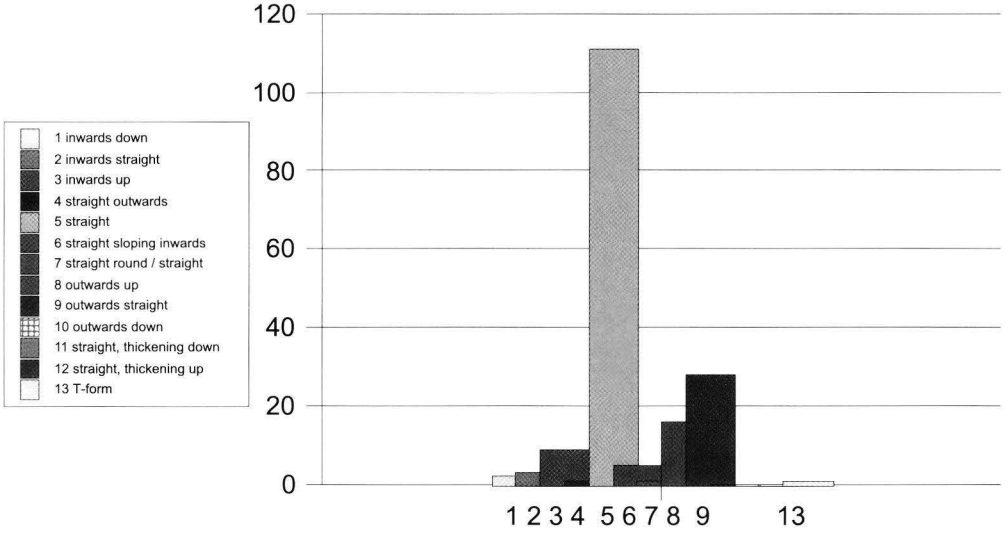


Fig. 4.7b. The number of vessels with different rim types. Central Finland and the Karelian Isthmus (Southern Ostrobothnia, the Lake Saimaa Water System, the Karelian Isthmus, the River Kymijoki Water System).

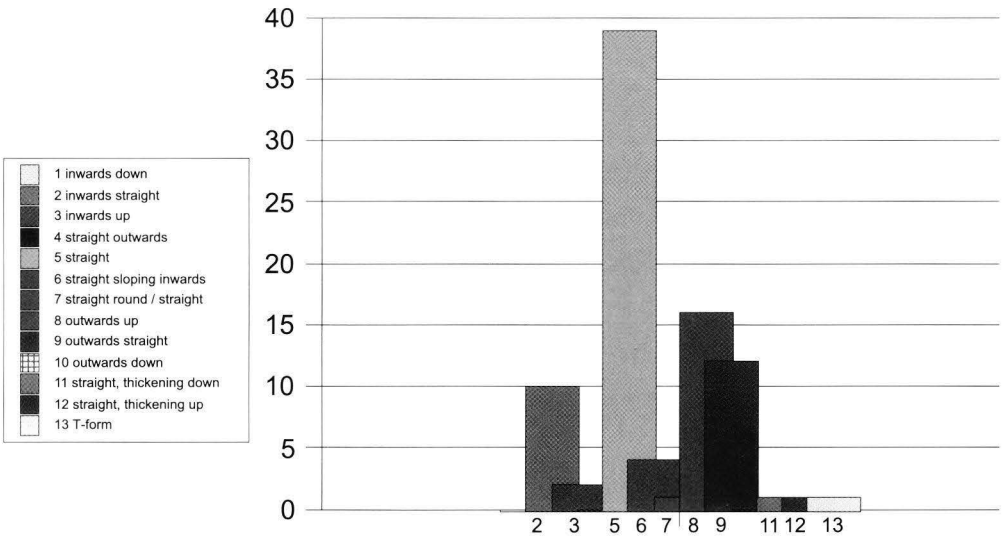


Fig. 4.7c. The number of vessels with different rim types. Southern Finland (the River Kokemäenjoki Water System, Varsinais-Suomi, Uusimaa).

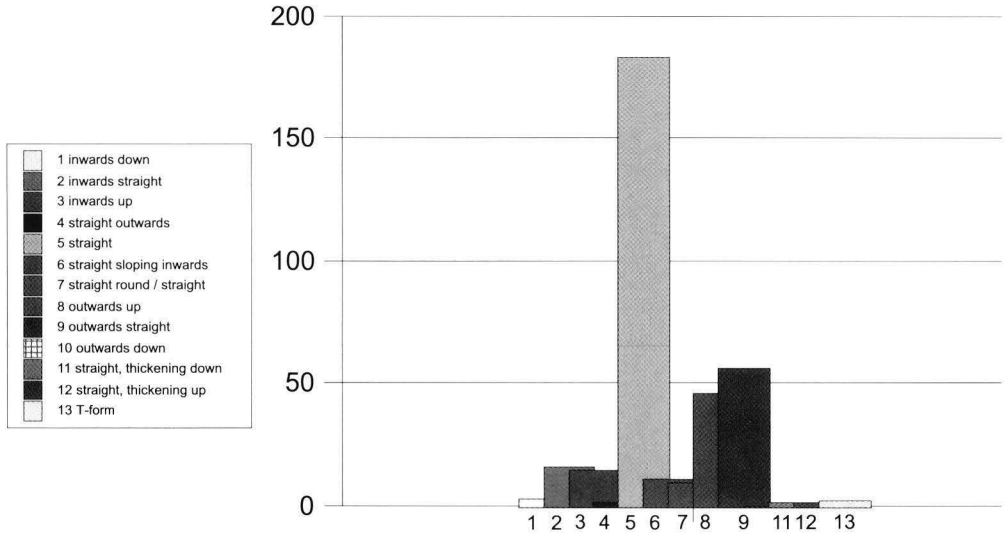


Fig. 4.7d. The number of vessels with different rim types in the whole Finland.

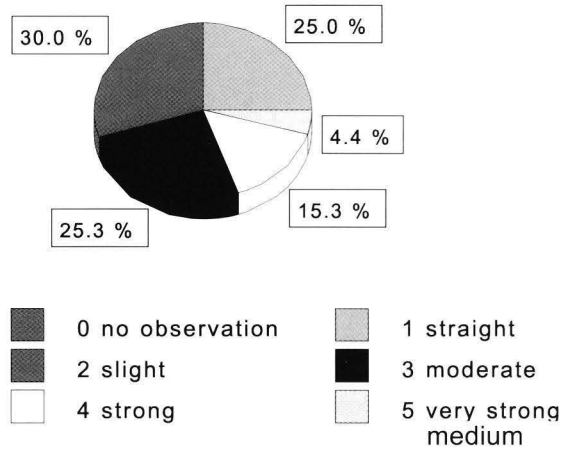


Fig. 4.8. Strength of profiling in Finnish Textile ceramics.

Profiling of the body in different parts of Finland	Number of obs. (%) Areas 1–2	Number of obs. (%) Areas 3–6	Number of obs. (%) Areas 7–9	Number of obs. (%) All areas (1–9)
0 no observation	1 (1.3 %)	0 (0.0 %)	0 (0%)	1 (0.3 %)
1 unrestricted, straight contour	23 (29.1 %)	41 (23.2 %)	20 (23.0 %)	84 (24.5 %)
2 rim upwards widening	3 (3.8 %)	1 (0.6 %)	4 (4.6 %)	8 (2.3 %)
3 unrestricted, simple, convex contour	2 (2.5 %)	24 (13.6 %)	15 (17.2 %)	41 (12.0 %)
4 restricted, simple, concave contour	28 (35.4 %)	50 (28.2 %)	37 (42.5 %)	115 (33.5 %)
5 involving the shoulder below the rim	17 (21.5 %)	42 (23.7 %)	4 (4.6 %)	63 (18.4 %)
6 complex	5 (6.3 %)	19 (10.7 %)	7 (8.0 %)	31 (9.0 %)
Total	79 (18.2 %)	177 (40.8 %)	87 (20.0 %)	343 (100.0 %)

Fig. 4.9. The number of vessels with different wall forms in three areas: Northern Finland (areas 1–2), Central Finland (3–6) and Southern Finland (7–9).[2]

[2] The numbers of vessels in classes 5 and 6 are not necessarily reliable, because the observation of these characteristics needs a more preserved surface than in other groups.

The main line of development still refers to the radical change in the shape of the bottoms at the beginning of the Early Metal Period.

4.3. Thickness and size

Meinander states that the thickness of the vessel wall in Textile ceramics varies between 6 and 10 mm. Therefore the vessels have not been very large and the diameter in them has normally been about 20 cm (Meinander 1954b:183). The diameter of the mouth has sometimes been measured with tangent or segment methods (Vikkula 1981:23–25). These methods give reliable results if the preserved rim is large enough. This is often the case with Ka II ceramics and even in Sär 2 ceramics, but the amount of well-preserved rim sherds in Textile ceramics is small. In this work the diameter was estimated using cardboard discs with diameters increasing in increments of 5 cm, because it was usually not possible to obtain more exact results. In the following (Fig. 4.10.) the vessel size was measured from parts of rim sherds.

Size	Number	Percent
No obs.	297	100 % (86.6 %)
0–14.5 cm	8	17.4 %
15–19.5 cm	3	6.5 %
20–24.5 cm	4	8.7 %
25–29.5 cm	3	6.5 %
30–34.5 cm	8	17.4 %
35–39.5 cm	12	26.1 %
40–44.5 cm	4	8.7 %
45–49.5 cm	4	8.7 %
Total	46	100 % (13.4 %)

Fig. 4.10. The size of vessels in Finnish Textile ceramics. The amount of sherds possible to be measured in different size groups.

The histogram shows the results more illustratively (Fig. 4.11).

The mean diameter of the mouth in Textile ceramics varies between 30–35 cm, the largest being between 35–40 cm. According to these observations Textile ceramics favoured clearly smaller vessels than Typical Combed Ware: only less than 18 % of all vessels are larger than 40 cm. The measurements were not made from the widest part of the vessel – the shoulder a few centimetres below the rim – but from the mouth. The measurements made from the rim often seem to give too large an estimate of the diameter. This possible therefore because most sherds were deformed as a result of taphonomic processes in the soil because the curvature of the sherds has changed.

The thickness of the rim and the wall was measured from all of the 343 vessels in the database. The results are presented as a histogram in Figure 4.12. The mean

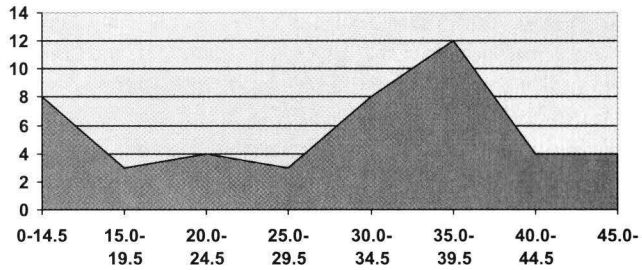


Fig. 4.11. Histogram showing the different groups of mouth diameter in Finnish Textile ceramics.

thickness of the rim in Textile ceramics is 7.8 mm, the mean thickness of the wall being 6.7 mm. This shows that the rim has often been slightly strengthened. Still, this is not a characteristic feature for the type. The thickness of both the rim and the wall follow a normal distribution. No remarkable local differences can be observed (Fig. 4.12.) and therefore they are not discussed more here.

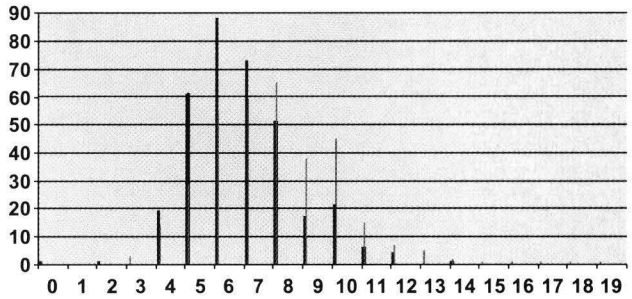


Fig. 4.12. Thickness of the rim (grey) and the wall (black) in Finnish Textile ceramics.

4.4. Decoration

Decoration is an even more important factor than shape in characterising ceramic types because it represents the personal decoration code of the potter. Still, many problems are related to finding, choosing and coding attributes for multivariate analysis. Understanding or deciding which attributes are essential or unessential in decoration is a complicated problem, which does not have an unambiguous solution. Decoration has been carried out in innumerable different ways following different rules or principles. These rules create a tradition, a style.

Jüri Kokkonen (1978) applied for the first time taxonomic principles and clustering methods in Finnish archaeology when carrying out a classification of Neolithic ceramics. Kokkonen (1978:35) has defined an ornamentation element as a single imprint or mark on a vessel surface, the repetition or combination of which forms motifs of the ornamentation. In coding an element is equal to an attribute. It can be made e.g. with the end of a bone or a wooden stick. Motifs (or design) have been carried out by repeating the same element or by uniting

them into combinations of elements. Kokkonen divided motifs into two separate groups: a linear reiteration design (lineaarinen toistoaihe) and a pattern design (kuvioaihe) (Kokkonen 1978:39). Carpelan (1965:fig. 3) divided elements into three categories: impressed ornaments (painokoristeet), drawn ornaments (piirtokoristet) and embossed ornaments (kohokoristeet). These main groups can be further divided into subgroups. Carpelan's main division is used as the first criterion in the hierarchical system of ornamentation elements in this study. Also classifications suggested by Leena Ruonavaara (1988) and Mirja Koskimies (1968) are used.

In this study 6 variables and 83 attributes (Figs. 4.13.–4.18.) were used in characterising the ornamentation of the rim and the body. All variables are dichotomous, which causes the number of attributes to become very large. For instance, a variable reflecting the element of ornamentation in the body has 36 dichotomous attributes – small spot, large spot, short comb stamp etc. – which either exist or do not exist in the decoration. The ceramic analysis shows that most often only one element has been used in the ornamentation of Textile ceramics. Because more than three elements very seldom exist in one vessel, only the three most important ones were coded.

An element is the smallest unit of ornamentation. It can be a point, stamp, line etc., which has been made *without lifting an implement from the surface* of a material. For instance, a small stick, which has been moved to another position by lifting it, is an implement for a zigzag ornament. A zigzag ornament can also be made by drawing, in which case the element is continuous. This example shows that defining an element is sometimes problematic. 9 attributes (elements) describe the basic ornamentation (Fig. 4.13.) of the rim (Rea-Rem) and 36 attributes (Fig. 4.15.) have been reserved for the body description (Kea-Keah).

The number of elements is small in relation to the number of possible motifs (Pankrushev 1978b: App. 2). In Textile ceramics motifs are simple and very often involve only one element. A row of pits or a zone of cord-impressions serve as examples of motifs. The number of rim motifs is 7 (Raa-Rag) (Fig. 4.14.) and body motifs 12 (Kya-Kyl) (Fig. 4.16.). One can see that in many cases elements correlate with each other. The dependence can also be a problem in statistical analysis. These problems are thoroughly discussed together with the interpretation of the results of factor analysis.

In this study a design means combinations of motifs and thus they are on a more general and abstract level than motifs. The same design can be made with different combinations of motifs and elements. It is also normal that one vessel can have several designs.

In the following chapters one coded version of the design in Finnish Textile ceramics is presented. The decoration of rims and walls is presented separately.

The description of decoration often needs much verbalisation. Because of the large amount of material (vessels) the mechanistic description of data is avoided and the main emphasis is on discussing observations together with statistical conclusions or on interpreting factors. Coding is difficult to carry out in such a manner that all relevant information is preserved: coding always simplifies data. An example of coding a comb stamp illustrates this difficulty. On a very general level of information the only important thing to know, is whether or not we have a comb stamp in a particular ceramic sherd. More often the situation is, however, that we want to know whether the comb stamp is the same in Textile ceramics and in Late Combed Ware. We can try to improve our classification by seeking the method or implement used for impressing stamps, but very soon the number of possibilities becomes too large to handle.

Simplifying data into a few attributes is more serious. Simplification takes place in several phases of the study process. The first phase is choosing the variables and the second phase is coding the observations into attributes. In practice, the number of attributes has to be small enough to condense the information, but it cannot be too small because the diversity of details, which is essential for obtaining good results is easily lost. The third problem is irrelevant attributes. All attributes have to be coded in the same way in order to obtain comparable information even though they do not occur in a sherd.

A basic difficulty is that the study material itself is fragmentary. An archaeologist has a whole ceramic vessel at his disposal only in extremely few cases. The normal situation is a large number of sherds of different sizes and states of preservation, perhaps hundreds of sherds belonging to one vessel unit. The Finnish ceramic material excavated from dwelling sites is usually not very rich: therefore only seldom is the number of sherds of Textile ceramics in the vessel unit more than 20.

4.4.1. Rim

In the following the ornamentation of the rim is presented on the basis of statistics. Rim is defined here as the mouth of a vessel, the surface transverse to the body. The rim is very often ornamented. Ornamentation is described here through elements and motifs. More complex figures, such as designs, were not separated.

4.4.1.1. Elements

Elements of ornamentation of the rim in Textile ceramics in Finland and the Karelian Isthmus are coded in Figure 4.13. More than half of the vessels has decoration on the rim. Decoration is simple. The special characteristic of Textile ceramics is the use of small points in making small spots, which are reminiscent of ornaments made with comb stamps. The difference is that in Textile ceramics every spot has been separately impressed with the end of a point or a stick.

Comb stamps are also common elements of ornamentation and they are sometimes difficult to discern from the ornamentation consisting of spots. Notches and nail-impressions sometimes occur but other elements are infrequent.

Ornamentation elements of the rim	Drawing of an element	Number and (%) of elements
0 not ornamented		152 (44.3 %)
1 spot		94 (49.2 %)
2 comb stamp		77 (40.3 %)
3 small pit		1 (0.5 %)
4 large pit		3 (1.6 %)
5 notch		5 (2.7 %)
6 nail-impression		7 (3.7 %)
7 ring-impression		0 (0 %)
8 sharp line		2 (1.0 %)
9 blunt line		2 (1.0 %)
Decorated		191 (55.7 %)
Total		343 (100.0 %)

Fig. 4.13. Elements of rim decoration in Finnish Textile ceramics.

Ornamentation motifs of the rim	Drawing of a motif	Number and (%) of motifs[3]
0 not ornamented		157 (45.8 %)
1 leaning to the right		87 (46.8 %)
2 leaning to the left		55 (29.6 %)
3 straight (cross to rim)		3 (1.6 %)
4 along the rim		6 (3.2 %)
5 zigzag		25 (13.4 %)
6 line along the rim		1 (0.5 %)
7 cross-figure		9 (4.9 %)
Decorated		186 (54.2 %)
Total		343 (100.0 %)

Fig. 4.14. Motifs of rim ornamentation in Finnish Textile ceramics.

4.4.1.2. Motifs

A motif is a unit of ornamentation, which had been carried out by using one element or combining two or more elements together. In rims, where the number of elements is small, motifs consist practically always of only one element. Therefore motifs are also simple and their classification is easy. Ornamentation motifs found on rims of Textile ceramics in Finland and the Karelian Isthmus are presented in Figure 4.14.

The most typical motifs are zones of comb stamps or a line made of small points leaning to the right (Fig. 4.14.), although small points leaning to the left are also relatively frequent. Often these stamps or point lines form a dense ornamentation zone that covers the whole rim. A peculiar – although not very frequent – motif in Textile ceramics is a cross-figure, which has usually been made with comb stamps. The use of small points or spots in decoration is also peculiar. Although many motifs are roughly similar to those used already in Neolithic ceramics, there are also clear differences between them. The most conspicuous difference is the use of spots instead of comb stamp. Ornamentation is also not as dense as in Neolithic vessels, a feature that is, however, difficult to describe and code. Only experience helps in finding these minor differences.

4.4.2. Body

The ornamentation of the vessel body is also divided into elements and motifs in the same way as the decoration of the rim. In addition to this ten groups of designs were also separated.

4.4.2.1. Elements

The elements of ornamentation of Textile ceramics have much in common with Combed Ware, so much that sometimes these types are difficult to discern from each other by virtue of ornamentation only. However, there are also several new elements and motifs in the ornamentation of Textile ceramics. The classification applied in the table (Fig. 4.16.) involves 36 elements. The classification of elements is hierarchical, although in the data matrix every attribute is equal in value. For instance, four different kinds of comb stamps (3–6) belong to the main group of *comb stamps*. Detailed distinction is needed when trying to find out geographical or even chronological differences in the material.

Ornaments are presented in three groups according to their order of importance. For instance, the element presented in the first group (I) refers to the most prominent element in the ornamentation. Groups II and III describe the secondary elements. Because there often exists only one element in the ornamentation, groups II and III remain empty (Fig. 4.15.).

[3] The larger number of vessels without motifs in relation to elements is due to fragmentary and poorly preserved rims; although it was possible to separate one element the separation of a motif was not possible.

Ornamentation elements of the body	Drawn ornament	Group I number and (%) of elements	Group II number and (%) of elements	Group III number and (%) of elements
0 not ornamented		29 (8.5 %)	203 (59.2 %)	319 (93.0 %)
1 small spot		126 (40.1 %)	3 (2.1 %)	1 (4.2 %)
2 large spot		19 (6.1 %)	8 (5.7 %)	1 (4.2 %)
3 short comb stamp		12 (3.8 %)	4 (2.9 %)	1 (4.2 %)
4 long comb stamp		48 (15.3 %)	7 (5.0 %)	0 (0.0 %)
5 deep short comb stamp		3 (1.0 %)	1 (0.7 %)	0 (0.0 %)
6 deep long comb stamp		4 (1.3 %)	0 (0.0 %)	0 (0.0 %)
7 bone impression		7 (2.2 %)	0 (0.0 %)	0 (0.0 %)
8 chain impression		3 (1.0 %)	1 (0.7 %)	0 (0.0 %)
9 barb		2 (0.6 %)	0 (0.0 %)	0 (0.0 %)
10 leaflet		0 (0.0 %)	0 (0.0 %)	0 (0.0 %)
11 small pit, round		16 (5.1%)	20 (14.3 %)	5 (20.8 %)
12 small pit, flat		7 (2.2 %)	34 (24.3 %)	4 (16.7 %)
13 small pit, conical		0 (0.0 %)	3 (2.1 %)	0 (0.0 %)
14 pit, round		17 (5.4 %)	19 (13.6 %)	0 (0.0 %)
15 pit, flat		5 (1.6 %)	12 (8.6 %)	4 (16.7 %)
16 pit, conical		7 (2.2 %)	2 (1.4 %)	0 (0.0 %)
17 notch, short		13 (4.1 %)	9 (6.4 %)	2 (8.3 %)
18 notch, long		8 (2.5%)	0 (0.0 %)	0 (0.0 %)
19 nail-impression, short		1 (0.3 %)	0 (0.0 %)	0 (0.0 %)
20 nail-impression, long		0 (0.0 %)	0 (0.0 %)	0 (0.0 %)
21 ring-impression		0 (0.0 %)	0 (0.0 %)	3 (12.5 %)
22 fish-bone-impression		1 (0.3 %)	1 (0.7 %)	0 (0.0 %)
23 D- or C-impression		0 (0.0 %)	1 (0.7 %)	0 (0.0 %)
24 I-, II- or L-impression		0 (0.0 %)	0 (0.0 %)	0 (0.0 %)

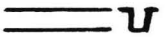
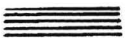
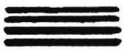
Ornamentation elements of the body	Drawn ornament	Group I number and (%) of elements	Group II number and (%) of elements	Group III number and (%) of elements
25 notched line		4 (1.3 %)	0 (0.0 %)	0 (0.0 %)
26 twisted-cord-impression		0 (0.0%)	0 (0.0 %)	0 (0.0 %)
27 corded-impression		2 (0.6 %)	0 (0.0 %)	0 (0.0 %)
28 line, drawn with a sharp implement		2 (0.6 %)	7 (5.0 %)	1 (4.2 %)
29 line, drawn with a blunt implement		3 (1.0 %)	5 (3.6 %)	0 (0.0 %)
30 groove, round-bottomed		3 (1.0 %)	0 (0.0 %)	1 (4.2 %)
31 groove, flat-bottomed		0 (0.0 %)	0 (0.0 %)	1 (4.2 %)
32 grooved with a sharp comb		0 (0.0 %)	1 (0.7 %)	0 (0.0 %)
33 grooved with a blunt comb		0 (0.0 %)	0 (0.0 %)	0 (0.0 %)
34 embossed line, narrow		0 (0.0 %)	0 (0.0 %)	0 (0.0 %)
35 embossed line, broad		0 (0.0 %)	0 (0.0 %)	0 (0.0 %)
36 oval-impression		1 (0.3 %)	2 (1.4 %)	0 (0.0 %)
Total (decorated)		314 (91.5 %)	140 (40.8 %)	24 (7.0 %)

Fig. 4.15. Elements of wall ornamentation in Textile ceramics in Finland and the Karelian Isthmus.[4]

The most common decoration elements on walls are small pits, which were very likely made with the same implements used in decorating rims. Typical are also long comb stamps or impressions reminiscent of comb stamps. Normally they are combined with different kinds of pits. When comparing these elements with Neolithic Combed Ware one can see many similarities. The size and the depth of impressions differ: these elements are clearly smaller in Textile ceramics than in Neolithic pottery. Also the pits differ strikingly in size from the Neolithic ones. It is also still worth mentioning that different kinds of drawn ornaments – horizontal lines and grooves – may occur, although they do not usually play an important role in decoration. The decoration of Textile ceramics is often monotonous.

4.4.2.2. Motifs

In many cases motifs of ornamentation are only rows or lines of elements without a complicated structure. This is because ornamentation in Textile ceramics is usually simple and scant. Motifs in their simplest form are shown in the following table (Fig. 4.16.).

Lines of spots and comb stamps are the most typical ornamentation motifs in Finnish Textile ceramics. They have usually been impressed in an oblique position turning to the right or the left; a feature, which is also typical in Neolithic Combed Ware. There are still important differences. In Textile ceramics comb stamps can also be vertical and horizontal. Attention should be paid also to the large percentage of zones or lines of spots. The size of pits becomes considerably smaller when moving from the Neolithic to the Early Metal Period. This may be partly explained by the smaller size of vessels. One should not forget either that the ornamentation occurs in Textile ceramics only in the upper part of the vessel.

Also different kinds of stamp ornaments occur. The existence of twisted-cord-impression is an interesting detail, which seems to be concentrated in the Karelian

[4] There are also such elements in the table, which do not exist in Textile ceramics. This is because a large amount of comparison material includes ceramics from the Late Neolithic, the Bronze Age or the Early Metal Period. These were left out of the analysis of Textile ceramics, but the original coding system was preserved.

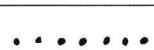
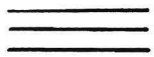
Ornamentation motifs of the wall	Drawn ornament	Group I number and (%) of motifs	Group II number number and (%) of motifs	Group III number number and (%) of motifs
0 no motif		28 (8.2 %)	202 (58.9 %)	317 (92.4 %)
1 row of spots		133 (42.3 %)	9 (6.4 %)	0 (0.0 %)
2 row of comb stamps		82 (26.0 %)	12 (8.5 %)	1 (4.0 %)
3 row of pits		55 (17.5 %)	88 (62.4 %)	8 (32.0 %)
4 row of stamps		34 (10.9 %)	13 (9.2 %)	5 (20.0 %)
5 row of corded-impressions		2 (0.6 %)	0 (0.0 %)	0 (0.0 %)
6 angled line		2 (0.6 %)	0 (0.0 %)	0 (0.0 %)
7 zone of straight lines		2 (0.6 %)	8 (5.7 %)	1 (4.0 %)
8 horizontal furrow		1 (0.3 %)	3 (2.1 %)	1 (4.0 %)
9 horizontal stave		2 (0.6 %)	1 (0.7 %)	0 (0.0 %)
10 embossed lines		0 (0.0 %)	0 (0.0 %)	0 (0.0 %)
11 finger furrows		1 (0.3 %)	0 (0.0 %)	0 (0.0 %)
12 inside ornamentation		1 (0.3 %)	6 (4.3 %)	9 (36.0 %)
Total		315 (91.8 %)	140 (41.1 %)	25 (7.6 %)

Fig. 4.16. Motifs of wall ornamentation in Textile ceramics in Finland and the Karelian Isthmus.

Isthmus. Using this ornamentation C. F. Meinander discovered a new ceramic type, Kalmistonmäki ceramics.

Drawn ornaments represent a new type of motifs in the ceramics in eastern Finland. Still they were used only seldom. For instance, a zone of drawn lines is a central motif in Luukonsaari ceramics. Zones of drawn lines in Textile ceramics are still easy to discern from those in Luukonsaari ceramics.

4.4.2.3. Design types

Design types represent combinations of motifs. They either form real abstract, peculiar figures such as framed-frieze or they express practically the same information, which already exists in a motif. An example of the latter is a pit zone.

Motifs are classified into ten groups (Fig. 4.17.). In the table, the number of observations (533) is higher than the number of Textile ceramic vessels in the basic study material (343). This is due to the fact that the one and the same vessel can have more than one design type in its ornamentation. For instance, ornamentation can include both pit zones and oblique zigzag lines. In the earlier tables this problem does not occur, because in coding these ornaments were divided into three different groups (I, II and III).

Figure 4.17. draws together common ornamentation groups in Finnish Textile ceramics. The most typical are horizontal pit zones (4). Typical are also oblique lines (1) and oblique zigzag lines (2). These ornamentation groups can be found already in the Neolithic ceramic traditions. New features have different sorts of horizontal drawn line zones (5), vertical zones (7), net-figures (9) and first of all framed-frieze ornamentation (8). However horizontal zones and framed-frieze belong first of all to the Sär 2 tradition. In this group also lines consisting of spots which are different than in the subgroups of Sär 2 are included. The ornamentation is further discussed from a cultural-historical point of view together with other ceramic types relating to Textile ceramics (chapters V and VII).

The photographs of Textile ceramics are presented in tables 1–25 in Appendix 10. The tables are arranged in geographical order. The number of vessels in Appendix 10 was restricted for practical reasons and it was possible to show only the most essential ornamentation com-

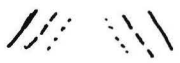
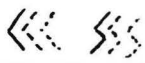
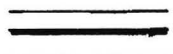
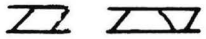
Ornamentation design of the body	Drawn ornament	Number of cases and (%) of motifs
0 no motif		8 (2.3 %)
1 oblique lines		80 (15.2 %)
2 oblique zigzag lines		53 (10.1 %)
3 oblique lines with pits		6 (1.1 %)
4 pit zones		156 (29.7 %)
5 horizontal drawn lines		95 (18.2 %)
6 horizontal zigzag zones		10 (1.9 %)
7 vertical zones		32 (6.1 %)
8 framed-frieze		54 (10.3 %)
9 net-figures		19 (3.6 %)
10 horizontal and vertical zones		20 (3.8 %)
Total (number of obs.)		533 (100 %)

Fig. 4.17. Design groups of Textile ceramics in Finland and the Karelian Isthmus.

binations and details. The number of photographs used in visual comparison was manyfold: in principle, all vessels of Textile ceramics, which have observable ornamentation, are documented on film.

4.4.2.4. Density of ornamentation

The density of ornamentation is an attribute, which characterises the relationship between an ornamented and an unornamented surface. Here it is described using an interval scale.

All the characteristics represented in Figure 4.18. were discerned without any measurements. This is because reliable measurements of the density of ornamentation would have needed a more homogeneous base material and larger ceramic sherds. Even when keeping in mind these defects, Figure 4.18. still shows that Finnish Textile ceramics were moderately or densely ornamented. This may seem to be an unexpected result. It must be remembered that here the ornamentation is first and foremost compared between the rim sherds and ornamentation has been made only on the upper part of the vessel. If the whole vessel were used as a comparison material the density of ornamentation would be much sparser.

Density of ornamentation	Number of vessels
0 undecorated	35 (10.2 %)
1 slight decoration	51 (14.9 %)
2 spacious decoration	41 (12.0 %)
3 moderate decoration	87 (25.3 %)
4 dense decoration	107 (31.2 %)
5 very dense decoration	22 (6.4 %)
Total	343 (100.0 %)

Fig. 4.18. Density of ornamentation of Textile ceramics in Finland and the Karelian Isthmus.

4.4.2.5. Implements of decoration

The decoration of ceramics often combines both artistic and practical aims. In many cases the latter may have played an even more important role than the first. On many occasions it has been suggested that deep, large pits in Combed Ware served as air channels during firing.

Different kinds of implements – knives, axes, burins, points, cords etc. – were certainly used. These implements were made of stones, wood and bones. But even more important were probably implements made of root, bast, bark and reed. These organic materials are available everywhere in nature and they do not need very much preparation before use. These materials are needed when making cord, braiding, wickerwork etc.

No implements, which were used in carrying out ornamentation, are preserved in the same context with Finnish Textile ceramics. They have still sometimes been documented together with Neolithic ceramics: e.g. stone stamps with several teeth were found in recent excavations of Sätös in Outokumpu (Karjalainen, pers. comm. 15.10.1998).

It should be mentioned that it is possible that examples of some design types can be found from sewn implements. When looking more carefully at the vessels made of root and bast in Siberian Textile ceramics one easily notices certain points in common with the ornamentation found in ceramics. Glushkov and Glushkova (1992:91) have separated three main types of ornamentation, which can be carried out by braiding. The groups are: 1) oblique lines of horizontal stitch, 2) oblique lines of vertical stitch, and 3) horizontal lines of oblique stitch.

Twigs are laid in an order: 1) two up, one down, two up, or 2) two up, two down, two up. By following this kind of system either horizontal or oblique relief turning to the right or the left can be made. The angle or steepness of oblique lines can be, in principle, varied by a different order in braiding. Still there do not exist a large number of possibilities for variation. The third type, the "braided tiles", represents a case where lines are piled on top of each other forming a step-like structure (Glushkov & Glushkova 1992:91–92, figs. 48–3,6).

Many points in common with sewn vessels can also be found in the ornamentation of Finnish Textile ceramics. Particularly evident are the vessels from

Suomussalmi with horizontal and vertical lines consisting of small spots. Also oblique, right or left turning lines of comb stamps resemble this kind of sewn ornamentation (Appendix 10). The impression that the decoration of vessels was copied from wooden, reed, braid or textile cups becomes evident when looking at the regular setting of small pits and spots or framed-frieze ornamentation, where horizontal lines are drawn together by oblique lines. This has necessarily nothing to do with technique, but it simply tries to give an impression of a vessel, which is kept solid by a virtual system of cords and sewn zones.

V MULTIVARIABLE ANALYSIS OF TEXTILE CERAMICS IN FINLAND

5.1. Introduction

The preceding parts of this study concentrated on analysing attributes of technology, shape and decoration, which are the basis for coding and arranging ceramics. In this chapter the information contained in attributes is compressed through multivariable analysis into factor loadings. This heuristic information is the basis for separating the second level entities – groups, types and styles – that holds a key position in archaeological reasoning. In the third level this information is used in separating individuals and groups behind ceramics.

The scientific archaeology at the end of the 1800's adopted an evolutionary idea, which saw the development of artefact types as an analogous process to separating new species in biology (Montelius 1903). Archaeological types were seen analogous to species with their development and fall in the past.[1] Like living organisms also artefact types were assumed to have a course of life, which was possible to be revealed as the result of careful analytical studies.

Although typology today is not interpreted in the Darwinian manner, the assumption of the birth, development and disappearance of types has still maintained its important position in archaeological thought (Clarke 1968). Early analyses of prehistoric ceramics were mostly interested in two basic aims: the description of types and the study of the technological achievements of ancient civilisations (Watson 1977:381). From these studies the focus of interest has proceeded to a non-quantitative analysis of shape and decoration of ceramics and to obtain information about styles and relationships between the people who made the ceramics.

The methodology of separating types has developed in many ways but the main purpose of the analysis has remained the same. One general tendency grows from the art historical, Gestalt-approach, which has given way to detailed statistical comparisons with a precise measurement of attributes of decoration and technology (Watson 1977:383). Together with this development the emphasis has been directed more and more to the attempts to study the social and organisational patterning of social groups on the basis of these analyses (Longacre 1968). Although archaeologists have separated cultures from the beginning of the typological method, no archaeologist today assumes that cultural information can be read straight from the typology.

While the analysis of attributes in ceramics has proceeded towards a more and more detailed investigation, the theoretical basis of interpretation of ceramic types has also radically changed (see Carr 1995a; Carr & Neitzel 1995a; Roe 1995a). The positivistic approach of New Archaeology has given way to the reading of ceramics from many other viewpoints. The ethnoarchaeological approach has also brought new ideas and question framing to the study (Hodder 1982b; Arnold 1993). These questions are thoroughly discussed together with the concept of style.

Despite some general tendencies in the methodology of archaeology, some general features in typology have remained the same throughout the century. An archaeologist aims to focus his attention on culturally significant aspects of artefacts by grouping entities involving similar traits, although pottery classes often fail to separate the cultural aspects from less significant details (Rouse 1970:93; see also Shepard 1956:97–100). Rouse also finds it problematic that the term *type* has been used loosely. He has propagated the concept of style instead of type. In addition to this he has defined an extra concept, the mode (Rouse 1970:93). While type refers to a certain kind of pottery, mode refers to material, technique, shape or design, which occurs in the pottery (Rouse 1970:91). Rouse considers types and modes to be abstractions of classes. A type consists of diagnostic attributes, which distinguish one artefact class from another. A mode consists of diagnostic attributes, which distinguish one aspect, e.g., the rim profile of the ceramic vessel, from the same aspect in another class of artefact (Rouse 1970:92).

To simplify the problem in this work the neutral concept of classification is used in the first phase of analysis. This was done to try to avoid cultural additional meanings which typology brings with it, but also to try to carry out classification itself before making cultural-historical interpretations. The analysis begins with existing ceramic groups such as Textile ceramics (Sarsa-Tomitsa ceramics) and proceeds to test whether these types – in the light of contemporary material and infor-

[1] Compare the method of seriation, which was carried out as a context or a frequence seriation (Renfrew & Bahn 1996).

mation – are still valid or should they be connected with some other types or divided into smaller geographical or chronological entities. The study also discusses the neighbouring ceramic groups of Textile ceramics and tries to define their position with Textile ceramics.

This chapter presents classifications of ceramics through multivariable statistics using factor analysis. Although statistical analysis is always the beginning of the separation, this does not mean that interpretation is made only through this information. Factor analysis aims to separate correlating attributes. The second step is to explain why factor analysis gives the results it does. It is a detailed separation of the most important variables in different factors and explaining whether they correlate with already existing types, subtypes, geographical areas, chronology etc.

One should not forget that the purpose of this chapter is not to carry out a mechanical statistical multivariable analysis. Studying ceramic typology aims to separate styles in different geographical areas or during different time periods, to observe differences between attributes and to try to interpret them in the light of the archaeological information available. This is an interpretation that can use statistical multivariable analysis but which is still based more on the archaeologist's ability to separate essential variables and to explain their relationship with cultural phenomena.

The analysis proceeds in such a way that after conducting a large multivariable analysis and comparison between different ceramic types, some preliminary interpretations of the types and their most important features is presented. In this connection also factors and factor loadings are critically examined and compared with other statistical information of the variables in ceramics. Differences are explained by referring to geological, topographical, chronological and cultural reasons. These interpretations are further developed in connection with a large-scale analysis of the Early Metal Period in Finland and on the Karelian Isthmus; a culture (or cultures), which have usually been separated on the basis of ceramic typology.

5.2. Question framing for statistical analysis and comparison of ceramics

Three aims are posed for the statistical classifications in this study. The first is to analyse Textile ceramics from Finland and the Karelian Isthmus as a large entity and to test the validity of the hypotheses presented on its subdivisions. These hypotheses concern, for instance, the possible existence and characteristics of Sarsa and Tomitsa ceramics. The assumption is that the watersheds, large end moraines (the Salpausselkä formation) or the development of new outlet channels (the formation of the River Vuoksi) may have had an effect on the spread of influences in styles. Further, more detailed local analyses were carried out when looking for differences inside large water systems. It was also possible to conduct detailed studies of the ceramics between dwelling sites or even between individual vessels.

The second aim is to locate Textile ceramics among the other Late Neolithic and Early Metal Period ceramic types. The study tries to show which ceramic types come typologically close to each other and which might also have cultural-historical connections. In this analysis multivariable statistics plays only a secondary role, the main emphasis being in understanding continuity and discontinuity of tradition.

The third aim is to develop methods, which aim to connect statistical procedures with the traditional archaeological analysis of ceramics. This means making a typology by finding essential features in ceramics and separating them from unessential or secondary ones. In this work the practical separation was carried out through factor analysis although also many other statistical procedures could have been used. Source criticism is of particular importance in this work, because by relying only on statistical information it is very easy to draw far-going interpretations, whose validity and reliability is very poor. Statistical analysis has to be controlled all the time by other means. In this work this takes place through a continuous discussion and testing of hypotheses from other viewpoints. In addition to this, the study takes into account other information – not only that suggested by archaeologists - in particular when making interpretations of social and cultural relationships. This is because analysing ceramics itself gives too narrow a view of cultural phenomena, therefore, many other aspects are added for discussion in the last chapters of this study.

5.3. Methodology of multivariable analysis of Textile ceramics

The preceding chapters (III and IV) gave a detailed description of different attributes of ceramics. This information is used in the factor analysis – the first step in discerning ceramic types from each other. The types separated by factor analysis are hypothetical and their possible existence is discussed further by comparing them chorologically and chronologically. The essential attributes or features in ceramics are also looked for by comparing the hypothetical types with the existing ones. Also observations that are not possible to code into attributes and intuitive characteristics of ceramics are essential when sorting out the unessential features of Textile ceramics from the essential ones. This procedure is just a phenomenological analysis of Textile ceramics. The purpose is to (re-) construct the manner of making Textile ceramics and its different subtypes.

The statistical analysis takes into account only those vessels, from which all attributes could be coded. Therefore, also other observations had to be added into the dis-

cussion. Basically the analysis is comparing partial materials with each other. For instance, Textile ceramics from different water systems were compared with each other or they were compared with other types, e.g. Luukonsaari ceramics. This aims to discover details of features in ceramics and to continuously check whether the existing ceramic types can really be discerned from each other.

In this work the multivariable statistical analysis was made by factor analysis only. This is because typological analysis aims at to find tendencies and also faint features correlating with each other. While cluster analysis separates individual vessels from each other, factor analysis uncovers attributes and their correlation: it emphasises more the types instead of individual vessels. Because this study concentrates on attributes, types and styles, this is more important than the vessels themselves.

Factor analysis also separates the essential attributes from the unessential ones. The values of attributes, which do not appear even once in the analysis, were excluded when calculating the correlations between attributes. Also constant variables (exist always in the type) were omitted in the factor analysis because they do not bring new information into the analysis, although they are, naturally, important when characterising the type or style as a whole. The number of variables and attributes used in each analysis varies depending on the geographical area, the number of vessels, the characteristics of the types (if there exist, for instance, Textile ceramics and Luukonsaari ceramics only from Saimaa) and the question (for instance, when comparing certain ceramic types).

Normally, the maximum number of attributes was used in the analysis. Because of the large number of attributes (251) sometimes only a part of them was included in the comparison. In these cases it is sometimes also difficult to decide which attributes are worth including and which are of secondary importance. Most attributes are dichotomous and they characterise the elements of shape and ornamentation. The number of variables is so high because the ordinal scale observations were divided into dichotomous (0–1) attributes. This means, for example, that variable K1 (see Fig. 4.16. is divided into 36 dichotomous attributes (Ke10, Ke1a, Ke1b...). One basic assumption is that no more than three different *elements of ornamentation* were separated from one vessel. There are a small number of exceptions but they do not alter the main picture much. For this reason and to keep the number of variables small enough to handle, the number of *elements of ornamentation* is only three (K1, K2 and K3). Before conducting the factor analysis the variables from K2 and K3 were copied into K1 in order to simplify the practical calculations (for instance, Ke2a to Ke1a and Ke3ö to Ke1ö). This means that there is no hierarchy, or degree of importance, between the elements of ornamentation in the factor analysis.

A statistical difficulty lies in the linear dependence of the attributes. This problem arises from the assumptions of the analysis where for instance ornamentation is presented as elements (K1, K2, K3), motifs (KY1, KY2 and KY3) and ornamentation types (Design groups 1–10, Fig. 4.17.). The effect of linear dependence causes high correlations between certain elements and motifs, which means that clustering of some ceramic types also rises, although this does not suit the intuitive idea of their closeness. This emerges particularly in such types in which the ornamentation is simple and monotonous. Fortunately the problem is not very prominent in Finnish Textile ceramics because its ornamentation varies. Still some factors in the factor analysis show a very high dependence.

The factor analysis was carried out by the SURVO program package developed by Professor Seppo Mustonen at the Department of Statistics, University of Helsinki (Mustonen 1992; 1995). Mustonen shows using several examples that the classical criticism against factor analysis concerning its inaccuracy and unavailability for solving statistical problems is often not valid (Mustonen 1995:106–112). Often the problem is that the "faint signals cannot be discerned from background if the number of samples is small" (Mustonen 1995:112). After a discussion with the statistician Dr Kimmo Vehkaranta,[2] factor analysis was chosen as the analysis method for ceramics. One more reason for this was that factor analysis can discern hidden attributes which do not arise easily out of the material but which may still be of decisive importance for the typology.

The analysis begins with calculating correlations and factor loadings for the ceramics. Usually it was possible to calculate three or four factors. Interpretation of the factors begins with separating the factor loadings greater than 0.30. Because factor loadings are usually low, also less prominent factor loadings ($0.15<x<0.3$) were sometimes separated. Still more important was the plotting of vessels or all of the material belonging to one type from the dwelling sites into the XY-table. The tables illustrate scatter plots of single vessels, but in those cases where the number of vessels is large, the information was condensed by calculating a mean for each ceramic attribute in each dwelling site involving this ceramic type. When elucidating large-scale phenomena (for instance the whole of Textile ceramics) only those dwelling sites involving more than 5 vessels belonging to the ceramic type under investigation were usually used. This was made firstly in trying to make scatter plots readable and secondly to eliminate the possible effect of a random sample, which may change the mean value of ceramics considerably.

[2] I would like to express my deepest gratitude to Dr Kimmo Vehkaranta for his help in many problems in using the SURVO program and in discussing the practical problems relating to the factor analysis.

5.4. Textile ceramics among Late Neolithic and Early Metal Period ceramics in Finland

The appearance of Textile ceramics is the most important sign of the beginning of the Early Metal Period, the phenomenon, which is synchronous with the beginning of the Bronze Age in Southwest and South Finland. Because it represents a profound stylistic change it is natural to interpret it as a phase of discontinuity in the culture also. Late Neolithic types, Corded Ware, Kiukainen type and Pöljä-Jysmä ceramics have to be taken into account when trying to understand the roots of Textile ceramics, but also the end of the period between ca. 500–1 BC has to be discussed. This late context is characterised in the southern part of Finland by Morby ceramics and in northern Finland by subgroups of Sär 2 ceramics.

The statistical analysis begins with separating Early Metal Period ceramics from Late Neolithic asbestos ceramics. Although a large number of factor analyses were calculated to obtain heuristic information, for practical reasons in the following figures only the most important factor plots are presented. These plots are intended to characterise the general characteristics.

The first analysis was calculated for observations made from 861 vessels. It includes vessels of several ceramic types ranging from Kierikki ceramics to Sär 2 types. Because the loadings of the first factor are almost constant it was omitted. Instead, factors F2, F3 and F4 are more informative. A factor plot F3/F4 (Fig. 5.1.) shows interesting clusters. All vessels of the Sär 2 group or of Late Neolithic ceramics are concentrated in relatively dense clusters but Textile ceramics shows a very open scatter. Still one should not draw too far-reaching conclusions about this, because the material at hand is very large and it comes from a large geographical area. It is interesting, however, that Textile ceramics seems to correlate with both Late Neolithic and Early Metal Period types.

Figure 5.1. contains much information that is practical when condensed in some ways. Interesting results can be obtained from the plot where mean factors were calculated for every ceramic type. A plot F2/F3 (Fig. 5.2.) separates Textile ceramics into a type of its own but still to the same side of the figure together with the Sär 2 types and Lovozero ceramics referring to a kind of northern connection. Late Neolithic types together with Asbestos ceramics are in the left side of the figure.

The plot F3/F4 is also very interesting, because it now puts Textile ceramics on the other side of the figure, close to the ceramic types in South Finland (Fig. 5.3.). One possible interpretation for this is that there exists two types of Textile ceramics with two origins – the one (Tomitsa) which comes close to the northern types and Sär 2, and the other one (Sarsa) which comes close to the southern ceramic types.

The next step is to investigate with a more detailed analysis whether any geographical clustering in the material exists. The division of Finnish Textile ceramics by

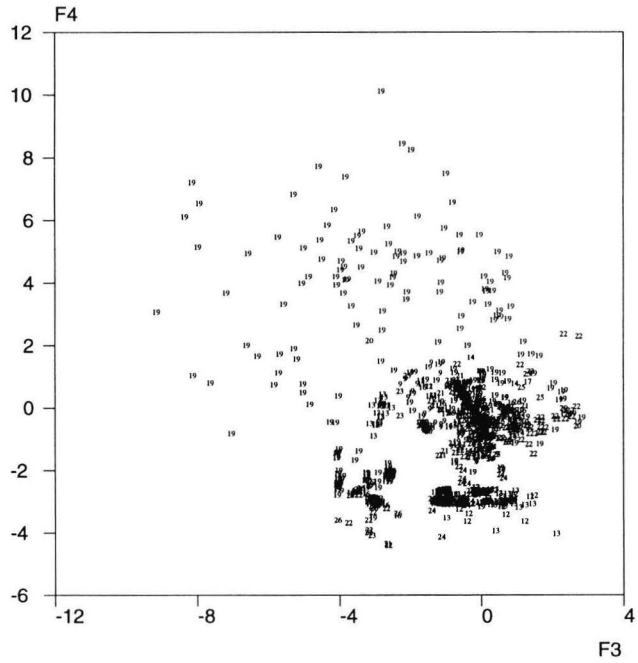


Fig. 5.1. Late Neolithic, Bronze Age and Early Metal Period ceramic types in single factor plots F3/F4 in Finland and the Karelian Isthmus. Legend: 9 – Organic-tempered ceramics, 10 – Kierikki ceramics, 11 – Pöljä ceramics, 12 – Corded Ware, 13 – Kiukainen ceramics, 14 – Lovozero ceramics, 15 – Jysmä ceramics, 16 – Late Neolithic ceramics, 17 – Final Neolithic ceramics, 18 – Imitated Textile ceramics, 19 – Textile ceramics, 20 – Anttila ceramics, 21 – Kjelmøy ceramics, 22 – Luukonsaari ceramics, 23 – Sirnihta ceramics, 24 – Bronze Age ceramics, 25 – Undefined Säräisniemi 2 ceramics, 26 – Early Metal Period ceramics.

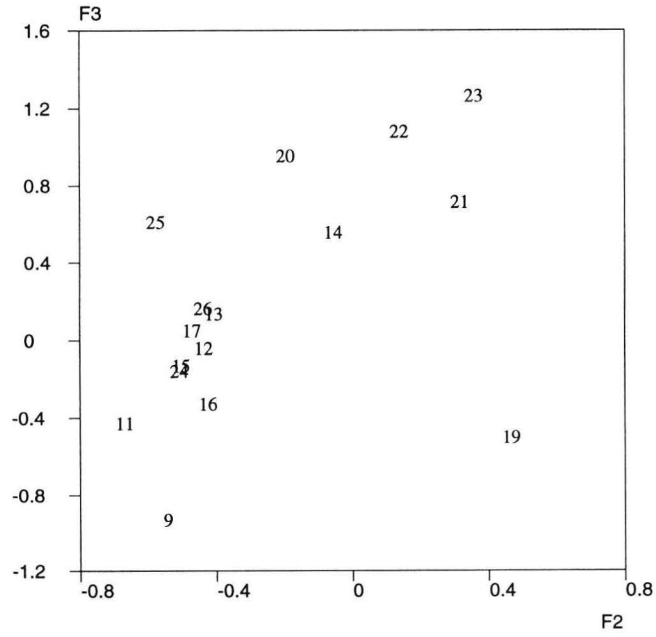


Fig. 5.2. Late Neolithic, Bronze Age and Early Metal Period ceramic types in single plots F2/F3 in Finland and the Karelian Isthmus. Combined means of attributes of ceramic types. Legend: 9 – Organic-tempered ceramics, 10 – Kierikki ceramics, 11 – Pöljä ceramics, 12 – Corded Ware, 13 – Kiukainen ceramics, 14 – Lovozero ceramics, 15 – Jysmä ceramics, 16 – Late Neolithic ceramics, 17 – Final Neolithic ceramics, 18 – Imitated Textile ceramics, 19 – Textile ceramics, 20 – Anttila ceramics, 21 – Kjelmøy ceramics, 22 – Luukonsaari ceramics, 23 – Sirnihta ceramics, 24 – Bronze Age ceramics, 25 – Undefined Säräisniemi 2 ceramics, 26 – Early Metal Period ceramics.

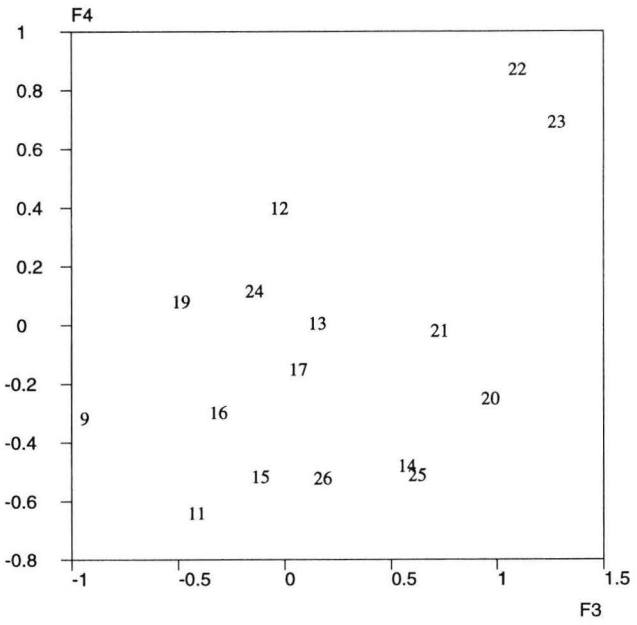


Fig. 5.3. Late Neolithic, Bronze Age and Early Metal Period ceramic types in single plots F3/F4 in Finland and the Karelian Isthmus. Combined means of attributes of ceramic types. Legend: 9 – Organic-tempered ceramics, 10 – Kierikki ceramics, 11 – Pöljä ceramics, 12 – Corded Ware, 13 – Kiukainen ceramics, 14 – Lovozero ceramics, 15 – Jysmä ceramics, 16 – Late Neolithic ceramics, 17 – Final Neolithic ceramics, 18 – Imitated Textile ceramics, 19 – Textile ceramics, 20 – Anttila ceramics, 21 – Kjelmøy ceramics, 22 – Luukonsaari ceramics, 23 – Sirnihta ceramics, 24 – Bronze Age ceramics, 25 – Undefined Säräisniemi 2 ceramics, 26 – Early Metal Period ceramics.

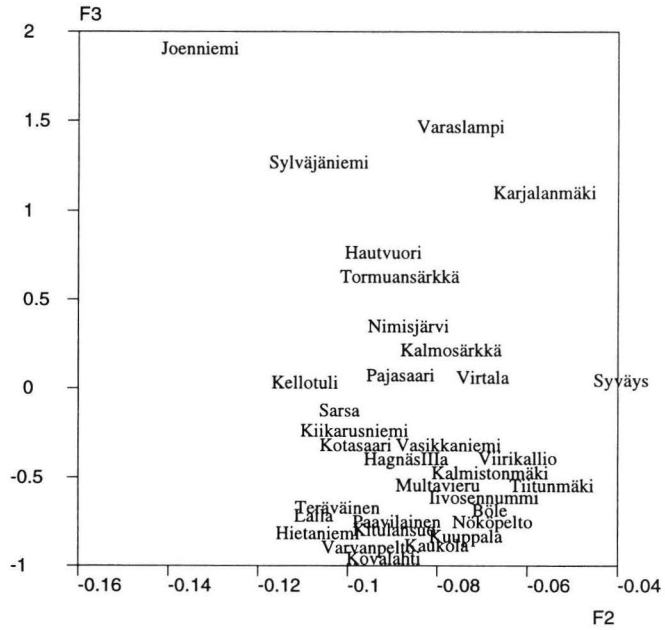


Fig. 5.4. The most important dwelling sites with Textile ceramics in Finland and the Karelian Isthmus. The mean values of combined factor plots F2/F3 of vessels have been calculated for each site.

four factors shows no clear geographical clustering, but at least allusive concentrations in northern (or eastern) and southern types (Fig. 5.4.) can be found. There are still some evident exceptions. The material from Hautvuori in Laitila does not fit into the picture and adding or reducing the number of factors does not change the situation.

Figure 5.4. shows clear regional distributions. The easternmost dwelling sites, Varaslampi in Joensuu, Sylväjäniemi in Kuhmo and Karjalanmäki in Pihtipudas, are at the right end of the figure. There is a loose concentration of the dwelling sites of Kainuu in the middle and the dwelling sites from the Karelian Isthmus and South Finland can be seen in the lower side of the plot. The Figure 5.5. gives an example of a detailed factor analysis with factor loadings for each attributes. Later, for saving room, only factor plots will be presented.

Although clear dependences are visible in the plots, factor loadings do not help the interpretation much. The first plot – F1 against F2 – shows how great linear dependence can be. Interesting is that only attributes KE1ä and KY1e – corded impressions – rise from the material thus referring to the Kalmistonmäki group. Factors F2 and F3 reflect unornamented, simple Textile ceramics, the paste of which has been tempered with feldspar. Ornamentation was usually carried out horizontally but also vertical motifs exist although they do not rise clearly visible in factor loadings. It is not possible to discern a geographical difference in this case either.

Some interesting features can still be observed generally: clear geographical loadings were obtained for asbestos and soapstone, although almost all other tempers were also used in this group. Factor F4 separate the eastern and the northern concentrations. It suits best the material found in the dwelling sites of northern Saimaa and Suomussalmi where asbestos and talc were much used for tempering. The most typical ornamentation was small spots, horizontal drawn lines and framed frieze -designs. The problem with this factor analysis is that it does not emphasise details of decoration well enough, thus the local components are difficult to observe. Better results are obtained by studying smaller local areas.

As a conclusion of the large-scale analyses presented before it can be said that the results support the hypothesis of eastern and western Textile ceramics in Finland and the Karelian Isthmus. It is interesting that they also support the hypothesis of the existence of a possible subgroups of Sarsa and Tomitsa, and even the subgroup in Kainuu (Lavento 1997:169–177). Although it must be remembered that the number of Kalmistonmäki ceramics is small and although part of the material has already been "cleaned" from Textile ceramics it still, perhaps, can be seen as the separate high factor loading of the corded impression (F1). The position of Kalmistonmäki ceramics among other subtypes of Textile ceramics is discussed later.

5.4.1. Subgroups of Textile ceramics

On the basis of factor analysis carried out for the entire material of Textile ceramics in Finland both a southern and a northern (or eastern and western) group can be

	F1	F2	F3	F4	h^2
Q1	0.023	−0.008	−0.070	0.005	0.006
K1	0.023	−0.129	−0.007	0.125	0.033
SH	−0.058	−0.034	−0.008	0.084	0.012
SK	−0.017	−0.020	−0.016	0.010	0.001
PM	−0.015	−0.057	0.021	0.026	0.005
PN	0.013	−0.017	−0.021	−0.109	0.013
PT	0.013	0.180	−0.160	−0.082	0.065
PS	−0.068	−0.071	0.078	0.080	0.022
PO	−0.030	0.029	0.071	−0.103	0.017
RF	−0.075	−0.140	−0.071	0.174	0.061
V	0.017	**−0.416**	0.207	0.055	0.219
X	−0.034	−0.170	0.147	−0.033	0.053
Y	−0.009	−0.031	−0.055	−0.185	0.038
M10	−0.005	0.051	0.002	−0.073	0.008
M1a	−0.021	−0.164	−0.092	−0.039	0.037
M1b	0.043	**0.495**	**0.395**	−0.060	0.406
M1c	−0.080	−0.276	0.085	**0.829**	0.776
M1d	−0.052	−0.142	0.169	**0.373**	0.190
M1e	−0.030	−0.175	0.050	−0.179	0.066
M1f	−0.041	−0.088	0.079	**−0.382**	0.162
M1g	−0.029	0.089	0.009	−0.133	0.026
M1h	−0.019	0.027	−0.056	−0.030	0.005
M1i	−0.013	0.034	−0.008	−0.056	0.004
M1j	−0.006	−0.022	0.096	−0.126	0.026
PM1	−0.000	0.050	−0.042	−0.037	0.006
PT1	−0.001	−0.007	0.048	−0.039	0.004
RM0	−0.009	0.076	−0.070	−0.141	0.031
RMa	−0.003	0.027	0.005	−0.062	0.005
RMb	−0.020	−0.050	0.108	−0.017	0.015
RMc	−0.016	0.009	−0.100	−0.043	0.012
RMd	−0.006	−0.023	0.057	0.061	0.008
RMe	0.079	0.087	0.029	−0.077	0.021
RMf	−0.015	−0.050	0.053	0.010	0.006
RMg	−0.007	0.133	−0.098	0.007	0.027
RMh	−0.028	0.053	−0.107	−0.022	0.016
RMi	−0.047	−0.205	0.076	0.154	0.074
RMk	−0.001	0.054	−0.041	−0.022	0.005
RPa	0.139	0.112	0.086	−0.106	0.051
RPb	−0.009	0.071	−0.028	−0.006	0.006
RPc	−0.021	0.090	−0.036	−0.160	0.035
RPd	−0.061	−0.085	−0.100	0.064	0.025
RPe	−0.005	0.086	−0.079	0.011	0.014
RE0	0.037	**0.686**	**−0.655**	0.100	0.911
REa	0.012	−0.423	**0.377**	**0.465**	0.538
REb	−0.047	−0.328	0.256	**−0.551**	0.479
REc	−0.005	−0.008	0.042	−0.016	0.002
REd	−0.008	−0.022	0.075	−0.026	0.007
REe	−0.008	−0.027	0.104	−0.047	0.014
REf	−0.010	−0.034	0.112	−0.082	0.020
REh	−0.003	−0.002	0.038	−0.053	0.004
REi	−0.005	−0.008	0.049	−0.037	0.004
RA0	0.032	**0.621**	**−0.688**	0.150	0.882
RAa	−0.061	**−0.381**	0.342	−0.078	0.271
RAb	0.066	−0.181	0.296	−0.221	0.174
RAc	−0.005	−0.012	0.076	−0.100	0.016
Km0	−0.008	0.073	−0.009	0.003	0.005

	F1	F2	F3	F4	h^2
Kma	0.044	−0.073	0.059	−0.124	0.026
Kmb	0.069	−0.070	0.148	−0.162	0.058
Kmc	−0.010	−0.042	0.106	0.014	0.013
Kmd	0.049	−0.102	−0.155	−0.112	0.050
Kme	−0.056	−0.164	−0.032	**0.326**	0.137
Kmf	−0.018	−0.076	0.064	0.063	0.014
Kmg	0.107	−0.007	0.030	−0.126	0.028
Kmh	−0.052	−0.215	0.073	**0.481**	0.285
Kmi	−0.036	−0.286	−0.081	0.217	0.137
Kmj	−0.020	−0.064	−0.045	−0.032	0.007
SIZE	−0.037	−0.235	−0.101	−0.019	0.067
RAd	−0.011	−0.028	−0.072	0.050	0.009
RAf	−0.004	0.033	−0.028	0.078	0.008
RAg	−0.003	0.068	−0.051	−0.031	0.008
KE10	0.061	**0.755**	**0.578**	0.076	0.913
KE1a	−0.088	**−0.309**	0.083	**0.811**	0.768
KE1b	−0.025	−0.053	−0.061	0.006	0.007
KE1c	−0.024	−0.188	0.040	−0.241	0.096
KE1d	−0.031	−0.100	0.073	**−0.428**	0.199
KE1e	−0.012	−0.106	0.024	−0.085	0.019
KE1f	−0.006	0.021	0.027	−0.094	0.010
KE1g	−0.006	0.036	0.032	−0.096	0.012
KE1h	−0.005	0.006	0.054	−0.110	0.015
KE1i	−0.001	0.030	0.004	−0.054	0.004
KE1k	0.113	**−0.308**	−0.135	−0.125	0.142
KE1l	−0.038	−0.211	0.049	0.039	0.050
KE1m	−0.016	−0.129	0.006	0.113	0.030
KE1n	−0.017	−0.063	−0.019	−0.238	0.061
KE1o	−0.025	−0.134	−0.164	−0.103	0.056
KE1p	−0.005	0.132	−0.089	−0.055	0.028
KE1q	0.128	0.012	−0.192	−0.027	0.054
KE1r	−0.006	0.029	0.042	−0.086	0.010
KE1s	−0.003	−0.010	0.047	−0.021	0.003
KE1u	−0.020	−0.262	−0.237	0.070	0.130
KE1v	−0.003	0.019	0.014	0.016	0.001
KE1x	−0.013	−0.163	−0.089	0.045	0.036
KE1z	−0.010	−0.097	0.019	−0.099	0.020
KE1ä	**0.973**	−0.049	−0.005	0.017	0.950
KE1ö	−0.017	−0.054	−0.125	0.075	0.025
KE1aa	−0.012	0.018	0.047	0.058	0.006
KE1ab	−0.010	0.020	−0.158	0.043	0.027
KE1ac	−0.012	−0.106	−0.188	0.053	0.049
KE1ad	−0.010	−0.093	−0.179	−0.003	0.041
KE1ah	−0.004	0.042	−0.018	−0.042	0.004
KY10	0.062	**0.763**	**0.559**	0.053	0.902
KY1a	−0.085	−0.230	0.136	**0.722**	0.600
KY1b	−0.051	−0.228	0.076	**−0.461**	0.273
KY1c	0.007	−0.179	−0.165	−0.280	0.137
KY1d	0.080	−0.032	−0.140	−0.106	0.038
KY1e	**0.973**	−0.049	−0.005	0.017	0.950
KY1f	−0.008	0.007	0.037	0.042	0.003
KY1g	−0.021	−0.103	−0.147	0.096	0.042
KY1h	−0.012	−0.019	−0.071	0.034	0.007
KY1i	−0.009	0.021	−0.162	0.031	0.028
KY1k	−0.003	0.050	−0.043	0.010	0.004
KY1l	−0.030	−0.309	−0.144	−0.200	0.157

Fig. 5.5. Loadings for four factors. The material implies all Textile ceramics (343 vessels) from Finland and on the Karelian Isthmus. See legend App. 4.

separated. This hypothesis was tested with a large number of partial analyses of the material. The first comparison represents Textile ceramics collected from the Saimaa Water System. The division of the material into two types is evidently visible in all factor plots (Figs. 5.6. and 5.7.; comp. also Lavento 1997:183–184).

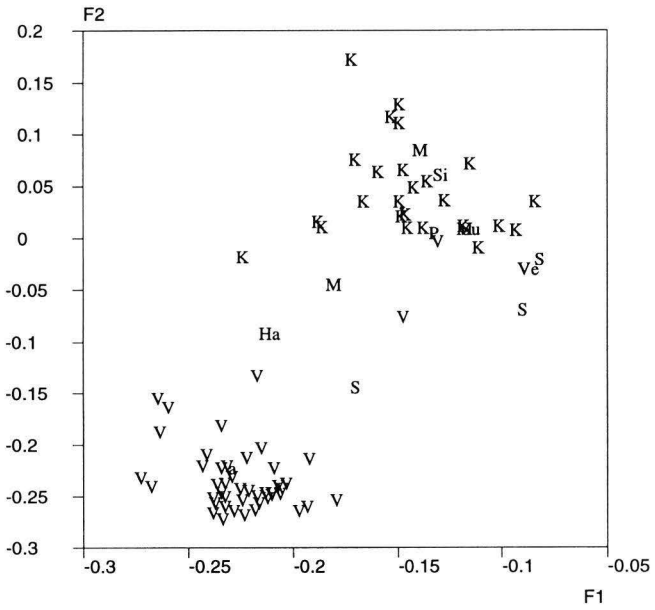


Fig. 5.6. The most important dwelling sites with Textile ceramics in the Saimaa Water System. Factor plots F1/F2. Legend: Ha – Haukilahden pohja in Savonlinna, K – Kitulansuo d in Ristiina, M – Multavieru in Polvijärvi, P – Pulmionlampi in Ristiina, S – Syväys in Ilomantsi, Si – Sirnihta in Kesälahti, V – Varaslampi in Joensuu, Va – Valkeasaari in Taipalsaari, Ve – Vehkaranta in Kerimäki.

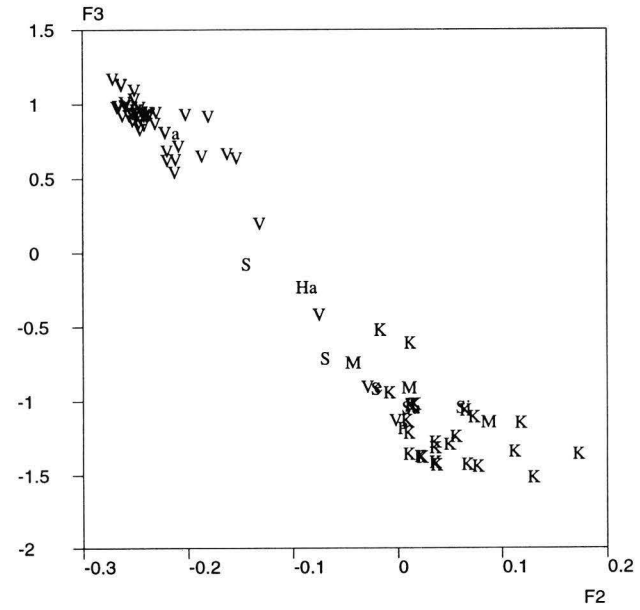


Fig. 5.7. The most important dwelling sites with Textile ceramics in the Saimaa Water System. Factor plots F2/F3. Legend: Ha – Haukilahden pohja in Savonlinna, K – Kitulansuo d in Ristiina, M – Multavieru in Polvijärvi, P – Pulmionlampi in Ristiina, S – Syväys in Ilomantsi, Si – Sirnihta in Kesälahti, V – Varaslampi in Joensuu, Va – Valkeasaari in Taipalsaari, Ve – Vehkaranta in Kerimäki.

The typological subdivision becomes particularly evident when comparing factors F2 and F3. Factor F2 characterises southern Saimaa and particularly the material from Kitulansuo in Ristiina. For this cluster organic and chamotte temper, long comb stamps with small pits and a slightly profiled rim with oblique pit ornaments is typical. Factor 3, the "Varaslampi-factor", represents asbestos and talc tempered ceramics with heavily profiled rims. Ornamentation has been carried out with horizontal zones of small pits or framed-frieze-type of motifs.

5.4.2. Tomitsa ceramics and Kainuu ceramics

When comparing Textile ceramics from the Saimaa and the Kainuu Water Courses both differences and similarities can be seen. In the factor plot (Fig. 5.8.) the materials from Kitulansuo in southern Saimaa and from Varaslampi in northern Saimaa differ very clearly from the material from Kainuu. The same observation can also be made from other plots.

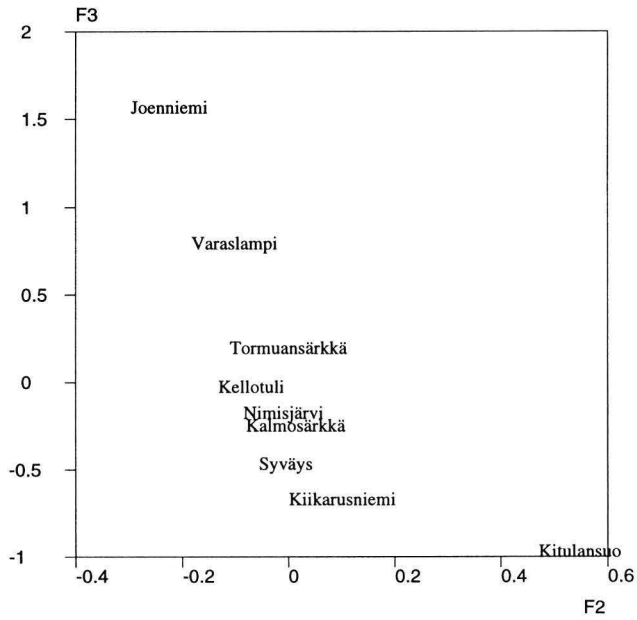


Fig. 5.8. The most important dwelling sites with Textile ceramics in the River Oulujoki Water System and the Lake Saimaa Water System. The mean values of combined factor plots F2/F3 of vessels have been calculated for each site.

Factor F2 is the most important one in separating the southern Saimaa material from the other ones and Factor F1 separates the northern Saimaa from the other sites. Important variables effecting its formation are heavy profiling of the shoulder, oblique comb stamps on the rim and horizontal ornamentation of walls consisting of grooves. Factor 2, which fits best the material from southern Saimaa, differs from other factors due to chamotte and organic temper (together with feldspar), convex upper part of the wall and relatively deep and long comb stamps. Factor 3, instead, represents Textile ceramics from Kainuu and northern Saimaa, where as-

bestos and talc were much used in tempering. The rim ornamentation consists of small spots, horizontal and vertical lines or framed-frieze ornaments. The use of small spots in ornamentation is very characteristic: small spots are in a horizontal line just below the rim. The Joenniemi material in Suomussalmi discerns very clearly from other Textile ceramics through analysis. The material is small, and not very far-going interpretations should be made, yet.

The earlier analyses separated southern Saimaa from the Textile ceramics from northern Saimaa and Kainuu. To show the validity of the hypothesis of the existence of Kainuu ceramics it should be possible to make a distinction between the northern Saimaa and the Kainuu material also. The plots between areas show positive evidence (Fig. 5.9.).

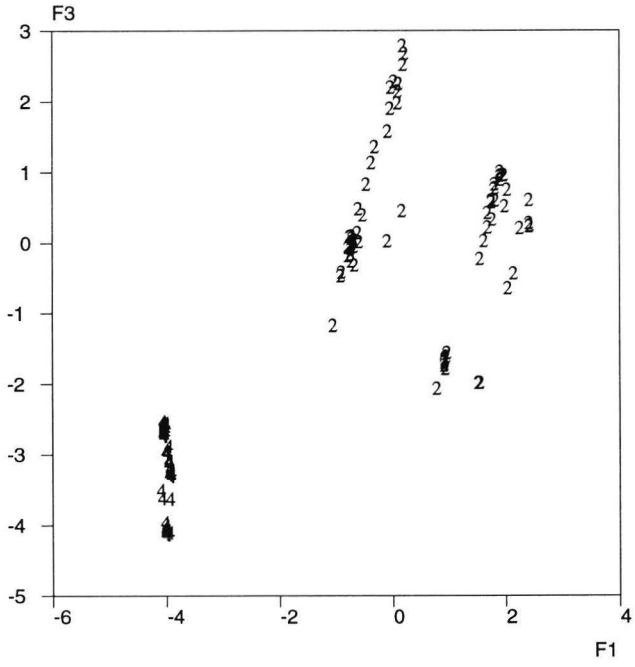


Fig 5.9. Comparison of single vessels of Textile ceramics in the River Oulujoki Water System and the Lake Saimaa Water System. Factor plot F1/F3. Legend: 2 – the River Oulujoki Water System, 4 – the Lake Saimaa Water System.

Although the Varaslampi material differs from other Kainuu sites, Multavieru at Polvijärvi and Syväys at Ilomantsi do not correlate as clearly with Varaslampi, but come closer to Kainuu sites. This means that the simple geographical distinction between Kainuu and northern Saimaa can be presented (Fig. 5.10.), but the situation is still more complicated. If single vessels from different dwelling sites from Kainuu and whole Saimaa are plotted in the figure, one can observe that the Varaslampi material forms a relatively dense cluster with only some vessels making an exception. The Kainuu material, on the other hand, shows more loose scattering, and a considerable part of it comes close to Kitulansuo material.

Two models can be presented to explain this. The material from Varaslampi was collected from one site only whereas the material from Kainuu comes from several sites, or the site may have been in use for only a

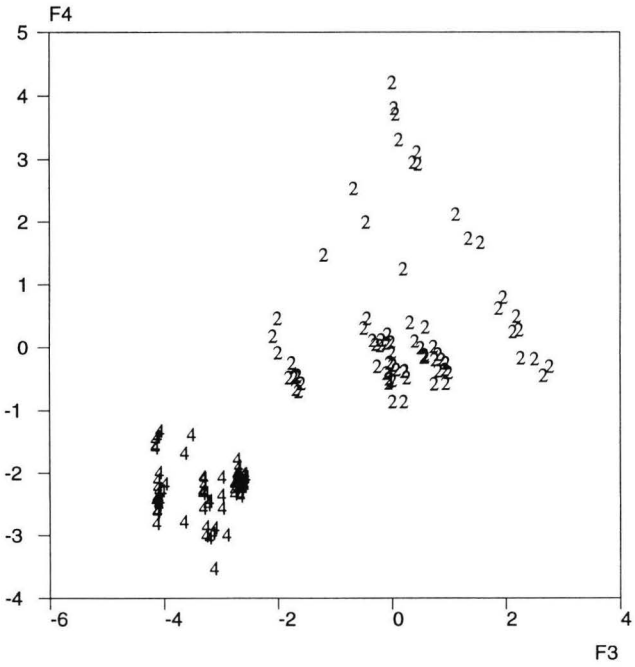


Fig 5.10. Comparison of single vessels of Textile ceramics in the River Oulujoki Water System and the Lake Saimaa Water System. Factor plot F3/F4. Legend: 2 – the River Oulujoki Water System, 4 – the Lake Saimaa Water System.

relatively short period (see App. 1). Therefore, it forms a dense cluster both typologically and culturally in comparison with the material from the dwelling sites in Kainuu, which often represent over a thousand-year-long period of use. In this way these materials are not comparable with each other. Also the material from Kitulansuo forms relatively dense cluster in the figure, perhaps for the same reasons as in Varaslampi.

It seems possible to present a hypothesis that Textile ceramics from both Kainuu and northern Saimaa could be connected in the concept "Tomitsa ceramics" which can be further divided into two subtypes. The first subtype, Varaslampi ceramics, represents a developed phase of the Tomitsa type, whereas the other subtype, Kainuu ceramics, represents a heterogeneous group that very likely mainly represents the earlier phase of the Tomitsa type. This chronological distinction is discussed more thoroughly together with chronology.

5.4.2.1. Tomitsa (Varaslampi) ceramics

The Textile ceramics from Varaslampi differs distinctly also from the material found in the Karelian Isthmus. Also worth noting is that all plots of the Textile ceramics from southern Saimaa come in the same cluster as the Kaukola and the Räisälä material (Fig. 5.11.). Therefore a hypothesis can be presented that Textile ceramics from Varaslampi represents a slightly different tradition but the Textile ceramics from Kitulansuo at Ristiina is a part of the Textile ceramics found in southern Saimaa and the Karelian Isthmus.

In Varaslampi at Joensuu Textile ceramics has a peculiar appearance. Asbestos and soapstone tempers make the paste compact and notwithstanding soft minerals,

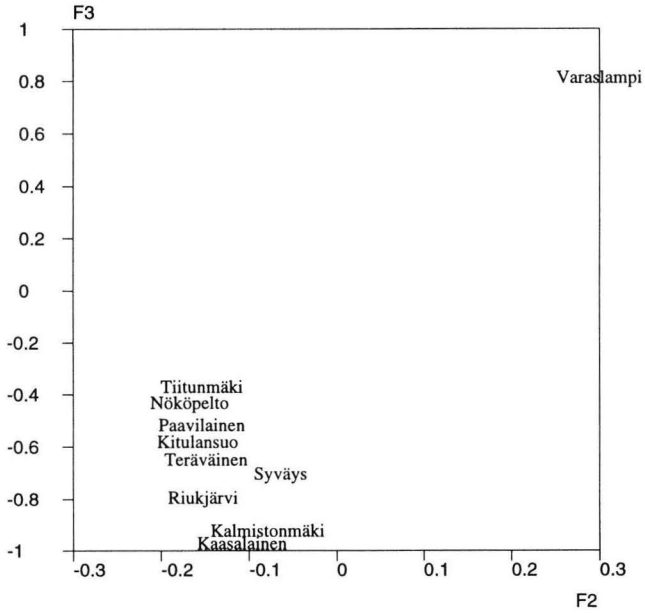


Fig. 5.11. The most important dwelling sites with Textile ceramics in the Saimaa Water Course and on the Karelian Isthmus. The mean values of combined factor plots F2/F3 of vessels have been calculated for each site.

sherds are relatively hard. Textile-impression, hatching and smoothing are common types of surface finish. Textile-impression and smooth-faced surface are the most important types of surface finish, although also a different kind of hatching occurs together with textile-impressed sherds.

Strong profiling is characteristic of the Varaslampi material. This means that the diameter of the lower part of the vessel is clearly larger than in the rim. Still, vessels with strong profiling exist in all subgroups of Textile ceramics, which means that it alone cannot be considered as an identification mark of the Varaslampi or the Tomitsa type.

The ornamentation is relatively dense and usually made with small spots (App. 10). Also broad, horizontal furrows play an important part in ornamentation. Very characteristic is also framed-frieze, a design, which outlines the rectangular and trapezoidal figures in the upper part of vessels. Inside the frieze straight or zigzag lines in an oblique position occur sometimes. Ornamentation has often been made with care. Horizontality is evident but not as striking as in the Kainuu material. The ornamentation is richer than in any other subgroup of Textile ceramics in Finland. An interesting exceptional feature is the existence of vessels which are very sparsely decorated but which have a broad, horizontal, round-bottomed furrow just below the rim. This is a trait, which brings it closer to Anttila ceramics.

5.4.2.2. Kainuu ceramics

In the earlier studies conducted by the author the Textile ceramics from Kainuu, along the Oulujoki Water Course, differed from both the eastern (Tomitsa) and the western (Sarsa) types so much that it seemed justifiable to consider it as an independent subgroup (Lavento 1997; Lavento 2000a). In the light of new analyses it still seems valid to separate it as a type of its own but it is still necessary to take several reservations into account.

The vessels of Kainuu ceramics are often asbestos tempered although almost any other temper had been allowed to be used. Textile-impression occurs but it is not very common and a more typical surface finish is hatching. The form of the vessel also varies considerably. In general, the profiling is not very strong although there exist also exceptions.[3] Ornamentation implies spots, pits and comb stamps in horizontal zones or in a vertical position. The rows of inclined comb stamps or spot lines occur in Kainuu ceramics but they are not common. Also the framed-frieze exists but it is not typical either. The ornamentation is sparse and it makes a clumsy and inexact impression in comparison with the ornamentation of Varaslampi ceramics. A certain part of Kainuu ceramics is still made with precision involving long comb stamps crossing each other. Short vertical lines can also occur as a zone between horizontal lines of ornamentation. Despite this, the special feature in Kainuu ceramics is a striking horizontality of the ornamentation. In general, the elements of ornamentation are very simple. Further, in most cases only one element – spot, small pits or a long comb stamp – had been used.

The scatter plots and factor points slightly support the idea that Kainuu ceramics forms a distinct group in which heterogeneity is striking, however. The most important characteristics discerning the Textile ceramics of Kainuu from other material are as follows:

- often asbestos and/or quartz temper
- walls are usually not strongly profiled
- ornamentation has been carried out most often with horizontal zones of pits or stamps but also crossing lines of comb stamps or pits exist

Although the factor correlations give some idea of the attributes used in the factor, one should *not* interpret the results in such a way that the high factor loadings in F1 are the *same as a ceramic group* and – even more importantly – that high loadings do not mean that *only these* attributes exist in the ceramic group. One should realise that factor analysis picks up such hidden correlations, which discern Textile ceramics in Kainuu from other types.

When discussing the nature of Tomitsa ceramics in Finland the reasons, which might have influenced the heterogeneity of Kainuu ceramics, have already been referred to. One more possibility should be taken into account. The Oulujoki Water System represents an extreme periphery of the distribution of Textile ceramics in Finland. Mark Kosmenko (1996:59) has already referred to this kind of possibility. For this reason the subtype of Kainuu may have received such influences, which have not had much affect on the development of Textile ceramics in the southern area of the Karelian Republic, but it is not to be excluded that influences from the makers of Sarsa ceramics may have had some effect on Kainuu

[3] Huurre 1959:61, fig. 9.

ceramics. In addition to this also over a thousand-year-long time perspective has to be taken into account. While the Varaslampi material – that implies the majority of the Tomitsa ceramics in Finland – represents a relatively short period, the material from Kainuu comes from many sites of different ages. It seems relevant that one should divide the Textile ceramics from Kainuu into much smaller subgroups. This possibility is later discussed from different viewpoints.

5.4.3. Sarsa ceramics

Sarsa ceramics is more difficult to distinguish from the rest of Textile ceramics than the subgroups mentioned before. The reason is that the Textile ceramics from southern and southwestern Finland and the Karelian Isthmus come close to each other and regional differences are not easy to find. Slight differences can still be seen between Karelian and southwestern Finnish Textile ceramics. The distribution area of the Sarsa subtype corresponds to the distribution area of Sarsa-Tomitsa ceramics presented by Meinander (1954b:181). The majority of sites, which are included in this study, exist already in Meinander's study.

Although Textile ceramics from South Finland and the Karelian Isthmus can be considered as a heterogeneous group in relation to more northern types, they can still be separated from each other.

For instance, a plot (Fig. 5.12.) represents a figure where Sarsa, Kotasaari, Hietaniemi and Lalla belong loosely together. Sites in the Karelian Isthmus form another loose cluster. Hautvuori seems exceptional also in these plots. One should also pay attention to Kalmistonmäki, which differs clearly from the other sites in the Karelian Isthmus. It must be remembered that Kalmistonmäki ceramics has already been separated from the material into a group of its own (Type number 32, see App. 4) by the author and thus the rest represents the Textile ceramics from the dwelling site of Kalmistonmäki in Räisälä.

The factor analysis of vessels divides Sarsa ceramics into two or possibly three groups (Fig. 5.13.), which have no very clear geographical correlation. Factor F1 is almost constant and factor F2 refers to undecorated vessels, which understandably can be common in every Textile ceramics dwelling site. Therefore, factor F1 brings only very little information and it was omitted. Factors F3 and F4 describe two main types on the basis of ornamentation. Factor F3 describes vessels with horizontal and framed-frieze ornamentation. Factor F4 characterises oblique comb stamp ornamentation with small spots on the rim. In the first type the most prominent temper is asbestos, in the second type, instead, mica and organic temper.

Despite these observations, the most typical characteristic in the Sarsa group is feldspar temper but also chamotte was often used. The latter tempering is most often connected with Corded Ware and it does not exist

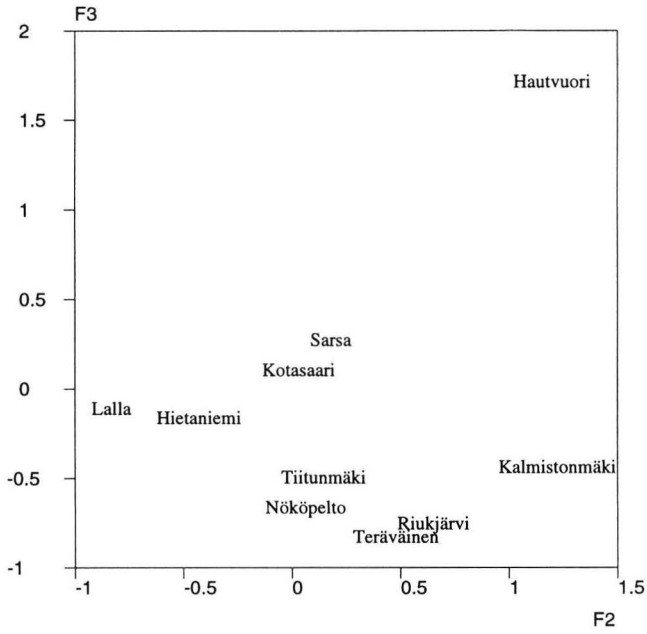


Fig. 5.12. The most important dwelling sites with Textile ceramics in the Karelian Isthmus and Southern Finland (in the River Kokemäenjoki and the River Kymijoki Water Systems, Varsinais-Suomi and Uusimaa). The mean values of combined factor plots F2/F3 of vessels have been calculated for each site.

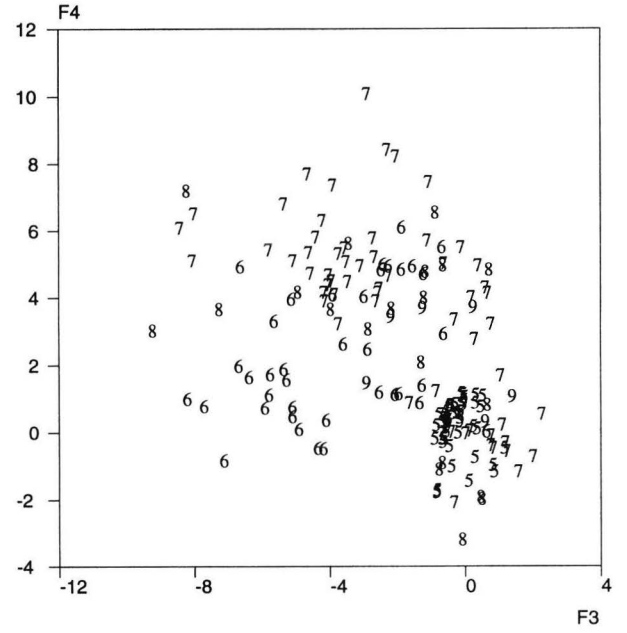


Fig. 5.13. Comparison of single vessels of Textile ceramics in the Karelian Isthmus and Southern Finland. Factor plot F3/F4. Legend: 5 – the Karelian Isthmus, 6 – the River Kymijoki Water System, 7 – the River Kokemäenjoki Water System, 7 – Varsinais-Suomi, 9 – Uusimaa.

in the other subgroups of Textile ceramics. The most usual tempers are quartz and feldspars. Asbestos has never been applied and mica, dark amphiboles and organic tempers are relatively rare. Vessels have either textile-impression or a hatched surface. The profiling of Sarsa ceramics is usually not as strong as in Tomitsa ceramics.

The ornamentation has most often been carried out with comb stamps or lines of small spots inclined to the right and/or left. Ornamentation implies dense zigzag zones in a vertical position. One regional detail is an occurrence of short comb stamps, which have been put in a dense, horizontal line. Sometimes short comb stamps have been pressed into the zones together with sparsely occurring small pits. It is interesting that particularly in the material from the dwelling site complex in Sarsa, small pits can occur very irregularly without forming a line or a zone. Typical are also pits, which have been pressed onto the textile-impressed surface. These pits do not belong to a line or a regular system either (App. 10).

Ornaments have not been pressed deep into the surface but give an impression of a light or superficial decoration. Their general characteristics have some characteristics common with Late Neolithic ceramics. The use of comb stamps has also much in common with typical Combed Ware. The irregular pits have a typological link with Late Neolithic ceramics. Despite some common traits one should be very cautious with the cultural-historical interpretations between Late Neolithic types and Sarsa ceramics. It is evident that Sarsa ceramics differs in many details from Tomitsa and Kainuu ceramics. It is tempting to explain these differences with a hypothesis based on the different origins of these types. In other words, the central factors effecting the formation of Sarsa ceramics are similar to those in Combed Ware, Corded Ware and Kiukainen ceramics. An important special type, which might have had a central influence in Sarsa ceramics, is Middle-Zone ceramics (see chapter VII).

To summarise, the material from the dwelling sites of Sarsa ceramics differ from each other: the dwelling sites of the Karelian Isthmus seem to be concentrated on the other side in the scatter plots of sites than the ones of Häme and Varsinais-Suomi. When plotting all single vessels in the figure the clear geographical order is not as clear any more (Fig. 4.13.). Approaching this question needs a more detailed analysis and comparison of Textile ceramics with the preceding and the following types.

5.4.4. Kalmistonmäki ceramics

The existence of a possible subgroup of Textile ceramics in the Karelian Isthmus has remained a problem for Finnish archaeologists, because it does not emerge very clearly from the material available in Finland. The problem is that Meinander defined Kalmistonmäki ceramics on the basis of very little material and that the definition itself is principally based on two attributes only: a twisted-cord-impression and small pits.

One means in trying to find out what Kalmistonmäki ceramics is, is to investigate what kind of Textile ceramics exists in the Karelian Isthmus. The first observation refers to the heterogeneity of the material. For instance, the Textile ceramics from Tiitunmäki in Kaukola has much in common with the ornamentation of the Textile ceramics found in Multavieru, Polvijärvi. Common attributes can also be found from the material in the dwelling sites of the Päijänne and the Kokemäenjoki Water Systems. Factor analyses show that the connection between the ceramics from the Karelian Isthmus and Sarsa ceramics is still much closer than with the Varaslampi or the Kainuu subgroups.

At least three kinds of ornamentation (sub-) types exist in the Textile ceramics found in the Karelian Isthmus. One subtype involves comb stamps, which have been pressed in an inclined position below the rim and also a horizontal row of pits belongs to the type. The second subtype of ornamentation emphasises horizontality. Pits, comb stamps and different kinds of impressions have been put into a horizontal row. This ornamentation has also something in common with the ceramics found in Kainuu. The third subtype represents corded-impression, which forms a kind of zigzag ornamentation or rather, an opening <-form figure. This third type represents the combination according to which Meinander defined his Kalmistonmäki ceramics.

It is important to realise that the "Kalmistonmäki" ceramic group separated by factor analysis (Fig. 5.12.) in the dwelling sites of the Karelian Isthmus is not the same as the one C. F. Meinander separated as the ceramics of the Kalmistonmäki type. One possibility is that these three subtypes represent different periods of habitation, the third subtype being the youngest. Unfortunately so far there does not exist enough dating information to discuss further the chronology of the Textile ceramics on the Karelian Isthmus (see still Chapter VI p. 102–103).

As we have already pointed out it is possible to see slight marks about the Kalmistonmäki ceramics in scatter plots (Fig. 5.14.). When plotting vessels of Textile

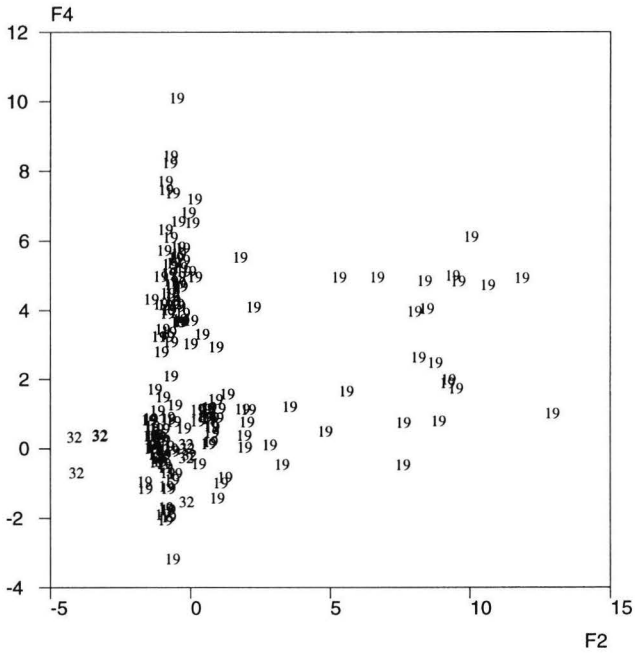


Fig. 5.14. Comparison of Textile ceramics and Kalmistonmäki ceramics in the factor plots F2/F4 of single vessels. Legend: 19 – Textile ceramics, 32 – Kalmistonmäki ceramics.

ceramics from southern Finland and the Karelian Isthmus and Kalmistonmäki ceramics – separated from Räisälä material – from the same area a clear clustering can be observed (Fig. 5.14.) when applying factors F2, F3 and F4. It is specially worth noting that Kalmistonmäki ceramics forms a dense cluster in comparison with the whole of the Textile ceramics from the Karelian Isthmus.

The attributes linking the vessels of Kalmistonmäki ceramics are feldspar temper, very slight profiling and an ornamentation, which has been carried out with short <-shaped comb stamps arranged horizontally into a line. An important trait is also a corded-impression.

Although it now seems that Kalmistonmäki ceramics can be separated from other types of Textile ceramics in the Karelian Isthmus and southern Finland, it is evident that its definition is very narrow. Although it differs clearly from other Textile ceramics, it can also be connected to it as a subtype. According to my observations Kalmistonmäki ceramics can be found only in four dwelling sites: Kalmistonmäki at Räisälä, Riukjärvi at Kaukola, Böle at Porvoo and Rahkoissuo at Askola. In the material from the Karelian Republic, the eastern side of Lake Ladoga, there exists a small number of corded-impressed ceramics (Meinander 1969:43).

The distribution area of Kalmistonmäki ceramics can be confined to the Karelian Isthmus and to the coastal area of eastern Uusimaa. In the light of the material available at present it can be stated that Kalmistonmäki ceramics has easily definable characteristics but so far the amount of ceramics does not support its separation into an independent ceramic group with ethnic dimensions.

VI DATING

6.1. Introduction

Exact absolute chronology is one of the central dreams of traditional archaeology, which assumes that it is possible to divide prehistory into periods on the basis of groups of material. Very often this material is ceramics, because differences in ceramics are relatively easy to discern. Archaeologists often bypass the real problem by concentrating on the dating itself, instead of discussing *what* the issue to be dated is. In other words, instead of discussing *how* and with *which methods* we can get the dating, we should put much more emphasis in understanding what is worth dating and what these dates tell us about prehistory.

In spite of criticism presented before, this chapter concentrates on the scientific dates of Textile ceramics from several traditional points of view. Although the purpose is to find the earliest and the latest moments in time when this ceramics was in use in Finland, the central problem often is what is the first manifestation, or prototype, of the new ceramic type. It is usually not difficult to carry out a natural scientific dating of a vessel, but it is difficult to decide into which type ceramics should be included. Archaeologists have often deferred this problem, because they have seen ceramic types as entities, which can be easily discerned. The following practical preconditions should still be seriously considered:

1) This study dates Textile ceramics that the author has separated from the material found in Finnish dwelling sites.

2) This ceramics belongs to the typology created by the author. It is probable that different archaeologists would include different sherds and vessels into the group called Textile ceramics.

3) The typology presented does not necessarily correspond with any real entity or group of people in the past (Gräslund 1987).

4) Ceramics is only one group of material in prehistory. It is possible that many other material groups exist which could better elucidate the beginning of the Early Metal Period.

5) Dates involve a large number of uncertainties and errors making it difficult to separate periods of prehistory.

For these reasons one should take a critical view of the results which follow. The period of use of Textile ceramics is approached using different dating methods. More important than the exact, absolute dating itself is to determine which types could be wholly or partly synchronous and from which directions impulses may have come, because this may have had an effect on the development of some ceramic types. Dating of Textile ceramics also helps in building models concerning groups and populations behind this ceramic type.

6.2. An overview of the chronologies for Late Neolithic and Early Metal Period ceramics in Finland, Sweden, Norway, Baltic countries and Russia

The first section of this chapter is a short overview of the chronology of Textile ceramics and its neighbouring ceramic groups. In the second section the shore displacement chronology gives a general chronology for Textile ceramics in Finland. Also the basic assumptions and accuracy of the method itself is critically discussed. The third section presents an absolute chronology based on both conventional carbon-14 dates from context dates and AMS-dates made from Textile ceramics itself. Also some TL-dates are available. The hypothesis of the using period of Textile ceramics in Finland and the Karelian Isthmus is based on this information.

6.2.1. Finland

In 1914 A. M. Tallgren suggested that the cemetery and the dwelling site of Kalmistonmäki at Räisälä in the Karelian Isthmus, involved synchronous fragments of casting moulds and asbestos tempered ceramics (Tallgren 1914:11–12,17–21, figs. 11–13,18–19). The site was situated at an elevation of about 9 m above the water level of Lake Ladoga. Tallgen writes:

> "Detta faktum, liksom fyndförhållandena i Hankasalmi, delvis också i Säräisniemi, torde bevisa, att asbest- och kamkeramikerna delvis äro samtidiga. Men å andra sidan utvisa våra gjutformar, att asbestkeramiken fortlever ännu under ananjino-tiden. Den har alltså antingen fortlevat genom hela bronsåldern från stenålderns slut, eller också har kamkeramiken bibehållit sig mycket längre än till den antagna slutpunkten för stenåldern (c. 1500 f.Kr.). För egen del är undertecknad av sistnämnda åsikt, isynnerhet emedan asbestkeramiken enligt min åsikt representerar en främmande kultur och ej kan utvecklat sig ur kamkeramiken."(Tallgren 1914:20–21.)

In the beginning of the 1900's Julius Ailio argued with Tallgren about the "continuity of the Stone Age" and the beginning of the Bronze Age in the inland dwelling sites. Ailio thought that the appearance of bronze implements showed a discontinuity in tradition (Ailio 1913). Tallgren assumed, instead, that the use of stone implements still continued during the period of use of bronze celts (Tallgren 1911b:196). Tallgren thought that the way of living did not change although people learned to cast copper celts by using local raw material for the moulds. The populations continued to use Stone Age fishing and hunting grounds during the Bronze Age. The only thing that changed was the adoption of metal implements. In the footnote of a small article concerning new Stone Age finds in Finland in 1918 and 1919 Äyräpää stated his disagreement with Tallgren's hypothesis that Asbestos ceramics represented a new culture that was still living during the Bronze Age until the beginning of the Ananino Period, about 700 BC. Äyräpää emphasised that asbestos was already in use in Typical Combed Ware and that the use of this temper was a long-living phenomenon (Europaeus 1921:21).

As late as 1934 A. M. Tallgren (1935) and A. Äyräpää (1935) had a dispute over the same problem. Tallgren had come to a conclusion that asbestos ceramics belonged to the Bronze Age context. The exchange of views concerned the mould and its context on the island of Kaunissaari in Parikkala. In this case Äyräpää commented on Tallgren's dating for asbestos tempered ceramics – which was based on the casting mould – by repeating what he had already said about the find contexts at Säräisniemi, Nimisjärvi: in Kaunissaari there was Early Combed Ware, Typical Combed Ware and even so-called Early Asbestos ceramics together with Textile ceramics (Äyräpää 1935:49–51). Tallgren (1935:47–48) considered all asbestos tempered ceramics synchronous with the casting mould. Äyräpää's idea of the long using period of asbestos tempered ceramics has proved to be right.

In his monograph of the Battle Axe culture in Russia Äyräpää discussed also the origin of Textile ceramics in Russia and in Finland. Äyräpää, referring to Tallgren, considered the so-called sub-Fatyanovo ceramics and Combed Ware partly synchronous (Äyräpää 1933:107). When discussing the chronology of the Battle Axe culture he came to the conclusion that it had to be younger or at least of the same age as Ka III: 2 (Äyräpää 1933:109). The relation between the western and the eastern parts of cultures is interesting:

"In Finnland, wo die Textilkeramik beinahe in denselben Formen auftritt wie in Russland[4], scheint sie kurz nach der Bootaxtkultur aufzutreten, und wir haben keinen Grund anzunehmen, dass ihre Anwendung in Russland später begonnen hat, trotzdem sie sich dort in der in ihrer Entwicklung zurückgebliebenen Gorodiščekultur sehr lange im Gebrauch erhalten hat (was einigermassen auch in Finnland der Fall war). Unter solchen Umständen stellt sich die Frage auf, ob nicht diese Keramik möglicherweise in mitteleuropäischen spätneolitischen Einflüssen wurzelt. Bei kleinpolnischen schnurkeramischen Gefässen treten nämlich zuweilen Zeugabdrücke auf[5], welche wahrscheinlich auf die »nordische» Keramik der Tschechoslowakei zurückzuführen sind [6]. Auch aus Ostpreussen (Zedmar und Kurische Nehrung) ist Textilkeramik bekannt[7]. Da man aber aus dem Zentrum der Fatjanovokultur keine anderen sicheren Spuren kleinpolnischer schnurkeramischer Einwirkungen nachweisen kann, muss die Frage vorläufig verneint werden. Die Entstehung der zentralrussischen und der mit ihr in Zusammenhang stehenden finnischen Textilkeramik, welche nach S. Pälsi eine besondere technische Stufe bei der Herstellung von Tongefässen vertritt [8], bleibt nach wie vor ein offenes Problem."(Äyräpää 1933:114.)

In other words, Äyräpää brought into the discussion the possibility that textile-impression and Textile ceramics in Finland would have its origin in Central Europe. Already in 1925 Äyräpää had observed together with Corded Ware some pieces of Textile pottery (Europaeus 1925:22) and textile-impression on the bottom of the vessels in Kiukainen ceramics (Europaeus 1922:147). In 1922 he had considered it possible that Textile pottery from Koivistosveden in Kirkkonummi might be synchronous with Corded Ware (Europaeus 1922:135; 1925:22). By referring to Sakari Pälsi (1916:66–68) he stated that Textile ceramics belonged to the last period of the Stone Age. Another possibility was that Textile ceramics had no connection with Corded Ware but it would have a later dating (Europaeus 1922:135). Carpelan later supported Äyräpää's idea by stating that the textile-impressed ceramics in Koivistosveden should be classified as Middle-zone ceramics and its origin should be found in Central Europe, although archaeologists have not paid much attention to the existence of textile-impression there (Carpelan, pers. comm. 24.4.2000). Due to the lack of archaeological studies concerning textile-impression in Central Europe this question has remained open so far, but it is still evident that in the Baltic countries there are a lot of Late Neolithic textile-impressed ceramics (see chapter 2.5.).

In the middle of the 1950's C. F. Meinander placed the *terminus post quem* of the Bronze Age in Finland to about 1200 BC (Meinander 1954b:195). Thus it seemed to be in harmony with the end of the Kiukainen culture. Further, he separated two typological horizons in Textile ceramics: Sarsa-Tomitsa ceramics and the Kalmistonmäki group, the chronological border of which he dated to ca. 1000 BC. The end of the Kalmistonmäki phase he dated to the beginning of the Pre-Roman Period, ca. 500 BC (Meinander 1954b:195). Meinander's reasoning was mainly based on typology, which he believed to be in harmony with the Textile ceramics in Russia.

In 1969 he (1969) revised the end of the Kalmistonmäki phase, referring to Gurina's (1961) chronology, to be remarkably younger.

"Enligt Gurinas inledning skulle Kalmistonmäki passa in i den grupp som kallas äldre järnålder och i stort sett omfattar tiden 300 f.Kr. – 300 e.Kr. Också i dessa fynd är tvärsnoddsornamenten en viktig företeelse, såsom en hänvisning till boplatserna Juskovo och Izsady vid Volchov ger vid handen." (Meinander 1969:43.)

Later Meinander (1982:28) also revised the beginning of Sarsa ceramics to the earlier period of 1500 BC by virtue of the dates of Seima axes. In 1984 he also gave a

new dating for the beginning of Textile ceramics. The whole period was dated to between 1400–500 BC by Meinander (1984a).[1]

Unto Salo did not accept Meinander's view about the possible link between Textile ceramics and Kiukainen ceramics. Meinander's argument was based on the dwelling site of Raineåsen at Pirttikylä, where Sarsa ceramics seemed to have been used already during the II period of Montelius, at the latest ca. 1200 BC (Salo 1981:322). Salo argued that the textile-impression that had been found on the bottom of the vessels of Kiukainen ceramics was not a phenomenon which should be explained by a cultural connection: textile-impressions had been found also inland, in Pöljä ceramics (Salo 1981:322). Later Salo (1996:340) has presented a dating table where he present the calibrated chronology for the beginning of Bronze Age ca. 1500 calBC. Salo separated three waves, which brought textile-impressions to Finland.

"Pöljänryhmän tekstiilikeramiikka täyttänee siten ainakin osittain sitä aukkoa, joka erottaa Kiukaisten kulttuurin tekstiilikeramiikkaa ylisen Volgan vanhimmasta tekstiilikeramiikasta. Toisen, joskin heikon linkin saamme Viron Akalin asuinpaikalta, jossa esiintyy tekstiilikeramiikkaa myöhäisellä kivikaudella, nuorakeramiikan loppuvaiheessa, mahdollisesti toisen vuosituhannen alkupuolella tai puolivälissä. Ilmeisesti Itä-Suomen ja Suomen rannikon myöhäiskivikautinen tekstiilikeramiikka merkitsee tekstiilikeramiikan ensimmäistä aaltoa, lähtökohtanaan ylisen Volgan myöhäiskivikautiset avoimet asuinpaikat, joilla varhaisin tekstiilikeramiikka esiintyy myöhäisen nuorakeramiikan l. Fatjanovon kulttuurin perinteen vielä vaikuttaessa. Sarsankeramiikan toi sen sijaan uusi tekstiilikeraaminen aalto, joka suuntautui Aunukseen, Etelä- ja Pohjois-Karjalaan sekä Kokemäenjoen vesistöalueelle; Virosta ei sarsankeramiikkaa tunneta, mutta kyllä kampaleimoin koristettuja tekstiilinjälkisiä astioita. Karjalan kannaksella sarsankeramiikka päättyy kolmanteen tekstiilikeraamiseen aaltoon, nim. kalmistonmäenkeramiikan tuloon, nähtävästi aikana, jolloin siellä valettiin itävenäläisen Ananjinon kulttuurille (n. 700–200 eKr.) ominaisia pronssikirveitä. Kun tämän keramiikan uudet kuosit ovat lähtöisin Volgan yläjuoksun ja siitä luoteeseen olevan alueen linnoitetuilta asuinpaikoilta, joita alettiin käyttää viimeisen esikristillisen vuosituhannen puolivälissä, on sarsankeramiikan katsottu päättyneen Karjalassa juuri tuohon aikaan." (Salo 1981:322–323.)

According to Gurina's assumption the sites at the Ladoga region are situated at an elevation of about 15–18 m above the water level of Lake Ladoga. Gurina named these sites the Volchow group (Gurina 1959:19–21).

In 1970 Ari Siiriäinen and Matti Saarnisto (1970) published an article in which they dated the transgression maximum of Lake Ladoga to about 500 BC. Although two important Epineolithic dwelling sites – Kuuppala at Kurkijoki (18.5 m a.s.l.) and Kalmistonmäki at Räisälä (18.5 m a.s.l.) – are situated over 3 m above the maximum water level during the transgression, the authors assumed that regression had most probably not began until the Pre-Roman Iron Age. They also assumed that the transgression very probably did not begin until the Epineolithic Period (Saarnisto & Siiriäinen 1970:17), because several important dwelling sites at Riukjärvi in Kaukola imply both Combed Ware and Epineolithic ceramics at an elevation of ca. 21 m a.s.l. (Pälsi 1922; Meinander 1954a:190).

Archaeological material and its stratigraphy strongly supported the hypothesis, which was tested also by pollen stratigraphy (Donner 1966:6). Saarnisto and Siiriäinen (1970:18) reasoned that the use of Textile ceramics continued during the Early Iron Age.

"Laitilan Hautvuorelta on Sarsan tyypin tekstiilikeramiikkaa ja palasia Koitön astiaa muistuttuvasta saviastiasta; Koitö ajoittuu varhaiselle rautakaudelle. Tomitsasta on Sarsan tyypin keramiikkaa yhdessä rautapalasten kanssa, samoin Bölestä (Meinander 1954 s. 164, 188). On ilmeistä, että Sarsan tyypin tekstiilikeramiikka on ainakin osittain rautakautista."(Saarnisto & Siiriäinen 1970:18.)

Kosmenko (1991a) considered the dating of the transgression maximum suggested by Saarnisto and Siiriäinen to be too late. Referring to Lak *et al.* (1978) he revised the peak of the Ladoga transgression to the period 1100–1000 BC, which coincided better with Textile ceramics (Kosmenko 1991a:162). In 1994 some new data was obtained by dating a dwelling site with asbestos ceramics at an elevation of 18 m a.s.l. close to Kuuppala at Kurkijoki. This site was carbon-14 dated to (Le-4145) 2970±380 (Saarnisto *et al.* 1994:77; Saksa 1998:135, 189)[2]. The find horizon implies asbestos-tempered pottery of Lovozero type. Saarnisto and Grönlund (1996) recently dated the transgression maximum to about 3100 BP, which is synchronous with the chronology given by Lak *et al.* (1978).

In his article Carpelan (1975b) divided the Early Metal Period ("den östliga metallkulturen") into three subperiods. He connected the earliest period with the Seima-Turbino industry, which reached Finland already at about 1600 BC (Carpelan 1975b:286). The closing phase of the Seima influence was about 1200 BC. The middle period falls between 1300–1100 BC, into which Carpelan connected the Maaninka axes. The younger Bronze Age began about 800 BC with Mälar and Ananino axes and it continued up to 500 or even to 400 BC (Carpelan 1975b:286–287.) In the late 1970's Carpelan linked Textile ceramics with Sär 2 and gave them synchronous dates between 1200 BC–300 AD (Carpelan 1979:11, fig. 2). Matti Huurre has given the *terminus ante quem* dating of 500 BC for Textile ceramics by virtue of the datings from Kemijärvi Neitilä 4 (Kehusmaa 1972:48; Huurre 1983:259).

[1] The reasons why Meinander wanted to change the dates of Sarsa-Tomitsa ceramics are probably first of all connected with the dating of the bronze celts of the Seima type. The beginning of Seima (-Turbino) period was dated to the 16th or the 15th century BC. Another reason might have been becoming familiar with Russian material. Russian archaeologists (Gurina 1961; Pankrushev 1964) stated that the beginning of Textile ceramics should be placed to 1500 BC or even 1800 BC. In his article in the Finnish-Russian archaeological symposium Meinander (1982) presented the early dating for the group.

[2] In Saksa 1994:32 the dating is 2970±360.



Fig. 6.1. The dwelling site and cemetery of Kuuppala, Kalmistonmäki in Kurkijoki. Photo: National Board of Antiquities/Jouko Voionmaa 1937.

In his article concerning Imitated Textile ceramics Aki Arponen collected the carbon-14 datings of the type from all Nordic countries and gave the type the calibrated dating of 1450–500 calBC (Arponen 1992:12–13). Arponen has also re-calibrated the "textile-ceramics" from northern Norway to between 1880–1100 calBC (Arponen 1992:13, Bilaga 2, p. 15).

During the 1980's Textile ceramics was not the main interest of Finnish archaeology. In the middle of the 1990's it became the focus of research again (Lavento & Hornytzkyj 1996; Lavento 1997b; 1997c). On the basis of these studies the author suggests that the beginning of the use of Textile pottery in Finland dates to about 1600 calBC; on the basis of context dates and shore displacement data the end of the period is at 300/400 BC (Lavento 1997b: 223). A more detailed discussion and updating of these results is presented in chapter 6.3.

6.2.2. Sweden and Norway

Although the author does not consider it likely that Swedish and Norwegian Textile ceramics can be culturally connected with Finnish Textile ceramics without difficulties, it is still necessary to know their chronology to make a comparison. Therefore, the main lines of their chronology are briefly presented here.

Astrid Linder made the first carbon-14 datings for Asbestos ceramics in Scandinavia on the basis of North Swedish pottery in 1966. The famous "Laisa-krukan", which Linder defined as Textile ceramics, turned out to be unexpectedly old (St-1356, 3170±160 and St-1808, 3025±80). Most datings fall into the period between the 5th and the 1st centuries BC (Linder 1966:148).

> "Kan det nu erhålla ^{14}C-dateringarna sägas vara representativa för den norrländska asbestkeramiken i dess helhet? Det kan förhålla sig så. Den tidigare påpekade homogeniteten i utformning och ornering samt godsets beskaffenhet och arten av enbart boplatskeramik kan tala för ett mera begränsat tidsavsnitt än vad fallet är för asbestkeramiken i Finland och Norge."(Linder 1966:149.)

The "real age" of the Laisan-vessel was later debated and one solution offered for the "too old" dating was the use of old wood in fireplaces (Hulthén 1991:54; Kosmenko 1996d: 65). But is the result necessarily too old?

Birgitta Hulthén divided the North Swedish Asbestos ceramics into two groups: Asbestos Pottery and Asbestos Ware (Hulthén 1991:14). One textile-impressed vessel of Asbestos Pottery from Lappvallen has a dating (St-1352) 2685±110 BC (Linder 1966:148), which was made from the vessel itself (Hulthén 1991:14). Two other dates from the layers beside the textile-impressed vessels gave the following results: Edånger 1070–830 calBC and Hälla 1740–1520 calBC (Hulthén 1991:14–15). The description of the contexts and the carbon-14 values themselves are slightly unclear in Hulthén's study. Still, according to Hulthén, Asbestos Pottery dates to between 1800–500 BC, Asbestos Ware being from the period between 500–1 BC. Hulthén also assumed that the latter vessels would have been used when smelting

iron (Hulthén 1991:35–36). In Sweden, the typology of Asbestos ceramics in Norrland has not been investigated very thoroughly so far and Hulthén's distinction between the amount of asbestos temper relies too much on one attribute (Bolin 1999:114–119). Some more detailed studies were made of asbestos tempered pottery in Norrland in the 1990's (Ramqvist 1992:186–187; Lindqvist 1994:41).

Textile-impressed ceramics was reported in publications already in the beginning of the 1920's in northern Norway (Nicolaissen 1921). R. Jørgensen and B. Olsen (1987; 1988) suggested a chronology also for Textile pottery from northern Norway. Their two datings (T-6471 3360±150 BP and T-6473 3080±170 BP) were Masca-calibrated with the results (T-6471 calBC 1775±265 and calBC T-6473 1405±235).

When comparing these results with the Finnish and Russian chronology for the Textile ceramics, one can see that the age-difference is not great. Jørgensen and Olsen date Norwegian Textile ceramics to between 1500–500 calBC (Jørgensen & Olsen 1987:28–29). The absolute chronology of the ceramic type related to Textile ceramics is further discussed later (see also App. 8a).

6.2.3. Baltic countries

Early Textile ceramics is known in Estonia from the multi-period dwelling sites of Akali, Kullamäe, Tamula and Loona. Although they were excavated and published already in the 1950's, they are still of great importance in understanding the origin of Early Textile ceramics in the Baltic countries. Comb stamps and pits and tempering vessels with organic material (Jaanits 1959:148–149) refer to the local Late Neolithic Combed Ware. Lembit Jaanits still presented the hypothesis that the origin of Estonian Textile ceramics was the Fatyanovo culture in the Upper Volga area. Jaanits reasoned further that vessel form and textile-impression bore witness to the eastern origin of the type (Jaanits 1959:149).

It is especially interesting that in the dwelling sites of Emäjogi the development of Textile ceramics took place together with Corded Ware, where they occur in the same stratigraphical horizon. Also crushed stone was used in both types (Jaanits 1959:149). Jaanits assumed that although Textile ceramics had its origin in Fatyanovo ceramics the local Corded Ware influenced much of its development in Estonia. An additional argument supporting the connection between Textile ceramics and Corded Ware is hatching, which often occurs also on vessels involving textile-impression. In spite of this Jaanits emphasised that Corded Ware involving both corded- and textile-impression in one and the same sherd had not been found (Jaanits 1959:149). Jaanits dated the appearance of Textile ceramics in Estonia as early as the 17th–16th centuries BC (Jaanits 1959:301) or at the latest to the second half of the 2nd millennium BC (Jaanits *et al.*1982:118).

Aivar Kriiska has recently excavated in the site of Riigiküla IV by the River Narva estuary. The material in the site involves Late Neolithic Combed Ware, Corded Ware and even a few sherds of textile-impressed ceramics (Kriiska 1995; 1996a; 1996b; 1998). Kriiska connects this textile-impressed ceramics with Corded Ware on both contextual and typological grounds. The site is carbon-14 dated to the beginning of the 2nd millennium BC.

This is not the only site where it is possible to observe the connection between textile-impressed ceramics and Corded Ware in Estonia. This connection also exists in Lemmitsa I, close to Pärnu (Kriiska 1997), where Kriiska dates it very roughly to between 2500–1500 BC. In the dwelling site of Altküla by the River Pärnu (Lõugas 1992:65) Textile ceramics date to the 1st millennium BC. Kriiska suggests that it might be possible to derive Textile ceramics from Corded Ware instead of it being derivative of Late Neolithic Combed Ware.

The same kinds of results have also been obtained in other Baltic countries. According to V. Daugodis the Textile ceramics from Eiguliai D I, close to the city of Kaunas, represents a relatively early phase although organic temper had already been replaced by crushed sand. According to him (Daugodis 1966:39) and R. Rimantiné (1962:330) the use of the type dates to the second half of the 2nd millennium BC.

The dating of the later phase of the Textile ceramics which (Daugodis 1966:39) could be connected with gorodisches is also of interest. For instance, the Gorodische of Aukštadvaris about 60 km west of the city of Vilna, dates to the first half of the 1st millennium BC (Daugodis 1966:39). Worth noting is also that in Poland, in the dwelling site of Jeziorku, there exist the same kind of ceramics as in Aukštadvaris (Antoniewicz & Okulicz 1959:29). It has been suggested that they reflect the distribution of Finno-Ugric people during the first centuries AD (Daugodis 1966:40), during the period of the Dyakovo culture.

P. N. Tretyakov (1966a:135; 1966b:192–197) interpreted Textile ceramics as a cultural and ethnic integration of Finno-Ugric populations. According to him (Tretyakov 1966b:192) there are two chronological phases in the ceramics of the Gorodische culture of the Dyakovo type. The first is characterised by Textile ceramics. The second phase – characterised by smooth-faced unornamented vessels – he called Late Dyakovo ceramics (Tretyakov 1966b:195–196). The end of Late Dyakovo ceramics took place at about the 2nd–3rd centuries AD (Tretyakov 1966b:194).

Sārnate ceramics is Late Neolithic Organic Tempered Ware with a hatched surface. Its scant ornamentation implies comb stamps and small pits. Vessels are profiled (Vankina 1970:114–116). In Latvia this type is dated to the middle or the second half of the 3rd millennium BC (Vankina 1970:140). Sārnate ceramics occurs together with Combed Ware. Except for hatched surfaces there exists also a small number of sherds with textile-impression (Vankina 1970, Tab. LXXIX) referring to the possible connection between Late Neolithic Organic Tempered Ware and Early Textile ceramics. Carbon-14



Fig. 6.2. A Late Neolithic and Early Bronze Age dwelling site area in the estuary of the River Kokshaga, in Mari-El, the Middle Volga area. Photo: Mika Lavento.

datings are from the beginning of the 2nd millennium BC. Organic tempered Textile ceramics came into use in the middle of the 2nd millennium BC (Loze 1979:121–122). During the late 2nd millennium BC it was replaced by Late Textile ceramics, which differs from the earlier type because of its scant ornamentation.

Also Janis Graudonis suggests that Textile ceramics is a descendant of Corded Ware and that Baltic Bronze Age populations are derivative of the process where the Corded Ware populations and aboriginal people have been in very close contact with each other (Graudonis 1997:37–38). Among the Early Textile ceramics dwelling sites in Latvia are, for instance, Lagasha, Aboras, Ejni, Lejmanishki and Krejsi and Sārnate.

6.2.4. Russia

North and Central Russia. The middle and the late Bronze Age were characterised by the culture-sphere of Textile ceramics in the large area from the lower course of the River Kama to Scandinavia. This chapter tries to give a short description of the chronology of the most important cultures related to Textile ceramics in the coniferous forest belt of Russia.[3]

In the 1950's Otto Bader dated the earliest phase of the Volosovo culture to the turn of the 3rd and the 2nd millennium BC (Bader 1958:12). Nowadays, the long-lived Volosovo culture is divided into four separate periods. The latest period dates to the first quarter of the 2nd millennium BC. Ceramic vessels of this period are organic tempered and their rim part is either Γ- or T-formed (Krajnov 1987a:14–15); the features, which seem to characterise Late Neolithic and Eneolithic ceramics in a very large area.

One starting point to the chronology of Textile ceramics is in Post-Fatyanovo and Rhomb-Pit ceramics early in the 2nd millennium BC (Oshibkina 1987:155). Although this ceramics has been found together with Seima-Turbino bronzes, it is still not evident that they belong to the same context (Kosmenko 1991a:160). The Seima-Turbino phenomenon began its influence during the 15th–14th centuries BC, the earliest dating being from the 17th century BC (Chernyh & Kuzminyh 1987:102). It is also important to realise that the Seima-Turbino phenomenon lasted probably no longer than two centuries.

The Fatyanovo culture emerged at the beginning of the 2nd millennium BC and its earliest dates are from the 15th century BC (Krajnov 1987b:70–74). Bader and Halikov dated the Balanovo culture to between the beginning of the first half of the 2nd millennium BC and the 9th century BC (Bader & Halikov 1987:76). T. B. Popova (1985) presented that the use of Pozdnyakovo ceramics began already in the 14th–13th centuries BC and continued until the turn of the 1st millennium BC. The Pozdnyakovo culture is divided into three periods. The

[3] The main information concerning the Russian ceramic chronology relating to Textile ceramics is collected in App. 6a and 6b.

first period began already during the 15th century BC and lasted only two centuries. The second period is dated to between the 14th and 13th centuries BC. During this period the cemetery of Dikariha – which involves also Textile ceramics – was in use. At that time the Pozdnyakovo culture had reached its largest and northernmost distribution. It also had connections with the Srybnaya-Abashevo and the Andronovo cultures in the south and southeast. The third period of the Pozdnyakovo culture covered the end of the 2nd millennium BC until the turn of the 2nd and the 1st millennia BC (Bader & Popova 1987:132–133.)

Textile ceramics occur sometimes together with Pozdnyakovo ceramics. The drastic increase in the quantity of Textile ceramics took place at the turn of the 2nd and the 1st millennia BC (Patrushev 1989:27). In the dwelling sites in Mari-el this connection dates back to the end of the 2nd millennium BC and to the beginning of the 1st millennium BC (Patrushev 1989:31).

In the Gorkij region P. N. Starostin and V. F. Chernykov studied several dwelling sites, where most ceramics is of the Pozdnyakovo type (75 %), hybrid Textile ceramics being second. Also some elements of Prikazan and Chirkovo-Seima ceramics characterise the material. These sites can be dated from the 11th to the 9th centuries BC (Patrushev 1989:28).

In the Vladimir district 19 sites involving Textile ceramics, which date to the turn of the 2nd and the 1st millennia BC have been studied (Patrushev 1989:29). In the Yaroslavl region the most important dwelling site involving Textile ceramics is Dikariha (Nikitin 1963; Patrushev 1992). Nikitin dated the site roughly to the second half of the 2nd millennium BC. According to Patrushev this dating merges together both Textile and Fatyanovo ceramics. He interprets Textile ceramics to be stratigraphically above Fatyanovo ceramics (Patrushev 1989:30). Bader and Popova (1987:135) dated the cemetery to the second stage of the Pozdnyakovo culture, between the 14th–13th centuries BC. One of the most important Textile ceramics sites (90 % of the material) in the Vladimir district is Pleshevo III, which is dated to between the 9th–7th centuries BC (Patrushev 1989:31).

The rims with wedge-like or drop-like pits belong to Late Prikazan ceramics. This ceramics is found in the Akhmylovo cemetery dated to the 8th–6th centuries BC (Patrushev & Chalikov 1982, fig 38). According to Patrushev Textile ceramics (or spun-speckled ceramics) dates back to the period which began at the end of the 2nd millennium BC and ended in the middle of the 1st millennium BC; the most important period of use of this ceramics being from the 8th–6th centuries BC (Patrushev 1992:52–55). It occurs often together with Prikazan, Ananino and Pozdnyakovo ceramics in the Middle Volga dwelling complexes. The first combination with Prikazan ceramics took place during the Atabaevsk stage dating back to the 12th–11th centuries BC. The next combination with Late Prikazan ceramics of the Maklaseev stage dates to the 10th–9th centuries BC (Patrushev 1989:26.) The Prikazan ceramics of the Atabaevsk stage has much in common with Pozdnyakovo ceramics. The Late Prikazan ceramics of the Maklaseev stage is smooth-faced and it has relatively thin walls. The latest combination can be found in the cemetery of Akhmylovo, which also gives the name for one separate culture (Patrushev 1989:26–27).

We can state in general, that the use of Pseudo-net or Textile ceramics together with Pozdnyakovo ceramics began already during the 15th–14th centuries BC in the Middle Volga (Patrushev 1989:27). However, the clear increase in the use of Textile ceramics took place at the end of the 2nd millennium BC and continued until the middle of the 1st millennium BC. During this period the amount of undecorated pottery increased drastically (Patrushev 1992:55). It is still difficult to estimate the *terminus ante quem* for Textile ceramics. If taking into consideration Dyakovo ceramics, the dating can be extended to the period between the 4th century BC and the 3rd century AD. At this time, in the course of the third period, between the 3rd–5th centuries AD the use of Dyakovo ceramics disappeared (Rozenfeldt 1974:189).

The early connections of Textile ceramics with other cultures took place in the Middle Volga area between the Fatyanovo-Balonovo and the Tsirkovo-Seima cultures. If accepting some common characteristics in ceramics as a sign of hybrid relations, the earliest dating of Textile ceramics might be synchronous with the Fatyanovo-Balanovo and the Tsirkovo cultures during the first and the second quarter of the 2nd millennium BC (Voronin 1998:320). Voronin has stated that the 17th and the 16th centuries BC are possible *terminus post quem* for it. In the area of Mstinsk Early Textile ceramics was connected with Pit Combed Ware. In the Yaroslavl, Ivanovo and Kostroma regions it was connected with Late Neolithic ceramics implying comb-impression only sparsely (Voronin 1998:320). All these are local variants.

Karelia. The Eneolithic is an important transition period in the Karelian Republic. The carbon-14 dating (TA-1410 3400±60) for the undisturbed Eneolithic dwelling site was obtained from Kladovets IV (Vitenkova 1988:68), and Rhomb-pit ceramics in Pegrema I was dated to between 5200 and 4200 BP. In the beginning of the 1990's Alexandr Zhulnikov presented a typology for Eneolithic asbestos and organic tempered ceramics. He suggested five typological periods, which were both regional and chronological (Zulnikov 1991:128–147). The earliest Asbestos ceramics in Karelia comes from the River Vyg, where its use (group II) began at about 2700 BC. Only one decade later group I emerged in northeastern Karelia and in the Lake Vodlozero basin. The latest of Zhulnikov's groups (group V) existed in all regions of Karelia. Its use began at about 2000 BC and it remained in use until about 1200 BC. Zhulnikov's (1991:144) chronology was based on parallels and comparisons of chronologies with Finnish asbestos ceramics and also on carbon-14 datings.

In 1999 Zhulnikov published a large monograph, where he separated only four ceramic types instead of five. These types are mainly chronological and also geographical (Zhulnikov 1999:40–55). The earliest type,

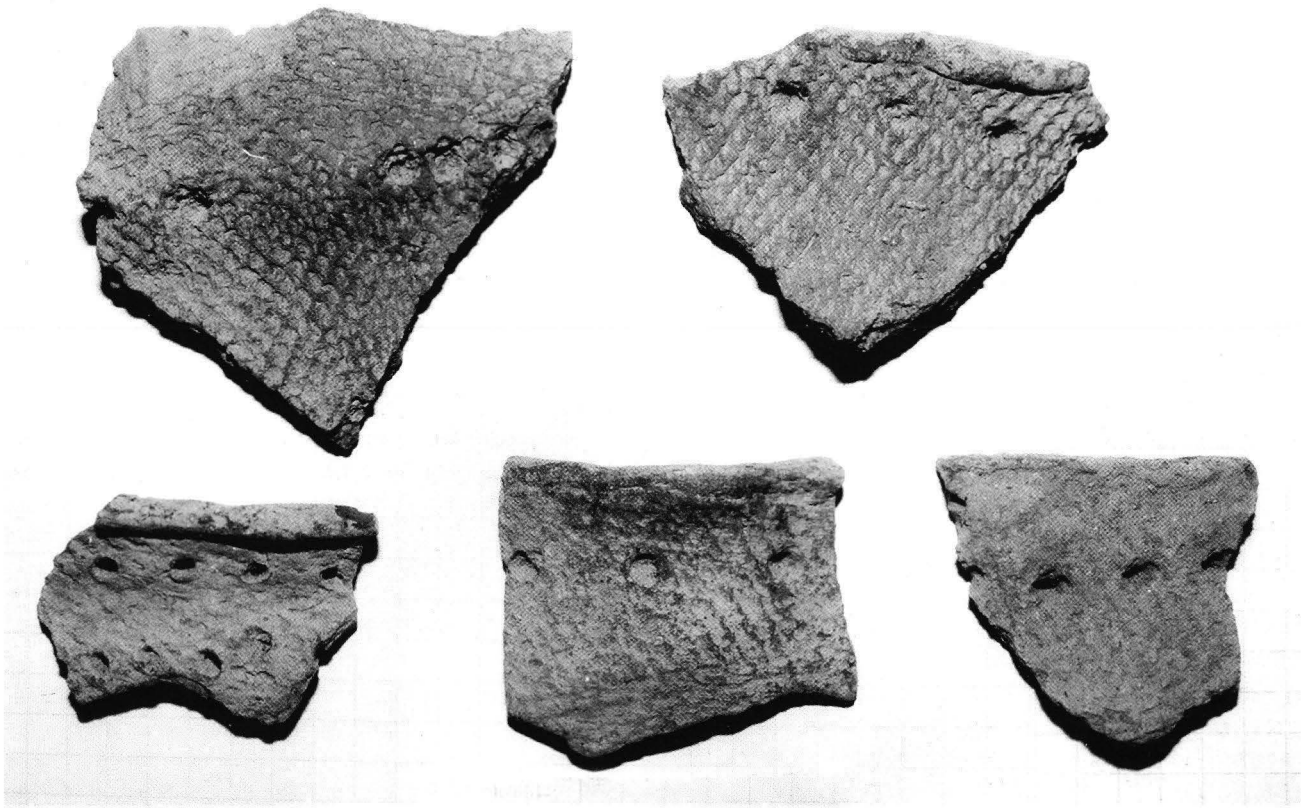


Fig. 6.3. Dyakovo ceramics from the dwelling site of Vatachka, the Middle Volga area, from the Kostroma museum. Scale 1:1. Photo: Mika Lavento.

which he calls Vojnavolok XXVII (Zhulnikov 1993), was dated on the basis of shore displacement chronology and carbon-14 datings to the middle of the 3rd millennium BC (Zulnikov 1999:77). Two other types – the early and the late phase of Orovnavolok XVI – are dated to about 2300 BC and the fourth one, Palajgyba II, dates to the turn of the 3rd and the 2nd millennia BC (Zhulnikov 1999:77). It is interesting that Zhulnikov dates the emergence of Textile ceramics to the middle of the 2nd millennium BC. He states that the third and the fourth period of Eneolit in the Karelian Republic during the third quarter of the 2nd millennium BC are partly synchronous with the appearance of Textile ceramics (Zhulnikov 1999:79).

According to Bryusov Textile ceramics existed in the dwelling site of Tomitsa, close to the city of Petrozavodsk, during the last centuries of the 2nd millennium BP (Bryusov 1950:302). Meinander (1954b:188) considered the Tomitsa and the Sarsa material to be synchronous and the chronological connection between the Karelian and the Finnish material played a considerable role in his datings.

G. A. Pankrushev's studies concerning the dating of the Late Neolithic and the Early Metal Period is based on the uniformly decreasing land uplift model with a transgression. He dated a part of Late Neolithic and Early Metal Period dwelling sites to be ca. 500 years later when compared with the results obtained by carbon-14 datings (Pankrushev 1978b:fig. 15, p. 44; Kosmenko 1991:163). Karelian archaeologists no longer accept Pankrushev's hypothesis of the Eneolithic/Bronze Age transgression of Lake Onega (Pankrushev 1978a:fig. 15 and 17, p. 46–48). E. I. Devyatova did not interpret the shore displacement in Lake Onega as a steadily retarding process. She considered the development in the lake as a series of fluctuations, meaning that the shore displacement in the lake had been both transgressive and regressive. She based her hypotheses on "microshores", which can nowadays be seen as rows of low, sandy ridges implying short shore formation periods. The difference in altitude between Devyatova's transgressive and regressive phases is a minimum of only 0.5 m and a maximum of ca. 5 m (Devyatova 1986:52; 71–81). Devyatova's hypothesis has received much criticism from Russian and Finnish geologists and archaeologists (Saarnisto, pers. comm. 4.5.2000). Devyatova based her hypothesis on shore terrace sediments, i.e. on alternating coarse and fine sediments. However, on the basis of stratigraphical material Saarnisto (pers. comm. 24.4.2000) suggests that a smooth shoreline displacement is the most probable explanation.

If Fatyanovo ceramics played some part in the formation of Textile pottery, this took place during the second half of the 2nd millennium BC (Folomeev 1975:158). Kosmenko set the *terminus ante quem* for the Pozdnyakovo ceramics in the Karelian Republic to the third quarter of the 2nd millennium BC; the most intensive period of its use was the last quarter of the 2nd mil-

lennium BC (Kosmenko 1991a:160). It is characteristic particularly in southeastern Karelia. Pozdnyakovo ceramics is only a short phenomenon in the Karelian Republic (Kosmenko 1992:162).

Kosmenko dated Textile ceramics in Karelia roughly to between the middle of the 2nd millennium BC and the middle of the 1st millennium BC (Kosmenko 1992:148), and in the footnotes of articles he (1991a:160; 1993a:63) mentions two dates from the fireplace at Kelka III for Textile ceramics: 3100±70 (TA-2268) and 3520±80 (TA-2269).

The ornamentation of Textile ceramics, which was carried out with short comb stamps, is typical for Ananino ceramics (Kosmenko 1991a:161). One carbon-14 analysis from Ust-Vodla II gave the dating 2700±100 (TA-1892). According to Kosmenko some carbon-14 dates for classical Asbestos ceramics date to the turn of the 2nd and the 1st millennia BC (Kosmenko 1991a:161).

At Sjamozero, in the dwelling site of Kudama XI, the bronze celt of the Mälar type dates Textile ceramics to between the 8th–6th centuries BC (Kosmenko 1980:140). It seems that the use of Textile ceramics ceased in southeastern Karelia in the middle of the 1st millennium BC and on the western side of Lake Onega during the third quarter of the 1st millennium BC. A variant of Textile ceramics on the southwestern shores of the White Sea – the Belomorsk type – differs from the ceramics by the Lakes Onega and Ladoga. The chronology of the Belomorsk type has not yet been fully fixed. There is some evidence that its use began during the second half of the 1st millennium BC and continued until the middle of the 1st millennium AD (Kosmenko 1982a; 1991a:165; 1996c: 256–257; Savvateev 1977, tabl. 14).

A large number of dwelling sites involving furnaces and iron slag (61 sites) are known in the Karelian Republic (Kosmenko & Manyuhin 1999). For instance, three iron furnaces were excavated in Kudama X (Anpilogov 1966:178–184) and four in Kudama XI (Kosmenko 1980:113–118). In both cases furnaces were dated with the help of ceramics of the Kudama type, although also other types – classical asbestos ceramics, hatched-faced and Textile ceramics – were found. Kudama ceramics is typologically very close to Luukonsaari ceramics. Kosmenko dates its use from the end of the 1st millennium BC to the 6th century AD. Because also the Arctic type exists in Kudama XI, Kosmenko considered these groups synchronous (Kosmenko 1991b:204; 208). The end of Belomorsk ceramics was dated on typological grounds to between the middle of the 1st millennium BC and the middle of the 1st millennium AD (Kosmenko 1991b:212).

One fixed point for the beginning of Late Kargopol ceramics is casting moulds, which typologically belong to the context of bronze axes of the Ananino type. Analogous forms exist in the Asva type of gorodisches, where they were in use during the 7th century BC (Manyuhin 1991:174; Foss 1952:89–101). Oshibkina (1987:149) assumed that the Late Kargopol culture began already during the 14th–12th centuries BC. This dating is, however, far from the chronology suggested by Foss (1952:89–101) and Manyuhin (1991:174). Manyuhin divided the Late Kargopol ceramics in Vodlozero into two chronological groups: the early, from the middle of the 1st millennium BC to 1 BC, and the late, from 1 AD to 6–7 AD (Manyuhin 1991:192–193). The dating of Late Kargopol ceramics covers the period from the 6th–5th centuries BC to the 6th–7th centuries AD (Manyuhin 1991:194–195).

One can sum up the chronology of Textile ceramics in the Karelian Republic in such a way that the use of this ceramics began in the middle of the 2nd millennium BC (Kosmenko 1996d:64–65). These early sites are found only in southeastern Karelia. Kosmenko assumed that the end of the period of use of Textile ceramics coincides with the beginning of the Early Iron Age and the Ananino culture (Kosmenko 1996d:65). This means that its period of use did not end synchronously in the whole of Karelia. In the southeastern part of the area it disappeared during the 6th century BC, but in the western part of the Karelian Republic it lasted until the second half of the 1st millennium BC (Kosmenko 1991b; 1993a:82–83; 1996d:65).

It is interesting that the use of textile and hatched-faced surface treatment continued as the Lepnaya type ceramics in the southern part of the Karelian Republic and the St. Petersburg area during the 1st millennium AD. Gurina (1961:114) dates this group particularly to the 9th–13th centuries AD. S. Kotchkurkina (1996:303) and A. Spiridonov (1986; 1989) dated the using period of the type in the northwestern side of Lake Ladoga to as late as the 10th and the beginning of the 11th centuries AD.

Siberia. In western Siberia exist Textile ceramics, which have been divided on technological grounds into two main types and further divided into several subtypes. The first main type – the Textile-pit or the Textile-comb tradition – is known particularly in the Forest Zone of West Siberia. Siberian archaeologists V. I. Molodin (1981:74) and A. I. Petrov (1987:11–12, 15–16) date this ceramics of the Aleksandrovskij type to between the middle of the 3rd millennium BC and the beginning of the 2nd millennium BC. The ceramics may have had a cultural connection with the local Pit-Combed tradition. Vessels also have corded-impression on their surfaces. V. F. Zajbert gave very early dates to the Siberian Textile ceramics related to the Pit-Comb tradition in the dwelling site of Botaj. The type was in use from the end of the 4th–3rd millennia BC (Zajbert 1985:10).

Textile ceramics of the Odino type are dated to the 2nd millennium BC (Krizhevskaya 1977:92) or more accurately to between the 18th–17th centuries BC (Kosarev 1981:62). Also one carbon-14 dating was obtained from the dwelling site of Odino: 3180±70 (Krizhevskaya 1977:91).

Some archaeologists suggest that habitation spread into eastern Siberia from the western area (Ural Mountains). There is anthropological evidence on common characteristics even with the East Baltic area in the cemeteries of northern Babari (Polosmak *et al.* 1989:91–92). It is still very likely that Siberian textile-impressed pottery is of local origin instead of the influence coming

from the western side of the Ural Mountains. Thus it is probable that textile-impression may have been 'invented' in several areas independently from a cultural influence. Using textile-impression could be more a technological and practical than a cultural phenomenon.

6.3. Dating of Textile ceramics in Finland

6.3.1. Shore displacement dating

The location of Stone Age dwelling sites follows the rule according to which sites were always close to the shore. This is the basis of the shore displacement method, according to which geologists and archaeologists have constructed chronologies since the end of the 1800's. Although this postulate does not necessarily function, as well with the Early Metal Period sites, it is the basic hypothesis in this study as long as the observations are in accordance with each other. Conventional carbon-14 method gives absolute fix points for shore displacement chronology. The method has been developed into a well-working means not only to date prehistoric dwelling sites but also to find new ones in archaeological surveys.

Because of differences in land uplift in different parts of the Scandinavian shield (Kääriäinen 1953; 1975) it has been necessary to construct local shore displacement curves even for middle-sized lakes in Finland (Donner 1978). Although the general features of shore displacement in Finnish archaeology are already known (Siiriäinen 1974; 1978), interesting details have recently been found in different lakes. This is of central importance in trying to fix not only the beginning and the end of the period but also its subphases.

The Ancient Lake Saimaa area and the Karelian Isthmus are central in trying to understand the shore displacement chronology of Textile ceramics. Therefore the main emphasis of shore displacement studies has concentrated on these areas. Still there are some important seashore sites in Ostrobothnia and Varsinais-Suomi bringing additional information to the chronological sequence.

6.3.2.1 Ancient Lake Saimaa area

Aaro Hellaakoski carried out the first shore displacement studies in Ancient Lake Saimaa in the 1920's (Hellaakoski 1922; 1934; 1936). The geologists Veikko Lappalainen (1962) and Matti Saarnisto (1970) continued these studies in the 1960's and the 1970's. Saarnisto suggested a model, which was well in accordance with the shore displacement data of Stone Age dwelling sites.

Although Hellaakoski's studies were the basis for the archaeological shore displacement chronology in the Saimaa area, they were also contradictory. C. F. Meinander (1948) showed that the highest shoreline in the entire Suursaimaa area was metachronous. Archaeological observations dealing with the dating of the dwelling sites have later tried to present more and more detailed models for the shore displacement history (Saarnisto 1970; Edgren 1964; Siiriäinen 1969; 1972; Matiskainen 1987; Jussila 1996, manuscript of the pro gradu -work; 1999; Pesonen 1996b; Lavento 1997b).

In the 1990's Timo Jussila searched synchronous *terminus post quem* – shores for Stone Age and Early Metal Period dwelling sites in the southern Lake Saimaa area. He approximated the age of the shores by searching the cliff bases (törmän tyvi) of the shore terraces in front of dwelling sites (Jussila 1994a; manuscript of the pro gradu -work; 1999). There are often several terraces from different periods in the same site (e.g. Martinniemi at Kerimäki) but there are also pure dwelling sites representing only one ceramic type. All shores used in the analysis have been levelled.[4] Because carbon-14 datings are only few in number, the reliable absolute chronology for the shore terraces in Ancient Lake Saimaa is not yet available. So far the absolute chronology of shore terraces is mostly based on ceramic typology.

Jussila based his method on calculation of the "shore date index" which expresses the relative age of the period (Fig. 6.4.). From our point of view the most interesting shores are the ones involving ceramics from the Early Metal Period. Jussila included in his calculations (manuscript of the pro gradu -work) 16 Textile ceramics sites and 7 Sär 2 ceramics sites. According to Jussila the earliest dates of Textile ceramics are 4100–3900 BP and the youngest between 2000 and 1850 BP. In his article Jussila dates Textile ceramics and the beginning of Sär 2 ceramics to about 2000 BC (Jussila 1996:7). These datings of Textile ceramics are very early.

Jussila states that because the elevation change between the Stone Age and the Early Metal Period is clear, a sudden lowering of the water level – less than 1 m – may have occurred at that time (Jussila 1999:120–122). This assumption is based on observation of bog sediments (Jussila 1999, note 2). It has not been confidentially verified so far by archaeological evidence. Carpelan (1975d) presented a hypothesis of the subboreal flood during the Early Metal Period. Despite a stratigraphical observation at the island of Sirnihta this has not been verified either so far. It is probable that short-period floods had occurred, which may have caused sedimentation on several sites. Still this does not mean that they should be connected with the large-scale changes in the shore displacement history in the Ancient Lake Saimaa area (Jussila 1999:131).

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[4] Over 100 dwelling sites comprise the basic material of the study. The work began already in the beginning of the 1970's when M. Saarnisto, C. Carpelan and A. Siiriäinen levelled several archaeological dwelling sites in the Ancient Lake Saimaa area. Most levellings were made, however, during the project "The habitation and contacts in the Area of Ancient Lake Saimaa during the Prehistorical time" in 1992 by T. Jussila and M. Lavento (Jussila 1994a). Also L. Lehtinen and T. Sepänmaa, from the Savonlinna Provincial Museum, carried out several levellings. Some levellings were also made by P. Pesonen, O. Räihälä and T. Karjalainen.

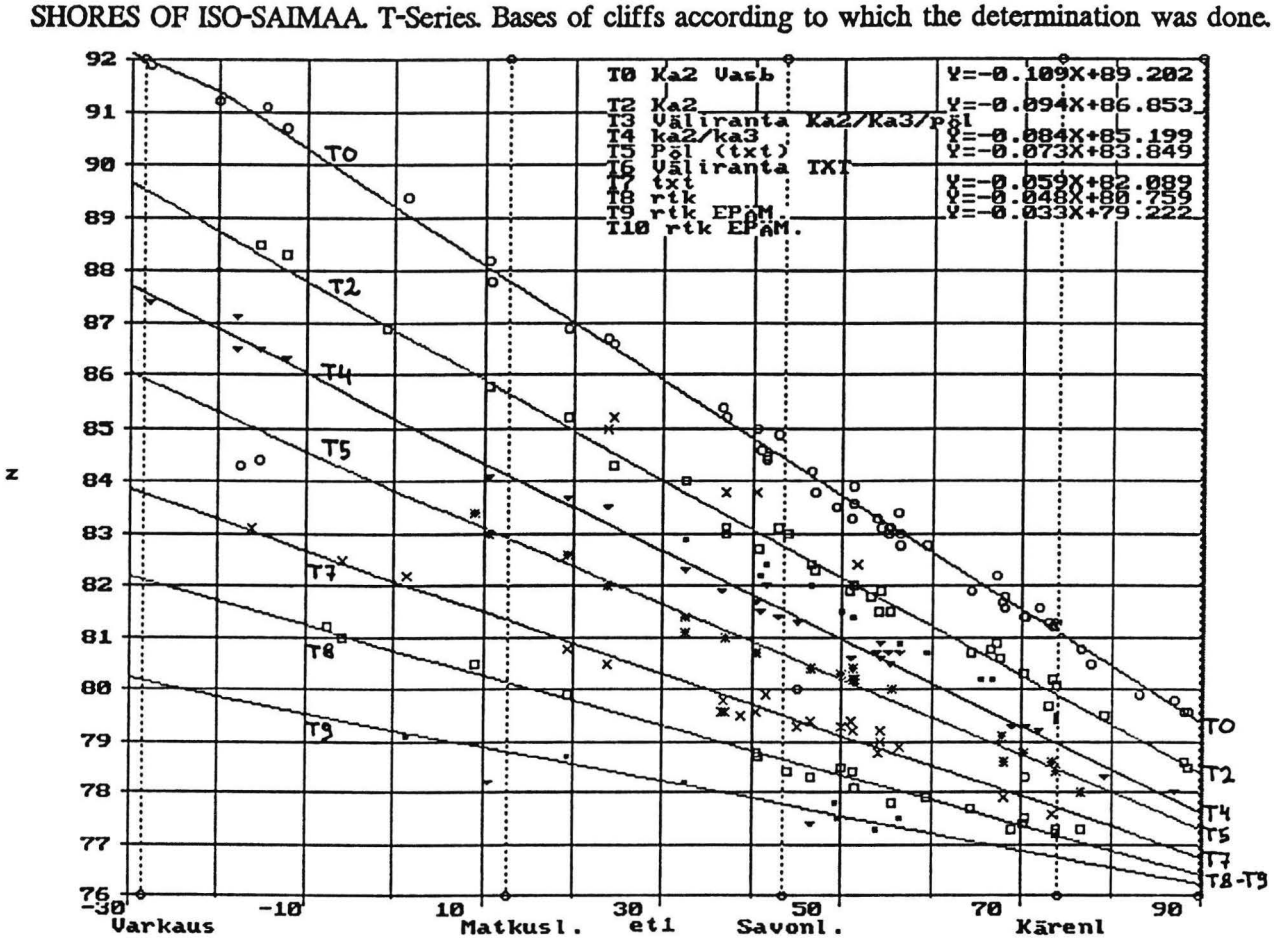

Fig. 6.4. Regression lines for the Neolithic and Early Metal periods in the southern part of Lake Saimaa as suggested by Timo Jussila (Diagram 10. Pro gradu -manuscript). Legend: Ka 2 – Typical Combed Ware, Vasb – Early Asbestos Ware, Ka III – Late Combed Ware, Pöl – Pöljä Ceramics, TXT – Textile ceramics, rtk – Sär 2 ceramics.

One strategy in searching for the lowest elevation of the dwelling site instead of shore morphology is phosphorus analysis and comparing results with shore morphology. These observations were made in 12 Early Metal Period sites (Lavento 1995a; 1997a). This data obtained usually agrees well with the shore displacement data of shore morphology. The difference in elevation is normally less than 1 m.

Fig. 6.5. presents the regression line for the dwelling sites involving Textile ceramics in southern Saimaa, on the southeastern side of the Ristiina-Joensuu line (Jussila, manuscript of the pro gradu -work). There are, however, more dwelling sites involving Textile ceramics in southern Saimaa, which were dismissed for different reasons. One reason is that the sites have not been levelled. Another reason is that there exist different kinds of ceramics mixed together in the cultural layer and it is often impossible to say from which terrace the ceramics had been found. The elevation of the foot of a cliff was used as a reference point. While most sites were situated close to the shore during the habitation period, there are also sites, which are – for the local topographical reasons – over 3 m above the elevation of the foot of the bank. The dispersion of the elevations can be partly explained by local factors: location in relation to open or closed shores, topographical factors, steepness of the shore and

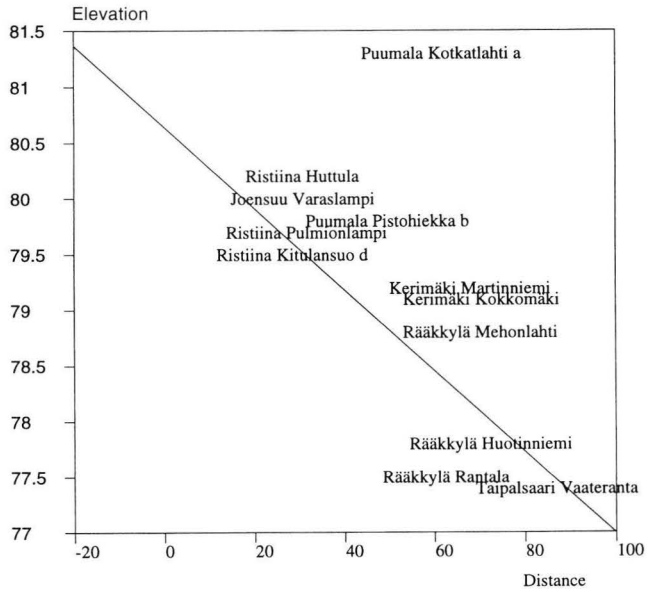

Fig. 6.5. Regression line of Textile ceramics in the Saimaa. Drawn by Mika Lavento.

temporal transgressions caused by temporary floods (Saarnisto M., pers. comm. 9.9.1996).

The shore displacement chronology presented in fig. 6.5. differs slightly from that of Jussila's. Some new sites were included in the study material but correspondingly

some other sites were omitted. One central problem is related to the ceramic typology. Ceramics, which were used as chronological reference points, occur only as small fragments in sites and placing them into the correct ceramic group is often difficult. Second problem is related to context. The two most important dwelling sites involving much Textile ceramics are Varaslampi in Joensuu and Kitulansuo d in Ristiina. In both cases the dating of hearths carried out with the conventional carbon-14 method differs essentially from the dating of ceramics obtained using the AMS-method. Of interest is also that the dwelling site of Kitulansuo d involves the Sarsa type and Varaslampi the Tomitsa type of Textile ceramics.[5]

Three AMS-datings of ceramics are available when trying to fit the absolute chronology for shore terraces involving Textile ceramics. Two are from Varaslampi, Joensuu and one from Kitulansuo d, Ristiina. The dwelling sites on the regression line can be dated to between 1600–930 calBC (see App. 8a).

The second shoreline (fig. 6.6.) for the Early Metal Period sites includes either Luukonsaari, Sirnihta or some other Sär 2 type of ceramics. Plotting all the levelled sites including the Sär 2 ceramics in the table shows a bit better correlation with the regression line than Textile ceramics, but only very slight difference can be seen between their slopes.

In the southern area of Lake Saimaa two regression lines for the Early Metal Period can probably be discerned, although the result remains very uncertain. These are interpreted here as the line of Textile ceramics and the line of Sär 2 ceramics. Discerning more accurate chronological phases is difficult for many reasons. The number of Early Metal Period dwelling sites with definable ceramics is relatively small. This means that every single observation has an effect on the slope of the regression line. The second difficulty is related to ceramics itself: the internal chronology of Textile ceramics or Luukonsaari ceramics is still a difficult question.

One AMS-dating (Ua-10314, calBC 110–60 calAD) for Sirnihta ceramics dates the period to the turn of our era. If we add here the two AMS-datings from Luukonsaari (Hela-8 and Hela-97) ceramics, we get a very tentative dating for the regression line to between calBC 800–400 calAD. More AMS-datings of ceramics are still necessary in order to get more accurate curves, particularly for the Early Metal Period dwelling sites. Still one should not forget that the method itself has its restrictions and trying to force too much information from the data does not lead to acceptable results. The slope of regression lines is very sensitive even for small changes of data. This comes easily visible in the App. 7. This is due to the factors discussed before, but also

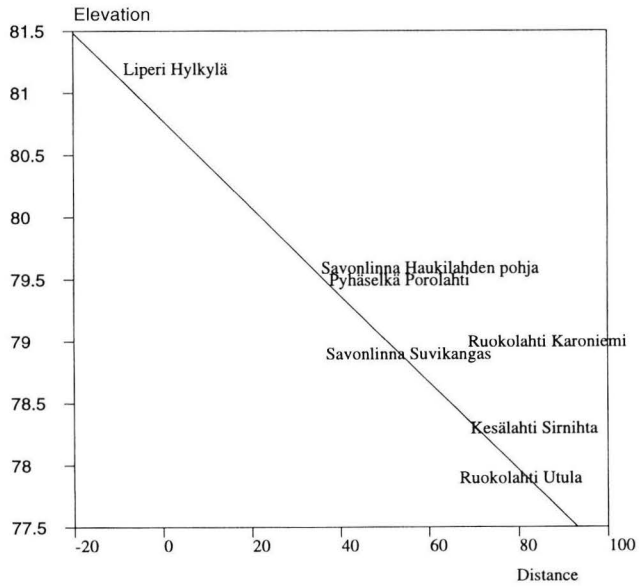

Fig. 6.6. Regression line of Säräisniemi 2 ceramics in the southern Saimaa area.

too small number of finds and their concentration on the SE side of Lake Saimaa (Jussila 1999:120–123).

On the basis of shore displacement observations and AMS-dates in the Saimaa area the use of Textile ceramics did not begin earlier than 1600 calBC (see Fig. 6.11. and App.8a). Jussila's datings (1996:6–7) – ca. 2200–2000 BC for both Textile ceramics and Sär 2 groups – seem evidently too old.[6]

6.3.2.2. Shore displacement chronology in other areas in Finland

The number of Early Metal Period dwelling sites possible to date by the shore displacement method is small outside the Saimaa Water Course. In Kainuu it is not possible to use shore displacement together with Textile ceramics. The most suitable sites for this method are in Ostrobothnia, Varsinais-Suomi and the Karelian Isthmus. One difficulty with these results is that they represent an uncalibrated chronology.

1) Northern Ostrobothnia. In northern Ostrobothnia the dwelling site of Halonen (or Halosentörmä) in Muhos by the River Oulujoki belongs to the earliest finds of Textile ceramics in Finland. The elevation – 35 m a.s.l. – dates it to about 1000 BC (Huurre 1983:259; Siiriäinen 1978:16; Ikäheimo 1994; 1999). A gouged adze, which belongs to the inventory of the Kiukainen culture, was found in the site. An even older dating was obtained from AMS-dating of the jewing resin (Hela-154, 3420±105), which gave the calibrated age interval to between 1880(68.2 %)1600 calBC (App. 8a).

[5] The absolute *terminus post quem* dating for Varaslampi can be obtained by AMS -dating of ceramics. According to this data the site was not in use earlier than ca. 1200 calBC (see App. I). According to the context dating of the hearth the dating is much more recent – 750 calBC (App. 8b).

[6] Jussila hypothesised a catastrophe-like regression in the water level in Saimaa at about 2200 BC. No Early Metal Period ceramics exist above this elevation (Jussila 1996:6).

Although the dwelling site Neitilä 4 in Kemijärvi does not belong to the shore displacement system, its extraordinary stratigraphy makes it possible to construct a well-working dating system, where the *terminus ante quem* for Textile ceramics is about 500 BC (Kehusmaa 1972:48). This dating supports the assumption that Textile ceramics was still in use in the middle of the 1st millennium BC.

2) Southern Ostrobothnia. One of the most important shore displacement dating points for the Late Kiukainen culture in Finland is the dwelling site of Raneåsen (Stenrosbacken) in Närpiö. The elevation of the site is 37.5 m ASL (Siiriäinen 1969:71). Fitting this into the shore displacement curve constructed for southern Ostrobothnia (Glückert 1989; Glückert *et al.* 1993) gives the dating to between 3600–3200 BP (uncalib.). The shore displacement dates differ from each other because Glückert used two shore displacement curves dated by carbon-14 method of pollen samples (in the list of Fig. 6.7. min and max). C.F. Meinander gave the *terminus post quem* dating of 1200 BC for Raneåsen (Meinander 1954a:180–184), and in his report even older (Meinander 1950b). Site elevations for the most important Late Neolithic and Bronze Age sites in the area (Fig. 6.7.) are based on articles (Siiriäinen 1969; Miettinen 1986; 1989; 1994a) or information given in excavation reports.[7]

Site	elevation	max	min
Oravainen Paljak	45.0 m	3800 BP[8]	
Oravainen Finndalen	42.0 m	3800 BP[9]	(uncalib.)
Närpiö Raneåsen	37.8 m	3200	
Alahärmä Puisaarenkytö	36.0 m	3000	
Laihia Annikkalanmäki	35.0 m	3000	2600 BP
Vöyri Vitmossen	33.0 m	2900	
Laihia Nikonkallio	30.0 m	2700	
Jepua Asplandet	30.0 m	2700	
Alahärmä Karkaus	27.5 m	2700	
Maalahti Tallmossen B	27.5 m	2700	
Maalahti Brännskogen	26.0 m	2600	
Laihia Viirikallio	25.0 m	2600	2300 BP
Laihia Luhtalanmäki	25.0 m	2400	
Närpiö Portbäck	25.0 m	2400	
Korsholma Storhällorna	25.0 m	2400	
Uusikarlepyy Råbacken 2	24.5 m	2400	2300 BP
Laihia Kullerinmäki	22.5 m	2400	

Fig. 6.7. Elevations and datings of the Late Stone Age and the Early Metal Period sites in Southern Ostrobothnia. Sites involving Textile ceramics are in bold type.

The youngest Early Metal period sites, Kullerinmäki in Laihia and Råbacken in Uusikaarlepyy, are at an elevation of 22.5 m ASL (Kotivuori 1992). In Glückert's curve the age of these sites falls between 2500–2400 BP.

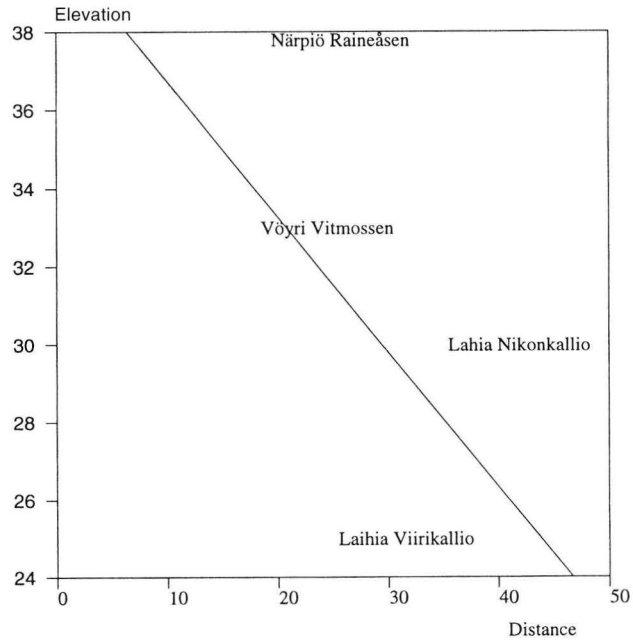

Fig. 6.8. Regression line of Textile ceramics in Southern Ostrobothnia.

Nikonkallio in Laihia has received some attention in showing the end of the Bronze Age in the area (Meinander 1943:43–44) together with Viirikallio. Meinander (1943:43–44) did not mention textile-impressed surfaces, but Mirja Miettinen (1994a:46) observed such in some sherds found at Nikonkallio. Following the shore displacement curve (Glückert *et al.* 1993) the earliest dating of the Late Stone Age/Early Metal Period sites is ca. 3500–3800 BP.

Using the isobase line presented by Siiriäinen (1969:44) it is also possible to construct distance diagrams for the late Neolithic and Bronze Age ceramics in southern Ostrobothnia (App. 7b:1–3). In this study the dwelling sites were divided into four groups. In general outline slopes follow regressing line, but the deviation increases in younger sites. The first group (App. 7b:1) involves Late Neolithic/Early Bronze Age dwelling sites with Kiukainen or Bronze Age ceramics (from Findalen to Annikkalanmäki). Early Bronze Age sites belong to the second group (Vitmossen, Nikonkallio, Asplandet, Viirikallio and Karkaus). These sites imply Textile ceramics or textile-impressed ceramics (Fig. 6.8.). The third group, which includes Morby-liknande (Miettinen 1989) and Bronze Age ceramics, dates to the end of Bronze Age and to the beginning of Pre-Roman Iron Age (App. 7b:2). The uncalibrated datings of Textile ceramics fall between 2900–2600 BC in Southern Osthrobothnia. The fourth regression line represents sites dating to Pre-Roman Iron Age or Early Iron Age with Sär 2 or Morby ceramics (App. 7b:3). Grouping of dwelling sites for drawing regression lines is sometimes very difficult. Problems (comp. Saimaa area) are related also here particularly to the uncertainty of elevation information, definition of ceramics and context dating of sites.

3) Varsinais-Suomi. In Varsinais-Suomi there are three known Bronze Age or Early Metal Period dwell-

[7] The site Peltomaa (Miettinen 1989:104) in Laihia (35 m ASL) with it's carbon-14 dating (Hel-2447; 2325 BP) does not fit well with the shore displacement dates (App. 7b:2, 3).

[8] Miettinen (1994a:11) gives the maximum age of the site only 1300 BC.

[9] Glückert 1989; *Glückert et al.* 1993. Each site could also have a 200–400 years older dating if using the second curve presented by Glückert *et al.*1993.

ing sites involving Textile ceramics (Fig. 6.9.), which can be dated by shore displacement chronology (Glückert 1989).

Site	elevation	max
Paimio Toispulojanummi	35 m	4200 BP
Laitila Hautvuori	30 m	3800 BP
Nousiainen Koivumäki	29 m	3700 BP
Laitila Lalla	24.5 m	3300 BP
Kaarina Hulkkio	22.8 m	3200 BP

Fig. 6.9. Elevations and datings for the Early Metal Period sites in Varsinais-Suomi. Sites involving Textile ceramics are in bold type.

It is conspicuous that the earliest shore displacement dating belongs to the famous Bronze Age dwelling site of Toispuolojanummi at Paimio. It seems evident that Toispuolojanummi was no longer a shore dwelling site during the Bronze Age. The finds on the hill of Hautvuori in Laitila are explained by the fact that the site had not been by the shore during the use of Textile ceramics. The dwelling site of Koivumäki, which has been studied by Torsten Edgren and can be dated by shore displacement chronology to the Final Neolithic or the Early Bronze Age, has in its ceramics many characteristics in common with Textile ceramics. Edgren has classified the ceramics from Koivumäki as belonging to the Morby type (Edgren 1993:153–154). The dwelling site of Lalla in Laitila has played an important role in dating western Textile ceramics. C. F. Meinander dated it to ca. 1000 BC (Meinander 1982). According to Glückert's curve the dating is ca. 3300 BP. All in all, according to the shore displacement chronology, Textile ceramics appeared in southwestern Finland at about 1300 BC at the latest. The dwelling site of Hulkkio in Kaarina (Strandberg 1996) is discussed later.

Uusimaa. In Uusimaa there are five dwelling sites involving Textile ceramics. Their dating using the shore displacement method is difficult due to lower isobases and transgressions.

Site	elevation	max
Espoo Koivistosveden	35 m	–
Askola Ruoksmaa	30 m	–
Karjaa Hagnäs IIb	25 m	3800 BP (Ristaniemi & Glückert 1988)
Karjaa Östergård	16.5 m	3200 BP (Ristaniemi & Glückert 1988)
Porvoo Böle	15 m	2500 BP (Eronen 1983)

Fig. 6.10. Elevations and datings of the Late Neolithic, Bronze Age and Early Metal Period sites in Uusimaa. All sites involve Textile ceramics.

The Litorina transgression lasted in the Uusimaa area for about 3000 years. Although the Litorina transgression has been suggested on many occasions (Siiriäinen 1972; Korhola 1995), some geologists have taken the stand that there has not been a transgression near Helsinki (Hyvärinen 1999:83). The dwelling sites of Koivistosveden in Espoo and Ruosmaa in Askola are situated at an elevation above this level (Donner & Eronen 1981; Eronen & Haila 1982), which means that shore displacement cannot be applied. For Hagnäs IIb in Karjaa and Böle in Porvoo shore displacement datings can be given (Eronen 1983). The dating of the Textile ceramics of Böle, Porvoo, is still problematic. The shore displacement of Östergård in Karjaa dates Textile ceramics to the Early or the Middle Bronze Age, ca. 3200 BP.

6.3.2. Absolute datings and their problems

After the 1950's, the carbon-14 method has become the basis for absolute chronology in prehistoric archaeology all over the world. Dates are not made of ceramics itself, but of the context where ceramics was found, and first of all of hearths and fireplaces. This causes many source-critical problems about the own-age of the dated material and its context (Kankainen 1992:7–10).

The accelerating technique (AMS) makes it possible to date very small samples of charcoal, bone or other organic materials. Only 1 mg of soot or slag is enough for dating, which is usually more reliable than context dating (Possnert 1988:171; Possnert 1994:160–161). The AMS-samples are important in dating ceramics also in this work because so far only few reliable context dates for Textile ceramics in Finland are available. All Finnish AMS results presented in this study were made at the Tandem Accelerator Laboratory in Uppsala. Also some dating data published in Scandinavia was taken into consideration as comparison material. Despite the source-critical problems related to context datings, they are presented from the dwelling sites involving Textile ceramics also. They still occupy an important position in trying to define when the period of use of Textile ceramics ceased in Finland and the Karelian Isthmus.

6.3.2.1. AMS-datings

Archaeologists do not usually know the own-age of the firewood in the hearth and how long the particular hearth had been used in the dwelling site. If the dating is made of the dirt or slag on the surface of a vessel, we can assume that it reflects more reliably the moment of time when the vessel was in use. The age of the vessel is relatively short compared with the possible using period of a hearth.

It has usually been assumed that the matter inside a vessel represents the charred remains of food (Hulthén 1991:54). Soot on the surface of a vessel, instead, comes from heating. The essential question still is, what are we dating with these materials. Hulthén (1991:54) states, referring to Thomas Bartholin's (1987) observations of the dendrochronologically dated pines, that wood can be as old as 600 years, and that just this wood may have

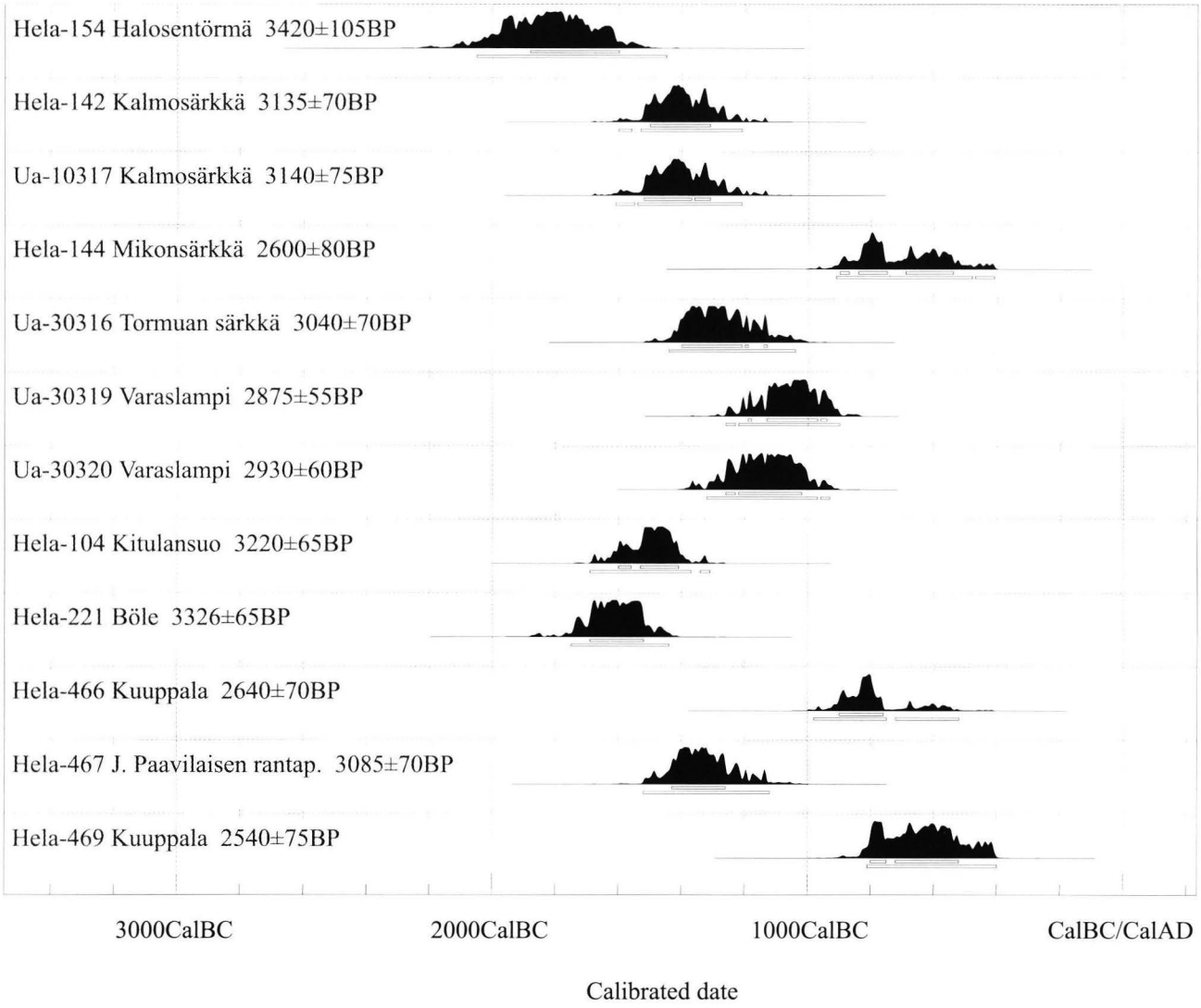

Fig. 6.11. Calibrated AMS-datings of Finnish Textile ceramics.

been used in the fire. Therefore, the error can become large. Still, soot on the outer surface of a vessel represents the most reliable means of dating it. The assumption has been made that the lifetime of a vessel varies from some minutes to some years depending on its function.

Because accelerating dates have opened new possibilities for dating ceramics itself, large dating projects have been conducted in order to update contemporary chronologies. Over one hundred ceramic samples from the Finnish Lapland and the Province of Oulu have been dated since 1995 in the project "Early in the North" (Carpelan 1998). One purpose of the dating program has been to update the chronology of the ceramic sequence in northern Finland, from Sär 1 ceramics to Sär 2 types. Also some samples of Textile ceramics have been analysed. Dates have also been made in the international archaeological project "The Household and Settlement at Besov Nos on Lake Onega during the Mesolithic and Early Metal Age". The most important part of the Finnish ceramics analysed by the accelerating method in this project is the samples of Textile ceramics from Saimaa and Kainuu[10]. The sample data is presented in Appendix 8a.

To obtain a reliable absolute chronology carbon-14 dates have to be calibrated. After the 1960's much work has been done to construct an accurate calibration curve. In this work calibration takes place using the program presented by Stuiver & Reimer (1993). The most recently

[10] Samples Hela 45–49 were dated for the project "Early in the North", samples Ua 10314–10320 for the project "Household and Settlement at Besov Nos on Lake Onega during the Mesolithic and Early Metal Age", and samples Hela-466, 467 and 469 for the project "Viipurin läänin historia." One sample, Hela-221, belongs to the material excavated by MA Nina Stradberg, to whom I express my deepest gratitude for the possibility to use her so far unpublished data. Samples with the code Hela were prepared at the Radiocarbon laboratory of the University of Helsinki but dated in Uppsala. Samples with the code Ua were dated in Uppsala.

published Oxford calibration program for Windows[11], OxCal Program v3.5 was chosen, because the results can be looked at graphically by comparing histograms of probability distributions. All dates available, which have some value in understanding the Textile ceramics in Finland, were calibrated (App. 8a). The results in App. 8a and 8b are given with 1σ probability.

In general, earlier archaeological dates correspond well with the new results. The highest probabilities (1σ) for the using period of Textile ceramics fall between 1700(68.2 %)1000 calBC. According to the probability on the 95.5 % confidence level the use of Textile ceramics began in Finland already in 1900 calBC and lasted at least until 500 calBC.[12]

One can see that the dates imply Early Textile ceramics. The small distribution of dates in Finland can be a result of a random choice of a small number of dated samples. They relate well with the earlier chronology (Meinander 1954b; Carpelan 1979) and the beginning of the tradition of Textile ceramics in Finland. The datings of Kalmistonmäki subtype on the Karelian Isthmus fall between 900-500 calBC.

So far only some preliminary hypotheses can be presented of the chronology of different subtypes of Textile ceramics. The earliest date comes from the dwelling site of Halonen (or Halosentörmä) in Muhos[13], where the calibrated *terminus post quem* dating for Textile ceramics is between 1880–1600 calBC. For many reasons this early result cannot be accepted without criticism. The dating from Halosentörmä is earlier than that in its neighbouring areas. It has to be remembered, however, that so far there are no AMS-dates for the Textile ceramics available in Russia and the Baltic countries.

Also important is the calibrated AMS-dating (1690–1520 calBC) from Böle in Porvoo, which might date particularly the very early phase of Textile ceramics. Thus it supports the hypothesis of the early distribution of the western Textile ceramics. Because Strandberg's excavation has not been published (forthcoming) until 2000 I have not been able to take a closer look at the material.

From Kitulansuo at Ristiina exists early Textile ceramics, which can be connected with the Sarsa type. Close to this dating are also the vessels from Suomussalmi, which belong to the Tomitsa type. It is interesting that there does not seem to be much difference between the early dating obtained from ceramics in South, East or North Finland.

On the basis of AMS-data a clearly younger horizon of Textile ceramics comes from Suomussalmi, dating roughly to between 1500–1200 calBC. Also the dating from Kaukola fits to this range. Results from Varaslampi in Joensuu represent the third horizon between 1200–950 calBC. These sherds represent the Tomitsa type and their AMS-dates are almost synchronous.

According to the AMS-date from Mikonsärkkä in Suomussalmi the use of Textile ceramics ceased ca. 500 calBC in Finland. Also the AMS-dates from Kurkijoki represent the younger end of the using period of the Textile ceramics, showing that the Kalmistonmäki ceramics existed during the first half of the I millennium calBC. As already mentioned this is necessarily not the end of the period as there is other evidence referring to its later use. Because no more AMS-dates are available, the younger end of the use of Textile ceramics needs to be dated by other methods: with context dates and shore displacement method.

Lovozero and IT ceramics have been much AMS-dated in connection with the project "Early in the North"[14]. One should observe that both Lovozero and IT ceramics have a synchronous chronology with Textile ceramics (Carpelan 1999:273, kuva 8). This fact should not be overlooked although the cultural relationship between these types is not necessarily very strong.

The use of Anttila ceramics seems to have begun first, roughly at about 1000 calBC (Carpelan 1999:273). Anttila ceramics is a geographically restricted group in the area of the River Kemijoki and the Oulujoki Water System. Its partially synchronous occurrence with Textile ceramics is obvious and the hypothesis, that its origin is related to Textile ceramics, seems plausible. According to AMS-dates it can be considered to be the earliest subgroup of the Sär 2 family.

The probability distribution of the dates for Luukonsaari ceramics is densest between 800–400 calBC, although Carpelan (1999:273, kuva 8) considers the beginning of Anttila, Luukonsaari and Sirnihta ceramics synchronous. However, this interval seems to concentrate on the early Luukonsaari ceramics, but there exists information (shore displacement data and context data), which supports also a much younger dating for the type. Luukonsaari ceramics was used on both sides of the beginning of the Christian era (Meinander 1969:62–63; Carpelan 1979:11) and there is evidence that shows that this ceramics was in use as late as in the middle of the 1st millennium AD (see later). The chronology of Sirnihta ceramics is the most difficult to establish. Although some AMS-dates exist, these have not been published so far.

[11] The calibration curve published in Stuiver *et al.* (1998) and Bronk Ramsey 2000.

[12] When probability in calibrated results is given in parenthesis involving 1.00 or smaller value it refers that the probability has been calculated from 1σ. If the value in parenthesis implies percentages (100 % or less) the values have been calculated from the whole probability.

[13] The dating from Halosentörmä is made from a piece of jewing resin, which means that strictly speaking it is a context dating. Therefore one should not consider it as equal to the samples from soot or food residue.

[14] Because Carpelan will soon publish the results (Carpelan *forthcoming*) of the dating project only the main lines of them can be presented here.

According to Carpelan (1999:273) the use of Kjelmøy ceramics began ca. 800–700 BC. So far a small number of this type has been found in Saimaa, Kainuu and even in the Karelian Isthmus. The main concentration of the probability mass of Swedish and Norwegian dates for the Kjelmøy ceramics concentrates between the time interval from 400 calBC to 300 calAD (App. 8a). Almost the same concentration exists also in the Finnish data.

The Norwegian and the Swedish AMS-results for local Textile ceramics show many similarities with the Finnish ones, despite the assumed cultural differences. A textile-impressed vessel from Gasadakes in Karasjok (T-6471, 3360±150) has a calibrated dating of 1880–1510 calBC. Also other dates are in principle in accordance with the Finnish ones (App. 8a). On the basis of AMS-dating Swedish textile-impressed ceramics dates roughly to between 1550–750 calBC. These results make it hypothetically possible that there were contacts between North Scandinavian and Finnish Textile ceramics. This is a separate question that is discussed later.

6.3.2.2. TL-datings

So far only three TL-datings have been made for Finnish Textile or Epineolithic ceramics. The ceramics from Ketohaka in Salo belonged to the cultural layer implying textile-impressed or hatched-faced ceramics (Uino 1986:fig. 5:5). According to Uino (1986:table 5:3), the dates are the following:

TL-34	20562b:286	3230±320	1900 (68.2 %) 1050 calBC
TL-35	20562:463	2740±270	1300 (68.2 %) 500 calBC

When thinking about the applicability of these dates one must keep in mind their large standard deviation. Still they are of special importance, because they make it possible to assume once again that Textile ceramics might also have roots in the western culture sphere and that the use of Textile ceramics here can be a bit earlier than in eastern Finland.

Along with these results also context dates were obtained (see App. 8b). Calibrated carbon-14 datings from layer 201b are between 1260 and 910 calBC. On the basis of this, one should put more emphasis on the younger end of the TL-dates in Ketohaka. During the middle of the 2nd millennium BC Textile ceramics was very probably being used in southwestern Finland.

Also the third TL-dating (Keto-17, 2160±160) was obtained (Uino 1986:table 4:6) from the textile-impressed vessel (NM 20838:1029). Its calibrated age is very young (calBC 400 (68.2 %) 10 calAD). However, typologically this vessel does not belong to Textile ceramics although it has a faint textile-impression on its surface. In the dwelling sites of Isokylä in Salo it is possible to follow the development of Textile ceramics until the disappearance of textile-impression as late as during the Pre-Roman Iron Age. It must be maintained that the existence of a faint textile-impression on the Epineolithic vessel does not necessarily mean that it should be included into Textile ceramics. Perhaps it is a parallel phenomenon with Corded Ware or Pöljä ceramics, where textile-impression sometimes exists although not in the same tradition as the Textile ceramics itself.

6.3.2.3. Carbon-14 datings from dwelling sites; context datings

The dates obtained from hearths, fireplaces or stratigraphical layers containing charcoal have traditionally been the most important source of carbon-14 samples for the archaeologist. The main interest for using them is to get the absolute dating for the habitation period of dwelling sites. Understanding the context of the sample is a prerequisite for a successful interpretation. This is of major importance particularly on sites, which have been used for a long time and during different habitation periods. These kinds of difficult conditions prevail often in Finland and particularly on dwelling sites situated on the supra-aquatic area, where shore displacement did not have an effect on the choice of dwelling places.

Despite a considerable number of AMS-information available, context dates are central in building chronologies still today. For this study all relevant dates from the dwelling sites including Early Metal Period ceramics in the research area are listed (App. 8b). Results from nine geographical areas are briefly elucidated. Only the most important results are discussed here (see details in App. 1).

Southern Lapland. There are no context dates that could be used in establishing the chronology for Textile ceramics. Dwelling sites of Neitilä were already discussed in other connections.

Northern Ostrobothnia and the Oulujoki Water System. Almost all dwelling sites in Kainuu are on a supra-aquatic area, outside the possibilities of shore displacement chronology. This makes also context dates problematic. Because the same sites were used again and again for a long time, this often makes results of the carbon-14 dates confusing. The author has ended up with the pessimistic conclusion that there does not exist a dating which could be used to establish the chronology of the Textile ceramics in this area. Although there are plenty of Textile ceramics, for instance, in the dwelling sites of Kainuu, there are no dwelling sites with a clear context involving only Textile ceramics in the cultural layer.

In Salmenniemi in Suomussalmi a dating (Hel-3232, 2130±100; 360(15.7%)290 calBC, 260(52.5%)40 calBC) from the Early Metal Period was obtained. The context in the site implies, except for Textile ceramics, also mica tempered ceramics of the Anttila type. Dates from Mikonsärkkä (Hel-3233, 1490±120; 430(68.2%)660 calAD) and Joenniemi (Hel-2570, 1480±100; 430(68.2%)660 calAD) in Suomussalmi gave Iron Age results (Kontio 1991c). In Mikonsärkkä most ceramics found during the excavation are mica tempered Sär 2 ceramics (Kontio 1991a), although some sherds of Textile ceramics were also found.

Ancient Lake Saimaa area. The dwelling sites – Varaslampi in Joensuu and Kitulansuo d in Ristiina –

are of special importance in dating the Textile ceramics in the Ancient Lake Saimaa area. Both sites involve particularly Textile ceramics but also a small amount of other Early Metal Period ceramics, first of all Luukonsaari ceramics (App. 1). Two carbon-14 datings were made from the one and the same hearth, at different layers, in Varaslampi: (Su-2476), 2360±30; calBC 485(13.5%)460, calBC 455(6.7%)435, calBC 430(0.8%)420, calBC 415(47.1%)385, and (Su-2477), 2430±30; calBC 760(9.9%)720, calBC 540(58.3%)400.

The dates show that the most probable period of use of the hearth was between 520 (68.2%) 390 calBC. Comparing these results with AMS-dates, which fall between 1220–1000 calBC, shows a considerable gap between them. According to Maarit Lönnberg's excavation report (Lönnberg 1974:6) in the same squares (374–375/99) with hearth no. 1 in excavation area no. 5 particularly Luukonsaari ceramics was found but also some small sherds of Textile ceramics. The most probable explanation is that hearth no. 1 was used during the Luukonsaari period.

Ristiina Kitulansuo d is another dwelling site containing mostly Textile ceramics. At present, six carbon-14 datings are available from the site.

I	Hel-3671	550±90	calAD 1300(35.9%)1370, calAD 1380(32.3%)1440
II	Hel 3672	530±80	calAD 1300(28.8%)1370, calAD 1380(39.4%)1450
III	Le-5093	2460±60	calBC 760(22.4%)680, calBC 670(8.8%)630, calBC 600(3.5%)570, calBC 560(21.0%)480, calBC 470(12.5%)410
IV	Hel-3836	2170±90	calBC 360(68.2%)110
V	Hel-3837	1530±80	calAD 430(68.2%)610
VI	Hel-4149	320±70	1480 (68.2%)1650 calAD

Samples V and VI date the iron furnace. The others were taken from the context reflecting more or less Textile ceramics. Luukonsaari ceramics was found particularly from excavation area 6, together with the iron furnace (Lavento 1996:71; 1999b:77–80). The first two samples do not fit the assumptions of the prehistoric settlement period of the site. Samples III and IV, instead, might date the period during which Textile ceramics was in use. Still, in both cases dates seem too young in relation to the AMS-dating of Textile ceramics. Another possibility is that the using period for Textile ceramics should be extended to a younger period, ca. 700–150 calBC. The danger of contamination of the samples is naturally possible. It is also possible that iron making (samples V and VI) in the site may have had an influence in the "too young" dates.

The other Early Metal Period dates in the Ancient Lake Saimaa area are related either to Luukonsaari or to Sirnihta ceramics. Because the relationship between Textile ceramics, Late Neolithic and Sär 2 ceramics is interesting, some of them are briefly discussed here also. The Early Metal Period sites involving no Textile ceramics were discussed more in the licentiate thesis (Lavento 1997b). Unfortunately, so far no data is available from the Late Neolithic Asbestos ceramics. Also the same gap exists in AMS-dates conducted by the "Early in the North" -project (Carpelan 1996)[15].

Carbon-14 dates from the island of Sirnihta in Kesälahti are problematic, because they date the using period of the site to the Medieval Period (App. 8b). This can reflect the actual situation, although it fits poorly with the ceramic material found on the island. Two dates are still worth mentioning here.

Hel-307	1560±110	calAD 400(68.2%)620
Hel-309	2030±120	calBC 200(68.2%)90calAD

These datings can be connected either with Luukonsaari or Sirnihta ceramics. It is interesting that the first dating comes very close to the dating of the furnace in Ristiina. This may indicate settlement activity during the dark period of the Iron Age in eastern Finland.

One dating reflecting most probably the age position of Luukonsaari ceramics was obtained from the dwelling site of Meijerikangas in Pielavesi (Kankkunen 1999:62): Hel-3187, 1910±110; calBC 40(68.2%)240 calAD. In the same site also Stone Age dates were obtained (App. 8b). The material in Meijerikangas includes also some sherds of Textile ceramics. The ceramics around the dating point included only Luukonsaari ceramics.

It should also be mentioned that the Lappish cairn at Kuusikkolahdenniemi included small sherds of asbestos tempered ceramics[16] including textile-impressions. Also button-like bronze implements were found (Pohjakallio 1978a:21–24). Pohjakallio has dated it roughly to the Bronze Age (Pohjakallio 1978a:24).

Southern Ostrobothnia. In several dwelling sites in Southern Ostrobothnia carbon-14 samples were taken, which are of special importance not only in dating the habitation in each site, but also in updating shore displacement chronology. In Jepua Råbacken (Kotivuori 1990:129–132) six dates were obtained. Three of them can be connected with Luukonsaari and Morby ceramics, their sum of probabilities falling between 800(68.2%)250 calBC (see App. 8b). The material from Annikkalanmäki in Laihia represents ceramics, which has a hatched surface but no textile-impressions. The following carbon-14 dates were obtained from the dwelling site.

[15] A poster presented by Christian Carpelan at the VII Nordic Conference on the Application of Scientific Methods in Archaeology in Savonlinna 7. –11.9.1996.

[16] KuM 6154. Finds are in the Pohjois-Savo Provincial Museum in Kuopio. The assumption that the sherds may have textile-impression on their surface was made on the basis of a picture (Pohjakallio 1978a: 23, fig. 12).

KM 26571:14 (185/504)	Su-2430	2630±60 BP	calBC 900 (7.5%)870, calBC860 (59.7%)760, calBC 680 (1.0%)670
KM 26571:12 (95/505)	Su-2431	2500±40 BP	calBC 790 (5.7%)750, calBC 710 (62.5%)520

The dwelling site of Viirikallio in Laihia (Miettinen 1994a:50) implies textile-impressed, hatched-faced and smooth-surfaced Textile ceramics.

Hel-2683	2350±110 BP	calBC 800(58.0%)350, calBC 300(10.2%)200
Hel-2684	2360±120 BP	calBC 800(61.8%)350, calBC 300(6.4%)200

Textile ceramics in Viirikallio represents perhaps the youngest end of its use. Most vessels are mica and sand tempered but also asbestos was used. Combined dates give the result calBC 800(1.00)200. The material in the site implies also smooth-surfaced and scratched western Bronze Age ceramics (Miettinen 1994a:46). The uncalibrated shore displacement result fits well with the calibrated carbon-14 dating.

As a conclusion of the carbon-14 dates from the dwelling sites of Ostrobothnia it can be said that they follow quite well the shore displacement chronology suggested by geologists. The carbon-14 dated sites seem to be regularly a bit younger than the shore displacement dating. However, this fits well with the idea that the site was inhabited somewhat later than what might be its first possible dating for habitation. Perhaps a more important observation concerns the youngest dates of Textile ceramics. According to the dates from Viirikallio, it seems possible to say that Textile ceramics was in use as late as 800–200 calBC.

Varsinais-Suomi. In Varsinais-Suomi there exist two radiocarbon dated Early Metal Period dwelling sites, which are of some interest when considering the relationship between Bronze Age and Textile ceramics.

The dwelling site of Hulkkio in Kaarina implies Textile ceramics, Paimio ceramics and Morby ceramics. Shore displacement chronology brings it to the first half of the 1st millennium BC (App. 1). Carbon-14 datings from the site cover a long period between calBC 1390–720 calAD (Strandberg 1996b:39–43). The existence of different ceramic types refers to the possibility that both coastal and inland populations used it. The material is miscellaneous and presents no possibilities to date the ceramic types. It is worth to note that the using period of Morby ceramics from the end of II millennium calBC to the middle of I millennium calBC is partly synchronous with the Textile ceramics (Edgren 1999b.325–326).

The dwellings sites and cairns in Salo, Ketohaka 1 and 2, and the group of dwelling remains at Ketohaka have been dated by tens of context dates (Uino 1986). The most important results were already presented together with the TL-results. It is enough to state here that the great majority of them fall into the Roman Iron Age. Because Pirjo Uino (1986) discusses the results thoroughly in her licentiate dissertation, repeating the results is not necessary here.

Uusimaa. Dating material for Textile ceramics is available only from Böle in Porvoo (see 6.3.2.1.), but they will be not discussed in this connection more (Strandberg, forthcoming).

6.3.2.4. Interpretation of results

AMS-chronology is the basis for the dating of Textile ceramics and its neighbouring groups. One weakness in the dated material available is that majority of ceramic samples come from either northern or eastern Finland. At present, there are only two AMS-results from the Textile ceramics of western Finland available. For instance, there are no AMS-dates from the Sarsa area. In addition to this, there is not much context data from the dwelling sites, which can plausibly be connected with Textile ceramics.

Considering the AMS-data of Textile ceramics available so far, we see that the beginning of the period seems to be better established than the end. AMS-dated, calibrated *terminus post quem* for the Textile ceramics in Finland is about 1700 calBC, or perhaps even 1800 calBC. A more exact chronology for this is difficult to give. Two AMS-dates obtained from Muhos and Porvoo are very early in relation to the chronologies represented in the neighbouring countries. In the lack of comparative information particularly from Russia and Estonia, it is too early to say how much chronological meaning these observations have for the whole type.

Shore displacement data is generally in accordance with conventional carbon-14 and AMS-datings. In the Saimaa area even earlier chronologies have been presented for Textile ceramics (Jussila 1996; 1999) but the discrepancy might also be explained by the shortage of absolute dates for establishing a plausible chronology for different regression lines.

The end of the use of Textile ceramics is perhaps more difficult to establish than its beginning. According to the calibrated AMS-dates its use ended in eastern Finland at at latest about 500 calBC. For many reasons this does not seem acceptable. For instance, the dwelling site of Viirikallio in Laihia is carbon-14 dated to between 800–200 calBC. This fact, together with the shore displacement chronology, supports the assumption that the use of Textile ceramics continued during the Pre-Roman Iron Age. This hypothesis is supported also by Kitulansuo in Ristiina, where the context is carbon-14 dated to between 700–150 calBC. Still, one should not forget the possible effect of contaminated samples. Further support for the late datings comes from Ketohaka in Salo (Uino 1986:121–123). As a conclusion of the AMS, conventional radiocarbon and shore displacement dates it can be said that the use of Textile ceramics continued at the latest until the end of the Pre-Roman Iron Age.

Three TL-datings from Isokylä in Salo shed some light on the beginning and the end of the use of Sarsa

ceramics. One dating from Salo allows the assumption that the earliest dates go back to the beginning of the 2nd millennium calBC. Again, on the basis of one TL-dating the *terminus ante quem* for the end of Sarsa ceramics might be at the end of the Pre-Roman Iron Age.

The chronology of Sär 2 ceramics is partly synchronous with Textile ceramics. Anttila, Luukonsaari and Sirnihta ceramics seem to emerge roughly about 1000 calBC. The hypothesis that Luukonsaari ceramics would have still been in use as late 500–600 calAD is reasonable but so far very weakly supported. In Saimaa there exists a small amount of ceramics belonging to the Sär 2 group – Sirnihta ceramics – the dating of which roughly follows the emergence of Luukonsaari type.

6.3.3. Internal chronology of Textile ceramics in Finland and the Karelian Isthmus

The Early Metal Period lasted at least 1000 years, but perhaps even 1500 years. It is probable that during that time changes occurred both in style and in society. The analysis has left this question almost without discussion so far. On the basis of statistical analysis, Finnish Textile ceramics can be divided into two or even four subgroups. The division into Sarsa and Tomitsa can be supported by observations, although the typology is not without problems. A more detailed division – into Kainuu and Kalmistonmäki subgroups – is more complicated.

Although most dates seem to concentrate on the older end of the Textile ceramics, there exist two dates of the Kalmistonmäki subtype representing the younger end of it. The conventional carbon-14 dates are mostly from such contexts, which have mixed material from earlier or later settlements. Finally, shore displacement data often comes from such areas, where there is not much Textile ceramics. Although the internal chronology of Textile ceramics is difficult to establish, something can still be said. The AMS-dates from Muhos, Porvoo, Ristiina and Suomussalmi represent the early phase of the type indicating the first appearance of Textile ceramics in Finland. They do not show any considerable time gap between different areas in Finland. Into this early period belong also ceramics from the dwelling sites of the Kokemäenjoki and the Kymijoki Water Systems (incl. Sarsa in Kangasala and Kotasaari in Asikkala). On the Karelian Isthmus there is probably material, which can be dated to this phase also.

From a typological point of view the Textile ceramics from Varaslampi in Joensuu represents a developed phase of the type in Finland. Dates between 1250–930 calBC are, in practice, about 300–800 years younger than in the first phase. Varaslampi ceramics best represents the Tomitsa type in Finland.

The transgression maximum in Lake Ladoga was between 1100-1000 calBC (Lak *et al.* 1978; Saarnisto *et al.* 1994; Saarnisto & Grönlund 1996). This means that new shore displacement data does not support Meinander's late dating of the Kalmistonmäki group. It is still evident that Textile ceramics in the Karelian Isthmus would partly date to the turn of the 2nd and the 1st millennia BC and the Kalmistonmäki ceramics would have been used also later, in the middle of the 1st millennium BC.

The fourth group, which is partly synchronous with the Kalmistonmäki ceramics involves material from southern Ostrobothnia and southwestern Finland. It seems that the sites in Ostrobothnia represent the youngest phase of Textile ceramics. Among the most important sites is Viirikallio in Laihia, where Textile ceramics exists in the same context with Morby ceramics. According to shore displacement data the *terminus post quem* of this site is ca. 800 calBC but it may have been used as late as 200 calBC. Also some carbon-14 dates give the same sort of information. The amount of ceramics in these sites is small leaving only a few possibilities for typological analysis. In some dwelling sites (e.g. Salo and Ristiina) carbon-14 dates were obtained, which support the continuation of the type until the end of the 1st millennium BC.

Dating the end of Textile ceramics is perhaps not a realistic aim at all, because a ceramic style does not necessarily disappear quickly. More probable is that it loses its important characteristics during a slow process lasting hundreds of years. Depending on the point of view towards the attributes, the disappearing process can be very roughly dated to between 500–1 BC. The cultural-historical meaning of this interpretation is discussed in the last chapter of this study.

VII THE RELATIONSHIP OF TEXTILE CERAMICS AND ITS NEIGHBOURING TYPES

7.1. Introduction

Very often archaeologists concentrate only on that particular ceramic type they have chosen as the object of their study. Although this is for many reasons practical and even necessary due to the large amount of material, this raises the problem of verifying the existence of the type if it is not compared in relation to other types.

This chapter aims to compare Textile ceramics with the preceding and the following ceramic types. This analysis tries to minimise circular reasoning, which often begins already when choosing the study material. The most natural approach to avoid the problem is to investigate essentially larger material and to find out how a particular type comes out in this environment.

Studying larger material, instead of one restricted type, also helps to understand continuity and discontinuity. It helps to separate those characteristics from the preceding types, which may reflect continuity in the later types. It may also give ideas about the origin and the disappearance of the type. The definition of boundaries of ceramic types is often difficult. Therefore, studying a particular ceramic type – in this case Textile ceramics – gives one the possibility to study the definition of the type in a different light. One should not forget that a ceramic type is often not a homogeneous entity, but it can be further divided into subtypes, which reflect chorological and chronological differences in style. It must also be remembered that types are entities created by an archaeologist, who tries to understand styles, which may have existed in the prehistoric past.

One means to approach Textile ceramics is to compare it with its neighbouring types in local areas, in this case between the water systems in Finland, and also with the Textile ceramics in the neighbouring countries. Therefore, the detailed geographical analysis of Textile ceramics is worth conducting as time-consuming as it may be.

7.2. Comparison of Finnish Textile ceramics with Textile ceramics in the neighbouring countries

7.2.1.Estonia

Early Textile ceramics

In Estonia Textile ceramics is not a uniform entity and at least two different types can be discerned in it. In this work, Estonian Textile ceramics is divided into early Textile ceramics (Lavento 2000a), which is found particularly in the dwelling sites of Akali and Kullamägi (Jaanits 1959) and late Textile ceramics, which is found in the dwelling sites and cemeteries dating to the Pre-Roman Iron Age or even later (Laul 1966; 1997).

The scatter plot of the material (Fig. 7.1.) in Akali and Kullamägi differ markedly from the sites in southern Finland and the Karelian Isthmus. In Estonian early Textile ceramics organic tempers were used almost without exception, while in Finland organic tempers are not as common. It is interesting that organic tempers were used in ceramics found in the dwelling site of Kitulansuo in Ristiina, which belongs to the earliest of the type in the dwelling sites in Finland.

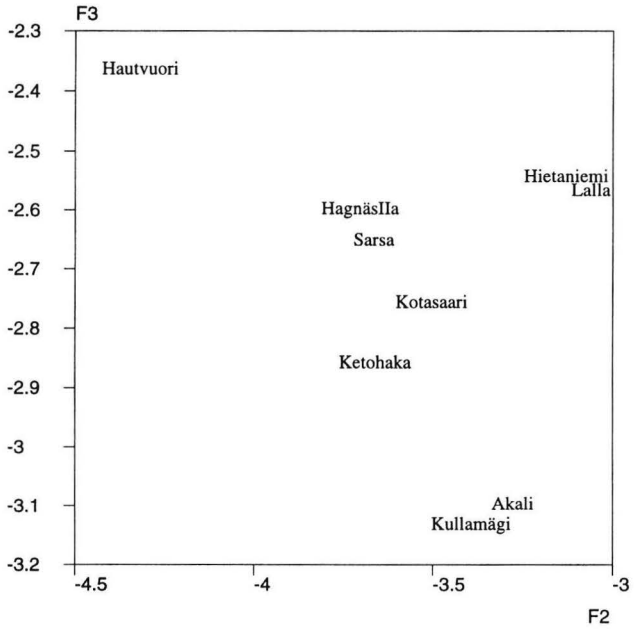

Fig. 7.1. Comparison of the most important sites with Textile ceramics in Southern Finland and the sites with Early Textile ceramics in Estonia. Factor plot F2/F3.

The scatter plot of Textile ceramics between dwelling sites shows that Akali and Kullamägi form a dense group of their own. This can be explained with the small variability of the early Textile ceramics in Estonia. The ornamentation is quite scant and conducted with simple elements. Typical ornamentation involves oblique, short comb stamps or angled lines of short comb stamps form-

ing a horizontal zone (Jaanits 1959, tabl. XXIII–XXV). Small comb stamps occur in irregular zones.

Despite some essential differences one should not forget that the early Textile ceramics in Estonia has many points in common with the early Textile ceramics in southern Finland. Several traits – scant ornamentation, irregular order of pits, short and relatively thin comb stamps – refer to connections between these ceramics. Parallels in Finnish Textile ceramics can be found, for instance, in the material from the dwelling cluster of Sarsa. In both cases ornamentation of the Textile ceramics is careless in its general character. It gives the impression that ornamentation was not an important issue in this ceramic type.

The number of Textile ceramics known so far from the Finnish coastal area is very small and finding parallels is difficult. The connection of Middle-zone ceramics and Estonian early Textile ceramics is also difficult to establish. Parallels may exist but they cannot be easily verified. The ceramics from Lalla at Laitila differs clearly from the early Estonian Textile ceramics.

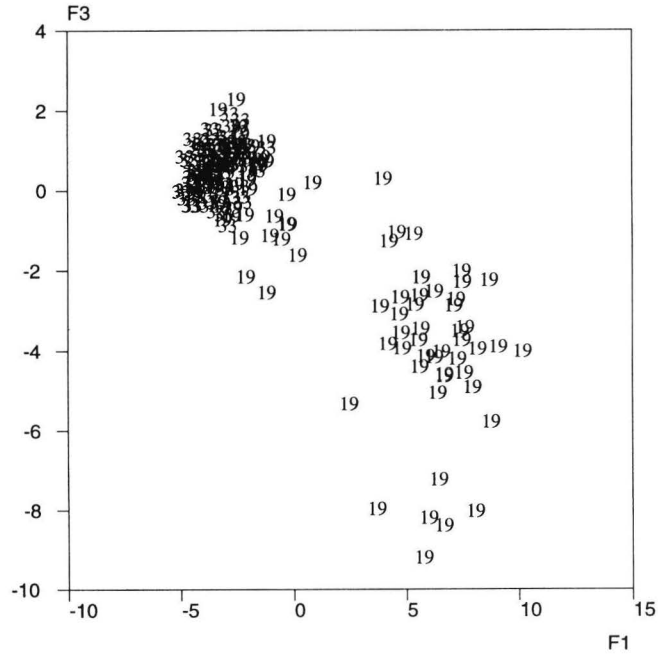

Fig. 7.2. Comparison of Textile ceramics vessels in Southern Finland and Asva ceramics in Estonia. Factor plot F1/F3. Legend: 19 – Textile ceramics, 33 – Asva ceramics.

Asva ceramics

The late Textile ceramics in Estonia can be connected with the finds in the Asva hillfort and therefore this ceramics is the main comparison material in this work (Indreko 1939;1961). Although late Textile ceramics exists probably in many sites in Estonia (Laul 1966; 1997), their investigation would need much work which has not been possible to conduct for this study. For this reason also statistical analysis of late Textile ceramics was made through Asva ceramics only.

Asva ceramics represents the younger phase of textile-impressed ceramics in Estonia dating roughly to the Pre-Roman Iron Age. This type differs so much from early Textile ceramics that it would not be reasonable to discuss whether it should be included into Textile ceramics at all.

Finnish Textile ceramics can be discerned without difficulties from Asva ceramics using statistical analysis. The separation is evident, because Asva ceramics forms a very dense cluster when all factors are calculated (Fig. 7.2.). This is explained with the scant and simple ornamentation of Asva ceramics. Another reason is that all material comes from the fortress of Asva. Further, it was possible to use only about 50 % of the large amount of material collected in the excavations in Asva. In the light of this analysis, Finnish Textile ceramics does not have close parallels with Asva ceramics.

This question is further discussed in connection with Morby ceramics.

7.2.2. The south and the east coast of Lake Ladoga

Material from six dwelling sites involving Textile ceramics is included in this analysis (see App. 2). The largest collection of Textile ceramics comes from the dwelling site of Issady, the inventory of which includes over 100 vessels. Also a large amount of Textile ceramics was collected from Ust-Rybezna. All sites are situated on the southern and eastern coast of Lake Ladoga.

In the scatter plot (Fig. 7.3.) between the dwelling sites on the south and east coast of Lake Ladoga, the Karelian Isthmus and the Saimaa Water Course, the Tomitsa ceramics from northern Saimaa (Varaslampi) differs clearly from the others. The scatter plots of Issady II and Sopka (Gurina 1959; 1961) come close together and so do the sites in the Karelian Isthmus and southern Saimaa. Their typological clustering is very interesting although Textile ceramics on the southeastern side of Lake Ladoga has generally richer ornamentation than that in Finnish sites or sites in the Karelian Isthmus. Of some interest is also the Textile ceramics from Kalmistonmäki in Räisälä, which differs clearly from other sites. This material involves five vessels, which are included into the type of Textile pottery; the "proper" Kalmistonmäki ceramics has already been separated from this group (see chapter 7.5.5.), because it differs so much from the other material in the site.

7.2.3. Dwelling sites on the east and west side of Lake Onega and the northern part of the Karelian Republic

Factor analysis separates clearly the Textile ceramics found in the Eastern Finland from the material found in Lake Sjamozero and the west coast of Lake Onega. To

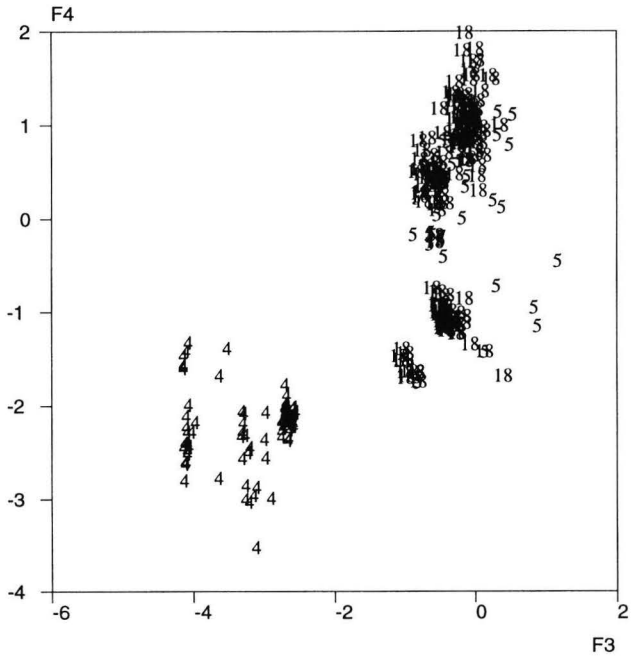

Fig. 7.3. Comparison of Textile ceramics vessels in the Saimaa Water System and on the Karelian Isthmus and the dwelling sites in the south and the east coast of Lake Ladoga. Factor plot F3/F4. Legend: 4 – the Lake Saimaa Water System, 5 – the Karelian Isthmus, 18 – the south and the east coast of Lake Ladoga.

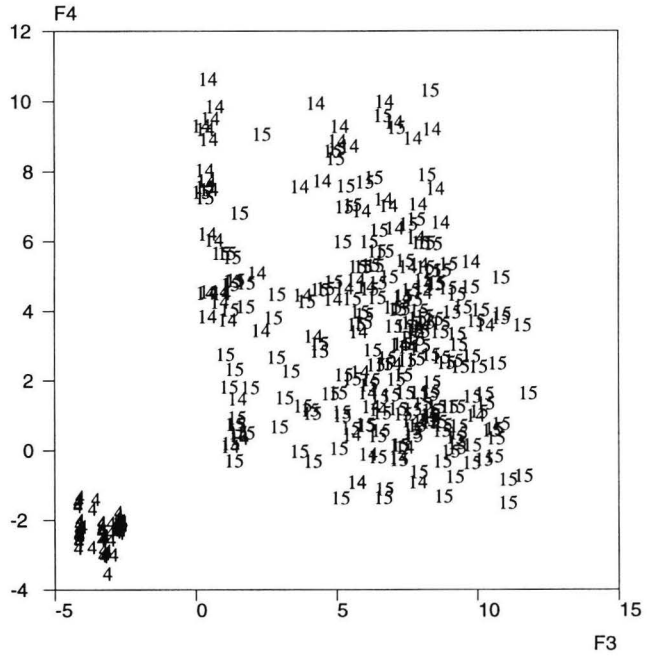

Fig. 7.4. Comparison of Textile ceramics vessels in the Saimaa Water System and the Karelian Republic. Factor plot F3/F4. Legend: 4 – the Lake Saimaa Water System, 14 – the eastern side of Lake Onega (Vodlozero), 15 – Lake Sjamozero.

the latter material belongs, for example, the classical ceramics from the dwelling site complex of Ust-Tomitsa in the estuary of the River Tomitsa, on the northern side of Petrozavodsk. It is interesting that the difference between the Finnish and the Karelian material seems to be clear referring to the situation that they probably did not necessarily have a very close relationship with each other.

It is also worth noting that in the factor plot F3/F4 (Fig. 7.4.) of the Textile ceramics in Saimaa Water System also concentrate in one dense cluster. The clustering into two heterogeneous groups becomes visible between the sites in the Karelian Republic independently which factors have been used in plots.

The amount of feldspars used as temper on the eastern side of Lake Onega and in the sites around Sjamozero is about 75 % and only ca. 33 % in the northern Saimaa region, where the amount of soapstone and asbestos tempers exceeds 50 %. In ornamentation the difference is reflected through the use of elements. In the Karelian material elements are larger in size and they cover a larger percentage of the surface than in northern Saimaa. Thus ornamentation in the Karelian Republic is richer despite the fact that the Varaslampi material represents relatively many-sided ornamentation, which indicates an evident relationship with the Karelian one.

The comparison between the above-mentioned material from the Karelian Republic and the Textile ceramics from Kainuu shows the same kind of results (Fig. 7.5.). According to factor plots the Kainuu material differs from the Textile ceramics in the Karelian Republic like the Saimaa material differs from the Karelian one. The grouping of the Textile ceramics from Kainuu into one, although not very homogeneous, group is peculiar. Textile ceramics in the Kainuu seems to form more heterogeneous cluster than Textile ceramics from the dwelling sites in the east and SW side of Lake Onega. There are probably several reasons for this and also source critical problems should be taken into consideration here. Because the amount of material in the Lake Vodlozero and

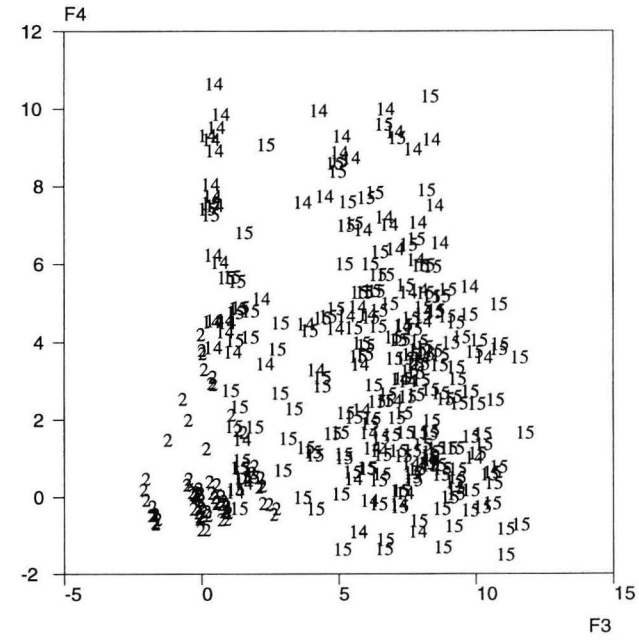

Fig. 7.5. Comparison of Textile ceramics vessels in the River Oulujoki Water System and on the Karelian Republic. Factor plot F3/F4. Legend: 2 – the River Oulujoki Water System, 14 – the eastern side of Lake Onega (Vodlozero), 15 – Lake Sjamozero.

Lake Sjamozero is larger it allows larger variability in attributes than in Finland. Also the state of preservation of Textile ceramics is better in the Karelian Republic than in Finland, and only the best-preserved fragments of vessels were taken into account for statistical analysis; from Finland even very small rim sherds were included.

The comparison of the Textile ceramics in Kainuu and the area of the River Vyg, the Belomorsk area and the western side of Lake Onega also provides interesting information (Fig. 7.6.). In the same way as in the comparison of the more southerly areas, also here the ceramic material from Karelia divides into two relatively dense clusters, and the Textile ceramics in Kainuu concentrates on a heterogeneous cluster of its own.

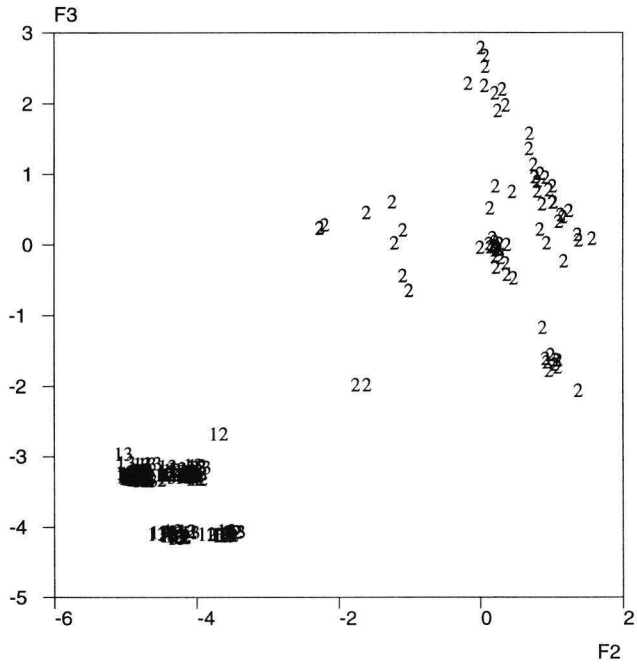

Fig. 7.6. Comparison of Textile ceramics vessels in the River Oulujoki Water System and on the Karelian Republic. Factor plot F2/F3. Legend: 2 – the River Oulujoki Water System, 11 – the Lake Kuittijärvi Water System, 12 – the River Vyg Water System, 13 – the western side of Lake Onega.

If now comparing material from the Saimaa Water System with the area of the River Vyg and the area in western side of Lake Onega one can easily separate the cluster of Varaslampi from Karelian ceramics (Fig. 7.7.). Interesting is that the cluster of southern Saimaa (Kitulansuo) partly coincides with the second cluster of Karelian Textile ceramics.

One more comparison elucidates the relationship between the Textile ceramics in Oulujoki and Saimaa Water System and the ceramics from the area of the River Vyg and Belomorsk. Figure 7.8. present the same comparison as figure 7.7. but in this case also Textile ceramics from Oulujoki Water System is included. It is conspicuous that just this part forms very heterogeneous group and thus separates also from the material from Saimaa Water System which seems to be closer to Karelian ceramics than that one in Kainuu.

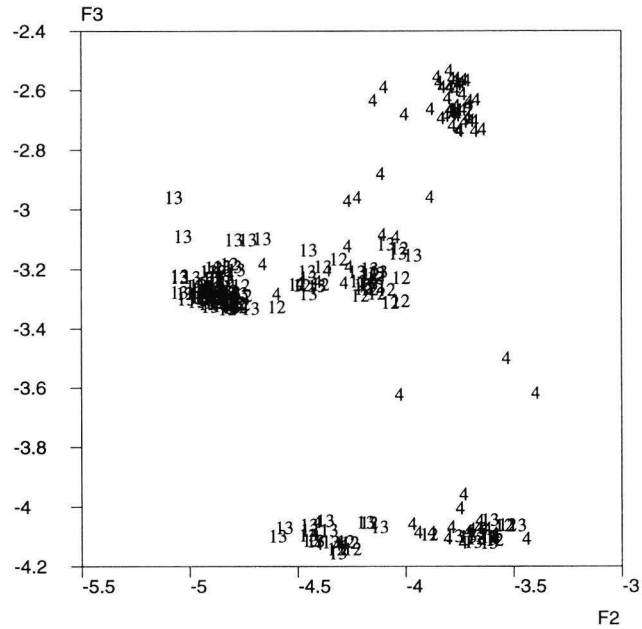

Fig. 7.7. Comparison of Textile ceramics vessels in the Lake Saimaa Water System and on the Karelian Republic. Factor plot F2/F3. Legend: 4 – the Lake Saimaa Water System, 11 – the Lake Kuittijärvi Water System, 12 – the River Vyg Water System, 13 – the western side of Lake Onega.

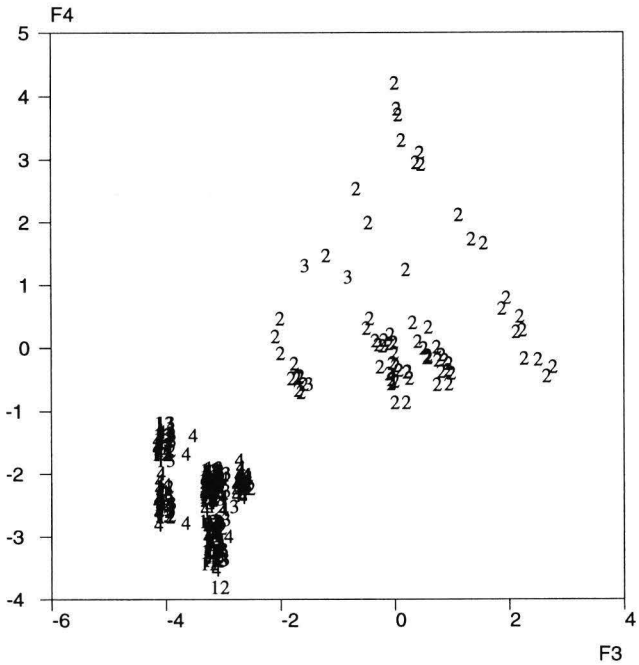

Fig. 7.8. Comparison of Textile ceramics vessels in the River Oulujoki and the Lake Saimaa Water Systems and the Karelian Republic. Factor plot F3/F4. Legend: 2 – the River Oulujoki Water System, 4 – the Lake Saimaa Water System, 11 – the Lake Kuittijärvi Water System, 12 – the River Vyg Water System, 13 – the western side of Lake Onega.

One result of these analyses is that the Textile ceramics from Kainuu can easily be separated from every subareas in Karelian Republic. Still it should not be forgotten that a part of Textile ceramics in Kainuu is almost identical with that in eastern Karelia even though the majority of vessels differs clearly. This may refer to the possibility that although contacts took place between these areas their number was not large.

The comparison of tempers between Karelian and eastern Finnish Textile ceramics shows evident differences. In the Karelian Republic feldspars and quartz were almost without exception in use, but they were not so common in eastern Finland. For instance, in Kainuu asbestos and soapstone cover over 40 % of all tempering material. In the Karelian Republic only ca. 7 % of Textile ceramics involves these minerals, feldspar representing about 75 % of all tempers. In both areas ornamentation is essentially based on comb stamp and pit-impressions. The difference is that in Karelian Republic comb stamps and pits are bigger and they were used to create denser ornamentation. It is also interesting that the number of single elements is larger in Kainuu than in western and northern sites in Karelian Republic. This is yet another factor, which may explain the heterogeneity of the Kainuu material in relation to the Karelian one.

One reason, which may explain the heterogeneity of Textile ceramics as a group, may be derived from cultural-historical reasons. In some cases Textile ceramics in Kainuu comes typologically very close to Lovozero ceramics and their discerning from each other is difficult. The same holds true also with Sär 2 ceramics of the Anttila type. On the basis of this it is possible to assume that the formation process of these ceramic types may have even more in common than what has been assumed earlier. In other words, the dwelling sites of Kainuu – and here first of all the dwelling site complex of Nimisjärvi – may have been a furnace for the Early Metal Period ceramic types in northern Finland.

7.3. Ceramics preceding Textile ceramics in South Finland

Corded Ware

Clear differences between Textile ceramics and Corded Ware can be seen in tempers, hardness and smoothness of the wall. Also shape and ornamentation differ much. Plotting of separate vessels shows that when Textile ceramics has a more heterogeneous distribution, Corded Ware always forms two – or even only one – dense concentrations (Fig. 7.9.).

Still some other qualities bring these ceramic types quite close to each other. For instance, feldspars and organic materials are important tempers in both types, but while the former dominates Textile ceramics, organic tempers are dominant in Corded Ware. The amount of organic material is often small and a considerable part of Corded Ware seems to have no temper.

Differences between the types are easily seen in ornamentation. The ornamentation elements in Textile ceramics are small spots (25 %), comb stamps and small pits. In Corded Ware they may rarely exist but the main ornamentation elements are small notches, corded-impressions or horizontal lines drawn with a sharp or a blunt implement. Often no ornamentation can be seen.

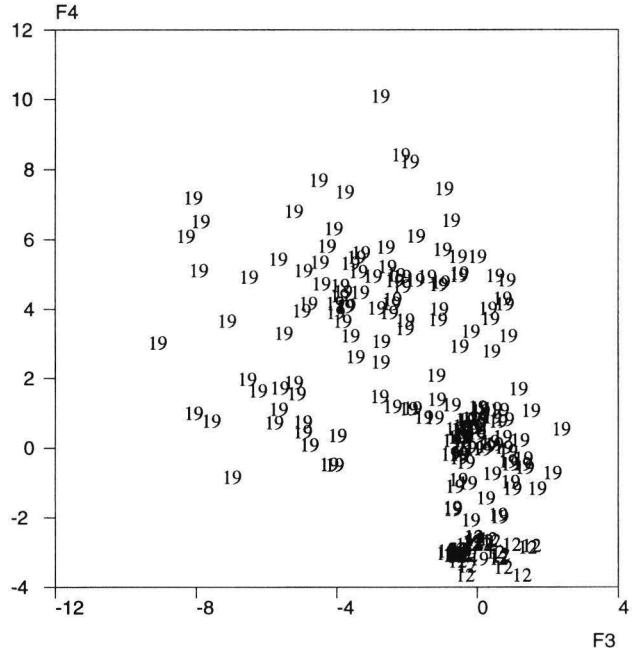

Fig. 7.9. Comparison of Textile ceramics vessels and Corded Ware in the Karelian Isthmus, the River Kymijoki Water System, the River Kokemäenjoki Water System, Varsinais-Suomi and Uusimaa. Factor plot F3/F4. Legend: 12 – Corded Ware, 19 – Textile ceramics.

It was already suggested that Corded Ware might have influenced the development of early Textile ceramics particularly in the Baltic countries. Common characteristics can be seen in tempering materials. Textile-impression is, naturally, common in Textile ceramics but in Corded Ware it exists only seldom. Vessels in both types are profiled. Vessels in Textile ceramics are usually smaller in size than in Corded Ware. Despite several common characteristics the number of attributes discerning types from each other is still considerable. Therefore, the question concerning common links between these two types remain so far without a satisfying answer here.

Kiukainen ceramics

Kiukainen ceramics was studied in this work through the material collected from the sites already presented in Meinander's (1954a) study. Comparing them with Textile ceramics from southern Finland and the Karelian Isthmus refers to evident similarities between them. The dwelling sites of Kiukainen ceramics are concentrated together into two not very dense clusters below the clusters of Textile ceramics (Fig. 7.10.).

It is interesting that the plots of Kiukainen ceramics form very same kind of figures than Corded Ware (com. Fig. 7.9.). There exists one or two dense clusters of Kiukainen ceramics in comparing them with the loose scatter plot of Textile ceramics.

Similarities can also be observed when comparing tempers in Kiukainen ceramics and Textile ceramics in southern Finland. In both types feldspar is the most common temper but also organic materials were much used.

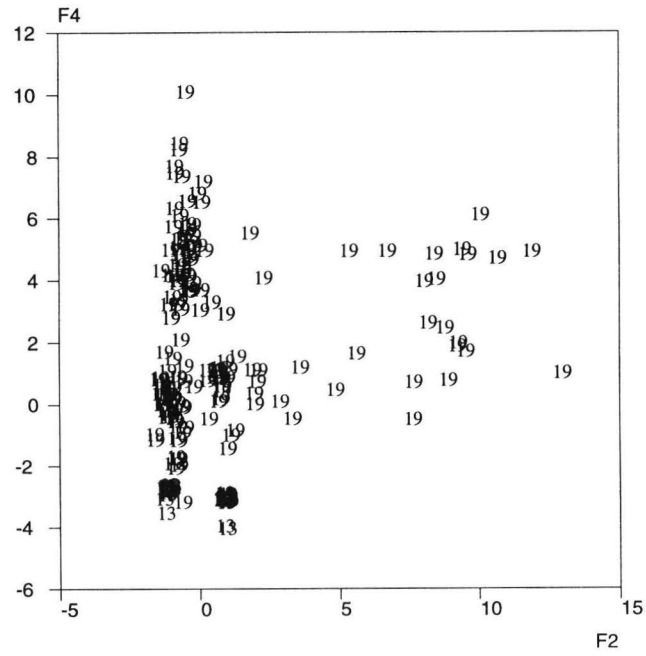

Fig. 7.10. Comparison of Textile ceramics vessels and Kiukainen ceramics on the Karelian Isthmus, the River Kymijoki Water System, the River Kokemäenjoki Water System, Varsinais-Suomi and Uusimaa. Factor plot F2/F4. Legend: 13 – Kiukainen ceramics, 19 – Textile ceramics.

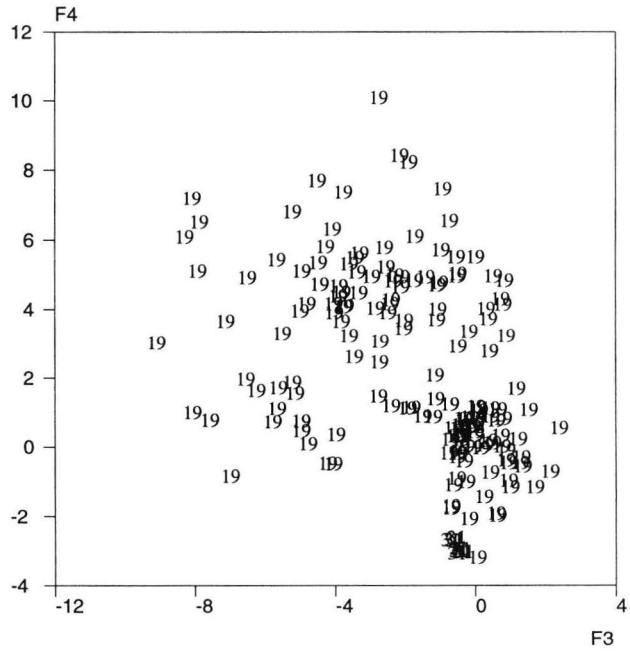

Fig. 7.11. Comparison of Textile ceramics vessels and Kiukainen ceramics on the Karelian Isthmus, the River Kymijoki Water System, the River Kokemäenjoki Water System, Varsinais-Suomi and Uusimaa. Factor plot F3/F4. Legend: 19 – Textile ceramics, 31 – Middle-zone ceramics.

In Textile ceramics there exists also amphiboles, mica, talc and even asbestos. In both types ornamentation was often carried out with small spots, which were pressed in horizontal lines. Vertical motifs are, however, more typical in Textile ceramics than in Kiukainen ceramics. Kiukainen ceramics has larger pits often forming loose belts. Also a more profound profiling and an upwards opening rim separate Textile ceramics from Kiukainen ceramics. Porous paste with organic temper occurs sometimes in Textile ceramics although it is more common in Kiukainen ceramics. One should not forget the textile-impression either, which occurs, according to statistics, in ca. 10 % of the Kiukainen ceramic vessels and in almost 40 % of the Textile ceramic vessels.

Middle-zone ceramics

In the lack of a better name, Christian Carpelan called the ceramic type dating to the Final Neolithic Period *Middle-zone ceramics*, the distribution area of which is situated between the coastal zone of Kiukainen ceramics and Pöljä/Jysmä ceramics (see Fig. 2.3.) in eastern and central Finland (Carpelan 1979:14–15).

Only 13 Middle-zone ceramic vessels were available for statistical analysis in this study. In factor analysis these vessels form a compact cluster which is much more homogeneous group than Textile ceramics (Fig. 7.11.) giving an impression its being a subgroup of Textile ceramics. This result should be critically approached and not only because of the small amount of material available. Middle-zone ceramics has never been exactly defined which makes the separation from other Late Neolithic or Bronze Age ceramics somewhat difficult.

Middle-zone ceramics involves feldspars, mica, organic tempers and chamotte as temper. Its rims are only slightly profiled and the ornamentation is not very conspicuous. The main elements of decoration are relatively small pits and lines drawn with sharp or blunt implements. Short notches also exist.

To better understand the nature and position of Middle-zone ceramics in the Finnish prehistory, many new empirical studies of this ceramic group and its comparison with other types is needed. So far it can be taken only as a hypothetical possibility that Middle-zone ceramics may have played an important role in the development of the Textile ceramics of the Sarsa type.

7.4. The Bronze Age and the Early Metal Period

Bronze Age ceramics on the southwestern coast of Finland

Some illuminating results can be reached when comparing the scatter plots of Textile ceramics from the whole of Finland and the Karelian Isthmus with Bronze Age ceramics (Fig. 7.12.). Although the relative amount of Bronze Age ceramics is small, it still seems evident that some clusters exist. In most cases Bronze Age ceramics condense into one or two dense clusters suggesting that it represents more homogeneous type that Textile ceramics. Looking at the single vessels from different sites shows that there is a correlation between Bronze Age

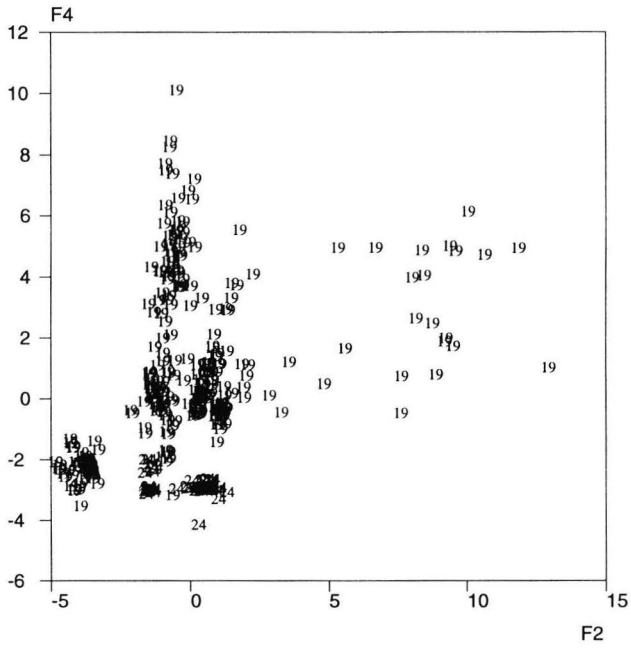

Fig. 7.12. Comparison of Textile ceramics vessels and Bronze Age ceramics in Finland and on the Karelian Isthmus. Factor plot F2/F4. Legend: 19 – Textile ceramics, 24 – Bronze Age ceramics.

ceramics and the Textile ceramics from Kitulansuo. It seems possible that the most important link between these two types is the relatively scant ornamentation.

It is also worth noting that almost every scatter plot of Bronze Age ceramics concentrates in relatively dense clusters in comparison with Textile ceramics. On the basis of factor analysis one can come to the conclusion that Bronze Age ceramics and Textile ceramics could have much in common, and also this analysis gives an impression that Bronze Age ceramics (Paimio ceramics) come close to some part of Textile ceramics. The problem also in this comparison is the small amount of material.

Lovozero ceramics

The use of Lovozero ceramics may have begun a little before than that of Textile ceramics but in general these types are synchronous. It is therefore natural that these types have many common characteristics. The amount of Lovozero ceramics known so far is only a minority of the amount of known Textile ceramics, which may also have an influence in the results of the comparison. In this work only Lovozero ceramics found from the southern part of the Kemijoki and the Oulujoki Water Systems was used.

Lovozero ceramics differs essentially from Textile ceramics. An important discerning feature is temper. In Lovozero ceramics almost all vessels were tempered with asbestos. Of all Textile ceramics along the Oulujoki and the Kemijoki Water Courses less than 45 % of Textile ceramics was tempered with asbestos. It is also interesting that the main distribution area of Lovozero ceramics is in the area of the Kemijoki Water Course, where it is far more difficult to find asbestos than in the Oulujoki area. Textile-impression is rare in Lovozero ceramics but it is interesting that it is rare also in the Textile ceramics along the Oulujoki Water Course: only about 10 % of vessels have textile-impression. The scatter plot of Lovozero ceramics against Textile ceramics in northern Finland gives the impression that the Lovozero type forms a denser type cluster than Textile ceramics.

Lovozero ceramics differs from Textile ceramics in its shape: both types have profiled rims but in Lovozero ceramics profiling is only slight and heavy S-form vessels exist only in Textile ceramics. Textile ceramics has more variation in decoration also. Although long lines of spots or comb stamps were used in Lovozero ceramics, the most typical are still sharp or blunt drawn lines. Drawn lines often form a net-figure, which sharply differentiates Lovozero ceramics from Textile ceramics. In the scatter plot (Fig. 7.13.) this difference is evident. It forms a clear cluster indicating a smaller variability of attributes than Textile ceramics.

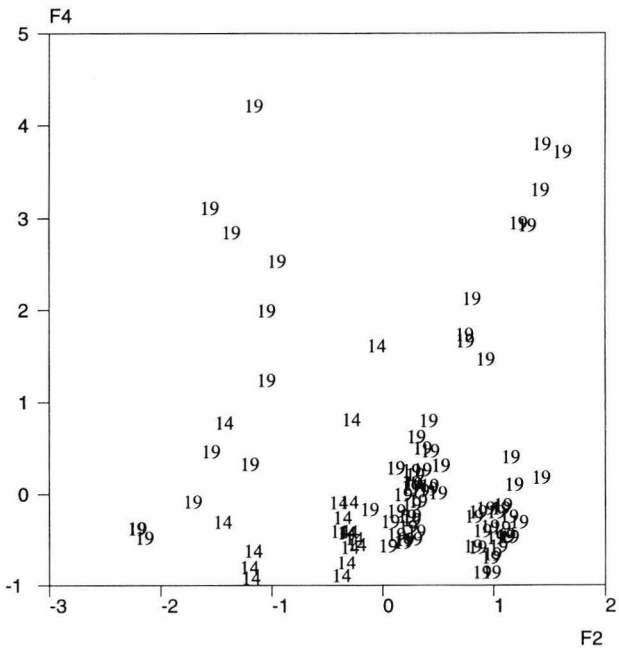

Fig. 7.13. Comparison of Textile ceramics vessels and Lovozero ceramics in the River Kemijoki Water System and the River Oulujoki Water System. Factor plot F2/F4. Legend: 14 – Lovozero ceramics, 19 – Textile ceramics.

7.5. Ceramics following Textile ceramics in northern and southern Finland

7.5.1. Säräisniemi 2 types

Ceramic types belonging to the Sär 2 family are also in a close typological relation with Textile ceramics. In the following they are compared with Textile ceramics sepa-

rately by emphasising their geographical distribution. One essential question is to test the existence of these subgroups in relation to Textile ceramics and to find out whether they differ enough from each other to be in groups of their own. The analysis functions also the other way round in testing the applicability of factor analysis in the ceramic analysis.

Anttila ceramics

Perhaps the earliest of the Säräisniemi 2 types is the Anttila type (comp. Carpelan 1999:273), the distribution area of which covers the watercourses of the Rivers Kemijoki and Oulujoki (Fig. 2.8.). Although the type was originally described in the dwelling site of Anttila in the Kemijoki area, the largest single concentration of finds is around Lake Nimisjärvi, near the head of the River Oulujoki. Altogether 220 vessels from both ceramic types were analysed by factor analysis using four factors. The analysis shows that the ceramic types differ markedly from each other. Anttila ceramics seems to form more homogeneous concentrations than Textile ceramics. In the scatter plot (Fig. 7.14) Anttila ceramics concentrates on two dense clusters. Also this plot indicates a denser clustering than Textile ceramics. This is not unexpected because the ceramic types clearly differ from each other already on the basis of their many visual characteristics.

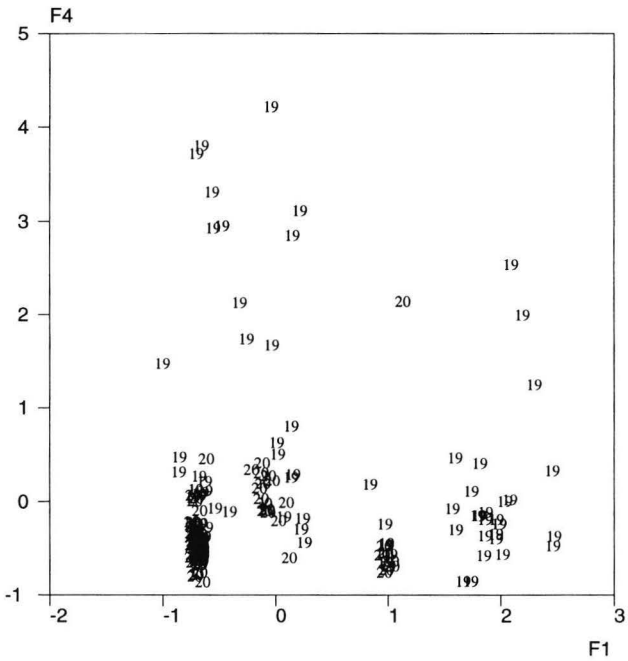

Fig. 7.14. Comparison of Textile ceramics vessels and Anttila ceramics in the River Kemijoki Water System and the River Oulujoki Water System. Factor plot F1/F4. Legend: 20 – Anttila ceramics, 19 – Textile ceramics.

The most important variables affecting clustering are tempers and ornamentation. Textile ceramics were most often tempered with feldspars, quartz and asbestos whereas almost 90 % of Anttila ceramics has talc and mica as the first temper. Asbestos was much used as a secondary temper. The ornamentation of Anttila ceramics is often simpler than in Textile ceramics. Horizontal lines drawn with sharp or blunt implements or horizontal round- or flat-bottomed grooves are the central characteristics of Anttila ceramics. In Textile ceramics ornamentation implies spots and short comb stamps; horizontal lines exist, but they are often combined with vertical notches forming simple framed-friezes. The framed-frieze occurs also typically in Anttila ceramics but it is accompanied with oblique lines or lines of spots forming a parallelogram.

Plotting the names of the dwelling sites into the figure shows that most Textile ceramics on the right side of the figure come from Suomussalmi and Kuhmo; the concentrations on the left side involve mostly the material from Nimisjärvi in Vaala. One can observe a clear connection between these types in Nimisjärvi.

As a conclusion it can be said that Textile ceramics and Anttila ceramics differ markedly in typology from each other. Still they have also many common characteristics in tempers, profiling and in the use of framed-frieze ornamentation. There exists Textile ceramics in Kainuu, which has a close connection with Anttila ceramics. This makes it possible to suggest that the latter might have its origin in the former one.

Kjelmøy ceramics

Kjelmøy ceramics is mostly found in the Kemijoki Water System and northern Lapland (Fig. 2.8.). A small amount of Kjelmøy ceramics exists also in Kainuu. The scatter plot between Kjelmøy and Textile ceramics (Fig. 7.15.) separates these two groups clearly from each other. The Kjelmøy type forms two clusters in comparison with more heterogeneous Textile ceramics. Asbestos represents over 50 % of the main tempers in the Kjelmøy type,

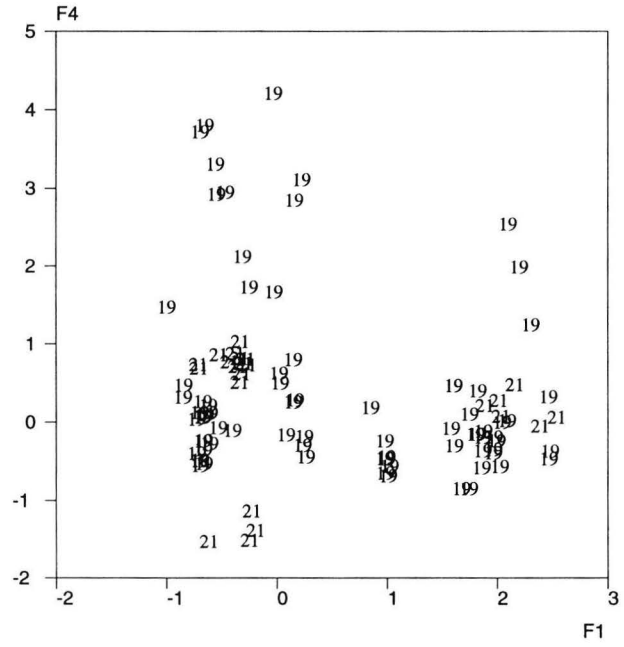

Fig. 7.15. Comparison of Textile ceramics vessels and Kjelmøy ceramics in the River Kemijoki Water System and the River Oulujoki Water System. Factor plot F1/F4. Legend: 19 – Textile ceramics, 21 – Kjelmøy ceramics.

over 30 % being talc (or soapstone). In Textile ceramics many tempers were used.

The ornamentation of Kjelmøy and Textile ceramics has many common characteristics. In both types spots and short comb stamps pressed into horizontal, vertical or oblique positions were much used. In Kjelmøy ceramics sharp and blunt horizontal lines are more common. Otherwise, the application of ornamentation elements is more varied in Textile ceramics although the result may be influenced by a larger amount of comparison material in the latter type.

In general it can be said, that these ceramic types have much in common and separating them from each other can sometimes be difficult. The same kind of profiling also gives an impression of their close relationship. In practice very heavily profiled S-shaped profiles do not exist in Kjelmøy ceramics.

Luukonsaari ceramics

The main distribution area of Luukonsari ceramics is the Saimaa Water Course but the type has often been met also in Kainuu (Fig. 2.8.). The same kind of analysis as with Anttila and Kjelmøy subtypes along the Oulujoki Water Course was carried out between Textile ceramics and Luukonsaari ceramics within the area of the Saimaa Water System. Altogether 210 vessels were included in the comparison material. The Saimaa area was chosen for the analysis area because most of Luukonsaari ceramics has been found just there. The second point of interest is the hypothesis according to which it might be possible to see a difference between the eastern and the western – Tomitsa and Sarsa – types inside Textile ceramics.

If the scatter plot is presented including also the Oulujoki and the Kemijoki Water Courses, the result resembles much those presented together with the northern types of the Sär 2 group. The two concentrations of points are the dwelling sites of Varaslampi and Kitulansuo in the Saimaa area. Luukonsaari ceramics seems to come closer to the Varaslampi concentration on the left side of the figure. If the scatter plot implies only material from the Saimaa area, the concentration of Luukonsaari ceramics becomes even more evident (Fig. 7.16.). All in all three concentrations – two for Textile ceramics (Varaslampi and Kitulansuo) and one for Luukonsaari ceramics – can be observed. It separates Textile ceramics and Luukonsaari ceramics very clearly from each other but it also confirms the idea that there also really exists a clear difference between the eastern and the western Textile ceramics in the Saimaa area. One can interpret this as a difference between the Tomitsa and the Sarsa types. It is also worth noting that when looking at the taxonomic distances between these three groups one can see that the Luukonsaari group seems to be closer to the eastern than to the western group.

Luukonsaari ceramics is almost exclusively tempered with asbestos, whereas asbestos occurs as a main temper only in 2.5 % of all Textile ceramics in the Saimaa area. Feldspar, talc and organic tempers exist more typically in Textile ceramics, asbestos being only a secondary material in the paste. The most conspicuous element of ornamentation of Luukonsaari ceramics is a horizontal zone of grooves drawn with a comb stamp. The manner of pressing a vertical line of spots by stopping the drawing of a comb stamp is peculiar. Spots and comb stamps forming horizontal or vertical lines occur also, but more typically as a secondary ornamentation. Elements are set on geometric motifs as framed-friezes or horizontal zones. Although the ornamentation in Luukonsaari ceramics, as also in all subtypes of the Sär 2 group, concentrates on the upper part of the vessel, it is dense and many-sided.

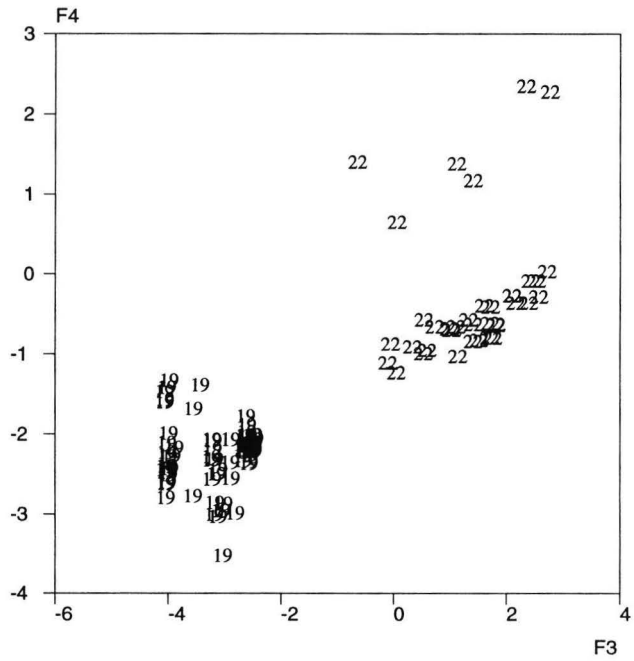

Fig. 7.16. Comparison of Textile ceramics vessels and Luukonsaari ceramics in the Lake Saimaa Water System. Factor plot F3/F4. Legend: 19 – Textile ceramics, 22 – Luukonsaari ceramics.

Sirnihta ceramics

The amount of ceramics in the Sirnihta group is so small that its statistical comparison with other types is not possible. In his recent writings C. Carpelan (1999) has connected it with Luukonsaari or Kjelmøy ceramics, which shows that its typological definition is still unclear. Typologically Sirnihta ceramics differs less from Kjelmøy ceramics than from Luukonsaari ceramics although its distribution area coincides particularly with the latter. So far Sirnihta ceramics has been found only in 3–4 dwellings sites in the Saimaa area (Fig. 2.8.). The best examples of the type come from the small island of Sirnihta in Kesälahti, in the middle Saimaa region.

Sirnihta ceramics is asbestos tempered and clearly profiled in its form. A peculiarity, which discerns it from the other types of the Sär 2 group, is an embossed, often horizontal, either broad or narrow line. These lines form a framed-frieze ornamentation, which connects them with the Sär 2 types. Also circular imprints, which exist

without a clear order, belong to the ornamentation. It is also interesting that the surface is sometimes smooth giving an impression of dark paint. Although it is not easy to find parallels to the Sirnihta type in Finland, in Kakel by Lake Hornavan in the Arjeplog parish there are ceramics with the same kind of embossed, horizontal ornamentation (Hedman 1993: fig. 8).

7.5.2. Epineolithic ceramics in South and Southwest Finland

Morby ceramics. Morby ceramics developed mainly from the coastal Bronze Age ceramics and it was in use during the Pre-Roman Iron Age in southern Finland. It has many points in common with coastal Bronze Age ceramics and also with the Textile ceramics of the Sarsa type (Meinander 1969:40–52). It is essential to remember that Morby ceramics can be separated as a subgroup, which differs from other synchronous Epineolithic ceramics in southern Finland.

Morby ceramics occurs in some southwestern dwelling sites together with Textile ceramics but these do not often exist together. Although some important dwelling sites of Morby ceramics were investigated during the study, many such sites were, however, omitted because they do not involve Textile ceramics.

The small amount of Morby ceramics causes some problems in statistical analysis but despite this – or therefore – a dense cluster of the type can be presented in factor plots indicating its narrow typological definition in relation to Textile ceramics (Fig. 7.17.). Only material from Häme, Varsinais-Suomi and Uusimaa was used in the analysis.

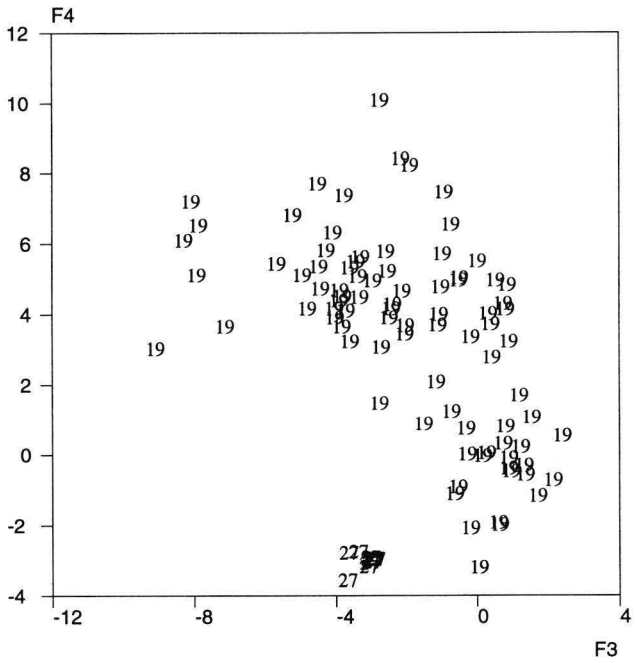

Fig. 7.17. Comparison of Textile ceramics vessels and Morby ceramics in the River Kokemäenjoki Water System, Varsinais-Suomi and Uusimaa. Factor plot F3/F4. Legend: 19 – Textile ceramics, 27- Morby ceramics.

Morby ceramics most often has feldspar temper but also organic matter and chamotte were used. The vessel shape is mostly concave, which means that jars are thickest in their belly some centimetres below the rim. Textile-impression does not exist in Morby ceramics but hatched surface occurs in 2/3 of the vessels.

The classical detail of the type, the cat's paw ornament, has not often been recognised in vessels classified as Morby ceramics. According to my observations, cat's paw exists only in about 1/6 of the vessels in the type. Therefore, there may also be other peculiar attributes, which cause the clustering of Morby ceramics. Finding the special characteristics for Morby ceramics is not without problems, because the ornamentation of the vessels is often almost lacking or it had been conducted only superficially. Short comb stamps and unclear corded-impressions occur together with impressions reminiscent of fish-bone.

The factor analysis shows a clear difference between Morby and Textile ceramics. Although ornamentation differs much in general, there are in Textile ceramics also feldspar tempered, slightly profiled vessels, which are only superficially decorated. This makes it possible to suggest that the later phase of Textile ceramics may have much in common with Morby ceramics and that this later Textile ceramics may have strongly influenced the development of Morby ceramics.

The origin of Morby ceramics is seen in Textile ceramics of the Sarsa type or the Estonian Asva ceramics. A comparison of Morby and Asva ceramics refers to their clear relationship. Still, there are differences, too. Asva ceramics is more carefully made involving only pit ornamentation, whereas the ornamentation in Morby ceramics is more careless and unclear. It must also be remembered that Morby ceramics has not been defined in a satisfactory way and also here a more empirical study is needed in the future to achieve a better understanding of the type.

7.6. Relationship of Textile ceramics and Late Bronze Age ceramics in southern Finland

The relationship between Textile ceramics and its partly synchronous neighbouring groups in southern and southwestern Finland are not studied as thoroughly as types in eastern Finland in this work. The reason for this has already been explained in different connections. The first reason is that so far we do not know those ceramic groups as well as the subgroups of Sär 2 ceramics. The subtypes of Bronze Age ceramics have not been studied much after Meinander (1954b), Carpelan (1979) and Salo (1983). Epineolithic ceramics itself has remained as an obscure entity without a clear definition (Hackman 1917). Per-

haps Morby ceramics has been studied most actively (Salo 1968; Meinander 1969; Edgren 1969;1999b). Problematic is also Middle-zone ceramics (Carpelan 1979), which has remained only a name without further studies. Factor analysis separates both Middle-zone ceramics and Bronze Age ceramics from Textile pottery. In both cases the amount of ceramic material for comparison can not be considered large enough and therefore the results should be considered only preliminary. Paimio ceramics has not been statistically compared with Textile ceramics, because there are not enough observations for doing so in this study.

7.6.1. Results of factor analysis of Finnish Textile ceramics

In general, factor analysis has functioned well in trying to find groups both inside the Textile ceramics itself and in comparing the neighbouring ceramic groups with it. In those cases, where the analysis did not work the main reason usually was an insufficient amount of material. Factor analyses revealed hidden information in the factors that can also help in finding new classifications or relations between vessels or even materials from different dwelling sites.

Factor analysis shows that Luukonsaari and Anttila ceramics form relatively homogeneous concentrations, which separates them easily from Textile ceramics. Kjelmøy ceramics is a cluster, which does not come off as easily. In addition to the small amount of material these observations could also be explained with the styles themselves: the ceramic types are close to each other.

Even more interesting – and important for this study – is that it was possible to separate at least two, but maximally even four, subgroups in the Textile ceramics in Finland and on the Karelian Isthmus. It is also possible to discern Sarsa ceramics and Tomista ceramics from the material without problems. The difference between these groups can be illustratively seen in Saimaa, where the eastern material can be interpreted to correspond with Tomitsa ceramics and the western one with the Sarsa type. It must be emphasised that Sarsa ceramics is more heterogeneous.

The subgroup of Kainuu can be interpreted either as an independent subgroup or as a subgroup of Tomitsa ceramics. Although these subgroups can be discerned, this does not mean that there do not exist mixed vessels, the classification of which into a group is sometimes difficult.

The fourth subgroup is the most problematic. One might think that the small number of vessels from the Karelian Isthmus forms a clear concentration, which differs from Sarsa ceramics, but this group is probably not necessarily the same type that Meinander called the Kalmistonmäki group. The reason why this is not the case, can be related to both a typological and a chronological problem: one should also assume that all ceramics in the Karelian Isthmus should represent the closing period of Textile ceramics in Finland. This problem is discussed more thoroughly later.

VIII ARCHAEOLOGICAL MATERIAL RELATED TO TEXTILE CERAMICS

8.1. Introduction

In Finland the concept Early Metal Period refers to the appearance of bronze objects and a new kind of ceramics into the archaeological material. However, this concept can be interpreted as referring to the earlier period (Carpelan 1989:53), the Eneolithic, during which copper implements were already in use along with stone implements. Because these implements are extremely rare in Finland, the transition has been dated according to more easily definable phenomena. Following the chronology of Textile ceramics and the appearance of the Seima axes, Finnish archaeologists have dated the beginning of the period to the middle of the 2nd millennium BC. Because bronze implements are assumed to have played an important role in the formation of the culture during the Early Metal Period, it is necessary to briefly discuss their connection with Textile ceramics here also.



Fig. 8.1. A copper ring from the dwelling site of Sola in Polvijärvi (NM 14982:1). Photo: National Board of Antiquities.

8.2. Early metal objects

Metal objects – celts, swords and other artefacts – are rare in the whole of Finland during the Late Neolithic and also during the Early Metal Period and Bronze Age. Particularly interesting are some early metal finds, which show the use of copper implements in the Stone Age context, before bronze had come into use. These implements are connected with Eneolithic finds in the Karelian Republic (Zhuravlev 1975; 1991b). In the following these early finds are briefly discussed before presenting the bronze axes. Most emphasis is put on the contexts of the finds and how they are related to ceramic groups in different dwelling sites.

In 1959 Tuomas Björkman carried out a small excavation in the Stone Age dwelling site at Sola in Polvijärvi (1959). The excavations yielded an exceptionally interesting find – a small copper ring – from a clear Stone Age context. C. F. Meinander continued excavations in the site in 1961 but was not able to find any metal implements and in the report stated pessimistic views concerning the authenticity of the artefact (Meinander 1962). However, the most likely explanation of the context connects the ring with the population of Ka II (Taavitsainen 1982:43; Zhuravlev 1975; 1991b).

An even more interesting Early Metal Period find – the gouged adze made of almost pure copper – comes from the small island of Kukkosaari in Suomussalmi. In 1984 a schoolgirl found the artefact in sand by the shore of Lake Kiantajärvi. The context of the find is even more complicated because the object was not *in situ* and the island had been inhabited for over 5000 years. Huurre dated the axe roughly to the Late Neolithic Period, ca. 2000 BC (Huurre 1982:19–21; 1984:48–49). Both the above-mentioned finds belong to the period before the occurrence of Textile ceramics. In other words, they represent metal implements from a Late Stone Age environment. In Suomussalmi two other copper pieces were also found (Huurre 1982:21–22) and a bronze arrowhead from Hyrynsalmi (Huurre 1982:23). All these are very difficult to date.

In addition to these finds (Fig. 8.1.) excavations have recently produced several new copper finds in interesting contexts (Fig. 8.2.). Petro Pesonen (1998:26–27) excavated the dwelling depression dating to the context of Ka II and found nine small copper fragments in Vihi, Rääkkylä, eastern Finland. In the site of Ankonpykäläkangas in Kerimäki a copper fragment was found in the

test pit (Jussila *et al.* 1992:25) together with Ka II and Neolithic Asbestos ceramics. Petri Halinen (1993:40) found a piece of copper in the Late Neolithic context in Poikamella, Sodankylä. It is interesting that also a piece of textile-impressed pottery belongs to this context.

Some small finds have been made in Jomala, Jettböle in Ahvenanmaa (Edgren 1984:82). Also copper finds at the dwelling sites in Kierikkisuo, Yli-Ii and Purkajasuo Korvala, Yli-Ii are also interesting. These both date to the period of Kierikki and Pöljä ceramics. The most recent copper find was made in Rusavierto, Saarijärvi in 2000 (pers. comm. Sirpa Leskinen, 26.10.2000).

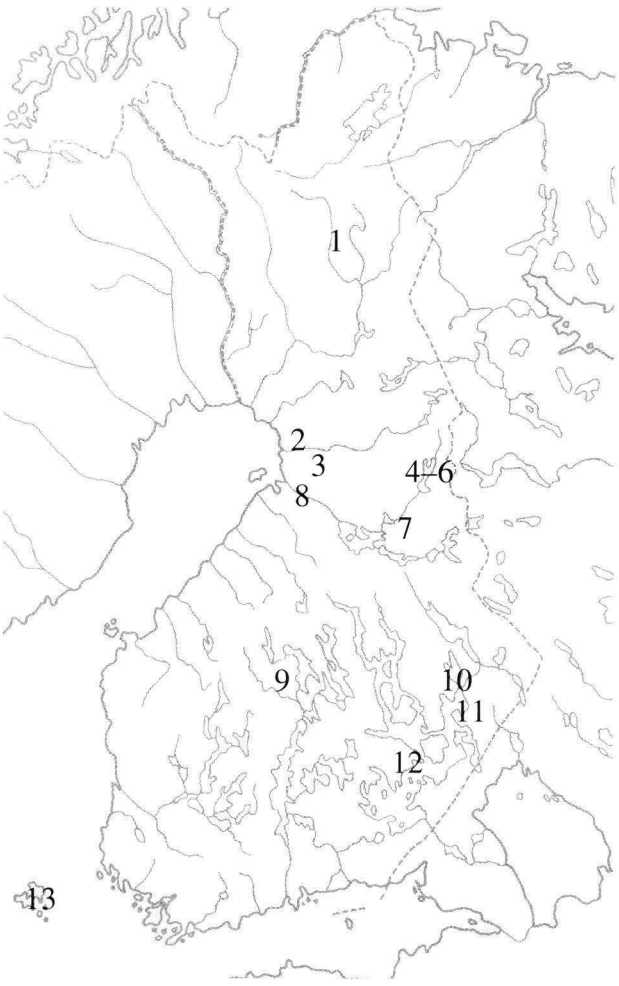

Fig. 8.2. Sites with early copper implements in Finland. 1 Poikamella in Sodankylä, 2 Purkajasuo Korvala in Yli-Ii Kierikki, 3 Kierikkisuo Eteläharju in Yli-Ii, 4 Kukkosaari in Suomussalmi, 5 Kalmosärkkä in Suomussalmi, 6 Joenniemi in Suomussalmi, 7 Ahonranta in Hyrynsalmi, 8 Halosentörmä in Muhos, 9 Rusavierto in Saarijärvi, 10 Sola in Polvijärvi, 11 Vihi in Rääkkylä, 12 Ankonpykäläkangas in Kerimäki, 13 Jettböle in Jomala.

Source criticism is needed when interpreting the above-mentioned finds. Firstly, it is not clear that all metal fragments are really copper; so far only a part of the material has been analysed (Huurre 1982:21–23). Secondly, the dating of the fragments is often very problematic. They can represent Stone Age activity but some can date to the Late Iron Age as well.

Still, these finds show that copper very likely belonged to the context of Ka II and Asbestos ceramics in many dwelling sites in Finland. These finds have changed the general view of the Late Neolithic and the Eneolithic Period in such a way that it seems acceptable that the early use of metal in practice began considerably earlier than has usually been assumed. These observations are well in accordance with the information obtained from the Karelian Republic (Zhuravlev 1975; 1991b). It is also worth noting that so far almost all early copper finds have been made in eastern and northern Finland. This might indicate a connection to the Lake Onega area, where natural copper is available.

8.3. Bronze Axes

The majority of bronze axes found in Finland belong to the context of the Western Bronze Age in the coastal area of the Baltic Sea. The bronze axes found in the Eastern Finnish Bronze culture show a more sporadic distribution, where the context is difficult to establish. Because the eastern types of axes are of special interest for studying the relationship of bronze implements and Textile ceramics, these axes are thoroughly presented.

On typological and chronological grounds axes are divided into four groups: Seima, Mälar, Maaninka and Ananino types. All bronze axes found in Finland are presented in the map (Fig. 8.4.–8.6.) and in the table (App. 9a).

8.3.1. Seima axes

The earliest eastern bronze axes are of the Seima type, which reflects the influence of the Seima-Turbino industry from the 16th to the 14th centuries BC. The influence or even the Seima phenomenon itself is reflected in Finland only through four axes.

A.M. Tallgren called bronze celts found from Laukaa, Pielavesi (KM 2058:1) and Noormarkku Pielavesi axes (Tallgren 1914:15–17). The same kinds of axes were found also around Kazan. After publishing the Seima find (Tallgren 1911b:189–191) and describing the excavations carried out in the dwelling site of Seima (Tallgren 1915a:83), close to Nishnyj Novgorod, Tallgren began to use the name Pielavesi-Seima type. The Pielavesi celt became known to archaeologists through the object itself at the museum of Kuopio, where Hj. Appelgren-Kivalo noticed it during his visit. The exact location and the information concerning the circumstances of the find were not known (Hackman 1900:55–56). Hackman compared the axe both with the Laukaa celt (Nyman 1882:186–187; Fig. 8.3.) and also with Ural-Permian and Siberian socketed axes. The Noormarkku celt (NM 3033:1) has the simplest ornamentation of all of the Finnish bronze axes of the Seima type.

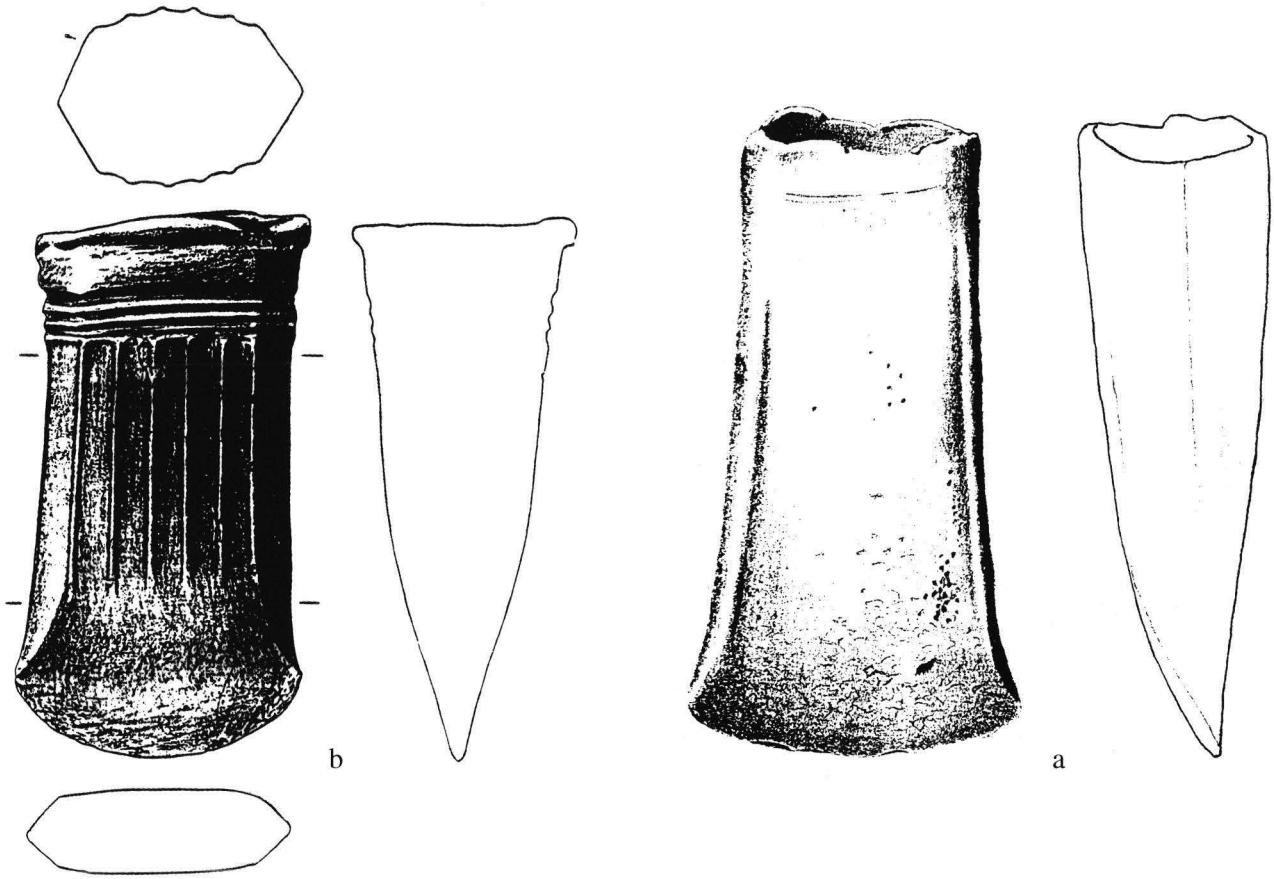

Fig. 8.3. Two bronze axe types in Finland: (a) The Seima axe from Simuna in Laukaa (NM 10551), drawing Jyrki Hård/National Board of Antiquities, b) The Maaninka axe from Oinila in Paimio (NM 10454), drawing Tuula Piili/National Board of Antiquities.

In 1926 an exceptional metal cache was found in Lusmasaari, Inari: neck and arm rings, a razor and a Seima axe were found under a large stone by Mr Heikki Sarre. Both the rings and the razor are of Scandinavian types but the axe is connected with the eastern bronze culture (Tallgren 1926:81). Tallgren assumed it to be most likely of local manufacture, representing the treasury of a rich man (Tallgren 1937:22). The Scandinavian rings represent the Scandinavian Bronze Age, period V, with the help of which Tallgren dated the axe to the 7th century BC (Tallgren 1926:81). On the basis of not very characteristic ornaments – horizontal, fringed lines and vertical, curved lines which form a ladder-like figure – Tallgren and Meinander considered it atypical and younger than the typical Seima axes (Tallgren 1926:82; Meinander 1954b: 41).

The main distribution area of Seima axes is on the Rivers Oka, Kama and the middle course of the Volga. In Siberia, in the upper course of the River Ob, they have the same distribution area as the Samusko-Kizhirovski type (Chernyh & Kuzminyh 1987:90). From this point of view the Finnish Seima axes represent the utmost periphery of the Seima phenomenon.

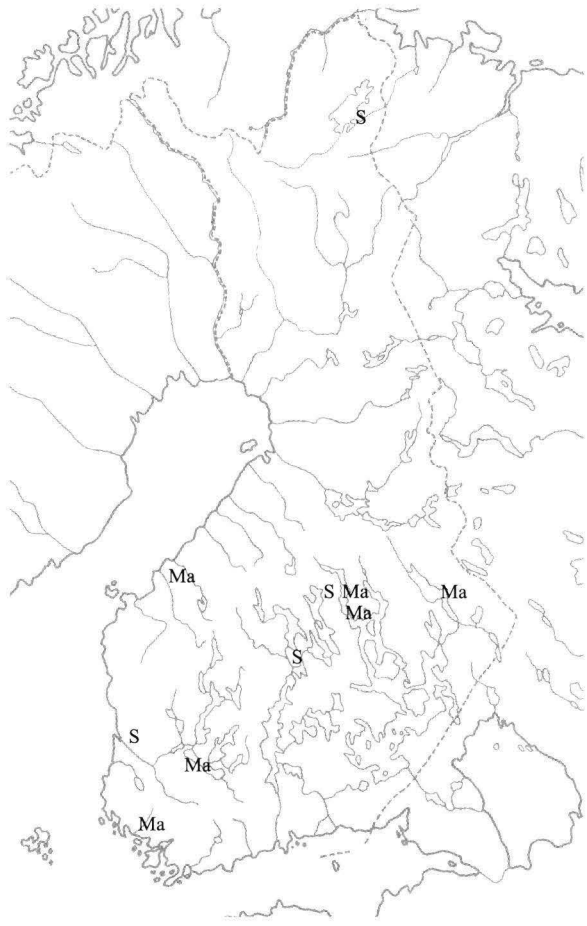

Fig. 8.4. Distribution of Seima and Maaninka axes in Finland. Legend: S – Seima axe, Ma – Maaninka axe.

8.3.2. Maaninka axes

Six Maaninka axes are known in Finland so far. The bronze celt (NM 5311) of Hämeensuo, Halola, in the parish of Maaninka was found 60–70 years before it become known to archaeologists (Hackman 1910b: 6–7). This axe was later presented as the first example of a new type, the bronze celt of the Maaninka type. Hackman dated it to the IV period of the Scandinavian chronology, although he, without doubt, connected it with the influence coming from the east (Hackman 1910b: 6–7). The special feature of the Maaninka axe is its long and upright form. Ornamentation consists of vertical furrows and the axe has no eyelet.

The other axes come from Paimio (NM 10454; Fig. 8.3.), Nokia (Tottijärvi) (NM 10811), Lieksa (NM 11313) and Lapinlahti (NM 18351). The Paimio celt was found in 1935 in a field during the digging of a ditch (Kivikoski 1937:53). The Nokia and Lieksa (Pielisjärvi) celts (Kivikoski 1943:22) were both published by Ella Kivikoski in 1943. The latter was found in 1937 near the manor of Laukko in Vesilahti, in the place where mud was taken from the River Pärräjoki. The Lieksa celt was found as early as the 1890's when digging iron ore from Lake Pielisjärvi (Kivikoski 1943:22–23). The two latest Maaninka axes were found in Jokiniemi in Lapinlahti (NM 18351) and Asplandet in Jepua (NM 26618). Torsten Edgren published the Lapinlahti axe, which was found in 1968 when getting sand. Neither of axes can be connected with a dwelling site (Edgren 1981:22–24). The latest Maaninka axe was found in a closed context and also shore displacement chronology can be used to date it. Mirja Miettinen gave the cairn of Asplandet the *terminus post quem* dating of 900 BC (Miettinen 1994:7). Whilst playing, two schoolboys found the axe together with a long, straight-based flint arrowhead in a depression of a Bronze Age cairn.

The bronze celts of the Maaninka type have been of special interest to Finnish Bronze Age researchers because they are atypical in relation to both the Mälar celts and the celts from the Volga region or the Urals. An ornamentation characteristic to Maaninka axes is not known in the Urals and it occurs only rarely in Sweden also. Tallgren paid attention to ornaments – vertical furrows combined with zigzag-motif above the furrows – that occur in younger bronze celts in East Prussia and the Baltic countries. These artefacts differ from the Finnish axes in other features (Tallgren 1911b:190). As a conclusion it can be stated that the Maaninka axe is a Finnish type among eastern Bronze axes and it has no clear parallels with either eastern or western material (Tallgren 1911b:190–191; Kivikoski 1937:54; 1943:23; Meinander 1954b:44).

8.3.3. Ananino celt

Up to now, only one bronze axe of the Ananino type has been found in Finland. It was found in the farm of Haihu at the parish of Maaria, in southwestern Finland (KM 9685) at the beginning of the 1920's. The artefact was found in a field, which had remained fallow for many years and was now under cultivation again. No remains of a cultural layer were found (Tallgren 1934a:18–19). Tallgren dated the axe to the Pre-Roman Iron Age, ca. 300 BC and considered it as an occasional find lost by a Lapp (Tallgren 1934a:18–19). The bronze axe from Maaria is a small, scarcely ornamented object with a segment-formed upper part.

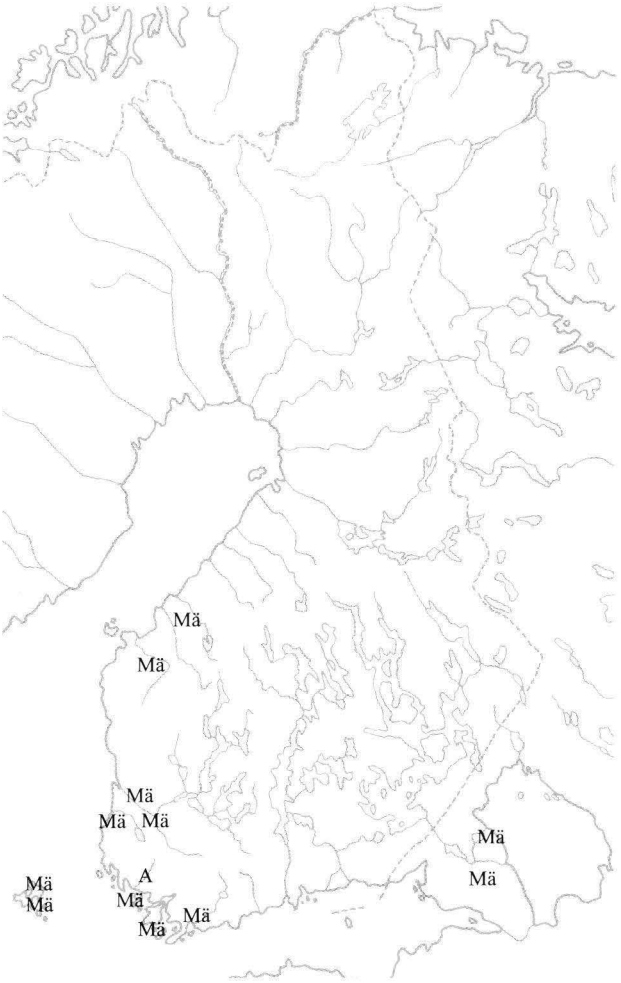

Fig. 8.5. Distribution of Ananino and Mälar axes in Finland and the Karelian Isthmus. Legend: A – Ananino axe, Mä – Mälar axe.

Tallgren compared ornamentation of an axe with casting moulds (Tallgren 1926:85) found not only in Ylitornio and Muhos (see 9a) in northern Finland but also in Räisälä, the Karelian Isthmus and in Babja Guba, Karelian Republic (Meinander 1954b:45–46). It is interesting that Ananino axes are known also in Sweden – in Sorsele, Lycksele and Gamla Uppsala (Meinander 1954b:46).

The distribution area of the Ananino culture very distinctly follows the Rivers Volga and Kama, between Vetluga and the upper course of the River Kama (Chernyh &Kuzminyh 1987:100–104). From the Central

Russian point of view the axe and mould finds in northern Fennoscandia are peripheral. The most important sites of the Ananino culture are two cemeteries, Akozino (Halikov 1962; 1977) and Ahmylovo (Patrushev & Chalikov 1982) situated, however, on the western side of the main distribution area of the culture (Meinander 1985:17). It is very important to bear in mind that although the number of axes is low in Finland, it is still reasonable to assume, on the basis of casting mould fragments (see 8.7.), that Ananino axes were cast in northern and eastern Finland (Meinander 1969:52–56).

8.3.4. Mälar axes

Up to now 12 bronze axes, which can be classified as Mälar axes, have been found in Finland and the Karelian Isthmus (Meinander 1954b:26; Edgren 1993:130–132; Meinander 1985:26–33). The majority of them come from southwestern Finland and Uusimaa, two from Ahvenanmaa and two from the Karelian Isthmus. In Suomussalmi and Kemi in northern Finland there exist casting moulds, which were used for casting Mälar axes.

Two Mälar axes were found on the Karelian Isthmus. The Kaukola axe (NM 2535:1) was found in the village of Rokosina in front of a cowshed, in loamy soil (Hackman 1897:190). The characteristic features in ornamentation are four narrow bands forming a zone in the middle of the axe. Together with the bands is a knob for binding the metal blade to the handle (Hackman 1897:190). The celt from Valkjärvi (NM 2298:193) was found on the island of Karvsaari in the ancient bed of the River Vuoksi. The ornamentation is simpler than in the before-mentioned examples: in the upper part only two vertical furrows can be seen (Hackman 1897:190).

The axe of Laihela, Kyläpää in Laihia, no longer exists. It is known only from a description given by a land surveyor, C. G. Holm. The axe itself was lost probably during the fire of Vaasa in 1852 (Meinander 1954b:223). Typologically it is a variant of the Mälar axe. The rich ornamentation included a horizontal double zigzag line running immediately below the eye of the axe and in the middle there was a tree-like vertical line and two short lines on both sides of it (Hackman 1897:389–390).

The Lohja axe (NM 8330) is a local variant of the main type (Meinander 1954b:26–27, 224). Meinander considered the axe atypical. It was found in connection with fishing (Meinander 1954b:224). The Nakkila axe (NM 2151:272) differs from the before-mentioned implements in its general shape. It has been connected with the so-called Skandau type, the main distribution area of which is in East Prussia (Meinander 1954b:26–29; Sturms 1932:274). The Harjavalta axe is also known only on the basis of a description. According to Meinander it is of the Mälar type. Meinander considered the find context to be a grave (Meinander 1954b:26, 221; Tallgren 1906b:43; Tallgren & Lindelöf 1916:157.) The Kiukainen axe (NM 6690) is not a typical Mälar axe, either. It was found in 1914 as a stray find in a field in Toriseva (Meinander 1954b:26, 218.; Tallgren and Lindelöf 1916:153). So far the latest Mälar axe was found in 1979 in Maalahti (Miettinen 1984:19–21). The shore displacement dates the axe to the end of the Bronze Age.

By virtue of the cemetery of Ahmylovo C. F. Meinander considered the Mälar and the Ananino axes synchronous and dated them to the VI period of Montelius (Meinander 1969:55), to the 6th century BC (Meinander 1985:26–33). The chronology of the different axe types is well known. It is unfortunate that the find contexts do not give any possibility to discuss the relationship between the bronze axes and Early Metal Period ceramics: there are no contexts in Finland, where axes would have been found together with ceramics. There are probably many reasons for this. It is still evident that bronze axes were valuable prestige goods, which were not lost in dwelling sites but several casting moulds for the Mälar axes have been found in dwelling sites instead.

It is unexpected that although the majority of axes were found in southern Finland, not many casting moulds are known there. Most moulds come from northern Finland but only one axe has been found there.

8.3.5. Flanged and socketed axes

In this connection there is not much to say about flanged and socketed bronze axes. Both types represent the Western Bronze Age and their dating follows Scandinavian chronology. All together 19 flanged axes have been found in Finland so far. Their use began during the second period of the Scandinavian Bronze Age, about 1300 BC and continued to the third period into the 9th century BC (Meinander 1954b: 19–20; Salo 1981:245). Most probably all flanged axes in Finland are stray finds, the contexts of which cannot usually be connected with sites or structures. The possibility that they would have been in graves has sometimes been speculated (Kivikoski 1961:24–26). The distribution area of both types in Finland is concentrated in southwestern Finland.

If not taking Mälar axes into account, 13 Scandinavian socketed axes are known in Finland. The use of these types began during the third period, but during the fourth period they wholly replaced the flanged types (Brønsted 1939:18–21; Larsson 1986:49–50) and their use continued to the sixth period. Most of these axes are small, they date to the Late Bronze Age and their prototypes can be found in Scandinavia (Baudou 1960).

What has been said about the distribution and find context of flanged axes, also holds true for hollowed axes. Because they do not belong to the context of Textile ceramics in Finland, there is no reason to discuss these types any further here.



Fig. 8.6. Distribution of flanged and socketed axes in Finland. Legend: F – Flanged axe, So – Socketed axe.

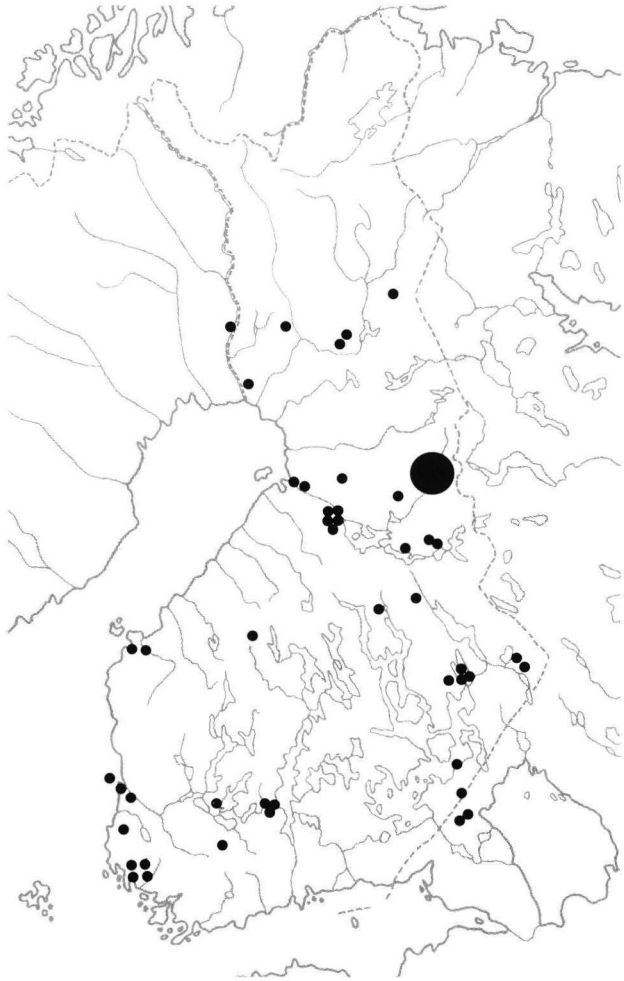

Fig. 8.7. Distribution of Bronze Age and Early Metal Period casting moulds in Finland and on the Karelian Ishmus. A large point means over 10 moulds.

8.4. Casting moulds and crucibles

Two kinds of casting implements characterise the Finnish Early Metal Period material: casting moulds and crucibles (Fig. 8.7.). The former dominates the finds. Finnish casting moulds and crucibles are made of soapstone or clay. Moulds differ much from each other in their form and purpose of use and also in their geographical distribution and chronology. The early moulds belong to the Early Bronze Age and the late ones date to the Late Iron Age. The first mould fragments were found as early as the beginning of the 1900's (Hackman 1903; Tallgren 1910; 1911a). After the 1950's they have surfaced in dwelling sites – particularly in Suomussalmi (Huurre 1982).

It is interesting to note that although the number of bronze celts is small, many implements used to make bronze celts and fragments of these implements are known, however. A considerable number of Finnish casting moulds are made of soapstone. The fact that just soapstone was used for moulds is of particular interest, because this rock is not common in Fennoscandia or northern Russia. In eastern Finland it occurs in association with mafic and ultramafic rocks and it can be found either in bedrock or as stray pebbles distributed by glaciers.

Casting moulds and crucibles have been found in over 40 sites in Finland so far (see App. 9b). The majority of them have been made for casting axes; for Mälar axes exist three and for Ananino axes 15 moulds (Turpeinen 1995:liite 1).

The first mould was found in southwestern Lapland as early as the 1890's at Alkkula in Ylitornio at a small cape between Lake Sirkkajärvi and the River Tengeliönjoki. The soapstone mould was made for casting an Ananino celt (NM 2160). In 1911 Tallgren conducted a trial excavation in the site by the farmhouse of Krunni (Tallgren 1911a). The excavation showed that the find place was a dwelling site containing several hearths. An ice pick of the Rovaniemi type and a rhombic stone axe with a hole for the shaft were the most important finds in the site (Tallgren 1911a:52–55). This kind of rhombic axe is usually connected with the Scandinavian bronze culture (Meinander 1954b:67–70). The find context differed strikingly from that of bronze axes.

Tallgren carried out a small excavation also in the dwelling site at Alapaakkola in Kemi, where he found a grinding stone and an axe with an eye together with stone material. Also hearths with burnt stones were

found. Hackman (1903:1–2) interpreted them as a half-finished implements for casting a Mälar celt of the Swedish type.

The mould (NM 3045:37) from Tahvola in Muhos was found in a field. The provincial Ananino mould was ornamented with a horizontal belt of small triangles. At both ends of the horizontal line there are also short vertical lines. The mould was made of soapstone (Hackman 1897:397; Meinander 1954b:228). The find context had been disturbed but Tallgren (1911a:56) connected it with a dwelling site. Contrary to this, Ailio (1913:12) did not agree with this interpretation but thought that stone axes and the mould did not belong to the same context. He also directed the same kind of criticism to the other find contexts of moulds in northern Finland. One of his main arguments is the small number of finds in Tallgren's excavation sites.

Tallgren assumed that the bronze axes and casting moulds found in Finland were indicators of connections between the metal centres of the Ural Mountains and northern Scandinavia. At first sight the small number of artefacts, which can be connected with metallurgy in northern Fennoscandia, gives no support to the idea of large-scale commercial activities in the arctic area. It seems that the relationship between arctic populations and bronze-using populations in North and Central Russia were rather weak but still important (Tallgren 1934a:20–21).

In the dwelling site complex of Nimisjärvi in Vaala (Säräisniemi) (Heikel 1896; Hackman 1897:395; Ailio 1909:198) fragments of casting moulds were found (NM 3147:19–21 and NM 4080:12, 14) the clay paste of which resembled potsherds (Heikel 1896:91) later connected with the Sär 2 group. The geologist B. Frosterus carried out an analysis of some samples and verified the observations made by archaeologists (Ailio 1913:16). Still today this observation is of importance, because it gives both a chronological horizon and a context for the Ananino moulds and Sär 2 ceramics in Finland.

In the Karelian Isthmus moulds have been found in Kalmistonmäki, Räisälä (NM 2845:8; 6675). Tallgren (1914:12; 1935:41–45) connected the mould fragments with the Ananino culture. The find place in Kalmistonmäki consists of a gravel heap, a cemetery and also a dwelling site. Tallgren (1935:41–45) dated the casting mould to ca. 300 BC. Hackman (1920:38) compared the circular bronze rings found in Nimisjärvi with those used in the Pianobor culture during the Younger Roman Iron Age.

In 1939 and 1945–46 C. F. Meinander excavated the cairns of Nikonkallio in Laihia, southern Ostrobothnia. The find inventory consists of Bronze Age ceramics, some fragments of clay casting moulds and unburnt sheep bones. Meinander interpreted the find context to be secondary (Meinander 1950b:56). He also stated that because there were some drops of bronze on the surface of the mould fragments, they had come from the forge of a bronze smith (Meinander 1950b:56). The finds showed that bronze casting was carried out already during the Bronze Age.

In Kotasaari in Asikkala (Fig. 8.8.) moulds were found in an interesting connection: according to the find catalogue they can be connected with Textile ceramics. Because excavation reports do not exist this assumption cannot be verified. According to Salo mould fragments were also found in Rieskaronmäki in Nakkila, which is known for the reconstruction of the Bronze Age house (Salo 1981:281–283; 1984:153-154; Salo & Lahtiperä 1970:30–34; 110–113). In Rieskaronmäki one fragment of a crucible (SatM 16 454:58) and 11 fragments of casting moulds were found (SatM 116 454:8, 50, 52, 55, 57, 59). Five fragments of casting moulds were also found in the hillfort of Vanhalinna in Lieto. Luoto considers them to be artefacts, which cannot be dated more exactly than to between the Pre-Roman Iron Age and the Middle Ages (Luoto 1984:126).

Luistari is a well-known name in Finnish archaeology because of its large Iron Age cemetery and the very detailed studies of its graves (Lehtosalo-Hilander 1982). There is, however, also a dwelling site by the cemetery on the shore of the River Eurajoki. Together with Epineolithic ceramics and Paimio ceramics a casting mould was found there (NM 18000:3052). Morby ceramics was also found in the site (Salo 1981:96–98). It is interesting that the finds from the cemetery involve a fragment of a textile-impressed vessel (NM 24740:630), which cannot be considered to be Textile ceramics, however. In the dwelling site of Hylli in Pälkäne moulds date to the Late Iron Age (Edgren 1968:38–43; Lehtosalo-Hilander 1982:100).

The parish of Suomussalmi has risen to a special position in Finnish archaeology because of its considerable number of casting moulds and their fragments. Matti Huurre conducted the first surveys in the area in the late 1950's (Huurre 1959). Surveys of large areas were quickly conducted because the Lakes Kianta and Vuokkijärvi were planned to become water reserves for hydroelectric power stations. The water regulation raised the water level in Lake Kiantajärvi over 4 m triggering rapid shore erosion. A considerable number of dwelling sites have been totally washed into the water. At present 28 casting moulds or their fragments have been found at Suomussalmi. Except for one, all moulds are made of soapstone (Huurre 1982:23; 1992:64–76).

Huurre has explained the unexpectedly high number of moulds in Suomussalmi with advantageous water routes between the east and the west (Huurre 1982:28). Advantageous routes not only in Kainuu, but also in northern Karelia were noted by Pekka Sarvas (1969:39), too. In particular Suomussalmi seems to have been a central place for bronze casters. Soapstone is easily obtained there, but the raw material, copper and tin ores, must have been transported from elsewhere. This was likely the case in the whole of Finland. In theory, it might have been possible to use copper ore in the Outokumpu area in the beginning of bronze metallurgy in eastern Finland. Although the Outokumpu ore deposit is one of the richest in Europe, the amount of copper in the richest ore varies between 2–3 % only. This percentage is still too small to utilise the raw material with primitive technology.

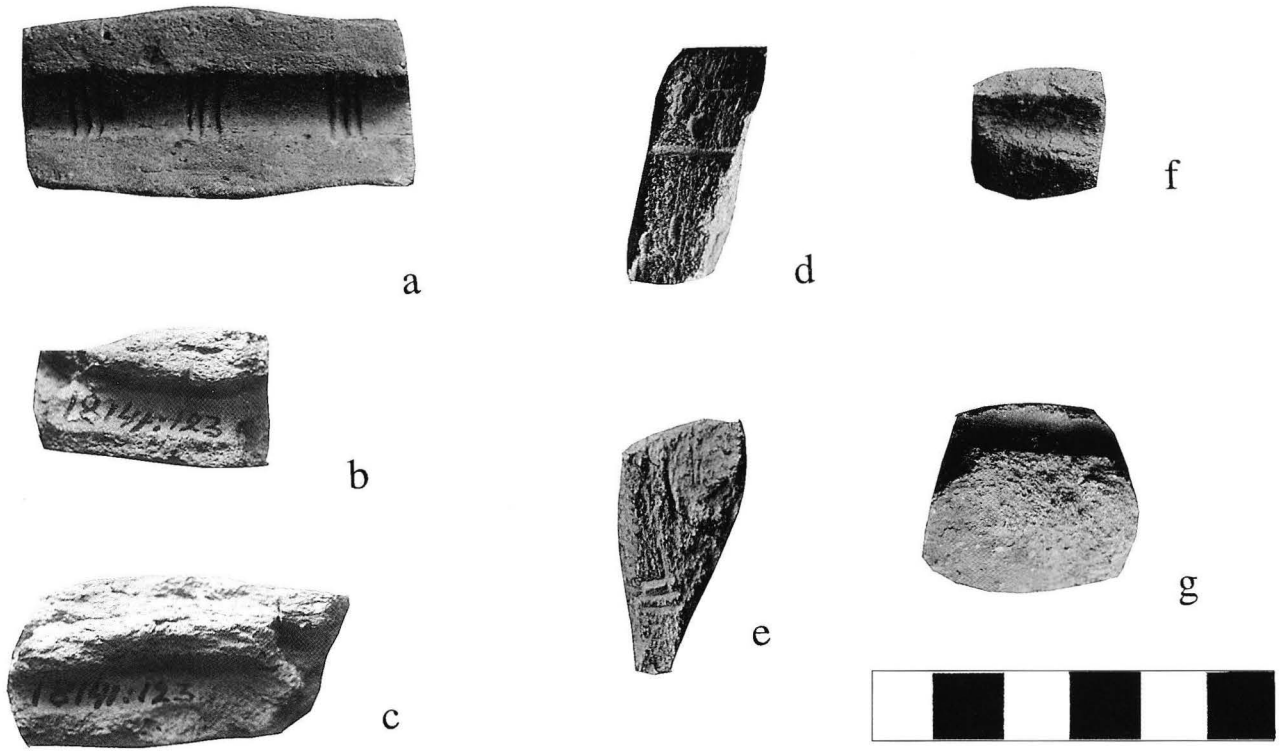

Fig. 8.8. Fragments of casting moulds in Finland. Kaunissaari in Parikkala (a – NM 5176:14), Kotasaari in Asikkala (b and c – NM 18141:123), Sillankorva (Nimisjärvi) in Vaala (d – NM 3147:20, e – 3147:21, f – 2378:36, g – 4080:12). Photo: Mika Lavento.

In trying to find out whether the metal could be of local origin geologist Seppo Hornytzkyj and the author analysed some metal samples.[1] Scanning Electron Microscopy with sensitive EDS-equipment was the chosen method. The results showed that no metal was left in the sample. The experiment resulted in the pessimistic conclusion that most Finnish casting moulds do not contain metal, which could be analysed. There are, however, some pebbles, where drops of metal can be seen with the naked eye but they are not from the axe moulds.

When referring to the crucibles it is necessary to mention a well-preserved example from Kiikarusniemi in Sotkamo (NM 22198:422). The artefact is a flat clay cup with a spout (Huurre 1986a:102). The clay crucible is tempered with mica. On the basis of the temper the crucible can be connected with Sär 2 ceramics.

It seems odd that so far fragments of casting moulds or bronze implements have been found only in four dwelling sites in Karelian Republic. At Babja Guba by Lake Ledmozero two halves of the casting mould of an Ananino celt were found, which Bryusov dated to the beginning of the 1st millennium BC (Bryusov 1940:207). Three other dwelling sites with bronze finds are known in Karelia. The earliest ones are Voj-navolok IX, Derevjannoe I and Orov-navolok IX, where bronze fragments have been found (Gurina 1951:101–118). In Orov-navolok IX there exist two bronze hooks, a fragment of a knife and some other bronze objects together with eleven bronze fragments (Gurina 1951:118–128, 132–133; 1961:101, 107; Foss 1952:10). The third one is the important Bronze Age dwelling site of Tomitsa (Bryusov 1940:238), which represents already the "proper" Bronze Age (Gurina 1961:108).

Casting moulds were used for many purposes but perhaps most of them were made for casting axes. The Ananino moulds are the following (see details in App. 9b):

Hyrynsalmi Vonkka II
Iisalmi Jysmä
Ilomantsi Mekrijärvi
Kemijärvi Neitilä 4
Muhos Tahvola
Räisälä Kalmistonmäki
Suomussalmi Joenniemi
Suomussalmi Maikonsärkkä
Suomussalmi TB:n ranta
Vaala Sillankorva
Valtimo
Ylitornio Krunniniva

We see that the distribution area of the moulds of Ananino axes is in northern and eastern Finland. Moulds used in casting the Mälar axes were found in Ala-Paakkola in Kemi and Salmenniemi in Suomussalmi. Also their distribution area lies in northern Finland. The problem, that moulds of the eastern axes were found mostly in northern and northeastern Finland and that the axes, instead, come from southern or southwestern Finland, is interesting. The explanation for this is discussed later.

[1] Four casting moulds were chosen, in order to test the methods for analysis. The test samples were the following: Salmenniemi in Suomussalmi NM 12671:1–2, Kotasaari in Asikkala NM 18141:123 and Kalmistonmäki in Räisälä NM 6675:38.

8.5. Iron

The connection between bronze and iron technology is central, not only as a technological question, but also when discussing the relationship between them and different ceramic types. The question is also connected with the chronological difference between Textile and Luukonsaari ceramics. The find contexts of iron furnaces in eastern and northern Finland and in eastern Karelia have much in common (Kosmenko & Manyuhin 1999:42).

In Sweden early iron production has been largely discussed and some interesting hypotheses have been presented. In southern Sweden in several dwelling sites and cemeteries, iron objects, knives and pins in bronze brooches have been found in closed connections. This supports the idea that the bronze metallurgists adopted first the new technology (Hjärtner-Holdar 1991:128–129). According to Hjärthner-Holdar (1993:35) the indications of iron metallurgy have been dated to as early as 1000–800 BC in Västergötland, Uppland and Södermanland. However, the early dates have also been criticised (Magnusson 1986:219).

Farmers had a greater need for iron than people living in a hunter-gatherer economy did (Serning 1984:60). The question arises, from where the impulses, which led to the adoption of iron technology came. Inga Serning has proposed three routes through which iron technology may have come to Sweden. One hypothetical route crossed southern Finland, the second came from Poland and the third from Denmark (Pleiner 1981:115–128). Serning finds it possible that iron smelting may have come to Sweden also through northern routes (Serning 1984:60). Iron technology, which developed in the Volga area, may have spread with horse-riding nomads into western and northern Europe.

Birgitta Hulthén suggested a hypothesis that iron would have been made with the help of chrysotile tempered ceramic vessels (Hulthén 1991:17, 34). Many archaeologists have criticised Hulthén's hypothesis (Espelund 1992; Sundquist 1999; Lavento & Hornytzkyj 1996). It seems possible that iron slag had found its way into the vessel by accident (Sundquist 1999:53) instead of being deliberately put into it.

Although the remains of iron production in Neitilä 4 in Kemijärvi (Kehusmaa 1972) have been known since the 1950's, it was not until 1984 that the first furnace was found in northern Finland, at Äkälänniemi in Kajaani (Schulz 1986). The construction used for iron production was carbon-14 dated to the beginning of our era.[2] In Äkälänniemi ceramics were not found.

Since 1989 Hannu Kotivuori has excavated four structures related to iron smelting and smithing in Rovaniemi. Excavations were conducted in Riitakanranta and Sierijärvi in the rural community of Rovaniemi (Kotivuori 1996:108–111). Kotivuori found two different types of structures, which were both used in iron production. The basic structure of the first one is very similar to the furnace in Kajaani: it is a low, rectangular stone box without roof stones. The second type is much taller and it includes a structure similar to the ones found in Scandinavia (Hjärthner-Holdar 1993).

The archaeological laboratory at the University of Oulu has also conducted excavations in sites that include furnaces. The dwelling site of Rakanmäki is the earliest, dating roughly to between 1–400 AD (Mäkivuoti 1987:69). A smelting furnace in Kainuunkylä, Ylitornio is dated to the 11th or the 12th century. The iron furnishing site at Ylikylä, Rovaniemi was not used until the Late Middle Ages (Mäkivuoti 1987:66).

In 1995 the Department of Archaeology of the University of Helsinki, conducted a seminar excavation at the Early Metal Period dwelling site of Kitulansuo d (App. 1) in Ristiina, in the southern part of the Saimaa Water System. A similar rectangular box made of stone slabs as in Kajaani and Rovaniemi was found (Lavento 1996a; 1997d; 1999b). Many iron slag pebbles were found inside the structure (Fig. 8.9.). It is interesting that these kinds of structures have been found only in the northern and eastern parts of Finland and that they seem to represent the eastern influence of iron production in Finland. However, the dating of the Kitulansuo furnace is distinctly younger than those in Kajaani and Rovaniemi. According to two carbon-14 datings available, iron production in Kitulansuo dates to the Merovingian Age or later. These dates are still problematic and the danger of contamination is serious. More probably the using period of the furnace in Kitulansuo dates back to the first half of the 1st millennium AD (Lavento 1999b:79).



Fig. 8.9. An iron furnace from Kitulansuo d in Ristiina in 1995. Photo: Mika Lavento.

[2] Carbon-14 datings of the iron furnace are Hel-2098, 2220±100 and Hel-2101, 2180±90 (Schulz 1986:172).

Parallels for these finds have been found in many sites from the Karelian Republic: e.g. Orov-Guba (Gurina 1951:132–134), Kudama XI (Anpilogov 1966:184) and Kudama X (Kosmenko 1988:113–118) and possibly also Tomitsa (Bryusov 1940:137–138, 238–243). Up until 1999, 26 furnaces from 14 sites were known (Kosmenko & Manyuhin 1999:31) in Karelian Republic. Anpilogov used an iron sickle as the basis of his dating. According to finds in gorodisches in the Upper Volga he dates the implement type and the dwelling site to the end of the 1st millennium BC. A relatively young carbon-14 date from the furnace of Kudama XI, 1590±60 BP (Kosmenko 1980:113, 118) seems to be synchronous with the first dating from Kitulansuo. Kosmenko (1980:113–118) connects Luukonsaari ceramics together with iron production at Kudama X. The furnaces in Kudama represent the type of rectangular stone boxes, which are of same type as in eastern and northern Finland.

Still there were other furnace types used in the Karelian Republic. In southeastern Karelia Kosmenko and Manyuhin (1999:33–39) separated furnaces of wooden construction in the dwelling sites of Ileksa V and Muromskoe VII. In these contexts there exists Luukonsaari ceramics (Manyuhin 1996:236–237). This type of furnace was probably found in Finland in the dwelling site of Neitilä 4 in Kemijärvi (Kehusmaa 1972:80–88). Types 3 and 4 represent ground and pit furnaces, which are quite late (Kosmenko & Manyuhin 1999:44; Gurina 1963:182–187). These types of structures have been found in Finland, for instance in Retulansaari in Tyrväntö (Hirviluoto 1977) and in northern Finland (Mäkivuoti 1987:64–68); from the Karelian Isthmus they are known in Hovi Tontinmäki in Räisälä (Leppäaho 1949:44–50).

The Finnish find contexts of early iron production in the inland area can be connected with the ceramics of the Sär 2 family. Luukonsaari ceramics was found in Ristiina together with the furnace (Lavento 1996a:71–72; 1999b:76–79) and in Rovaniemi the context implies Kjelmøy ceramics (Kotivuori 1996:108–111).

In the dwelling site of Tomitsa bronze and iron slag was found also (Bryusov 1940:137–138, 238–243). In Bryusov's text it is not clear how the iron production is dated. In theory, it might be possible to connect it with Tomitsa ceramics. In Sokolskoe II in the Kostroma area large pit furnaces occurred together with Textile ceramics. Still the excavator of the site, Nina Gurina (1963:195), was sceptical about the possibility of this early dating and suggested that the dating should be later. Hjärthner-Holdar (1993:171–176; 183–184) has strongly emphasised the early dating of iron production in Sweden. According to her hypotheses it would be possible to connect it even with a Late Bronze Age connection (Hjärthner-Holdar 1993:35). In Finland observations of such early iron production do not exist and thus we remain with the traditional hypothesis that the users of Textile ceramics did not make iron in Finland. This does not exclude the possibility that iron implements may have been in use already at that time.

8.6. Straight-based arrowheads

Straight-based arrowheads are morphologically easily recognisable tool type with clear chronological and chorological borders. The type has only a rough dating to the Final Neolithic and the beginning of the Early Metal Period (Carpelan 1975b:286; Siiriäinen 1978:16). For this reason its possible relationship with Textile ceramics needs to be discussed. Two studies (Carpelan 1962; Huurre 1983) which are central in this overview, have been made from the material.

At present at least 188 straight-based arrowheads have been found and the number increases almost yearly (Carpelan 1962; Huurre 1983). Straight-based arrowheads have a characteristic form: the base is usually flat but in some cases concave. Flint and quartzite heads often have notched edges: a feature, which might be explained by the quality of the raw material. The distribution map shows that the most considerable concentrations – if not taking Ala-Jalve in Utsjoki into account[3] – have been so far in Nellim, Lapland (Carpelan 1962) and Suomussalmi in Kainuu, but new material was recently found in Enontekiö. Most finds belong to excavation materials (Huurre 1983:286), but the number of stray finds is also considerable. Most finds come from northern Finland. Straight-based arrowheads are made of flint, quartz and quartzite. Quartzite was a new material for stone tools, because it came into use during the Late Neolithic Period. Comparing the number and raw materials of arrowheads reveals interesting regional differences. In northern Lapland a large majority of arrowheads were made of quartzite. The amount of quartz and flint is much the same in Kemijoki and Kainuu but quartzite is mostly absent. In Saimaa and southern Finland straight-based arrowheads are rare. An arrowhead from the cairn at Saunalahti in Siilinjärvi is made of flint (Pohjakallio 1978b:114–115), which is typical for most arrowheads found in southern Finland.

It is evident that straight-based arrowheads occur together with Textile ceramics in some dwelling sites (e.g. Ruhtinansalmi in Suomussalmi, Halonen in Muhos etc.), but they occur also with many other ceramic types in different cultural environments (Fig. 8.10.). 46 straight-based arrowheads have been found from the Early Metal Period sites including Textile ceramics. However, before a detailed study, it is difficult to count the number of sites where straight-based arrowheads occur in the Late Neolithic or Early Metal Period context. In northern Lapland there exist 42 sites with arrowheads; only two of them have some connection with ceramics. On the sites in Oulujoki Water System straight-based arrowheads exist in 23 find places – seven of them involve Textile ceramics. It seems evident that Textile ceramics and straight-based arrowheads are at least partly synchro-

[3] The material from Utsjoki Ala-Jalve is not included here, because of the large number of the finds: there are tens of straight-based arrowheads made of quartzite. All arrowhead finds have not been published (Rankama 1986; 1997).

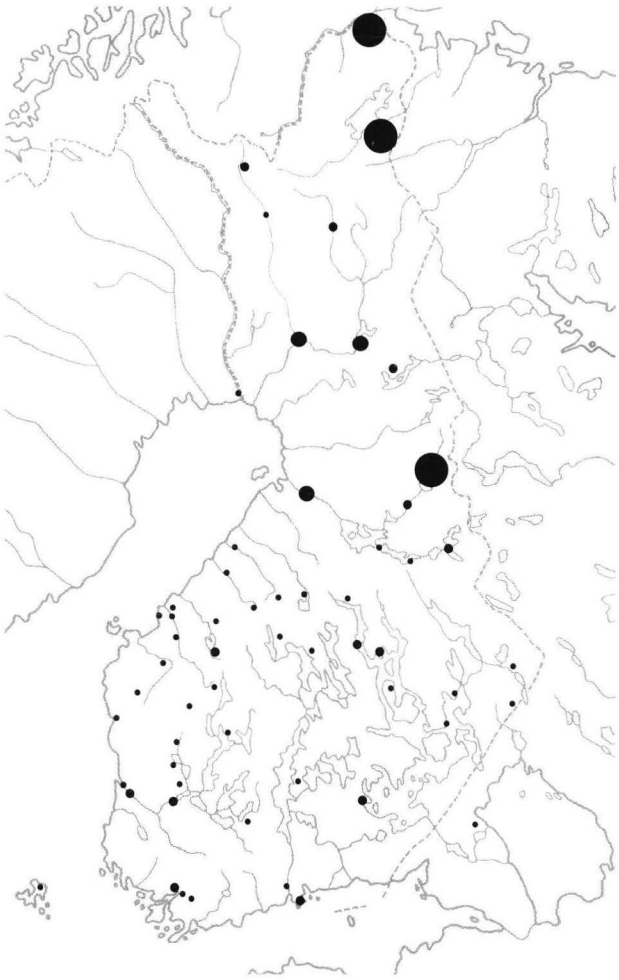

Fig. 8.10. Distribution of straight-based arrowheads in different municipalities in Finland and on the Karelian Isthmus. Legend: largest point > 30 finds, medium > 5 finds, small > 3 finds, a dot – 1 find.

nous. Still it is necessary to make one critical remark: most finds come from Lapland and Kainuu where they are extremely difficult to be connected with any chronological period.

In the Karelian Republic straight-based arrowheads are also known (Kosmenko 1993a:70) but they do not seem to be as characteristic a find group in the Early Metal Period dwelling sites as in Finland. Pankrushev (1978, part II:10) connects them together with the asbestos ceramics of the classical type and dates them to the Eneolithic Period. They are abundant in the Kola Peninsula (Meinander 1954a:130; Carpelan 1962:17). The type exists also in the Middle Volga, in the Pozdnyakovo, the Seima-Turbino, the Bor and even the Hvalynsk cultures (Bryusov 1940:passim; Bader 1959:10, 14; Bader & Popova 1987:133).

In Norway the distribution area of straight-based arrowheads is in Finnmarken, where Povl Simonsen has dated them to the Late Stone Age, to the IV period of the South-Varangian chronology (Simonsen 1961:482–485). Referring to Gjessing (1942) and Simonsen (1961) Carpelan dated the type as synchronous with Finnish straight-based arrowheads (Carpelan 1962:18). In Norrland the type is also known. Its occurrence there follows the same general chronology as in Finland and northern Norway (Carpelan 1962:19). The distribution area of the type covers the whole of Norrland but these implements have been found as far south as Hälsingland. In Norrland it has been considered to be a characteristic member of the slate and quartzite culture (Carpelan 1962:17). Therefore the viewpoint is essentially different than in Finland (see later).

Interesting enough, there exist straight-based arrowheads also in stone cists in southern Scandinavia. Meinander (1964a:31–32) suggested that it would be possible to derive the northernmost straight-based arrowheads in Scandinavia from these. Carpelan and some others have criticised the hypothesis on chronological grounds (Pohjakallio 1978b:117). Carpelan dated the using period of the type to between 1300–600 BC (Carpelan 1962:5–7). Meinander dated the emergence of the type earlier and by basing his dating on the chronology of "hällkist" finds and on some finds in the dwelling sites of the Kiukainen culture he assumed that their use began as early as during the Late Neolithic Period (Meinander 1964a:31–32).

Although it seems evident that straight-based arrowheads belong to the Late Neolithic, Eneolithic or Early Metal Period their connection with Textile ceramics is not so evident. The spread of straight-based arrowheads is a larger phenomenon in northern Scandinavia, exceeding the distribution areas of the Late Neolithic and Early Metal Period ceramic types. Some archaeologists have connected straight-based arrowheads with the distribution of Seima bronzes (Gjessing 1942:183–185; Carpelan 1962:17–18; Huurre 1983:287). In the 1950's also Meinander (1954a: 128–133) interpreted straight-based arrowheads as a reflection of the Seima (-Turbino) phenomenon but he later gave up this idea.

Straight-based arrowheads have been seen only as a cultural-historical find type. In Sweden Lena Holm (1991) has studied the development of flaking techniques of lithic material from the Mesolithic Period to the Bronze Age. Her starting point is a careful analysis of lithic technology and its products. In this analysis straight-based arrowheads represent mainly a Bronze Age implement type showing the change in bifacial flaking technique and the intensified use of brecciated quartz (Holm 1991:122). The difference between the traditional and the new viewpoint is that whereas straight-based arrowheads were earlier seen as a morphological type, it is now important also to understand how these implements were made and what the technological factors which characterise the change of culture area (Johansson 1978; Holm 1991).

Holm has emphasised that an essential change took place in technology: a new kind of craftsmanship emerged which also needed raw material of the highest quality. Quartzite replaced quartz in flaking scrapers and bifacially flaked points. This raw material was obtained through operators who organised the transportation. Holm (1991:118) roughly dates this change to about 2500–1600 BC and suggests that this tradition came to an end at about 500 BC.

8.7. Shafthole axes

Shafthole axes form a loose, but still an easily recognisable artefact group indicating the transition from stone tools to metal ones. Meinander, who studied the group in his dissertation, distinguished five separate groups of shafthole axes on the basis of their morphology (Meinander 1954b:57–84). On this occasion these types are only briefly discussed because they evidently belong to the Western Bronze Age culture material.

The rhomb-formed axes with sharp edges is one subgroup of shafthole axes. Their sharp ends are particularly characteristic. Although they are usually connected with the western Scandinavian Bronze Age culture (Meinander 1950:42–43), Salo (1981:288) has suggested that they might also have an eastern origin. These axes are typical in Scandinavia and therefore Meinander put forward the hypothesis that Finnish axes may have been brought from Sweden to Finland.

The rhomb-formed axes with sharp edges have not been considered to be suitable working axes. Instead, they may have been used as weapons of war or implements needed for cult purposes (Meinander 1950a:42–43). Although it can be said that rhombic axes represent a western implement group, we can not perhaps say that all rhombic axes belong to the same group with the Scandinavian types. According to Huurre (1983:282) some northern Finnish rhomb-formed axes differ clearly from Scandinavian artefacts, which supports the assumption of their local origin. Most recent found has come from Utajärvi (Mäkivuoti 1991).

One subtype of shafthole axes has a curved base. This subtype can be found in Evert Baudou's (1953) classification (Meinander 1954b:67–69). Salo (1981:292) called it the Baudou's type. This type is rare in Finland and the artefacts have been found only in Ostrobothnia and Ahvenanmaa.

Five-angled shafthole axes are known in Finland in Satakunta, Häme and Uusimaa. They have also been found on the Karelian Isthmus, in Salmi and Sortavala. This type is common in the Lausitz culture. Meinander interpreted this as an indication of contacts between the Lausitz culture and Finland through the Baltic countries (Meinander 1954b:80). Their distribution refers to their origin in the Western Bronze cultures.

The distribution and observations concerning the find contexts of the shafthole axes show that all subgroups have western parallels only. Only the rhomb-formed axes with sharp edges might have been known among the populations using Textile ceramics, because this type is found in the Early Metal Period dwelling sites both in eastern and western Finland. It must still be kept in mind that there exists no find context, where they would have been found together with Textile ceramics. The conclusion therefore is that shafthole axes belong to the Western Bronze Age culture.

8.8. Flint

Flint does not exist in Finnish bedrock. Despite this it has still been used during almost every period in the Finnish prehistory. There still exists a considerable variation in the amount of flint used in different periods. The maximum amount of flint is found in Typical Combed Ware. It has been stated on many occasions (Huurre 1979; Vuorinen 1982; Kinnunen *et al.* 1985:10–11) that flint and chert were imported to Finland from two directions: from the large area in the east (the area from Valdai to the White Sea) and from southern Scandinavia. Also northern Norway must be taken into account as a possible source area. This idea also seems natural when considering the occurrences of flint (Hood 1991).

By virtue of the straight-based arrowheads Huurre stated that the source area of flint in eastern Finland lies on the southern side of the White Sea, in the Karelian Republic. Huurre even thinks that in particular the water routes of the Rivers Oulujoki and Kemijoki played a central role in importing these raw materials (Huurre 1983:289). According to observations made by the author also northern Karelia (the northern part of the Saimaa Water System) should be included into this group. The amount of flint is considerable in the dwelling sites of Varaslampi in Joensuu and Syväys in Ilomantsi, dating particularly to this period.

The amount of flint is conspicuously small, instead, in the southern part of the Ancient Saimaa Water System during this period. In the dwelling site of Kitulansuo d in Ristiina, where much Textile ceramics exists, only half a dozen small flint flakes have been found (see App. 1). This observation is very interesting. It might give some support to the idea that the makers of Tomitsa ceramics in eastern Finland were in contact with the culture of Textile ceramics in eastern Karelia, while the makers of Sarsa ceramics in southern Finland were not able to get flint either from the Onega area or southern Scandinavia.

The small number of clean dwelling sites with Textile ceramics hinders the thorough study of this question. Some sites were inhabited from the Early Neolithic to the Early Metal Period and for this reason separating flint belonging to the period of Textile ceramics is difficult. Therefore, the hypothesis stated earlier should be considered to be only preliminary.

8.9. Asbestos

Asbestos is an important raw material the use of which spread into a large area in Finland as early as in the beginning of the Neolithic Stone Age. Asbestos is not available everywhere. The most important occurrences of asbestos minerals are in the northeastern part of the Ancient Lake Saimaa Water System and some small areas in Kainuu and Central Lapland. Long distances may have

caused the development of a kind of exchange network between Neolithic and Early Metal Period populations. Considerable changes can be observed in the type and in the use of this raw material during the prehistory. For this reason studying the provenience of asbestos can bring some interesting information.

The first studies of asbestos raw materials were made already in the beginning of the 1900's (Ailio 1909; 1913) and some experimental studies were made in the 1950's (Carlson & Meinander 1968). During recent years a large amount of material from the whole of Finland and the Karelian Isthmus has been investigated with interesting results (Lavento & Hornytzkyj 1995; 1996). The starting point of these analyses was the comparison of raw material from known asbestos sources with pieces of raw material and asbestos temper in different ceramic types. A scanning electron microscope and an EDS-microanalyser were used to separate minerals and elements in ceramic samples. The results showed that most of the asbestos in the ceramic samples was antophyllite (Fig. 8.10.), the provenience of which is most probably in the sources in the Outokumpu and Heinävesi area (Lavento & Hornytzkyj 1995:72–75; 1996:55–62). In addition, analyses made from samples from Kainuu, Lapland and the western part of the Karelian Republic showed that asbestos temper was often antophyllite most likely obtained from the sources in Saimaa. During the Stone Age antophyllite predominated these areas. At the end of the Stone Age and in the beginning of the Early Metal Period also other asbestos minerals came into use in Kainuu, Lapland and the Karelian Republic.

These results raised interesting questions. Were the asbestos sources in Saimaa available for all who needed raw material or were there populations, which controlled them and carried out trade with some other populations? An interesting question is also, what happened in the beginning of the Early Metal Period when the use of asbestos as temper seemed to cease. It is also worth noting that the use of asbestos was not usual in Textile ceramics or in Anttila ceramics, but became the norm in the Luukonsaari, Sirnihta and Kjelmøy groups, which represent the southernmost and northernmost groups of Sär 2 ceramics. The wide spread use of asbestos during the Neolithic Period may be related to the existence of commercial network systems during the Stone Age and its breakdown during the beginning of the Early Metal Period. The following model can be suggested on the basis of the existing studies (Lavento & Hornytzkyj 1995:72–75; 1996:63–64). The chronology has been updated (Carpelan 1999:273).

Phase 1: 4500–3600 calBC. The use of asbestos begins in the Saimaa area among the populations making Early Asbestos Ware. Using antophyllite asbestos spreads from Saimaa to Kainuu and the Lake Päijänne area.

Phase 2: ca. 4000 calBC. The spread of Typical Combed Ware to Finland breaks down the Asbestos network systems formed during the Early Metal Period.

Phase 3: 4000–3500 calBC. Acculturation between the populations of Early Asbestos Ware and Typical Combed Ware. The use of asbestos begins again.

Phase 4: 3000–2500 calBC. The spread of Organic-tempered Ware to Finland. Asbestos remains still in use.

Phase 5: 3000–1800 calBC. Formation of Middle/Late Neolithic Kierikki/Pöljä and Jysmä Wares where the use of asbestos is dominant. The distribution area of Asbestos-tempered Ware is larger than earlier. Asbestos comes into use also in some dwelling sites in the Karelian Republic.

Phase 6: 1700–1500 calBC. Breakdown of the use of asbestos in the beginning of the Early Metal

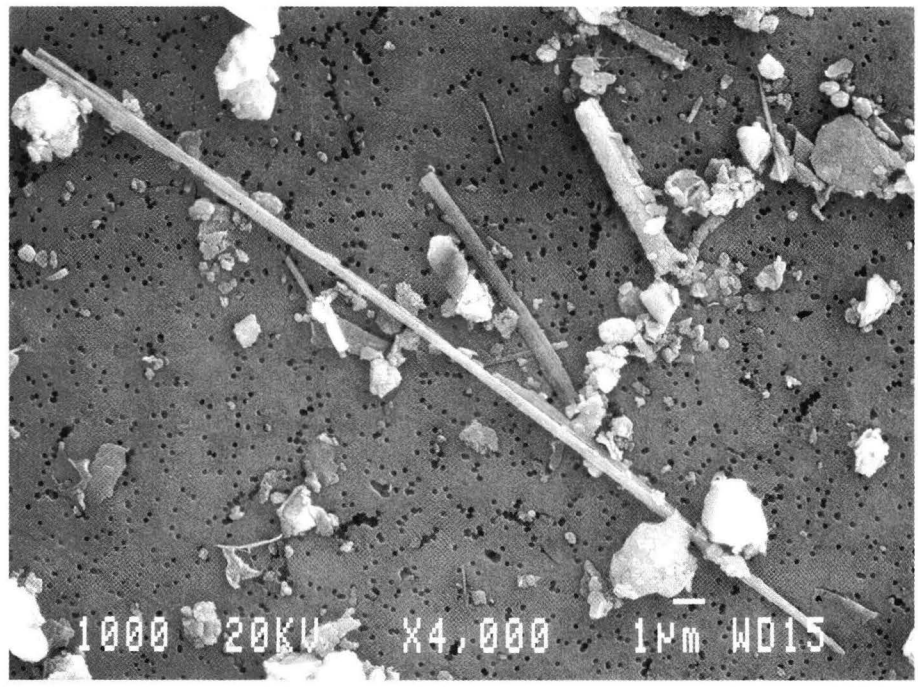

Fig. 8.11. Antophylite asbestos fibres from Paakkila in Tuusnemi seen through scanning electron microscope. Photo: Seppo Hornytzkyj.

Period. Quartz/feldspar/amphiboles and soapstone replace asbestos in Textile ceramics. At the end of the period asbestos comes into use again.

Phase 7: 1000–1 calBC. Differentiation of Sär 2 ceramics into several subgroups. Anttila ceramics is mica tempered. Antophyllite from Saimaa is used in the Luukonsaari and Sirnihta groups. Kjelmøy ceramics is mostly tempered with actinolite or tremolite-actinolite from northern Finland.

Phase 8: 400–600 calAD. The use of asbestos together with ceramic making ceases in eastern Finland and Lapland in the middle Iron Age.

Asbestos as an exchange object may indicate the existence of a commercial network system for a long period; another example of a possible exchange article is flint in Kainuu. Although connecting flint in the dwelling sites with the appearance of Textile ceramics is not unambiguous, it seems possible that a lot of flint came to Kainuu during the Early Metal Period. The argument behind this hypothesis is straightforward: the more Early Metal Period ceramics there are in the dwelling sites, the more flint implements and flakes are found. Possibly together with the appearance of Textile ceramics the casting of metal implements began in eastern Finland. Copper and tin from abroad were needed for casting but excellent mould material was available in Kainuu. Putting the possible exchange articles side by side we see a comparison between the Kainuu and the Lake Onega areas:

Kainuu	Lake Onega
– soapstone raw material	– bronze metal or finished bronze implements
– asbestos	– flint raw material or finished implements

Metal implements and bronze axes are rare in eastern Finland and in Lapland but in some cases it is possible to find there raw material for casting them. The relationship between populations or a possible commercial relationship between them is not discussed any further here, but they are more thoroughly elucidated in the last chapter of this study.

IX DWELLING SITES OF TEXTILE CERAMICS IN FINLAND AND THE KARELIAN ISTHMUS

9.1. Introduction

Different kinds of dwelling sites of Textile ceramics provide an important dimension not only in trying to understand the ceramics itself but also the culture of the Early Metal Period. This chapter concentrates on presenting all dwelling sites involving Textile ceramics in Finland and the Karelian Isthmus. The first part of this chapter characterises the development of the studies of Early Metal Period sites in Finland. After this some general features of sites and their relationship to the environment and topography are discussed. Also some geoarchaeological observations are presented. An important point is the comparison of sites involving Textile ceramics with other Early Metal Period sites not only in Finland but also in the Karelian Republic, the St. Petersburg area and Estonia. The comparison also includes a discussion on differences between the Neolithic and the Early Metal Period sites in order to elucidate the differences in the settlement type. These differences play an important role in interpreting the relationships between populations responsible for Textile ceramics and others, which can be at least partly synchronous with it.

The detailed descriptions of each site involving Textile ceramics in Finland and the Karelian Isthmus is presented in Appendix 1. A list of dwellings sites of Textile ceramics on the Karelian Republic, the St. Petersburg area and the most important Estonian sites involving Textile ceramics is given as a list in Appendix 2. Unfortunately only a small proportion of Estonian Early Metal Period sites have been published so far.

9.2. Field research concerning the Bronze Age and the Early Metal Period sites in Finland and on the Karelian Isthmus

In Finland and the Karelian Isthmus there exist 175 sites where Textile ceramics have been found. The number of Early Metal Period dwelling sites (sites involving Early Metal Period ceramics other than Textile ceramics) is at least twice as large. Sites may occur alone or they may be concentrated in tight complexes of several sites. In the latter case their separation from each other is sometimes problematic. The number of dwelling sites involving Textile ceramics is the largest at the complex of Riukjärvi and Piiskunsalmi in Kaukola, the Karelian Isthmus. Dense site clusters exist also at Sarsa in Kangasala, at Laasola in Ristiina and at Ruhtinansalmi in Suomussalmi. Therefore, counting the number of dwelling sites only may give a slightly misleading view about the density and distribution of the ceramic finds. Counting the number of vessels gives another dimension but because the number of vessels is tightly connected with the excavated area it gives an even more erroneous view of the situation.

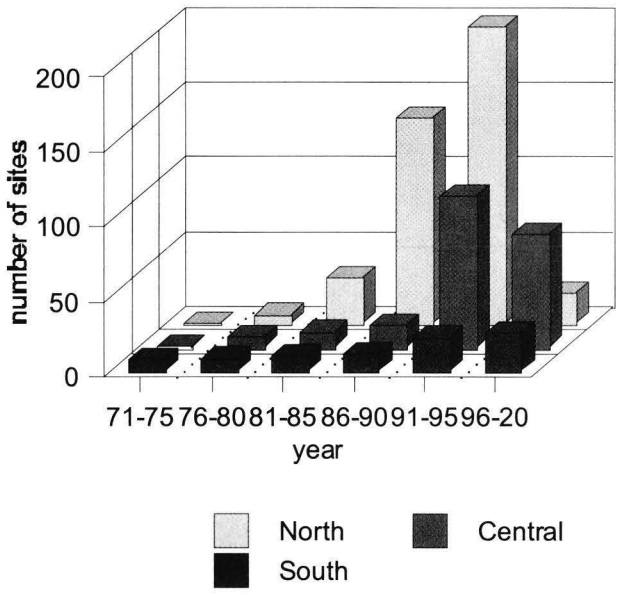

Fig. 9.1. The number of Early Metal Period and Bronze Age sites studied in Finland between 1971–2000.[1] North: Lapland and Kainuu, Middle: Ostrobothnia, Eastern Finland (Saimaa), Central Finland (Päijänne), South: Finland Proper, Häme, Kyme, Uusimaa.

The third important factor affecting site density is the study activity and the number of field studies conducted in different areas (Fig. 9.1.). An essential increase in the archaeological research activity in Finland took place between the 1970's and the middle of the 1990's. Conspicuous is also that the number of sites diminished dras-

[1] The period 1996–2000 has been calculated according to the information on 31th of December 2000.

tically in northern and even in eastern and central Finland during the second half of 1990's. This is a clear result of the decrease of the survey activity of the Municipal Museums and the National Board of Antiquities; for instance, the post for an archaeologist no longer exists in Ivalo. The data (Fig. 9.1.) describing this change is based on information collected from the main catalogue of the National Board of Antiquities. Although the main catalogue cannot be considered as the perfect source of information, it still shows the general trends reliably enough. The Municipal Museum of Turku has its own catalogue including this new information collected after the 1970's. The missing information included in it partly explains the small number of Bronze Age sites in southern Finland. The second problem deals with the different datings of the sites. In northern and eastern Finland both Bronze Age and Iron Age sites have been classified into the Early Metal Period whereas in southern Finland only Bronze Age sites have been included into this group. The Pre-Roman, Early Roman and Roman Periods have been omitted thus essentially reducing the number of sites in relation to the Early Metal Period ones in northern and eastern Finland. The numbers on the y-axis in Figure 9.1. refer to sites, which have been dated to the Bronze Age according to the main catalogue. The term site includes here, not only dwelling sites, but also cairns, cemeteries etc. Most information was collected by field surveys and inspections, excavations representing only a minority.

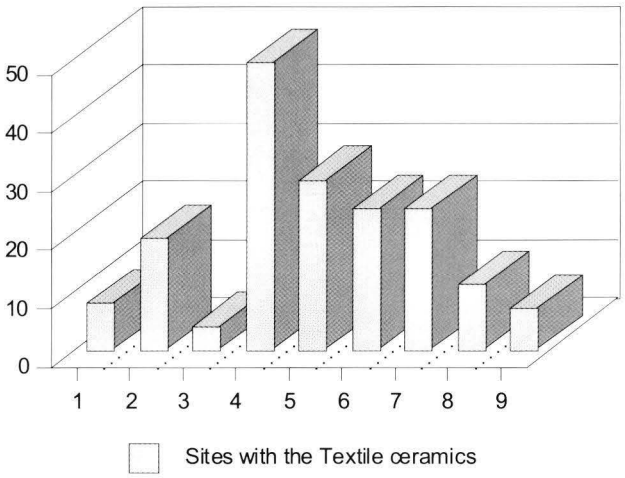

Fig. 9.2. The number of Bronze Age (and Early Metal Period) sites and sites involving Textile ceramics in different areas of Finland. Legend: 1: the River Kemijoki Water System, 2: the River Oulujoki Water System, 3: Southern Ostrobothnia, 4: the Lake Saimaa Water System, 5: the Karelian Isthmus, 6: the River Kymijoki Water System, 7: the River Kokemäenjoki Water System, 8: Varsinais-Suomi, 9: Uusimaa.

The histogram (Fig. 9.2.) presents the number of dwelling sites containing Textile ceramics in relation to Early Metal Period and Bronze Age ceramics in Finland. The latter includes all types of sites involving Sär 2 ceramics, Bronze Age ceramics and Morby ceramics (sites with Textile ceramics not included). It reflects clearly how Textile ceramics is concentrated in inland areas, particularly to the east of Finland.

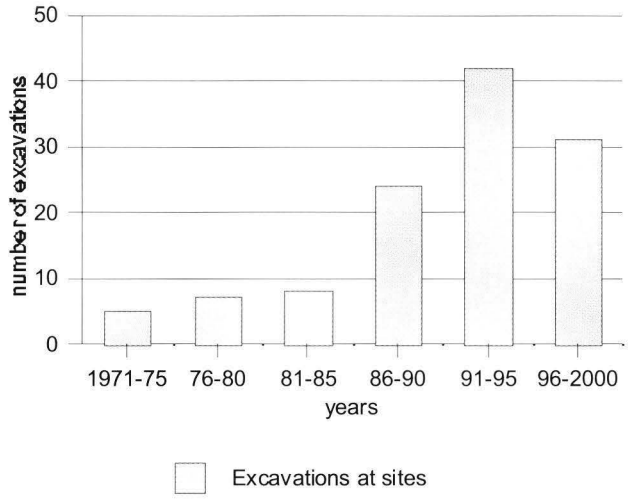

Fig. 9.3. The numbers of excavations carried out in the Early Metal Period and Bronze Age dwelling sites in Finland between 1971–2000. In most cases the excavated sites were multi-period dwelling sites.

Figure 9.3. shows excavations carried out in Bronze Age or Early Metal Period dwelling sites between 1971–2000. One can see in the figure that the research activity essentially increased during the 1980's and the first half of the 1990's. The number of studies conducted in the Early Metal Period or Bronze Age sites was low in the beginning of the 1970's but the activity increased essentially in the mid 1990's. During the second half of the 1990's the number of excavations diminished. Although taking into account the coding problems, which leaves some southern Finnish sites outside the statistics, one can clearly see that the archaeological activity has moved from southern Finland to northeastern and northern Finland. From the 1970's on, the employment policy has transferred a large number of surveys and excavations to eastern Finland and Lapland. Further, three archaeologists working permanently in northern and eastern Finland have brought to light many new sites as a result of systematic municipality surveys. In the late 1990's the lack of money to employ people for excavation has drastically reduced the amount of archaeological fieldwork. This has immediately been reflected in the slowing down of the increase of archaeological material.

This development has led to the situation that only a small number of new finds and new dwelling sites come from southern Finland. The general view of the Early Metal Period in southern Finland has not changed overwhelmingly since the days when C.F. Meinander wrote *Die Bronzezeit in Finnland* in 1954. Instead, it has totally changed in northeastern and northern Finland.[2]

The difficulty in comparing the culture of the Early Metal Period and the Bronze Age in the coastal zone has already been pointed out. Although they certainly have

[2] New sites with Textile ceramics have been found in the surveys in the valley of River Porvoonjoki organised by the Museum of Lahti in the season 2000. These sites are not included in this work, because the reports of these studies are not yet available.

connections with each other and although both cultures have utilised both inland and coastal resources seasonally (Siiriäinen 1981; 1982; Matiskainen 1989), there still exists a clear difference in the material culture and in the nature of dwelling sites; in general the border between inland and coastal cultures is often not easy to draw on typological, geographical and ecological grounds (Taavitsainen *et al.* 1998).

One further distinction is important. When speaking about the distinction between coastal and inland ceramics we speak about Bronze Age ceramics and Textile ceramics, thus the comparison between them should also be investigated. The comparison of mixed sites, e.g. sites involving Textile ceramics, Corded Ware and Bronze Age ceramics, might also be of special interest. Hautvuori in Laitila or Koivistosveden in Kirkkonummi are examples of these kinds of sites. The comparison of Bronze Age and Early Metal Period sites is also important, because it might illuminate the differences in the nature of settlement, economy and size of populations. One version of the latter comparison is made in this study by using information in publications, not by using primary material. To use primary material would need much extra work and also go beyond the scope of this study.

In the following a short overview of the sites with Textile ceramics in Finland is given. Special care is devoted on elucidating possible centres of habitation during the period (Fig. 9.4.). The first section (9.3.) presents the most important dwelling sites or site clusters. Whether a typical Textile ceramics site can be construed and how this site differs from the Late Neolithic and Early Iron Age ones is pondered. Slash-and-burn cultivation and economy is discussed at the end of the chapter (9.5.).

Although a large number of dwelling sites involving Textile ceramics was researched for this study in the Karelian Republic, the St. Petersburg region and Estonia, these sites are only very briefly listed in Appendix 2. One problem is that it has proven to be difficult to get information, which causes that only a part of them can be presented in a satisfactory way.

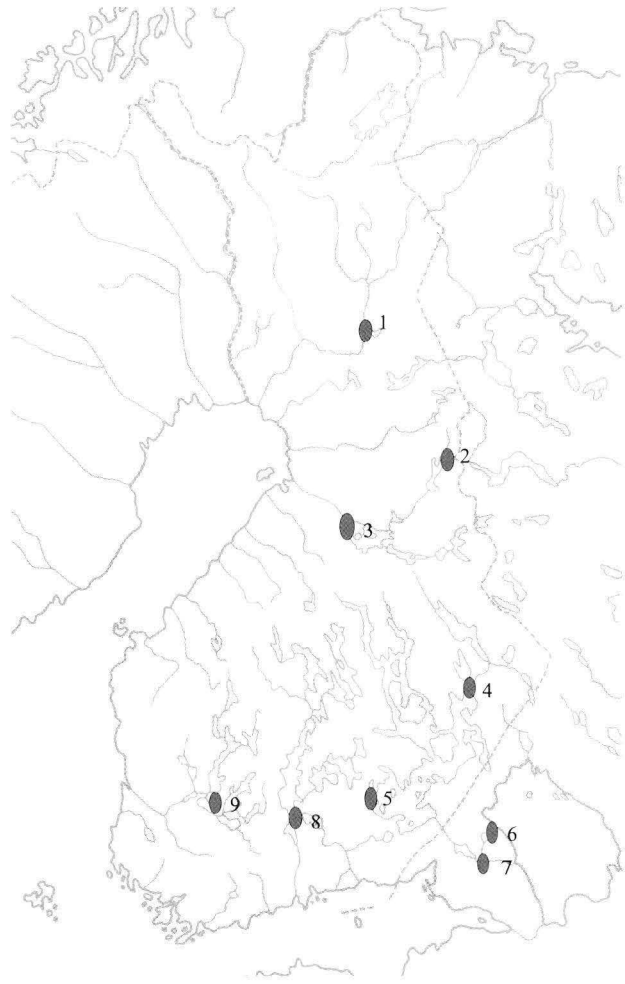

Fig. 9.4. Dwelling site clusters in Finland and the Karelian Isthmus. The most important sites or site complexes involve Textile ceramics. 1 – the Neitilä area in Kemijärvi, 2 – the Ruhtinansalmi area in Suomussalmi, 3 – the Nimisjärvi area in Vaala, 4 – Varaslampi in Joensuu, 5 – the Laasola area in Ristiina, 6 – the Riukjärvi and Piiskunsalmi area in Kaukola, 7 – Kalmistonmäki in Räisälä, 8 – Kotasaari in Asikkala, 9 – the Sarsa area in Kangasala.

9.3. Dwelling site clusters involving Textile ceramics in Finland

In Finland and the Karelian Isthmus several geographical areas where sites involving Textile ceramics form clear clusters can be separated. This is partly but not only, due to excavation activity. In Kainuu there are two dwelling site complexes the material of which is of special importance in interpreting Textile ceramics and other Early Metal Period ceramics in Finland. Although the dwelling site complex around Lake Nimisjärvi is not rich in Textile ceramics, it still is a key site when separating Textile ceramics from other Early Metal Period ceramic types.

As early as the 1880's an enthusiast and amateur ethnographer O. A. F. Mustonen (1892) heard about finds picked up from the fields around Lake Nimisjärvi in the parish of Säräisniemi. No metal objects were found, but some fragments of soapstone moulds referred to bronze casting during the Early Metal Period. A large number of stone artefacts and ceramic fragments were also found. Already in 1895 A. O. Heikel (1896) conducted an archaeological excavation in the area, one of the earliest in prehistoric dwelling sites in Finland. Soon after this several short excavations were carried out at Nimisjärvi (see Ailio 1909; Suominen 1996) and a large amount of material was collected. Even today this material is one of the most diversified and illustrative in Finland, representing nearly all of the periods of prehistory.

The second centre of Early Metal Period habitation in Kainuu is the Ruhtinansalmi area in Juntusranta, Suomussalmi. This dwelling site complex has been known since 1957, thanks to surveys and extensive excavations conducted by Matti Huurre (1959; 1982; 1992).

The dwelling sites of the Ruhtinansalmi area were inhabited for over four thousand years, like the Nimisjärvi sites. Practically all prehistoric material found at Ruhtinansalmi has come from mixed contexts. Here shore displacement has affected the situation of the prehistoric habitation only slightly. The popularity of the Ruhtinansalmi area is based on a favourable location along the water routes between the east and the west in relation to hunting and fishing grounds (Huurre 1983).

Early Metal Period finds and Textile ceramics have been found also in Kuhmo and Sotkamo but not as abundantly as in Suomussalmi. After an intensive excavation period, which started in the beginning of the 1990's, the general view has essentially been enriched. The central area of Early Metal Period habitation in Kuhmo lies on the island of Pajasaari and the cape of Vasikkaniemi (Karjalainen 1996a).

The dwelling sites at Neitilä in Kemijärvi resemble in many ways those at Ruhtinansalmi. However, the environment differs in one important respect: the sites in Neitilä are on a riverbank. The River Kemijoki has deposited sediments on the dwelling sites causing development of stratigraphy, which is a relatively unusual phenomenon in Finnish archaeological contexts. With the help of stratigraphy Aimo Kehusmaa (1972) was able to postulate a ceramic sequence in the dwelling site of Neitilä 4. Despite the small amount of ceramics the relative stratigraphy has much value in studying the relationship between Typical Combed Ware and the Sär 2 types. Only a small number of Textile ceramics has been found in the dwelling sites of the River Kemijoki. The recognition of ceramics is often difficult because of the small number and size of finds. Despite some uncertain finds no Textile ceramics has been found on the northern side of the River Kemijoki (App. 1), which can be considered to be the northernmost border of Textile ceramics in Finland. The surveys and rescue excavations in Kemijärvi began during the 1960's for the same reason as in Kainuu. Field studies soon ceased after the building of hydroelectric power stations on the River Kemijoki. Surveys activated archaeological studies again in the beginning of the 1990's (Kotivuori 1991).

So far in the Saimaa area archaeologists know of only one Early Metal Period dwelling site complex in Ristiina, Laasola, which is comparable with the clusters in Kainuu. The sites in Ristiina are known because of the surveys made by the Savonlinna Provincial Museum and by the project *Settlement and contacts in the Ancient Lake Saimaa Area during the prehistorical time.*[3] Most of these new sites are known only through survey finds (Sepänmaa 1993). Excavations have been conducted in Ristiina, Kitulansuo d by the National Board of Antiquities and the Department of Archaeology, University of Helsinki (Lavento 1996a; 1999b).

An important separate site rich in Textile ceramics is situated in the city of Joensuu in eastern Finland. In the dwelling site of Varaslampi in Joensuu Textile ceramics together with Luukonsaari ceramics – as in Ristiina – have been found. The rescue excavations at Varaslampi were carried out for the first time by Maarit Suni and Lea Väkeväinen. The material belonging to Textile ceramics is the largest known in Finland so far.

The Karelian Isthmus is represented in this study mainly through the material excavated before the 1940's by Finnish archaeologists. After World War II no large Early Metal Period studies have been conducted. Alexander Saksa (1994), Vladimir Timofeev (Timofeev 1986; 1993a; 1993b; Dolukhanov & Timofeev 1997) and other archaeologists from St. Petersburg have conducted small surveys, trial excavations or excavations lately at Kurkijoki and Räisälä, the main emphasis being on the study of the Late Iron Age settlement in towns.

The largest material in the Karelian Isthmus, which dates partly to the Early Metal Period, was excavated from the Riukjärvi and Piiskunsalmi area in Kaukola as early as the beginning of the 1900's (Pälsi 1915). Most finds were picked up as stray finds without information of the context. Also the excavation material is mixed and it is not possible to construct a stratigraphy. The material from Kalmistonmäki in Räisälä has played an important role in studying Textile ceramics. Meinander (1954b:189–190) distinguished the youngest phase of Textile ceramics as a separate Kalmistonmäki group. Also this site involves material from different prehistoric periods from Early Combed Ware to the Historical Period. In the dwelling sites of Kuuppala in Kurkijoki and Häyrynmäki in Viipuri Textile ceramics have also been found.

One can find several sites with a rich variety of ceramics in Häme and Satakunta. The most remarkable centres of Textile ceramics are Hietaniemi in Luopioinen, Kotasaari in Asikkala and first of all the dwelling site complex at Sarsa in Kangasala. Textile ceramics has been excavated in several dwelling sites of Sarsa. This site complex comprises ten larger or smaller sites with a remarkably large find material. The find material from Sarsa was researched in one pro gradu-work (Koskimies 1968). Also Timo Miettinen described the rich material from Hietaniemi in Luopioinen in his pro gradu-work (Miettinen 1975). The material of Asikkala, Kotasaari has not been published or researched.

Sakari Pälsi conducted the first excavations at Sarsa already in 1920 in the dwelling sites of Pohtio and Sepänjärvi. In the 1930's and the 1940's Pälsi and Ville Luho continued field studies in the area. In the 1950's Meinander excavated at Autio, Sepänjärvi and Pohtio. Mirja Miettinen carried out large studies as salvage excavations between 1965–1968 at Pohtio. For Meinander (1954b:182–184) the material from Sarsa was the key for defining Textile (or Sarsa-Tomitsa) ceramics.

Further, outside the above-mentioned central places of Textile ceramics, there are many important dwelling sites in the large territory. Even in the coastal strip, by the Finnish Gulf and in Varsinais-Suomi, inside the dis-

[3] The project was carried out between 1992–1996 by the University of Helsinki, the National Board of Antiquities and The Municipal Museum of Savonlinna. Http://www.helsinki.fi./hum/arla/wwwsaima.html.

tribution area of the Western Bronze Age culture, there are several dwelling sites, which obviously belong to the distribution area of Textile ceramics. One of the most important and interesting of these types of sites is in Hautvuori at Laitila (Meinander 1954b:184–185) representing the contact between Textile ceramics, Bronze Age and Morby ceramics. Lalla in Laitila and Hulkkio in Kaarina (Strandberg 1996) should also be mentioned as interesting sites involving mostly Textile ceramics.

In the 1980's and the 1990's also from southern Ostrobothnia sites involving Textile ceramics were found (Miettinen 1994a). By virtue of these finds it can be said that the distribution area of the ceramic type has grown essentially larger since Meinander's days. On the south side of the River Kemijoki there are also Textile ceramics; only the coastal zone of the Baltic Sea is short of them. Because there is also a different type of Bronze Age culture in the area, this refers to the possibility that the economy of Textile ceramics was primarily based on utilising inland resources instead of marine ones.

9.4. Characteristics of the dwelling sites of Textile ceramics in Finland and on the Karelian Isthmus

One problem in trying to characterise a typical dwelling site of Textile ceramics is that only a small number of excavated sites have included material belonging to only one ceramic period. This is the case particularly with the large sites in Kainuu, the Karelian Isthmus and at Sarsa itself. In these sites it is usually not possible to observe any particular features, which can be connected with a certain period. The situation is different in the Saimaa area and in those areas where shore displacement has affected the changes in the dwelling sites. Because many excavations in these sites have been conducted in the Saimaa area, most information comes just from there. The observations made in the Saimaa area are compared with the sites along all major water systems in Finland and between different topographical environments.

It has been noticed (Lavento 1997b) that a considerable change took place in the nature of dwelling sites from the Late Neolithic to the Early Metal Period. The first important feature is that large sites with several dwelling depressions disappeared and small sites with few finds came into use. Particularly during the 1990's many archaeological field studies were made on dwelling depressions dating to the Middle or Late Neolithic Period (Seger 1986a; Hiekkanen 1984; Kotivuori 1993; Karjalainen 1996b; Koivunen 1996; Räihälä 1997, Halinen *et al.* 1998; Pesonen 1998; 1999). The great majority of dwelling depressions in Finland can be connected with Typical Combed Ware, Late Combed Ware or Asbestos ceramics of the Kierikki and Pöljä type. Some examples of Mesolithic dwelling depressions are also known (Miettinen 1999) but they are rare so far. At present there are only a few dwelling depressions, which could possibly be connected with the Early Metal Period (Mökkönen 1999;2000).

The disappearance of dwelling depressions at the end of the Neolithic Period has also been observed by Karelian archaeologists (Kosmenko 1993b; 1996a). Large dwelling depressions with one or two entrances usually involve Pit-Combed Ware and Asbestos ceramics, which dates the structures roughly synchronous with the Finnish depressions in eastern Finland (Zhulnikov 1996). If not taking into account some exceptions (Kosmenko 1982b), dwelling depressions do not belong to the context of the Textile ceramics.

Although dwelling depressions related to Textile ceramics are almost missing in Finland and the Karelian Republic, the situation is different further to the east. In the Upper and Middle Volga large dwelling site complexes with large depressions are typical. Large dwelling depressions involving Pseudo-net and Prikazan ceramics have been excavated in the Middle Volga, e.g. in Kokhaisk 4, Sosnovaya Griva, Ahmylovo, Kurgan and Kazanka II (Patrushev & Halikov 1982:123-125; Solovyev 1984:67-71; Halikov 1969:292; 1980:15; Starostin 1967).

In Mari-El the tradition of building these types of depressions is grounded already in the Volosovo culture (Krajnov 1987a; Nikitin 1991:15-18). In the beginning of the Early Metal Period dwelling depressions were large and deep. However, it has been suggested that a considerable change in the construction of buildings took place during the Late Prikazan Period (Nikitin & Solovyev 1982:115): structures seem to have been built above ground level (Halikov 1980:15; Starostin 1967). This phase dates back to the 14th–11th centuries BC (Nikitin & Solovyev 1982:122). The tradition of building dwelling depressions continued during the Iron Age; dwellings above ground level were built since the end of the 2nd millennium BC (Patrushev & Lavento 1996:37).

Although the dwelling depressions are related to Textile ceramics in the Middle and Upper Volga, the picture of dwelling sites is essentially different in Finland and the Karelian Republic. In the Karelian Republic there are dwelling depressions in sites with Textile ceramics referring to the short-period use of sites (Kosmenko 1996:190–191). Signs of dwellings built above ground level have been excavated at Elmenkoski (Kosmenko 1982b) and Kelka III (Kosmenko 1996a: 191). The largest dwelling (6 m x 3.5 m in size) has two entrances and a hearth made of stones. Even smaller round dwellings (3 m x 3.2 m in size) with a stone hearth were documented on these sites (Kosmenko 1996a: 191). Despite these examples the small number of remains of dwellings together with Textile ceramics is still a striking phenomenon.

The Early Metal Period sites are usually considerably smaller than during the Neolithic Period and the number of finds also indicates either a smaller population or a shorter period of habitation. If considering only three main features of the dwelling sites involving Textile ce-



Fig. 9.5. The dwelling site of Huotinniemi in Rääkkylä close to the large Stone Age dwelling site area of Pörrinmökki. During the Early Metal Period the Huotinniemi site was a small island. Photo: Mika Lavento.

ramics – the lack of dwelling depressions, the size of the site and the small number of structures found in excavation – one can end up with the conclusion that the sites were temporary. According to information available it is still difficult to say whether they were used only seasonally; in some cases it seems probable that sites were used particularly during a certain period of the year. For instance, the dwelling sites of Ruhtinansalmi (Kalmosärkkä, Kellolaisten tuli) in Suomussalmi or Nimisjärvi in Vaala were used during spring and early summer because of good fishing conditions (Lavento 1989:24). It is still difficult to connect most sites with any particular season.

One difficulty in characterising the dwelling sites involving Textile ceramics is that only a small number of archaeological excavations have been conducted in sites involving only Early Metal Period ceramic types. So far Varaslampi in Joensuu is the largest Textile ceramics site excavated in Finland. Remains of habitation were found in the terrace sloping gently into the pond Varaslampi (Suni 1974), no structures other than hearths were found during the excavation. A large excavation was also carried out at Kitulansuo d in Ristiina (Lavento 1996a; 1999b). No structures other than small hearths and patches of a cultural layer were located of Kitulansuo, either. It is interesting that an iron furnace dating to the Early Iron Age representing the context of Luukonsaari ceramics was located there also. In the neighbourhood of Kitulansuo d – on about a 5 km long part of an esker – several sites involving Textile and Luukonsaari ceramics were found (Sepänmaa 1993; Lavento 1995a; Koivikko & Mökkönen 1996). No dwelling depressions dating to the Early Metal Period were found in the area.

While Stone Age sites are situated on eskers, glacifluvial deltas, foots of moraine hills on sandy or gravel soil, many Early Metal Period sites are on fine sand or silts. Many Early Metal Period sites are now situated in fields or on the lower edges of eskers (Fig. 9.5.). This shift of dwelling sites from a pine forest into a birch forest can best be followed in the Saimaa area where shore displacement has profoundly affected the topography. Good examples of this kind of shift are the dwelling sites in Rääkkylä and Kerimäki (Taavitsainen *et al.* 1998; Lavento 1997a).

Also an interesting phenomenon is that some Early Metal Period sites are situated on small islands. The best examples of these kinds of sites are Luukonsaari in Kuopio (Meinander 1969) and Sirnihta in Kesälahti (Carpelan 1975e). It also reflects the difference in the settlement tradition in comparison with the Stone Age. The islands are so small that only a relatively small number of people could have lived there. So far only small excavations have been conducted on them and the type of habitation in not well known. Although some Textile ceramics has been found on the islands, it is mostly Sär 2 ceramics, which should be connected with this kind of environment.

The dwelling sites, where Textile ceramics has been found, are in most cases situated in a topographical environment, which can be used only by a small population. Also the finds, which have usually been picked up from a small terrace, support this hypothesis and the

amount of survey finds is essentially smaller in these sites than in the Neolithic ones. There is one interesting exception to this phenomenon: in Kainuu the number of Early Metal period finds represents the majority in relation to the Stone Age ones. For instance, at Nimisjärvi in Vaala (Huttunen *et al.*, in press) and Kalmosärkkä in Suomussalmi (Lavento 1989) over half of all ceramic finds dates to the Early Metal Period. This fact makes it possible to assume that one concentration of habitation was in Kainuu precisely during the Early Metal Period (Huurre 1986a; Lavento 1992:30–33). It is also remarkable that during this period much bronze casting was also conducted. The number of casting moulds and crucibles is largest just in Kainuu (Huurre 1982).

The topographical difference between the Stone Age and the Early Metal Period sites can be explained with shore displacement and the necessity to move dwelling sites to new areas. There is, however, another reason, which might have affected the location of sites: in eastern and northern Finland early experiments in agriculture were also made (Vuorela & Hicks 1996; Vuorela & Kankainen 1991; Vuorela & Kukkonen 1992; Taavitsainen *et al.* 1998; Huttunen *et al.*, in press).

Mark Kosmenko (1996a:90) has suggested that dwelling sites involving Textile ceramics in the Karelian Republic are situated on small islands, on the shores of small lakes or at river mouths. Also small-sized places, such as river bends, were used. Not many Early Metal Period sites have been found on the shore of Lake Onega.

Although several differences in the location of the Early Metal Period dwelling sites in relation to the Stone Age ones can be observed, it is still important to remember that the differences are slight when comparing them with the Iron Age sites or sites from the Middle Ages or the Historical Period, when agriculture had already become the primary means of living. Therefore, it is essential to remember that the culture where Textile ceramics was made represented a fisher-hunter economy and the means of living were basically the same as during the Stone Age. What is different is the size, type and geographical location of dwelling sites which may reflect the decrease in size of populations and, perhaps, a transition to a mobile way of life instead of semi-sedentary tradition.

Looking at the topographical situation of the Early Metal Period dwelling sites in relation to the Stone Age ones shows that they can be found in the same but also in a different kind of environment.

9.5. Textile ceramics and slash-and-burn cultivation

The results of palynological investigations carried out during the 1980's and the 1990's in Finland have essentially enlarged the view of the economy of hunter-gatherers. It has turned out that slash-and-burn cultivation was conducted already during the middle of the 3rd millennium BC (Vuorela & Hicks 1996; Grönlund *et al.* 1990; Poutiainen *et al.* 1995). Even though slash-and-burn cultivation did not occupy a primary role in the economy, it still had some influence since the Late Neolithic Period in Finland.

On the basis of palynological information slash-and-burn cultivation was either adopted or it spread to eastern Finland during the beginning of the 2nd millennium BC (Vuorela & Hicks 1996; Taavitsainen *et al.* 1998). Cultural loan from the east, southeast, south or west is possible. The earliest traces of cultivation are found in the dwelling site of Niuskala in Turku, where they are connected with Kiukainen ceramics (Soininen 1990). The earliest carbon-14 sample for the layer, where grains of barley were found, gave the dating 3840±100 BP, calBC 2460(64.1%)2190, calBC 2170(4.1%)2140. A grain itself was AMS-dated to be essentially younger, 3200±170 BP, calBC 1690(68.2%)1260 (Vuorela & Lempiäinen 1988:36). Terttu Lempiäinen (1999:154) states that so far early pollen grains have been found only in southeastern Finland. However, for instance, an early dating was obtained from eastern Finland, from Kitulansuo in Ristiina, where a barley grain has the AMS-dating (Hela-167) 2990±60 BP; calBC 1370(2.7%)1350, calBC 1320(65.5%)1120 (Lavento 1998b:50). These finds are connected with Early Textile ceramics.

According to Vuorela the earliest evidence of cultivation provided by pollen samples were obtained from Keuruu and Lammi with a dating between 4000–3500 BP (Vuorela 1999:146). The dating (3690±80 BP) calBC 2200(9.3%)2160, calBC 2150(59.9%)1950 from Puolanka in eastern Finland is also worth noting (Vuorela & Kankainen 1991). It is interesting that these three early agricultural evidences come from inland representing either the Late Neolithic culture of Asbestos ceramics or Textile ceramics. According to Irmeli Vuorela (1999:147) the next phase in the spread of cultivation dates to between 3500–300 BP: already 15 pollen profiles of cereals are known from this period. Early dates have been obtained in many occasions, for instance, in southern (Tolonen 1978; 1981), southeastern (Vuorela 1995:214) and eastern Finland (Poutiainen *et al.* 1995).

The earliest traces of cultivation are from southwestern Finland but also other possibilities have to be taken into account (Fig. 9.6a.) Vuorela has suggested that also Central Ostrobothnia and the River Tornionjoki and River Oulujoki may be areas through which new influences spread to Finland (Reynaud & Hjelmroos 1980; Vuorela 1999:150). Even more interesting are two more routes of influence in eastern and southeastern Finland. The speculations concerning the earliest traces of cultivation often remain quite hypothetical. Much careful consideration is needed when connecting the palynological results with the archaeological ones; one should not forget the sources of error connected with the pollen analysis itself and the dates it gives.

Although the slash-and-burn cultivation may have begun in eastern Finland as early as the beginning of the

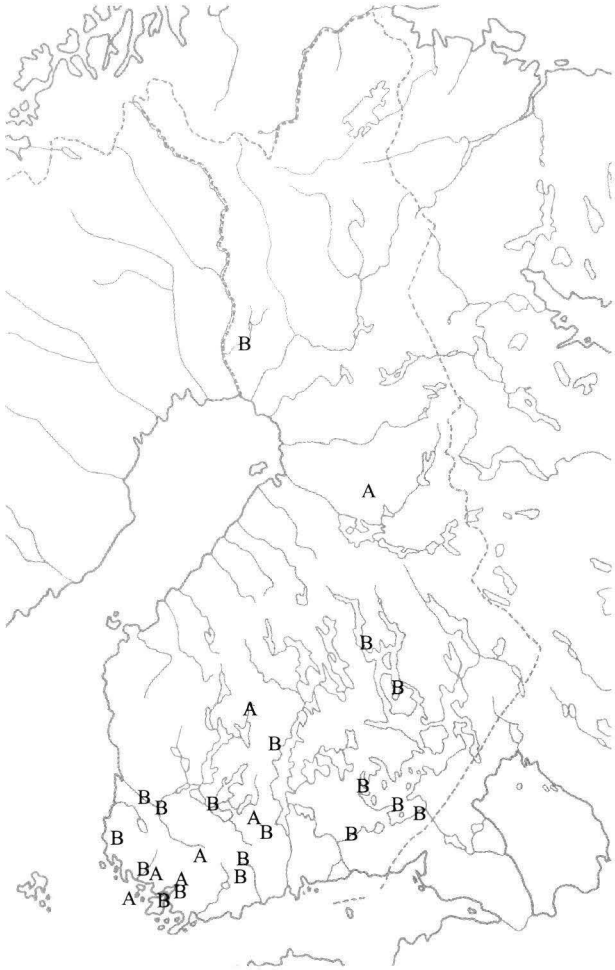

Fig. 9.6a. Pollen data on slash-and-burn cultivation in Finland. Legend: A – Late Neolithic, B – Early Bronze Age.[4]

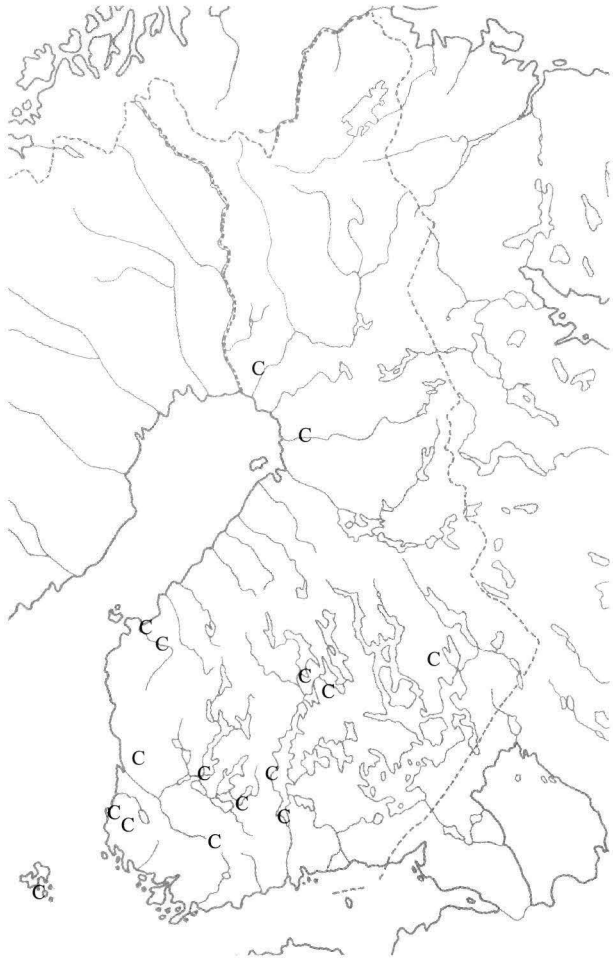

Fig. 9.6b. Pollen data on slash-and-burn cultivation in Finland. Legend: C – Late Bronze Age.

2nd millennium BC (Vuorela 1982; Poutiainen *et al.* 1996), an essentially earlier dating has been given. In the early 1980's the beginning of cultivation along the Rivers' Oulujoki and Tornionjoki water courses was dated to the Early Neolithic Period (Reynaud & Hjelmroos 1980), but the reinvestigation of these studies did not give support to such an early cultivation. For instance, the reinvestigation at Lake Nimisjärvi – one of the most important dwelling site complexes in northern Finland – showed that the *empirical cereal limit* of cultivation dates to as late as the 5th century AD (Huttunen, R. -L. *et al.* in press). However, human activity in the area can be observed already during the Mesolithic Period and very clear evidence is visible, from the Late Neolithic and the Early Metal Period ca. 3000–2500 BP. The investigations made in order to find remains of agriculture in the Ruhtinansalmi site complex in Suomussalmi have not supported the adoption of slash-and-burn cultivation in the economy earlier than during the Iron Age (Lavento *et al.* in press). It is slightly unexpected that very early evidence of cultivation has been obtained from Kotilahti in Puolanka but not in Nimisjärvi in Vaala or Kalmosärkkä in Suomussalmi. In archaeological studies only sporadic evidence of prehistoric settlement has been found in Puolanka. Instead, the prehistoric settlements in Nimisjärvi and Suomussalmi are rich in finds and continuous.

The pollen analysis connected with the archaeological evidence does not support the hypothesis of the group living on agriculture in Finland during the Early Metal Period. On the basis of pollen data not any considerable increase takes place showing large cultivation during the Early Metal Period in inland Finland (Fig. 9.6b). One can, naturally, state that large Early Metal Period dwelling sites have not been found so far or one might refer to the possibility that sites known so far are not favourable for agriculture. This may be the case, but a more natural explanation for the situation, in the light of contemporary of information, is that agriculture was conducted only sporadically during the Late Neolithic and the Early Metal Period in eastern Finland. Hunting and fishing still dominated the economy, slash-and-burn cultivation having only a secondary role (Meinander 1984b; Taavitsainen *et al.* 1998).

[4] Figures 9.6.a and b are based mainly on Taavitsainen *et al.* 1998, Vuorela 1999, and articles referred in this study. Pollen chronology is based on uncalibrated carbon-14 datings. Because only coarse chronology can often be given for the spread of cultivation in Finland maps 9.6. a and b present only relative datings.

Although accepting the minor role of cultivation in economics, one still should not leave agriculture without a comment. One could at least hypothetically argue that the increase in the eastern contacts – those contacts which had an affect on the beginning of the making of Textile ceramics, bronze casting and the use of bronze implements – also had something to do with the early experiments in agriculture in eastern Finland. The spread of experiments in slash-and-burn cultivation to eastern Finland could be most naturally connected with the influence of new impulses (Meinander 1984b:11–14; Taavitsainen *et al.* 1998:205); particularly the Seima phenomenon and the spread of Seima axes represent these early connections. The small number of axes both in Finland and in the Karelian Republic leaves many questions open and refers to the peripheral nature of this area in relation to the areas of the River Volga and the Ural Mountains.

It is probable that slash-and-burn cultivation came both from eastern and southern directions. Several populations tried to establish it in Finland during the Late Neolithic and the Early Metal Period but without success. There are many explanations for this: one can refer to the deterioration of the climate, the inadequate know-how, the inadequate local natural conditions or the small number of people (comp. Taavitsainen *et al.* 1998).

Agriculture in the form of slash-and-burn cultivation proved to be unsuccessful in Finland due to several reasons. The deterioration of the climate made cultivation prone to unsettled weather conditions and disadvantageous years. Hunting and fishing, which was the basis of the economy, still proved to be a superior way of living. Extremely small populations did not need an essential increase in food production. In other words, population pressure did not demand a new means of livelihood. Large and sparsely populated forests were rich in natural products. Slash-and-burn cultivation was only an experimental enterprise without the need to change the economic system.

9.6. Sedentary versus mobile populations

Not only the archaeological material, but also the type and the amount of dwelling sites, show that something dramatic happened in the prehistoric society in eastern Finland between the Late Neolithic and the Early Metal Period. Both dwelling sites and artefact types were replaced by new ones. There are several possible interpretations for this.

The first explanation begins with the continuity of the population. It emphasises that what changes in the first place is the material culture, not primarily the populations. Thus changes in material culture can be explained on the basis of outer influences, which became more and more established in the Late Neolithic and the Early Metal Period populations. This explanation assumes that many characteristics remain invisible to archaeologists. In the following, these hypotheses are discussed in the light of the information available. In his recent publication Carpelan (1999) supports this model.

"Kysymys Suomen itäisen kulttuuripiirin alkuperäisen 'asbestikeraamisen' kulttuurin jatkuvuudesta on epäselvä, mutta pidän mahdollisena, että keskineoliittista asbestikeraamista traditiota jatkavaa *Pöljän-Jysmän* -keramiikkaa valmistettiin kunnes paikallisyhteisöissä alettiin tekstiilikeramiikkaa jäljitellen valmistaa asbestikeraamisia muunnoksia. Siten arkeologinen kuva muuttui pronssikaudella Itä-Suomessa melko kirjavaksi. Kenties tekstiilikeramiikan valmistajat harjoittivat viljelyä ja asbestikeramiikan valmistajat pyyntiä. Keramiikkalöydöt rannikon asuinpaikoilta osoittavat, että itäisen kulttuuripiirin yhteisöt (sekä tekstiilikeraamiset että asbestikeraamiset) ylläpitivät aktiivisia kosketuksia läntiseen piiriin ja jopa meren taakse Keski-Ruotsiin (Jaanusson 1981). Vastaavasti kiviröykkiöhautauksen (lapinraunioiden) ilmaantuminen itäiseen kulttuuripiiriin osoittaa, että sillä taholla omaksuttiin myös läntisiä käytäntöjä."(Carpelan 1999:269–270.)

Carpelan suggests here that making Textile ceramics was a cultural loan from elsewhere and that, for one reason or another, people who had made asbestos ceramics for over 2000 years found it better to make a new kind of ceramics. Carpelan also finds it possible that there existed two contemporary populations: the aboriginal one living by hunting and fishing and the newcomers by cultivation. Further, he assumes that there were active connections between Central Sweden and the eastern culture sphere.

The hypothesis that new ceramics was adopted into the repertoire of Late Neolithic Asbestos ceramics is not easy to verify. The use of asbestos for tempering represents a long local tradition. Asbestos was utilised not only in those places where it was easily available but also in an essentially larger area referring to the existence of an exchange system. Therefore, it is difficult to understand why the use of asbestos ceased and it became allowable to add any possible raw material to Textile ceramics. Technically Textile ceramics is worse than Asbestos ceramics. Also form and decoration changed profoundly. This is not easy to explain with reference to copying only.

Another problem concerns the possible synchronous existence of the population using Asbestos ceramics and the one using Textile ceramics. Although this is possible, so far there is not much evidence of this. Textile-impression exists very seldom in Pöljä ceramics. This is still so unusual that no far-going explanations can be built on the grounds of this. Further, there is not a dating showing that there existed two synchronous ceramic types. This is not to say that these two populations did not meet, it is only to say that the period when they were in contact was probably very short. The general impression is that the culture changed very rapidly, not at the same pace as the Kiukainen culture.

The second model begins with the hypothesis that something happened which radically changed the Late Neolithic populations responsible for Asbestos ceramics. A basic assumption is that the population disappeared because the sedentary economy entered into a crisis. This may have happened because of overpopulation. Another

reason may have been the change in the environment. A deterioration in climate has often been referred to as the main reason for a population vacuum during, for instance, the Pre-Roman Iron Age. Neither of these hypotheses can be verified. Although there is no evidence for the economic crisis, it still deserves more research.

Unfavourable natural conditions may have temporarily made the traditional hunting and fishing economy unproductive triggering a new kind of economic development. It could be possible to see remains of this kind of unstable period in the early experiments of cultivation. Agriculture did not come into use either because the conditions in nature were not favourable or the traditional hunting and fishing economy proved to be superior over agriculture in the long run after short unfavourable periods.

This explanation also poses several difficulties. Large village-type dwelling sites with dwelling depressions disappeared and the settlement moved to a different kind of environment. Assuming that cultivation was a means of living, which was experimented with when hunting and fishing entered into crisis, we could also assume that it would be possible to find some references of these experiments near large dwelling sites. Surprisingly enough, near the large Stone Age dwelling sites along the Saimaa and the Oulujärvi Water Systems, there is not much positive evidence of agriculture. For instance, in the dwelling site area of Sätös in Outokumpu cereal cultivation did not begin until about 600 AD (Saastamoinen 1996:131). In the dwelling site complex of Pörrinmökki in Rääkkylä it was not possible to show the connection of cultivation and Stone Age habitation (Vuorela 1996). The same kinds of results were obtained from the large Stone Age dwelling site complexes in Kainuu (Huttunen *et al*, in press; Lavento *et al*, in press). Thus one might suggest that the Stone Age dwelling sites were situated on dry soils, eskers, glaciofluvial deltas etc., which are not suitable for cultivation and so cultivation and dwelling activity had to concentrate in a different kind of environment (Taavitsainen *et al.* 1998). This assumption seems to get support from palynological data (Vuorela & Kankainen 1991; Vuorela 1995; Vuorela 1999) but some problems still remain: for instance, there is no direct evidence for cultivation close to the dwelling sites of Textile ceramics in pollen diagrams (Saastamoinen 1999; Lavento *et al.*, in press). Still, according to macrofossil studies, barley was used, for instance, at Kitulansuo as early as ca. 3000 BP (Lavento 1998b). Traces of cultivation have been found elsewhere, other than near the central places of the Late Neolithic or the Early Metal Period habitation, but one still has to be critical of these results: so far the data available is too narrow for far-going conclusions.

A population decrease in the beginning of the Early Metal Period may have also resulted from unpeaceful conditions or even wars. At present, these hypotheses cannot be proven archaeologically and therefore one should consider them more as theoretical possibilities rather than relevant results. Serious controversies between populations seem not very likely also due to the fact that hunters and fishers hardly had as an important a need for land as agricultural societies. Controversies between populations may have occurred but it is still difficult to assume that they were as serious as a controversy between local populations and newcomers.

Already A. M. Tallgren (1933:20–21) emphasised the role of metal trading in the arctic area. Carpelan built his explanation on the basis of the Seima phenomenon and assumed that the change in the society was a result of armed traders who moved in a very large area in the Boreal Forest Zone trading goods. This idea seems to get some support in Finland. Traders or small mobile groups conducted trade and looked for copper and tin ores. Traders did not need large dwelling sites with dwelling depressions, because their stay was basically temporary and dwelling sites were small, because populations were small. This also explains why the find material changed so radically and also why the characteristics of dwelling sites are so different.

Carpelan seems to assume that all the dwellers were men with no intention of staying in the new area. From my viewpoint this does not explain all observations connected with the period well enough. Metallurgy and metal implements suit well this picture but making Textile ceramics and conducting elementary slash-and-burn cultivation can not be so easily explained. My argument begins with the fact that Textile ceramics has nothing in common with local asbestos ceramics, which means that their makers were very probably newcomers. Ceramics is not necessarily needed during short visits because it is difficult to carry over long distances. Further, ceramics was usually made by women, which should also be considered. Conducting agriculture requires a stay for at least one season and thus it demands a certain semi-sedentariness. Neither of these characterises the Seima warriors.

For these reasons Carpelan's idea needs some modification. Populations using the Textile ceramics were small but very likely they were not only men. It is also evident that a part of these groups remained in mainland Finland, not as farmers, but as hunters and fishers because these occupations proved to be more functional in Finnish conditions.

During the 1990's many Finnish archaeologists put much emphasis on surveying and excavating dwelling depressions. These enterprises were successful and the number of known dwelling depressions increased rapidly, particularly in eastern Finland, on the Lake Saimaa Water System. These archaeological investigations showed that during the Neolithic Period the life style was much more sedentary than what has been earlier thought. A hypothesis can be presented that the Neolithic societies led a sedentary life at least for some periods of the year – and probably not only during the wintertime as was earlier assumed on the basis of observations made of the Koltta-saami populations in the beginning of the 1900's (Vilkuna 1971).

A clear difference can be seen between the economics of the Late Neolithic populations and the populations making Textile ceramics. The Late Neolithic groups

lived a semi-sedentary life with some large villages as central places but they also had smaller dwelling sites. The makers of Textile ceramics led a nomadic or a semi-nomadic life without large dwelling sites. The question arises: why does the manufacture of Asbestos ceramics seem to disappear and be substituted with Textile ceramics. Is it possible to see a kind of cycle between a nomadic and a sedentary way of life?

Usually it has been thought that no change in the economy occurred after copper came into use in the form of cold-hammered copper implements, either (Taavitsainen 1982; Ylimaunu 1997; Ylimaunu *et al.* 1998). It has also been often assumed that not until slash-and-burn cultivation as the main economy there were any means to trigger a full-scale discontinuity in the societies living by hunting and fishing. This change took place very late. In historical sources it has normally been connected with the arrival of farmers in Savo or northern Ostrobothnia (Luukko 1954) or some Iron Age communities in southern Savo (Lehtosalo-Hilander 1988; Taavitsainen 1987; Kirkinen 1996) and Karelia (Uino 1997; Saksa 1998).

The semi-sedentary life became mobile with the appearance of Textile ceramics in the beginning of the Early Metal Period. But during the experiments of slash-and-burn cultivation it turned out that hunting and fishing was still a better economic system than agriculture and a change took place in the economy before the Iron Age. Slash-and-burn cultivation was not necessarily in opposition to hunting, because many animals, such as fox and ermine, favoured a young forest that grew soon after a period of cultivation (Taavitsainen 1987; Taavitsainen *et al.* 1998:239). Despite the fact that agriculture was entered into as the main means of livelihood during the Middle or Late Iron Age, Finnish peasants carried out hunting until the Historical Period (Orrman 1991; Vilkuna 1972).

9.7. Sedentary versus mobile settlement in the Northern Scandinavia during the Bronze Age

Because, on the one hand, the discussion concerning sedentary and mobile types of settlements and, on the other hand, the differences relating to coastal and inland habitation and economy are also actual in northern Sweden, the most important viewpoints of these studies are also presented here. Questions concerning settlement hierarchy, detailed analyses of dwelling sites or a comparison of find material cannot be discussed here.

Hans Bolin (1999:21) has suggested two opposite models that characterise differences in viewpoints in interpreting the nature of cultures and their economy in Norrland during the Bronze Age and the Early Metal Period. The model of a common culture system implies that the coastal area and the inland settlement represent only different seasonal phases of the economy of the one and the same culture (Selinge 1979). The opposite model is based on the idea of cultural duality and it sees the inland and the coastal areas as separate cultural systems (Bakka 1976; Forsberg 1992). The applicability of these models in explaining the relationships between the Bronze Age coastal populations and the inland populations with Textile ceramics in Finland is also briefly discussed here.

Opposite to the development in eastern Finland, the number of sites increased in Norrland during the transition period from the Late Neolithic to the Early Metal Period. This development is related to the abundance of workshops and the replacement of a unifacial stone tool tradition with bifacial flaking (Holm 1991:120). Quartz lost its central position to quartzite in flaking and also the number of dwelling sites increased. The remains of dwelling constructions have been interpreted as huts and shelters (Forsberg 1985:253–261), although the most conspicuous remains found in the digs are not dwelling constructions but flakes of bifacial implements; their function can most probably be explained through workshop activities. The preliminary conclusion that an intensification of stone manufacture rose to the level of production can be drawn (Holm 1991:123). In these sites dwelling structures imply also asbestos-tempered ceramics with textile-impressions.

Although the transition from the Late Neolithic Period to the Bronze Age brought many changes in the culture, there are still reasons to conclude that the Subneolithic hunting culture continued. Klas-Göran Selinge (1979:194) has stated that although grave constructions appeared in the coastal area during the latter part of the period as an innovation, this still was not an indicator of appreciable ethnic changes in southern Norrland: in principle the economic system stayed the same (Selinge 1979:163). The economy was based on hunting and a mobile type of livelihood, which did not leave many dwelling structures behind.

Swedish archaeologists have separated different types of dwelling sites on different premises. Lars Forsberg (1985) has used seasonality, function and social structure as basic features in separating sites. Lars-Göran Spång (1997) has started with the analysis of artefacts using multivariate statistics and the theme was also approached from the centre/periphery viewpoint (Baudou 1989). Forsberg (1985:268–275) has separated models of settlement patterns for mountain foothill areas and forest areas, between which there are transient camps. These camps and hunting bases represent temporary use by smaller groups. Residential camps in the forest area are large and were occupied during winter and summer. Residential camps in the mountain area were used during autumn for reindeer hunting. Forsberg poses the question whether there were also aggregation sites where several groups met each other in the forest area.

According to Spång (1997:203–205) a certain type of hut existed during the Late Neolithic Period and the Early Iron Age in Åsele, Lappmark. "It is oval and over 1 meter long and consists of a ring of stones and a few fire-

cracked stones in the middle" (Spång 1997:203). Huts were temporary in their nature suggesting a transient type of site. They are semi-subterranean and often have several hearths. Spång also mentions a more permanent type of hut for winter use, which implies fire-cracked stones. In some cases even traces of a floor have been observed. Still, the general impression is that normally it is not possible to observe a settlement structure in excavations (Spång 1997:204–205).

The transition period from the Late Neolithic Period to the Bronze Age in Norrland has been characterised as a period of intensification. Forsberg (1985) has emphasised the change in the settlement pattern during the Bronze Age in Norrland by explaining this through eastern influence. In Forsberg's model it is particularly the mountain area that was sensitive to eastern influence. The coastal area was dominated by techniques and influence from the south instead (Baudou 1990:26–27).

Evert Baudou (1989) has maintained that since the Late Neolithic Period several waves of influence affected the cultural picture in the development of techno-complexes in northern Norrland. Norrland had cultural relationships both to the east and to the south: through southern Scandinavia some cultural influences spread to the north from as far as central and western Europe. During the Late Bronze Age in Norrland three local culture areas developed: 1) the coastal culture, 2) the inland culture in the middle and southern Norrland and 3) the inland culture in northern Norrland (Baudou 1989:182–183). Also worth noting is the emergence of metal and Ananino material in northern Norrland: this represents one wave of cultural influence in the area. In a way this is a parallel development with the one in Finland between the coastal Bronze Age culture and the inland culture of the Early Metal Period.

Kristian Kristiansen (1987) has developed the centre/periphery approach for the entire Fennoscandia. Kristiansen separates centre/periphery relationships between 1) an organisational complexity on a regional scale, which took place between southern and northern Scandinavia and 2) local scale centre/periphery relationships in smaller areas in southern Scandinavia. The coastal and inland cultures in central Scandinavia "do not conform to the same culture and subsistence" (Kristiansen 1987:82). An important part in the maintenance of an interregional network is played by an exchange of prestige goods; this also transferred the ideological and ritual framework to the periphery. This exchange network and transfer of prestige goods declined during the Early Iron Age and the whole centre/periphery relationship system collapsed (Kristiansen 1987:84). On a larger scale this development can also be followed in the more arctic and eastern zone, where the large-scale connections ceased after the Ananino period.

It is interesting that parallel phenomena in the development of coastal and inland cultures with strong eastern influence can be seen both in Norrland and Finland. Similarities can also be seen in the type of dwellings that often refer to the temporary nature of settlement of relatively small bands. In the light of the available archaeological information concerning the relationship between inland and coastal areas, it seems more likely that they represent different cultures instead of seasonal sides of the economy of the same culture with different types of sites in different kinds of ecological areas as suggested by Selinge (1979). This naturally accepts the idea that they very probably had contacts with each other. In addition to this, the inland culture may have sometimes used coastal ecological niches and vice versa. What is different between Finland and Norrland is the ecological milieu: inland Norrland is characterised by mountainous areas with long rivers, inland Finland is relatively low involving many lakes and good water routes further to the east.

As a conclusion of the models presented about the Bronze Age cultures in northern Sweden it can be stated that more likely than seasonality, the difference between inland and coastal dwelling sites and artefact groups can be explained by postulating two different cultures, which may still have had contacts with each other. The same kind of situation probably also prevailed in Finland where the coastal culture is connected with the Scandinavian Bronze Age, but inland the Early Metal Period culture represented a different economy with its strong cultural contacts with the east.

X FUGUE

10.1. PRELUDE

10.1.1. Introduction

The earlier chapters approached Textile ceramics from many different perspectives. Chapter X is the conclusion, the fugue, in which these perspectives are compared with each other. Much new information of Textile ceramics and the Early Metal Period is not presented; the information presented in earlier chapters is discussed from a larger perspective instead.

Interpretation of material and data from a larger perspective is the main aim of archaeology. Still, this interpretation often remains without basis because archaeologists themselves are not willing to discuss their own preconditions and assumptions. Therefore this concluding chapter begins with a large presentation of contemporary approaches on style. Although typology is the central method, the emphasis has turned more to style. It is the first step to theories on populations and to the individuals behind styles.

Although the main purpose is to find the population(s) behind Textile ceramics, it must be stressed however, that this study does not aim to elucidate Textile ceramics as a reflection of ethnic groups. The problems arise not only from the difficulties to define prehistoric ethnic groups in a satisfactory way, but also from the difficulties to prove the hypotheses presented concerning them. This study tries to uncover ceramic styles, which might be connected with other different parameters, other archaeological implement groups, observations on sites, economics etc.

Chapter X has two parts: the first part, the style theory, is the prelude to the second part, the fugue, which utilises these approaches and aims to give one possible interpretation of Textile ceramics and the Early Metal Period in Finland. Ceramics is in the central role in this interpretation, because it is the central artefact group through which an archaeologist can observe changes, define the period itself and its beginning and end.

10.1.1.1. Why does style tell us more about prehistory than type?

One aim of archaeological research is to construct a confident model of prehistoric society and to tell something about the social relationship of people in and between populations. In the best case it is a well-based, coherent hypothesis, which can be partly verified with different kinds of archaeological data.

Individuals who made ceramics in the past lived during a particular period in a particular geographical area. They did not make ceramics independently from each other but society strongly influenced their manners and assumptions of what was considered to be correct. Archaeologists themselves have created ceramic types and it is important to realise that these types do not have a natural correlation with styles. Because style reflects views and hidden manners that human beings have followed, it is a more fruitful pointer to the past than type. The difference between type and style can be illustrated most simply as a difference between *etic* and *emic* approaches (see later). The concept of style comes close to the tradition. Approaching prehistory through styles opens many doors to the interpretation of the material culture and the people behind it. Although one cannot construct a coherent view of Textile ceramics in Finland and the Karelian Isthmus, style studies can still give much valuable information which has not been much discussed in Finnish archaeology.

The theoretical frame of reference here is based on an ethnoarchaeological analogy but not with the same meaning as, for example, environmental-deterministic processualism or early structuralism. It does not mean that the same kind of environmental factors necessarily lead to the same explanations in different contexts. Instead, it accepts many different possibilities as acceptable explanations for phenomena.

The purpose of the large introduction is to present different theories and observations, which can be used when building a coherent view of Textile ceramics and of individuals and their possible relationships during a certain period of prehistory. In this study the central method is hermeneutics, which means that knowledge can be acquired through continuously widening the horizon of the researcher himself by many different methods. According to this view, research is an endless process, which increases our knowledge of prehistory in many different ways. Style theories and studies serve this aim because they may bring into discussion such ideas, which have perhaps not been taken into consideration. Later studies may show many of them to be unacceptable but still some of them will enrich our view of the style or the period.

10.1.2. Style in ceramics

"...archaeology has used style as mirror, if not also as key, in order to make all the cultural materials of the past accessible to us" (Sauerländer 1983; quoted through Conkey & Hastorf 1990:vii).

James Sackett defines style from two aspects: (a) "It is a highly specific and characteristic manner of doing something, and (b) this manner is always peculiar to a specific time and place"(Sackett 1977:370). It belongs to the unwritten assumptions of the cultural-historical tradition of archaeology that "attributes which have proved to be diagnostic in space-time systematics are exclusively stylistic per se"(Sackett 1977:375). Style is something, which individuals created in prehistory. By following regulations and learning processes an individual is a part of the tradition. Tradition is also as loose a concept as style although in a particular situation it can be very strict and involve exact boundaries. Traditions are an essential part in the formation of culture.

Culture is perhaps the most important but at the same time the most difficult concept in archaeology. Randi Håland has pointed out the double meaning of culture: firstly, it is a "collection of artefacts belonging to one class according to the archaeologist's criteria of classification" and secondly it is "a group of people which the archaeologist assumes is the bearer of the cultural tradition he believes he has identified by his classification" (Håland 1977:2–3). These two are bound together because before an artefact type can have a life it needs its maker.

Archaeologists often define cultures on the basis of find material and differences between sites, which has often been made only with the help of small surveys or excavation material cultures. Archaeological cultures are not static entities (Meinander 1954a; 1954b; 1969): their boundaries and definitions change depending upon the archaeological material and the point of view of the researcher.

In Northern Europe particularly during the Neolithic and the Early Metal Period, ceramics have a leading role in defining cultures in archaeology. This is because one can easily see differences, which can be correlated with changes in time and space. Although archaeologists have much used ceramics in defining cultures, this does not mean that the method is without problems and that cultures and their changes can be best approached from these viewpoints. This is one reason why discussing the sociology of ceramics is necessary. This study does not much use the concept of culture for making prehistory understandable for two reasons. The first reason is connected with the concept itself and the problems of its definition. The second difficulty lies in phenomena, which are both spatially and chronologically too small to obtain enough possibilities for verification. For these reasons, styles, possible populations or even individuals are looked for instead of cultures.

In a large sense style is something, which a person well acquainted with a particular period or material, can understand using his intuition. For instance, although a musicologist can never find all the features characterising Beethoven's style, he still, immediately and without difficulty, recognises Beethoven's style when hearing a few bars of his music. Style in its most simple form is a collection of regulations and rules, which affect the artist's mind. These regulations are not strict but they can be varied in an accepted way, inside some limits and in different contexts. The ability to understand these regulations and their limits is necessary when decoding the qualities of style.

Lewis Binford defined style in archaeology as a "leftover" class after all of the techno-functional and "technomic" parameters are subtracted. Although sensible at first sight, this view raises several objections. Peter Roe (1995:34–35) stated that Binford's definition comes close to the romantic notion of traditional technologies of non-literate peoples. It is a fetish figure in a purely functional form with a real world in mind and a positivist idea of the possibility of an objective assessment of things. It raises the problem of style/function dichotomy and the difficulty of distinguishing intrinsic from conventional functionality, the functionality of artefact notions (Roe 1995:34–35). To this connection belongs also Heather Lechtman's concept "technological style" which is based on an idea of a process determining material patterning, a result of technological activity and behaviour. Both Binford and Lechtman emphasise the role of technology in separating style. The main problem in these views is that differences in primitive technology – for example in pottery making – are not easily discernable from different prehistoric traditions.

In the 1990's definitions of style were conducted in more postprocessual terms. A good example is Conkey and Hastorf's approach on style as "ideas, intentions, and perceptions" (Conkey & Hastorf 1990:2). Style is unavoidable when trying to construct past cultures but it also brings frustrating problems with it: style is ambivalent, unclear, elusive and implicit. Although one can make reliable inferences from the style, there are no methods to make acceptable choices between attributes and details. (Conkey & Hastorf 1990:2–3.)

Carr's material style represents a population of artefacts. Style accepts a certain degree of variation of attributes in a single artefact (Carr 1995a:165). In theory, because style is dependent on viewpoints – both in past populations and among today's researchers – every single artefact is a member of innumerable possible styles. In practice, taking into account the contextual information – social factors, practical factors etc. – the number of possible styles can be reduced. Style is related to cultures or some smaller social units. There exist also micro styles, like workshop or family traditions (Fry 1979:500), within more broadly defined styles. There are still more aspects in style. According to Hodder's "interpretive and evaluative" approach, style "involves social strategies", "style is power" and it links an individual event and social context (Hodder 1990:46).

Peter Roe has suggested eight elements in style: Recognition means that only parts of elements are stylistic traits, which can be identified as essential characteris-

tics of style. Style implies virtuosity or instinct of workmanship. Style is a means of expression and it has both contextual and historical dimensions. Style is a systematic selection of possibilities from known alternatives (variability of style). The intended decisions of artisans are normative. Style is a corpus – a single artefact cannot possess style. Style is also a qualitative experience (Roe 1995:30–31). Roe has put these aspects of style into the following definition:

> "Style is an intentional, structured system of selecting certain dimensions of form, process or principle, function, significance, and affect from among known, alternate possibilities create pleasing variability, within a behavioural artefactual corpus"(Roe 1995:31).

According to Roe there are psychological, formal, social, mythical and structural aspects at different levels of complexity in style. Individual creators and artisans operate on a psychological level. The formal level represents the viewpoint ethno-science has of style (Roe 1995:38). The social level means a kind of backwater versus main river dichotomy or an occupation versus no-man's land. This complicated formulation implies that "the main rivers are the style centres with rapidly succeeding styles, whereas the interfluves are the conservative backwaters of previous stages" (Roe 1995:41). Social interaction is most lively on the main river, whereas the role of interfluves is normally of secondary importance.

One element in style is the workmanship or virtuosity (Roe 1995:30). This means that much more time is spent on making an artefact than is necessary for its function (Jones 1973:266–267). Ornaments are elaborated far beyond utilitarian needs (DeBoer 1990:103), the reasons being artistic, symbolic, religious etc. Artists never want to produce identical works and therefore the idea of style involves an idea of novelty inside particular rules. Style can be conceived as an aesthetic quality, which reflects its creator but also carries some features of the natural or social environment. Decorative style can tell something about the iconographic or mythological themes of society. Style may uncover a symbolic code of beliefs, cosmological structures etc. (Rice 1987:251).

The traditional approach to styles in archaeology has emphasised finding the central stylistic features of decoration, comparing them and making observations on chorological and chronological differences (Rice 1987:249–250). During the early 20th century, style in archaeology was almost exclusively considered from the cultural-historical viewpoint. Style was needed to understand changes in culture but in particular to discern ethnic groups from each other (Conkey 1990:8). New Archaeology used style in a different manner: it was needed to explain the development of cultural processes and the adaptation of man to nature. Archaeologists saw individual producers of style as passive fulfillers under external pressure (Roe 1995:28). In the 1990's style was seen more contextually as a "unique product of a given set of people, the denizens of a certain place and time"(Roe 1995:30).

For postprocessualists style is a complicated entity, which is difficult to define. Hodder (1990) states that although style has "a number of social functions, it does not consist of those functions" and further, "style is not a summation of cultural attributes. It is not a polythetic set of similar but varying attributes" and "style is not a set of rules for action" nor "the summation of objective content (e.g., motif) and rules – a polythetic set of similar attributes and structures" (Hodder 1990:44). Hodder moves here away from the scientific dream to unload style into measurable attributes. According to Hodder the notion of style involves both "objective" and "interpretative" similarities and differences; it is a concept, which has to be constructed in time and space (Hodder 1990:46). Here Hodder condemns as unrealistic the idea of detailed classifications or typologies defined by objective criteria.

10.1.3. Why is style theory needed in archaeology?

Archaeologists have not often discussed their theoretical starting points when decoding meanings in prehistoric material. They have relied on their common sense and ideas from contemporary life. The complexity connected with understanding the possible messages in style has lead to the attitude that a coherent theory cannot be developed. Building models for interpretation has often been discarded and the theoretical frame of reference has been considered both impractical and too complicated for practical studies. Material studies in archaeology have remained highly descriptive and empirical.

Although the task is difficult, some archaeologists have tried to develop a methodology and theoretical models to interpret style in ceramics. These theories have been more profoundly discussed after the 1980's. It must be mentioned that early theoreticians of archaeological typology seriously discussed the problems of interpretation at the beginning of the twentieth century (Montelius 1903; Brew 1946; Ford 1954a and b).

Knowledge is always relative to questions, methods and theories. The purpose in many contemporary style theories is not to find testable knowledge, but to understand or present models on how things may be understandable from our point of view. Theories try to shed light on the past by building models in certain contexts. This is considered possible because there are common elements between the behaviour in the past and at present. Although direct empirical observations can uncover only an extremely narrow part of the life of a prehistoric population, on some level we are still able to understand life in the past.

Inductive reasoning has often been used in archaeology more loosely than that allowed in other sciences. Inductive reasoning, which proceeds to far-going theories on populations and cultures, is often based on very narrow empirical information. This is one reason why theoretical discussions are important. It tries to free ar-

chaeologists from pure fantasy. The reality behind the style has often been explained in a simple way, forgetting all the complexities between relations of groups and peoples. The following discussion concentrates on different theories of style in archaeology. The main purpose is to present those theories which have been applied in the study of ceramics.

10.1.4. Theories on style in archaeology

Because of the complexity of an archaeological record and human behaviour, understanding stylistic variation is difficult (Plog 1995:369). Usually archaeology has approached style in material terms; a careful description of material, typology and dating is essential. Material creates the culture.

Binford tried to develop a general theory for the processes of living systems. The method was to collect information concerning contemporary cultures, make statements about the past and to convert these observed facts of the archaeological record into statements of dynamics. Binford accepted the principle of uniformitarianism developed in geology to understand the dynamics of processes in the past. (Binford 1977:6–7.)

According to Hodder the middle-range theory was developed in order to obtain "objective yardsticks or instruments of measurement"(Hodder 1992b:100). Perhaps a general theory of style is not a realistic aim in archaeology at all. Carr presented this by stating that each school of theories focuses only on some subsets of the style (Carr 1995a:152). He emphasises an approach, where one cannot say "which theory of style is 'right' but, rather, which kinds of formal attributes can reflect which kinds of processes – enculturation, communication, or other processes" (Carr 1995a:153).

Contemporary studies often approach style from a broad perspective. It is a conceptual process (Conkey 1978:66), ideas, intentions and perceptions (Conkey & Hastorf 1990:2) and it transmits information about personal and social identity (Wiessner 1983:256). Notwithstanding several approaches, archaeologists have remained uncertain about style and its applicability to more abstract interpretations and thus a general theory cannot be presented. Only some of the most important trends are introduced here. Style theories range from low-level theories to high-level ones reflecting the prehistoric societies (Hodder 1992b:100).

Historical-contextual school. The traditional manner to approach style in archaeology is connected with art history. Style in material has been defined as a part-whole relationship or Gestalt perspective in space-time. According to anthropological observations this way of understanding style prevails in many contemporary ethnic groups. Instead of an analytical approach to style and its attributes, artisans identify each other's works, not by single attributes of style, but rather as a whole constellation of attributes; perceiving them in a Gestalt manner. Attributes are seen as a context for others and they become meaningful through association.(Pryor & Carr 1995:269.) Thus understanding style is not separating attributes but seeking style from a larger perspective. An archaeologist has an eye or a feel for understanding which objects belong to style and which do not. Style always needs a context in which it can exist.

An essential part of the historical-contextual approach is an aesthetic point of view, which has often been used in chronology. It is more important than uncovering social issues behind style. The historical-contextual school has been central in classical archaeology where style has played an important role in dividing periods into shorter subperiods.

Following Whitney Davis (1990:19), the division of style in art history involves a description of a polythetic set of similar varying attributes in a group of artefacts, the presence of which can be explained using the history of artefacts and a common descent from an archaeologically identifiable artefact production system (Davis 1990:19). Stylistic analysis uses chronology and chorology. A particular style, such as Greek sculpture, has a chronology in a particular geographical area. According to Davis, style does not exist 'in' the material, the matter of artefacts or works of art. Style must be discovered and written up by someone (Davis 1990:19). This description is often full of attributes, which are impressionistic and subjective and the language is also metaphorical. In art history a polythetic set involves a large number of attributes and each attribute can be found in many artefacts of the group, and further, no single attribute can be found in every artefact (Davis 1990:19).

The concept of similarity is also complicated. Mass produced artefacts, duplicates or copies represent one end of the concept. The similarity relation is often described as parallelism, convergence, analogy etc. Still it does not have a simple relationship with a historical period or place (Davis 1990:20). An artefact has both shared and unique attributes which both play an important role in style, because without them it is not an artefact but a copy, kitsch etc. One cannot say beforehand which attributes are unique. Similarity is not 'in' the material, but in a particular order set up by the observer (Davis 1990:21).

Although all attributes in artefacts are potentially stylistic, not all are stylistic in practice. Picking out the essential from the unessential ones cannot be done by following rules or instructions. The attributes can be aesthetic or functional, although they can also be something else. Even "missing" attributes can be essential when characterising style.(Davis 1990:21.)

Style explains the similarities between the attributes (Davis 1990:23) and is often connected with the common history of artefacts. Archaeologists, like art historians, can be interested in composition, its "look" or "feel" which Richard Wollheim (1979:137) has called "coordinating rules". When art historians are interested in artefacts and their messages, archaeologists, instead, try to elucidate cultures, ethnic groups, chronology, social relations etc.

In the context of art, researchers often use the concept of language. It refers to artists who follow certain norms and rules to express conversation. Sackett expresses the basic needs for this conversation as a "highly specific and characteristic manner of doing something" which is "peculiar to a specific time and place" and a "degree of similarity among the choices that are made in two historically related loci depends upon the intensity of social interaction shared by their occupants" (Sackett 1977:371). Davis criticises this definition first of all for the second postulate: there does not necessarily exist intensive social interaction between artists. Again, the absence of a similarity relation is not evidence for their missing relations. (Davis 1990:27.)

Social interaction theories. Social interaction theories reduce the role of individuals in creating style. Social norms and passively adopted practical know-how is an important part in the development of style. The style is learned during childhood under the constraints of social and tutorial norms (Carr 1995a:153). Two basic premises can be presented: 1) the stylistic similarity will vary with physical and social distance, and 2) the amount of diversity between styles in different areas will diminish in relation to increasing intra-regional interaction (Voss & Young 1995:81). The learning process plays a central role and a common mental template is acquired through interaction between individuals.

The social interaction theory assumes that stylistic characteristics diffuse in direct proportion to the frequency of interactions between contacts between individuals, such as intermarriage, trade etc. (Braun & Plog 1982:509). The theory asserts that the greater the interaction between individuals or groups, the greater the stylistic similarity. Braun and Plog have criticised social interaction theory because of its hypothetical passive nature. They prefer, instead, an active view with the possibility to copy and adopt new methods without being restricted by any institutional framework. In other words, the degree of stylistic similarity is not in a simple relation with the intensity of interaction between groups (Braun & Plog 1982:509). The main difficulty of making a detailed analysis of how interaction may have taken place between individuals and populations still remains.

The social interaction theory predicts that when the stylistic similarity increases within larger units (region), the homogeneity of the style in smaller units (groups) decreases. Notwithstanding its validity, in some cases also opposite trends have been observed (Braun & Plog 1982:509–510). The main criticism against the social interaction theory is centred on enculturation, which does not put enough emphasis on the social context. It is also thought to reflect too straightforwardly the social organisation, not the actual functioning within the society. It has also been pointed out that the theory has not been successful in explaining the distribution of stylistic attributes (Voss & Young 1995:81). The theory also sees the social interaction as too static and not a dynamic enough process.

Information exchange theory. The information exchange theory implies that style is actively adopted and developed and it also pertains to the social context of production. Style is communication in which an actively working artist, who is able to express himself in material work, is a prerequisite. Contrary to social interaction theories, the main emphasis is on dissimilarities. Style is a conscious decision, an adaptive response in relation to ecological, social or individual conditions (Carr 1995a:153). Differences in stylistic behaviour result more from the social constraints than the social context in which a person learnt his decorative repertoire (Braun & Plog 1982:510). It transmits information about individual social identities including symbols and conventionalised manners, gestures etc.

Two more factors affect information exchange. Firstly, the role of decoration conveys the messages of group affiliation and secondly, the information is transmitted only if the parties encounter each other often enough to be able to recognise each other's decorative message (Braun & Plog 1982:510). Also the social distance between the parties must be taken into account. In normal conditions socially distant parties do not encounter each other often enough to recognise messages. Ethnographic observations have emphasised the importance of learning (Stanislawski 1973).

Style reflects formal variability within social systems, which takes place through artefacts. The transmission of information can be communication for status, ownership, affiliation, religious, political etc. reasons. The aim of this communication is to convey messages to the defined target populations (Wiessner 1983:257). Stylistic messages are directed to the socially distinct individuals who have the understanding and the opportunity to receive them (Wobst 1977:325–326).

One of the main criticisms against the information exchange theory (Sackett 1985:157) is that conscious message transmission is emphasised too much. It also easily forgets contextual meanings (Hodder 1982a:177) and inhibits the stylistic development inside the social group (Hodder 1982b:205). Hodder criticises the functionalist approach of the theory (Hodder 1982a:192). One more difficulty exists between the "expressible conscious" and the external world, between relatives and socially distant individuals (Voss & Young 1995:83–84). Despite criticism, the information exchange theory was much favoured during the 1980's and the 1990's. Many researchers have considered it to be the most important style theory in contemporary archaeology.

Also processual and neo-Darwinian theories on stylistic development have been presented. For instance, James Hill (1985) and James Braun (1995) construed a biological evolution theory where "breeding population" is an analogue to a social group, "gene pool" represents the pool of alternative stylistic traits, "gene frequencies" being analogous to the frequencies of diffusion of these traits and innovation being an analogue to mutation. "Gene flow" is the same as a transmission or diffusion of traits. Selection is made in both cases and finally, "selective advantage" corresponds to the adaptive advantages or effects of traits (Carr & Neitzel 1995b:441).

For Braun, the short-time variation in archaeology is

irrelevant: important are long-term, transgenerational changes. Thus he rejects the information exchange theory and the social dialectical theories of style. He represents himself as a selectionist with a neo-Darwinian meaning. Although it is easy to criticise Braun's primary theory of the long-term changes, however, a cultural-historical archaeology has implicitly operated under this frame of reference. Braun and Hill suggest that an individual can choose and make his own decisions within certain limits – make a genetic mutation in the material culture (Carr & Neitzel 1995b: 442). Still, social practices, tradition, learning and social pressure are central factors in defining the direction of an artisan. If this would not be the case, there would be no basis for style either!

It is the human side in style, which often brings most difficulties to the interpreter. One can construct elaborate causal theories, which focus on maximising and utilising the decision-making and selection processes. Still these theories can be far from the artisan's ideas. If the decisions are logical to us, did the people in the past share the same logic?

Should the researcher concentrate only on long-term processes? What is the role of individuals and small groups in stylistic development? One individual or a small elite group can forcefully affect the change in style, but there can also be "segments within which stylistic innovation beyond traditional lines is possible" in the society (Carr & Neitzel 1995b: 445).

Isocrestic theory. One interesting effort to characterise style is James Sackett's idea of the isocrestic variation of style (Sackett 1986:629–630). Sackett has proposed the concept "isocrestic" to connote the essence of style. It involves an idea "equivalent in use", which means that the same conditions in nature and society cause potters to choose in the same way within certain limits of tradition. This explains why the same kind of style has been adopted in particular areas. It also assumes that there is a natural (or practical) way to make things, which is better than other ways. Choices are dictated by the technological traditions within which they are enculturated as members of social groups. These choices are specific and are consistently expressed by a given group at a given time, although changes in patterns of social interaction also influence isocrestic variation in material culture.(Sackett 1990:33.)

There is no firm line between functional and stylistic variability, although Sackett (1977:370–371) makes a distinction between function and style. He insists that function is a complementary dimension or an aspect of variation (Sackett 1986:630; 1990:34). For Mark Harlan, style is a residual category. Where function stops, style begins (Harlan 1979:473). The idea can be illustrated by an example: although very close functional equivalents can be seen in both construction and performance, the ethnic distinctiveness of the German Mauser, French Lebel and English Enfield rifles was not lost on any soldier on the Western Front in World War I (Sackett 1986:630).

Sackett has illustrated the isocrestic variation by making a division between *adjunct* and *instrumental* forms (1990:33–34). Instrumental form is utilitarian involving technological and functional ends, the variation with respect to clays, tempers, shapes etc. The adjunct form has traditionally been central in the study of style and a straightforward equation of style with it characterises contemporary ceramic sociology (Sackett 1990:34). The artisan chooses between a "broad spectrum of equally viable alternative ways of achieving the same end" (Sackett 1986:630). The isocrestic model must be seen in a large context. It aims to cover all possible aspects – conscious or unconscious – connected with the object.

Sackett's theory can explain, for instance, why textile-impression had such a large distribution during the Late Neolithic and the Early Metal Period. In the Northern Coniferous Zone from western Siberia to northern Fennoscandia the natural conditions are similar and also the new element in economy, the weaving of textiles, was adopted for use in this area. Textile-impression may be a result of a distribution of an idea between cultures but it may be an idea invented in several areas roughly synchronously as well.

An archaeologist can approach artefacts from a technological viewpoint and consider as technological also such characteristics that can be interpreted as artistic or design attributes (Sackett 1985; Carr 1995a:182). Sackett (1977:378) criticised Binford by uttering that "the choices (or functional equivalents) are not themselves crosscut by style". Sackett insists on a very broad view of style. Style is not a crosscut but consists of all formal variation, which has potential for its users. Archaeological studies often oversimplify the role of a normative space-time approach. They have been too eager to see types corresponding to ethnic variation (Sackett 1986:633). A too normative and detailed interpretation of the attributes of style may lead to the attempt to obtain too detailed information from the material.

Sackett maintains that there are no "pan-cultural stylistic patterns" but every culture gives its unique rules for them (Sackett 1986:651). This comes close to the presumption that a general and comprehensive theory of style cannot be found (Conkey and Hastorf 1990:2).

Also Sackett's theory has been much criticised. It operates between cultural and environmental levels leaving an individual's possibility to affect style unclear. It does not explicitly explain why the cultural and environmental conditions produce certain kinds of style. Sackett's idea is interesting but diffuse. The isocrestic model accepts a passive role for the individual in style. Passivity can, however, turn into activity when communication or expression of identity is needed (Wiessner 1990:107).

Structural theory. The structural theory operates on a symbolic level of style. It emphasises the specific context and the active role of the self. Individuals and groups should be motivated to express symbols (Voss & Young 1995:85). The cultural similarity reflected by material symbols is dictated by the contextual needs of individuals or groups (Hodder 1982b:185). Contrary to the social interaction theory, the structural theory asserts that

individuals are willing to convey their particular impressions to others (Voss & Young 1995:85).

Although unconscious and conscious sides of the psyche have not been much discussed by archaeologists, they still belong as an essential part to new approaches. Archaeological material offers no direct links to psychological factors and the strong natural scientific tradition of New Archaeology has focused on larger issues, on ecological and processual questions. One can see that postprocessual archaeology has not been very interested in psychological viewpoints, either (Carr & Neitzel 1995b:448). The unconscious part of the psyche is even more difficult to interpret. Mythical and universal archetypes affect the material style (Carr & Neitzel 1995b:450) and because they are common to all people it is possible to get access to them.

Probably more than structuralism, post-structuralism has given archaeologists ideas for interpreting the past. Whereas structuralism saw text as a focus of analysis without taking a stand on its historicity, post-structuralism realised that text has two phases in the flow of time: text has to be written and it has to be read (Hodder 1989:68). Writing an understandable text requires accepted rules, structures and grammar. Not everyone can write a text; permission to write is often linked with power (Hodder 1989:69). The second aspect in text is its reading. It is essential to understand the context, which is continuously changing during the process of reading. This is due to the fact that the objects are interpreted differently in different contexts (Hodder 1989:73), by generations of researchers, in research paradigms etc.

Material culture differs essentially from language for the analysis of which structuralism was developed. An analogy between text and material objects works only partly. Meanings in the material culture are usually non-discursive and subconscious (Hodder 1989:73), which makes interpreting unambiguous material symbols difficult. Material symbols have, contrary to text, long durability in traditions (Hodder 1989:73).

One important problem involving structuralism in archaeology is the lack of a theory on a practical level (Hodder 1992b:105). Lévi-Strauss's theory has little to say about the change of structures; dualities seem to be eternal entities without change. Further, it has been said that structuralism presented by Lévi-Strauss "is hardly more than a licence for the free exercise of imagination in establishing associations" (Pettit 1975, quoted by Hodder 1992b:106). It has also been criticised for giving too little emphasis to the role of the individual when interpreting cultural patterns (Voss & Young 1995:86). The criticism may be sensible but soon arises the problem that reaching the individual from the archaeological material is extremely difficult. Stylistic behaviour has both an individual aspect and an aspect expressed through cultural codes (Voss & Young 1995:86). Early structuralism did not take into account context and historicity. Post-structuralism put more weight on the individual's life in a context, although constant structures were still in the background of the analysis.

Jüri Kokkonen (1984) briefly presented the main ideas of post-structuralism in connection with archaeological question framing in the Finnish prehistory. He suggested that "various kinds of symmetry and rhythm" could be found in the ceramic ornamentation (Kokkonen 1984:161). He still presented his fear that possible rules of decoration do not shed much "light on the actual semiotic function of the product" (Kokkonen 1984:161) by comparing the situation with music and abstract ornamentation.

A second possible application of structuralism in Finnish archaeology can be found in the interpretation of Stone Age and Early Metal Period rock art (Taavitsainen 1978); contemporarily also a contextual approach has been applied (Lahelma 2000). Also the analyses made by Aarni Erä-Esko of Germanic Animal Art (Salin's style) with reference to structures of Christian symbolism represent early examples of structural thought – "proto-structuralism" (Kokkonen 1984:161). Kokkonen emphasised that archaeological analysis may also have a non-observable side. The rigorous use of analogy or testing as the only means of research is too narrow an approach in archaeology (Kokkonen 1984:162).

Structuralism and post-structuralism have much affected the methodology of contemporary archaeology. This approach is worth considering also when interpreting ceramics, although its starting points and hidden assumptions have to be carefully discussed before its application.

Contextual approach. Discussion of meanings has become more and more important not only in structuralism but in contemporary archaeology in general. The contextual theory has many points in common with the structural theory. The decisive difference is in the emphasis of context and historicity, which gives studies a time and a space dimension. Interpretation is always for a particular situation. Laws and large generalisations do not belong to contextual archaeology.

The first premise of contextual archaeology says that material culture is meaningfully constituted. Secondly, these meanings cannot be determined through a cross-cultural study of the material properties and functions of objects. The third premise is of primary importance: the symbolic meanings of artefacts are not arbitrary but they are bound by contexts. (Hodder 1992a:14).

The contextual approach moves archaeology towards relativism. It accepts some generalisations, which are the basis of all scientific work but it does not forget the context in which the object was made and used. Generalisations can be inferred but in most cases they are valid only in relation to context. Material culture is not a passive by-product of human behaviour, either, but is created by actively working individuals (Hodder 1992a:15).

Applied systems theory. On the basis of Kuhn's and Toulmin's ideas, Dean E. Arnold (1989) developed his theory of systems paradigm for the study of style in ceramics. The theory emphasises isomorphism between different organisations, which can be either living or non-living. Further, the systems are dynamic and capable of

change together with other changes through time (Arnold 1989:13). The system is multi-causal: any changing component causes a change in all other components, because all entities in the system are causally related to each other. The relationship between ceramics and the environment can be described with the help of cybernetics, consisting of goal-directed behaviour, process and control of the system. Feedback mechanisms control the system as a whole (Arnold 1989:17).

Cultural ecology is the second main theoretical approach in Arnold's theory. Cultural similarities and differences can be analysed through a relationship between technology and a particular environment (Arnold 1989:13–14). Connected with demographic factors, this approach is called cultural materialism (Harris 1979). An ecological approach is "basically etic and thus cross-cultural in nature" (Arnold 1989:14). The basic assumption is that an isomorphic relationship between different cultures around the world makes it possible to interpret social and cultural behaviour of past societies through material culture (Arnold 1989:14). The third main approach is ethnoarchaeology, which provides much data for discussing observations. Arnold still does not put much weight on ethnoarchaeological data, because it usually does not have a cross-cultural generalising power. Arnold's theory is in harmony with scientific positivism. It is a clear contrast to the Boasian mentalist view, which saw the native's own point of view as a starting point for studies, thus favouring a relativistic approach.

For Arnold, the development of a ceramic theory is a stepwise process from one paradigm to another. One analogy comes from Saussurian linguistics. A vessel is not a basic unit of cultural behaviour, but it is a type, where attributes are patterned in a certain way. Structuralism or linguistics with the distinction between *langue* and *parole* characterises this idea: a ceramic type is like a phoneme, which is idealised as a "mental template" (Deetz 1967:45–49) in a potter's mind. In other words, a potters has "an ideal set of attributes" in his mind which is possible to be brought back to life as a ceramic style constructed by an archaeologist (Arnold 1989:7). Arnold maintains that these ideas were contrasted in the 1980's by those studies which emphasised that style is guided, not by mental templates, but by motor habit patterns instead (see e.g. Kempton 1981). Arnold's theory has many points in common with the middle-range theory. It suits the scientific milieu of American archaeology, which is based on positivism, but which has also adopted a considerable number of ideas presented by postprocessual archaeologists.

Binford has proposed that tradition means continuity through time in the formal properties of locally manufactured craft items (Binford 1965:208). This implies variability inside the style. It also involves sociotechnic items, a functional variability of archaeological remains and defines the context of social relations. Finally, it refers to the possibility that artefact types are connected with the physical environment (Binford 1965:209).

Middle-range theory. The middle-range theory is based on attempts to glue aspects of different theories in a large synthesis. One attempt is Polly Wiessner's (1983:257) division between emblemic and assertive style. A larger perspective is suggested by Christopher Carr, whose middle-range theory tries to synthesise all possible aspects of style into a coherent theory.

The middle-range theory tries to integrate high-level and middle-range theories into a practical model by taking into account the ideas of both processual and postprocessual archaeology. The local context, particularly history, coherent internal meanings, part/whole relations and relations between individuals and society are key parts of the theory (Carr & Neitzel 1995a:4). The theory implies design alternatives for each step of the manufacturing process, hierarchical structure of design attributes, behavioural meanings of design reflecting interaction among individuals or groups and establishes the behavioural meaning for the attributes at each level (Voss & Young 1995:91–92).

The unified middle-range theory links together different attributes from different levels of scientific observation. It is a hierarchical model implying first-, middle- and last-order attributes. First-order attributes consist of technological attributes with high visibility, such as raw material. These attributes often have a wide geographical distribution (Carr 1995b:172–181). Middle-order attributes characterise a moderate geographical distribution and the relationships between social groups. Last-order attributes reflect fine-scale processes, personal, psychological or even depth-psychological functions of design. The attributes can be active or passive, conscious or unconscious. The theory pays attention to five major points: 1) processes that can determine the formal states taken by the attributes of an artefact, 2) the relative visibility of attributes, 3) manufacturing decisions, 4) production steps, and 5) the geographical distribution of the alternative states taken by the attributes (Carr 1995b:172). The hierarchical approach assumes that all attributes of style are visible in a different way. The relative order of attributes is also involved in the design and manufacture of artefacts (Carr 1995b:173).

Active/passive and conscious/unconscious represent the ends of a continuum with a large variability between them. Although enculturation has often been seen as a passive process, there is much variation in the state of activity in it (Carr 1995b:184). An example of an active process is the expression of personal preferences and inspiration. In society, control is needed to conduct communication in terms of social messages and to express social relationships and order. The degree of consciousness is important when mediating messages in artefacts. An artisan may be conscious of some messages of social and personal identity but be also almost totally unconscious of some other aspects of a social or a psychological side (Carr 1995b:184).

Carr aims at building a bridge between attribute visibility and behavioural processes. This connection would reflect also social units in and between societies (Carr 1995b:188–189). Attributes of visibility can be divided into two main groups, which can be further divided into subgroups. The first main group involves physical vari-

Hierarchy of attributes	Hierarchy of attribute absolute contextual visibility	Hierarchy of manufacturing decisions	Manufacturing production sequence	Hierarchy of geographic expanse of distribution of attribute states	Bridging propositions for mapping form to processes/ constraints	Hierarchy of processes/ constraint: etic meaning of attributes
First-order attributes	Highly visible	First-order manufacturing decisitions	Early or late production steps	Broad geographic distribution	Technological Social, active Interacting artisan level, active Personal, active Utilitarian	Technological attributes: e.g. color, raw material, size, shape, texture
Middle-order attributes	Moderately visible	Middle-order manufacturing decisions	Intermediate production steps	Moderate geographic distribution	Social, active Interacting artisan level, active Personal, active Utilitarian	Attributes reflecting society, community, or social segment level processes, active or passive
Last-order attributes	Poorly visible	Last-order manufacturing decisions	Late or early production steps	Restricted geographic distribution	Social, passive Interacting artisan level, active or passive Personal and psychological Depth-psychological Utilitarian function	Attributes reflecting finer-scale processes: family or interacting artisan level personal and personal psychological, depth-psychhological, panhuman, passive

Fig. 10.1. Hierarchies of design attributes, processes and ordering criteria. (Carr 1995b:174–175). Modified by Mika Lavento.

ables, the second one contextual. Into the first main group can be classified, for instance, the size of the attribute or its frequency in the artefact. Attributes such as the geographical density of the artefact, the social and physical contexts of its use or its use-life can be included in contextual variables (Carr 1995b:186).

One of the implicit assumptions in the visibility of attributes is that "a hierarchy of socially meaningful compositional detail always exists in people's stylistic practices" (Braun 1995:135). On each level of composition can be discerned details, which carry information about the social phenomena of the potter's world. Even the tiny details in decoration can carry some meanings, which are possible to be decoded by using appropriate methods. The message potential of the visible attributes varies between the wide range of regional and society messages. The smaller the social distance between the artisans, the more easily understandable are also the details in the visibility.

Voss and Young (1995:93–94) have thoroughly discussed the interaction of distribution and visibility in society and separated six levels in it: 1) High visibility attributes with a discrete distribution reflect the relationship between the individual and the operational society in a small-group interaction. 2) High visibility attributes with a clinal distribution refer to the culturally recognised or accepted style. This has often been interpreted as a presence of some kind of social boundaries. 3) High visibility attributes with a random distribution have been interpreted as referring to a society, which easily accepts the artistic license. 4) Low visibility attributes with a discrete distribution can express an active within-group process, a passive isocrestic process or it can be caused by the coding of a clinally distributed attribute as dichotomous. 5) Low visibility attributes with a clinal distribution are a form of interaction in small groups. 6) Low visibility attributes with a random distribution characterise the situation with large artistic license and creativity. Visibility involves also raw material, technology and functional constrains.

Attributes showing a continuous variability inside the style represent nuances reflecting the social exchange component of style. The universal validity of these assumptions has often been criticised (Voss & Young 1995:91). Expressions of personal identity are one form of attribute visibility. An artisan has often no possibili-

Duration of interaction	Examples of processes of active interaction among communities or societies	Visibility level of obscure attributes indicating interaction
Long	Intermarriage amoung groups and extended visiting among kinsmen Extended ritual, sociopolitical and/or aggregations among allies and/or geographically dispersed kinsmen Utilitarian trade in neighboring villages, markets, fairs	Less obscure attributes only
Short	Ceremonial trade among trade partners, brief interaction Silent trade	Less obscure through very obscure

Fig. 10.2. Processes of active interaction and the visibility levels of obscure attributes that reflect those processes (Carr 1995b:195). Modified by Mika Lavento.

ties to give much emphasis to it because the social demands give priority to the social messages over the personal ones. There are also obscure attributes, which are insufficient in communicating messages. They are usually traditional, passively learned practices an artist unconsciously applies in the manufacturing process.(Carr 1995b:191–197.)

Archetypes comprise mythology, religion and cosmology, social structures and depth-psychological levels. These qualities are manifested in artefacts, for instance, as supernatural beings. Archetypes are often unconscious with a low visibility. They can transmit metamorphic information about the organisation of society or cosmos. The third type involves archetypal personifications such as heroes (Carr 1995b: 198–199).

Symbolic and iconographic aspects of style are usually connected with the maintenance of a boundary against other ethnic groups, to symbolise alliance within the group or to reinforce social identity or cohesion (Plog 1995:372). Plog has described style as a multidimensional entity, which is not only isocrestic, symbolic or iconographic, but comprises all of these different aspects (Plog 1995:374). Focusing on one of these causes the archaeologist to not understand stylistic variation as a totality. It is common that an archaeologist documents attributes on one or two levels of visibility (Carr 1995b:199). This leads to the one-sided and even wrong idea about the meaning and importance of artefact design.

Material style involves at least three kinds of messages. The first type contains culturally dictated values, which are uniform throughout the society. The second type includes culturally dictated values, which vary in different social situations in the society. The third type of values is dependent on the artisan himself, his motives and his preferences (Carr 1995b:206). The social situation and cultural context affect the expression of the social and the personal self. Role ambiguity determines which aspects of the personal self are socially appropriate to emphasise. (Carr 1995b:209.)

Larger social units use more visible attributes in communication than smaller ones. Ecological-evolutional factors represent an external stress, which influences the amount and nature of the design. The stability of a social unit is in relation to its size. Small-scale social units are more stable than larger-scale units (Carr 1995b:202). It has also been suggested that establishing ethnic identity is more difficult in mobile hunter-gatherer societies than in sedentary groups (Fitzhugh 1977:50).

Ecological-evolutionary theory. The ecological-evolutionary theory has some points in common with the middle-range theory of style, but it makes more evidently deterministic assumptions. It assumes, for instance, that the attribute visibility is related to the population increase or the deterioration of the natural or social conditions. Human beings are rational decision-makers who prefer cultural and symbolic factors essential for the survival of their system. They perceive the survival of the system as a matter of personal survival. The duration of regional stress is assumed to be long enough to make it possible to express important messages. The theory can be applied only for those artefact groups, which have an ecological or an adaptive function. The theory pertains only to attributes which have horizontally differentiated social units (Carr 1995b:204).

Many of these assumptions are law-like postulates, whose validity and applicability in different time and space environments are not self-evident. They are based on anthropological observations and therefore are removable as such to different conditions. The ecological-evolutionary theory of artefact design begins with the definition of a homogeneous population, selecting attributes and defining relevant attribute states. Attributes are ordered hierarchically and assigned with general etic meanings. The geographical and other contextual information of meanings is checked. Meanings are refined by defining message priorities also by considering multiple artefact classes (Carr 1995b:247–250). In short, the theory emphasises the multivariate nature of style, not only on the level of attributes and variables, but also between style and human behaviour (Plog 1995:370).

Summary. The current debate on style can be approached at least from five points of view. The first one concentrates on the continuous and discrete stylistic attributes of visibility. The second approach seeks structural features or general iconic design elements as indi-

cators of social groups. In the third, the structural characteristics of style reflect social groups depending on context and aspects on structures. In the fourth, the structural characteristics of style can be in varying degrees active symbols of social communication but they can also be passive, traditional and rule-bound manners. The fifth approach asks whether it could be possible to archaeologically discern emic characteristics in style. (Carr & Neitzel 1995a: 7.)

The general drift in archaeological style studies has proceeded from exact material definitions of style into more abstract concepts. Instead of observable patterning in the archaeological domain, the interest is focused on indirect empirical correlates (Conkey & Hastorf 1990:2; Hodder 1990a:46–51). A gradual shift from decoding towards interpreting is worth noting (Carr & Neitzel 1995a: 8).

Braun and Plog (1982:511) have supported the information exchange theory instead of the social interaction theory because the former better explains stylistic variation in tribal regional networks. Although they favour the former one, they also think that these two are complementary to each other and they both can work in different conditions. Decision-making in pottery decoration functions on several levels of abstraction. The scale varies from the overall arrangement of the design into the particular, even insignificant, details of decoration (Braun and Plog 1982:511).

The most important and often used theory of style since the 1980's is the social interaction theory. It assumes the users of a certain style to be passive receivers of manners they learned during childhood under the constraint of social and tutorial norms (Carr 1995a:153). The information exchange theory finds individuals more active and conscious decision makers who are willing to adopt new information by adapting to economic and social conditions and contexts (Carr 1995a:153). The isocrestic theory and the systems theory of style do not have many followers. The contextual theory has won favour recently but due to many different viewpoints it is not a coherent theory.

Separation of style studies into different theories is in many ways artificial. Martin Wobst (1977) first presented the distinction between the social interaction and the information exchange theories. Before this, researchers applied both ideas in appropriate contexts for their purposes. The first phase of the theoretical approach in style studies in the cultural-historical school was in the service of chronology and typology. The second phase is connected with New Archaeology: it was used as an analytical tool in studying social units and changes in social systems. The information exchange and the communication theories were at the top of the wave in the late 1970's and 1980's. The adaptive character of style was emphasised at the end of 1970's together with the function or the use of material items in past societies. Differentiation characterises the style studies of the 1980's. The complexity of style shows the practical problem: two researchers investigating the same data, even with similar basic assumptions, can reach very different results (Conkey & Hastorf 1990:3–4). The role of theories presented by structuralism, hermeneutics and other movements of humanities have won favour also with archaeologists conducting style studies. This has increased diversity but it has offered some new possibilities to understand the decisions and the work archaeologists have done.

10.1.5. Levels of style

Style is flexible and it can operate simultaneously on many levels and contexts (DeBoer 1990:103). Style can have a large geographical or chronological context

Social interaction theory (normative)	Information exchange theory	Isocrestic theory	Historical contextual theory
– psychological function	– adaptive function	– adaptive function	– psychological function
– individual level	– social level	– social level	– social level
– passively used	– actively used	– passive level	– active social action
– traditional norms	– active decision making	– traditional norms	– active decision making
– emphasis on similarities	– emphasis on dissimilarities	– emphasis on similarities	– emphasis on similarities
– no message affiliation	– messages of group communication	– no message	– medium of
– passive attitude on technology	– differing attitude on technology	– emphasis on technology	– passive attitude on technology
Kroeber (1948); Whallon (1968)	Braun & Plog (1982); Wiessner (1983); Conkey (1990)	Sackett (1977, 1982, 1985, 1986)	Lechtman (1975)

Fig. 10.3. The most important style theories and their central characteristics. Some archaeologists and anthropologists supporting each theory are also mentioned. Examples of the most important monographs, articles or essays are listed.

(Tallgren 1934) or a very restricted local or subcultural context – we can even speak about the style of one particular artist (Friedrich 1970:332). This means that style is hierarchical (Roe 1995a:35), which is not automatically reflected in the attributes or variables; it is the archaeologist's task to seek style from his own question horizon. Carefully controlled ethnographical situations have enriched the view of style and given useful patterns for interpreting communities known only by archaeological information (Friedrich 1970:343).

On the basis of abstractness, style can be separated into six levels (Carr 1995b:162–163):

Personal and panhuman physiological levels
Depth-psychological level
Personal and personal psychological level
Family and interacting artist level
Society and community level
Techno-functional level

The techno-functional level represents the most practical and common activity. For the archaeologist this level is easily understandable; the personal or depth-psychological level represents the other end of the scale. Pryor and Carr have presented a slightly different division (1995:275):

Individual level	artisan's personal preferences, inspiration, skills
Family level	enculturation, technological dependency
Interacting artisan's level	passive interaction
Community level	
(Sub)language level	active and passive interaction, migration?

Although these levels were discerned from the basketry of Indians in California, they still have value also in trying to elucidate the hierarchical levels of style in ceramics. The interaction of artisans coming from different cultural backgrounds can have a considerable effect on stylistic boundaries, mixing the basis of interpretation. According to Pryor and Carr (1995:283) this affects both easily visible and poorly visible attributes. Thus interaction between individuals affects the stylistic relationships between ethnic groups.

Style was not necessarily applied to exclude other people but, instead, to integrate them into the community. The stylistic boundaries between basketry were not between ethnic groups but between language groups (Pryor & Carr 1995:285). On the sublanguage level the significant factors affecting style are: 1) a shared cultural history in the form of past migration, 2) passive interaction as casual learning and diffusion through personal contacts, 3) active interaction as the artisan's or group's conscious attempt to integrate into another group through stylistic mimicry, and 4) the technological dependence on design and form on weave, working in combination with the above factors (Pryor & Carr 1995:285).

An important dimension related to style is connected with teaching and learning processes, where know-how is adopted and transferred. Anthropological observations have shown that women were makers of ceramics in many cultures; this has often been interpreted as conservatism in pottery making. Deetz and Longacre formulated the hypothesis by stating that matrilineage yields design homogeneity, whereas patrilineage yields heterogeneity (Roe 1995:51–52). After these generalisations, one can ask how important it has been to follow the designs of teachers in actual situations. How important has it been for the group to identify itself through these designs? According to contemporary archaeological theories they get their meaning in particular situations and within particular groups (Hodder 1990a).

One working definition of style in ethnoarchaeology says that style is a "formal variation in material culture, which transmits information about personal and social identity" (Wiessner 1983:256). When the first aspect stresses striving for membership in different groups of people, the second aspect involves the individual's endeavour to differentiate himself from others by showing creativity and innovation (Wiessner 1983:257). Wiessner calls the first aspect emblemic style. It transmits a message of conscious affiliation or identity to a defined target population. A social group, its norms and values, play a central role in the formation of style. Emblemic style stresses the sense of solidarity in a group, which may affect also the boundaries between them. It is also important that emblemic style does not change without an external reason, because it represents the stability of the group (Wiessner 1983:257). The second aspect is assertive style, which emphasises, instead of society, a person. Assertive style is a variation in the material culture, which is personal and supports individual identity by separating persons from each other (Wiessner 1983:258). Assertive style does not concentrate only on an individual. It emphasises the individual's needs, but not without the existence of a society with its norms and identity in the background. Assertive style mediates over boundaries. According to John Crook's hypothesis, assertive style is well-developed among hunter-gatherers. Wiessner confirms this with her own field studies among San hunters (Wiessner 1983:258), where society controls the artisan. Emblemic style is poorly-developed among hunter-gatherers, because these societies are often too small to develop messages for a strict social network (Wobst 1977). It is important to realise that the need to maintain and emphasise boundaries between groups is not as well-developed among hunter-gatherers as in agricultural societies.

According to Friedrich, there are three basic indicators of the intensity of communication. The first is the spatial division of ornaments. The general style prevails in a large area, but indicators of substyles are small and not very prominent (Friedrich 1970:338). The second indicator is a classification of design configurations. The intensity can be observed, for instance, as a more complex variation in design configuration classes (Friedrich 1970:337). The third indicator is the function of a design element. Clear differences can be shown between villages (Friedrich 1970:338).

Undoubtedly style carries information about societies. The information theory has been used to explain the mes-

sage which style can transmit. A visual signalling of shapes, colour and details in decoration may reflect features in societies such as interaction between social groups, the efficiency of social encounter etc. (Hays 1993:81). Style has also the ability to convey messages concerning status and power (Wiessner 1990:110). These aspects of style have much weight in studies, but interpretations are often made from an extremely narrow basis of information. Defective source material has often lead to assumptions, which have been taken as self-evident facts. Because the task is unusually complicated, one has to be aware of assumptions, which may affect the results, all the time. There are mainly two basic approaches to style in material culture. The first approaches style as a static phenomenon; the second one sees style as a dynamic process (Voss & Young 1995:77).

10.1.6. Individuals behind style

10.1.6.1. Who made ceramics?

It is an evident fact that ceramic manufacture and decoration style was learned from the older generation (Longacre 1968:97–98). The Deetz-Longacre hypothesis (Longacre 1964; Roe 1995:51–52) refers to conservatism in pottery making – the importance of following the designs and forms of teachers. This has often been interpreted in such a way, that in particular women convey conservatism and permanent values in the making of ceramics. The Deetz-Longacre hypothesis is supported all over the world, although criticism has also been directed to it on the grounds of the complex nature of social relations.

Anthropologists have observed the importance of young women in conveying tradition in many contemporary societies. In many tribes men make long-distance travels to find brides. "The young woman is at the mercy of her mother-in-law, thus ensuring the bride's assimilation of the mother-in-law's style" (Roe 1995:52). The child bride has to learn style from her mother-in-law. The adoption of style can also take place through adoption from grandmother to child, so that a girl learns methods from her grandmother, bypassing her mother (Roe 1995:53).

The degree of stylistic similarity is assumed to be more or less proportional to the rate of interaction between communities. Speaking more practically, postmarital residence of women from one village to another is one reason for diffusion and the heterogeneity in style could be a result of the rate of flow within a region. Instead of greater or lesser rates of intercommunication between villages, exchange of ideas or diffusion can take place also through copying. Stylistic variability can still be explained more naturally as the actual movement of artisans (Whallon 1968:229). Whallon observed that the trend towards increasing stylistic homogeneity correlates with economic and social reasons. The gradual intensification of agriculture was the main reason for the increase in population. Villages grew and their interaction intensified under the pressure of the withes in the area (Whallon 1968:240–242).

Ethnographical observations show that potmaking is transmitted usually through mothers-in-law. This hypothesis includes that kidnapped girls do not bring traditions they learned as children with them. It is still possible that traditions would blend together and that it would not be possible to discern the geographical areas. Peter Roe (1995:53) has pointed out that the "heterogeneity of bride origin is no predictor of stylistic continuity". In this case it is the captor's mother, who has the decisive influence on preserving tradition. Ethnographers have also emphasised the role of the mother of the mother-in-law in the actual teaching process (Kensinger 1975:64; quoted by Roe 1995:52). In this case the permanency of values is even stronger. The crossover can also take place for artistic reasons; in this case the reasons are linked with the skills and talents of the teacher (Roe 1980:51–6).

Although one can begin with the basic hypothesis that in most cases ceramic traditions have been in the hands of women, there is still some ethnographical evidence that also men made ceramics. Roe's observations are here very interesting, because they show that men working with ceramics were often shamans and that the design and the mythological world were richly present in the ornamentation (Roe 1995:54).

It is interesting to notice certain differences between male and female potters. According to Roe, male aesthetics is simpler, because masculinity excludes many details of graphic art (Roe 1995:54). On the other hand, Whallon states that there is a clear tendency in eastern North America that in a matrilocal tradition some individual attributes in ceramics were present in high frequencies, but some others were relatively few. In non-matrilocal groups a more equal representation of attributes was observed (Whallon 1968:228).

A potter's working process can be divided into active and passive. Active processes may be, for instance, maintenance of boundaries between groups, promotion of solidarity (Wiessner 1983) and reinforcing or resisting high status (Wobst 1977). Passive processes exist in shared cultural history, in the artisan's personal preferences (Pryor & Carr 1995:260), in the work of closely interacting artisans (Friedrich 1970:337–339), enculturation, motor skills or even the availability of raw material (Pryor & Carr 1995:260). Enculturation is the most important factor of passive interaction, because it takes place inside the nuclear family, between mothers and daughters. The intrafamily power relation functions between a high-status old teacher and a low-status young student (Pryor & Carr 1995:260).

Also the respect other people show to the artisan affects greatly the demand for technical and artistic standards of ceramics. On the basis of quality, it might be possible to interpret the artisan's status in society. One element of style is workmanship or even virtuosity (Roe 1995:30). This does not mean only the utilitarian needs, because much more time has been spent on making an implement than necessary (Jones 1973:266–267; DeBoer

1990:103). The reason has been either artistic or symbolic. The craftsmanship comes out of style, but artefacts still remain inside it (DeBoer 1990:103). Copying is an important way of borrowing, which potters often do without hesitation. Design figures are sometimes not easy to learn, which means that adopting them needs more intense interaction between potters (Friedrich 1970:337). Still, artists do not want to make identical works and the idea of style involves also an idea of novelty within particular rules.

The potter's social status varies between societies. In many cases it is straightforwardly related to the market value of the products (Foster 1970:44–45). In these cases potters are part- or full-time specialists, who take the products to market. In these societies potters may be considered as artisans and their status may be high. In peasant societies, where the commercial utilisation of craftsmanship is not possible, their status is generally low (Foster 1970:47). It is also important to realise that potters are often more resistant to innovations than other individuals in societies. This resistance concerns not only new techniques and methods, but also potters' homes and their world-view. It is easier to teach a new individual to be a potter than to persuade a potter accustomed to his methods and style to make radical changes. This is the case, because a novice does not have any preconditions to new ideas. The absence of motivation to develop style and techniques results in no changes taking place or that the changing process is slow (Foster 1970:50–52).

The rate of intermarriage of potters has sometimes been used as a criterion of status (Matson 1970:283). Hélène Balfet (1970:165) presented a very general sociological statement that hand-shaped pottery is connected with women, but wheel-made pottery, on the other hand, with men. On the grounds of North African ethnographical material she also suggested that pottery-making is feminine domestic work in normal patriarchal societies, where the tradition is transferred by watching and copying more skilful workers (Balfet 1970:162).

One significant factor affecting rapid stylistic change is population growth. One possibility is the replacement of tradition by new settlements of small groups of people (Plog 1995:372). Binford suggests that change in the sociocultural system is responsible for the stylistic change. This can happen, if "the daughter populations are likely to bud off from parent communities" or "in stable demographic situations sampling error drift might result because of discontinuity between generations in learning and enculturative behaviour in a region" (Shanks & Tilley 1987:139).

From the artistic point of view an innovation is a breakthrough of an unusual and talented individual in his search for a new design. The reason for change is the artist's desire. Potters may sometimes be artisans but they are rarely artistic innovators. It is also interesting to realise that in peasant societies, where commercial aspects may play an important role in a potter's subsistence, the new, useful techniques remain secret and are not shared with competitors. In hunter-gatherer societies the situation may be different, because no immediate benefit can be obtained for an individual himself.

Carr and Neitzel separated four main factors, which affect change of material style: 1) dynamic processes, 2) constraints or milieu that define, promote or discourage processes, 3) unique triggering events that activate processes, and 4) regulating structures (Carr & Neitzel 1995b:437). Style can also be approached from a holistic point of view. This means using a hierarchical approach to different aspects of style. Some phenomena can be explained on the level of an ecosystem by referring to changes in it. Some other, e.g. depth-psychological factors in a potter's mind, must be approached in a different way. A researcher should take into account different aspects of primitive technology, cultural-historical context with social and ideological influences and the life histories of artefacts together with their formation processes (Carr & Neitzel 1995b:439).

10.1.6.2. Message in ceramics

New Archaeology aims to find cultural patternings in a spatio-temporal context. Stylistic studies were in the shadow of research that concentrated on the relationship between man and nature. In the 1980's style came into focus again and in the spirit of structuralism, stylistic variation was interpreted as a language or text, which was possible to be decoded (Conkey 1990:9). One central aspect of style is communication, which can be either personal or social. Wiessner (1989:57) emphasises that people are willing to present "positive self-images to others in order to obtain self-esteem and self-recognition". This means choosing suitable costumes for different situations: nobody goes to a funeral wearing a T-shirt and shorts or if this happens he wants to express something with this.

Some design figures are planned to play an iconographical role. Plog (1990:68) suggests that style, aimed at symbolising social relations, exhibits only little covariation of attributes. If style is developed to be iconographical it includes a large number of components making it comparable with language. Wiessner (1989) divided the means of communication into four groups. The first looks for the behavioural basis of style in different cultures. Much attention has been paid to context and conditions. Information is obtained by making careful observations on the behaviour connected with style in culture. This information can be utilised also the other way round, when deriving conclusions about social and symbolic phenomena in a prehistoric society (Wiessner 1989). Secondly, the cultural context is important, although archaeology can approach it only on very general terms, by comparison or by using recorded data documented by anthropologists. The third way is related to the information on the boundaries and the interaction between ethnic groups. Fourth, style means negotiating and communicating personal and social identity and it indicates a balance between the interests of the individual and the society (Wiessner 1989). However, all these conclusions remain imperfect without any possibility to

check them against the information obtained by other means, by different categories of data.

Style can also reflect status. This status concerns both the artisan and the owner of an artefact. In the latter case its prestige value in the society may be the only reason for its use. This means that it is also related to power (Hodder 1990a:46). The relationship between life and death and also with spirits and gods is an important aspect of status artefacts and style has been used to express and convey a message between them. This is the highest, spiritual level in ornamentation, which unfolds itself in the most complex way to the researcher (Wiessner 1990:111).

Religious and mythological themes sometimes play an important role in artefact ornamentation. Anthropomorphic figurines can have coloration, shapes of eyes, mouth and nose etc. These figurines with characteristic features can transmit universal myths (Rosenthal 1995:351). For instance, masks can represent universal myths but they can also carry powers, which have strength in curative purposes of medicine men. Good examples are Greek vases showing anthropomorphic legs, which have been interpreted as fertility elements (Weinberg 1970:197–199). The main problem with these meanings is that no direct information can be obtained from the religious symbolism and literal evidence of their use is needed in order to uncover their deeper symbolic meanings.

A large number of similar vessels in the same place may be an indication of some ritual, such as the breaking of vessels. It is often difficult to differentiate between ritual and household pottery; some (miniature) vessels may have been votives. Understanding the context – the site, the burial etc. – is therefore of particular importance (Matson 1970: 282).

Documenting the artisan's working process, building hierarchies and simulating possible decision points of prehistoric artists has also won favour among archaeologists concentrated on ceramic studies (Plog 1980:42). It has been observed that not all decisions are equal in importance. Plog has criticised the idea of identifying cultural meaning with attributes in prehistoric styles; it requires more evidence than an archaeologist usually has available. Further, it requires parallels between prehistoric and historic societies (Plog 1995:377). This criticism is directed towards over-optimistic assumptions to read ceramics in order to interpret cultural and social characteristics from it.

Observing variation is a key for understanding meanings. Binford separated two kinds of variations in artefacts, which he calls the technical and the design dimensions (Binford 1965:206). He further discussed functional variability by proposing two categories: the primary and the secondary types. The first arises from the basic difference between the function of vessels: one vessel is a plate and another is a storage jar etc. The secondary variation refers to the traditional ways of doing things in a family or some other small social unit, meaning the degree of work specialisation or small local differences inside the site (Binford 1965:205–206). Binfords's division reflects his attempt to see culture as a concept, which is built from the parts on different levels.

Polly Wiessner (1985:160–161) separates symbolic and iconological variation. The first refers to human behaviour in society. Style lives in society in decorating, imitating, reproducing, altering and finding new solutions. People compare their own manners with others, adopting new ways of decorating and making artefacts. This approach can be criticised by pointing out that after having adopted the tradition people become conservative in their manners, which limits the scope of variability and innovation and thus favours continuation of tradition. Iconological variation is based on the idea that society has certain, conscious "messages aimed at a specific target population" (Wiessner 1985:160–161; Plog 1990:62). A rapid increase or decrease in population within a group – or between two groups – may also cause rapid changes in design. Therefore the stability of decorative patterns, an association between decorative attributes and the degree of association between particular decorative features can be connected with the stable relationships between groups (Plog 1990:66).

In egalitarian societies where all members of the band are, in principle, socially equivalent, the messages in artefact decoration represent the group as a whole (Neitzel 1995:396). The more hierarchically the society is organised, the more complex are the messages it reflects. If members of society try to transmit information concerning social positions, the status markers have to be highly visible (Neitzel 1995:396). In practice, this visibility is reflected on the levels of artefact visibility: the more elaborately manufactured, decorated and technologically better quality artefacts are, the more highly visible are also the markers. It means that the more energy and time put in the making, the higher the quality of production and also rare raw materials are often used.

One should still be careful not to interpret the absence of variability as an expression of cultural or ecological similarity. Different groups may have very similar styles of making ceramics, while the same group may have varied stylistic characteristics in an ecologically varying area. The simple method to uncritically sum up the attributes of cultural similarities and differences between archaeological assemblages as cultures needs further discussion of aspects (Hodder 1979:452).

10.1.6.3. Bridging theories between ceramic groups and social groups

Already Gustav Kossinna and the *Kulturkreislehre* assumed that a sudden emergence or disappearance in material culture can be explained with migration, colonisation, conquest or assimilation (Olsen & Kobyliński 1991:9). The main difficulty in linking material and social groups is related to the problem of how to use the criteria of artefact groups as indicators of social groups. Archaeological material gives only very small possibilities to verify the arguments. The problem is simply that in one case the particular material group can be inter-

preted as a diagnostic criterion in identifying a group of people, in another case this same information is used to indicate another group of people (Håland 1977:3).

One of the aims of archaeological study is to separate ethnic groups. But what is an ethnic group that archaeologists try to find? It is not the sum of certain objective differences, but only those, which the actors themselves regard as significant (Barth 1969:13). Barth makes a distinction between overt signals, such as language and the form of a house, and basic value orientations, such as standards of morality (Barth 1969:14). For archaeologists the first point is important because it is just material signalling that is within the reach of observations.

Different artefact groups have different amounts of arbitrary traits, which have value in seeking ethnic features. Different techniques, shapes and decorations have been invented in different areas, and therefore they may have value in studying ethnic specialities. People have always been prone to copy, imitate, adopt and learn different skills and techniques (Håland 1977:14). The use of technological traits as ethnic affiliation is not without problems, because the same kind of artefact assemblages may occur in different geographical environments, far from each other. Both stylistic and technological information can easily cross ethnic boundaries, but perhaps it is even more important that artefact assemblages often have a larger ecological adaptation than ethnic groups (Clark 1977:19). Clark believes optimistically that it might be possible to approach people through tools "if the total archaeological assemblage is considered in its full context" (Clark 1977:19). This means that all information available from the occupation area should be used in the interpretation. He has presented simple rules for using archaeological material when making conclusions about the intrusion of a group into a new area. According to him, the archaeological material has no parallel or antecedent in the context where it is intrusive. It also has parallels in the area whence the people involved are supposed to have come. Finally, the material has to be assimilated into the foreign context (Clark 1975:48). The situation is usually much more complicated. Archaeologists often observe only one characteristic changing in the culture while the others remain the same (Håland 1977:4).

The problems often arise when mixing cultural characteristics and ethnic groups with each other. The culture area is described by boundaries of cultural forms based on similarities and differences in these forms (Håland 1977:14). An ethnic group, instead, is a category of identification of people (Håland 1977:14). Also other concepts characterising ethnicity are problematic. For instance, the concept of tribe is nowadays thought to be naive and too simplistic (Odner 1992:86). Ethnic stereotypes or even nationalistic hidden meanings influence the interpretations. A good example is the research between the sites of Norwegian and Saami populations. According to Odner (1992:87) the former are relatively well known because of the detailed studies, but the latter are, instead, almost *terra incognita*.

It is evident that a single material indicator is not enough to delimit a social group but a large number of different attributes have to be taken into account, instead. Carr discerns three main characteristics in the process of making artefacts: 1) active versus passive, 2) conscious versus unconscious, and 3) dichotomy between groups and within group dynamics (Carr 1995b: 214). Four kinds of social distribution processes can be separated in the interaction between manufacturers. An attribute, which belongs to the repertoire of a social group, may have been used either actively or passively. A process may involve active communication between groups or active intragroup communication. This brings difficulties for the researcher interpreting ethnic groups on the basis of the distributions of artefact types (Carr 1995b:242); differences and similarities cannot be straightforwardly interpreted as signs of ethnic groups. Active communication on boundaries between groups can also show active competition between subgroups. This situation is described by Barth (1969) and Hodder (1982a:104, 187), who suggest that competition between subgroups is often a more important motivation than showing a difference between groups (Carr 1995b:244). One should not forget the active or passive personal processes, either (Carr 1995b:242). These views favour the contextual approach to the material.

Archaeologists often see society as a static and unchanging entity without different levels in human social units and hierarchy (Sackett 1982:65). The opposite view allows a large variability in social units or in geographical clustering of the populations responsible for the artefacts. The difficulty between material culture and social culture is the leap from types to the interpretation of society. This leap involves a large number of hidden assumptions.

The natural starting point is that similarity in material culture is a result of the interaction of people. D. Clarke (1968:414) assumes that contacts between people and their extent and continuity are central factors affecting material culture. Hodder (1979:452) states that ethnic groups or any groups of people become visible in the archaeological material only if these groups have thought it essential to manifest their within-group organisation against the other. Still style can be adopted unconsciously without any particular sense of solidarity. Style is also an entity, which is possible to be invented afterwards by an archaeologist. A counterargument says that although a considerable part of the details in style can be unconscious, it cannot emerge without tradition. One cannot create a new style without an existing tradition.

Wiessner (1982:175) connects the variability in style with the means for reducing risks. Stylistic differences do not often follow dialectic or linguistic group boundaries. The ownership marks, instead, seem to be connected with the storages of hunter-gatherers (Wiessner 1982:175). Style may exist to reinforce the group by excluding other groups and to integrate people. The maintenance of a boundary against other groups is not important (Pryor & Carr 1995:261).

The traditional approach says that material signals constitute an ethnic group. The situation is nowadays seen also in a more complex way: these signals are necessarily not ethnic ones but they can represent social status, prestige etc. (Simonsen 1985:16). Changes in style or a development of substyles can reflect changes in social conditions, economy or ecological factors. The development and increase of the Hopewell exchange systems of the Middle Woodland Period was a result of the growing importance or even alliance between neighbouring communities as the population density increased. Mobility of the populations decreased, instead (Braun & Plog 1982:517). It has been presented that group identity tends to increase when fear, intergroup competition or aggression grows. This is because political co-operation and control over the group is needed. Instead, the situation of rising personal identity is a result of interindividual competition, breakdown of social order etc. (Wiessner 1990:109).

For Barth, ethnicity is a way to organise interaction between groups, whose actors are individuals who identify themselves. No ethnic group lives in isolation and they are also dynamic. They are not concrete phenomena but ideations in the sphere of social consciousness (Barth 1969:13–14). Further, contextuality is essential for them and therefore in particular identifying ethnic processes is linked with a historical context. According to Barth the four basic preconditions for an ethnic group in anthropological literature are the following (Barth 1969:10–11):

1) The population is self-perpetuating
2) The population shares fundamental cultural values
3) The population makes up a field of communication and interaction
4) The population has a membership, which identifies itself, and is identified by others

This ideal characterisation says that society is a unit, which discriminates against individuals outside its own members. Also language is a powerful factor affecting discrimination and finally, the geographical and ecological factors are of central importance affecting adaptation, specialisation and isolation (Barth 1969:11).

One problem in studying ethnic groups is the concept of culture. These two have been too straightforwardly seen as a one-to-one relationship. They also have common traits: like ethnic groups, cultures do not exist, but they are always in the process of formation. Neither cultural boundaries nor ethnic groups are static but continuously changing. Ethnic groups may have clear boundaries but more often they have no boundaries at all. Only socially relevant factors have meaning when discussing membership in an ethnic group. Membership cannot be defined by virtue of property or ornaments (Barth 1969:14–15), although most archaeologists base their reasoning on these arguments. Still there is one important difference between these two concepts: culture is a concept interpreted by the researcher (Conkey 1990:12), an ethnic group, instead, is understood by people who actually live together and feel themselves to be an ethnic group.

In the case when two ethnic groups are in contact with each other, they may adapt to the situation in at least three ways: by occupying distinct niches in the natural environment, by monopolising separate territories – in which case they are in competition for resources – and by providing goods and services for each other (Barth 1969:19). Barth's view favours an ecologically adaptive approach to ethnic groups. Demographic factors play an important role when analysing ethnic groups. The size of the group affects essentially its adaptation into an ecological niche. Human fertility and mortality regulate the size of the population and also trigger emigrations or immigrations.

Archaeologists often give ecological factors a central role when explaining adaptation or changes in cultures. Barth (1969:25) states that ethnic groups only rarely think of ecological feasibility in relation to the natural environment. Models, which try to explain cultural change as a response to environmental fluctuation, are therefore simplistic (Plog 1990:70).

It is normally assumed that ethnic groups in hunter-gatherer groups are egalitarian. However, the groups can be stratified, too. This kind of situation can develop, for instance, when a group has control over the products of another group (Barth 1969:27). Social stratification means hierarchical sub-cultures or hierarchy between individuals in the society. It is often assumed that the stratification can take place only in large societies. Although this may be the case in general, there can still exist intergroup classes, which act in large areas. One interesting example of this is the Seima phenomenon.

Innovators are individuals, who can usually operate among other ethnic groups also. These agents have three basic strategies: they may attempt to become incorporated in the cultural group, they may accept a minority status and accommodate to the group as minor participants, while participating in the larger system in other sectors of activity, and finally they may emphasise their own ethnic identity (Barth 1969:33). Although Barth's ideas were intended for pre-industrialised societies, they can also be applied on a very general level for hunter-gatherer societies. For instance, the first strategy refers to the situation where an individual loses his original ethnicity for the time being and remains culturally conservative in his new group. The second strategy, instead, leads to a polyethnic life (Barth 1969:33). Although the person's main allegiance is to one and only one local group, he may have substantial interests in others, which means a polylocal residence (Allen & Richardson 1971:49). Individuals have also been reported of exchanging the membership in one local descent group for another. The genealogical connection is only one, although important, factor which affects the membership in a population.

There exist also minorities inside the major population (Barth 1969:30–32). Minorities often live in regional peripheries but sometimes also as scattered minority populations, such as gypsies. In this case no geographical boundary exists between minority and majority populations. A different kind of situation prevails between Saami groups and Scandinavians, where Scan-

dinavians represent the majority. The Saami people live in a certain geographical area but are still a minority.

The concept of ethnicity in social anthropology has the difficulty that its approach is normally synchronous, not diachronous, and it ignores the historicity of the phenomena (Kleppe 1985:76). Archaeologists have different aims for their analyses. The three basic needs for their material before the interpretation of ethnicity are the following: 1) it has to be large enough, 2) it has to be synchronous, and 3) it must be systematically studied (Kleppe 1985:76).

Hodder (1979) emphasises economic and social stress in the formation of ethnic boundaries. This perspective has been criticised for its focus "only on ethnicity as strategy for competition for resources within the same niche" (Olsen & Kobyliński 1991:19). Hodder seems also to forget that "stable and contrasting repertoires is often a necessary presupposition for organising stable interethnic relations" (Olsen & Kobylinski 1991:19). The dichotomy "we" and "they" can have various reasons. Bjørnar Olsen has presented that the identification of ethnic groups and ethnicity in the archaeological material is difficult, because these symbols have idiomatic status. Therefore, neither isolated, ideal and typical nor objective criteria with universal validity of the ethnos exist. The context of these idioms is of central importance (Olsen 1985:27). The archaeological material has three basic contexts: 1) the geographical distribution, 2) the interaction between different geographical areas, and 3) the chronological connection between them (Olsen 1985:27–28).

The material type, which is connected with one culture, is not sufficient to interpret ethnicity. A typical situation is that ceramics is the only material group showing enough discontinuity or variety making it possible to suggest hypotheses of the population behind the vessels. Additional data is needed and a natural solution for the problem is to broaden the sources of the study with non-archaeological data such as natural scientific, linguistic or historical information.

An example of this is the Horizon Style or the Chavín Period in Peru (Willey 1945). The Chavín horizon or civilisation is a phenomenon involving religion, ideology, style and technology and it represents a profound change in socio-political and economic conditions. There are some important unifying characteristics in ceramic styles, the Chavín iconography. It is striking that this iconography seems to diffuse very rapidly into a large geographical area. More than a political, hierarchical society, it represents the common religious unity and cult, although not as a centralised authority over the area. It represents a changing social identity during the Late Initial Period and Early Horizon instead of an expression of intensive interaction (Burger 1988:133). The most likely explanation is that local cultures gave up the iconography of the traditional ceramics imitating more closely the pottery of the groups beyond their territory (Burger 1988:138). Although there exists a unifying style in the area, the local ethnic groups continued their existence with their local substyles in ceramics (Willey 1945:50). Again this is not a question of diffusion of the Chavín cult or of long-distance exchange (Burger 1988:133), but the adoption of a more universal ideology and the desire to manifest the sense of a supra-group identity (Burger 1988:138).

Most theories of kinship reconstruction in archaeology have been developed together with ethnographic analogy. Three basic models have been presented. The first model attempts to reconstruct kinship without the ethnoarchaeological analogy, with the help of archaeological material only. The second model is based on the ethnoarchaeological analogy without a residence or descent theory. It accepts, for instance, that "in communities with a high degree of matrilocal residence, pottery and other items of material culture manufactured by female artisans would exhibit a non-random clustering of stylistic attributes" (Allen & Richardson 1971:42). This idea assumes also that mothers taught their daughters to be potters in matrilineal descent groups. The third model uses ethnographic evidence but also the residence and descent model in interpretation. Also here it is asserted that the older generation is responsible for the training of the younger. If this transmission is disrupted, there must be some definite reasons for this (Allen & Richardson 1971:43). These reasons can be population decrease, hostile tribes or changes in economic or ecological conditions in and around society.

James Deetz suggests three descent categories: matrilineal, patrilineal and bilateral. Empirical observations in societies have proved that residence rules and the actual practice vary much between societies. This makes it difficult to generalise practices and even more difficult to understand them in the past cultures. Allen and Richardson (1971:47) come to the conclusion that an archaeologist "is severely handicapped in his reconstructions of residence patterns by the simple fact that it is impossible to ascertain the individual residence choices...made in prehistoric populations".

Cohesiveness in design is not often tied with descent or residence rules, but more often with the tradition or societal ideals in the population. This makes the ideas presented by archaeologists suspectable. As a conclusion to their analysis Allen and Richardson (1971:51) state their pessimistic opinion that the analysis of kinship should be left to the ethnographers.

Also M. Stanislawski (1973:117) has criticised normative assumptions behind the interpretations of ceramics. The problem actualises when thinking about the descent relation between mother and daughter. It has been considered evident that the styles of a mother and her pupil – who is in most cases her daughter - are very similar to each other. Stanislawski says, instead, that the daughter can make quite different pottery than her mother and her style may change throughout her career; she can keep learning new styles from new sources (Stanislawski 1973:121). Have women almost without exception made ceramics? On the basis of ethnographic work Stanislawski (1973:121) states that both men and women have worked with ceramics without any strict sexual division. The examples presented above show that general

models cannot be presented because the actual practices differ considerably in different social units.

Two important features have sometimes been considered to characterise desert hunter-gatherer societies (Yellen 1977:268–269). The first one is the long continuity of tradition and the second is their resistance to rapid change – their conservatism. Yellen (1977:271) has criticised this idea by pointing out that desert cultures are not static but dynamic and ready to adopt new elements into their culture.

Carr and Maslowski (1995:323) suggest five mechanisms affecting changes in culture in egalitarian societies, both in mobile band societies and more settled tribal societies:

1) the extent of learning pools as a function of social interaction over the long term
2) patterns of recruitment (e.g. intermarriage) of persons between learning pools
3) migrations and intrusions of an exotic population into a region
4) regional population replacement
5) spatial overlap of settlement systems at their peripheries

The before-mentioned conditions have been observed on the basis of spinning methods in the middle and upper Ohio drainage basin in the eastern United States. Still they have much in common with ceramic sociology. The first condition can show a uniform distribution over a large area or stability through several generations in isolated contexts of hundreds of years (Carr & Maslowski 1995:323). The learning pools can be an intracommunity within an ethnic or a linguistic group. In these cases there are some possibilities to reconstruct groups on the basis of the distribution of certain artefact groups.

The best example of recruitment of people between ethnic groups is intermarriage where diffusion takes place as a spread of pottery-makers rather than pots (Ehrich 1970:6). Trigger has emphasised the influence of exogamous marriages on the diffusion of ideas from one population to another. "If patrilineal bands engaged in exogamous marriages, female potters may have diffused from group to group rapidly enough to give the impression of a sweeping occupation of the region by newcomers, when no change in population had taken place"(Trigger 1977:22).

Five processes characterise the expression of ethnicity in archaeological material. The first process is the desire for active representation and symbolisation of group boundaries, competition etc. (Barth 1969:214). The second process involves an active expression of competitive strategies between subgroups (Hodder 1982a:75–86). The third one represents within-group cooperation (Carr 1995b:214). Migrations and intrusions of one ethnic group into the territory of another group are presented in the archaeological record as a sudden occurrence of different habits in the method of manufacture (Carr & Maslowski 1995:325–326). Regional population replacement comes close to the third one. For some reasons an earlier tradition seems to end abruptly and the material culture is suddenly replaced by a different one. The fifth type is the overlapping of settlement systems. It assumes that not all sites have the same function within a single settlement system. "Different local bands or tribal villages can use the same logistics – extractive sites alternately through time, or local bands may join together temporarily at a logistics – aggregation site" (Carr & Maslowski 1995:327). Shared sites may contain material where traits of different traditions were mixed into a new type. Another possibility is that both groups retain their own tradition. In these cases an archaeologist often interprets the difference as a temporal difference without taking into account the possibility that groups may have been in very close connection with each other. Plog (1995:375) has maintained that choosing only smaller or larger sites distorts the picture an archaeologist obtains from the stylistic variation. Deciding which attributes are the most important components of stylistic variation can lead to the same difficulty. Often the question depends on what can be measured, not on choosing between the most appropriate ones (Plog 1995:375).

In its simplest form the definition of migration (or immigration) implies that people leave one geographical area for a new one. Mats Malmer stated that "every new addition to a population from elsewhere is an immigration" (Malmer 1962:807). Malmer suggests that direct evidence can be obtained not through archaeological material but through physical anthropology: immigration becomes confirmed by comparisons of racial characteristics between populations in two geographical areas (Malmer 1962:47). The indirect method implies observing changes in the material culture in both old and new areas. Immigrations should be confirmed through physical anthropological material and a detailed investigation of changes in the material culture. Further, exact analogies should be observed in the archaeological material between old and new areas (Malmer 1962:807).

It is remarkable that one can speak about the change of paradigm when looking at the change that has occurred in the archaeologist's view of ethnos from the 1960's on. The most important changes are shifts from a static and objective to a dynamic and subjective approach (Olsen & Kobyliński 1991:6–8). Odner states that in functionalistic models a researcher assumes that there is a kind of invisible hand, which acts as a harmonising force over people (Odner 1985:37). An opposite model is based on a diachronous viewpoint: cultures appear and disappear.

Exchange. It has often been accepted as a basic hypothesis that the frequency of exchanged artefacts decreases with the distance from their source. On many ethnographic occasions it has been proved, however, that this deterministic idea does not correspond with reality (Hodder 1979:446–447), an exchange being often more intense with the distant groups than with the neighbouring ones (Wiessner 1982:175). The more standardised the article of exchange, the more standardised is also its associated social information (Braun & Plog 1982:511; Sahlins 1972:193–194).

Exchange systems are one of the most interesting branches of prehistoric economics. The concept "ex-

change system" has a larger extension than the concept "trade" and therefore it better describes the problem. Part of the exchange took place as an internal one – inside the social group – but the main interest is still focused on interregional exchange. Robert Fry (1979:497), who has studied the exchange systems in Maya Lowland areas in Mexico, suggests the following typology for the exchange systems:

I Supply zone
- exchange between producer and consumer
- highly local

II Gift exchange
- dyadic exchange, widespread distribution

III Simple centralized exchange
- exchange through a single centrally located person or market
- widespread distribution (changes considerably)

IV Noncentralized market
- exchange through smaller scale markets
- high correlation between frequency and geographic distance

V Complex redistribution system or market
- hierarchical redistribution system or hierarchically organized local and regional markets
- overall randomness in market

Fig. 10.4. A model of exchange systems in the Maya Lowland area in Mexico (Fry 1979:497).

The typology presented above is mostly applicable to complex societies with a hierarchical division of labour, status and wealth. Therefore the applicable types in egalitarian hunter-gatherer societies are the first three. The dyadic relationship between producer and consumer (Fry 1979:497) or potter and the user of the vessel, and also type III are possible in the conditions of hunter-gatherer societies. It is also possible that ceramics itself was not a primary trade object but a container, for instance, for oil and wine (Ehrich 1970:11).

Also ceramics has sometimes been seen as a status symbol, although its correlation with more easily visible status symbols is not high (Neitzel 1995:409). Manufacturing ceramics needs less labour and it is also less visible than some other items of status. Archaeologists have also often assumed that trade did not play a considerable role in hunter-gatherer societies. Pottery is heavy and too fragile for long-distance transportation. An easy availability of raw material favours local manufacture of ceramics. On the basis of ethnographic and ethnoarchaeological observations Keith Nicklin (1971:14–16) states that archaeologists underestimate the role of long-distance trading in prehistoric societies. He suggests that the personality and talents of single artisans (or potters) have often been forgotten when trying to explain extraordinary artefacts or even abrupt changes in style. Although many changes in style may puzzle archaeologists, individuals and their innovative energy are often discarded (Nicklin 1971:27–29, 47). The lesson, which must be learned from ethnoarchaeological studies, is that although the design elements are often easy to recognise, they are still not necessarily good indicators of social interaction (Friedrich 1970:342).

10.2. FUGUE

10.2.1. Introduction

The purpose of the second part of the last chapter of this work is to present an overview of the typological characteristics and subtypes of Textile ceramics in Finland and the Karelian Isthmus and use it to make interpretations about the individuals and populations behind this ceramics in the light of comments presented in the beginning of this chapter (10.1.). The main questions of this work are still related to the Textile ceramics itself, and therefore its applicability in interpreting cultural and social relations should not be overestimated. Still, the study of ceramics makes it possible to continue asking questions about what happened in eastern Finland in the beginning of the Early Metal Period and in which way the culture seems to have changed in the light of contemporary research. Therefore the main emphasis of this work still is in separating Textile ceramics from other ceramic types and investigating whether subtypes can be separated in it. The observations concerning ceramic typology, chronology and chorology have to be explained in some way. For this purpose also other archaeological and other kinds of scientific information is valuable. Understanding and explaining Textile ceramics raises new questions, some of which are briefly discussed here.

10.2.2. Material objects related to Textile ceramics

The last five chapters present some viewpoints of the period defined on the basis of Textile ceramics. This period is not equivalent with the concept Early Metal Period and even less so with the concept Bronze Age, although the appearance of Textile ceramics has traditionally been considered one of the central features indicating the beginning of the Early Metal Period. Because textile-impression exists in many ceramic types before and after the using period of Textile ceramics, it cannot be accepted either as a simple chronological or as a typological sign. Textile ceramics as a type still represents a chronological period coarsely between 1800 calBC and the beginning of our era. Despite several typological and archaeological problems, it still has a relatively clear geographical distribution area in southern, eastern and northern Finland. The distribution area is clearly inland and so far a smaller number of dwelling sites have been found in the coastal zone than inland.

A typological analysis shows that usually Textile ceramics can be easily separated from other more or less contemporary ceramic groups of the Early Metal Period and the Bronze Age and that Textile ceramics can be further divided into typological and geographical subgroups. Still, this study is not only a typological and chronological investigation but it also elucidates Textile ceramics from several other viewpoints. Textile ceramics is an important implement type elucidating the populations and individuals that lived during the period of its use. This study begins with the assumption that the difference and similarity of ceramic sherds can be applied when interpreting the nature and degree of communication between populations and individuals, but it remains on a weak basis without any further evidence. Because researchers today have only material remains at their disposal, a lot of assumptions are needed in order to arrive at these results. The following five premises elucidate a part of these background assumptions. In addition to these, also premises and statements presented in part 10.1. are used in the interpretation.

1. The more common features there are in ceramics, the closer is also the typological distance between vessels. The number of common technological features, shape and ornamentation in vessels – the taxonomic distance between ceramic vessels – is in complex relation to the distance of styles and traditions.
2. The more common attributes there are in ceramic vessels and the more ceramic sherds resemble each other, the closer is also the relationship between potters.
3. Ceramic styles are chronologically and geographically in relation to populations. The differences in ceramics between chronologically and geographically close groups are smaller than between chronologically and geographically distant groups.
4. The more ceramics there exists in a dwelling site, the more intensively the site was inhabited – either during a long chronological period or intensively during a short period. The number of vessels or their fragments in the dwelling site reflects the number of people who lived there.
5. The unusual attributes in ceramics represent a discontinuity in tradition. The discontinuity reflects either autochthonous changes in the tradition or some outer influence on it. Changes in a ceramic tradition are in relation to changes in relationships between individuals and populations.

The first premise states the fundamental philosophy of this study. The comparison is based on attributes in ceramics. Ornamentation has a special status when discussing detailed differences between vessels, because it is in a close relationship with the individual who made the ceramics.

The second premise assumes a relationship between ceramics and potters and also between ceramic types and populations. In theory, vessels made by one potter resemble each other more than those made by different potters. If the vessels are identical, the premise says that the same individual made them. This principle functions both in time and place: the greater the chronological difference between ceramics, the greater is also the dissimilarity between vessels. The same holds true with distance: the greater the geographical distance, the greater the dissimilarity. According to the third premise, style is closely connected with a population. Populations have a tradition of making ceramics in a certain style. It is still important to remember that a style or tradition of making ceramics has necessarily nothing to do with populations. The basic hypothesis still is that populations living close to each other have more in common in a ceramic style than populations living far from each other.

The fourth premise assumes that ceramics reflects habitation activity in the site. A hidden assumption behind this is that all populations used ceramics mainly in a similar way. This assumption rests on a weak basis (Simola 2000), because the need for ceramics may have been essentially different in different populations. Therefore the amount of material is only a rough denominator of habitation activity or population density.

The fifth premise tries to discover continuity or discontinuity in the material. Usually archaeologists observe discontinuity, which does not, without further information and additional hypotheses, give the reasons for it. Interpretation is based on explaining phenomena on general principles or – in the most favourable case – in law-like postulates (Watson *et al.* 1984; Salmon 1982). Interpretation can also be contextual and cognitive and try to understand prehistory by building a coherent view of the observed phenomena by using a large variety of methods, ethnoarchaeological analogy, historical material etc. (Hodder 1982a; 1982b; 1985; 1986; Shanks & Tilley 1992; Olsen 1997).

Justifiable criticism can be directed to all of these principles. They all represent inductive reasoning implying, not only those hidden assumptions mentioned before, but even more of them. The lack of directly observable and verifiable information easily makes many branches of archaeology more an art than a serious science. Also those archaeologists, who explain phenomena as an interaction between man and nature, make many assumptions and the constructed theories often prove difficult to verify. It is always essential to ask, whether or how much these observable regularities explain the questions we are interested in.

This study takes into consideration also, as a factor influencing the prehistory, the human being and his decisions, although conditions in nature may also have influenced his decisions considerably. The conclusion in the last chapter is all interpretation, which suggests different possible alternatives when trying to understand different phenomena, continuity, discontinuity, similarities and differences between prehistoric remains of the Early Metal Period in Finland and the Karelian Isthmus.

10.2.3. Communication through sherds

Ceramics and metal implements are the most applicable artefact groups in making detailed observations of the changes during the Early Metal Period in Finland and the Karelian Isthmus. Although the spread of metal in the form of copper and bronze implements is an even more visible phenomenon than ceramics and although studying metal objects gives possibilities to study large-

scale cultural relationships, the benefit of ceramics is that it makes it possible to approach populations and individuals in a more detailed way. The ceramic material is large and it is found in different contexts. It implies a large diversity of attributes through which ceramics can have a geographical and chronological correlation. Typology can also be correlated with the study of style, which opens many possibilities for making interpretations of individuals and their social relationships.

In the following an interpretation of the ceramic groups separated from the Late Neolithic and the Early Metal Period material in Finland and the Karelian Isthmus is presented. These types should not be seen as equal to ethnic groups or even populations. The author's opinion is that they may have a correlation with different populations but that there are also other possibilities to explain their existence.

Corded Ware. The emergence of Corded Ware is traditionally interpreted as a sign of an abrupt change in the Late Neolithic coastal culture. Its emergence has been explained by referring to the migration of a new population into the coastal area from the southern and western sides of the Baltic Sea. This interpretation is natural, because it is not possible to find the prototypes of this ceramics in Finnish Neolithic ceramics. Recently the role of immigration has not been seen to be as important as earlier (Luoto 1987; Lang 1998; Carpelan 1999); still Corded Ware has influenced considerably the development of Finnish Late Neolithic ceramics.

Of central importance is the possible connection, which may have conveyed textile-impression to the Textile ceramics of the Sarsa type. The connection was necessarily not straightforward, but it may have taken place through a mediator, which Christian Carpelan (1979; 1992) has named Middle-zone ceramics. It is interesting that both in Finland and in Estonia there exists Corded Ware with textile-impressed surfaces. This seldom exists and no direct links should be postulated between Corded Ware and Sarsa ceramics. It is still possible that Corded Ware populations brought textile-impression to Finland from Estonia.

Kiukainen ceramics. Textile-impression has an important role in Kiukainen ceramics referring to the possibility that it may, in turn, have influenced the development of Textile ceramics in Finland. Kiukainen ceramics is a type, in which two subgroups have sometimes been separated – one representing the proper Kiukainen ceramics and the other Late East Baltic Corded Ware with textile-impression and an ornamentation, which has much in common with Sarsa ceramics (Carpelan 1992). The most important link between these groups is a corded-impression, which much resembles a comb stamp. These stamps are either right or left inclined zones in horizontal zones or both[1]. It seems that it is just this ornamentation that typologically connects Kiukainen and Sarsa ceramics and that the models of ornamentation in Sarsa ceramics can be found also in Kiukainen ceramics. Still this connection is all but clear, and no straightforward development of Sarsa ceramics from Kiukainen ceramics is possible to conclude.

Middle-zone ceramics. Middle-zone ceramics has not been defined in a detailed way so far and therefore distinguishing it typologically from Sarsa-Tomitsa ceramics is not easy. It is still important to take into consideration what Carpelan has said about its position as a mediative link between East Baltic Textile ceramics and Sarsa ceramics. It has been considered partly synchronous with Kiukainen ceramics. In Middle-zone ceramics there exists textile-impression and hatching and the walls are profiled. Ornamentation is always rather insignificant. Small pits, which form an irregular horizontal zone in the upper part of the vessel, is a distinctive element of the type. According to Carpelan (1979:14–15; 1992) this type exists in the dwelling sites from Satakunta to Viipuri, Häyrynmäki[2]. It is enough to say here that the connection between East Baltic Late Corded Ware and Early Textile ceramics may exist but its influence or the routes to Finnish Sarsa ceramics have not been clarified yet.

Bronze Age ceramics. In Finland three types of Bronze Age ceramics have been separated: Coarse and Fine Ware in the mainland and Rusticated ceramics in Ahvenanmaa. Unto Salo calls a part of Coarse ceramics Paimio ceramics (Salo 1984:154–155) and C. F. Meinander calls Fine Ware Fine Lausitz-influenced ceramics (Meinander 1954b:176–178). In Ahvenanmaa Rusticated pottery is central (Gustavsson 1997:67–69). However, it has not had much influence on Bronze Age ceramics on the mainland. It is conspicuous that Bronze Age ceramics and Textile ceramics seem to have little in common. Bronze Age ceramics does not have textile-impression; a feature, which separates it also from Kiukainen ceramics. This can be explained by its foreign origin. It is still worth to note that factor analysis did not unambiguously separated Bronze Age ceramics from Textile ceramics. Bronze Age ceramics (Paimio type) proved to be more homogeneous involving less variation than Textile ceramics (Sarsa type). More simple ornamentation and more homogeneous characteristics in technological variables in Bronze Age ceramics may explain differences between these two types (traditions).

Meinander (1954b) and Carpelan have proposed that the Western Bronze culture in Finland has its origin in small groups of men coming from Scandinavia to Finland for trade during the II period of the Scandinavian Bronze Age (Carpelan 1982a:272–273). These traders came into close contact with the local population of the Kiukainen culture and assimilation soon took place

[1] Examples of this kind of ornamentation were presented by C.F. Meinander (1954a: 59, table 28, fig.a; 65, table 31, fig. a, b, f).

[2] Examples of this kind of ornamentation were published by C. F. Meinander (1954b:table 28l and table 30a, i). This kind of ceramics can also be found in Estonia (Jaanits 1959:151–167, tables XXVI–XXIX) and Latvia (Latvias PSR arheologija 1974:84–85, tables 24–25).

(Carpelan 1982a:273–274). Although some features of culture refer to assimilation, some others – such as ceramics – changed essentially. It is remarkable that textile-impression of Kiukainen ceramics did not spread into Bronze Age ceramics. The absence of textile-impression in Bronze Age ceramics could be explained with the abrupt change in tradition as a result of the influence of traders.

The first evidence of the beginning of agriculture in southwestern Finland dates to the transition period from the Late Neolithic ca. 2000 (ca. 2300 calBC) to the Bronze Age, 1500 BC (Vuorela & Hicks 1996:249). In southern and southeastern Finland cereal cultivation dates later: in the western part of the region and the Karelian Isthmus it is dated to between 1000–1 BC (Vuorela & Hicks 1996:248), which is well in accordance with the emergence of the Western Bronze Age culture on the southwestern coast of Finland.

In its general characteristics Textile ceramics in Finland represents a mobile hunter-gatherer population, which conducted agriculture only sporadically. Therefore, the sedentary coastal Bronze Age culture with its hut floor basins, agriculture and animal husbandry gives an impression of a different economy and culture. Also this shows that these cultures probably had not much in common and that contacts were only sporadic.

Sarsa ceramics. More than eastern ones, western and southern contacts are emphasised in Textile ceramics of the Sarsa type. Its textile-impression probably has its origin in Estonian Corded Ware. Textile-impression came into use during the Kiukainen culture and Middle-zone ceramics. The distribution area of Sarsa ceramics is mostly in Häme and southern Saimaa, which more or less follows the distribution area of Meinander's Sarsa-Tomitsa ceramics (Meinander 1954b:Abb. 96, Carpelan 1979:14–15).

Another possibility is that the inspiration for the use of Sarsa ceramics spread into Häme and southern Saimaa from the eastern direction. This may have been possible, but in the light of recent archaeological evidence it is difficult to prove. More datings are needed, particularly on the Russian side, where so far no AMS-datings and only a few conventional datings are available from the earliest phase of Textile ceramics.

Tomitsa ceramics. Tomitsa ceramics is known in the northern part of the Ancient Lake Saimaa area, a dwelling site of Varaslampi at Joensuu being one its most important find places so far. Tomitsa ceramics has its roots in the east. Almost parallel material can be found in the southern part of Lake Säämäjärvi (Kosmenko 1980). Still the Finnish material, particularly in northern Karelia, can easily be separated from the ceramics in Karelian Republic by factor analysis.

The number of dwelling sites in eastern Finland involving Tomitsa ceramics is not large and the number of vessels found in these sites has been small so far. This makes the chorology of the ceramic type problematic. It is evident that small amount of Textile ceramics for comparison in most sites affect on results. Instead, the large material at the dwelling site of Varaslampi is an excaption which emphasises the homogeneity of the type perhaps too much. Tomitsa ceramics is mostly concentrated on the northern part of the Saimaa Water System. Tomitsa ceramics exists also in Kainuu, although the predominant type there is another subtype of Textile ceramics, Kainuu ceramics. Typologically Tomitsa ceramics represents the fully developed phase of Textile ceramics in Finland. Both the Sarsa and the Kainuu types were in use already relatively early in the middle of the 2nd millennium calBC. Tomitsa ceramics in eastern Saimaa area did not come into use until probably 1200 calBC. The ornamentation gives an impression of more careful ornamentation than in the two other subtypes. One should not forget either that the typological distance between Sarsa and Tomitsa is greater than between Tomitsa and Kainuu ceramics.

Kainuu ceramics. Kainuu ceramics came into use already during the first quarter of the 2nd millennium calBC. Parallels can be found particularly in the northwestern part of the Karelian Republic (Kosmenko 1982b) and also in the area of the Saimaa Water System. Kainuu ceramics have some features, which discern it from the other ones; one of these is the use of asbestos for tempering and also ornamentation has its characteristic traits. There are many characteristics, which bring Kainuu ceramics close to the Tomitsa type and thus it is possible to include it into the Tomitsa type as a subtype. One should still not forget the heterogeneous nature of Kainuu ceramics. This can be explained in many ways. It can reflect the area as a furnace of different ceramic types, but the diversity can also result from the fact that the material comes from many different sites dating to a long period of use.

Textile ceramics plays an important role in the prehistory of Kainuu and the amount of it is prominent in relation to the Stone Age types. A sudden increase of Textile ceramics gives an impression of a rapid change of culture in the beginning of the Early Metal Period. This change is also connected with the spread of bronze implements and casting moulds made of local raw materials.

Both of the northern subtypes of Textile ceramics – the Kainuu and the Tomitsa types – have an evident typological relationship with the subtypes of Säräisniemi 2 ceramics. A very close relationship between Textile ceramics and Anttila ceramics can be seen in the dwelling sites of Nimisjärvi in Vaala. It seems evident that the prototype of the subtypes of Säräisniemi 2 ceramics is in Textile ceramics.

Kalmistonmäki ceramics. The position of Kalmistonmäki ceramics in the development of the Early Metal Period ceramic types has remained unclear, because its separation on the basis of the typological and archaeological evidence Meinander presents is not convincing. Meinander (1954b) used also the concept Kalmistonmäki-Böle-Asva complex for the last phase of the development of Textile ceramics in southern Finland. The main problem is that the amount of ceramics, which can without typological discussions be connected, with Kalmistonmäki ceramics, is small. New material has not

been found in the Karelian Isthmus since World War II. In the dwelling site complex of Böle at Porvoo excavations were recently conducted, but Strandberg did not separate Kalmistonmäki ceramics from this material (Strandberg, pers. comm.). According to my own observations, Late Bronze Age or Pre-Roman Iron Age ceramics is mostly Morby ceramics. Further, Asva ceramics differs clearly from the criteria of Kalmistonmäki ceramics presented by Meinander. On the basis of the material in Kalmistonmäki in Räisälä Meinander (1969) separated the Kalmistonmäki population. Although it is evident that there existed people who made late Textile ceramics in southern Finland and the Karelian Isthmus, Meinander's reasoning is on a weak basis.

Morby ceramics continues the tradition of the Western Bronze culture. Also Morby ceramics has remained without typological studies since Meinander (1969). Still, several archaeologists have pointed out that the most characteristic feature of Morby ceramics, the cat's paw ornament, together with Meinander's subdivision, is not a satisfactory criterion for the type (Carpelan 1980:189; Edgren 1969:22–26; 1999b:313–317). The definition of Morby ceramics needs new typological studies and its separation from other Epineolithic ceramics has to be conducted. Morby ceramics has hatching on its surface. The scant ornamentation was been made using pits and sometimes also long comb stamps.[3] Horizontal and vertical drawn impressions are typical. The general impression is that the decoration is careless. Paste is brittle.

Anttila ceramics. Comparing Textile ceramics with the subgroups of Sär 2 ceramics reveals important similarities and differences. In the same way that Textile ceramics is a name for a relatively heterogeneous complex involving ceramics from a large geographical area, also Sär 2 ceramics represents more a complex than a homogeneous type.

Of all of the subtypes of the Sär 2 complex, Anttila ceramics, the use of which began ca. 1000 calBC, comes typologically and chronologically closest to Textile ceramics. In general, it differs clearly from Textile ceramics, but in certain dwelling sites, their typological separation is difficult. Anttila ceramics is almost always tempered with talc or soapstone, but it never has textile-impression. The ornamentation is exceptionally horizontal, the most characteristic element being a wide furrow drawn with a finger or a wooden spatula. Profiling is never strong.

The distribution area of Anttila ceramics corresponds largely with Textile ceramics in Kainuu. Still, one cannot draw the conclusion that it would be an immediate follower of Kainuu ceramics, because it seems that both types have also been in use contemporarily. The simplest interpretation speaks of two partly simultaneous groups of potters. Another possibility is that particularly in Kainuu Textile ceramics developed into Anttila ceramics so that there existed only one and the same population which developed new charactersistics to the ceramic tradition. The model of two populations is possible but not necessary to postulate.

Luukonsaari ceramics. Luukonsaari ceramics is easy to distinguish from Textile ceramics and other subtypes of Sär 2 ceramics. According to Carpelan (1999:kuva 8) it is synchronous with Anttila type. It is practically always tempered with asbestos. The surface is most often smooth and textile-impression never occurs. The most important special ornament is a horizontal zone drawn with a short comb stamp together with small pits.

The main distribution area of Luukonsaari ceramics is in eastern Finland, particularly in the Saimaa Water System. Although the distribution areas of Luukonsaari and Tomitsa ceramics overlap to a certain degree, their overlapping is not as evident as with Anttila and Kainuu ceramics. Also in this case it can be postulated that Luukonsaari ceramics is the follower of Tomitsa ceramics. Still the same reservation must be remembered as with the Kainuu and the Anttila types: it seems possible that also they were partly synchronous.

Sirnihta ceramics. In the Saimaa area, on the island of Sirnihta in Kesälahti, there exists ceramics, which Carpelan separated from the Sär 2 family. He presented the type in his lectures (1992), but he has not published its definition so far. On the basis of contemporary information, Sirnihta ceramics is dated to the period from 1000 calBC to the middle of I millennium calBC (Carpelan 1999:kuva 8). Because the number of Sirnihta ceramics known so far is relatively small, its cultural-historical position cannot be discussed here. It is essential that it comes chronologically and chorologically close to the Luukonsaari ceramics, but typologically it is closest to the Kjelmøy type.

Kjelmøy ceramics. Kjelmøy ceramics also has much in common with Textile ceramics. Ornamentation involves pits and comb stamps. Kjelmøy ceramics is perhaps typologically more heterogeneous than the other Sär 2 groups. This can be considered as a suggestive idea only, because this study includes only a small part of the known Finnish Kjelmøy ceramics.

Both typologically and in its geographical distribution, Kjelmøy ceramics remains more distant to Textile ceramics than the Anttila and the Luukonsaari types. Textile ceramics may have influenced the formation of Kjelmøy ceramics, but its connection with Lovozero ceramics is more important, however. This can be seen illustratively in the material found in the dwelling sites of the River Kemijoki.

Lovozero ceramics. Although Textile ceramics and Lovozero ceramics are almost synchronous, it still seems that they do not have much in common. The distribution area of Lovozero ceramics is in the Kemijoki Water System and in Swedish and Norwegian Lapland. It seldom occurs in Kainuu or even in southern areas. The

[3] The classical Morby ornamentation was carried out with a cat's paw ornament and small, shallow pits in irregular zones (Meinander 1954b:table 27; Meinander 1969:fig. 9). The more regular ornamentation exists in Nousiainen Koivumäki, where the horizontal zone of ornaments was made with some kind of cord-impressions (Edgren 1993:154–155).

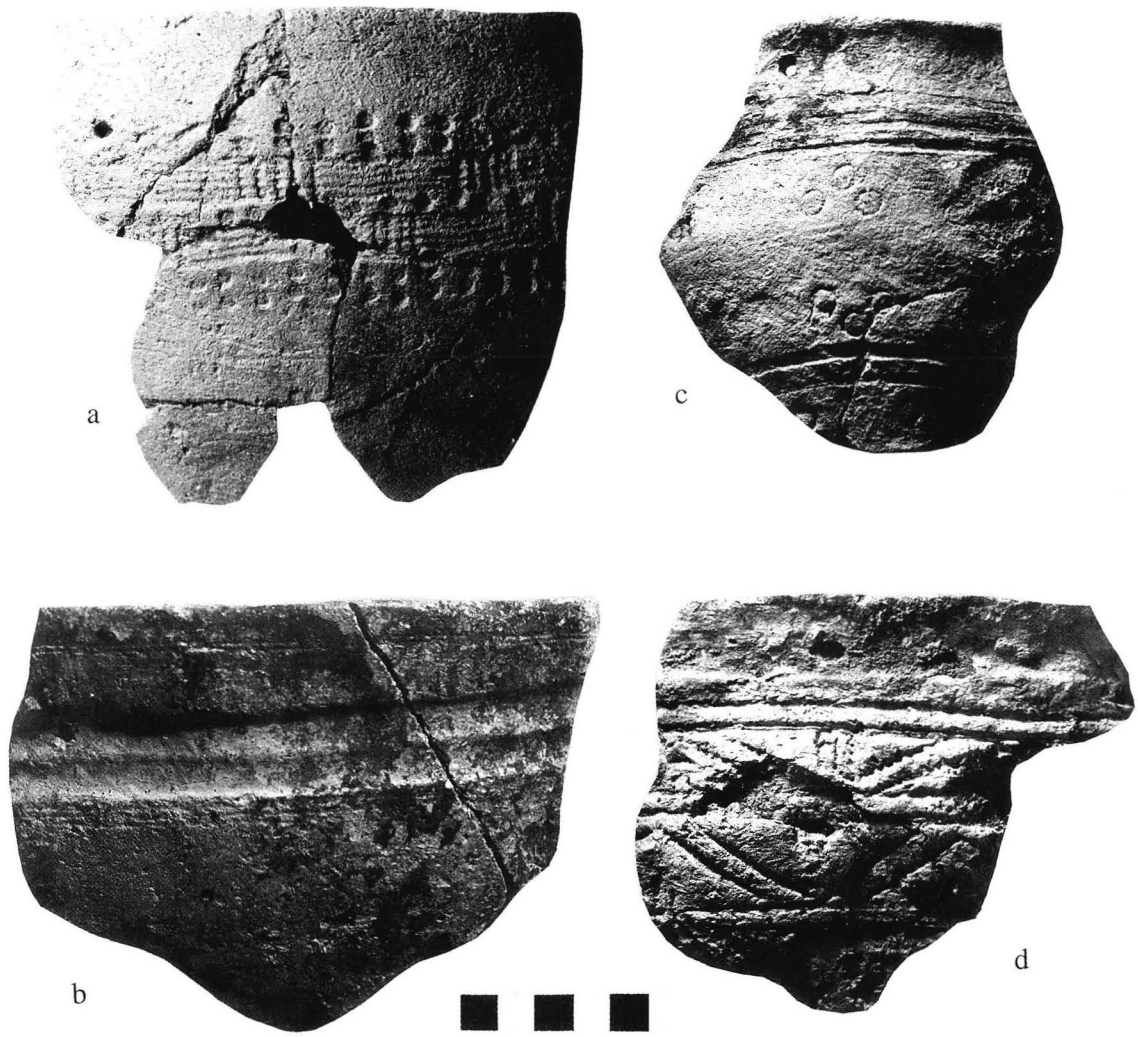

Fig. 10.5. Examples of Sär 2 ceramics in Finland. Luukonsaari in Kuopio (a – NM 16492:1), Kalmosärkkä in Suomussalmi (b – NM 20414:25), Sirnihta in Kesälahti (c – NM 16910:263, d – 16910:277). Photo: Mika Lavento.

opposite can be said of the distribution area of Textile ceramics, which is practically to the south of the Kemijoki Water System.

The ornamentation in Lovozero ceramics is very simple and it implies no textile-impression. The origin of Lovozero ceramics is difficult to explain. It is possible that it developed as a result of the influence of Textile ceramics although many of its characteristics differ much from it (Carpelan 1999:270). It is still evident that it has more in common with textile-impressed ceramics in northern Scandinavia.

IT ceramics. IT ceramics represents also a northern ceramic group, which does not have much in common with Textile ceramics. The waffle-like textile-impression differs essentially from the ones in proper Textile ceramics. Except for this it does not have any decoration. Carpelan (1999:273) considers IT ceramics synchronous with Textile ceramics. The origin of IT ceramics has much in common with the Lovozero type. IT ceramics has been found very seldom in Kainuu or more southerly areas.

10.2.3.1. Interpretation of the ceramic network

By virtue of the results presented earlier, tree-figures can be constructed, which illustrate the typological relationship of the Early Metal Period ceramics in Finland. Three large geographical areas can be separated: East Finland, Lapland and South and Southwest Finland. The assumed directions of influence illustrate the development of the Sär 2 types from Textile ceramics (Fig. 10.6.).

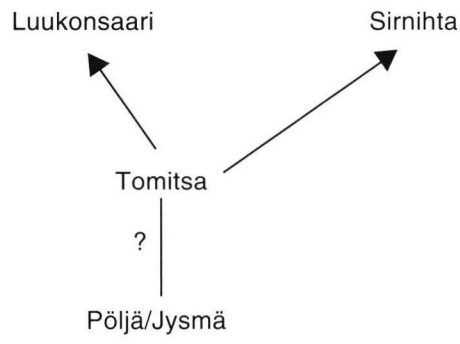

Fig. 10.6. A suggestion for the development of ceramic types from the Late Neolithic to the Early Metal Period in Eastern Finland.

In the light of contemporary dating information it seems probable that both Luukonsaari and Sirnihta ceramics are roughly synchronous. They both have developed from Textile ceramics of the Tomitsa type. It is also probable that these types were partly synchronous with Textile ceramics during their earlier using period. The position of Pöljä and Jysmä ceramics is unclear. Although they may sometimes involve textile-impression, it is still not very likely that their origin could be found in these types. In Kainuu and Lapland the sequence is slightly more complicated (Fig. 10.7.).

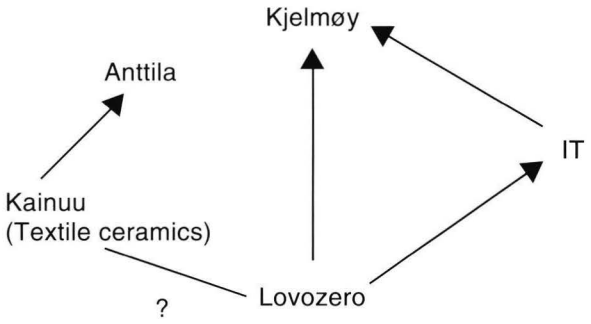

Fig. 10.7. A suggestion for the development of ceramic types from the Late Neolithic to the Early Metal Period in Kainuu and Lapland.

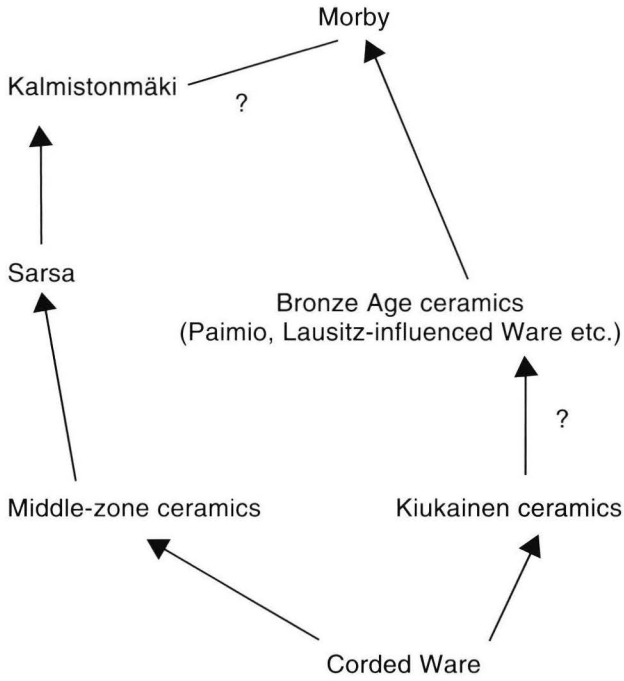

Fig. 10.8. A suggestion for the development of ceramic types from the Late Neolithic to the Early Metal Period in Southern Finland and the Karelian Isthmus.

The relationship between Lovozero ceramics and Textile ceramics has not been clarified much in this study. Lovozero ceramics is rare in Kainuu but common along the Kemijoki Water System. A relationship between them is still possible, although it is difficult to show it in the light of the contemporary ceramic material. Even more problematical is the relationship between Textile and IT ceramics. Sometimes, and from a large perspective, IT ceramics is seen as a subgroup of Textile ceramics (Kosmenko 1991a). In this study IT ceramics is considered as a group of its own and little connection is assumed to have existed between these groups in Finland.

A close relationship between Textile ceramics of the Kainuu type and Anttila ceramics seems evident. It is assumed here that Anttila ceramics developed in Kainuu under the influence of Textile ceramics of the Kainuu type. Textile ceramics may have influenced also Kjelmøy ceramics although this connection remains problematic.

Knud Odner has presented that Early Metal Period asbestos ceramics represents "et taust tegnsystem – anlogt til de senare samiske hus-arrangementene – som signaliserte grunnleggende verdier om autonomi og inkludering i et stort moralsk fellesskap"(Odner 1992:102). It is a tradition, which represents ethnicity in an important way (Odner 1992:102). Odner's view of the role of asbestos ceramics leaves a lot of applicable information on styles inside asbestos ceramics unobserved. The distribution of Early Metal Period asbestos ceramics is still probably a larger phenomenon than the later Saami identity. In South and Southwest Finland the following graphical presentation can be constructed of the development of Bronze Age and Early Metal Period ceramics (Fig. 10.8.).

The figure shows the relationship and directions of the assumed influence between two lines: the coastal groups from Kiukainen ceramics and the inland group, where Middle-zone ceramics may have been central. The roots of Sarsa ceramics are seen in Corded Ware, because the earliest textile-impressions can be found in this type. Also in some dwelling sites on the southern coast of Finland, both Corded Ware and Textile ceramics occur together. The chronological distance between these cannot be great, which means that there might have even been direct links between late Corded Ware and Textile ceramics. This influence may also have been mediated through Middle-zone ceramics. The relationship between Sarsa and Bronze Age ceramics remains a problem so far; in the light of contemporary data these two types have not very much in common.

The typological and cultural-historical position of Kalmistonmäki (or Kalmistonmäki-Böle-Asva complex) has not been much discussed since Meinander. He stated that it represented a period of cultural contacts between Estonia and Finland. Ceramic typology does not strongly support these contacts although they are naturally possible. At least Asva ceramics differs clearly from the Finnish Morby type or the Kalmistonmäki type, although it has some points in common with them.

In southern Finland Sarsa ceramics may have also been followed directly by Morby ceramics or Epineolithic ceramics, which has not been defined more exactly so far. In some cases it is difficult to discern Sarsa and Morby ceramics from each other. It is even more difficult to make a distinction between Morby and

Epineolithic ceramics. The relationship between Bronze Age ceramics and Morby ceramics was evidently closer than the connection between the Kalmistonmäki and the Morby types.

The question of the relationship between the subgroups of Finnish Textile ceramics is the final problem. According to the results presented above, there is a close typological connection between all these subgroups when considering the features of technology, shape and ornamentation. Still it seems probable that the influences came from many different directions partly synchronously and partly during different periods. One should consider Textile ceramics in Finland not as a coherent typological group, but as a complex where influences from different directions merged together.

When discussing the possibility of transporting ceramic vessels, many archaeologists have come to the conclusion that Neolithic vessels were made and used in sites, because of their large size, weight and fragility (Edgren 1982:58-59; Nunez 1990:35–36; Huurre 1998:228–229). Although vessels of Textile ceramics were smaller, their transportation over long distances is not probable, which excludes the idea of the long-distance trade of ceramics. The basic assumption is that individuals changed places instead of vessels.

10.2.4. Communication through metals

As an introduction to the manner of seeing cultural relationships in Finnish archaeology, A. M. Tallgren's views (1934a) of why metal objects are found in Finland can be mentioned:

> "Tarkoitan yhteyttä, joka ulotti metallikauppaa Uralilta käsin länteen. Sen vaikutus ilmenee mm. valinlöydöissä ja puolivalmiina itävenäläisinä pronssiesineinä, joita on löydetty Suomesta, sekä Kannakselta – Räisälä – että Pohjois-Suomesta – Säräisniemi, Muhos, Ylitornio, Kemi, Kuolajärvi – Pohjois-Ruotsista ja kenties Norjan Ruijasta. Kyseessä ei varmaankaan ole säännöllinen suurkauppa. Löytöpaikkojen luonne ja esineitten laatu näyttää mieluummin osoittavan, että asia on selvitettävä kulttuurikosketusten kautta: alemmalla kehitystasolla elävät luoteisen Pohjois-Euroopan asukkaat, ehkä arktikot, ovat saaneet vaikutuksia Itä-Venäjän rikkaasta pronssikeskuksesta, ehkäpä useitten välikäsien kautta, ja jossain määrin omaksuneet sikäläisiä saavutuksia aineellisen kulttuurin alalla, samalla kuin sosiaalinen tila, joka oleellisesti perustui anastaviin elinkeinoihin, pysyi muuttumatta. Ehkäpä poronomadismilla oli tässä itään suuntautuvassa yhteydessä jokin osuutensa, varmasti myös ikivanhalla ja perityllä kulttuuriyhteydellä Pohjois- ja Sisä-Venäjälle Uralia myöten. Se yhteys on kai ollut myös eräänlainen etnillinen: sukulaissuhde arktikkojen ja Itä-Venajän pronssikauden luojien välillä oli ilmeisesti läheisempi kuin skandinavien ja molempien viimiksimainittujen välillä."(Tallgren 1934a:20–21.)

Although written some 70 years ago, some of Tallgren's assumptions still live in archaeologists' hypotheses. Tallgren used metal objects as a denominator of the cultural relationship in the large area in the Boreal Forest in northeastern and northern Europe. Several hidden assumptions can be read in this argumentation: 1) Metal came to Finland and northern Russia via primitive commercial contacts, not by regular, organised or hierarchical trade. 2) Metal spread to northwestern and northern Europe through diffusion – from more advanced cultures to arctic populations. 3) There were ethnic and perhaps even genetic relations between the arctic populations in northern Scandinavia and the "creators of the East Russian Bronze Culture" in the large area of the Boreal Forest. These relations spread influences and also metals in this area. 4) Finally, Tallgren did not speak about the migration of populations during the Early Metal Period.

Essential in this argumentation is that Tallgren used concepts such as "yhteys" (connection), "kulttuurikosketus" (cultural contact) or "vaikutus" (influence), which do not take a stand in the nature of contacts between populations or individuals. These concepts are in use still today (Huurre 1998; Carpelan 1999). At least two explanations can be presented for this. It shows illustratively how difficult it is to find new explanations for phenomena, although the amount of material – particularly find types other than metal implements – has essentially increased. It also shows that not much emphasis has been put on interpretation and developing models for interpretation. Therefore one could end up with the conclusion that not much has changed since Tallgren's days in the interpretation of Early Metal Period populations in Finland.

The concepts mentioned earlier are here replaced by the concept of communication, which is, at first sight, as diffuse as the ones presented before. The difference is that the concept of communication sees phenomena between individuals and populations in a more concrete way. Communication is a human act between individuals – an interchange of thoughts and information. It means an active operation, where individuals play an essential role.

In archaeology communication is interpreted through material objects. From the researcher's point of view it is realised through common elementary signs in the material in different areas. Communication can have taken place between two areas – or even as an intrasite phenomenon – if an archaeologist is able to find implements, which resemble each other enough. An archaeologist makes an assumption that common observed features or attributes are signs of operation of individuals. In principle, a close relationship between individuals explains the existence of archaeological find types and ceramic styles.

The sign of communication between different traditions and populations can also be a new element, which was not present before. Still, this remains only an observation until archaeologists can explain how and through which routes an element or an implement came to the site.

10.2.5. Exchange and trade

Two general assumptions have been presented about the Early Metal Period exchange in Finland. The first states that exchange or even trade took place, but its practical

forms are unclear. The second assumption explains exchange by referring to traders, a small group of men, who carried out their activities in a large area in the Boreal Zone of Russia and Fennoscandia (Carpelan 1982a; 1999). In the following, attention is paid to possible direct commercial contacts between populations.

Using the concept exchange instead of trade is more plausible, because money was not in use: exchange took place by exchanging goods. The actual process was very probably not simple, but implied a lot of norms and traditions. Although primitive societies have often been considered egalitarian, it is evident that there were individuals who organised and took care of the reciprocal relationships with other populations. Individuals were responsible for exchange relations and one does not need to hypothesise any centralised organisations between populations. The goods themselves were not necessarily the main interest of exchange but the main motive was to keep up relations or *status quo* between other populations. Valuable objects were gifts without a considerable functional value.

In his classical book "Stone Age Economics" Marshall Sahlins (1972) presents three main types of exchange. The *generalized reciprocity* refers to altruistic sharing, hospitality, help or even a free gift. This kind of reciprocity can actualise between near kinsmen or between "loved ones". The second type, *balanced reciprocity*, refers to direct exchange, gift-exchange, buying-selling or a less personal type of exchange. The third type, *negative reciprocity*, tries to maximise utility at the other's expense. It is impersonal and unsocial, gambling or even theft. (Sahlins 1972:193–195.)

Kinship has always played a central role in hunter-gatherer populations, where only a few hierarchical factors affect social relations. Individuals of a small population cannot behave according to negative reciprocity because they live too close to their relatives. Strict moral rules control kinship relations. When exchange takes place between neighbouring populations it is based mainly on kinship relations between individuals. When the distance increases, the probability of a kinship relation decreases. This means that the personal, reciprocal nature of exchange does not function in the same way any more, which gives possibilities for traders who are in a new area for the first time.

Colin Renfrew has presented four exchange models for the Neolithic populations in the area around the eastern Mediterranean Sea. The Finnish archaeologist Jukka Vuorinen (1982) used these models in explaining how flint was obtained in Finland during the Stone Age and the Early Metal Period.

Renfrew's models describe mechanisms of trade during the Aegean Bronze Age, from the end of the 3rd millennium BC to about 1200 BC. The first model, (I) *down-the-line exchange* suits best raw materials, such as obsidian. Renfrew's definition says that the percentage of obsidian decreases when the distance from the source area increases (Renfrew 1972:465). This means that up to 200–300 km from the source area, the amount of obsidian is still very high. When the distance increases its fall-off is rapid (Renfrew 1972:Fig. 20.9). Obsidian was obtained only from the island of Melos.

(II) *The prestige chain* explains the transfer of ceremonial or valuable objects: 1) only specific notable persons in the community can have these objects, 2) the prestige goods are frequently changed by exchange, 3) they are not used in daily life, and 4) they are often found in burials, but find contexts refer also to the possibility that they were lost. Sometimes the objects may have been left where they were broken (Renfrew 1972:467). Prestige objects were usually gifts, which had different purposes ranging from personal needs to securing friendships between neighbouring communities. An example of a special gift is amber, which has come to the Aegean Sea area from the Baltic Sea (Clark 1952:263).

(III) *Freelance commercial trade* takes place in a very large area through middlemen or intermediaries. According to Renfrew: 1) goods of this trade are usually not objects of high prestige, 2) merchants are freelancers, 3) profitable exchange is the primary motivation, and 4) goods are often very widely found (Renfrew 1972:469). The freelance trade needs no personal relations between merchants and buyers. Merchants are not necessarily producers or masters, who quarried the materials or made the goods, either.

(IV) *Directional commercial trade* is the case where goods are transferred from the source area to a specific destination, usually through a specific route. This kind of trade can be generalised by stating that 1) goods are primarily raw materials, 2) trade is organised on a regular basis, and 3) source areas or sites are well provided with goods (Renfrew 1972:470–471). Caravans have typically carried out this kind of trade. It is also worth noting that distances between the source area and the destination are often very great. The starting point is a commercial relationship between two parties.

In the same way as in the Aegean area, also in Finnish prehistory periods can be shown during which the amount of goods of a non-local origin markedly rose. Typical Combed Ware represents this kind of peak of prosperity. During this period also the amount of flint increased which has been explained by referring to flint import and trade (Vuorinen 1982). Vuorinen explained the import using Renfrew's models, particularly the prestige chain and directional commercial trade. Vuorinen (1982) presents that it might also have been possible to use the model of freelance commercial trade in explaining the exchange of goods during the Stone Age in Finland.

10.2.5.1. Models of exchange from the Ural Mountains to Fennoscandia during Textile ceramics

The discussion of exchange relations has not attracted much attention in Finnish archaeology. For instance, the explanations for how metal implements or raw material was obtained in Finland are often based on ideas that goods were paid for or exchanged for furs (Huurre 1979:92; 1983:240–241). Because evidence of this trade article has not been preserved, its actual role in primi-

tive exchange has remained obscure. One difficulty when discussing exchange in hunter-fisher societies is that goods have often been seen in a simple way and it has been argued that all items have a value, which can be calculated and compared with other items. According to this view, for instance a bronze axe may have a value of 50 pine marten skins. It must also be taken into consideration that bronze axes may not have been for sale and that only some members of the community had the possibility to obtain and use them. The means to obtain them may have also been very complicated and they may have changed markedly during the Early Metal Period. Different implements or objects were probably exchanged through different kinds of exchange mechanisms and therefore, different models are needed when modelling the ways of how different objects came to Finland. This becomes clear when comparing the prestige value of a bronze axe and asbestos raw material.

The beginning of the Early Metal Period inland and the Bronze Age culture in the coastal area of Finland has been interpreted as a revival of markets (Huurre 1983:241): not only the use of metal, but also major changes in burial traditions and in the nature of the dwelling sites refer to this.

Straight exchange connections mean that partners are more or less equal and that they know each other. This is possible either through kinship relations or generations-long relations between populations. Straight exchange can apply to highly valuable prestige goods and also to raw materials or utility objects, the prestige value of which is low. These goods are obtained through *down-the-line exchange*, through *freelance commercial trade*, or in *directional commercial trade* (Renfrew 1972:465–466). The exchange can function, even though resource areas are far away. Renfrew's models I and IV suit such situations, where raw material is easily available in the source area. Examples of this kind of raw material are flint and asbestos. The situation is different with copper and tin, which are not as easily available. This model suits even worse the understanding of the exchange of ready-made copper or bronze implements, such as axes, the casting and smithing of which needs mastering high technology. Although bronze axes may have also been utility objects for working wood or bone, their prestige value was still very high. It is even possible that they were not used for everyday work. It is natural that they did not come to Finland by direct commercial exchange, but through *the prestige chain* (see later).

Despite evident discrepancies, the models presented above are worth discussing when thinking about the exchange and the relations between the Early Metal Period populations in the large area from northern Scandinavia to the Ural Mountains. The following three hypotheses, developed on the basis of Sahlins (1972), Renfrew (1972), Vuorinen (1982) and Carpelan (1982a; 1999), model the exchange in this area.

1) Exchange of prestige goods. Ready-made metal objects or amber are examples of prestige objects, which may have played an important role in keeping up the social relations between individuals and populations. This type of exchange makes it possible to understand why strange and highly valuable implements moved very far from their original place of manufacture.

In Renfrew's systematics, prestige exchange corresponds to *the prestige chain*, which may have functioned particularly through the personal relationships of the leaders of populations. The objects of prestige exchange were often ceremonial, but their use in utilitarian connections is still not excluded. Inside the population, prestige objects were a sign of the status of their owner. Outside the population they were used for reciprocal exchange. The purpose of exchange was not to obtain goods but to attain other ends: to keep up good personal relationships and peaceful relations between different populations or to give gifts for other reasons.

Sahlins' (1972:193–195) types can be taken into discussion here. The first, *the generalized reciprocity*, refers to altruistic sharing or hospitality. This kind of reciprocity is possible between near kinsmen, who can, naturally, be members of different populations. Although exchanging goods may have sometimes occurred as an impersonal and unsocial gambling with unknown persons or populations, this was probably not usual.

In Finland the exchange of prestige goods probably functioned through ready-made, imported, status implements such as bronze axes. Because metal is extremely rare in Finnish bronze cultures, the position of these objects as prestige symbols was very high and thus it is probable that these objects were in circulation for many generations. Still they seem to have had some practical functions also, because only a minority of bronze axes in Finland and the Karelian Isthmus has been found in graves. In most cases the find contexts refer to accidental loss; this might indicate that they were too valuable to give to the deceased. Grave robbery should still not be excluded.

Exogamous relations between populations are probably reflected in the material also. Traditionally it has been assumed that ceramics was made by women (Äyräpää 1952a:23; Meinander 1961; Edgren 1982:70). If this is the case, it is first of all exogamy that influenced the spread of ceramic traditions in a large area. Due to their size and weight, ceramic vessels were hardly objects of exchange and it is more likely that potters moved instead of vessels.

Some characteristics in style and technological know-how may spread through brief contacts, such as the ceremonial exchange of gifts, which made it possible to copy new features. The exchange of women was probably even more influential. These kinds of exogamous relationships are difficult to verify, however, because identical or almost identical decoration in two distant sites can be explained in many other ways.

Further, it is improbable – by virtue of anthropological style studies – that exchanged or kidnapped young girls brought a new style with them. It is more likely that they learned the tradition from their mother-in-law or grandmother-in-law. Therefore, I do not find it probable that the cessation of Neolithic Asbestos ceramics and the beginning of Textile ceramics in Finland can be ex-

plained with the exchange of women. There were more fundamental reasons for the change.

Warfare also has to be taken into consideration when discussing the possible situations where different objects come into the possession of new populations. Prestige objects, sacrificial utensils or rare utility implements can be obtained through war. It is very difficult to verify warfare on the basis of archaeological material. Taking into account the small size of populations and the large, thinly populated areas, war cannot be considered as a very likely explanation for obtaining precious objects. The capture and possession of land was not important among hunters and fishers. It played a more important role perhaps in the coastal area, where cairns have sometimes been interpreted as signs of ownership (Seger 1984).

2) Exchange through traders (Seima phenomenon in periphery). Carpelan has suggested that the spread of bronze implements can be explained with the work of traders (Carpelan 1982a; 1994:33). Traders came both from the west and the east. In the coastal area, in the Bronze Age culture, traders came over the Baltic Sea (Carpelan 1982a:272–273), but if thinking of Seima, Maaninka and Ananino axes it seems evident that traders came from the east (Carpelan 1994:33).

Attention should be paid especially to the Seima phenomenon, a special kind of period in prehistory, which seems to have launched the Early Metal Period in the large area of the Boreal Zone. Its existence fits well with A. M. Tallgren's (1934b) statement that implements do not migrate, but it is man who moves. The remains of the Seima phenomenon can be seen from the River Kama to Fennoscandia during the short period of about 1600–1400 BC. Its most important feature is bronze metallurgy. Its transcultural character, which is visible to archaeologists as a large distribution area of Seima celts, is particularly interesting. This has been explained by referring to Seima warriors, traders who came into contact with local populations. Traders sought copper and tin ores but they also distributed Seima axes and other bronze implements. The distribution of the axes does not represent any borders, ethnic groups or populations. (Chernykh & Kuzminyh 1987:103–104.)

Sahlins' theory of *balanced reciprocity*, which means direct and less-personal gift-exchange, a buying-selling relationship, can be applied to the relations between traders and local populations, but perhaps more probable is some kind of *negative reciprocity*, where partners try to maximise utility at the other's expense. This means that relations were not confidential.

Renfrew's model of *freelance commercial trade* has some points in common with the Seima phenomenon. Merchants operated on a freelance basis and the motivation for their work was personal profit. They were probably middlemen and not necessarily blacksmiths themselves. Another interest was connected with the search for raw materials. The main difference between Seima traders and Renfew's model is connected with the objects themselves, which were probably of very high prestige – at least in the beginning of the period. Further, it is likely that these merchants did not have any kinship connections with local populations. The traders did not have a network of relations with local populations; also language problems may have affected communication.

The number of known Seima axes is small (4) in Finland and the Karelian Isthmus. This can be interpreted with the difficult availability of the material and its high prestige value. Because of the lack of local raw materials it is very likely that worn-out and broken axes were reused to cast new axes. For this reason it is difficult to estimate how many axes were in use. No casting moulds made for Seima axes have been found in Finland so far, which supports the idea that Seima axes had a very high prestige value.

It is possible to explain the distribution of Seima axes in northern Fennoscandia by referring to the activity of Seima traders, but there are also other explanations. Objects with prestige value spread to Finland in order to maintain relationships between persons or groups. During the course of the Early Metal Period the network system changed: people learned to cast bronze axes in Finland and axes were reused to make new ones. The role of the traders lost its importance and bronze objects were exchanged between local populations.

3. Exchange of raw material and utility objects. If there was any kind of direct exchange of goods between populations, the best candidates for this kind of exchange are raw materials, asbestos, soapstone and flint. It is possible, although not very probable, that populations visited the area where raw material was available and collected the material as needed (Lavento & Hornytzkyj 1996:63).

Asbestos may have been an exchange object in a large area (Simonsen 1982:420–421). Asbestos was without exception used in Pöljä, Kierikki and Jysmä ceramics, but its use suddenly ceased in Textile ceramics. One might assume that its use may have continued also in Textile ceramics, particularly in those areas where asbestos was easily found in the bedrock (Aurola & Vesasalo 1954; Vesasalo 1965). Still this was not the case. Asbestos was used only very seldom in Textile ceramics in Tomitsa ceramics, in the northern part of the Saimaa Water System. More asbestos was used in Kainuu. The analyses show (Lavento & Hornytzkyj 1996:61) that local resources were used only seldom, but asbestos from Saimaa was exploited far from its original source. This observation supports the idea of the existence of an exchange network system during the Late Stone Age.

Strangely enough, the exploitation of asbestos of the Saimaa region did not cease in Kainuu in the beginning of the Early Metal Period, during the early phase of Textile ceramics. This is difficult to explain by referring to communication, because there exists only a very small number of Textile ceramics, which date back to this period near the occurrences of asbestos.

A possibility, which has been discussed sometimes says that Late Asbestos ceramics and Early Textile ceramics were partly synchronous. This means that the

use of Asbestos ceramics may have continued for at least some generations after the appearance of Textile ceramics in Finland. This would explain the existence of possible exchange relations between two distinct populations.

It might be possible that asbestos raw material was exchanged for some other goods. One natural article of exchange is soapstone, which exists in Suomussalmi, Kainuu (Aurola 1964:219–220). Strikingly, over half of all casting moulds in Finland have been found in Suomussalmi. It is also essential that the great majority of moulds was made for casting bronze axes of the Ananino type (Huurre 1992:44). Judging by the fragments, some of the moulds were made for Mälar axes, but so far no moulds for Seima or Maaninka axes have been found. The use of local raw materials – first of all soapstone – did not begin until the later phase of the Early Metal Period. This excludes the possibility of the exchange of asbestos for soapstone. It is also possible to find soapstone in the northern area of the Saimaa Water System (Aurola 1964:219–220).

The distribution of bronze axes shows that although they are distributed over the whole of Finland, the large majority of finds come from southern Finland and the coastal zone. There are types of axes – from the Seima axes to the Ananino axes – that represent the entire period of the Early Metal Age. It seems evident that the Seima axes were brought from outside. The same may have been the case with the Maaninka axe, although it has been considered to be a local type (Hackman 1910b:6–7; Tallgren 1911b:190). During the later phase of the Early Metal Period, axes were cast locally. Although copper and tin were not found in local sources, the manufacture of casting moulds refers to their local application. It is likely that the metal was obtained from worn-out bronze axes.

Although it might be tempting to present hypotheses of trade network organisations between the occurrences of soapstone raw material and the areas involving copper and tin, this is not a very probable alternative. A central problem lies in the extremely small number of items of trade – the bronze axes. From a period of over 1000 years, only 56 bronze axes have been found. Because it was not possible to obtain metal from local sources, it was reused by later generations and the number of metal axes remained small during the whole period.

Not much asbestos was used in Textile ceramics in Finland and the Karelian Isthmus. Asbestos was used in considerable amounts in Textile ceramics only in Kainuu; in southern Finland it is almost totally absent. Also flint is only very seldom found in the contexts of the Early Metal Period habitation. It seems evident that – if not taking into account the sites in Kainuu – flint import seems to have ceased almost totally in the beginning of the Early Metal Period (Vuorinen 1982; Lavento 1998b). Also the number of soapstone, and particularly casting moulds made of soapstone, is very small outside Kainuu and the northern Saimaa area.

The large distribution area of Sär 2 ceramics is interesting from the point of view of raw material. Asbestos was obtained only from restricted areas and analyses of fibres show that antophyllite asbestos from the Tuusniemi and Kaavi area can be found far from its original sources, particularly in Finnish Lapland and the Karelian Republic (Lavento & Hornytzkyj 1986). The distances from the source areas to Lapland are so great that populations probably did not fetch the raw material themselves. In these conditions *down-the-line* exchange may have functioned between groups and small populations. Less likely is any kind of *directional commercial trade*, because in this area there were no centres, which could have acted as a destination. Another problem is connected with the lack of any kind of road network. The need to trade arose from the need of friendly relations between populations and also from the need of raw material.

It is likely that communication between populations took place through exchange connections, which were based on kinship and confidential relations. This is more probable than the assumption that individuals who needed raw material fetched it themselves from the source area. It is also possible that there were different periods of relations during the Early Metal Period.

10.2.6. Diffusion, migration and convergent development

The distribution of metal implements is a phenomenon, which can be explained in the large scale by referring to the diffusion of an idea. Metal casting was invented in a particular place, from where it spread through many kinds of contacts between people and populations. The same model can be applied also to understand the spread of Textile ceramics in the Boreal Forest Zone between the River Lena and Fennoscandia during the 2nd millennium BC (Okladnikov 1963).

Diffusion has not lost its favour in Finnish archaeology when discussing the spread of casting of bronze axes or Textile ceramics in the large area of the Boreal Forest Zone. Concepts such as "connection", "influence" or "wave of influence" represent this approach. The problems of diffusion are related to its obscure and passive meaning.

The second possibility to explain change is acculturation in which two or three subconcepts can be separated. Acculturation is a process, which brings changes to the material and the mental culture in a new geographical area through migrations of populations or individuals. What happens is a mixing of elements from two or more different traditions. While acculturation proceeds horizontally in the society, the second concept, enculturation, refers to the spread of new ideas or influences in a vertical direction. It exists particularly in the developed societies and descends from the upper layer of the hierarchy to the lower one. Distribution proceeds also from the centre to the periphery (Champion 1982:43). The third possibility to explain the existence of common phenomena in a large area, is the concept of convergent evolution (Service 1962): a result of change of the condi-

tions in nature or innovations in societies. Convergent evolution has remained almost totally without discussion in Finnish archaeology.

The use of diffusion to explain phenomena of prehistory has received much criticism. Renfrew (1979) criticised Childe and the earlier generation of archaeologists for a too mechanical use of diffusion to explain the beginning of European metallurgy. He showed, using carbon-14 datings, that it was not possible to use diffusion to explain the spread of metallurgy. "The development of metallurgy was not a single and unique process...but a sequence of inventions and discoveries that may have taken place quite independently at a number of different places and times"(Renfrew 1979:185).

It is not possible to understand the rapid distribution of the Seima axes by referring to a series of independent innovations. This is not likely because of the small number of raw material occurrences in the area. Instead, when discussing the emergence of textile-impressed ceramics in the large area from the River Kama to northern Fennoscandia this possibility becomes more plausible. This is due to the fact that textile-impression can be adopted very easily, even during a very short contact or by copying. It also explains why very different kinds of textile-impressions can exist.

The case is very different when considering the ceramic style of Textile ceramics. The recent studies of the early phases of Textile ceramics in Russia suggest that there were two innovation centres where styles developed independently (Voronin 1998:322). From these innovation centres in the Upper Volga and in the East Baltic and Valdai regions, Textile ceramics may have spread also to Finland (Lavento 2000).

Textile ceramics represents a new style with a new ornamentation and vessel form. Excepting this, it is even more difficult to explain why the application of asbestos ended rapidly in Finland. Asbestos was successfully used in eastern Finland for over 2000 years because of the superior qualities of minerals. What was the reason to change asbestos for poorer tempers by adopting the new idea through diffusion or brief cultural contacts? It is natural to assume that Textile ceramics was not an innovation that local populations adopted through diffusion. It is more probable that potters who did not know of local raw materials made the new ceramics. The local tradition of asbestos ceramics ceased rapidly – or it had already ceased – when the new tradition came into use. Although it is possible to hypothesise that these two traditions may have lived synchronously for a short period, there is no evidence to verify this.

For these reasons diffusion does not seem to be a working explanation for the spread of Textile ceramics to eastern Finland. The situation may have been slightly different in the coastal zone. Äyräpää interpreted the Kiukainen culture as a younger phase of Corded Ware (Äyräpää 1930:205) and considered it as a denominator of an ethnic development (Äyräpää 1952b:293). Meinander later criticised Äyräpää's hypothesis by stating that the tradition of local Combed Ware was strong. Meinander (1954a:175) assumed that the possible immigrants making Corded Ware did not play a considerable role in the development of the Kiukainen culture. Meinander proceeded as far as considering it evident that textile-impression had nothing to do with Corded Ware, but that it was of eastern origin (Meinander 1954a:175–176). Meinander postulated that although the contacts with the makers of Pöljä ceramics and Kiukainen ceramics were not prominent and that "man von einer wirklichen Kulturgrenze zwischen dem Küstengebiet einerseits und dem Inneren des Landes anderseits sprechen kann" (Meinander 1954a:176), they were still important for the development of Textile ceramics. The ceramics of the Sarsa type was in use in southern Finland and the Karelian Isthmus (Meinander 1954b:182–183). This area overlaps the distribution area of Carpelan's Middle-zone ceramics, which was the decisive factor in the formation of Sarsa ceramics (Carpelan 1979).

The development of Sarsa ceramics took place on the northern branch of Corded Ware, the southern one influencing Kiukainen ceramics. When taking into account that the Kiukainen culture developed essentially on a local basis from Late Combed Ware, it is natural to assume that also Sarsa ceramics should have a strong local colouring. This cannot be easily shown. Many characteristics in Sarsa ceramics separate it from Kiukainen ceramics and other Late Neolithic types. Sarsa ceramics got its beginning from outside factors.

The situation was different in eastern Finland. A clear discontinuity of the ceramic traditions implies that Textile ceramics represents an essentially new tradition. Therefore it does not seem probable that adopting a new way of making ceramics may have happened only through communication between traders and local populations. It is more likely that also individuals who made ceramics came to eastern Finland. Further, accepting the hypothesis that ceramics was made by women, means that at least some females immigrated to eastern Finland in the beginning of the Early Metal Period.

It is not impossible that there were contacts between newcomers and the local population. If these contacts existed, they probably did not exchange much common material goods, but *prestige objects*, particularly metal implements. Metals were gifts between the leaders of populations and they also maintained friendly relations between them.

Another hypothesis assumes that local populations and Textile potters did not meet each other, because the tradition of asbestos ceramics had already ceased earlier. According to this view, the Neolithic population did not exist any longer and the newcomers settled into the new, unsettled area. Several observations support this idea. New archaeological material almost totally replaced the old one. Also the sporadic experiments with agriculture belong to the new context (Carpelan 1999:268). Accepting this hypothesis means that total discontinuity took place between the Late Neolithic and the Early Metal Period.

After the establishment of Textile ceramics to the area, the essential question of this study is the relation between different populations of Textile ceramics in Finland and the Karelian Isthmus. The first hypothesis is that two different populations made Sarsa and Tomitsa ceramics. Further, on typological grounds it is possible to discern the third, more or less synchronous, subtype of Textile ceramics in Kainuu. Although the origins of these types differ, it seems evident that the populations responsible for these ceramic types had contacts with each other. Despite the fact that ceramic subtypes can be clearly discerned, there are details in ornamentation, shape and technical characteristics, which resemble each other very much. In the beginning of the period there was no need to have much contact, but it developed in the course of time. It is probable that kinship relations between different subgroups developed. Kinship relations may have been organised through exogamy where women, at least occasionally, changed populations. Although it might be possible to present many kinds of detailed hypotheses using ethnoarchaeological analogies on how this process may have happened, on this occasion one has to be satisfied with the general comment that it was close kinship relations that may have had the decisive influence in the development of Textile ceramics in Finland.

10.2.7. Sites of Textile ceramics

The dwelling sites of Textile ceramics have many similarities in the eastern, northern and southern parts of its distribution area in Finland and on the Karelian Isthmus. The most conspicuous feature is that in particular they differ from the semi-sedentary hut floor basins of the Middle and Late Neolithic Period. The sites are small in size and they are often situated on narrow necks of land, ridges, on the necks of small rivers and lakes or on small islands. This separates them from both the Late Neolithic and the Bronze Age sites of the southwest coast. Dwelling sites are central in this work because, not withstanding a small number of exceptions, Textile ceramics in Finland has been found in dwelling sites.

10.2.7.1. Classification of dwelling sites

Communication and relations between populations have been mostly studied with the help of ceramics, because ceramics give an archaeologist the means to follow phases of continuity and discontinuity. It is necessary to know the ceramic groups preceding and following Textile ceramics, because they also give a possibility to make thorough analyses on sites; in the most extreme case an archaeologist can infer that in two different dwelling sites ceramics made by one and the same person can be found. Normally, the question is about finding local subtypes or chronological phases with the help of which the discontinuity, immigration and other exceptions in prehistory are interpreted.

Communication between people is also studied in dwelling sites by observing differences and similarities between many other observable characteristics in dwelling sites and their neighbourhood. Although the main object of this study is ceramics, some observations concerning sites are of importance when trying to understand the Early Metal Period culture in Finland. At least the following general features can be presented:

1) Comparing the number of dwelling sites with the Late Neolithic and the Early Metal Period sites.
2) Comparing the size and type of dwelling sites in different parts or geographical areas in Finland and the Karelian Isthmus.
3) Comparing the geographical location of sites involving Textile ceramics with the Late Neolithic and Early Metal Period sites with Sär 2 ceramics.
4) Information about local central places can be obtained by locating possible clusters of sites in the area under investigation. Also concentrations of stray finds in different regions should be taken into account.
5) Comparing the ceramics and other find material between sites of Textile ceramics (inside the culture) and the Late Neolithic and the Early Metal Period sites with Sär 2 ceramics.

10.2.7.2. Central locations versus peripheries

Because clear differences between dwelling sites can be observed on the basis of the quantity and quality of Textile ceramics, a simple model can be constructed to explain the functions of sites.

Dwelling sites/ site complexes	Number of vessels	Excavation areas
Suomussalmi Kalmosärkkä	70	783 m²
Vaala Nimisjärvi (Säräisniemi)	18	–[4]
Ilomantsi Syväys	16	130 m²
Joensuu Varaslampi	189	3192 m²
Ristiina Laasola	84	594 m²
Kaukola Riukjärvi and Piiskunsalmi	128	–[4]
Asikkala Kotasaari	71	≈400 m²
Kangasala Sarsa	74	1200 m²
Luopioinen Hietaniemi	23	278 m²

Fig. 10.9. Dwelling sites/dwelling site complexes in Finland and on the Karelian Isthmus involving more than 15 Textile ceramics vessels.

Figure 10.9. presents the dwelling sites or dwelling site complexes where sherds from more than 15 vessels of Textile ceramics have been separated. It shows where the most important concentrations are situated. Five clusters can be clearly seen: Kainuu, northern Saimaa, southern Saimaa, northern Häme and Kaukola on the Karelian

[4] Not possible to estimate.

Isthmus. Still, one should not put too much emphasis on the numbers of ceramics, because they are mainly dependent on survey and excavation activity. These concentrations are still clearly visible and they remain so also when looking at the typology and concentrations of subtypes of Textile ceramics thus referring to the existence of traditions or even populations. Many common elements exist in Textile ceramics, which refers to the communication between the makers of these subtypes.

In the Ancient Saimaa Water System considerable differences in the size and type between the Late Neolithic and the Early Metal Period dwelling sites can be seen. Although most sites from both periods are situated on eskers, glacifluvial deltas, drumlins or end moraines, most Early Metal Period sites are still located in different microenvironments than sites during the Stone Age. Also a considerable difference between the sizes of Stone Age sites can be seen. A large number of small, temporary sites are known but also very large Stone Age "villages" belong to this period (Karjalainen 1996b; 1998; Kotivuori 1993). Although Textile ceramics has been found in five sites (Vehkaranta and Martinniemi in Kerimäki, Sirnihta in Kesälahti, Pörrinmökki in Kerimäki, Vaateranta in Taipalsaari) in the Lake Saimaa Water Course, in none of these sites can Textile ceramics be connected with dwelling depressions. Large sites with dwelling depressions were used during Typical Combed Ware and Kierikki/Pöljä Ware. The situation is the same in other areas in Finland (Meinander 1976; Matiskainen & Jussila 1984; Halinen *et al.* 1998; Pesonen 1998; 1999).

Large, village-type sites from the Early Metal Period, which can be connected with Textile ceramics, have not been found in inland Finland. A small number of known sites are, instead, related to the periods immediately preceding or following Textile ceramics. The site at Kuorikkikangas in Posio, which can be connected with Lovozero ceramics, is contemporary with Textile ceramics (Pesonen 1996). Of special interest are also the dwelling sites in southern Ostrobothnia. The dwelling site of Trofastbacken in Korsnäs, which according to shore displacement chronology dates to the Pre-Roman Period (Seger 1986a:180), involves Morby ceramics. Also in the same municipality is the dwelling site of Orrmoan (Seger 1986b). Seger interpreted these sites as seasonal bases built by men coming from the mainland to hunt seal (Seger 1986a:181). House structures are small and they are situated on a very stony area. Their temporal, seasonal character is worth noting. They definitely do not represent a central location or a house depression for a semi-sedentary life. The dwelling site of Mickels in Espoo should probably be added to this group also (Hiekkanen & Seger 1988).

Building a dwelling depression is a sign showing some kind of (semi)sedentariness, because the same pits were probably used for tens of years (Kotivuori 1993:130–134; 1996:11). The population has been assumed to have varied between 60–500 though ca. 100 individuals may have lived in a typical Neolithic village (Pesonen 1999:13). If these calculations are compared with the populations living in the Early Metal Period sites, the difference is clear. The largest sites of Textile ceramics do not involve dwelling depressions. Although it is very difficult to estimate the size of the population, it still seems likely that the population did not exceed 50 inhabitants. In most cases the accumulation of finds can be explained by short-period, temporary visits to the sites. Good examples of this kind of habitation are sites such as Kalmosärkkä in Suomussalmi or Kitulansuo d in Ristiina. The largest Early Metal Period dwelling sites are situated on places advantageous for fishing in either spring or autumn. They may also be situated on the course of good water routes and watersheds. This also explains why different populations used them for thousands of years.

The majority of the Early Metal Period dwelling sites with Textile ceramics is situated inland, only few being on the coastal zone of the Baltic Sea. Further, any kind of central locations situated on the estuaries of the large rivers of Ostrobothnia, Uusimaa or Kymenlaakso do not exist in the context of Textile ceramics. The evident explanation is that the Baltic coast did not belong to the territory of these populations. The Bronze Age coastal culture used them perhaps more, although unambiguous evidence for this does not exist so far. This fact shows how different the living tradition and economic system were in comparison with Typical Combed Ware with its interest for mass seal hunting or large-scale fishing in the estuaries of large rivers. Why is this? Archaeological material refers to considerably smaller populations: food was not needed as much as during the Neolithic Period.

A special area is the Oulujoki Water System, particularly Kainuu. Dwelling depressions are not known in the area. Many reasons can explain this. It is possible that they may be found in further surveys. Another possibility – particularly in the upper course of the water basin – is that since the 1950's water regulation flooded large sites. Although this helped archaeologists to find sites (Huurre 1986a:22–23), it also destroyed many of them. Further, one possibility is that for topographical and geographical reasons Kainuu has always been an area for temporary stays and transit. This hypothesis is based on the observation that most southern and northern ceramic types have been found there. In particular the Early Metal Period shows a great variety in types.

The distribution of dwelling sites involving 5–14 vessels of Textile ceramics (Fig. 10.10.) does not present as clear clusters as Figure 10.9. Except for sites in Suomussalmi, no central locations can be separated. One must still keep in mind that the number of excavations and the size of excavation areas essentially affect the result. Therefore one should use the information – together with further information from the excavations and their find contexts – presented in Figures 10.9. and 10.10. very carefully (App. I). One more difficulty is related to the find material itself. Because of the very large amount of material from Ketohaka in Salo and Böle in Porvoo, this ceramics has been investigated superficially. Further, in

Dwelling sites/ site complexes	Number of vessels	Excavation areas
Sotkamo Kiikarusniemi	10	196 m²
Suomussalmi Tormuan särkkä	6	–[5]
Suomussalmi Joenniemi	6	–[5]
Laihia Viirikallio	10	111 m²
Kerimäki Kulennoinen	6	164 m²
Pielavesi Meijerinkangas	5	150 m²
Polvijärvi Multavieru	7	233 m²
Kurkijoki Kuuppala	7	<500 m²
Räisälä Kalmistonmäki	7	129 m²
Kinnula Häähkäniemi	6	90 m²
Nastola Kovalahti	6	45 m²
Laitila Lalla	13	–[5]
Salo Ketohaka	5–10	2373 m²
Porvoo Böle	8	5016 m²[6]

Fig. 10.10. Dwelling sites/dwelling site complexes in Finland and the Karelian Isthmus involving 5–14 Textile ceramics vessels.

Böle, Nina Strandberg has carried out new excavations, the results of which have not yet been published[7].

Long water systems are suitable routes for communication (Huurre 1986b). Looking at the geographical situation of the Early Metal Period sites or site complexes shows that many of them are favourably situated in relation to water routes (Fig. 10.11.). They are in places, which are easily reached by newcomers, but at the same time they are places, which the local population used as transit sites between distant areas. Also during the winter the sites may have served as temporary camps and landmarks. Skiing and using sledges drawn by dogs or even reindeer provided the possibility to cover long distances relatively quickly. A well-known example of this is the Stone Age sledge runner from Laukaa, which is made of sembra pine. It came to Finland from the Ural Mountains (Ailio 1912:266–67). Suitable routes for skiing are land ridges, mires, rivers and lakes.

Eskers are also useful routes. Unto Salo (1984) has suggested that during the Bronze Age they became more important than before. Salo's argument is based on new words such as "kangas" in the Proto-Finnish language. These arguments are still not very strong even though it is evident that during the Late Neolithic and the Early Metal Period, language received many new loan words (see 10.2.5.).

Waterways from Finland to the Water System of the River Kem and rivers running into Lake Onega were important from the Stone Age to the Historical Period (Fig. 10.11.). The river system, which reaches the upper courses of Lake Pielinen (and Saimaa), also has connections to the River Suna and Lake Onega. The rich dwelling site systems around Lake Sjamozero runs through Lake Suja to Lake Onega, close to the city of

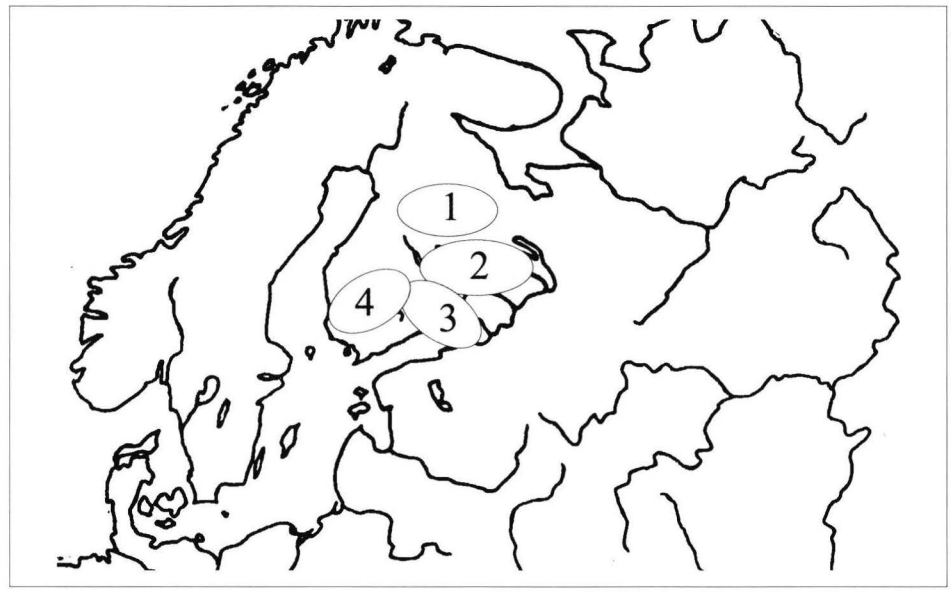

Fig. 10.11. An approximate geographical map of the subareas of Textile ceramics in Finland and on the Karelian Isthmus. Legend: 1 – the area between the Rivers Oulujoki and Vyg, 2 – the area between northern Lake Saimaa and western Lake Onega, 3 – the area between southern Lake Saimaa and the Karelian Isthmus, 4 – the area between Lake Päijänne and Satakunta.

[5] Difficult to estimate.

[6] Excavated areas have been calculated on the basis of information given in the reports. In many cases reports are not available or excavation areas cannot be calculated from the information in the report.

[7] Also the dwelling site of Hulkkio in Kaarina might involve more than 5 vessels of Textile ceramics. This material has not been investigated here, because it has been thoroughly investigated in Nina Strandberg's pro gradu –work (1986; 1987).

Petrozavodsk. The large dwelling site area of Tomitsa is situated there (Bryusov 1940). It is worth to note that some common elements – in ceramics, metals and their pruduction, raw materials etc. – between and particularly inside large water systems can be found (see chapter 8). One should still not forget, for instance, the considerable typological differences between Textile ceramics in northern and eastern Finland and Textile ceramics in the Karelian Republic (see chapter 7.2.).

From southern Saimaa natural waterways are connected to Lake Ladoga by the River Vuoksi. So far the largest dwelling site area involving Textile ceramics in southern Saimaa is in Ristiina. In the Karelian Isthmus most Textile ceramics have been found in Kaukola and Räisälä, along the water systems of the "old" River Vuoksi (Pälsi 1915; Meinander 1954b), which ran through Käkisalmi (Priozersk).

The fourth, large water system with dwelling sites of Textile ceramics is the River Kymi and Kokemäenjoki Water System, including, for instance, the large site complex of Kotasaari in Asikkala, in douthern part of Lake Päijänne. The lower course of the Kymi Water System is not rich in Textile ceramics, which fits well with the hypothesis that the coastal zone and the estuaries of large rivers did not belong to the territory of Textile ceramics. The upper course of the Kokemäenjoki Water System in northern Häme involves the large dwelling site complex of Sarsa in Kangasala (Meinander 1954b). The following sub-territories can be separated from the distribution area of Textile ceramics in Finland and the Karelian Isthmus.

1. Upper course of the River Oulujoki water basin and the River Kem and River Vyg water basins
2. Upper course of the Lake Saimaa water basin and the Rivers Suna and Suja water basins
3. Southern Saimaa Water System and lower course of the River Vuoksi Water System (the Karelian Isthmus)
4. Upper course of the River Kymijoki and Kokemäenjoki Water Systems

The large majority of dwelling sites involving Textile ceramics are inland. The estuaries of large rivers running to the Baltic Sea were not utilised and visiting the seashore was only occasional. This also supports the assumption that populations making Textile ceramics had relations mostly between other inland populations and the populations on the eastern side of Finland.

These observations support the hypothesis that there was not much communication between inland and coastal populations in the beginning of the Early Metal Period. The existence of many eastern types of bronze axes, not in eastern Finland, but in the coastal area instead shows that there must have been some connections between these populations. It is probable that at least formal relations existed between coastal and inland populations. Prestige goods – first of all bronze axes – may have played an important role in these relations. The small number of these implements found, suit well the view that their value for the populations was very high. They exist in graves only seldom, or if they had been put there, they were dug up and reused by later generations. These implements were so important for the society – and between societies – that they were not given even to distinguished dead, but played an important role in maintaining peaceful relationships between populations. Prestige goods may have changed ownership also as a result of robbery or even war. In the beginning of the Early Metal Period the first contacts between local populations of Asbestos ceramics and Textile ceramics, if they existed at all, were probably not peaceful. One should not forget the possibility, either, that after people learned to cast axes they were not exchanged but copied according to models, which were originally found, stolen, robbed etc.

In addition to prestige goods, there are no other find groups showing connections between coastal and inland populations. This statement gets support from archaeological material and also from differences between dwelling sites, burial customs and even means of livelihood. Ceramic traditions of inland and coastal populations differed for a long time and acculturation seems not to have proceeded between them until the end of the period. During the Late Bronze Age, ceramics in the coastal area developed into Epineolithic or Morby ceramics. In the large area inland, populations developed a new ceramic tradition of the Sär 2 type. Asbestos was again adopted, but it never spread in large scale to the coastal zone. Both cultures preserved their traditions without influences from the other one. This also suggests that individuals were not exchanged between the coastal and the inland areas.

Also the way of life differed essentially between these populations. When the coastal populations lived a semi-sedentary life with their houses and fields (at least during the end of the period), the inland populations remained mobile. Inland populations were smaller and they did not have a close connection with the land. Very early sporadic experiments with slash-and-burn cultivation gained some importance among the inland settlers. Their short-period existence refers to the temporary nature of habitation. Even though there were attempts to establish cultivation, it was unsuccessful in eastern and northern Finland and therefore it did not play an important role in the economics among inland populations. It was more important in the coastal zone, although it was not the main source of living there, either.

10.2.8. Textile ceramics and linguistics

Traditionally, also linguists have presented their theories about the connection between loan words and cultures. In the following some recent views of these questions are briefly presented. A more thorough discussion of the question is omitted here because of its complexity.

According to Jorma Koivulehto (1984:202) the Germanic influence in Finnish began during the Bronze Age, at the latest about 1000 BC. Recently he has connected the earliest Indo-European loan words with the arrival of the Battle Axe culture as early as about 3200 calBC

(Koivulehto 1999:233). Worth noting is that for linguistic reasons a primitive cultivation seems to have belonged to the economy of the Battle Axe populations in Finland also (Häkkinen 1996:10–122; 1999:166–167; Koivulehto 1999:233), despite the sceptical arguments presented by many archaeologists (Edgren 1984a; 1992; 1999a and b; Zvelebil 1981) and palynologists (Vuorela & Hicks 1996; Vuorela 1992; 1999:146; Lempiäinen 1999:153).

Many interesting results about the Aryan loan words in Finnish were obtained during the 1990's. Both Koivulehto (1999) and Asko Parpola (1999a) suggested that a considerable number of Aryan loan words exist both in Finnish and Lappish. Koivulehto (1999:233) and Parpola (1999b:191) dated the pre-Aryan contacts to the end of the Yamnaya (Pit Grave) culture between 3600–3000 BC. They also agree with the hypothesis that the Abashevo culture may have played an essential role in the spread of these loan words to Finno-Ugric languages. According to Parpola this period dates to between 2200–1900 BC. He connects the later stratum of Aryan load words with the Timber Grave culture between 2000–1200 BC. As a "leading fossil" indicating early agriculture Koivulehto mentions the word "huhta", which he connects with the emergence of Textile ceramics. For him the word "kaski" is earlier and its origin is in the western populations that may have brought cultivation to the coastal zone of southwestern Finland (Koivulehto 1999:233). Both Koivulehto and Parpola support the hypothesis of the importance of the Battle Axe culture as a source of early Indo-European words in western Finno-Ugric languages. The differentiation of the "Itämerensuomi"(Baltic-Finnic) from Lappish took place already during this phase (Carpelan 1999:266; Parpola 1999b:190).

Parpola suggests that Proto-Aryan branched into two at about 2000 BC. According to this model Proto-Indo-Aryan should be represented in the Andronovo culture and Proto-Iran in the Srubnaya (Timber Grave) culture (Parpola 1999b:194). Parpola has assumed, by referring to Carpelan (1999), that the spread of Aryan loan words to Finland took place through Textile ceramics. The rich copper occurrences in the southern Ural area came into use and contributed to an explosive distribution of Aryan speaking individuals to different directions (Parpola 1996; 1999a). Within a short period the "culture of Textile ceramics" merged with local people speaking Finno-Ugric languages in the Upper Volga and in the area to the northwest from it (Parpola 1999b:196). When Parpola talks about the ruling class (1999b:196), Koivulehto is more cautious in connecting Textile ceramics and the spread of Iranic and Indo-European loan words to Finnish and Lappish.

"Mielestäni lainasanojen levikki voi myös selittyä etelämpänä olevista kontaktialueista, ehkä siellä olleista iranilaisista ja indoarjalaisista substraateista: sanat olisivat sittemmin vain vaeltaneet volgansuomalaisten ja tiettyjen esisaamen puhujien mukana pohjoiseen" (Koivulehto 1999:233–234).

Parpola's model is flashier:

"Luontevin selitys näille arjalaissanoille olisi se, että ne levisivät Suomeen tekstiilikeraamisen kulttuurin myötä... Joka tapauksessa tekstiilikeramiikka (n. 1900–1800 eKr; Carpelan 1999:kuva 6) näyttää syntyneen näiden "uusien tuulien" ansiosta, joita toivat nimenomaan Pozdnyakovo- ja Abashevo-kulttuurit. Juuri tähän aikaan etenkin etelä-Uralin metalliesiintymien rikastuttamat arjalaisten kielten puhujat olivat räjähdysmäisesti levittäytymässä eri tahoille... Tekstiilikeramiikan superstraatiksi olettamani arjalaiskielet ovat tietenkin suhteellisen pian sulautuneet paikallisiin suomalais-ugrilaisiin kieliin, ilmeisesti lähinnä ylä-Volgan alueella, mutta tekstiilikeramiikka-kulttuurin varhaisina johtajina arjalaisia on voinut tulla Suomeenkin saakka."(Parpola 1999:196.)

Parpola goes far and assumes that only some Seima warriors would have reached Finland. I partly agree with this interpretation. Many features in the material culture refer to the possibility that the number of immigrants was a bit larger, because they were able to profoundly change the Late Neolithic culture in inner Finland. I also assume that this is in accordance with linguistics, because it is possible to date a considerable number of new loan words to this period. These loan words may have spread to Finland through Finno-Ugric populations. It can be hypothesised that immigrants arrived in eastern Finland, which was almost totally unoccupied or very sparsely populated during the Late Neolithic Period.

Also toponyms have often been used to support migrations in prehistory. Toponyms have been seen as layers from different periods of prehistory (Kosmenko 1993a; 1996d). One example of this is the long discussion concerning the etymology and the meaning of "Karelia" (Uino 1977:121–122). Beginning with the word "karja" (see e.g. Kuusi 1983:235–241), it has also been connected with migration from western Finland (Kettunen 1940:142) or with "kari" (a rocky and stony area) (Jaakkola 1941; 1952). D. V. Bubrih (1947:17) and Heikki Kirkinen (1984:272–273) have supported the hypothesis that the name is of Lithuanian-Latvian origin stemming from the words "girja" or "garja", which refer to "upland" or "outlying land". Without going further into details, it can still be mentioned that the word "Karjala" has also been connected with "gaira", the original meaning (wedge, borer etc.) of which changed to mean an organisation and finally people or a nation (Pekkanen 1984:191–193; Uino 1997:122).

From the point of view of this study particularly interesting are such hypotheses, which date the origin of the term "Karelia" to the Early Metal Period. T. E. Karsten (1915:141) explained the term to mean "group of people", stemming from the Ancient Germanic word "harja". Recently the origin of "Korela" has been connected with Volga-Finnish "kor"-words, which refer to a road or traffic route (Rahkonen 1998:110–111). Pauli Rahkonen's (1999) studies have concentrated particularly on Early Metal Period toponyms. He finds it possible to explain some place name groups on the basis of migrations, which may have reached Finland during the Ananino period. Important examples of these discussions are the names "Uhtua" and "Saimaa". The first one, "ohta" or "ošta", might refer to "white" water, the latter one, "*šämä > säämä > säimä", referring to "black" water (Rahkonen 1999:23). It is essential to assume that the populations using Textile ceramics and living in Häme, Savo-Karjala and Kainuu (Rahkonen 2000, in press)

were speaking a Finno-Ugric language. The arrival of a new population suits the idea that the use of Asbestos ceramics of the Pöljä and Jysmä types had already ceased before the spread of Textile ceramics in eastern Finland. After several hundred years Sär 2 ceramics came into use and asbestos became again the most important temper. This is not necessarily a tradition from the Neolithic Period: the use of asbestos may have been reinvented by new populations.

The position of the Proto-Saami population is also an important problem. It seems probable that this Saami population had its roots already in the Mesolithic Period and that it continued its existence, at least in the northern part of Finland, after the period of Textile ceramics. It seems probable that there were not many connections in the beginning of the Early Metal Period, but that in a later phase the connections were lively, leading to acculturation or enculturation.

10.2.9. Textile ceramics and genetics

Some hypotheses presented about the genetic origin of Finns postulate a "genetic bottleneck", during which the population was unusually small, but after which a slow immigration took place. During the 1980's geneticists still looked at the prehistory of Finland through an old theory, which was based on the immigration of Finns in the beginning of our era. H. Nevanlinna (1984:168–169) found it very likely that the bottleneck existed exactly during this time and that the population lived (or immigrated) to southwestern Finland.

Although archaeologists rejected the immigration of Finns, the genetic bottleneck along with the reduced variation caused by "a small effective population size of males during a more extended period of time" (Lahermo *et al.* 1998:10) has still maintained its position as the most practical explanation for the rare features in Finnish populations. About 30 very rare recessive diseases, which are not found in other parts of the world, have been separated from Finnish populations. Earlier geneticists were seeking the rare occurrence of markers and diseases, whereas today the emphasis is directed to the elements of DNA.

The study of mitochondrial DNA has become an important method in researching the genetics of individuals and populations. Recently this has been studied much by many groups of geneticists (Sajantila *et al.*1995; Lahermo *et al.* 1996). It is vital that these studies do not show any essential differences between Finnish and other European populations. This seems to mean that the eastern origin of Finns has been earlier overestimated.

Differences can still be observed when comparing Y chromosomes descending from father to son, although they include the majority of markers in common with European populations. Of particular interest is the polyformism of the marker Tat C-T, the C-form of which exists in over a half of the Finns. The same marker has been found in Mari and Saami populations (Savontaus & Lahermo 1999:62).

It is conspicuous that many genetic studies have dated the bottleneck to the beginning of our era. As R. Norio has pointed out, the relevance of this dating is problematic (Norio 1999:304). Although interesting observations about common, rare diseases or transitions of DNA in chromosomes can be found, this cannot be used as decisive proof for e.g. the roots being in the east. Some of these rare diseases have been found in Japan, but it does not seem very convincing to claim that they would be related to Finns (Norio 1999:301). Thus the conclusion is that genetics still needs much support from other disciplines to verify these theories of phases in history and to give them a dating.

This work cannot go any deeper into the practical results and methodological difficulties relating to the applicability of genetics in interpreting prehistory. It is still possible to present some general hypotheses, which could have some points in common with the discontinuities in prehistory. If postulating the bottlenecks, there are two candidates in eastern Finland. The first one is between the Late Neolithic and the Early Metal Period. It is possible to assume that the number of local inhabitants decreased very drastically from those periods when large villages were settled in Saimaa or northern Ostrobothnia. One can assume that the number of individuals was very small and that large areas of Finland were almost unsettled. This period dates to the first half of the 2nd millennium calBC. The second, and even longer, period of discontinuity begins with the disappearance of Luukonsaari ceramics, at the latest in the middle of the 1st millennium AD. This period with very few finds continues for several centuries. Discussion of the reasons for this goes beyond the scope of this study. Instead, the first period of discontinuity is further discussed in the next chapter.

10.2.10. Coda

10.2.10.1. The beginning of Textile ceramics

Archaeologists separate and define new periods on the basis of external traces in the material culture. The beginning of the Early Metal Period can be easily pinpointed by referring to several traces in the material and sites. The difficulty lies, not in showing these traces, but in interpreting their meaning in the light of cultural history and economics.

The beginning of the Early Metal Period is traditionally separated from the Neolithic Period on the basis of the following features in the material culture:

1) Bronze implements
2) Straight-based arrowheads
3) Textile ceramics, Lovozero ceramics and Bronze Age ceramics.

These new find types are very evident indicators of the new period even though they do not emerge synchro-

nously. In addition to these, some other changes can be listed also. These are not as evident as in the first group, but they may still be important in trying to understand the discontinuity.

4) Copper implements
5) Changes in stone axe types and striking techniques
6) Disappearance of Neolithic Asbestos ceramics (Pöljä and Jysmä) and Kiukainen ceramics
7) Ceasing of flint import (in some parts of Finland)
8) Casting technology of bronze implements (incl. casting moulds)
9) Slash-and-burn cultivation
10) Changes in dwelling sites
    a) disappearance of dwelling depressions
    b) smaller number and size of sites
    c) thinner cultural layers
    d) lower phosphorus values

These characteristics are connected with the period, but they do not unambiguously show the change of the culture during a short period. Bronze implements are the clearest sign of the Early Metal Period, the beginning of which in characterised in a very large territory by the Seima axe (Tallgren 1937; Meinander 1954b). A straight-based arrowhead is a new type, but the problem is its dating to a long period (Carpelan 1962; Carpelan 1975b:286; Siiriäinen 1978:16). It is possible that this type is more a style, which spread through copying and exchanging gifts.

Copper implements emerged in eastern Finland already during the Middle Neolithic Period (Taavitsainen 1982) and remained in use as a curiosity until the end of the proper Bronze Age (Ylimaunu & Costapoulos 1998). Cold-hammered copper implements do not fit well as indicators of a new period, because the amount of copper was extremely small and can be only very roughly dated. Copper implements were prestige objects of special value in the Neolithic populations. Therefore it is not necessary to take them into consideration in the Early Metal Period context.

Textile ceramics are the most important features showing the change in culture in eastern Finland during the late Stone Age. Although the emergence of a new pottery type can be explained by referring to a diffusion of ideas or temporary visits of outsiders, it must be remembered that a change in the society was clear, not only in ceramics, but also in many other levels of the material culture. Although new methods of making different ceramics may have been learned quickly, the essential question is why did populations and individuals give up the asbestos temper for new ones and begin to make technologically inferior vessels. Why did the form and ornamentation change totally? This cannot be explained by the change of fashion, either. The change is also very striking in other archaeological material supporting the hypothesis of the discontinuity in culture.

Synchronously with the spread of Textile ceramics also another change took place: for the first time manufacturing ceramics spread to the territory to the north of the River Kemijoki in Lapland. Lovozero ceramics and IT ceramics represent this phenomenon (Carpelan 1999).

The disappearance of Asbestos ceramics and Kiukainen ceramics is a phenomenon showing discontinuity. The basic hypothesis says that Asbestos ceramics, Kiukainen ceramics, Bronze Age ceramics and Textile ceramics were made by different populations. Some archaeologists have suggested (Carpelan 1999; Zhulnikov 1999) that Asbestos ceramics and Textile ceramics stayed in use synchronously in the beginning of the Early Metal Period. On the basis of contemporary data this alternative is not the most probable one in Finland. It is more likely that the Late Neolithic culture had already disappeared before the spread of Textile ceramics or that the population using Asbestos ceramics had shrunk and was very small. It is perhaps easier to support the synchronicity of Kiukainen ceramics and Bronze Age ceramics in the coastal culture area.

Stone implements retained their practical importance during the Early Metal Period despite the appearance of copper and bronze implements. One considerable change can still be observed: high-quality implements with excellent polish disappeared. This can be explained by metal implements replacing them as prestige goods. However, stone implements remained in use although their importance diminished. Also new stone implements came into use. Shafthole axes or rhomb-formed shafthole axes with sharp edges which were influenced by the tools of the Battle Axe culture can be mentioned as examples (Meinander 1950; Salo 1981). In Norrland the change in the tradition to make stone tools has been more carefully studied than in Finland. The result show verly clearly that the stone tool tradition which was based on unifacial flaking became replaced by bifacial one (Holm 1991:120), but the change of raw material from quartz to quartzite is not so clearly visible in the distribution area of Textile ceramics in Finland and Karelian Isthmus than in the area north of River Kemijoki.

The disappearance of flint from everyday use is also an interesting, but so far very little investigated, phenomenon. Jukka Vuorinen (1982) found no connection between Textile ceramics and flint. It seems still possible that flint remained in use in northern Finland (Kainuu) in the area of influence of Tomitsa ceramics but disappeared in southeastern and southern Finland. One could assume that bronze replaced the need for flint. However, it is more likely that raw material exchange contacts from the east (or from the south) did not reach southeastern and southern Finland any more. Still particularly worth noting is that the exchange of asbestos continued – although not very intensively - in the beginning of the Early Metal Period in a south to north direction, between the Saimaa, Oulujoki and Kemijoki Water Systems.

Slash-and-burn cultivation is an important phenomenon, which is partially synchronous with the appearance of Textile ceramics. The dating of this is not without problems and so far only sporadic information is available concerning the earliest phases of cultivation (Vuorela & Hicks 1996; Vuorela 1999). These early experiments in agriculture did not play an important role in economics. The absence of sedentary or even semi-sedentary dwelling sites, which are naturally connected

with agriculture, also speaks against it as the basis of economy. Although it is assumed that slash-and-burn cultivation was probably conducted far from permanent sites until the Historical Period, sedentary central sites were important (Taavitsainen 1987; 1994).

The disappearance of building dwelling depressions is also a phenomenon, the exact dating of which has not been possible so far and therefore it should be approached as a general change resulting from the change in society, the decrease in the size of populations etc. Textile ceramics have not been found in the context of dwelling depressions. The topographical locations of the Early Metal Period dwelling sites differ essentially from the Neolithic ones (Lavento 1997a). Sites refer to a mobile way of life.

10.2.10.2. The end of Textile ceramics

If the definition of the beginning of the Early Metal Period is difficult, the same holds true for the end of the period. At least the following phenomena have to be taken into consideration when trying to characterise the end of the using period of Textile ceramics.

1) The use of Ananino axes ceases. They may occur together with Textile ceramics, but they also belong to the context of the subgroups of Sär 2 ceramics.
2) Casting of bronze axes ceases. Casting moulds disappear.
3) Late Textile ceramics, which is synchronous with the subgroups of Sär 2 pottery, is gradually replaced by new types.
4) Iron implements appear and furnishing iron begins.

Although from the Middle-Russian viewpoint the Ananino axes in Fennoscandia are peripheral, they still have an important position in the western side of the main distribution area of the culture (Meinander 1985:17). The using period of the Akozino-Mälar axes seems to end during the 6th century BC (Meinander 1985:33), while the Ananino axes were in use until the 3rd century BC (Meinander 1985:18). Thus they suit well to characterise the end of Textile ceramics. Also bronze casting follows the phases of axes and its cessation can be connected with the Ananino axes.

Although the disappearance of Textile ceramics can be considered as an important factor showing the discontinuity, its date is difficult to fix, not only because of the small number of AMS- or carbon-14 datings. One difficult problem is typological: it is not easy to say whether the sherds should be included in Textile ceramics or in some subtypes of Sär 2 ceramics. For these reasons context dates and shore displacement chronology define the end of the period. According to Carpelan a differentiation took place during Late Textile ceramics and it led to the formation of four subgroups of Sär 2 ceramics. According to Carpelan, the first types of Sär 2 ceramics (Anttila, Luukonsaari and Sirnihta) came into use already about 1000 calBC. All subgroups of Sär 2 pottery are partly synchronous with later Textile ceramics. The development of the Sär 2 types can be derived typologically from Textile ceramics, Lovozero ceramics and IT ceramics. An important phenomenon is that asbestos came into use again. Carpelan assumes that this took place when the populations of Textile ceramics and Asbestos ceramics came into close contact with each other. Also more trivial explanations can be suggested. The use of asbestos may have been invented independently of the old tradition. Again, because Asbestos ceramics is easy to find in the Neolithic dwelling sites, it may have been a prototype inspiring the beginning of a new tradition of Asbestos ceramics.

Still it seems possible that Textile ceramics can be found in the sites, which were in use between 300–1 calBC. The using period of Textile ceramics may have continued until the beginning of our era. There is yet another typological difficulty when trying to define the end of Textile ceramics. In some dwelling sites in Finland there exists also Lepnaya ceramics, which belongs to the context of Late Textile ceramics, but the use of which still continued during the Late Iron Age. In the Karelian Republic and on the southeastern shores of Lake Ladoga there exists more of this ceramics. Before the typology and chronology of this type has been established, the end of Textile ceramics remains open.

Furnishing iron began in Finland at the earliest during the 4th century BC (Schulz 1986:172; Kotivuori 1996:410) and continued into the 5th century AD (Lavento 1999b) or even later (Kosmenko & Manjuhin 1999). Although traces of iron casting have been found in sites involving plenty of Textile ceramics, it seems still more likely that iron casting belongs to the context of Luukonsaari and Kjelmøy ceramics (Lavento 1996a; Kotivuori 1996). The dwelling sites of Sär 2 ceramics are often located in the same kinds of environment as the sites of Textile ceramics. The sites are relatively small indicating the small size of populations. The existence of sites on small islands is a conspicuous feature.

Traditional models state that metals and fur played a central role in exchange during the Early Metal Period, and first of all during the Ananino period between 800–200 BC (Tallgren 1937:19, 22; Meinander 1954b:88). It is interesting that the concentration of casting moulds is in the north (Bakka 1976:46; Huurre 1981:27). In addition to this "fur" model, the exchange of raw material, ready-made axes as prestige goods and gifts should be taken into consideration also.

Both Odner (1983:106–107) and Olsen (1985:29) have emphasised the importance of Sär 2 ceramics as the symbol of identity for hunter-gatherer populations. The end of local metal casting during the 2nd and the 3rd centuries AD can be interpreted in such a way that ceramics did not play an important role in making food or other needs (Olsen 1985:29).

Some archaeologists consider Sär 2 ceramics as an indicator of uniformity amongst the earlier heterogeneous hunter populations in northern Fennoscandia. An interesting linguistic fact is that in Lappish there exists no terminology for ceramics. Could it be possible that all remains of this long technical process have disappeared? (Olsen 1985:29–30). Odner has been sceptical about Carpelan's (1981) views to connect languages and ce-

ramic groups. He does not find it possible to make a difference between Proto-Lappish and Proto-Finnish ethnos on the basis of asbestos ceramics. He emphasises that in the linguistic material there is not enough evidence for the existence of Saami ethnicity before the beginning of our era (Odner 1985:39). There are many possible explanations for the way loan words may have spread in the language and a simple model of immigration of people from the east is only one possibility. The only sure fact is that there was communication during the Early Metal Period, which also affected the language.

Norwegian archaeologists (Helskog 1985; Odner 1992:97) have suggested that the Early Metal Period societies in northern Norway had already some kind of formal leadership. These ideas have been supported by the appearance of sedentary dwelling sites and their material and also by rock carvings in the Alta region. The society was probably relatively egalitarian if comparing it with the Indo-European tradition. Odner (1992:99) has especially emphasised the role of the shaman in the Saami society. He finds it essential that the Indo-European tradition and the Arctic/Boreal tradition met in northern Fennoscandia – the first in the coastal area and the second inland. In principle, the same kind of dichotomy can be seen in Finland with coastal and inland populations (Meinander 1954b; Seger 1984).

Odner (1983) presents that Saami population separated from the Finnish ones ca. 2000 BP. He emphasises the ethnicity of the Saami population, which is a result of the interaction between earlier heterogeneous hunter-gatherer populations in northern Fennoscandia and Finnish peasant populations. He states that these processes had their beginning during the older Roman Period, when hunter-gatherer populations began to be in contact with Finnish peasant populations coming from Estonia (Odner 1983:106–107; Olsen 1985:28). Odner's ideas do not seem to be very convincing from a Finnish viewpoint: they concern very large territories and at least in Finland empirical data supporting them is absent. Odner (1983) argues further that the Saami identity emerged in northern Fennoscandia as a result of cultural contacts between two populations with different economics – hunter-gatherers (Saami) and immigrant farmers (Norwegians) – which began already during the Early Iron Age (Odner 1983; Olsen & Kobyliński 1991:20). The separation of the identity of populations is extremely difficult on the basis of archaeological material and the same holds true with the populations responsible for Textile ceramics. Therefore further discussion about the ethnic questions is not presented here.

10.2.10.3. Textile ceramics in Finland and on the Karelian Isthmus

Archaeology becomes post-modern by approaching prehistory from very different viewpoints, which is the central method also in this study. When discussing the results of this work it has already been evident in many connections that the study does not represent a narrow coherent theoretical framework. The hermeneutical viewpoint accepts different approaches and tries to elucidate questions from new perspectives. This does not necessarily mean bringing totally new methods into discussion but, instead, accepting that the study is always interpretation and that thus the results are dependent on a large number of visible or hidden assumptions. The results of this study cannot often solve yes/no questions. Instead, they present possibilities, some of which seem – in the light of contemporary information – more probable than others.

The central aim of this study is to analyse Textile ceramics typologically in order to find out whether the group exists and whether it can be divided into subgroups. The study started with the hypothesis of the existence of three subgroups: Sarsa, Tomitsa and Kalmistonmäki ceramics. It soon turned out that the material can be divided into two groups, but if going further, even three or four typological subgroups can be found correlating with the geographical distribution. The distribution area of Sarsa ceramics covers southern and southwestern Finland and the Karelian Isthmus. The rough border between Sarsa and Tomitsa ceramics runs along the line joining Lake Ladoga–Savonlinna–Jyväskylä-southern Ostrobothnia. Tomitsa ceramics has been found in eastern and northern Saimaa. The distribution area of the subgroup of Kainuu covers the Oulujoki Water System. Both Kainuu and Tomitsa ceramics have a common eastern origin. In southern and southwestern Finland there exists Sarsa ceramics, which has already been described and defined by Meinander. The analysis gives some support also to the hypothesis that in the Karelian Isthmus, even the fifth subgroup of Textile ceramics can be discerned. This is not exactly the same as Kalmistonmäki ceramics, which Meinander presented as the youngest variant of the group. The material belonging to the Kalmistonmäki group is too small to verify or abolish Meinander's hypothesis. The conclusion is that on the basis of Meinander's definition of Kalmistonmäki ceramics it is not possible to postulate the existence of a separate population.

Western and eastern routes can be discerned when considering the spread of Textile ceramics. The western route connects Estonia and, instead of the south and southwest coast of Finland, the inland zone in Häme. This early appearance of textile-impression and Textile ceramics had its beginning in Late Neolithic Corded Ware. The hypothetical eastern routes of contacts can be divided into two or three territorial zones. The northernmost zone is in the Kemijoki Water System and particularly in the Oulujoki Water System. The northern part of the Saimaa Water System - the dwelling sites in Ilomantsi and Joensuu – indicate the second zone. The third zone connects the Lake Ladoga area to southern Saimaa through the River Vuoksi with the dwelling sites in Räisälä and Kaukola on the Karelian Isthmus.

Although there was much discussion of the possibilities of style in archaeological interpretation in the last chapters, this study is heavily based on typological analysis, an etic type of approach, but efforts to uncover the most essential characters, the *eidos*, of the type have been

made. The first divisions of the material were made by factor analysis. The division of the material into two main subgroups can be clearly seen in the statistical analysis. This interpretation needs another kind of methodology – that I have here called phenomenological – than only a statistical approach. The phenomenological approach aims to reveal the most essential characteristics of a ceramic type – in this case the *eidos* of Finnish Textile ceramics - its subgroups or even the *eidos* of a single vessel. It aims to find general characteristics, not single observations or simple statistical generalisations, but trends or hidden qualities, which are peculiar and possible to use, for example, in subtypes in some geographical areas. For this reason factor analysis was chosen for the multivariate method; the purpose is not to principally cluster vessels but to find factors and attributes which cause the formation of the type.

It is essential to note that this phenomenological approach is the procedure archaeologists have applied in practical studies for over a hundred years when carrying out typologies and classifications. It has been made without resorting to any statistical calculations or to methods other than using one's brain when combining different observations into types or styles.

Although in Finland over 170 dwelling sites involving Textile ceramics are known, the majority of them have only a small amount of ceramics. They give an impression of temporary sites, which were not intensively settled. This refers to the hypothesis that population density was considerably thinner during the Early Metal than during the Neolithic Period.

One can further ask, if Finnish Textile ceramics should be considered as peripheral to the centres in the Karelian Republic or even in the Upper or Middle Volga areas. Although this seems possible also from the typological viewpoint, this hypothesis does not answer many other questions. It is likely that populations in Finland and the Karelian Republic were in contact and individuals in a very large area understood each other's languages. These populations were probably almost self-sufficient in relation to all raw materials except bronze. The relations between southern and northern Finland were even closer.

The dwelling sites of the Early Metal Period were considerably smaller and their density of habitation was also clearly thinner than during the Stone Age. These observations open the door to interpret the nature of the society during the Early Metal Period. In the beginning of the period inhabitants were mobile in comparison with the Stone Age semi-nomadic life. The sites reflect a temporal type of settlement. Although in several areas signs of slash-and-burn cultivation can be found, they also refer to temporary experiments rather than permanent agriculture. Therefore, no radical change in the economy occurred when entering the Early Metal Period from the Neolithic Period.

Textile ceramics characterises the period, which radically changed the society in mainland Finland. It perhaps met the remnants of the populations of Asbestos ceramics, broke the old tradition during a short period of time or came to the territory where Asbestos ceramics had already disappeared. Textile ceramics disappeared over a thousand years later during the course of a slow process. It became replaced by the tradition responsible for different subtypes of Sär 2 ceramics and perhaps also Lepnaya ceramics. It brought the first bronze implements and bronze casting to eastern and northern Finland. Agriculture came to the coastal area from other directions, but in eastern Finland the spread of it may have taken place together with the makers of Textile ceramics. Experiments in cultivation did not lead to a change in economy. Hunting and fishing proved its strength and this type of economy continued for over two thousand years in eastern and northern Finland.

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ABBREVIATIONS

AA = Acta Archaeologica
AmAnt = American Antiquity
BAR = British Archaeological Report
ESA= Eurasia Septentrionalis Antiqua
ETRA = Eesti Talurahva Ajalugu
FA = Fennoscandia Archaeologica
FM = Finskt Museum
Haik = Historiallinen Aikakauskirja.
HYAL = Helsingin Yliopiston Arkeologian Laitos, moniste
MAGW = Mitteilungen der Anthropologischen Gesellschaft in Wien
MEL = Muistse Eesti Linnused
MT = Muinasaja Teadus
NAR=Norwegian Archaeological Review
SM = Suomen Museo
SMYA = Suomen Muinaismuistoyhdistyksen Aikakauskirja – Finska Fornminnesföreningens Tidskrift.
TATÜ = Eesti NSV Teaduste Akadeemia Toimetised Ühiskonnateadused
TMM/ÅLM = Turun Maakuntamuseo/ Åbo Landskapsmuseum
TYA = Turun Yliopiston Arkeologian oppiaine
ÕESA = Õpetatud Eesti Seltsi Aastaraamat 1924–1938. Sitzungsberichte der Gelehrten Estnischen Gesellschaft 1861–1923. Tartu (Dorpat)
ВСРГО = Всероссийское Русское Географическое Общество
ВЭИЭН = Вопросы Этнической Истории Эстонского Народа
Изв. ВГО = Известия Всесоюзкого Географического Общества
КСИА = Краткие Сообщения Института Археологии. Академии наук СССР
МИА = Материалы и Исследования по Археологии СССР
РА = Российская Археология
РАНИОН = Российская Ассосиасия Научно-исследовательских Институтов Общественных Наук
СА = Советская археология
ТГИМ = Труды Государственного Исторического Музея

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APPENDIX 1.

Sites with Textile ceramics in Finland and on the Karelian Isthmus.

1. THE RIVER KEMIJOKI WATER SYSTEM

1.1. Kemijärvi
- (1) Kemijärvi [18] Luusua Hietalahti 1
- (2) Kemijärvi [28] Juuniemi Anttila 1 and 2
- (3) Kemijärvi [31] Juujärvi Juuniemi
- (4) Kemijärvi [32] Juujärvi Rajaniemi
- (5) Kemijärvi [45] Luusua Neitilä 4
- (6) Kemijärvi [169] Alakylä Narkiperä

1.2. Rovaniemi
- (7) Rovaniemi [109] Kolpene
- (8) Rovaniemi [152] Kemihaara Säpsäkoski

2. THE RIVER OULUJOKI WATER SYSTEM
(The Province of Oulu)

2.1. Hyrynsalmi
- (9) Hyrynsalmi [18] Hyrynsalmi Vonkka II

2.2. Kuhmo
- (10) Kuhmo [29] Kuhmo Sylväjänniemi 1
- (11) Kuhmo [52] Katerma Pajasaari Island
- (12) Kuhmo [53] Katerma Vasikkaniemi SW
- (12) Kuhmo [68] Katerma Vasikkaniemi N

2.3. Muhos
- (14) Muhos [40] Laitasaari Halosentörmä (Hangaskangas)

2.4. Ristijärvi
- (15) Ristijärvi [20] Ristijärvi Likoniemi

2.5. Sotkamo
- (16) Sotkamo [10] Nuasjärvi Kiikarusniemi
- (17) Sotkamo [62] Nuasjärvi Ammonsaari Island
- (18) Sotkamo [111] Palolahti W

2.6. Suomussalmi
- (19) Suomussalmi [25] Kianta Kalmosärkkä
- (20) Suomussalmi [27] Juntusranta Kellolaisten tuli
- (21) Suomussalmi [48] Juntusranta Salmenniemi
- (22) Suomussalmi [53] Tormua Tormuan särkkä
- (23) Suomussalmi [56] Juntusranta Mikonsärkkä
- (24) Suomussalmi [108] Ämmänsaari Kumpuniemi
- (25) Suomussalmi [117] Kianta Joenniemi

2.7. Utajärvi
- (26) Utajärvi [86] Ahmas Pikkarainen

2.8. Vaala
Vaala (Säräisniemi) Nimisjärvi
- (27) Vaala [8] Nimisjärvi Sillankorva

3. SOUTHERN OSTROBOTHNIA

3.1. Laihia
- (28) Laihia [6a] Nikonkallio
- (29) Laihia [108] Nikkari Viirikallio

3.2. Närpiö
- (30) Närpiö (Pirttikylä) [1] Raineåsen
- (31) Vöyri [83] Tuckor Vitmossen 3

4. THE LAKE SAIMAA WATER SYSTEM

4.1. Enonkoski
- (32) Enonkoski [9] Parkunmäki Pöytälahti b
- (33) Enonkoski [21] Simanala Kotkuinniemi g

4.2. Ilomantsi
- (34) Ilomantsi [17] Piilovaara Syväys I
- (35) Ilomantsi [37] Nuorajärvi Korpisaari S

4.3. Joensuu
- (36) Joensuu [3] Karsikko Varaslampi

4.4. Kerimäki
- (37) Kerimäki [1] Kuokkala Vehkaranta
- (38) Kerimäki [57] Jouhenniemi Kokkomäki
- (39) Kerimäki [127–132] Raikuu Martinniemi (1–5, 8)

4.5. Kesälahti
- (40) Kesälahti [2] Ruokkee Sirnihta (=Sirnitsa)
- (41) Kesälahti [11] Suurikylä Suurenkylänlahti 1

4.6. Kitee
- (42) Kitee [1] Kiteenlahti Turusenniemi (Naurisniemi)
- (43) Kitee [34] Suorlahti Viilniemi

4.7. Kiuruvesi
- (44) Kiuruvesi [2] Näläntö Tuliniemi

4.8. Kuopio
- (45) Kuopio [17] Riistavesi Vanha-Koski

4.9. Maaninka
- (46) Maaninka [9] Tavinsalmi Huutoniemi

4.10. Parikkala
- (47) Parikkala [17] Kaunissaari Island

4.11. Pielavesi
- (48) Pielavesi [1] Taipale Virranniska
- (49) Pielavesi [6] Kuivaniemi Meijerinkangas
- (50) Pielavesi [60] Kaatiojoen suu

4.12. Polvijärvi
- (51) Polvijärvi [6] Martonvaara Multavieru

4.13. Punkaharju
- (52) Punkaharju [1] Kulennoinen Kaarniemi

4.14. Puumala
- (53) Puumala [9] Huhtimaa Pistohiekka b
- (54) Puumala [16] Liimattala Kotkatlahti a

4.15. Rantasalmi
- (55) Rantasalmi [35] Lautakangas

4.16. Ristiina
- (56) Ristiina [2] Himalansaari Heiniemi
- (57) Ristiina [22] Laasola Pulmionlampi
- (58) Ristiina [26] Laasola Kitulansuo d
- (59) Ristiina [28] Roinilampi
- (60) Ristiina [29] Laasola Akanlahti
- (61) Ristiina [32] Huttula Hietaniemenkangas
- (62) Ristiina [43] Hartikkala Ala-Pentti b
- (63) Ristiina [44] Hartikkala Metelinniemi
- (64) Ristiina [84] Heiniemi Mustalahti

4.17. Ruokolahti
- (65) Ruokolahti [45] Äitsaari Karoniemi

4.18. Rääkkylä
- (66) Rääkkylä [6] Täitimänniemi Mehonlahti 1
- (67) Rääkkylä [7] Täitimänniemi Pörrinmökki
- (68) Rääkkylä [8] Täitimänniemi Mehonlahti 2
- (69) Rääkkylä [9] Täitimänniemi Lappalaissuo 1
- (70) Rääkkylä [19] Täitimänniemi Huotinniemi
- (71) Rääkkylä [17] Täitimänniemi Rantala

4.19. Savonlinna
(72) Savonlinna [71] Tolvanniemi Haukilahden pohja
(73) Savonlinna [97] Pellossalo Suvikangas a
(74) Savonlinna [42] Hannolanpelto Käräänkangas (a–c)
(75) Savonlinna [101] Pellossalo Pöträmönniemi a
(76) Savonlinna [104] Pihlajaniemi Iso-Kankainen

4.20. Savonranta
(77) Savonranta [18] Muhola Pyyhiekka 1

4.21. Taipalsaari
(78) Taipalsaari [6] Jauhiala Vaateranta
(79) Taipalsaari [11] Kilpiänsaari Ketvele
(80) Taipalsaari [12] Haikkaanlahti Valkeasaari

5. THE KARELIAN ISTHMUS

5.1. Kaukola
Lake Riukjärvi and Piiskunsalmi
Dwelling sites of Kankaanmäki (Uino KAUK 14)
(81) Kaukola Riukjärvi Juho Paavilaisen kartanopelto
(82) Kaukola Riukjärvi Juho Paavilaisen rantapelto
The dwelling sites of Nököpelto (Uino KAUK 10)
(83) Kaukola Riukjärvi Olli Paavilaisen Nököpelto
Dwelling sites of Kyöstälänharju (Uino KAUK 13)
(84) Kaukola Riukjärvi Simo Iivosen nummi
(85) Kaukola Riukjärvi Simo Iivosen tontti ja perunamaat
(86) Kaukola Riukjärvi Pekko Iivosen tontti ja (kartano)pelto
(87) Kaukola Riukjärvi Pekko Iivosen rantapelto
(88) Kaukola Riukjärvi Heikki Teräväisen rantapelto
(89) Kaukola Riukjärvi Heikki Teräväisen kartanopelto
(90) Kaukola Riukjärvi Simo Iivosen vanhan talon paikka
Dwelling sites on
Tiitunmäki (Uino KAUK 12)
(91) Kaukola Riukjärvi Tiitunmäen kallion vieri
(92) Kaukola Riukjärvi Antti Varv(p)an (=Heikki Laukkasen) rintapelto
(93) Kaukola Riukjärvi Antti Varvan pihapelto ja koppolipelto
(94) Kaukola Riukjärvi Antti Varvan maat
(95) Kaukola Riukjärvi Tiitunmäen tienvieri
Dwelling sites of Juho Iivosen ja Simo Lankisen perillisten maat (no number)
(96) Kaukola Simo Lankisen perillisten maat
Dwelling sites of Piiskunsalmi (Uino KAUK 21)
(97) Kaukola Piiskunsalmi Aatami Ruuskan Vehnämaanlahden pelto
(98) Kaukola Piiskunsalmi Olli Kortteen ja Kalle Merosen pellot Piiskunsalmen rannalla
(99) Kaukola Piiskunsalmi Piiksuonkankaan asuinpaikka
Dwelling sites of Piiskunsalmi Lavamäki (Uino KAUK 23)
(100) Kaukola Piiskunsalmi Lavamäen pelto
(101) Kaukola Piiskunsalmi Ville Pessin Riihipelto
Dwelling sites by the Bay of Tossikanlahti (Uino KAUK 25)
(102) Kaukola Piiskunsalmi Antti Kaasalaisen Piiskun-, Tossikan- ja Savilahdenpellot
(103) Kaukola Piiskunsalmi Matti Kaasalaisen niemenpelto

5.2. Kurkijoki
(104) Kurkijoki [87] Kuuppala Kalmistonmäki Räkköläinen

5.3. Räisälä
(105) Räisälä [1] Hovi Kalmistonmäki
(106) Räisälä Kökkölä

5.4. Tytärsaari
(107) Tytärsaari [1] Kaunismäki

5.5. Viipuri
(108) Viipuri [18] Kärstilä Häyrynmäki
(109) Viipuri Krasnyj Holm

6. THE RIVER KYMIJOKI WATER SYSTEM

6.1. Anjalankoski
(110) Anjalankoski [1] Huruksela Ahvionkoski

6.2. Asikkala
(111) Asikkala [15] Kalkkinen Kotasaari

6.3. Hankasalmi
(112) Hankasalmi [2] Niemisjärvi Autioniemi

6.4. Iitti
(113) Iitti [10] Vuolenkoski Silamaniemi
(114) Iitti [12] Vuolenkoski Koskenranta
(115) Iitti [16] Lyöttilä Keidas

6.5. Jaala
(116) Jaala [5] Vesala Pukkisaari

6.6. Kinnula
(117) Kinnula [60] Muhola Häähkäniemi

6.7. Korpilahti
(118) Korpilahti [10] Putkilahti Hiirola
(119) Korpilahti [43] Oittila Raidanlahti
(120) Korpilahti [48] Raidanlahti Kotiranta

6.8. Kotka
(121) Kotka (Kymi) [12] Huruksela Töyrylä

6.9. Laukaa
(122) Laukaa [45] Savio Majaniemi b
(123) Laukaa [40] Savio Vuontee Juntula

6.10. Nastola
(124) Nastola [3] Immilä Kovalahti

6.11. Pihtipudas
(125) Pihtipudas [10] Kirkonkylä Majakaarre I (Kumpulainen)
(126) Pihtipudas [12] Kirkonkylä Madeneva
(127) Pihtipudas [17] Säkkärämäki Virtala 2
(128) Pihtipudas [22] Juntinniemi
(129) Pihtipudas [49] Lylysaari

6.11. Saarijärvi
(130) Saarijärvi [29] Summassaari Saarenpää
(131) Saarijärvi [36] Saarijärvi Voudinniemi
(132) Saarijärvi [41] Pyhäjärvi Jänissaari

6.12. Virolahti
(133) Virolahti [18] Ravijoki Niemistö

7. THE RIVER KOKEMÄENJOKI WATER SYSTEM

7.1. Hauho
(134) Hauho [40] Ilmola Lentolanmäki 7

7.2. Janakkala
(135) Janakkala [21] Irjala Irjala

7.3. Kangasala
The dwelling site complex of Sarsa
(136) Kangasala [3b] Huutijärvi Autio-Lunden
(137) Kangasala [3d] Huutijärvi Sepänjärvi II
(138) Kangasala [4a] Vääksy Pohtio I
(139) Kangasala [4b] Vääksy Pohtio II
(140) Kangasala [4b] Vääksy Pohtio III
(141) Kangasala [4b] Vääksy Pohtio IV
(142) Kangasala [4c] Vääksy Tiilitehdas I
(143) Kangasala [4c] Vääksy Tiilitehdas II
(144) Kangasala [4c] Vääksy Tiilitehdas III
(145) Kangasala [6] Vääksy Sepänjärvi I
(146) Kangasala [4d] Vääksy Pohtiolampi
(147) Kangasala [24] Tiihala Vehoniemenharju 2

7.4. Loppi
(148) Loppi [15] Sajaniemi Kavettula
(149) Loppi [76] Salo Kuitikas

7.5. Luopioinen
(150) Luopioinen [15] Hietaniemi Hietaniemenkärki (Hietasenkärki)
(151) Luopioinen [21] Saksala Isosaari

7.6. Nakkila
(152) Nakkila [15b] Soinila Kaasanmäki I (Jaakkola)
(153) Nakkila [35] Arola Rieskaronmäki (Tollukkaanperä or Himmelisuulinmäki)

7.7. Ulvila
(154) Ulvila [5] Suolisto Peltomäki

7.8. Valkeakoski
(155) Valkeakoski [1] Rapola Hirvikallio I and II

(156) Valkeakoski [14] Valkeakoski Linnosaari
7.9. Vammala
(157) Vammala [22] (Tyrvää) Vammala Haapakallio

8. VARSINAIS-SUOMI

8.1. Kaarina
(158) Kaarina [12] Hulkkio Tikankontti

8.2. Laitila
(159) Laitila [321] Laitila Hautvuori
(160) Laitila [89] Untamala Lalla

8.3. Lieto
(161) Lieto [17] Vanhalinna

8.4. Muurla
(162) Muurla [17] Kotikoivunummi Haansyrjänpelto

8.5. Perniö
(163) Perniö [88] Preitti 6

8.6. Salo
Salo Isokylä Ketohaka-area
(164) Salo Salo Ketohaka 1 (Katajamäki)
(165) Salo Salo Ketohaka 2
(166) Salo Salo The group of dwelling remains at Ketohaka

8.7. Turku
(167) Turku Niuskala Kotirinne
(168) Turku Niuskala 3:14 Polttolaitoksenkatu

9. UUSIMAA

9.1. Askola
(169) Askola [58] Taka-Piskolan Ruoksmaa

9.2. Karjaa
(170) Karjaa [50] Kroggårds Hagnäs IIb
(171) Karjaa [32] Läpp Östergård

9.3. Kirkkonummi
(172) Kirkkonummi [38] Kauhala Koivistosveden

9.4. Porvoo
(173) Porvoo [40] Munkby Böle

9.5. Siuntio
(174) Siuntio [37] Svartbäck Marsbacken 3

9. 6. Vihti
(175) Vihti [20] Paksalo Pinolahti

Introduction

The following presentation will elucidate the main features of Textile ceramic sites in Finland and on the Karelian Isthmus. The short descriptions vary markedly depending on the quality and quantity of field studies carried out at each site. The emphasis is on excavations, surveys or other possible studies at sites. In addition, notable structures observed and results of excavations have been briefly outlined. Shore displacement, AMS-, and carbon-14 -datings have also been taken into a consideration. The periods of habitation have been clarified by defining ceramic types or other characteristic artefacts at each site. Ceramics themselves have not been discussed in detail in this section, because of its thorough treatment in the main text.

A central problem of the catalogue is to decide which sites merit inclusion. The basic criterion used has been that the site must involve Textile ceramics. This means then that the problem is typological. There are dwelling sites involving materials, which surely belong to the research period; while most of the ceramics belong either to the Final Neolithic or the Early Metal period, Textile ceramics are represented through some tiny pieces of textile-impression. The problem is particularly difficult with sites situating along the river Kemijoki. It is probable that some of the sites which are here represented in the context of Textile ceramics should be omitted.

Further, all sites including textile-impressed ceramics have not been included in the site catalogue because typological definition on this base only is uncertain and the context does not support their connection with Textile ceramics. Sites have been excluded despite their possible role in elucidating the development of Textile ceramics in relation to subgroups of Sär 2, Kiukainen or Epineolithic ceramics in southwestern and southern Finland. The problem is exacerbated with the finds in southern Lapland when deciding whether a sherd should be classified as a Textile ceramics or a Sär 2 type. The main problem often lies in the small amount of material available.

Although this unclear material has been excluded from this section, it does not mean that it has not been taken into consideration when trying to see development in material in dwelling sites. A very large amount of material has been investigated to enable separating Textile ceramics from earlier or later types (see chapter 7, app. 5).

Although Karelian Isthmus does not belong any more to Finland it has still been included in the material. The main reason is the Kalmistonmäki ceramics, the understanding of which is still an important part of Textile ceramics in Finland. Also the availability of the old material at the collection of the National Board of Antiquities makes it natural part of study material.

The dwelling sites have been introduced in geographical order from north to south. The great water systems have been used to define different areas, because they have been assumed to represent more natural geographical divisions than the contemporary nomenclature of provinces in Finland. An implicit assumption is that the great water systems have influenced the distribution of habitation in different phases of prehistory. These geographical units have been applied in trying to explain differences in ceramics or some other artefact groups during the Early Metal period.

The material found at each dwelling site has been presented in connection with the main catalogue numbers (NM) of the Finnish National Museum. While all ceramics belonging to these main numbers have been analysed by investigating the actual material, the basic information concerning other finds is in most cases based on the data obtained from the main catalogue at the National Board of Antiquities. Source criticism is necessary when applying this material, particularly concerning the typological division of the material. Therefore, the description of finds other than ceramics should only be considered as suggestive.

In most cases, the excavation or survey report is available in the topographical archives of the National Board of Antiquities. The year when the report had been delivered to the archives is given in parentheses. If no report is available, as is the case with some excavations, this is noted. Survey reports are of variable quality. Some reports merely include coordinates, a basic map and one line of text. These reports have no name and thus not cited in the reference list. In cases where a survey report or a separate inspection report exists, these will be contained within the reference list.

The purpose of the site catalogue is to provide basic information on the sites. The name and number of the site is the same as in the find catalogues of the National Board of Antiquities. In some cases the site number may by missing, typically because it does not exist. Bsm presents the number of the basic map 1:20 000. The coordinates have usually been taken from survey or excavation reports, but sometimes they have been measured directly from the maps.

After each basic number, findings have been presented qualitatively. Considerable differences are apparent between sites. For instance, sites found recently provide more reliable information that sites excavated at the beginning of the 1900s. This is because classification of later findings is more detailed. Because of the large number of finds, the author is only able to characterise ceramics and a small portion of other materials.

Attempts have been made to include all field studies conducted at sites to the list. All published studies on the sites have also been listed. The following information has been given in the description: location, topography, soil, studies, most important structures and cultural layers, and ceramic types, particularly the existence of Textile ceramics. Other find than ceramics in dwelling sites have usually not been much described. Information about bronze axes, crucibles and straight-based arrowheads can be obtained in the find lists and appendices 9a, b and c.

1. THE RIVER KEMIJOKI WATER SYSTEM

1.1. Kemijärvi

1. Kemijärvi [18] Luusua Hietalahti 1

Bsm 3632 05
x = 7380 60 y = 514 65 z = 150 m above sea level (ASL)

Finds 9904:2 an ice pick
15667:1–358 ceramic sherds, a straight-based flint arrowhead, a slate arrowhead, fragments of stone axes and adzes, fragments of slate spearheads, a slate knife, flint slate and quartz implements and flakes, burnt bones
25486:1–5 quartz implements and flakes

Studies Erä-Esko, A., survey 1956
Sarvas, P., excavation 1962 (1972) (104 m^2)
Kotivuori, H., survey 1989 (1991)

Literature Kotivuori & Torvinen 1993

The dwelling site of Hietalahti 1 is situated around the southern shore of Lapinselkä along Lake Kemijärvi, about 22 km S of the Kemijärvi church. The dwelling site is located in the field, sloping gently to the SW of the outbuilding of the Hietaniemi farmhouse. The soil in the area is mainly moraine, including coarse gravel fragments, which changes into a fine sand at lower elevations. The site was in danger of being destroyed by the construction of the basin for the Seitakorva hydroelectric power station at Kemijoki River. The salvage excavation was conducted at the site by Pekka Sarvas in 1962.

Only a few remains of structures were observed during the excavation. In the excavation areas 1, 2 and 3, burnt stones and patches of red and black cultural soils were found. The cultural layer was mixed, and no clear concentrations or stratigraphy was observed (Sarvas 1972a). According to Christian Carpelan, the flint and quartz implements are either Neolithic or Epineolithic in character (Carpelan 1965:49).

The ceramic finds from Hietalahti 1 are varied. One strongly profiled rim sherd, which belongs to Textile ceramics, is of special interest. The ornamentation – long stamps made with dots, small pits and short vertical notches in a region below the rim – belongs to the combination which has been found in Kainuu and even in the Lake Saimaa area. This vessel has been tempered with coarse fragments of mica and quartz. The most heavily asbestos-tempered sherds belong to the Lovozero ceramics, but there are also some sherds, belonging to Sär 2 ceramics. A more exact classification is not possible because of the low degree of preservation of the sherds. Eight vessels have been distinguished in the material. Four of these belong to the Lovozero ceramics, and one can be classified as an undefined Sär 2 type. Three vessels have been classified as Textile ceramics.

2. Kemijärvi [28] Juuniemi Anttila 1 and 2

Bsm 3631 06
x = 7365 32/25 y = 512 85/513 07 z = 132 m ASL

Finds 14344:1–121 (Anttila I) ceramic sherds, a stone adze, a flint flake, quartz implements and flakes, hammer stones, fragments of stone implements, unburnt and burnt bones
14344:122–212 (Anttila II) ceramic sherds, a stone axe, a whetstone, a sinker, a stone adze, a flint flake, quartz implements and flakes, a fragment of stone implement, a quartzite implement, stone flakes, a hammerstone, burnt bones
Collection at the school of Juujärvi

Studies Erä-Esko, A., survey 1956
Sarkamo, J., excavation 1957 (1959) (Anttila I 245 m^2, Anttila II 85 m^2)
Kotivuori, H., survey 1989 (1991)

Literature Carpelan 1965; 1970; Kotivuori & Torvinen 1993

The dwelling sites of Anttila 1 and 2 are situated along the northern terrace of the Kemijoki River about 38 km S of the Kemijärvi church. Jaakko Sarkamo has separated the two dwelling sites at Anttila, but in the list compiled by Hannu Kotivuori and Markku Torvinen (1993:27), the sites have been combined. Thus, the previously given coordinates apply to both sites. The dwelling site of Anttila 2 lies on the riverbank, about 6 m above the water level of the Kemijoki River before the beginning of water regulation. Jaakko Sarkamo carried out a salvage excavation at the site in 1957. Below the thick turf layer, a



1. Anttila 2 in Kemijärvi. Photo: Jaakko Sarkamo/National Board of Antiquities.

cultural layer with Stone Age material was found, indicating a short period of habitation (Carpelan 1970:25). The site was not rich in finds, and only a few dwelling remains or structures were present in the soil. The remains of two hearths were excavated.

Ceramics have been found only in small numbers. They are, however, of special interest. According to Christian Carpelan, they represent the same ceramic type, which has been found in northern Norway (Carpelan 1970:30–31). The sherds are usually asbestos-tempered, but some organic material can be seen in the remains of very thin, curved hollows. These hollows have very likely been filled with hairs. Even more important special feature in these ceramics is their surface treatment. It is based on this special impression that these ceramics have been called imitated textile-impression. Although the treatment resembles textile-impression, it has not, however, been made with cloth. Instead, it has been produced with waffle-like stamp (Gjessing 1942:275–276; Carpelan 1970:31).

Further, the small but multi-faced ceramic material of Anttila 1 has also given its name to one variant of Sär 2 ceramics, the Anttila ceramics. These ceramics are talc or soapstone-tempered and have a characteristic shape and decoration. Although their main distribution area is in Kainuu, Carpelan has presented the best-preserved sherds at Anttila (NM 14344:83) as examples of this ceramic type. In all cases, the ornamentation has been restricted to the upper part of the vessel. Very typical are broad furrows, which have either flat or concave bottoms. Ornamentation often includes horizontal and inclined lines, forming parallelograms. Jagged lines may be contained with these.

On the basis of the ceramics, the dwelling sites of Anttila 1 and 2 likely were settled during the Late Neolithic and Early Metal periods. At Anttila 1 Imitated Textile ceramics (henceforth IT ceramics) have been found, and at Anttila 2, also Anttila and Lovozero ceramics. Only two sherds, which can possibly be connected with Textile ceramics, have been found. Some sherds of undefined Early Metal period ceramics are also present.

3. Kemijärvi [31] Juujärvi Juuniemi

Bsm 3631 06
x = 7365 26 y = 514 77 z = 130 m ASL

Finds 10396:3 an axe
14345:1–81 ceramic sherds, quartz implements and flakes, a fragment of stone implement, slate flakes, elliptical stones, hammerstones, asbestos, burnt bones
14698:1 an axe
25489:1–3 a quartz implement and flakes, a slate flake

Studies Sarkamo, J., excavation 1957 (1959) (110 m^2)
Kotivuori, H., survey 1989 (1991)

Literature Kotivuori & Torvinen 1993

The dwelling site of Juuniemi is situated on the E side of the Kemijoki River, about 37.5 km S of Kemijärvi church. Juuniemi is a cape running from the SE to the NW, alongside Lake Juujärvi. The dwelling site, which is situated at the apex of the cape, is heavily flooded by water regulation. Jaakko Sarkamo carried out the excavation at the site in 1957. The soil is gravel. Ice activity formed the shore terrace over a long period. The cultural layer could be observed only sporadically, revealing, for instance, scattered remains of hearths.

Textile ceramics and Lovozero ceramics have been found at Juuniemi, in addition to one sherd of ceramics, with deep grooves on the surface. The Textile ceramics vessel (NM 14345:41) is strongly profiled and twisted outwards. The ornamentation consists of a row of pits and inclined rows of spots, forming a comb-stamp. This ornamentation has much in common with Lovozero ceramics, but the pits and strong profiling distinguish it from Lovozero ceramics. Some sherds of Combed Ware are also present in the Juuniemi material.

4. Kemijärvi [32] Juujärvi Rajaniemi

Bsm 3631 03
x = 7362 42 y = 507 63 z = 130 m ASL

Finds 3266:7 a stone implement
3282:16–21 stone adzes, a whetstone, pieces of stone implements
3637:1–8 ceramic sherds, flint flakes, whetstones, quartz pieces and flakes, pieces of quartzite and slate, burnt bones
14995:1 quartz flakes

Studies Appelgren, Hj., excavation 1898 (1899)
Erä-Esko, A., survey 1960
Kotivuori, H., survey 1989 (1991)

Literature Kotivuori & Torvinen 1993; Kotivuori 1996

The dwelling site of Rajaniemi is situated close to the hydroelectric power station of Pirttikoski, above the basin, about 43 km SW of the Kemijärvi church. Despite water regulation, the site has remained undisturbed because of its location on a field far from contemporary habitation.

Hj. Appelgren-Kivalo conducted the first, and thus far the last, excavation of the site in 1898. Only some asbestos- and organic-tempered ceramic sherds were found, which – according to my definition – can be linked to the Lovozero group, but it is possible that some sherds could be classified as Textile ceramics. The site has been included in the group of Textile ceramics by Kotivuori (1996:104).

5. Kemijärvi [45] Luusua Neitilä 4

Bsm 3632 04
x= 7373 85 y = 516 85 z = 145.5 – 148.5 m ASL

Finds 15668:1 a stone adze
15671:1–1320 ceramic sherds, fragments of a casting mould, stone adzes and their fragments, a fragment of an ice pick, whetstones and their fragments, a blade of an iron knife, a fragment of rivet, a steel from a strike-a-light, amber ornaments, a flint spearhead, a slate awl, flint and quartz implements and flakes, slate point and knife, iron slag, a fragment of a fishhook, a hammerstone, pieces of slate implements, fragments of bone implements, a fragment of horn implement, weights, burnt bones, asbestos, horn, red ocher, birch bark, talc
16145:1–2166 ceramic sherds, a piece of copper utensil, two iron knives with mounts, a fragment of a bronze artefact, pieces of bronze and copper plate, an iron arrowhead, an amber pearl, fragments of amber artefact, a stone axe, stone adzes, an ice pick and their fragments, a whetstone, a weight stone, a base fragment of red schist spearhead, a schist spearhead, a boot-shaped knife and their fragments, quartz and flint implements and flakes, a quartzite arrowhead, iron slag, a slate knife, slate implements and their fragments, hammerstones, red ocher, burnt bones, a fragment of a horn implement, red schist, asbestos
16553:1–1836 ceramic sherds, an iron arrowhead, a small piece of metal, pieces of iron, a piece of bronze, schist axes and adzes, an unfinished ice pick, a fragment of an ice pick, flint arrowheads, a schist arrowhead, schist knives, pieces of amber, quartz arrowheads, quartz and flint implements and flakes, quartzite implements and flakes, a fragment of sandstone implement, a perforated stone, whetstones and their fragments, hammerstones, a slate awl, fragments of schist implements, schist flakes, iron slag, asbestos, talc, haematite, red ocher, weight stones, burnt bones
25495:1–12 quartz implements and flakes, a slate flake, quartzite

Studies Sarvas, P., survey 1962 (no report)
Sarvas, P., excavations 1962 (1972) (40 m²)
Sarvas, P., excavations 1963 (1972) (84 m²)
Sarvas, P., excavations 1964 (1972) (112 m²)
Kotivuori, H., survey 1989 (1991)

Literature Carpelan 1965; Kehusmaa 1972; Huurre 1983; Kotivuori 1996

The dwelling site of Neitilä 4 is situated about 29 km S of the Kemijärvi church, at the bottom of a small bay. The dwelling site lies on a 30 x 20 m terrace, which was formed as the result of flooding of the river. Neitilä 4 is an exceptional site in Finnish prehistory because of its clear flood layers have formed by the Kemijoki River. These layers have produced a natural stratigraphical mechanism, allowing archaeologists to construct a chronology based on stratigraphical observations (Siiriäinen 1963; Kehusmaa 1972). The thickness of the cultural layer was ca. 1.5 m. The soil is fine-grained sand and silt. At present, the site is for the most part eroded by water regulation.

Three salvage excavations have been carried out at the site under the leadership of Pekka Sarvas during 1962–64. The excavations uncovered patches of charcoal and red ocher. Moreover, postholes were localised. A considerable number of irregular stone settings were found, some of these been hearths. According to Sarvas a possible prehistorical grave was also localized (Sarvas 1972:10).

The excavation material consisted of finds over a long chronological sequence. Four fragments of a mould for a bronze axe were found (15671:1299); the mould fragments were made of soapstone involving asbestos fibres. A large collection of stone tools was discovered, including several adzes, axes and their unfinished fragments from different periods of prehistory.

The earliest ceramic groups at the site are Sär 1 and Ka II, found from the deepest layers of the excavation. Lovozero ceramics is the predominant group at the site. Finds of Kjelmøy ceramics have also been plentiful. Only one vessel of Anttila ceramics has been distinguished. Lovozero ceramics are asbestos- or organic tempered, and ornamentation comprises with small spots or thin furrows drawn with a sharp implement. The typical ornamentation prevails with crossing furrows, which form a net figure. The Kjelmøy ceramics have been tempered with asbestos and the ornamentation is dominated by horizontal lines drawn by sharp or blunt implement. Together with horizontal lines there, diagonal comb stamps or lines made up of small spots are observed. Huurre (1983) and Kotivuori (1996) mention the existence of Textile ceramics at the site, but Kehusmaa (1972) does not. Nor have I been able to unambiguously identify any, although it is possible that some sherds of Textile ceramics exist.

The following carbon-14 dates have been obtained from the dwelling site. Only one dating has been calibrated, because it belongs to the Iron Age context.

Hel-250	7310±180 BP	
Hel-251	1320±100 BP	calAD 620(64.3%)830; calAD 840(3.9%)860
Hel-191	6750±170 BP	

There are also several AMS-datings, which are to be published by Carpelan (forthcoming).

6. Kemijärvi [169] Alakylä Narkiperä[1]

Bsm 3632 06
x = 7395 04 y = 519 95 z = 147 m ASL

Finds 26544:1–57 ceramic sherds, stone adzes, an edge of a slate knife, pieces of slate implements, slate flakes, a fragment of a whetstone, quartz implements and flakes, hammerstones, red ocher, burnt bones
26544:58–80 ceramic sherds, slate implements and flakes, a bone awl, an unfinished slate arrowhead, quartz implements, flint flakes, burnt bones (gathered by the owners of the summer cottage at the site)

Studies Kotivuori, H., inspection 1991 (1991)

Literature Kotivuori 1996

The dwelling site of Narkiperä is situated about 7.7 km S of the Kemijärvi church. The site is almost completely flooded by water regulation and typically remains below the rising surface of the Lake Kemijärvi. The size of the site is 50 x 20 m (Kotivuori & Torvinen 1993:75).

The find material consists foremost of ceramics from the Early Metal period. Some of these can be classified as Textile ceramics, but the majority most likely belong to asbestos-tempered Sär 2 ceramics. The finds are at the Arctic Centre in Rovaniemi. The author has had only a cursory look at the material; however, it is evident that Textile ceramics are contained within these finds.

1.2. Rovaniemi

7. Rovaniemi [109] Kolpene

Bsm 3612 07
x = 7377 22–28 y = 445 89–446 08 z = 77–79 m ASL

Finds (252) 13870:1–2 a stone adze, a fragment of a stone axe
13871:1 a fragment of a stone axe
18967:101 an ice pick
(253) 13483:2 quartz flakes
13985:1–694 ceramic sherds, an ice pick, a slate knife, fragments of arrowheads, stone adzes and axes, quartz implements and flakes, whetstones and their fragments, hammerstones, burnt bones, charcoal
(254) 13768:1–515 ceramic sherds, an amber pendant, stone axes and adzes, a fragment of a flint arrow head, quartz arrow heads, ice picks and their fragments, a perforated stone, fragments of slate knives, flint implements and their flakes, whetstones and their fragments, fragments of stone implements, quartz implements and flakes, slate flakes, pieces of sandstone, burnt bones
18967:1–20 = 15751:1–20 a stone adze, quartz implements and flakes, stone flakes
24066:1 quartz flakes
26524:1–10 ceramic sherds, a flint implement, quartz implements and flakes, red ocher, burnt bones

Studies Erä-Esko, A., survey and trial excavation 1954
Kopisto, A., excavation 1955 (1955) (350 m²)
Paloniemi, M., excavation 1956 (1957) (550 m²)
Paloniemi, M., excavation 1957 (1958) (c. 500 m²)
Kopisto, A. 1962, excavation 1962 (no report)
Kotivuori, H., survey 1987 (1990)

Literature Kopisto, A. 1955; Paloniemi 1955; Erä-Esko 1955

The Kolpene dwelling site complex includes six separate dwelling sites, three of which (nos. 252, 253 and 254) have been included in no. 109 (Kotivuori & Torvinen 1994:61). It is situated on the Kolpeneenharju ridge about 2.5 km SEE of the Rovaniemi church. All dwelling sites at Kolpene are on pine growing sand or gravel ridge. Dwelling sites are partly destroyed by roads, gravel pits and bathing cabins.

The archaeological studies were launched, because of the hydropower station, which had caused a water rise of several metres. Aarne Kopisto conducted the first salvage excavation of the area in1955 (Kopisto 1955; Paloniemi 1955); Mikko Paloniemi continued fieldwork in the following two seasons. The last excavation in the ridge was conducted in 1962 by Aarne Kopisto.

The find material from the dwelling sites of Kolpeneenharju is rich and versatile. The ceramics are mostly organic-tempered Ka II 1 and 2 ceramics. There are, however, some sherds, which might be classified as Textile ceramics. The material from the first excavation com-

[1] In this connection it is also necessary to mentions two sites – Kemijärvi [99] Alakylä Lammasniemi and Kemijärvi [123] Isokylä Revässaari – which might involve Textile ceramics. Because the material is very fragmentary and the classification has been made on the basis of Main Cataloque of the National Board of Antiquities only, the interpretation is too unsure.

prises a large number of stone implements – ice picks, Ostrobothnian axes, flint implements and amber (Kopisto 1955:101–102; Paloniemi 107–109). The dwelling sites of Kolpeneenharju represent first and foremost Stone Age habitation during the periods Ka II 1 and Ka II 2. The sherds of Textile ceramics reflect only a temporary stay at the site.

8. Rovaniemi [152] Kemihaara Säpsäkoski

Bms 3613 11
x = 7359 36 y = 499 73 z = 97–98 m ASL

Finds 15730:1 quartz implements and flakes
18003:1–513 a slate adze, quartz implements and flakes, fragments of slate implements, slate flakes, quartzite implements and flakes, a stone weight for a net, asbestos, red ocher, burnt bones
18003:514–787 a slate point, slate adzes, an unfinished stone axe, a fragment of an ice pick, quartz implements and flakes, fragments of slate implements, a slate pin, a weight for a net, a stone implement with a furrow

Studies Erä-Esko, A., survey 1962
Tomanterä, L., excavation 1969 (1970) (c. 200 m²)
Mustakallio, M., excavation 1969 (no report)

Literature Huurre 1983; Kotivuori 1996

This dwelling site is situated on the northern bank of the Kemijoki River, about 60.5 km SEE of the Rovaniemi church. Today, the site is almost completely destroyed by water regulation in the Kemijoki River. Leena Tomanterä carried out a salvage excavation at the site in 1969. Marja Mustakallio continued the excavation in the same year.

Tomanterä speculated that Kemijoki River was flooded and deposited silt above the cultural layer, because dark and light laminas were identified in the area. This allows for the assumption that stratigraphy could be observed at the site. Tomanterä has not yet offered any interpretation for the chronological order of the finds in her excavation report.

Six ceramic vessels have been isolated from the material. All vessels are asbestos- and organic-tempered, and the ornamentation, which consists of small pits, has been made by stamp. Almost all the ceramics from the site can be classified as the Lovozero type. Very small sherds exist, which might be possible to classify as Textile ceramics[2]. Their categorisation is problematic, however.

[2] Kotivuori (1996:407) mentions as an example NM 18003:499. In my opinion these do not belong to Textile ceramics. Hannu Kotivuori suggests that the dwelling sites of Neitilä in Kemijärvi, Kolpene in Rovaniemi, and "a couple of dwelling sites in Sodankylä"(Kotivuori 1996:104) should be included in the sites involving Textile ceramics. According to my investigations, most dwelling sites of Neitilä include a large variety of ceramics from different periods, but no Textile ceramics. One candidate for the group of Textile ceramics is Poikamella in Sodankylä, where there are some sherds, which have possible textile-impression on their surfaces (see NM 27674:1533). Petri Halinen has suggested that the ceramics belongs to the Lovozero type (Halinen 1993:42). Eeva Raike (1995) assumes that this asbestos-tempered ceramics might belong to the Pasvik group. A relevant question is, however, should we include in the Textile ceramics all such sherds, which have a textile-impression as the only characteristics. Many other attributes in ornamentation and shape are either missing or not possible to observe, because of the small number (and size) of the sherds. In moving together up north in Lapland, the Textile ceramics lose its characteristics typical for Textile ceramics in Southern Finland, Saimaa or Kainuu. It is then problematic to define the border for the distribution of Textile ceramics in the North. In this study, Sodankylä has not been included in the distribution area of Textile ceramics (see also discussions about IT ceramics and Textile ceramics in Northern Norway, and Sweden).

2. THE RIVER OULUJOKI WATER SYSTEM (The Province of Oulu)

2.1. Hyrynsalmi

9. Hyrynsalmi [18] Hyrynsalmi Vonkka II

Bsm 3443 08
x = 7177 90 y = 571 46 z = 156–157.5 m ASL

Finds 15082:17–33 ceramic sherds, quartz implements and sherds, slate flakes, a fragment of an adze, burnt bones
15393:1–2527 ceramic sherds, a casting mould of a bronze axe (soapstone), a fragment of a straight-based arrowhead (flint), fragments of flint arrow heads of Pyheensilta type, fragments of gouged adzes, fragments of adzes, an axe and pieces of axes, a slate awl, flint and quartz implements and flakes, a slate arrowhead and a fragment, a slate knife, fragments of slate implements, slate flakes, a half of a perforated stone, slag, whetstones and their fragments, sinkers, a fragment of an ornamented bone implement, hammerstones, a quartzite implement, quartzite flakes, soapstone, talc, red ocher, burnt bones
19903:1–529 ceramic sherds, an iron knife, whetstones and their fragments, adzes and unfinished adzes, flint and quartz implements and flakes, slate implements and their fragments, burnt bones
20361:1–13 ceramic sherds, a stone axe, a whetstone and its fragment, soapstone, slate flakes, a quartz implement, quartz flakes, burnt bones
21466:1 a quartz arrowhead
23572:1–2 ceramic sherds, a bone implement
30723:1–59 ceramic sherds, a slate arrow head, fragments of stone implements, quartz implements and flakes, burnt bones

Studies Huurre, M., survey 1960 (1961)
Huurre, M., excavation 1961 (1962) (304 m²)
Huurre, M., excavation 1976 (no report)
Suominen, E., trial excavation 1997 (16 m²) (1998)

Literature Carpelan 1965; Huurre 1983; Huurre 1986; Huurre 1988; Suominen 1988; Siiriäinen 1971

The dwelling site of Vonkka II is situated about 1 km NW of the Hyrynsalmi church, and 300 m S of the Vonkka camping site. Vonkka II is a small cape, which is for the most part eroded as a result of water regulation of the Lake Hyrynjärvi. An excavation was carried out at the site, because it seemed evident that the rising water line of Lake Hyrynjärvi would drown the site. Matti Huurre excavated two areas in Vonkka in 1961, the larger one of which was called Vonkka II. Vonkka I was situated about 300 m SSW of it. The excavation area was chosen according to surface finds (Vonkka I). The soil at the site is stoneless sand. Eighteen hearths were uncovered during the excavation. Huurre observed some concentrations of red ocher, which he interpreted as graves (Huurre 1962:7).

It must be stressed that the water level of Lake Hyrynjärvi did not alter much during prehistoric times. The dwelling site has been used from the beginning of the Neolithic Period to the Early Metal Period. This causes a contextual problem. According to Huurre, there was a discernible layer in the soil, which was deposited by the floods of Lake Hyrynjärvi. The cultural layer was, in some parts of the site, over 120 cm thick (Huurre 1962:5). Nevertheless, the same kind of stratigraphy, which existed in Kemijärvi Neitilä 4 was not discernible in Vonkka II. (Huurre 1962:8). Esa Suominen carried out the most recent trial excavation at Vonkka II in 1997, digging a small excavation area and trial pits.

The ceramics at the site are mostly Early Combed Ware, but several vessels of Sär 1-type can also be detected. Typical Combed Ware is also present in the material. Pöljä ceramics are represented at the site, in addition to some sherds of Anttila ceramics. Only one small sherd of Textile ceramics is contained within the find material. Because of

the small size of the sherd, its identification has remained somewhat inconclusive. Among the most important finds is the casting mould of an Ananino axe.

2.2. Kuhmo

10. Kuhmo [29] Kuhmo Sylväjänniemi 1

Bsm 4413 05
x = 7115 30 y = 476 62 z = 162.5–165 m ASL

Finds 12755:1 a bronze connecting strap of a chain holder
20903:1–236 ceramic sherds, fragments of a clay casting mould, an iron knife, a clay idol, a slate adze, a fragment of clay pearl, fragments of bronze plates, flint and quartz implements and flakes, fragments of whetstones, fragments of bone implements, a fragment of a slate point, iron slag, a hammerstone, soapstone, burnt bones, charcoal
21748:1–6 a flint implement and flake, quartz implements and flakes

Studies Erä-Esko, A., inspection 1979 (no report)
Perkko, M., excavation 1980 (1980) (250 m^2)
Huurre, M., inspection 1982 (no report)

Literature Huurre 1983; Suominen 1988

The dwelling site of Sylväjänniemi 1 is situated about 1.2 km NNE of the Kuhmo church. Sylväjänniemi 1 is an approximately 50 x 20 m large dwelling site on the southern shore of Cape Sylväjänniemi, in front of the town of Kuhmo. The soil at the cape is partly sand and partly moraine. Pines are dominating trees in the area. Mikko Perkko conducted an excavation at the site by digging an area of 250 m^2. Perkko registered two find concentrations containing ceramics and quartz implements and flakes (Perkko 1980:5).

Although the ceramic finds include Sär I and Sär II –types most of the pottery sherds at the site belong to Textile ceramics. These ceramics are ornamented with rows of small dots, which are run either horizontally or inclined to the right. They may also form a net figure. Furthermore, some sherds of Sär 2 ceramics are present. A tanged iron arrowhead, two fragments of bronze plate and one piece of copper plate were found during the excavation. Their connection with Textile or Sär 2-ceramics is not probable. More likely, they represent later activities at the site. One carbon-14 dating (Hel-1601, 660±110) obtained from the site does not fit the prehistoric find context.

11. Kuhmo [52] Katerma Pajasaari Island

Bsm 4411 11
x = 7112 22 y = 450 96 z = 160–162.5 (N-end)
x = 7111 94 y = 451 10 z = 160–162.5 (S-end)

Finds 23204:1–5 an unfinished stone adze, quartz implements and flakes (N)
23205:1–9 ceramic sherds, quartz implements and flakes, iron slag, burnt bones (S)
23260:1–6 an "elementary" stone axe, an unfinished perforated axe, a whetstone, fragments of whetstones
23391:1–357 ceramic sherds, a fragment of a flint arrowhead, a fragment of an adze, flint and quartz implements and flakes, fragments of slate implements, quartzite flakes, red ocher, soapstone, burnt bones, charcoal
23561:1 a stone axe
23562:1 an unfinished stone implement
23700:1–315 ceramic sherds, a fragment of a slate adze, flint and quartz implements and flakes, fragments of slate implements, an iron ring, quartzite flakes, iron slag, soapstone, talc, red ocher, burnt bones
23957:1–6 quartz implements and flakes
24491:1–997 ceramic sherds, pieces of iron, an iron fishhook, a copper bar, a fragment of an iron skewer, fragments of iron "furnace" (clay together with iron slag), fragments of whetstones, a hammerstone, flint and quartz implements and flakes, an unfinished soapstone implement, iron nails, pieces of iron, iron slag, red ocher, burnt clay smelted with stones and slag, burnt clay, burnt bones
25342:1–791 ceramic sherds, a copper coin (of one öre), scissors, blades of iron knives, an iron spike, traces from a crossbow, iron implements, a fragment of a small iron bar, bronze pieces, a bowl of a chalk pipe, a fragment of chalk pipe, a whetstone, flint and quartz implements and flakes, quartzite, iron slag, burnt bones

Studies Huurre, M., inspection 1986 (no report)
Taskinen, H., excavation 1986 (1987) (136 m^2)
Taskinen, H, trial excavation 1987 (1988) (118 m^2)
Suominen, E., survey 1987 (1989)
Taskinen, H., excavation 1988 (Laulumaa 1996)(16 m^2)
Taskinen, H., excavation1989 (no report)

Literature Suominen 1988

The dwelling site of Pajasaari Island is situated about 25.4 km SW of the Kuhmo church. The hydroelectric power station of Katerma is situated only 1.4 km from the site. Remains of prehistoric habitation have been found in a long strip of shore which opens mostly to the SW. Pajasaari is about 700 m long and 250 m wide. Remains of prehistoric habitation have been found nearly all over the island. The dwelling site is partly destroyed by water regulation. The soil is virtually stoneless sand. The first excavations at the island were conducted by Helena Taskinen in 1986. Taskinen excavated a dwelling, which was visible at the surface as a 4.5 x 4 m depression. The deepest point in the middle of the depression was only about 20–25 cm below the surrounding surface. On the edge and on the bottom of the dwelling a charcoal layer was clearly visible, which characterised the shape of the dwelling (Taskinen 1987:9). By virtue of ceramic finds, it seems possible that the dwelling pit dates back to the period of Ka II. In 1987, 102 trial pits of 1 m^2 in size were dug at intervals of 6 or 12 m. A small excavation area was also studied. Trial pits were made on the east and west side of the island. Early Metal Period Textile ceramics were found on the eastern side of the island in 1986. Iron slag was also found (Taskinen 1988:12).

Taskinen continued the excavations in 1988. She excavated an iron furnace from the historical period and also parts of a Stone Age dwelling site. The iron furnace was round, an approximately 15–20 cm deep pit with a diameter of ca. 3 m. In addition, a square-shaped wooden crib with flat stones in the middle was identified. Iron slag was also found abundantly (Laulumaa 1996:6–7). Three carbon-14 dates have been obtained for the site (Hel-2735 440±100, Hel-2736 280±100, Hel-2435, 4270±90). It is conspicuous that they date from either historical or Stone Age habitation.

Sherds from three Textile ceramic vessels have been found at the site. The majority of the ceramics are, however, Early Combed Ware and Typical Combed Ware. Some Late Combed Ware also exists. Asbestos ceramics of the Pöljä type have been found amongst the vessels, along with Sär 1 ceramics and several sherds of Sär 2 ceramics.

12. Kuhmo [53] Katerma Vasikkaniemi SW

Bsm 4411 11
x = 7111 90–95 y = 451 85–95 z = 159–163 m ASL

Finds 23560:1–3 an (elementary) stone axe, a half of a perforated stone, burnt bones
23959:1–39 ceramic sherds, quartz implements and flakes, iron slag, burnt bones
25302:1–213 ceramic sheds, a stone adze, flint and quartz implements and flakes, quartzite flakes, whetstones, iron slag, burnt bones
29136:1–5283 ceramic sherds, a glass bead, a gouged adze, quartz implements and flakes, red ocher, chewing resin, fragments of stone implements, whetstones, a hammerstone, asbestos, quartzite flakes, iron slag, a sinker, oval quartzite stone, mica, soapstone, burnt clay, burnt bones

29861:1–1355 ceramic sherds, quartz and quartzite implements and flakes, a hammerstone, fragments of slate implements, birch tar, asbestos, sandstone, slag, burnt bones

Studies Suominen, E., survey 1987 (1989a)
Laulumaa, V., trial excavation 1989 (1989)
Karjalainen, T., excavation 1995 (1996c) (162 m²)
Raike, E., excavation 1996 (1997) (194 m²)

Literature Suominen 1988c; Karjalainen 1996a

The dwelling site of Vasikkaniemi is situated 22.2 km SWW of the Kuhmo church and 2 km NEE of the hydroelectric power station of Katerma. Finds have been identified from the shore terrace and from a farmhouse yard. This site is partly destroyed by water regulation, and a considerable number of finds have been collected from the washed beach. The site was found by amateur archaeologist Nuutti Mustonen. Esa Suominen inspected it during his survey in 1987.

Vesa Laulumaa carried out a trial excavation at the site in 1989. In all, 134 trial pits were made, 63 of which involved some finds. On the basis of ceramic finds, Laulumaa established three more or less discernible dwelling subsites. From the two opposing areas of the initial dwelling site, ceramics were found, which can be classified into the Sär 2 group. The third find place, with Textile ceramics is situated between these. Iron slag, found in large amounts, was located close to the shore. Esa Suominen had already earlier found abundant iron slag from the washed littoral zone. It seems probable that structures connected with iron furnishing and iron working were destroyed because of the heavy erosion.

In 1995 Taisto Karjalainen (1996a; 1996c) conducted an excavation at Vasikkaniemi SW, the main focus of which was to try to discern formations in the cultural layer, which might be possible to connect with dwellings. No reliable evidence of dwellings was obtained, although the clustering of finds supported the hypothesis. The ceramic material found during the excavation was mostly Textile ceramics (Karjalainen 1996c:16). One hearth at area 2 was unusually large (Karjalainen 1996a), and numerous Textile ceramics were found in its vicinity. The rest of the ceramics consisted of Sär 2 type and Asbestos ceramics of the Pöljä type. Eeva Raike continued excavations in 1996, which uncovering only two hearths and no other structures. The ceramics and quartz materials were plentiful and versatile.

13. Kuhmo [68] Katerma Vasikkaniemi N

Bsm 4411 11
x = 7112 15–24 y = 451 87–45260 z = 159 m ASL

Finds 23961:1–2 a quartz implement, quartz flakes
29039:1–5 ceramic sherds, flint flakes
29142:1–5 ceramic sherds, flint flakes, quartz implements and flakes, a fragment of a stone implement

Studies Suominen, E., survey 1987 (1989a)

The dwelling site of Vasikkaniemi N is situated about 24.4 km W of the Kuhmo church and 2 km NNE of the hydroelectric power station of Katerma. The dwelling site is on the narrow littoral beach pointing to the NE. Today, the area is washed because of water regulation in Lake Ontojärvi. Esa Suominen found the site during his survey in 1987. The site is situated only about 250 m NNE of the dwelling site of Vasikkaniemi SW. Only a few ceramic sherds were found. Some sherds can be classified as Textile ceramics.

2.3. Muhos

14. Muhos [40] Laitasaari Halosentörmä (Hangaskangas)

Bsm 3422 08
x = 7200 00–16 y = 3442 72–82 z = 34 m ASL

Finds 8746:1 a stone axe
13606:1–8 ceramic sherds, a piece of stone implements, quartz implements and sherds
17646:1–195 ceramic sherds, fragments of clay casting moulds, a fragment of a straight-based slate arrowhead, an straight-based quartz arrowhead, quartz arrow heads, a fragment of quartz knife, quartzite implements and flakes, pieces of stone implements, chewing resin, flint and quartz implements and flakes, a whetstone, a slate knife, slate implements and their fragments, burnt bones (in the Museum of Pohjois-Pohjanmaa)
23178:1–4 quartz implements and flakes, quartzite flakes, burnt bones
28798:1–5 ceramic sherds, a slate point, a retouched quartz implement
30888:1–92 ceramic sherds, an elk figurine made of soapstone, a straight-based quartz arrowhead quartz implements and flakes, jawing gum, flint and sherd implements and flakes, burnt bones
32048:1–1528 ceramic sherds, a fragment of a clay crucible, jewing resin, flint and quartz implements and flakes, quartzite flakes, stone implements and flakes, soapstone

Studies Huurre, M., survey 1954 (1955a)
Kopisto, A., excavation 1968 (no report) (140 m²)
Taskinen, H., survey 1985 (1986a)
Mäkivuoti, M., inspection 1993 (1993)
Ikäheimo, J., inspection 1995 (1995)
Ikäheimo, J., excavation 1998 (1999) (9 m²)
Ikäheimo, J., excavation 1999 (2001) (20 m²)

Literature Siiriäinen 1978; Huurre 1983; Huurre 1991a

The dwelling site of Halosentörmä (nowadays called also Muhoksen Halonen or Hangaskangas) is situated about 13 km SW of the Muhos church and 2 km S of the contemporary Oulujoki River. The site is on the pine-growing ridge. Most survey or inspection finds have been made along the ditch in the railroad scarp. The site was discovered already 1926. The first find, a stone axe, was found during the building of the railway (Huurre 1955a:12). Excavation finds include several fragments of casting moulds.

The material of the excavation conducted by Aarne Kopisto is now situated in the Museum of Pohjois-Pohjanmaa in Oulu, and the author has not examined it thus far. According to the find list, the ceramic material consists of only Textile ceramics (see also Huurre 1991a:41). The site is of special interest because it is one of the few dwelling sites involving Textile ceramics by the seashore. Thus, on the basis of shore displacement it can be dated to the period ca. 1000 BC (Huurre 1991a:41; Siiriäinen 1978a:7, 16).

Janne Ikäheimo (1999) conducted a small excavation at the site, uncovering some interesting finds. Particularly interesting is an elk figurine. Ikäheimo suggests that it has been made with the help of a metal implement. This might be connected with the casting of metal at the site. The find material involves only organic and soapstone-tempered Textile ceramics. It is conspicuous that there are no ornamentation is this ceramics. The amount of ceramics is still relatively small. Despite the small size of the excavated areas, Hangaskangas ranks among the most important sites for Textile ceramics in northern Finland.

One AMS-dating has been made of the piece of jawing resin (Hela-154, 3420±105), which's calibrated age interval falls between calBC1880(68.2%)1600 for the Textile ceramics sherd. Although it is a context dating it is still very likely that it represents also the using period the early Textile ceramics at the site.

2.4. Ristijärvi

15. Ristijärvi [20] Ristijärvi Likoniemi

Bsm 3434 06
x = 7158 97 y = 552 72 z = 135 m ASL

Finds 15706:1–22 a stone axe, an unfinished quartz arrowhead, quartz implements and flakes, a quartzite flake, burnt bones

15707:1 a pick shaped like a cradle-runner
15713:1–122 ceramic sherds, a flint arrowhead, flint and quartz implements and flakes, quartzite flakes, burnt bones

Studies Linkola, M., survey 1962 (no report)
Linkola, M., trial excavation 1962 (1963)
Suominen, E., inspection 1987 (1988b)

Literature Suominen 1988c

The dwelling site of Likoniemi is situated about 5.8 km NWW of the Ristijärvi church by Lake Iijärvi. The dwelling site opens to the S. The finds have been located along a 200 m long, narrow strip on the shore of Lake Iijärvi. Martti Linkola conducted the salvage excavation at the site in 1962 before the rise of the water level in the basin of the Leppikoski hydroelectric power station. The site was very close to water level, which means that spring floods have eroded its lower parts. Although the water level has not risen much because of water regulation, the majority of the site is – according to the excavator – eroded and rolled into Lake Iijärvi (Linkola 1963:2). Ceramics found comprised only 15 small sherds. In 1987 Esa Suominen made some trial pits to try to locate dwelling sites, but did not find any marks of habitation (Suominen1988b:2).

The number of ceramics found during Linkola's excavation was rather low. The sherds are very small, and their classification into a ceramic group is difficult. It seems, however, that they most likely represent Textile ceramics.

2.5. Sotkamo

16. Sotkamo [10] Nuasjärvi Kiikarusniemi

Bsm 3433 08
x = 7116 71 y = 567 12 z = 137.5–140 m ASL

Finds
18849:1 a quartz implement and flakes
21173:1–5 a ceramic sherd, a flint implement and flakes, quartz flakes
21482:1–215 ceramic sherds, flint and quartz implements and flakes, fragments of slate implements, chewing resin, a line sinker, a hammerstone, red ocher, asbestos, soapstone, burnt bones
22198:1–573 ceramic sherds, a clay casting mould, a fragment of a flint arrowhead, flint and quartz implements and flakes, a quartzite implement and flakes, fragments of slate implements, a stone knife, fragments of whetstones, iron slag, red ocher, a weight stone, hammerstones, burnt bones
23502:1 quartz flakes
27239:1–423 ceramic sherds, a stone adze, a flint arrowhead, an unfinished flint arrowhead, a slate arrowhead, a soapstone pendant, flint and quartz implements and flakes, a quartzite implement, quartzite flakes, a fragment of a whetstone, red ocher, asbestos, burnt bones
28671:1–599 ceramic sherds, a bronze plate, stone adzes, fragments of iron implements, a perforated stone, a half of a perforated stone, a fragment of slate spearhead, flint and quartz implements and flakes, fragments of stone implements, iron slag, asbestos, burnt bones

Studies
Erä-Esko, A., inspection 1972 (no report)
Huurre, M. & Nieminen, E.-L., inspection 1981 (1982)
Nieminen, E.-L., excavation 1982 (1983a) (38 m^2)
Nieminen, E.-L., excavation 1983 (1983b) (40 m^2)
Laulumaa, V. 1992 (1992) (50 m^2)
Suominen, E., excavation 1994 (1995) (68 m^2)

Literature Huurre 1983; Nieminen & Ruonavaara 1984; Suominen 1988c; Laulumaa 1997

The dwelling site of Kiikarusniemi is situated ca. 2 km NW of the Sotkamo church. Kiikarusniemi is a long cape located between Lake Pirttijärvi and Lake Nuasjärvi, in front of the centre of the Sotkamo village. The dwelling site is at the apex of the cape, which is topographically low and flat. A portion of the finds has been uncovered from the littoral zone and another portion from the terrace. Eeva-Liisa Nieminen excavated at Kiikarusniemi during two seasons in 1982–83 (Nieminen 1983a and b).

The most important Early Metal Period finds from the excavations in the 1983 season were two mica-tempered crucibles, one of which was adorned with drawn ornaments along its bottom half. The third ceramic vessel, which was also very well preserved, can be classified under Anttila ceramics. E.-L. Schulz considered these finds to be treasure-trove. The Typical Combed ceramics, Ka II, are well represented in the material. The most interesting finds were the bird-elements in the ornamentation (Nieminen & Ruonavaara 1984). The ceramics gave an impression of lasting habitation at the site. At least the following ceramic groups have been recognized thus far: Ka I 1, Sär 1, Ka II 1, Pöljä, Textile and Anttila ceramics. Quartz implements and flakes were the biggest find material group, but a considerable number of flint implements and flakes were also found. Stone implements have been found in unusually small numbers.

In 1992 Vesa Laulumaa continued studies at Kiikarusniemi. He came to the conclusion that the cultural layer at the site was extraordinaly thick, although the number of finds was not as great as in earlier years. Hearths were not observed, despite some charcoal patches clearly indicating the presence of fireplaces (Laulumaa 1992:4). The last excavations at Kiikarusniemi were carried out by Esa Suominen in 1994. Suominen excavated an area of 68 m^2 in an effort to define the borders of the dwelling site by digging a ditch across the cape. Ceramics were not as plentiful as in earlier excavations, but the number of stone implements was greater. Two small metal fragments proved to be difficult to date. The first one was a shapeless piece of iron, the other a bronze plate. One piece of iron slag was found. No stone hearts were identified. One leaf-shaped slate point was found (Suominen 1995). The two carbon-14 datings are from the Stone Age (appendix 8b), but they do not help in dating Textile ceramics.

17. Sotkamo [62] Nuasjärvi Ammonsaari Island

Bsm 3433 08
x = 7116 64 y = 566 42 z = 140 – 145 m ASL

Finds
22611:1 an iron spearhead
23466:1 a stone adze
23507:1–32 ceramic sherds, quartz implements and flakes
23879:1–3 quartz implements and flakes
29036:1–947 ceramic sherds, a penannular brooch, a fragment of a flint arrow head, stone adzes, fragments of whetstones, flint and quartz implements and sherds, fragments of stone implements, a hammerstone, red ocher, burnt bones
29926:1–1025 ceramic sherds, a bronze cross, a fragment of a metal implement, a flint arrow head, a fragment of a quartz implement, flint and quartz implements and flakes, fragments of stone implements, red ocher, burnt bones
30724:1–667 ceramic sherds, flint and quartz implements and flakes, fragments of stone implements, red ocher, talc, burnt clay, burnt bones

Studies
Laulumaa, V., inspection 1986 (no report)
Suominen, E., excavation 1995 (1996b) (56 m^2)
Suominen, E., excavation 1996 (1997) (78 m^2)
Suominen, E., excavation 1997 (1998) (76 m^2)

The dwelling site of Ammonsaari Island is situated about 2 km NW of the Sokamo church. Ammonsaari is a rocky island in Lake Pirttijärvi with a size of ca. 400 x 500 m. Finds have been made all over the island. An iron spearhead was found on the SE side of the island and an adze from the NW corner. The remains of dwelling site was located particularly on the E and SE sides of the island. Esa Suominen carried out excavations on the island between 1995–97.
The excavations uncovered some fireplaces dating most probably to the prehistoric period. In 1996 Suominen uncovered the remains of a

lodge timberwork with an oven in one corner. The size of the building was 3.5–4.0 m (Suominen 1997:3). The dating of the structure is from the historical period, however.

The finds are rich in ceramics from different periods. For this study the ceramic material has been only partly analysed. A short acquaintance with it has been carried out at the Provincial Museum of Kainuu in Kajaani, together with archaeologist Esa Suominen. The earliest ceramic type at the site is Early Combed Ware. The Sär 1 ceramics have also been represented. Numerous Pöljä ceramics have been found at the site. Some sherds of Textile ceramics have also been identified. The ornamentation consists of horizontal and inclined comb stamp lines. Anttila ceramics and Kjelmøy ceramics represent the Sär 2 group. It is probable that also some Lovozero ceramics (NM 29036:175) are contained within the material.

18. Sotkamo [111] Palolahti W

Bsm 4411 04
x = 7103 95 y = 435 50 z = 155 m ASL

Finds 28498:1–5 ceramic sherds, quartz flakes, burnt bones
31385:1- not yet available (in the Kainuu Provincial Museum)

Studies Laulumaa, V. & Suominen, E., survey 1993 (1995)
Suominen, E., excavation 1998 (no report)

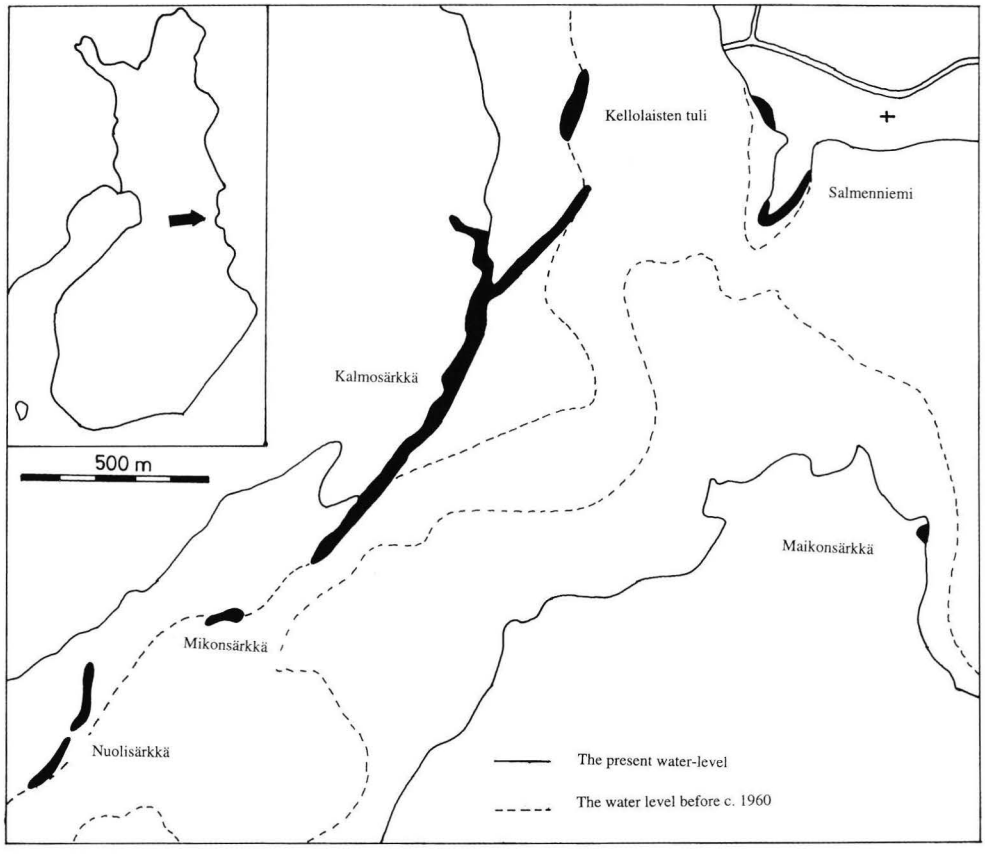
The dwelling site of Palolahti W is situated on the N shore of Lake Syväjärvi, between the Bay Patolahti and Lahtela, about 17.4 km from the Sotkamo church to SE. Soil is sand. Pine forest is growing in the area. Vesa Laulumaa and Esa Suominen found the site during their survey 1993. Size of the dwelling site area is ca. 10 x 60 m. Suominen continued studies at the site by counducting an excavation in 1998. The relatively large material includes both Neolithic and Early Metal Period material. Textile ceramics from several vessels can be found. No more information about the site is available.

2.6. Suomussalmi

19. Suomussalmi [25] Kianta Kalmosärkkä

Bms 4513 05
Kalmosärkkä N x = 7235 42 y = 474 58 z = 199 m ASL
Kalmosärkkä S x = 7234 46 y = 473 86 z = 199 m ASL

Finds 13174:1–3 fragments of stone implements
14244:1–12 (S) ceramic sherds, quartz implements and flakes, a quartzite fragment, asbestos, burnt bones
14504:1–517(S) ceramic sherds, fragments of amber ornaments, a stone axe, a piece of bronze, a blade of an iron knife, adzes and their fragments, fragments of ice picks, flint arrow heads, fragments of flint arrow heads, fragments of a slate arrowhead, a stone awl, flint and quartz implements and flakes, an unfinished quartzite arrow head, a hatched-surfaced mace, fragments of slate implements, slate flakes, hammerstones, a line sinker, whetstones and their fragments, iron slag, red ocher, burnt bones, fragments of horn, charcoal
14504:518–536 (N) ceramic sherds, fragments of flint arrowheads, an adze, quartz implements and flakes, fragments of stone implements, burnt bones
14829:1–500(S) ceramic sherds, a fragment of bronze implement, a bronze fragment, fragments of stone axes, an amber artifact, a straight-based arrowhead, a fragment of an arrowhead of Pyheensilta type, fragments of slate implements, flint and quartz implements and flakes, a metal fragment, fragments of stone implements, whetstones and their fragments, iron slag, burnt bones, animal teeth, asbestos
14830:1–1717 (N) ceramic sherds, a copper coin, a silver coin, fragments of clay casting moulds, an iron axe, a bronze socket, a fragment of a socketed spearhead, an iron sickle, an iron spearhead, a bronze fragment, iron



2. Suomussalmi Kalmosärkkä area. Map drown by Riitta Rainio.

nails, blades of iron knives, a bronze plate, stone axes, stone adzes, a flint spearhead, a slate pin, flint arrowheads and their fragments, a slate arrowhead, a perforated stone, flint and quartz implements and flakes, quartzite implements and flakes, fragments of soapstone implements, fragments of slate implements, whetstones and their fragments, fragments of bone implements, hammerstones, pieces of bronze and iron, iron slag, lake ore, red ocher, burnt bones
19541:1–11 (N) ceramic sherds, a fragment of a stone axe, a quartz implement, flint and quartz flakes, iron slag
19844:1 a stone adze
19881:1–16 ceramic sherds, a glass bead, a stone adze and their fragments, a fragment of an iron knife, a fragment of a soapstone pendant, flint and quartz implements and flakes, a quartzite implement, lake ore, burnt bones
20413:1–49 ceramic sherds, a stone adze, a fragment of a bead made of melted glass, a bronze sleeve, a fragment of a flint arrowhead, an ice pick, flint and quartz implements and their flakes, a whetstone, quartzite implements, iron slag, fragments of stone implements, soapstone, animal tooth
20793:1–6 (N) ceramic sherds, a stone adze, a flint flake, a slate flake
20799:1 (S) burnt bones
21016:1–14 (N) ceramic sherds, a flint implement and flakes, a quartz implement, a whetstone and their flakes, burnt clay, iron slag, burnt bones
21316:1–3 (N) ceramic sherds, a quartz flake
21732:1–10 ceramic sherds, flint implements and flakes, quartz and quartzite flakes, burnt bones
21848:1–3 ceramic sherds, an unfinished stone axe, a fragment of stone implement
21872:1 a human cranium
22064:1–4 flint flakes, a fragment of a stone implement, lake ore, a shell splinter
23600:1 (N) a bronze pendant
23833:1–7 (N) ceramic sherds, a fragment of a stone axe, a flint flake, burnt bones
23847:1–3 a stone adze, a quartz implement, iron slag
25072:1–2 a ceramic sherd, a fragment of a stone axe
25422:1–15 ceramic sherds, flint flakes, a quartzite implement, quartz implements and a flake, mica, burnt bones
26393:1–6 ceramic sherds, quartz implements
27167:1–426 (S) ceramic sherds, a straight-based jasperoid arrowhead, a fragment of flint arrowhead, a fragment of quartz arrowhead, a copper piece (tinned), flint fire-striking stones and their fragments, a fragment of slate arrowhead, a fragment of whetstone, quartz implements and flakes, red ocher, asbestos, burnt bones
27167:427–562 (N) ceramic sherds, flint and quartz implements and flakes, a piece of copper (tinned), iron slag, burnt bones, hematite, shell splinters
28315:1–122 ceramic sherds, quartz implements and flakes, a flint flake, fragments of whetstones, iron slag, burnt bones, charcoal

Studies Huurre, M., survey 1957 (1957)
Huurre, M., excavations 1958–59 (1959b, 1960b, 1960c) (768 m^2)
Huurre, M. & Manner. M., inspection 1974 (no report)
Huurre, M., inspection 1987 (no report)
Kontio, P., inspection 1988 (no report)
Kontio, P., field mapping 1991 (1991b)
Kontio, P., field mapping 1992 (1992)
Laurén, J., field mapping and trial excavation 1994 (1995) (15 m^2)

Literature Huurre 1959a; Edgren 1964; Carpelan 1965; Siiriäinen 1971; Huurre 1982; Huurre 1983; Huurre 1984; Matiskainen & Alhonen 1984; Huurre 1986a; Huurre 1986b; Suominen 1988c; Vikkula 1987; Lavento 1989; Huurre 1992; Lavento 1992; Pesonen 1995a; Lavento & Hornytzkyj 1996; Pesonen 1996b

The Kalmosärkkä dwelling site complex is an approximately 1.2 km long and 10–30 m wide sandy, arch-shaped sandbar running from SW to NE. The genesis of the sandbar might to be connected with the winds blowing from the retreating ice almost 10 000 years ago. This eolic formation is situated in Ruhtinansalmi, on the ridge opposite the Juntusranta village, about 1 km SW of the Juntusranta church. The site is destroyed markedly at its ends as a result of water regulation and the rise of the water level in the lake. The ends of the bar, which are rich in finds, have been excavated by Matti Huurre as a rescue excavation at the end of the 1950s (Huurre 1959a). Two supplementary excavations have been made in the 1990s.

The Kalmosärkkä dwelling site complex has been in use from the Mesolithic Stone Age to the end of the prehistoric period. The most intensive habitation has been during the Early Metal Period, and the site is one of the richest Early Metal dwelling sites in Finland.

Two depressions visible on the surface were excavated. Laurén suggested that one of them might have been a dwelling structure (Laurén 1995:9). The diameter of this depression is no more the 4 m. The trial excavation did not yield much evidence to support the hypothesis (Laurén 1995:9, 38–39). The observation is of considerable importance, however, because dwelling depressions are extremely rare in Kainuu.

Together 147 vessels have been separated from the find material, and the ceramic material itself has been analysed thoroughly (Lavento 1989; 1992). Recent excavations have brought forth new material, but the general picture of the site complex has remained much the same. Four vessels represent Sär 1 ceramics at the site. Ka I 1, and Ka I 2 are not among the finds. Ka II 1 and possibly Ka II 2 belong to the material. However, a comparison between Sär 1 and Ka II shows that Sär 1 seems to be more clearly represented than Ka II. Ka III cannot be clearly distinguished. The organic-tempered ware forms a group including ceramics, which might be classified into Ka II or into Pöljä ceramics. In the latter case Pöljä ceramics should be defined as a ware not including asbestos tempering. Early Asbestos Ware has also been represented. According to Laurén's trial excavation, the densest find concentration of this ceramic is at both ends of the bar. Altogether 48 vessels of Textile ceramics have been distinguished from Kalmosärkkä. This means that it – together with the neighbouring site of Kellolaisten tuli – is one of the largest sources of Textile ceramics in Finland. Furthermore, Sär 2 ceramics are richly represented at this site. 37 Sär 2 vessels have been separated from the material, and the number of undefined Early Metal Period vessels is 24. Early Metal Period habitation, in partcular, was very prominent at the site.

20. Suomussalmi [27] Juntusranta Kellolaisten tuli

Bsm 4513 05
x = 7235 70 y = 474 58 z = 199 m ASL

Finds 14246:1–3 a ceramic sherd, quartz flakes, burnt bones
14505:1–59 ceramic sherds, a fragment of flint arrowhead, an adze, fragments of adzes, quartz implements and flakes, flint flakes, a fragment of a whetstone, pieces of slate, red ocher, charcoal, iron slag
14831:1–2055 ceramic sherds, a fragment of bronze adze, a fragment of soapstone casting mould for a bronze brooch, straight-based flint arrowheads, a slate arrowhead of Pyheensilta type and its fragment, an iron blade, an ice pick and their fragments, stone axes and their fragments, adzes and their fragments, a boot-shaped slate knife, flint arrowheads and their fragments, a fragment of quartz arrowhead, a fragment of a flint spearhead, a chewing resin, a base of a flint spearhead, flint and quartz implements and flakes, quartzite implements and flakes, whetstones and their fragments, a line sinker and its unfinished fragment, sinkers, hammerstones, a piece of metal, iron slag, red ocher, yellow ocher, burnt bones
15052:1–37 ceramic sherds, a blade of an iron knife, an ice pick, an unfinished quartz arrowhead, a slate

knife, flint and quartz implements and flakes, a hammerstone, a fragment of whetstone, slate implements
15389:1 a flint arrowhead
19882:1–8 ceramic sherds, a flint implement, a quartz implement, quartz flakes, iron slag
20416:1–2 ceramic sherds, a quartz implement
20546:1 an iron spearhead
20792:1–5 ceramic sherds, fragments of clay crucible, a slate perforated stone, a quartz implement, a flint flake
21017:1–22 ceramic sherds, fragments of a clay crucible, a line sinker, flint implements and a flake, a quartz implement, soapstone, burnt bones
21733:1–20 ceramic sherds, a fragment of a flint arrowhead, flint and quartz implements and flakes, iron slag, a fragment of stone implement, soapstone, burnt bones
22066:1–25 ceramic sherds, an iron knife, fragments of a clay crucible, a fragment of a stone adze, lake ore, flint and quartz implements and flakes, a whetstone and their fragments, slate flakes, burnt bones
23127:1–5 ceramic sherds, a fragment of a flint arrowhead, a whetstone, burnt bones
25421:1–11 ceramic sherds, an unfinished of quartz arrowhead, a fragment of a stone adze, flint and quartz flakes, red ocher, soapstone, asbestos, burnt bones
26398:1–4 ceramic sherds, a flint flake, a fragment of a whetstone, a fragment of a slate implement
27082:1 an iron axe of Novgorodian type

Studies Huurre, M., survey 1957 (1957)
Huurre, M., excavations 1958–1959 (1959b) (625 m^2)
several inspections during 1970s and 1980s (no report)
Huurre, M., inspection 1978 (no report)

Literature Huurre 1959a; Edgren 1964; Carpelan 1965; Siiriäinen 1971; Huurre 1982; Huurre 1983; Huurre 1984; Huurre 1986a; Vikkula 1987; Suominen 1988c; Lavento 1989; Huurre 1992; Lavento 1992; Lavento & Hornytzkyj 1996

The dwelling site of Kellolaisten tuli represents the northernmost end of the eolian sandbar complex of Ruhtinansalmi. At present, it is almost completely flooded and can only be observed during low tide. Before water regulation, the dwelling site was a small sandy patch in the middle of the mire in the NS direction. Huurre divided Kellolaisten tuli into two excavation areas (Kellolaisten tuli I and II) (Huurre 1959b), but later finds have been collected without specifying between these areas. Huurre carried out excavations at the site during two seasons in 1958 and 1959, when a number of finds were collected. Habitation at the site had already begun at the beginning of the Neolithic period and the latest contemporary occupations have occurred when the fishermen came (according to local folklore) in the spring from the parish of Kello for pike fishing (Huurre 1959b:9).

Three red ocher graves (Huurre 1986a) and three patches of red ocher, which might have been graves, have been identified. Another possible grave has been found in Kalmosärkkä. Other structures present at the site are fireplaces.

The ceramic material consists of Sär 1 type, Ka II 1 and possibly also Late Combed Ware. In addition, Pöljä and Kierikki ceramics have been found. Lovozero ceramics are represented, but most of the ceramic material consists of Textile ceramics. A total of 14 Textile ceramics vessels have been discerned. Sär 2 ceramics are represented by Anttila and Luukonsaari ceramics.

21. Suomussalmi [48] Juntusranta Salmenniemi

Bsm 4513 05
x = 7235 35 y =475 10 z = 199 m ASL

Finds 14834:1–8 ceramic sherds, flint flakes, asbestos, quartz implements and flakes
15053:1–12 ceramic sherds, a straight-based slate arrowhead, flint flakes, quartz implements and flakes, slate flakes, quartzite flakes
26392:1–35 ceramic sherds, flint flakes, whetstones and their fragments, quartz implements and flakes, burnt bones, charcoal
28062:1–15 ceramic sherds, a whetstone, a stone flake, quartz flakes, burnt bones

Studies Huurre, M., survey 1959 (1960d)
Huurre, M., inspection 1978 (no report)
Kontio, P., excavation 1991 (1991c) (33 m^2)
Laurén, J., excavation 1993 (1995) (31.5 m^2)

Literature Huurre 1982; 1983; 1986a; 1992; Suominen 1988c

The dwelling site at Salmenniemi is a small island ca. 400 m SW of the Juntusranta church. Salmenniemi is an approximately 240 m long and 20 – 100 m wide cape. When the water level is high, the cape becomes an island. The soil at the site is silt. The southern part of Salmenniemi is considerably flooded. Excavations in the 1990's have not yielded much material; during the excavation in 1993 a single hearth was found. Weak remains of cultural layer were observed. According to Päivi Kontio (1991) and Juha Laurén (1995), the Salmenniemi dwelling site has been almost totally destroyed by regulation.

One carbon-14 dating has been obtained (Hel-3232 2130±100; see App. 8b) which dates back to the Early Metal Period. This dating most probably applies to the Anttila ceramics or some other mica-tempered Early Metal Period ceramics.

Typical Combed Ware and Kierikki ceramics together with some sherds from Late Neolithic vessels represent the Neolithic period. Sherds belonging to one Textile ceramics vessels have been found. Furthermore, Anttila ceramics and undefined Early Metal Period ceramics are represented. Overall, the ceramic material is not very plentiful.

22. Suomussalmi [53] Tormua Tormuan särkkä

Bsm 4513 06
x = 7243 38 y = 475 82 z = 201 m ASL

Finds 14839:1–46 ceramic sherds, flint and quartz implements and flakes, fragments of whetstones, a quartzite implement, fragments of stone implements, iron slag, asbestos, burnt bones
18059:1–13 ceramic sherds, fragments of whetstones, a slate knife, quartz scrapers and flakes, a fragment of slate implement, burnt bones
18322:1–1050 ceramic sherds, fragments of straight-based quartz arrowheads, fragments of quartz arrowheads, adzes, a fragment of slate ring, fragments of ice picks, a fragment of a perforated stone, a fragment of slate knife, a slate arrowhead, flint and quartz implements and flakes, fragments of stone implements, a quartz arrowhead, slate pins, pendant whetstones, a slone plate, slate knives, whetstones and their fragments, a line sinker, hammerstones and their fragments, asbestos, soapstone, an iron nail, iron ore, red ocher, burnt bones
21014:1–7 a ceramic sherd, a fragment of a stone axe, pieces of stone implements, a quartz implement and flakes, burnt bones
26400:1–46 ceramic sherds, a fragment of a stone axe, a fragment of a stone adze, flint and quartz implements and flakes, a fragment of a whetstone, burnt bones
27171:1–5 ceramic sherds, flint flakes, quartz implements, red ocher

Studies Huurre, M., survey 1959 (1960d)
Huurre, M., survey 1969 (1970)
Huurre, M, excavation 1970 (no report)

Literature Huurre 1983; 1984; 1986; 1992; Suominen 1988c

The dwelling site of Tormuan särkkä is situated ca. 48 km NNE of the Suomussalmi church. The head of the Alajoki River is situated only about 400 m NW of the dwelling site. Tormuan särkkä is a sandbar similar to Juntusranta formations, but is smaller and not curved. It has also been considerably flooded. Huurre carried out an excavation at

the site in 1970, yielding a large find. The material in many ways resembles those found at the dwelling sites of Ruhtinansalmi.

The ceramic material at the site represents many periods. Sär 1 and Ka II 1 are the earliest ceramics. Kierikki and Pöljä ceramics are also represented. One sherd, which might be classified as a Lovozero ceramics, has been found. Textile ceramics are most numerous group; 12 Textile ceramic vessels have been located. Kjelmøy ceramics, Sirnihta ceramics and some undefined Early Metal Period pottery also exists. One carbon-14 dating is available from the site (Hel-188 4190±140).

23. Suomussalmi [56] Juntusranta Mikonsärkkä

Bsm 4513 06
x = 7243 38 y = 475 82 z = 201 m ASL

Finds
14833:1–2 a quartz implement and flakes
19540:1–6 a ceramic sherd, a flint implement, a fragment of a whetstone, a quartz implement, quartz flakes, burnt bones
19879:1–50 ceramic sherds, bronze pendants, beads made of melted glass, a tang of an iron arrowhead, flint fire-striking stones, flint and quartz implements and flakes, pieces of iron, fragments of whetstones, iron slag, burnt clay, burnt bones
20414:1–31 ceramic sherds, fragments of crucibles, beads made of melted glass, a half of a mace head, a fragment of a bronze plate, stone axes, flint and quartz implements and flakes, a whetstone and a fragment of a whetstone, a quartzite flake, soapstone, lake ore, burnt clay, iron slag, burnt bones
20800:1 a bronze pendant
21018:1–36 ceramic sherds, fragments of beads made of melted glass, fragments of clay casting moulds, a straight-based flint arrowhead, a fragment of a stone adze, fragments of stone implements, burnt clay, flint and quartz implements and flakes, fragments of whetstones, a stone flake, burnt bones
21734:1–5 ceramic sherds, a flint implement, quartz flakes
22065:1–24 ceramic sherds, an unfinished fragment of a soapstone casting mould, a fragment of a clay casting mould, bronze pearls, bronze spirals, a fragment of a bronze pendant, bead slag, bronze slag, flint flakes, quartz implements and flakes, fragments of slate implements, lake ore, burnt bones
22438:1–12 ceramic sherds, a bronze buckle, fragments of bronze spirals, two beads made of melted glass, glass slag, quartz flakes, stone flakes, burnt bones
26391:1–144 ceramic sherds, a fragment of an adze, flint and quartz implements and flakes, pieces of iron, a fragment of an iron nail, resin, quartzite, burnt bones, charcoal
27172:1–2 ceramic sherds, quartz implements

Studies
Huurre, M, survey 1957 (1957)
Huurre, M., excavation 1959 (1960a)
Huurre, M., excavation 1975 (no report)
Huurre, M., inspection 1978 (no report)
Kontio, P., excavation 1991 (1991a) (77 m^2)

Literature Huurre 1975; 1982; 1983; 1984; 1986a; 1992; Suominen 1988c; Lavento 1989; Lavento 1992; Lavento & Hornytzkyj 1996

The dwelling site is situated between Nuolisärkkä and Kalmosärkkä ca. 2.2 km SW of the Juntusranta church. Today, it is a small, almost completely eroded and flooded island. The sandbar is similar to the other geological formations in front of the Juntusranta village. Before water regulation, the area was the bank of the Kaarronjoki River. At present Mikonsärkkä is an approximately 105 m long and 30 m wide eolic formation. The soil is fine sand, and some small pines and birches inhabit the island. The east side of Mikonsärkkä is low and is often below the water level.

The find material has been extraordinaly interesting because, in part, it dates back to the Late Iron Age and even to Medieval times. A Late Iron Age cremation grave dating back to 900s AD has been found in Mikonsärkkä (Huurre 1975).

On the basis of ceramic finds, the habitation in Mikonsärkkä began with Sär 1 ceramics. Other Neolithic ceramic types in the area are Ka II 1 and possibly even Ka III. The largest find of the Early Metal Period consists of Anttila ceramics, but Kjelmøy and Luukonsaari ceramics have also been identified. In addition, some indeterminate Early Metal period ceramics have been found. Five Textile ceramics vessels have been separated from the material.

24. Suomussalmi [108] Ämmänsaari Kumpuniemi

Bsm 4422 08
x = 7200 46 y = 447 45 z =199 (N-side)
x = 7200 12 y = 447 50 z =199 (S-side)

Finds
20387:1–5 ceramic sherds, a stone adze, a fragment of a whetstone, a quartz implement, quartz flakes
20854:1–7 ceramic sherds, a fragment of stone implement, quartz implements
21741:1 a fragment of stone implement
22954:1–20 quartz and quartzite flakes, whetstones

Studies
Huurre, M, inspection 1978 (no report)
Huurre, M., & Perkko, M., inspection 1980 (no report)
Taskinen, H., trial excavation 1985 (1986b)

Literature Huurre 1982; 1992; Suominen 1988c

The dwelling site of Kumpuniemi is situated about 5 km SWW of the Suomussalmi church, on the south shore of Lake Kianta. Kumpuniemi is an approximately 300 m long and 100 m wide sandy cape. The dwelling site is heavily flooded and during high water, only the spine of the cape remains above the water level. The remains of habitation have been observed on the E side of the cape. The head of the cape shelters the site to the W and NW. Helena Taskinen carried out a trial excavation at the site in 1985, revealing that the dwelling site was badly damaged by water regulation. A possible classification for the site would be as an ancient monument of III class (Taskinen 1986b:4). During the trial excavation no ceramics were found, although some had been picked up as inspection finds. All ceramics date back to the Early Metal Period. Sherds from one Textile ceramics vessel have been identified in the material, along with some Anttila ceramics.

25. Suomussalmi [117] Kianta Joenniemi

Bsm 442212
x = 7215 66 y = 456 26 z = 199 m ASL

Finds
20375:1–20 ceramic sherds, a half of a soapstone casting mould, ice picks, a stone adze, a whetstone, a flint implement, a quartz implement, iron ore
20801:1–28 ceramic sherds, a flint arrowhead, stone axes and adzes and their fragments, quartz flakes, whetstones and their fragments, pieces of stone implements, a hammerstone, slate flakes, soapstone
21023:1–19 ceramic sherds, a copper or bronze plate, a flint implement, stone axes and adzes and their fragments, a weight, whetstones, a hammerstone, a lead bullet, quartz implements and their fragments, an iron nail, burnt bones
21327:1–7 ceramic sherds, fragments of stone axes
21752:1 a fragment of an ice pick
22003:1–7 a ceramic sherd, a soapstone casting mould, an arrowhead of Pyheensilta type, a stone axe, a stone adze, quartz implements and flakes
22537:1–2 whetstones
23542:1–2 a fragment of stone implement, a quartz implement
23701:1–572 ceramic sherds, a straight-based quartzite arrowhead, stone axes and adzes and their fragments,

an iron arrowhead, a fragment of an iron knife, flint and quartz implements and flakes, whetstones and their fragments, quartzite flakes, a fragment of a chalk pipe, soapstone, burnt bones, charcoal
24506:1–274 ceramic sherds, quartz arrowheads and their fragments, fragments of stone axes and adzes, flint and quartz implements and flakes, whetstones and their fragments, quartzite flakes, soapstone, asbestos
26404:1–4 a ceramic sherd, quartz implements
27170:1–10 ceramic sherds, an iron arrowhead, a fragment of a stone adze, a fragment of a stone axe, a fragment of a whetstone, quartz implements and flakes, quartzite

Studies Huurre, M., survey 1957 (1957)
Huurre, M., survey 1978 (no report)
Huurre, M., survey 1980 (no report)
Kontio, P., excavation 1987 (no report)
Kontio, P., exavation 1988 (no report)

Literature Suominen 1988c; Huurre 1992; Lavento & Hornytzkyj 1996

Joenniemi is a sand and gravel cape about 14.5 km NNE of the Suomussalmi church. The Jaappaanjoki River runs along the N side of the Jaappaanlahti cove. The main part of the dwelling site is situated on the terrace about 1 m above the normal water level in Lake Kiantajärvi. The dwelling site is partly flooded and a great number of finds have been made in the shore waters. The most important find is a soapstone casting mould, which was a stray finding by amateur archaeologist Keijo Turunen.

Päivi Kontio carried out excavations at the site in 1987 and 1988. Although a considerable part of the dwelling site was destroyed by regulation, several Pöljä ceramics were still to be found. The most remarkable finds are those belonging to one large Pöljä ceramic vessel. Most finds were situated close to the present water level of Lake Kiantajärvi. A very dark cultural layer was found in the vicinity of ceramic finds. The greater part of the inhabited area has probably already been destroyed.

One carbon-14 dating (Hel-2570, 1480±100, see App. 8b) has been obtained from the site. This dating comes from the "dark age" in the Kainuu. No ceramics can be connected with it. Based on ceramic findings, habitation at the site began during the Kierikki and Pöljä ceramic periods. In addition, some undefined Late Neolithic ceramics have been found. Textile ceramics comprise seven vessels. Anttila, Kjelmøy and Luukonsaari ceramics are also represented in the material.

2.7. Utajärvi

26. Utajärvi [86] Ahmas Pikkarainen

Bsm 3424 05
x = 7173 00–40 y = 473 40–65 z = 100–105 m ASL

Finds 2508:28–29 stone adzes (find places unsure)
3671:22 an unfinished rhombic axe
3713:20 a stone adze
13594:1–5 a fragment of whetstone, stone adzes, a quartz implement and quartz flakes
14872:1 a stone axe
14948:1–2 a stone axe, a fragment of a stone axe
18562:1–158 ceramic sherds, fragments of clay casting moulds, a fragment of slate arrowhead, ice picks and their fragments, stone axes and adzes, a perforated stone, chewing resin, whetstones and their fragments, quartz implements and flakes, stone implements, a quartzite implement and flake, a tile fragment, red ocher, charred wood fragments, burnt bones
The Museum of Pohjois-Pohjanmaa 7312:1–17

Studies Huurre, M., survey 1954 (1955a)
Kopisto, A., excavation 1970 (1974) (180 m^2)
Vanhatalo, S., survey 1987 (1987)

Literature Huurre 1983; 1991a

The dwelling site of Pikkarainen is situated about 12.7 km to S of the Utajärvi church. The soil is fine sand. Aarne Kopisto carried out an excavation along the northernmost end of Lake Ahmasjärvi, at the place where stone axes were identified. Finds made during Kopisto's excavations are stored at the museum of Northern Ostrobothnia in Oulu. According to Aarne Kopisto, most ceramics were Combed Ware, subtypes Ka II 2 and Ka III. Between excavation areas II and III, pieces of asbestos-tempered ceramics and one piece of casting mould with a tiny drop of bronze were found. Kopisto states that no ceramics other than Asbestos-tempered Ware were found (Kopisto 1974.) Earlier ceramics identified in Pikkarainen are, however, Sär 1.

Textile ceramics are represented at Pikkarainen by 50 sherds. Textile ceramics from excavation area II have been decorated by small pits and comb stamps. Most asbestos ceramics have, however, talc, soapstone and muscovite as temper, the same kind of ware which has been found at Muhos Honkala (=Halosentörmä). These sherds can possibly be classified as Anttila type. However, only a small part of the epineolithic ceramics in Pikkarainen was asbestos-tempered. There are four fragments of clay casting moulds at the site (18562:106,119). Three small bronze drops remained in one of them.

2.8. Vaala

Vaala (Säräisniemi) Nimisjärvi

The dwelling site complex of Nimisjärvi, which was discovered already in the 1880's, is because of its rich and varied material one of the most important archaeological sites in Finland. Two ceramic groups, Sär 1 and Sär 2, have been named after Säräisniemi.

The dwelling site of Nimisjärvi is situated on the NE side of Lake Nimisjärvi, ca. 3 km SSW of the hydroelectric power station of Jylhämä at the head of the Oulujoki River. The topography around Lake Nimisjärvi is mostly flat and cleared for agriculture. Seventeen dwelling sites are included in the Nimisjarvi complex, ten of which are situated on the shores of the small lake. The rest of the sites are situated along the small Nimisoja River, which runs from Lake Nimisjärvi into Lake Oulujärvi. Four clusters of dwellings sites can be distinguished at Nimisjärvi (Huurre 1991a:24).

Since the turn of the 20th century, cultivated fields have almost completely surrounded Nimisjärvi. Finds have been regularly in connection with agricultural activities. At present, only a small part of the fields are cultivated, with the fields mostly in fallow; therefore, only a few new finds have been identified. Most recent field work in the area has been conducted by the Provincial Museum of Kainuu under the leaderhip of Esa Suominen in 1999 and 2000.[3]

The water level of Lake Nimisjärvi has possibly risen because of a small dam at the head of the Nimisoja River, which had been built for catching pike during the spawning season. No excavations at Nimisjärvi have been carried out after 1919. C. Reynaud and M. Hjelmroos conducted a pollen analysis for Lake Nimisjärvi (Reynaud & Hjelmroos 1980:300–301). The suggestion that cereals had been cultivated at Nimisjärvi (and Ahmasjärvi) already ca. 6000 BP has not received much support among Finnish palynologists and archaeologists. Reynaud and Hjelmroos connect the appearance of the first *cerealia* pollen with the distribution of Early Combed Ware after 4000 BC. A new pollen sample was drilled from the pond in 1997. A reinvestigation does not support the earlier result. The human influence in the area began already during the Mesolithic, and activation can be seen during the Typical Combed Ware and Anttila ceramics. Still the continuous pollen record indicting cultivation economy does not begin until the end of the Iron Age (Huttunen *et al.*, in press).

27. Vaala [8] Nimisjärvi Sillankorva

Bms 3141 09
x = 7157 90 y = 490 03 z = 123 – 125 m ASL

Finds 2378:31–37 ceramic sherds, stone adzes, fragments of stone artefacts, burnt bones

[3] During the excavation 2000 were uncovered Textile ceramics and Anttila ceramics. Because the material has not been catalogued so far it is omitted in this study.

3041:6–9 stone adzes, a whetstone, a fragment of a stone implement
3147:1–22 ceramic sherds, fragments of casting moulds, flint flakes, pieces of stone artefacts, burnt bones, iron nails
3204 fragments of stone implements
3998:24 a stone adze
4080:11–63 ceramic sherds, fragments of casting moulds, an ice pick and their fragments, a stone axe, an unfinished stone axe, stone adzes and their fragments, flint arrowheads, a fragment of slate spearhead, flint and quartz and quartzite implements and flakes, fragments of whetstones, unfinished stone tools and fragments of stone tools, slate flakes and fragments, iron nails, soapstone, burnt bones, charcoal
4250:4–13 ceramic sherds, stone adzes, a fragment of an axe, adzes, pieces of stone implements
5862:7–17 ceramic sherds, iron knives, a whetstone and their fragments, flint and quartz flakes, iron slag, burnt bones
7526:1–16 ceramic sherds, a bronze nail, stone axes, an ice pick and its fragment, a stone awl, stone adzes, fragments of stone implements, quartz flakes
7619:9–23 ceramic sherds, a stone axe, stone adzes, an ice pick, fragments of stone implements, fragments of flint and quartz implements and flakes
7620:1–145 ceramic sherds, an axe, stone adzes, bronze plates, a flint arrowhead, flint and quartz and quartzite implements and flakes, a fragment of an ice pick, whetstones and their fragments, hammerstones, a fishing hook, iron slag, asbestos, fragments of stone implements, fragments of bone implements, red ocher, unburnt bones, burnt bones
7683:2–13, 19–23 ceramic sherds, stone axes and adzes and their fragments, a slate pin, flint and quartz flakes, fragments of stone implements, slate flakes
8645:9–16 ceramic sherds, stone adzes, fragments of stone implements
9504:4 a stone adze
The Museum of Pohjois-Savo in Kuopio 1488-1490, 2765

Studies Heikel, A.O., excavation 1895 (1895)
Ailio, J., excavation 1900 (1900)
Tallgren, A.M., excavation 1911 (maps)
Europaeus, A., excavation 1919 (1919a)
Keskitalo, O., inspection 1967 (1967)
Tomanterä, L. & Mustakallio, M., survey 1969 (1969)
Suominen, E., inspection 1987 (1989b)

Literature Heikel 1896; Ailio 1909; Ailio 1913; Tallgren 1914; Europaeus 1921; Äyräpää 1953; Carpelan 1965; Meinander 1969; Siiriäinen 1971; Reynaud & Hjelmroos 1980; Huurre 1983; 1984; 1986b; 1991a; Suominen 1988c; 1996; Pesonen 1995a; 1996b; Lavento & Hornytzkyj 1995; 1996; Huttunen *et al.*, in press

The dwelling site is situated on the S end of Lake Nimisjärvi. The place has been named after the road from Säräisniemi to Vaala. The road and bridge constructions have partly destroyed the site. The rescue excavations at Sillankorva have yielded a rich and varied material. The place has been important for fishermen, who have caught fish using some kind of dam construction. Remains of two dam constructions have been found. Lake Nimisjärvi is rich in bream.

A. O. Heikel carried out the first excavation at the site in 1895. Perhaps the most important excavation at Sillankorva was conducted by Julius Ailio who used the material of the site as a starting point for his classification of the ceramics into Sär 1, Sär 2, and the "mediating group" (see chapter 2.3.2.). A. M. Tallgren and A. Europaeus excavated small areas in Sillankorva in 1911 and 1919. Since that no excavations have been conducted at the site.

The ceramic material at Sillankorva includes almost all types, which have been found in Northern Finland. Both earlier and younger types of Early and Typical Combed Ware have been found. Säräisniemi 1 ceramics are represented abundantly. Only those vessels, which have comb stamp ornamentation running from pit to pit have been classified as Sär 1 ceramics here. Early Asbestos Ware is also represented (Pesonen 1995a), along with Late Neolithic Combed Ware (Ka III). Kierikki and Pöljä ceramics exist, but not in great numbers.

Early Metal Period ceramic groups form, however, the bulk of the material, with only a few Textile ceramics included. Sherds belonging to this group are small in number and the ornamentation is not clearly visible on their surface. In contrast, Sär 2 ceramics have been found in great numbers. Anttila ceramics is the largest group identified in the dwelling site of Sillankorva, and over 1/4 of all material belongs to it. Furthermore, other subgroups of Sär 2 – Kjelmøy, Luukonsaari and even Sirnihta – are present. This means that only Lovozero ceramics and Late Iron Age/Medieval ceramics are absent in Sillankorva.

3. SOUTHERN OSTROBOTHNIA

3.1. Laihia

28. Laihia [6a] Nikonkallio

Bsm 1244 06
x = 6976 98 y= 554 10 z= 30 m

Finds 10857:1–12 ceramic sherds, fragments of casting moulds, flint and quartz implements and flakes, a fragment of a whetstone, burnt clay, burnt bones (partly missing)

Studies Aspelin, J. R. & Schvindt, Th., survey 1896 & 1899 (1899)
Meinander, C.F., excavation 1938 (1939a)
Jern, K., survey 1952 (1952)

Literature Meinander 1943; 1954a; Salo 1970; Uino 1986; Miettinen, M. 1994a; 1998.

The cairn and possible dwelling site of Nikonkallio is situated about 10 km SEE of the Laihia church. Nikonkallio is a small hill located about 600 m from the Laihianjoki River. There are four cairns, three of which have been excavated by C. F. Meinander (1954a:157–158). The biggest cairn was 11 m in diameter. No structures were observed inside it. Instead, there was a cultural layer comprising burnt bones and ceramics beneath the burial cairn. This means that finds were not located *in situ*. Unto Salo (1970) has suggested the former presence of a dwelling construction at the site.

According to Meinander (1943), the ceramics found at Nikonkallio are textile-impressed. Smooth-faced ceramics with a row of pits below the rim were also found. Together with these ceramics, a casting mould and a fragment of crucible were identified, which resemble those found at Kalmistonmäki in Räisälä. The position of Nikonkallio as a site with Textile ceramics is a bit problematic. It has been included to the group mainly on the basis of information given in literature (Meinander 1954a). To the material belong some small sherds, which can be connected with Textile ceramics.

29. Laihia [108] Nikkari Viirikallio

Bsm 1244 03
x = 6978 72 y = 541 72 z = 25 m ASL

Finds 23694:1–48 ceramic sherds, quartz implements and flakes, lake ore, charcoal
24366:1–123 ceramic sherds, fragments of clay casting moulds, quartz implements and flakes, hammerstones, a whetstone and their fragments, an "anvil" stone for



3. Viirikallio in Laihia. Photo: Esko Luoma/National Board of Antiquities.

making stone tools, slate flakes, lake ore, burnt bones
25010:1–50 ceramic sherds, a flint flake, a half of a hammerstone, burnt clay, quartz implements and flakes, melt iron, lake ore, unburnt bones

Studies Miettinen, M., trial excavation 1987 (1990) (25 m²)
Miettinen, M., excavation 1988 (1992) (33 m²)
Miettinen, M., excavation 1989 (1992) (53 m²)

Literature Miettinen, M. 1994a; 1998

The prehistoric characteristics of Viirikallio in Laihia were first observed based upon a group of cairns. Both the group of cairns and the dwelling site are on the rocky hill of Viirikallio situated about 10 km SW of the Laihia church. The cairns have been found at an elevation of 25 m ASL or a few metres higher. Over 50 cairns have been recorded by local landowner, Esko Luoma, the finder of the site. The soil is partly bedrock, partly coarse moraine.

Two cairns were excavated in 1987 by Mirja Miettinen. Neither of these included any finds. The dwelling site, situated at a height of 30 m, proved to be a small-scale, 60 x 40 m terrace. Four small excavation areas were opened in 1988. Some ceramics were found together with some pieces of iron ore.

The dwelling site is situated on a shore which gives it a *terminus post quem* dating of 600–500 BC (Miettinen 1990:14). One carbon-14 dating yielded (Hel-2684) 2360±120, calBC 800(58.0%)350, calBC 300(10.2%)200 (Miettinen 1990:14). Another one came close to the earlier one (Hel-2683) 2350±110, calBC 800(61.8%)350, calBC 300(6.4%)200 (Miettinen 1992:5). Both datings were taken from the pits containing large amount of charcoal. Miettinen (1998:114) gives a shore diplacement dating 500–400 BC for the site.

Mirja Miettinen has separated three ceramic types at the site (Miettinen 1998:104–107). No Neolithic ceramics were found at the site. Habitation seems to have begun with Textile ceramics. The ceramic material is not very rich, and sherds are almost invariably very small. Another ceramic type at the site is Morby ceramics, and the third type represents smooth-faced Lausitz-influenced ceramics. It seems likely that the chronological difference between these ceramics is slight. According to shore displacement chronology and carbon-14 datings, the site has been in use during the very end of the Bronze Age and in the beginning of the Pre-Roman period. This gives one dating for the end of Textile ceramics throughout Finland. Accordingly the last Textile ceramics may have been in use as late as 3rd century BC.

3.2. Närpiö

30. Närpiö (Pirttikylä) [1] Raineåsen

Bsm 1242 07
x = 6959 96 y = 527 52 z = 37.8 – 38.6 m ASL

Finds 4457:1 ceramic sherds
6111:8 a ceramic sherd
12221:1–73 ceramic sherds, flint and quartz implements and flakes, a stone adze, a whetstone and their fragments, a half of a smoothing stone, an unburt bones
12230:1 a whetstone
12545:1–266 ceramic sherds, flint arrowheads, flint and quartz implements and flakes, stone adzes and their fragments, a fragment of a stone axe, whetstones and their fragments, fragments of stone implements, hammerstones, an unburnt bones
16938:1 ceramic sherds
19822:1–56 ceramic sherds, flint and quartz implements and flakes, sandstone pebbles, sandstone flakes, whetstones, quartzite flakes
20149:1–2 ceramic sherds, quartz flakes

Studies Schvindt, Th., inspection 1906 (1906)
Tallgren, M. A., inspection 1912 (1912)
Meinander, C. F., excavation 1949 (1950b)
Meinander, C. F., excavation 1950 (no report)
Siiriäinen, A, inspection 1960s (no report)
Miettinen, M., excavation 1975 (1991)
Miettinen, M., inspection 1991 (no report)

Literature Meinander 1950a; Miettinen, M. 1980

The dwelling site of Raineåsen is situated about 17 km SSE of Närpiö and 2.7 km NW of the Pirttikylä church. The site is today on a pine-growing forest area. Some cairns are present at the site. About

100 m from the cairns is a small gravel pit which has some clear indications of cultural layer along its edges. C. F. Meinander carried out a trial excavation at the site in 1949, with the excavation area covering 55 m^2. He continued excavations in 1950. Meinander classified ceramics as "typical Kiukainen" but also compared them with some finds made from Ahvenanmaa, Stora Förvar in Saltvik. The elevation of the Raineåsen site was, according to Meinander, about 37 m ASL (38 m in the 1950a publication). When adding this to the shore displacement table one can see that the *terminus post quem* for the site is about 1200 BC. Meinander found this dating to be too young, but he interpreted it as the youngest phase of the Kiukainen ceramics (Meinander 1950b). In 1975 Mirja Miettinen carried out a short excavation at the site for the purpose of locating Meinander's excavation area, drawing a general map of the area, and defining the elevation of the site.

According to Meinander, a bronze sword and bronze rings were found over 100 years ago in Stenrosbacken. These finds had, however, been cast into metal in Vaasa (Meinander 1950a:54). The Kiukainen site has been a very important cornerstone for Meinander in his construct of a relationship the cultures of Kiukainen and the Bronze Age. He considered the Kiukainen culture to be a base for the Bronze Age culture (Meinander 1950a:55–56).

The number of ceramic sherds from the site is considerable. It comprises mostly Kiukainen ceramics, but some sherds of Textile ceramics are also present. Sär 2 ceramics may be represented as well.

31. Vöyri [83] Tuckor Vitmossen 3

Bsm 1334 07
x = 7010 25 y = 569 05 z = 38.5–42 m ASL

Finds 23341:1–72 ceramic sherds, quartz implements and flakes, fragments of stone implements, burnt bones
24466:1–62 ceramic sherds, quartz implements and flakes, fragments of stone implements, burnt clay, burnt bones

Studies Kotivuori, H., survey 1985 (1985)
Kotivuori, H., trial excavation 1986 (1987) (13 m^2)
Gestrin, T., trial excavation 1987 (1989) (11 m^2)

Literature Kotivuori 1988

The dwelling site and cairn group of Vitmossen is situated about 7 km NE the Vöyri church. Bogs and bedrock with few signs of modern habitation surround the site. Hannu Kotivuori carried out a field mapping of the site, which includes four ancient monuments [in sites Vöyri 82, 83 and 84]. In 1987 Tryggve Gestrin (1989) continued a trial excavation and observed two cairns and at least ten more-or-less rectangular patches where stones had been emptied. No structures were located in these patches.

Kotivuori considered the ceramics found to be Kiukainen ceramics dating back to the beginning of the Bronze Age (1300–1200 BC) (Salomaa & Matiskainen 1985; Kotivuori 1987:9). No carbon-14 datings have been obtained from the site thus far. I have, however, classified the material in a different way. Besides Kiukainen ceramics, four vessels of Textile ceramics can also be distinguished. It is rather remarkable that shore displacement dates the site to the beginning of the Bronze Age. Ceramic types of this era are mixed together. Textile ceramics have been tempered with coarse feldspar and quartz. Very weak textile-impressions exist on the surface of the sherds, and only pits have been used as ornamentation.

4. THE LAKE SAIMAA WATER SYSTEM

4.1. Enonkoski

32. Enonkoski [9] Parkunmäki Pöytälahti b

Bms 4212 07
x = 6895 85 y = 4447 88 z = 80 m ASL

Finds 24913:1 quartz flakes
27261:1–3 ceramic sherds, quartz flakes, burnt bones

Studies Lehtinen, L., survey 1989 (1989)
Bilund, A., survey 1992 (1992)
Jussila, T., levelling 1992 (1992)

Literature Bilund 1993

The dwelling site is situated about 9.3 km NNW of the Enonkoski church, and 150 m SE of the Pöytälahti a dwelling site. These two sites can probably be considered as one and same. Similar to Pöytälahti a, Pöytälahti b lies at an elevation of 80–82 m ASL on a small terrace gently sloping to the Pöytälahti gulf. Finds have been located on the side of a road. The ceramic sherds are very small and their identification is therefore difficult. Small ceramic sherds found at the site might be Textile ceramics. The temper is coarse, foliated rock, and the outer surface of the vessel is red. No excavations have been conducted at the site.

33. Enonkoski [21] Simanala Kotkuinniemi g

Bms 4211 09
x = 6880 24 y = 4448 68 z = 84–87

Finds 27245:1–14 ceramic sherds, quartz flakes, a fragment of a stone implement, burnt bones
28218:1–4 ceramic sherds, a fragment of a stone implement, quartz flakes, burnt bones

Studies Bilund, A., survey 1992 (1992)
Lavento, M., survey 1993 (1995a)

Literature Bilund 1993

The dwelling site is situated 9 km SW of the Enonkoski church, on the southern bank of cape Kotkuinniemi. On the long sandy ridge running NW to SE, seven Stone Age and one Early Metal Period dwelling site have been found. Kotkuinniemi g is situated in a summer cottage yard. Building has partly destroyed the site. At least two terraces can be seen; the lower terrace possibly being from the Early Metal Period, and the upper terrace dating back to the Stone Age. The soil is fine sand throughout. The podsol profile in the field close to the cottage is deeply coloured, which supports the assumption that the site has been intensively inhabited. The size of the dwelling terrace is ca. 20 x 40 m.

Finds have been uncovered from two terraces. The elevation of the lower terrace is ca. 82–83 m ASL. As a preliminary observation, one can note that quartz and burnt bones appeared to be concentrated on the upper terrace, and ceramics on the lower. The elevation of the upper terrace is 85 m. Surface finds and a phosphorous analysis of the dwelling pit yielded an impression of intensively habitated site. However, the habitation area seems to be relatively small, covering no more than 35 x 20 m. The phosphorous anomalies can also be of later origin, and thus they cannot be used *per se* as an argument for a prehistoric dwelling site. Ceramic material uncovered during the surveys is meagre, and consists of fragments of Textile and Sär 2 ceramics.

On the NW side of the site, a pit, which might have been a remain of a dwelling, was identified. The pit with its surrounding wall-like structures was about 1 m deep (see Lavento 1995a). The structure might alternatively be a tar-burning pit.

4.2. Ilomantsi

34. Ilomantsi [17] Piilovaara Syväys I

Bsm 4244 03
x = 6979 84 y = 4542 50 z = 144 m ASL

Finds 7222:1 stone axe of Ilomantsi type
17738:1–6 a quartzite spearhead, a fragment of a quartzite knife, a stone axe, a stone adze, an unfinished stone tool, quartz cores
17810:1–25 ceramic sherds, stone adzes and their fragments, a whetstone, fragments of stone implements, a fragment of tile, slate, quartz implements and flakes, a bones fragment
17875:1–94 ceramic sherds, a straight-based flint arrowhead, a cradle-runner shaped pick, stone axes of Ilomantsi type, stone adzes and their fragments, a gouge, a slate weight, a stone pick, a whetstone pendant, slate point, liner, flint and quartz implements and flakes, a flint blade, a fragment of a slate knife, slate flakes, tile fragments, soapstones, burnt bones
18200:1–389 ceramic sherds, a straight-based quartz arrowhead, a fragment of flint arrowhead, fragments of quartz arrowheads, a quartz "tanged point", flint points and their fragments, retouched flint blades and their fragments, a slate point and their fragments, flint awls, a coin (copeck 1798), a stone adze, fragments of slate rings, an iron nail, flint and quartz implements and flakes, a fragment of slate implement, quartzite flakes, burnt bones, unburnt bones
18218:1–19 iron slag, quartz implements and flakes, quartzite flakes, burnt clay, burnt bones
18374:1–58 ceramics, a stone axe, quartz and slate implements and flakes, a half of a perforated stone, burnt bones
23758:1–2 quartz and quartzite flakes

Studies Björkman, T., inspection 1969 (1969a)
Sarvas, A., survey 1970 (1970a)
Saarvola, K., excavation 1970 (1970) (90 m^2)
Saarvola, K., excavation 1971 (1971) (40 m^2)
Vikkula, A. (and Huurre, M.), inspection 1987 (1989)

Literature Vikkula 1991

The dwelling site of Syväys I is situated on the SE side of Lake Koitere, about 27.5 km NNW of the Ilomantsi church, at the mouth of the northern bank of the Syväys River. The topographical environment around the dwelling site is a relatively flat, sandy cape. The soil is sand, and the dominating tree is pine. The site is very well sheltered to the north by a ridge, and its location relative to the river favours fishing activities. Rich and varied find material shows that the site has been in use from Mesolithic to historical times (Björkman 1969a; Saarvola 1970, 1971; Huurre & Vikkula 1989; Vikkula 1991). Kari Saarvola excavated this site during two seasons at the beginning of the 1970's.

All archaeologists, who have visited at Syväys have stated that the rising water in Lake Koitere has flooded the dwelling site. They have also emphasized that excavations should be organised at the site before it is too late. One problem is that the site is difficult to reach. According to Saarvola (1970), most finds are in a secondary position, which means that the water level has changed considerably during the prehistory. The water has flooded and sedimented sand as well as prehistorical material in the area.

The flint material at the site is abundant and varied, containing several flint implement. The largest group of ceramics is composed of Textile ceramics. Altogether sherds from 16 Textile ceramic vessels have been identified, with most sherds being relatively small. Anttila and Luukonsaari ceramics are represented along with such Early Metal Period ceramics that are difficult to classify into the existing groups. Neolithic ceramics also exist; at least Early Combed Ware, Typical Combed Ware, Late Combed Ware and Pöljä ceramics have been found. In addition, undefined Late Neolithic ceramics are present. According to my observations, however, the most actively inhabited prehistoric period seems to have been the Early Metal Period.

35. Ilomantsi [37] Nuorajärvi Korpisaari S

Bms 4244 04
x = 6953 00 y = 559 36 z = 145 m ASL

Finds 27727:1–2 two oval toroise brooches (Ailio's type H)
27784:1–2 ceramic sherds, quartz flakes

Studies Huurre, M., inspection 1993 (1993)

The dwelling site of Korpisaari S is situated on the S end of the Korpisaari island in Lake Nuorajärvi about 13 km E of the Ilomantsi Lutherian church and about 1 km to the SW of the dwelling site of Jänissaari. Matti Huurre and Jaana Simonen uncovered finds from the



4. Varaslampi in Joensuu. Photo: Tanja Tenhunen.

beach during their inspection. No further studies have since been carried out. About 200 m N of Korpisaari S a find place containing two cancer-formed oval tortoise bucles of Ailio's type H (27727:1–2) dating back into the Crusaide Period has been found. On one ceramic sherd from Korpisaari S faint hatching together with an unclear textile-impression can be seen.

4.3. Joensuu

36. Joensuu [3] Karsikko Varaslampi

Bsm 4223 09
x = 6944 04 y = 4489 43 z = 80–81 m ASL

Finds 17943:1 a stone axe
19175:1–4 a ceramic sherd, quartz flakes, burnt bones
19471:1–1318 ceramic sherds, fragments of clay casting moulds, flint and quartz arrowheads, flint and quartz implements and flakes, quartzite flakes, fragments of burnt clay umplements, burnt clay, slag, clay slag, burnt bones, charcoal
20293:1 an unfinished stone axe
20731:1–154 ceramic sherds, flint and quartz implements and flakes, quartzite flakes, a flint fire-striking stone, asbestos, burnt clay, a fragment of a whetstone, a stone flake, burnt bones
Pohjois-Karjala Provincial Museum (PKM) 5125

Studies Lahtiperä, P., survey 1968 (1968)
Huurre, M., inspection 1973 (no report)
Suni, M., excavation 1974 (1994) (2660 m^2)
Väkeväinen, L., trial excavation 1979 (1980) (532 m^2)

Literature Lavento & Hornytzkyj 1996; Lavento 2000

The dwelling site of Varaslampi is a large find concentration on the NE side of the Varaslampi Pond, which extends from the Kettuvaara cemetery as a 350 m long zone to the NW side of Varaslampi. The Lutheran church of Joensuu is situated about 2.1 km NE of the site (Suni 1976:3). According to Lahtiperä (1968), the ridge of Kettuvaara, on which the dwelling site is situated, was an island during the Stone Age.

Maarit Suni carried out a large salvage excavation at Varaslampi in 1974. According to her, no clear concentrations of finds were present. It is worth mentioning, however, that only a few finds were excavated in areas 1–4, the richest areas being nos. 5–7. For shore displacement dating, it is interesting to see that almost all the material was found above a level of 81 m, with the exception that in area 8, the lowest limit was 80 m ASL (Suni 1976:10). Some observations about the transgression of Saimaa during the Late Mesolithic and Early Neolithic Periods were made by digging deep (4 m) test pits. No signs of Stone Age habitation were observed, but the marks of transgression at the depth of 120 cm were still recorded (Suni 1976:11).

From hearth no. 1 two carbon-14 datings have been obtained, from layers 5 and 7. The calibrated results are (see also App 8b):

(Su-2476)	2360±30	calBC 485(13.5%)460, calBC 455(6.7%)435, calBC 430(0.8%)420, calBC 415(47.1%)385
(Su-2477)	2430±30	calBC 760(9.9%)720, calBC 540(58.3%)400

Two AMS datings have also been made from the Textile ceramics at the site with the following results.

Ua-10319	19371:375	2875±55	calBC 1190(1.0%)1180, calBC 1130(62.6%)970, calBC 960(4.6%)940
Ua-10320	19471:499	2930±60	calBC 1260(5.4%)1230, calBC 1220(62.8%)1020

The AMS-datings are conspicuously earlier than the conventional carbon-14 dating. There are several explanations for this. I find it most probable that while the AMS-datings date only Textile ceramics, the context datings from the hearth represent more probably the habitation of the Luukonsaari ceramics period. Ceramic finds around the hearth support this idea.

Find	Ceramics	Clay	Flint			Mould	Iron slag	Quartz		
		B	A	S	F			A	S	F
Number	4820	921	3	62	228	3	3	3	28	602

Table 1. The most important find types from Varaslampi in Joensuu. Legend: B-burnt clay, A-arrowhead, S-scraper, F-flake.

The most important find groups have been presented in the Table 1. As in Syväys, the amount of flint is unusually high in comparison with quartz. This observation gains additional importance in view of the absence of Neolithic settlement in the dwelling site, suggesting that flint has been a primary raw material for tools during the Early Metal Period.

The considerable amount of burnt clay is also noteworthy. The great majority of the material is ambiguous: one cannot say whether it belongs to house construction or something else. However, three fragments of burnt clay, which are probably from casting moulds, are present. Furthermore, there are several clay pieces, which are likely the base of some clay implement[4], possibly belonging to the crucibles. "Feet" resembling these ones have also been found from Suomussalmi Kalmosärkkä (Huurre 1983:266).

Only Early Metal Period ceramics have been found in Varaslampi, making them a very good source material for comparison. A total of 203 Textile ceramic vessels have been identified. Textile ceramics is the dominating ceramic type, with only 14 vessels of Luukonsaari ceramics and a few Sär 2 vessels present.

On the slope between the graveyard of Karsikko and the sidewalk grows *Arabis glabra*, traditionally considered as an Iron Age settlement indicator. Some other possible indicators were observed (pers. comm T. Tenhunen 24.6.2000), but they were not unambiguously possible to connect with prehistorical human influence.

4.4. Kerimäki

37. Kerimäki [1] Kuokkala Vehkaranta

Bsm 3211 11
x = 6877 14 y = 4453 52 z = 81 – 88 m ASL

Finds 12854:1–7 ceramic sherds, a pick shaped like a cradle-runner, a stone adze, an unfinished stone axe
12927:1 ceramic sherds
13061:1–145 ceramic sherds, a stone axe, fragments of stone axes, flint and quartz implements and flakes, a stone pin, a line sinker, a flint awl, a fragment of a whetstone, fragments of stone implements, a whetstone and their fragments, a hammerstone, a fragment of a bone artifact, burnt bones
19323:1–18 ceramic sherds, a weight stone, fragments of a whetstones, a fragment of a perforated stone, iron slag
23071:1–14 ceramic sherds, quartz implements and flakes, burnt bones
23383:1–107 ceramic sherds, quartz implements and flakes, a flint flake, a fragment of a stone adze
25205:1–305 ceramic sherds, a quartzite arrowhead, a stone adze, a fragment of a stone axe, a stone lure, flint and quartz implements and flakes, fragments of whetstones, burnt bones

Studies Meinander, C. F., excavation 1952 (1955) (126 m^2)
Perkko, M., inspection 1973 (no report)

[4] NM 19471:668 and 1050.
[5] The "stone-box" is referred to here as a furnace, although its purpose is still under discussion. The problem has been discussed in greater detail in the chapter VIII.

Matiskainen, H., inspection 1977 (no report)
Heikkurinen, T., inspection 1980 (no report)
Kankkunen, P., excavation 1985 (1986) (107 m²)
Kankkunen, P., trial excavation 1986 (1990) (197 m²)
Lehtosalo-Hilander, P.-L., inspection 1988 (no report)
Moisanen, J., trial excavation 1989 (1989) (531 m²)

Literature Meinander 1954b; Saarnisto 1970; Moisanen 1991; Matiskainen 1993;
Pesonen 1995a: Pesonen 1996b; Lavento & Hornytzkyj 1996

The dwelling site of Vehkaranta is situated about 15 km NW of the Kerimäki church. Four gravel pits have been identified; two of which are from the 1950's and the other two are contemporary. The site is situated on the heath by Lake Iso Vehkajärvi, and its dimensions are approximately 300 x 250 m. The sand grain size on the E and S sides of the area is fine, but becomes coarser on the W and NW aspects. The trees in the forest are mostly pines.

C. F. Meinander initiated studies at the site in 1955 by excavating in three separate places. The find inventory was relatively rich, including mostly Typical Combed Ware (Meinander 1955). Päivi Kankkunen continued the studies in 1985 and 1986 (Kankkunen 1986; 1990). These salvage excavations were conducted because of a plan to build a new road in the area. The extent of the dwelling site was estimated by trial pits and phosphorous analysis. Jukka Moisanen completed the trial excavations by digging ten long trial ditches along the E and S sides of the area. Based upon these trial excavations, the dwelling site is assumed to have been relatively uniform. The most intensively inhabited area was likely on the SE side of the heath (Moisanen 1989:27–28; 1991:26–27).

The ceramics finds from Vehkaranta include one exceptionally interesting vessel. Aarne Äyräpää compared it with Andronovo ceramics, which have a distribution area in the southern part of the Ural Mountains. Heikki Matiskainen (1993:70) suggested that the influence reached Finland via some other central Russian group. It has been sometimes connected with Sär 2 ceramics, sometimes with the Final Neolithic context (Lavento & Hornytzkyj 1996). This classification is based on the comparison of the finds with the Late Neolithic asbestos-tempered ceramics of Eastern Karelia. The most important characteristics are an asbestos temper and a slightly profiled vessel form. In addition, the ornamentation, comprising small spots or comb-stamps, is both horizontal and vertical. So, these attributes refer to Textile ceramics. The classification of this ceramic find under Textile pottery would also be possible.

The elevation of Lake Iso Vehkajärvi is 80.6 m. The lowermost finds – which are Late Neolithic and Textile ceramics – have come from the elevation of 82.5 m. According to Moisanen, the ceramics are distributed in such a way that Ka II 1 seems to be concentrated on the E side, Ka II, Kierikki and Pöljä ceramics on the SE side, and Ka III on the S side of the area (Moisanen 1989:27). Pesonen has also identified Early Asbestos Ware in three areas (Pesonen 1995a:app. I). Although shore displacement dating worked very well for the Neolithic terraces at Vehkaranta, it is not as successful for Late Neolithic or Early Metal Period, because these ceramics have been found not only among Pöljä and Kierikki but also Ka II ceramics.

38. Kerimäki [57] Jouhenniemi Kokkomäki

Bms 4213 01
x = 6868 37 y = 4463 37 z = 77.5 m ASL

Finds 26645:1 ceramic sherds

Studies Sepänmaa, T., survey 1991 (1992)
Jussila, T., levelling 1992 (1992)
Lavento, M., survey 1993 (1995a)

The dwelling site is situated on the S side of Kokkomäki, ca. 1.2 km NE of the Kerimäki church, and ca. 200 m W of the bay of Olavinlahti. The site is part of an esker running SE to NW. A large gravel pit has destroyed the upper part of the area. On the S end of the esker is a sheltered terrace, which lowers gently towards the bay of Olavinlahti. The whole area is covered by pine forest. The soil type is gravel, which turns into sand lower on the terrace. Attempts were also made to locate dwelling sites also on the W side of the esker, ca. 100 m W of the former find concentration. The lower part of the terrace continues into the mire. A phosphorous analysis was carried out on this terrace, showing an anomaly on the upper part of the dwelling site, at an elevation of 79 m ASL. (Lavento 1995a).

Kokkomäki is an Early Metal Period dwelling site, the material of which consists at present only of surface finds or finds made from test pits (Sepänmaa 1991; Jussila 1994a).The ceramics have a hatched surface but no ornamentation. Only one vessel has been identified from the material. The ceramic paste has been tempered with talc and organic material, probably hair. Some textile-impression can be discerned on the surface of the sherd. Textile-impression is very irregular and has possibly been pressed onto a moist surface. This ceramic belongs to the Textile ceramics.

39. Kerimäki [127–132] Raikuu Martinniemi (1–5, 8)

Bsm 4213 06 x = 6881 68 y = 4472 74 z = 81–83 m ASL

Finds 27817:1–18 ceramic sherds, quartz implements and flakes, burnt bones
28124:1–20 ceramic sherds, a fragment of stone implement, quartz flakes, stone flakes, burnt bones
31514:1–12973 ceramic sherds, amber, flint and quartz implements and flakes, stone flakes, fragments of stone implements, grindstones, burnt clay, burnt bones, asbestos, mica
31691:1–net yet catalogued
Savonlinna Provincial Museum (SlnM) 543 a quartz core

Studies Turtiainen, J., inspection 1993 (no report)
Jussila, T. & Sepänmaa, T., field mapping 1993 (1994a)
Lehtinen, L., (Martinniemi 3) inspection 1993 (1993a)
Lehtinen, L, (Martinniemi 4) inspection 1993 (1993b)
Lehtinen, L., (Martinniemi 5) inspection 1993 (1993c)
Lehtinen, L., inspection 1993-1995 (1995)
Pesonen, P., inspection 1993 (1994)
Jusssila, T. & Sepänmaa, T., trial excavation and georadar prospection 1994 (no report)
Jussila, T. & Sepänmaa, T., inspection 1995 (no report)
Halinen 1998, excavation (2000) (509 m²)
Mökkönen, T. survey 1998 (1999)
Lavento 1999, excavation (2001) (178 m²)

Literature Jussila 1993; Pesonen 1995, Halinen 1998

The dwelling sites of the Martinniemi complex are situated on the N end of Kerimäki about 20 km to the N from the church. The dwelling sites date back to a between the early Stone Age and the Iron Age. Jussila and Sepänmaa carried out a field mapping at the site complex, a georadar prospection at the dwelling depression in Kerimäki 3 and a phosphorous analysis, showing separate dwelling clusters in the area. The dwelling site complex is a zone about 250 m long and 150 m wide, but in the vicinity of it have been found sites with dwelling depressions, too. The dwelling site complex of Martinniemi was found by amateur archaeologist Jari Turtiainen (Jussila 1993).

The Department of Archaeology at the University of Helsinki carried out large excavations at Martinniemi 3 and 4 in 1998 and 1999. The 1998 excavations lasted 8 weeks under the leadership of Petri Halinen, during which the largest dwelling depression of the area was excavated. Two students of archaeology, Jutta Joensuu (2000) and Lotta Martio (Nieminen) (2000) were in charge of drawing and collecting spatial information by total station. Their pro gradu works were also based upon the ceramic finds and the spatial organisation of the dwelling depression. The excavations, led by Mika Lavento, were continued in 1999 by digging a long trial ditch and some small excavation areas below the depression. Teemu Mökkönen (1999; 2000) conducted small trial excavations and levellings for his pro gradu work in the nearby dwelling depressions of Martinniemi 4 and its vicinity as well as in the municipality of Kesälahti.

The levelling, phosphorous survey and field mapping showed that the habitation has followed the regressing water level. According to Jussila, the highest terrace, at an elevation of 83.6 m, is at the level of Great Saimaa Level. Ka II and Early Asbestos Ware have been found at an elevation of ca. 82.5 m. Archaeological finds on the lower terraces are as follows: 81.2 m (Ka III and Pöljä), 80.3 m (Tomitsa), 79.2 m (Luukonsaari), 78.4 m (no ceramics) (Jussila 1994). Jussila has numbered the find clusters into five sites, two of which represent Early Metal Period habitation. Terrace no. 4 is just below Typical Combed Ware and Kierikki/Pöljä Ware. It is situated along the curve of a small road. According to Jussila the Textile ceramics are of the Tomitsa type. Site no. 5 represents an elevation of 79.2 m ASL and is situated below site no. 4. Textile ceramics together with Luukonsaari ceramics have been found on this terrace.

4.5. Kesälahti

40. Kesälahti [2] Ruokkee Sirnihta (=Sirnitsa)

Bsm 4213 07
x = 6864 40 y = 4482 36 z = 80 m ASL

Finds 18270:1–10 ceramic sherds, quartz implements and flakes
18904:1-4 ceramic sherds, quartz flake, burnt bones
18910:1–305 ceramic sherds, hourglass-perforated stone axe, a perforated stone, an unfinished perforated stone, a stone pendant, flint and quartz implements and flakes, iron slag, chewing resin, flint flakes, fragments of slate implements, a hammerstone, porphyrite flakes, asbestos, burnt clay, burnt bones
28220:1–2 ceramic sherds

Studies Keskitalo, O., inspection 1970 (1971a)
Carpelan, C., Huurre, M. and Perkko, M., inspection 1972 (no report)
Carpelan, C., trial excavation 1972 (1975e) (46 m^2)
Lavento, M. 1993 (1995a)

Literature Lavento, M. & Hornytzkyj, S. 1996

The site is situated on the small island of Iso-Sirnihta, between Siikalahdenselkä and Paljakanlahti Bay, about 9.5 km W of Kesälahti church. Iso-Sirnihta can be characterised as a drop-shaped island about 300 m long and 90 m wide. It is narrowest along its western side. The most intensive marks of habitation have been found on the lee side of the island. Several terraces can be discerned. Terrace A is on the SE side of the island. The elevation of the base of this terrace is 76.7 m ASL. Terrace B on the NE side is mostly covered with thick vegetation, which makes the topography poorly discernible. The elevation of this terrace is 77.5 m ASL. Terrace C with an elevation of 78.3 m ASL is situated on the SE side of the island. Terrace D on the eastern part of the island lies at an elevation of 79.35 m ASL. The highest point of the island reaches an elevation of 80.3 m. (Carpelan 1975e.)

The forest vegetation on the island is mostly pine, but on the west side, where the sand/gravel bank has been disturbed by the littoral activity of waves, a narrow zone of deciduous trees exist. The undergrowth is relatively dense twig vegetation. Soil on the island can be divided into three zones: on the NW side gravel prevails, on the top and SE slope sand dominates, and below an elevation of 79.5 m ASL the soil is a fine sand. Three Lapp cairns and four small depressions have been found on the island. A phosphorous analysis, carried out on the island in 1972, showed clear anomalous patches. Because of its location on a small island, the dwelling site has been preserved almost completely undisturbed; only on the S side has the sand bank been slightly eroded by waves.

Christian Carpelan excavated two small areas in 1972. Further excavations have not been conducted although the find material and observations made during the excavation were most intriguing.

The dwelling site of Sirnihta is known foremost for the Sirnihta ceramic type. This ceramic is the largest group in the material obtained during the excavation. Textile ceramics are represented by four separate vessels. Luukonsaari ceramics, Early Combed Ware, Typical Combed Ware and probably also Late Combed Ware have been found. Pöljä ceramics also exist. Particularly important are vessels of Sirnihta type, because these have been found only in small numbers from other dwelling sites. One AMS-dating has been made from the Sirnihta ceramics, but it has not yet been published.

41. Kesälahti [11] Suurikylä Suurenkylänlahti 1

Bsm 4213 03
x = 6861 06 y = 485 56 z = 77.5 – 80 m ASL

Finds 28711:1–41 ceramic sherds, a bronze nail, a glass pearl, tinder flint, a fragment of a chalk pipe, a quartz implement, unburnt bones
30622:1–3 ceramic sherds

Studies Poutiainen, H., Koponen, M. and Kupiainen, R., survey 1993 (1996)
Koponen, M. and Poutiainen, H., survey 1994 (1996)
Kupiainen, R. and Poutiainen, H., survey 1994 (1996 see above)
Lavento, M., Christensen, H.-G., Koponen, S., Mannermaa, K. and Marjamaa, M., survey 1997 (1997)

The dwelling site of Suurenkylänlahti is situated on a large field about 7 km SW of the Kesälahti church, on the W side of the Imatra-Joensuu highway (E6). The site lies about 50–100 m from the shore and about 250 m NW of the Myllyjoki River. On the lower terraces, close to the shore of Lake Puruvesi, there is an Orthodox cemetery. Two dwelling sites have been distinguished (Suurenkylänlahti 1 and 2). During their survey of the Metal Age and Middle Age sites in Pohjois-Karjala between 1992–1994 (1996), Hannu Poutiainen, Martti Koponen and Risto Kupiainen identified a swelling site and cemetery in Suurenkylänlahti 1. Poutiainen *et al.* have several times surveyed the field with the purpose of defining the exact location and size of the site and cemetery. During the survey conducted by the University of Helsinki in 1997 (Lavento & Halinen 1997), the site was estimated to cover an area of about 100 x 100 m.

Most find material consisted of material from the historical period (after 17th century), showing active habitation and cultivation in the area. One textile-impressed sherd was identified. No other Early Metal Period remains were observed.

4.6. Kitee

42. Kitee [1] Kiteenlahti Turusenniemi (Naurisniemi)

Bsm 4231 06
x = 6885 52 y = 4510 97 z = 80–85 m ASL

Finds 15482:1–4 ceramic sherds, quartz flakes, burnt bones
16529:1–7 ceramic sherds, a stone axe, a flint implement, quartz flakes, asbestos, mica, a bones fragment
19253:1–25 ceramic sherds, a stone adze
19254:1–15 ceramic sherds, a flint flake, quartz flakes
25190:1-3 ceramic sherds
The collections at the elementary school of Heinoniemi

Studies Björkman, T., inspection 1962 (1962)
Sarvas, P., survey 1963 (1964b)
Miettinen, T., survey 1973 (no report)
Laukkanen, E., inspection 1989 (no report)

Literature Edgren 1964, Pesonen 1995a

The site is situated about 4 km SE of the Kitee church. Dwelling site material has been found in the garden between a road and a house in Turusenniemi and partly by the road in the ditch. Turusenniemi is a small cape descending to the S, located on a neck of land between Lakes Kiteenjärvi and Hyypiänjärvi. The site is on the S side of the ridge running from NE to SE, and is very sheltered to the N and E. The soil is sand. According to P. Sarvas, roadbuilding has destroyed

the dwelling site. The ceramics and stone implements, which have been found in Turunen's potato field, have been situated in a secondary position (Sarvas 1964b:3). A considerable number of finds have been uncovered.

The ceramics material at the site is relatively rich, considering that no excavations have been perforated. Finds include Early Asbestos Ware, Ka II ceramics, Kierikki/Pöljä ceramics, Textile ceramics and probably also Luukonsaari ceramics. One vessel of Textile ceramic has been distinguished. Late Neolithic organic-tempered ceramics are also contained within the material.

43. Kitee [34] Suorlahti Viilniemi

Bsm 4214 10
x = 6890 31 y = 4495 77 z = 80–81 m

Finds 29716:1–3 ceramic sherds, quartz pebble, quartz flakes

Studies Pesonen, P., inspection 1996 (1996d)

The dwelling site is situated about 11.5 km WSW of the Kitee church. Cape Viilniemi is a formation jutting out to the NW in Lake Orivesi. The soil is sand, and the cape itself is mostly a pine-growing heath (or ridge). P. Pesonen, T. Karjalainen and R. Ylönen found the site in a ploughed forest, on the southern side of a small road to a Viilniemi farmhouse. No other studies have been conducted in the area. Only one ceramics fragment has been found, and this hatched-faced find is a Textile ceramics.

4.7. Kiuruvesi

44. Kiuruvesi [2] Näläntö Tuliniemi

Bsm 3324 05
x = 7081 64 y = 472 50 z = 127.5 (Tuliniemi I)
x = 7081 56 y = 472 56 z = 127.5 (Tuliniemi II)
x = 7091 75 y = 472 45 z = 127.5 (Tuliniemi III)
x = 7081 84 y = 472 14 z = 125 (Tuliniemi IV)

Finds 14906:1–3 a ceramic sherd, a stone axe, unfinished quartz implements
14943:1–6 ceramic sherds, a stone axe, a stone adze, a fragment of a whetstone, quartz flakes, a burnt bones
15323:1–4 ceramic sheds, stone adzes
15351:1–5 stone axes, stone adzes, a whetstone
15743:1–147 I (1–137) ceramic sherds, a stone axe, stone adzes and their fragments, quartz implements and flakes, quartzite implements and flakes, a whetstone and their fragments, hammerstones, fragments of bones implements, slate flakes, burnt bones
II (138–144) ceramic sherds, a fragment of a slate implement, a quartzite plate, quartz flakes
III (145–147) ceramic sherds, a fragment of a whetstone, an unfinished adze
15829:1–3 ceramic sherds, a stone axe, a fragment of a stone adze
17060:1–20 ceramic sherds, a quartz flake, burnt bones (Tuliniemi III)
The museum of local history and culture of Kiuruvesi KiKsm:26, 28, 49, 52
The Provincial Museum of Northern Savo KuM 6259:1–6 ceramic sherds, stone adzes, fragments of stone implements, quartz falkes, burnt bones). In the picture (KuM 6259:1) there is a very characteristic rim sherd of Textile ceramics.

Studies Luho, V., excavation 1962 (1963) (76 m^2)
Huurre, M., inspection 1977 (no report)
Matiskainen, H., survey 1977 (1977)

Literature Pesonen 1996b

The dwelling site group of Kiuruvesi Tuliniemi is situated about 21 km NW of the Kiuruvesi church. Tuliniemi is a small cape on the NW side of Lake Näläntö, ca. 1 km NE of the mouth of the Rikkajoki River. Ville Luho distinguished three dwelling sites at Tuliniemi, of which Tuliniemi I and II seem to belong together. Tuliniemi III is – according to Luho – a separate dwelling site. Luho conducted an excavation at Tuliniemi I because it was in danger of being destroyed by the building of a barn. The cultural layer seemed to already be destroyed before the excavation due to building and subsurface drain. Located about 400 m NW of the fore-mentioned dwellings sites is a fourth dwelling site, Tuliniemi IV. At this site, Early Neolithic asbestos-tempered Ware, Typical Combed Ware, and Sär 2 -ceramics have been found (Matiskainen 1977:62).

The finds from Luho's excavation were mostly Combed Ceramics, Ka I 1 and I 2, with some Typical Combed Ware as well. Asbestos ceramics were picked up as surface finds at Tuliniemi III. Only a few sherds belonging to Textile ceramics have been found. A small amount of Luukonsaari ceramics and undefined Early Metal Period pottery were also contained within the material.

4.8. Kuopio

45. Kuopio [17] Riistavesi Vanha-Koski

Bsm 3244 06
x = 6971 12 y = 557 81 z = 94 m ASL

Finds 20832:1–17 ceramic sherds, a fragment of a clay idol, flint and quartz flakes

Studies Aroalho, J., inspection 1982 (1982)
Aroalho, J. & Huurre, M., inspection 1988 (no report)

The dwelling site of Vanha Koski is situated about 8 km S of the Riistavesi church, on the N side of the dried channel between Lakes Saravesi and Roikanvesi. The finds have been uncovered from the garden on the SW side of the main building of the Koskiniemi farmhouse. The site is on a slope gently lowering to the SW. The soil is sand. Deciduous trees and bushes grow close to the site. The Stone Age dwelling site of Roikanmäki in Vehmersalmi is situated about 3 km S of this site. No excavations have been carried out at Vanha Koski.

The majority of the ceramic material is either Early Combed Ware or Typical Combed Ware. There are, however, some sherds, which can be classified as Textile ceramics. These sherds are very small and their definition is inconclusive. It is therefore slightly uncertain whether the site is connected with Textile ceramics.

4.9. Maaninka

46. Maaninka [9] Tavinsalmi Huutoniemi

Bsm 3331 06
x = 7007 68 y = 512 38 z = 82.5 m ASL

Finds 30706:1–2 ceramic sherds

Studies Aroalho, J., inspection 1997 (1997)

The dwelling site is situated on the small cape of Huutoniemi by the Lake Haatalansalmi about 2.2 km W of the Maaninka church. The site lies on the sandy shore bank about 15 m from the shoreline. Jouko Aroalho found ceramics from the historical period during his inspection of the excavations at Keskisaari conducted by Jukka Palm. The site is on an area, which will dry during low water, but during high water remains beneath the water surface. No further studies have been conducted at this location.

4.10. Parikkala

47. Parikkala [17] Kaunissaari Island

Bsm 4124 04
x = 6831 30 y = 4471 84 z = 70–74 m ASL

Finds 4916:1 a slate spearhead
5078:1 a double-purpose implement (axe and gouged adze)
5176:1–16 ceramic sherds, a clay casting mould, a flint arrowhead, flint and quartz implements and flakes, fragments of whetstones, fragments of shells, burnt bones
5427:255–274 ceramic sherds, quartz implements and flakes, slate flakes, fragments of stone implements, burnt bones
18245:1 a ceramic sherd
20292:1–2 ceramic sherds, quartz flakes

Studies Ailio, J., excavation 1908–09 (1908)
Miettinen, T., survey 1979 (1980)
Uino, P., inspection 1999 (1999)

Literature Hackman 1910b; Tallgren 1914; Pälsi 1915; Tallgren 1935; Äyräpää 1935; Carpelan 1965; Pesonen 1995a, 1996b; Juvonen 1996

The dwelling site of Kaunissaari Island is situated in Lake Simpeleenjärvi about 5.5 km SSW of the Parikkala church. The site is on a small, ca. 150 x 150 m, island between the capes of Koukunniemi and Moskunniemi. The soil is sand. After the artificial lowering of the water level in 1833 and the 1960s, the size of the island has increased. The site was almost completely destroyed by digging of sand and gravel for the railroad in 1907. Julius Ailio conducted two small salvage excavations in the site in 1908–09. No studies have been carried out at the site since 1909.

Most ceramics found at the dwelling site belong to Ka I and Ka II. The Early Asbestos Ware found represents a subtype called Kaunissaari ceramics by Pälsi (1915). P. Pesonen named one subgroup of Early Asbestos Ware after the site, calling it Kaunissaari Ware. Some sherds of undefined, asbestos-tempered Early Metal Period ceramics also exist at the site. One sherd of Sirnihta ceramics has been identified with some certainty, and Textile ceramics are represented by some small textile-impressed sherds. Moreover, a casting mould for a bronze brooch has been found at the site. A. M. Tallgren and A. Äyräpää debated in 1935 (Tallgren 1935; Äyräpää 1935) about the chronology of the find material. On the grounds of the casting mould, Tallgren emphasized Early Metal Period dating of the site. Äyräpää, in contrast, pointed out that at least the asbestos-tempered ceramics – the Kaunissaari Ware – should be dated into the period of Typical Combed Ware.

4.11. Pielavesi

48. Pielavesi [1] Taipale Virranniska

Bsm 3314 07
x = 7011 00 y = 484 02 z = 109m ASL

Finds 7593:2 flint and quartz flakes
7618:1–190 ceramic sherds, a flint arrowhead and their fragments, a stone adze, flint and quartz implements and flakes, fragments of stone implements, a hammerstone, fragments of whetstones, slate flakes, burnt bones
7954:12–15 ceramic sherds, flint implements and flakes, quartz flakes, a fragment of a stone implement
8051:1–5 ceramic sherds, flint implements and flakes
14522:1 a ceramic sherd
16637:1–2 a flint implement, a burnt bone
18026:1–10 ceramic sherds, a flint arrowhead, flint and quartz flakes, burnt clay, burnt bones
19564:1–3 ceramic sherds, quartz flakes, a burnt bone

Studies Europaeus, A., excavation 1919 (1919b) (c. 170 m^2)
Keskitalo, O., inspection 1969 (1969)
Aroalho, J., inspection 1995 (no report)
Jussila, T., 1997 (1997b)

Literarure Europaeus 1921; Meinander 1954b

The dwelling site is situated about 5 km SW of the Pielavesi church, on the SE shore of Lake Pielavesi, about 250 m NNE of a house in Virranniska. Currently the dwelling site is about 3.2–4.3 m above the level of Lake Pielavesi (Europaeus 1919). In 1919 the site was covered with deciduous forest, and the area was used for slash and burn cultivation. Now, a gravel pit is situated in the area, which has partly destroyed the dwelling site. According to Oiva Keskitalo (1969), a cultural layer remained visible on the western side of the gravel pit.

The ceramic finds found by Europaeus can be mostly classified as Typical Combed Ware, but some Textile ceramic sherds have also been found (Europaeus 1921:19–21). In addition, the majority of the later finds represent Typical Combed Ware, with a few sherds being identified as Late Neolithic ceramics. It is interesting to note that mica has sometimes been used as a temper in this ceramics as well. The Textile ceramics are strongly profiled and textile-impressed. A pit, which has been pressed inside the vessel, can be seen in one sherd (18026:4).

49. Pielavesi [6] Kuivaniemi Meijerinkangas

Bsm 3313 08
x = 6999 92 y = 482 31 z = 103–105 m ASL

Finds 19103:1 quartz flakes
19566:1 ceramic sherds
25011:1 quartz flakes
26088:1–82 ceramic sherds, an amber pearl, fragments of an amber objects, quartz implements and flakes, fragments of stone implements, quartzite flakes, burnt bones
26617:1–536 ceramic sherds, fragments of flint points, a fragment of an adze, flint and quartz implements and flakes, burnt clay, quartzite flakes, asbestos, fragments of flint implements, fragments of stone implements, red ocher, burnt bones
The Provincial Museum of Northern Savo KuM 5830 ceramic sherds (=NM 19566)

Studies Sarvas, A., 1972 (no report)
Huurre, M. (no report)
Pohjakallio, L. 1974–75 (no report)
Aroalho, J., inspection 1989 (1989)
Kankkunen, P., excavation 1990–1991 (1994b) (150 m^2)

Literature Lavento & Hornytzkyj 1996

The dwelling site of Pielavesi Meijerinkangas is situated about 15 km SW of the Pielavesi church. The site is on a 200 x 200 m islet surrounded by mire and the Lake Nilakka. The shore bank is steep and formed by erosion caused by the waves of Lake Nilakka. Trees on the islet are mostly deciduous, but pine is also present on the S and SE sides.

Päivi Kankkunen carried out two excavations at the site in 1990 and 1991. Six hearths were found, the largest of which was round, ca. 40 cm thick, and 120 cm in diameter. Found above it, from layers of 10–30 cm, were some large sherds of Luukonsaari ceramics. Carbon-14 dating from the charcoal in the fireplace yielded (Hel-3058) 4880±100 BP (Kankkunen 1994:8). Fireplace no. 2, situated on the N side of the site, had a diameter of ca. 1.5 m and reached a depth of 60 cm. Carbon-14 dating gave the result (Hel-3187) 1910±110, calBC 40(68.2%)240 calAD. According to the excavator, both fireplaces came from the same stratigraphic horizon, and their surfaces came visible at a depth of 30 cm (Kankkunen 1994:10, 21). The third radiocarbon dating proved to be recent (see App. 8b). The dwelling area seems to be situated on the E and S sides of Meijerinkangas. According to Kankkunen, there are numerous structures at the site – pits with cultural soil, and even a 25 m long wall (Kankkunen 1994:22), which function is unclear.

While the majority of ceramics belong to the Typical Combed Ware, Late Neolithic Combed Ware and Pöljä ceramics also exist. Early Metal Period ceramics are represented by five Textile ceramic vessels. Also represented are Luukonsaari ceramics and some sherds, which can be connected with Iron Age ceramics.

50. Pielavesi [60] Kaatiojoen suu

Bsm 3314 05
x = 7021 22 y = 474 32 z = 105 – 107 m ASL

Finds 30358:1–3 ceramic sherds, a quartz fake, burnt bones

Studies Jussila, T., survey 1997 (1997)

The dwelling site is situated on the mouth of the Kaatiojoki River, about 14 km W of the Pielavesi church. It lies on the NW side of the bay of Kaationlahti, about 150 m N of the mouth of the river. An ancient shore terrace is present, which implies a possible dwelling depression. According to the surveyor, Timo Jussila, a wall was also identified. The soil is sand and trees include pine and birch. The site is undisturbed and the sand pit on the W side did not contain any remains of prehistoric habitation.

Jussila has identified only Textile ceramics in the material. This observation, together with the dwelling depression, is of particular interest. At least some trial excavations should be conducted.

4.12. Polvijärvi

51. Polvijärvi [6] Martonvaara Multavieru

Bsm 4313 01
x = 6980 36–44 y = 4467 18 z = 100.0 m ASL

Finds 17869:1–33 ceramic sherds, a fragment of a stone implement, a flint flake, quartz implements and flakes, soapstone, burnt clay, unburnt and burnt bones
18266:1–39 ceramic sherds, a stone axe, a small stone adze, quartz flakes, asbestos, burnt clay, a burnt bones
18275:1–8 ceramic sherds, flint and quartz implement and flakes, burnt bones
20296:1–6 ceramic sherds, iron slag, quartz flakes, burnt clay, burnt bones
21088:1–5 ceramic sherds, a flint flake, quartz flakes, a fragment of a stone implement, a burnt bones
23819:1–28 ceramic sherds, flint and quartz implements and flakes, burnt clay, asbestos, burnt bones
25211:1–4 a flint flake, iron slag, burnt clay, quartz flakes
28720:1–10 quartz implements and flakes, burnt bones
29635:1–945 ceramic sherds, a flint point, a fragment of a clay idol, a fragment of a clay implement, an iron belt buckle, a fragment of a stone implement, flint and quartz implements and flakes, a fragment of a whetstone, burnt clay, burnt bones, an iron knife, iron slag, clay slag, quartzite flakes, a fragment of a bones implement, asbestos, soapstone, red ocher
30459:1–5 ceramic sherds, quartz flakes, burnt bones
30767:1–1018 ceramic sherds, flint and quartz implements and flakes, fragments of stone adzes, iron slag, burnt clay, burnt bones

Studies Björkman, T., inspection 1969 (1969b)
Keskitalo, O., inspection 1970 (1971b)
Grönlund, E., Koponen, M., Kupiainen, R. and Poutiainen, H., inspection 1993 (1996)
Poutiainen, H. and Kupiainen, R., inspection 1993 (1996 see above)
Lavento, M., excavation 1996 (1997e) (120 m^2)
Pesonen, P., inspection 1997 (1997b)
Lavento, M., excavation 1997 (1998d) (113 m^2)

Literature Tuomi 1984; Poutiainen *et al.* 1995; Kouki 1999; Lavento 1999c

The dwelling site lies on a low hill composed of fine sand, about 9 km NNE of the Polvijärvi church. A schoolboy, Harri Luukkainen, found the site on the edge of a sand pit in 1969. At present, the Kiskonjoki River runs in front of the SW side of the site. This dwelling site was greatly damaged by the digging of sand for the bridge of the nearby road. According to Tuomas Björkman (1969b), this site is quite large and includes several concentrations of prehistoric habitation. Oiva Keskitalo (1971b) made an inspection of the area and found a very strong and thick cultural layer. The University of Helsinki, Department of Archaeology carried out the field mapping and phosphorous analysis in 1996. A seminar excavation was also conducted. Surface finds were collected from an approximately 800 m long terrace, reaching from the ditch situated ca. 60 m E of the bridge over the Kiskonjoki River to a small ravine, by the one-family house of local school teacher, M. Kalamo.

The dwelling site complex is on a NW-SE directed low esker. The soil is stoneless silt. Three terraces can be observed, the highest being at an elevation of 103 m ASL, the middle one at one elevation of 101 m ASL, and the lowest at about 99 m ASL. Most finds have thus far been made from the middle terrace. The base of the lowest terrace most probably represents the water level of Lake Höytiäinen before 1856, prior to the abrupt regression of the lake as a result of digging of a channel from Lake Höytiäinen to Lake Saimaa. The vertical regression in the lake was 9.5 m. During the 1997 excavations the possible Mesolithic settlement was located on the highest terrace. Present on the middle terrace were a variety of remains of different activities. Large-scale iron smelting had occurred during the modern era (Poutiainen *et al.* 1995), and the most striking remains of this activity are the L-shaped pits with iron slag walls. Three charcoal pits, each ca. 10 x 10 m, have destroyed the prehistoric dwelling site. The iron furnaces can be dated with some certainty to the end of the 1770's on the basis of written information (Tuomi 1984:271–274). Paula Kouki (1999) has made her pro gradu –work relating to soils in the dwelling site area. Kouki studied the human influence on soil by different kind of element analyses.

The typological dating and spatial distribution of the finds show that the same dwelling terrace has been in use for over 6000 years. This indicates that the water level of Lake Höytiäinen has remained unchanged at least from ca. 4000 BC to 1856 AD. The ceramic material at the site is rich in different types, with the following having been identified: Early, Typical and Late Combed Ware, Early Asbestos Ware, Kierikki and Pöljä ceramics, undefined Sär 2 ceramics (most probably Luukonsaari ceramics) and Medieval Slavic-Karelian ceramics. Eight Textile ceramic vessels have been distinguished.

4.13. Punkaharju

52. Punkaharju [1] Kulennoinen Kaarniemi

Bsm 4122 12
x = 6852 00 y = 4458 30 z = 80 m ASL

Finds 17606:1–16 ceramic sherds, quartz flakes, a slate flake, burnt bones
17870:1–421 ceramic sherds, axes, a flint arrowhead, a slate ring, sinkers, flint flakes, quartz implements and flakes, fragments of slate implements, quartzite flakes, a whetstone, stone flakes, asbestos, burnt bones
18012: 1–4 ceramic sherds, a flint flake, quartz flakes, burnt bones

Studies Luho, V., inspection 1968 (no report)
Keskitalo, O., inspection 1969 (no report)
Schauman, M., excavation 1969 (1969) (ca. 164 m^2)
Perkko, M., inspection 1973 (no report)
Pesonen, P., inspection 1993 (1994c)
Lavento, M., survey 1993 (1995a)

Literature Pesonen, P. 1995a

The dwelling site of Kulennoinen is situated about 9.8 km SW of the Punkaharju church. The site is on a small cape, part of Cape Jousharjunniemi (Kaarniemi), along Lake Jännevesi. A summer cottage had been built on the cape, and the site was for this reason salvage-excavated by Marianne Schauman in 1969. The site topography is dominated by the relatively high esker of Jousniemenharju. The slopes of the ridge are steep, and only a few potential niches for dwelling sites are present on the narrow terraces by the lake. The terrace where the dwelling site of Kulennoinen is situated, is a 30 x 30 m area, which has steep slopes to the lake. The soil on the ridge is gravel and

sand, and the vegetation is mostly pine, with some deciduous trees on the dwelling terrace. Today, the dwelling site is beneath a summer cottage. The landowner, an artist named Erkki Soikkeli, has recently enlarged the building, which has destroyed the remains of the dwelling site. The excavation material showed that the site had been used for a long time in different phases of prehistory from the Stone Age and the Early Metal Period.

The ceramic material at Kulennoinen is rich and varied. The Middle Neolithic material includes Early Asbestos Ware, Ka II, Pöljä and Kierikki ceramics. The organic-tempered ceramics are mostly Ka III, but probably also Pyheensilta ceramics. In addition, Textile ceramics from four vessels, and some sherds of Luukonsaari ceramics have been found. The majority of the ceramics belong to the Neolithic period.

4.14. Puumala

53. Puumala [9] Huhtimaa Pistohiekka b

Bsm 3143 06
x = 6829 06 y = 3553 03 z = 79.7 m ASL

Finds 25050:1–2 ceramic sherds, quartz flakes
28233:1 quartz flakes

Studies Lehtinen, L. and Sepänmaa, T., survey 1989 (1990)
Jussila, T., survey 1990 (1991a)
Jussila, T., levelling 1992 (1994a)
Lavento, M., trial excavation and phosphorous analysis 1993 (1995a)

The dwelling site of Pistohiekka b is situated on the N bank of Pistalanselkä along Lake Lietvesi, about 10.5 km NE of the Puumala church. The site lies on the sandy, pine-growing terrace gently lowering to the N and NE. The distance from the site to the contemporary shore is about 150 m. A small road runs through the site and has partly destroyed it. Finds have been made along the side of the road. On the E side of the road, the forest has been fully cut down and the soil has been harrowed. The soil is medium- grained gravel or sand.

Timo Sepänmaa and Leena Lehtinen found the site during their survey. It has been levelled by Timo Sepänmaa, and a phosphorous analysis has been carried out by Mika Lavento (1995a). During the phosphorous sampling on the edge of the road ditch, a partly destroyed hearth was discovered – 50 x 50 cm in size – and excavated as a salvage excavation. A carbon-14 sample taken from it, proved to be too small for conventional radiocarbon dating. The hearth was made of a few stones, which were burnt by a blazing fire. The phosphorous analysis did not yield a very clear view about the dwelling site. Although some anomalous areas exist there, the intensity of habitation did not seem to be very considerable. It is possible that the main area of habitation had been on the W side of the road, on the harrowed, and thus partly destroyed, section. The environment of the site is, however, very favourable for habitation. The number of finds to date is limited, with only some Textile ceramic sherds having been uncovered from the harrowed area.

54. Puumala [16] Liimattala Kotkatlahti a

Bsm 3143 09
x = 6820 43 y = 3562 10 z = 80 m ASL

Finds 25053:1–4 ceramic sherds, flint flakes, quartz flakes, burnt bones
27559:1–3 ceramic sherds, a fragment of an idol, flint flakes
28231:1–2 ceramic sherds, a quartz flake

Studies Lehtinen, L., survey 1989 (1990)
Jussila, T., survey 1990 (1991a)
Jussila, T., levelling 1992 (1994a)
Lavento, M., survey 1993 (1995a)

The dwelling site of Kotkatlahti a is situated on the N side of the Kotkatsaari island, about 4.2 km S of the Puumala church. It is on a terrace opening to the S. The site has been partly destroyed by a small road, and finds have been identified along a section of the road. The slope is gentle closer to the shore, but becomes steeper further away from the water. The site is sheltered to the NW, N and WE. The soil is coarse sand and gravel. The forest along the ridge is mostly pine.

Two terraces are evident, of which the upper (88 m ASL) one involves finds from the Stone Age and the lower one, probably, from Early Metal Period habitation. The phosphorous analysis along three lines showed an anomaly in the upper terrace, where the survey finds have been collected (Lavento 1995a). Therefore, no clear evidence about the separate dwelling sites in different terraces have been obtained thus far. The ceramics include Typical Combed Ware and probably also Pöljä ceramics, as well as Textile ceramic sherds belonging to one vessel.

4.15. Rantasalmi

55. Rantasalmi [35] Lautakangas

Bsm 3233 11
x = 6876 41 y = 3571 00 z = 82–88 m ASL

Finds 28026:1–17 ceramic sherds, flint and quartz implements and flakes, a whetstone
28412:1–62 ceramic sherds, tinder quartz, a fragment of stone implement, quartz implements and flakes, burnt clay, pieces of iron, asbestos, burnt bones
29771:1–48 ceramic sherds, quartz implements and flakes, burnt bones, charcoal

Studies Sepänmaa, T., survey 1993 (1994)
Huurre, M. & Lehtinen, L., inspection 1993 (no report)
Pesonen, P., survey 1993 (1994c)
Kankkunen, P., trial excavation 1994 (1994a) (127 m^2)
Kankkunen, P., trial excavation 1996 (1996a) (57 m^2)

Literature Pesonen 1995a

The dwelling site of Lautakangas is situated about 8.9 km S of the Rantasalmi church, and lies on the E side of Tervajoki-Sydänmaa Road, about 250 m SE of the crossroads. Gravel digging has destroyed the central parts of the site. The survey and trial excavation finds have mostly been uncovered from a gently rising slope to the W. Päivi Kankkunen (1994a; 1996a) conducted two trial excavations, the number of sites remained small in both studies. It seems probable that the most intensively inhabited part of the dwelling site has been destroyed due to gravel being removed.

At least Early Asbestos Ware (Pesonen 1995a:app. I), Typical Combed Ware and Textile ceramics have been identified at the site. The last-mentioned group was, however, found on elevation of 86.5 m, which means that it had not remained in its original position along the shore. The number of ceramic finds is not abundant and almost all sherds are very small. On the walls of some sherds a textile-impression can be seen, but no sherds with a preserved surface large enough for making a conclusive determination.

4.16. Ristiina

56. Ristiina [2] Himalansaari Heiniemi

Bsm 3141 08
x = 6812 86 y = 3525 14 z = 105 m ASL

Finds 19022:1–3 a quartz implement, quartz flake, burnt bones
27371:1–3 a ceramic sherd, quartz flakes, burnt bones

Studies Perkko, M., survey 1972 (no report)
Sepänmaa, T., survey 1992 (1993a)

The dwelling site of Himalansaari is situated on the southern side of Lake Yövesi ca. 14 km SE of the Ristiina church, on the base of the Bay of Haavinginlahti. The dwelling site is on the apex of a hill, about 30 m above the elevation of Lake Yövesi. The topography of the site is exceptional. Mikko Perkko, who found the site, uncovered the first finds at the top of the hill, which forms a 40 x 40 m terrace. The slopes of the hill are steep, and the hill is part of a gravel esker running in the NW-SE direction. The soil of the hill is fine sand. The covering veg-

etation has been badly damaged by casual visitors who have wanted to see the scenery over the lake. It is not very likely that the place has been an ordinary dwelling site; more probably it has been a guard post or a stop-over site. No trial excavations have been carried out thus far.

Mikko Perkko found quartz flakes and burnt bones on the site. Later, during his survey Timo Sepänmaa found ceramics, which date back to the Early Metal Period. Because the sherds are very small in size, identification of the ceramics is difficult and inconclusive. Sepänmaa has classified the ceramics as Textile ceramics.

57. Ristiina [22] Laasola Pulmionlampi

Bsm 3141 06
x = 6823 12 y = 3519 08 z = 81 m ASL

Finds 27382:1–10 ceramic sherds, quartz implements and flakes, burnt bones
29633:1–6 ceramic sherds, quartz flakes

Studies Sepänmaa, T., survey 1992 (1993)
Jussila, T., levelling 1992 (1994a)
Lavento, M., survey 1993 (1995a)
Lavento, M., inspection 1995 (1996b)
Lavento, M., Tenhunen, T., Toivanen, M. & Vilhunen, S., survey 1996 (Koivikko & Mökkönen 1996)

Literature Lavento & Hornytzkyj 1996

The dwelling site of Pulmionlampi is situated along the road from Ristiina to Suurlahti about 4.7 km ENE of the Ristiina church. Road construction has partly destroyed the site, and most finds have been made from the ditch by the road. The site is on the low terraces of a sand ridge gently lowering to Lake Louhivesi along its N and NE sides. The soil is coarse sand. The site is on the glacifluvial delta, where 3 or 4 terraces can be discerned between the Ristiina-Suurlahti Road and Lake Louhivesi. The upper part of the heath is pine forest, but deciduous trees also grow close to the lake. Phosphorous sampling was conducted at the site in 1993, when it was considered a candidate for a seminar excavation of the University of Helsinki. The analysis did not show any clear anomaly between the road and the contemporary shore. It is possible that the main part of the dwelling site resides on the terrace above the road.

Finds have been uncovered during the surveys and inspections from the edge of the roadside ditches. The finds include a small amount of Pöljä ceramics. Sherds from one Textile ceramic vessel have been found.

58. Ristiina [26] Laasola Kitulansuo d

Bsm 3141 06
x = 6822 28 y = 3519 78 z = 81 m ASL

Finds 27383:1–6 ceramic sherds, quartz flakes, burnt bones
28112:1–137 ceramic sherds, a straight-based arrowhead, an oval flint fire-striking stone, flint flakes, quartz implements and flakes, a horseshoe nail
28541:1–1641 ceramic sherds, quartz implements and flakes, fragments of stone implements, flint flakes, quartzite flakes, burnt clay, unburnt clay, burnt bones, iron nails
28950:1–2640 ceramic sherds, quartz implements and flakes, a fragment of a slate point, flint flakes, a whetstone, a fragment of an iron object, quartzite flakes, asbestos, burnt clay, iron slag, burnt bones

Studies Sepänmaa, T., survey 1992 (1993)
Schulz, E.-L. and H.-P., excavation 1993 (1994b) (192 m^2)
Lavento, M., excavation 1994 (1995b) (216 m^2)
Lavento, M., excavation 1995 (1997d) (186 m^2)

Literature Lavento 1996a; 1999b; Saastamoninen 1999

The dwelling site of Kitulansuo d is situated about 5.2 km SW of the Ristiina church, and about 300 m W of the Roinila farmhouse. The environment consists of a sandy plateau formation, which belongs to an esker oriented from NW to SE. Present, on the W side of the sandy terrace is a bedrock formation, on the apex of which are three small cairns. The nearest of these is situated by the dwelling site, only ca. 20 m from excavation area 3. The vegetation at the plateau is pine, and the undergrowth is relatively sparse. The mire surrounds the dwelling site on three sides, with the SE side bordered by Lake Louhivesi. The slope lowers from the heath to the mire at a steep angle. The small gravel pit on the S slope has partly damaged the site.

Timo Sepänmaa found the "hanging" stone setting on the edge of the gravel pit during his survey in 1992, at which time ceramics and quartz flakes were also discovered around the hearth. The National Board of Antiquities included the site into its excavation programme in 1993, and a trial excavation was carried out under the leadership of Eeva-Liisa and Hans-Peter Schulz. The revealed that the site dated back to the Early Metal Period. Although most ceramics proved to be Textile ceramics, some sherds of Luukonsaari ceramics were also found. The Schulzes also observed a possible foundation of a dwelling at the base of the terrace (Schulz, E.-L. & Schultz, H.-P. 1993), of the excavation area 3. The size of the potential dwelling site is about 5000 m^2.

The Department of Archaeology at the University of Helsinki continued excavations in 1994 and 1995. A seminar excavation was held there in both years. The excavations of three separate areas in 1994 showed that the habitation represented solely the Early Metal Period. In 1995 the excavations yielded a surprise in the form of an iron furnace (Lavento 1996a). The iron furnace did not appear to belong to Textile ceramics, but rather to Luukonsaari ceramics. The iron furnace was a rectangular, low "box", which was made of flat stone slabs set on their sides. All stones would have been carried to the site from elsewhere, because the heath itself contains no stones. Two separate settlement horizons apparently exist, the first connected with Textile ceramics, the second with Luukonsaari ceramics, and the iron furnishing remains. It is quite interesting that in area 4 one ceramic vessel was found, which can be classified as Western Bronze Age ceramics. The connection between the dwelling site and the cairns on the bedrock hill has not yet been clarified. Altogether 42 Textile ceramic vessels and 5 Luukonsaari ceramic vessels have been distinguished.

The table above presents general statistics for the material. The small amount of flint is worthy of attention. If compared with the finds of Joensuu Varaslampi or Ilomantsi Syväys I a very clear difference can be seen. This can perhaps be explained by cultural relations, which were directed to the west in the case of Kitulansuo d, but to the east in the cases of the Joensuu and Ilomantsi dwelling sites. A total of 11 095 g of iron slag and 2058 g of burnt clay were found. Only two quartzite flakes were identified.

Find	Ceramics	Clay	Flint			Mould	Iron slag	Quartz		
		B	A	S	F			A	S	F
Number	5735	164	0	0	9	0	3596	1	36	419

Table 2. The most important find types from Kitulansuo in Ristiina. Legend: B-burnt clay, A-arrowhead, S-scraper, F-flake.

One AMS-dating has been obtained from the Textile ceramics themselves. The sample 28960:586 has given the dating:
Hela-104 3220±65 calBC1600(7.3%)1560, calBC1530(60.9%)1410

This dating shows that the early phase of western Textile ceramics can be as old as ca. calBC 1600. This information is of special importance because it dates the earliest phase of usage of Sarsa ceramics.

Five ^{14}C datings from the site present some conflicting information.

III	Le-5093 2460±60	calBC 760(22.4%)680, calBC670(8.8%)630, calBC 600(3.5%)570, calBC 560(21.0%)480, calBC 470(12.5%)410
IV	Hel-3836 2170±90	calBC 360(68.2%)110
V	Hel-3837 1530±80	calAD 430(68.2%)610

Samples III, IV and V are consistent with the assumed period of the use of the site. Samples III and IV have been obtained from excavation areas 3 and 4 (Lavento 1995b, 1997d), and they most closely match to the assumed habitation period. Sample V is from the iron

furnace (Lavento 1996a:67–71). Most Luukonsaari ceramics have been found in area 6 together with the forge. One TL dating from the furnace is still ongoing. The two first datings (see App. 8b) can possibly by explained by the slash-and-burn cultivation at the site.

59. Ristiina [28] Roinilampi

Bsm 3141 09
x = 6822 11 y = 3520 16 z = 80 m ASL

Finds 27385:1–4 ceramic sherds, quartz flakes, stone flakes, burnt bones

Studies Sepänmaa, T., survey 1992 (1993)
Schulz, E.-L. and H.-P., inspection 1993 (1994c)

The dwelling site of Roinilampi is situated by the Ristiina-Suurlahti road about 5.7 km E of the Ristiina church, and about 60–160 m SE of the Roinila farmhouse. Topographically, the site belongs to the esker running from NW to SE. The site is on a narrow terrace on the NW side of the esker. The forest vegetation is pine, but lower, at the same level as the mire and the Roinilampi Pond is a deciduous forest. The soil is gravel and sand.

The site was first observed by Timo Sepänmaa during the survey of the Ristiina parish in 1992. The ceramic sherds and quartz flakes were uncovered from the section dug for the ditches of the road. Sepänmaa states that two find areas are contained on the site, the first about 80 m SE of Roinila farmhouse, and the other one, about 160 m SE of the farmhouse. The road has destroyed most of the dwelling site. Ceramic sherds are small and few in numbers, which makes their classification difficult. The sherds are likely Textile ceramics.

60. Ristiina [29] Laasola Akanlahti

Bsm 3141 09
x = 6821 84 y = 3520 31 z = 83–88 m ASL

Finds 27386:1–11 ceramic sherds, a half of a perforated stone, quartz implements and flakes, flint flakes, burnt bones
28134:1–7 ceramic sherds, flint and quartz flakes
28542:1–5 ceramic sherds, a quartz implement, quartz flakes, burnt bones
29632:1–2 quartz flakes, a stone flake

Studies Sepänmaa, T., survey 1992 (1993)
Schulz, E.-L. & H.-P., inspection 1993 (1994a)
Lavento, M., inspection 1994 (1995c)
Lavento, M., inspection 1995 (1996c)

Literature Lavento & Hornytzkyj 1996

The dwelling site of Akanlahti is situated about 6 km E of Ristiina church. The site is on the W side of the Ristiina-Suurlahti road, and the finds have been picked up from ditches and on a small road, which turns to the W from the main road. The soil is sand, and the forest is growing pine. The site is situated on the same ridge formation together with many dwelling sites in Laasola. According to surface finds, the site is large. Construction of road and the sand pit have partly destroyed the site. According to Sepänmaa, most finds were identified from the trial pit at an elevation of 87 m ASL. The ceramic material consists mostly of Typical Combed Ware and Neolithic Asbestos-tempered Ware, along with some Textile ceramic sherds.

61. Ristiina [32] Huttula Hietaniemenkangas

Bsm 3141 09
x = 6821 86 y = 3528 28 z = 85 m ASL

Finds 27389:1–15 ceramic sherds, a slate arrowhead, a flint arrowhead, flint and quartz flakes, burnt bones
27833:1–15 ceramic sherds, a flint implement and flakes, a quartz implements and flakes, burnt bones
28236:1–5 ceramic sherds, quartz flakes, burnt bones

Studies Sepänmaa, T., survey 1992 (1993)
Jussila, T., levelling 1992 (1994a)
Pesonen, P., survey 1993 (1994c)
Lavento, M., survey 1993 (1995a)

The dwelling site of Hietaniemenkangas is situated on the N side of Lake Louhivesi, about 13.7 km E of Ristiina church. At present, the heath of Hietaniemienkangas is a large, completely deforested and ploughed area. Topographically, it forms a sheltered, curved, small bay, where at least two clear terraces can be seen. The ploughing has cut grooves at 2.5 – 3 m distances, and they go as deep as 40 cm into the soil. The soil is sand.

Timo Sepänmaa found the site during his survey in 1992. Since the slope has been tilled, it is easy to pick ceramics and quartz flakes from the furrows. The shore displacement seems to work very well at the site, although the terraces are not very visible. The terraces can, however, be seen between the elevations of 81 and 86 m ASL. Typical Combed Ware is most abundantly represented at the site. According to Jussila (1994a) some Textile ceramic sherds have been found.

62. Ristiina [43] Hartikkala Ala-Pentti b

Bsm 3141 08
x = 6819 48 y = 3521 72 z = 80 m ASL

Finds 27397:1–2 a ceramic sherd, quartz flakes

Studies Sepänmaa, T., survey 1992 (1993)

The dwelling site of Ala-Pentti is situated between two ponds, Ala-Pentti and Vesterinlahti, about 7.8 km E of the Ristiina church. A small terrace surrounds the dwelling site, which is on the edge of a glacifluvial formation. On the W and S sides is mire. The hill gently slopes upwards to the N and NE. Forest vegetation is mostly pine, but lower, by the elevation of the mire, the vegetation is deciduous. The soil is a stoneless gravel and sand. The dwelling site is very small and probably used only for temporary lodging.

Timo Sepänmaa found the site during his 1992 survey. No further studies have been conducted. There are three probably Early Metal Period dwelling sites (Ristiina 7, 40 and 42) on the same ridge. According to Sepänmaa, the ceramics sherds from Ala-Pentti b are Textile ceramics.

63. Ristiina [44] Hartikkala Metelinniemi

Bsm 3141 08
x = 6816 06 y = 3522 30 z = 79 m ASL

Finds 27398:1–3 a quartz implement, quartz flakes
29837:1–3 ceramic sherds, quartz flakes, burnt bones

Studies Lehtinen, L. & Sepänmaa, T., survey 1992 (1993)
Lavento, M., Tenhunen, T., Toivanen, M. & Vilhunen, S., survey 1996 (Koivikko & Mökkönen 1996)

The dwelling site of Metelinniemi is situated about 10 km SE of the Ristiina church, on the S side of Cape Aartamaniemi. The site is on a slope gently lowering to the SE. Several unclear terraces can be seen. The soil is gravel. Timo Sepänmaa found a quartz scraper and a quartz flake on two terraces divided by a small road leading to summer cottages. Cape Metelinniemi continues as a narrow, over 200 m long sandy formation to the south. The site was resurveyed in 1996 at which time time some small fragments of ceramics were found. Road construction has not damaged the site. No structures have been observed. The ceramic sherds are very small which makes identification of type difficult. The quartz-, feldspar- and asbestos-tempered ceramics most probably belong, however, to Textile ceramics.

64. Ristiina [84] Heiniemi Mustalahti

Bsm 3141 08
x = 6813 76 y = 352 67 z = 80–82.5 m ASL

Finds 29836:1–2 ceramic sherds, quartz flakes

Studies Lavento, M., Tenhunen, T., Toivanen, M. & Vilhunen, S. 1996 (Koivikko & Mökkönen 1996)

The dwelling site of Haikanniemi is situated about 12.5 km SE of the Ristiina church, and is on the upper part of a field opening to the NE. A sand pit of moderate size is present on the SW side of the site. The distance from the contemporary shore of Lake Yövesi in the Bay of Mustalahti is about 200 m. The field has been tilled, and the finds were uncovered from the ground. The soil is stoneless silt. The material is mostly Textile ceramics, likely belonging to one and the same vessel. No studies other than this survey have been conducted at the site.

65. Ruokolahti

4.17. Ruokolahti [45] Äitsaari Karoniemi

Bsm 4121 01
x = 6804 42 – 6804 38 y = 4420 20 – 4420 80 z = 79.0 m ASL

Finds 30875:1–36 ceramic sherds, a flint arrow head, flint and quartz flakes, tinder quartz, an iron ferrule, iron slag, burnt clay
31639:1–1462 check; not yet catalogued
32470:1– not yet catalogued
32371:1– not yet catalogued

Studies Kähtävä-Marttinen, M., survey 1996 (1996)
Kankkunen, P., salvage excavation 1999 (2001)
Kankkunen, P., salvage excavation 2000
Kirkinen, T., excavation 2000 (2001)

The dwelling site is situated about 18 km SWW of the Ruokolahti church, along the end of Cape Karoniemi, partly on the yard of the house, partly on the pasture. The nearby forest is growing pine, spruce and juniper. Cairns have been found within an area of about 140 x 600 m. The mean diameter of cairns is 2–3 m and their height is 50–90 cm. Cairns can be old heaps of stones from Historical period. Minna Kähtävä-Marttinen surveyed the site in 1996 and made some trial pits. She was unable to find any remains of structures or finds in the area. Botanist Pentti Thuneberg (see Kähtävä-Marttinen 1996:113) has found at the site several archaeophytes like dark mullein (Verbascum nigrum) and great mullein (Verbascum thapsus). Mervi Karoniemi, the hostess of Karoniemi farmhouse, was unearthed ceramics and charcoal in the field, when planting trees.

In 1999 Päivi Kankkunen conducted a small salvage excavation at the cape and found a very large number of finds from the Neolithic to Historical periods. The stray finds and finds excavated include Ka II, Ka III, Kierikki ceramics, Textile ceramics. Luukonsaari and Sirnihta types of Sär 2 are also represented. Kankkunen continued salvage excavation in 2000 together with the University of Helsinki, which conducted the seminar excavation at the site under the leadership of Tuija Kirkinen. The excavations conducted by the university unearthed particularly Textile and Luukonsaari ceramics. Particularly interesting was that also some sherds of possible Lepnaya ceramics were found (Carpean, pers. comm. 20.6.2000).

4.18. Rääkkylä

66. Rääkkylä [6] Täitimänniemi Mehonlahti 1

Bsm 4214 10
x = 6898 76–84 y = 494 34–44 z = 80 m ASL

Finds 22789:1–2 ceramic sherds
23167:1–4 ceramic sherds, a quartz implement, quartz flakes
23869:1–25 ceramic sherds, a flint implement, flint flakes, a stone flake
26556:1 a ceramic sherd

Studies Huurre, M., inspection 1985 (1987a)
Kankkunen, P., survey 1987 (1988)
Lavento, M., levelling 1992 (Jussila 1994a)
Pesonen, P. & Karjalainen, T., survey 1995 (1995)

Literature Pesonen 1995b; Lavento & Hornytzkyj 1995; 1996

The dwelling site of Mehonlahti 1 is situated about 19.5 km SE of the Rääkkylä church. A large gravel pit characterizes the area beside the site. Finds have been picked up from the crossroads of the small road to the Multala farmhouse and the road coming from the Jaamankangas heath. Finds have been uncovered both from the crossroads and from the lower part of the gravel pit.

Early Asbestos Ware, Ka II ceramics, Kierikki/Pöljä ceramics and Textile ceramics have been found identified. The number of Textile ceramic is small, but sherds from at least three vessels have been separated.

67. Rääkkylä [7] Täitimänniemi Pörrinmökki

Bsm 421410
x = 6897 92–6898 43 y = 4494 32–58 z = 80 m ASL

Finds 23166:1–14 ceramic sherds, a quartz implement, flint and quartz flakes
23870:1–8 (Pörrinmökki 2) ceramic sherds, a flint flake, quartz implements and flakes
23871:1–19 (Pörrinmökki I) ceramic sherds, flint and quartz flakes, stone flakes, burnt bones
25817:1–227 ceramic sherds, flint flakes, quartz implements and flakes, slate points, a fragment of a slate point, slate, fragments of whetstones, asbestos, a stone implement (?), a quartz core, burnt bones
25921:1–3 ceramic sherds, a quartz flake
26432:1–1079 ceramic sherds, an adze, flint implements and their fragments, flint flakes, flint cores, a flint knife, an asbestos hook shank, slate points, stone arrowheads, a quartz oblique-edge arrowhead, quartz implements and flakes, fragments of stone implements, stone flakes, mica, asbestos, resin, red ocher, a slate flake, sand stones, stones, burnt bones
27195:1–1979 ceramic sherds, a fragment of a stone adze, an unfinished stone axe (possible), a fragment of a slate points or spearheads, a fragment of a slate knife, flint and quartz implements and flakes, a fragment of a quartz point, a flint knife, a slate awl, quartz awls, unfinished line sinkers and their fragments, a stone pin, whetstones, a fragment of a whetstone, fragments of slate implements, a striking stone, a hammerstone, iron slag, asbestos, filling clay, resin, feldspar, red ocher, pyrite, burnt bones
28013:1–19076 ceramic sherds, clay-idols and their fragments, clay implements, fillig clay, burnt clay, flint and quartz implements and their flakes, stone implements and their fragments, jewing resin, filling resin, asbestos, burnt bones
28767:1–22 ceramic sherds, a fragment of a clay implement, flint and quartz implements and flakes, talc, burnt bones
29713:1–7604 ceramic sherds, clay idols and their fragments, burned clay, amber implements, fragments of slate ring, slate pendants, stone spearheads, adzes and their fragments, perforated stones, fish hooks, sinkers, whetstones and their fragments, flint arrow heads, flint implements and flakes, a quartz arrowhead, quartz implements and flakes, fragments of bones implements, burnt bones, asbestos, mica, jewing resin, talc, red ocher, birch tar
29766:1–6 ceramic sherds, flint and quartz flakes

Studies Huurre, M., inspection 1985 (1995b; 1995c)
Huurre, M. 1986 (no report)
Kankkunen, P., survey 1987 (1988)
Hintikainen, E., excavation 1990 (1991) (114 m^2)
Lavento, M., excavation 1991 (1992b) (292 m^2)
Pesonen, P, excavation 1992 (1993) (370 m^2)
Pesonen, P, excavation 1993 (1994a) (383 m^2)
Pesonen, P. & Karjalainen, T., survey 1995 (1995)
Pesonen, P., excavation 1996 (1997a) (427 m^2)
Lavento, M., survey 1996 (1996d)

Literature Pesonen 1994a; 1994b; 1995a; 1996b; Miettinen 1994; Vuorela 1996; Jussila, P. 1996; Ukkonen 1996; Lavento & Hornytzkyj 1996

The dwelling site of Pörrinmökki is situated on the W side of the Rääkkylä-Kitee road, about 20 km SE of the Rääkkylä church. The inhabited area is on the esker, which forms a glacifuvial terrace opening to the E and S. The dwelling area is large, in excess of 1 km in length. The soil is either coarse or medium grained sand. The vegetation is mostly pine, but growing along the S part of the site is a dense jungle of small trees including willows and alders. Six dwelling pits have been found, and five excavations have thus far been conducted at Pörrinmökki. The investigations have shown that the site is one of the largest Stone Age dwelling sites in the Lake Saimaa Water System. Regression has proceeded at Pörrinmökki in such way that the shore zone has grown into a mire.

A great variety of stone tools have been found at the site. The site will be not discussed further here, because several detailed studies already exist on this topic (Pesonen 1994a; 1994b; 1995a; 1996b). Until 1996 1288 m^2 have been archaeologically excavated in the Pörrinmökki area. The size of the site is over 10.5 hectares (Pesonen 1997:32).

The following ceramic types have been found at the site: Early Asbestos-tempered Ware, Ka II, Kierikki and Pöljä ceramics. The site is richest in Typical Combed Ware, Ka II 1 and 2. Curiously, some sherds of Sirnihta ceramics and waffle-impressed ceramics have been found, which might be classified as Textile ceramics, but in general more closely resemble the waffle-impression in Imitated Textile ceramics. The same kind of impression has not been found in Finnish Textile ceramics.

68. Rääkkylä [8] Täitimänniemi Mehonlahti 2

Bsm 4214 10
x = 6898 52–57 y = 494 40–45 z = 79.0 m ASL

Finds 23873:1–10 ceramic sherds, a flint implement, a flint and quartz flake
25294:1–19 ceramic sherds, a flint flake, quartz implements and flakes, a quartz core, burnt bones
25922:1–3 ceramic sherds, quartz flakes
26557:1 ceramic sherds
27571:1–5 ceramic sherds, a quartz flake
27836:1–5 ceramic sherds, quartz flakes, burnt bones
28240:1–17 ceramic sherds, a stone adze, a flint flake, quartz flakes, burnt clay, burnt bones

Studies Huurre, M., inspection 1986 (1987a)
Kankkunen, P., survey 1987 (1988)
Hintikainen, E., inspection 1990 (no report)
Lavento, M., inspection 1991 (no report)
Lavento, M., levelling 1992 (1995a)
Pesonen, P., survey 1993 (1994c)
Pesonen, P. & Karjalainen, T., survey 1995 (1995)

Literature Pesonen 1995b

The dwelling site of Mehonlahti 2 is situated in a cultivated field about 19.5 km SE of the Rääkkylä church. The site is on the S side of the Mehonlahti 1 dwelling site. The road to the Multala farmhouse crosses the site. Early Asbestos Ware and Ka II ceramics are located on the upper terrace. The elevation of this terrace is between 83–85 m ASL. The sherds of Early Asbestos Ware have been found at a higher elevation than Ka II ceramics. On the lower terraces, ceramic sherds have been identified as belonging to the Early Metal Period. The sherds are very small, but it seems probable that at least some of them can be classified as Textile ceramics. In addition, some asbestos-tempered, thin-walled ceramics are present. The elevation of this terrace is about 79–80 m ASL.

69. Rääkkylä [9] Täitimänniemi Lappalaissuo 1

Bsm 4214 10
x = 6897 54 y = 495 78 z = 80–87 m ASL

Finds 24030:1 flint flakes
26436:1–31 ceramic sherds, an adze, a flint implement, quartz implements and flakes, burnt bones
27572:1–5 ceramic sherds, a flint flake, quartz flakes
27996:1–8 ceramic sherds, a quartz implement, a flint and quartz flake
29767:1–3 ceramic sherds, burnt bones

Studies Huurre, M., inspection 1986 (1997b)
Kankkunen, P., survey 1987 (1988)
Lavento, M., inspection 1991 (1991a)
Lavento, M., levelling 1992 (Jussila 1994a)
Maaranen, P., inspection 1993 (1993)
Lavento, M., inspection 1996 (1996f)

Literature Miettinen 1994; Pesonen 1995b; Maaranen 1995; 1996

The dwelling site of Lappalaissuo 1 is situated about 21.5 km SE of the Rääkkylä church, on the S side of the Kitee-Rääkkylä road. On the SW side of the dwelling site are three cairns (a, b, c) on the bedrock. The fourth cairn (d) is relatively large – 9.7 x 10.6 m wide and 1.5 m high – and partly collapsed brickwork is visible inside a crater, which has later been dug into it. This cairn is built with large stones (20–40 cm). The other three are smaller and have been partly destroyed due to the ploughing of the forest. The area with the cairns has been named separately as Lappalaissuo 2 (Rääkkylä 10). The dwelling site finds have been located along the slope opening to the SE and the S. This slope has also been ploughed, thus the remains of prehistoric habitation have been mixed together. The ceramic sherds do not follow the shore displacement chronology very well (Maaranen 1993:27). Another problem is that the elevation of the ceramic finds was not established during the inspection. In addition, other terraces may have been destroyed during the ploughing. P. Pesonen (1995a:app. I) has assumed that Textile ceramics have been found both from the top of the hill and the lowest zone of the site. The levelling of the site was difficult because the hill is mostly bedrock, which does not follow possible shore formations.

The ceramic material found at the site covers a large time interval. The earliest finds are Early Asbestos Ware and Typical Combed Ware. Pöljä/Kierikki ceramics are also well represented. Some sherds of textile-impressed Textile ceramics have been found at the top of the hill, but also from the lower part of the slope.

70. Rääkkylä [19] Täitimänniemi Huotinniemi

Bsm 4214 10
x = 6897 35 y = 4494 85 z = 78.7 – 80 m ASL

Finds 27578:1–4 ceramic sherds, a fragment of a stone implement
28239:1–4 ceramic sherds, quartz flakes, stone pebbles

Studies Lavento, M., levelling 1992 (Jussila 1994a)
Lavento, M., survey 1993 (1995a)

The dwelling site is situated on the gently rising, straight slope about 21.2 m SEE of the Rääkkylä church. The distance between Huotinniemi and the large dwelling site complex of Pörrinmökki is only 800 m. The small hill forms an accessory part of the Jaamankangas esker. The site opens to the SW and W and is sheltered to the NE and N. This site was probably a small island during its habitation in the Early Metal Period. No clear shore terraces are observable. At present, the site is a potato-field. Pines grow on top of the hill, and soil on the upper slope is coarse sand or gravel. The lower terraces are covered by silt.

Phosphorous analysis showed that the site could be a dwelling site. Phosphorous analysis has also been applied in trying to determine the lowest elevation of habitation. According to shore displacement chronology, the site dates into the end of the Textile ceramics period. The topography of the site differs from a typical Stone Age environment. It is also interesting that the existence of older habitation at the site is not feasible because the area had not risen from Lake Saimaa until the

Early Metal Period. It represents a 'pure'dwelling site, which is typologically confirmed by Textile and Sär 2 ceramics. Sherds from four vessels of Textile ceramics have been identified from the material.

71. Rääkkylä [17] Täitimänniemi Rantala

Bsm 4214 11
x = 6902 10–30 y = 4490 12–23 z = 79.5 – 82.5 m ASL

Finds 26438:1–7 ceramic sherds, quartz flakes, burnt bones
27577:1–14 ceramic sherds, quartz cores, quartz implements and flakes, a stone implement, a stone flake, burnt bones
27840:1 a quartzite core
29768:1–2 a ceramic sherd, a quartz flake

Studies Lavento, M., inspection 1991 (1991b)
Lavento, M., levelling 1992 (Jussila 1994a)
Lavento, M., survey 1993 (1995a)
Pesonen, P., inspection 1993 (1994c)
Pesonen, P. & Karjalainen, T., survey 1995 (1995)
Lavento, M., inspection 1996 (1996e)

The dwelling site of Rantala is situated about 17 km SE of the Rääkkylä church, between Lake Täitimänjärvi and the Kivilampi Pond. The Kitee-Rääkkylä road, which runs at the foot of the upper terrace, separates the site into two parts. There are two phases of habitation at the site. The upper terrace at an elevation of 82.5 m ASL involves asbestos-tempered ceramics, while the lower terrace at an elevation 79.5 m ASL belongs to the Early Metal Period. The upper terrace lies on a low moraine ridge, and the lower terrace is a field, which is currently in cultivation. The soil in the field is fine silt. The size of the lower dwelling terrace today is only about 25 x 25 m.

Phosphorous analyses were made on both terraces, revealing that both terraces had most probably been inhabited. However, a clear difference was present in the strength of the phosphorous values, with values for the upper terrace being clearly higher than those for the lower terrace. This might be explained by a difference in the intensity of habitation. This hypothesis is consistent with the assumption of lower intensity habitation during the Early Metal Period in comparison with the Stone Age (Lavento 1997a). Another possibility is that cultivation and ploughing may have mixed the culture layer and lowered the values. The small size of the area suitable for habitation of the lower terrace does not support the assumption of long-term usage.

The ceramics found along the upper terrace is tempered with coarse asbestos fibres. This is of special interest because a bottom sherd from a straight-based vessel has been identified. The dating of the material is most probably Late Neolithic, and the vessel is likely representative of Jysmä ceramics. The lower terraces involve both textile-impressed Textile ceramics and Sär 2 ceramics, which have been tempered with very fine-grained asbestos.

4.19. Savonlinna

72. Savonlinna [71] Tolvanniemi Haukilahden pohja[6]

Bsm 4211 08
x = 6870 02 y = 4440 40 z = 79.5 m ASL

Finds 27582:1–2 a ceramic sherd, a quartz flake

Studies Jussila, T., levelling 1992 (1994a)
Lavento, M., survey 1993 (1995a)

The dwelling site of Haukilahden pohja is situated about 7.2 km N of the Savonlinna church, by the road leading to the Cape Tolvanniemi, about 50 m SSW of the Cove of Haukilahti. The site is on a low heath, which descends gradually into Lake Louhivesi. The area is pine forest and the soil is sand.

Timo Jussila carried out the levelling of the site in 1992. Only one ceramic sherd and some quartz flakes were found. The author carried out a phosphorous analysis at the site for the purpose of determining whether the place was really a dwelling site, and not only a stray find place (Lavento 1995a). No phosphorous anomaly was observed. Finds were not uncovered at the site, lending support to the possibility that this place should not be considered a dwelling site. The topography, however, seems to be favourable for the existence of a dwelling site, despite an elevation of only 79.5 m, which refers to the very late Early Metal Period. The site is still included in the list because of its finds and topography.

73. Savonlinna [97] Pellossalo Suvikangas a

Bsm 4122 06
x = 6859 68 y = 4432 04 z = 79 m ASL

Finds 28322:1–2 ceramic sherds

Studies Lehtinen, L. & Sepänmaa, T., survey 1994 (1994)

The dwelling site is situated about 9.6 km W of the Savonlinna church, on the NE side of the Naistenlahti Bay, which is located on the nose of the Cape Suvikangas. It is situated by a small road leading to an unloading area, where logs have been dropped into the water from transport lorries. Soil is sand and moraine. After Lehtinen and Sepänmaa surveyed the site no further studies have been carried out. The ceramic material found includes only Textile ceramics. The entire outer surface of sherds has been textile-impressed.

74. Savonlinna [42] Hannolanpelto Kärääankangas (a–c)

Bsm 4211 07
x = 6867 88–6868 06 y = 4441 88–94 z = 78–80 m ASL

Finds 24901:1–2 quartz flakes (Kärääankangas a)
29459:1–8 ceramic sherds, a quartz implement, quartz flakes (Kärääankangas b)
29460:1–4 ceramic sherds, iron slag, burnt stones (Kärääankangas c)

Studies Lehtinen, L., inspection 1989 (1989b)
Bilund, A., inspection 1996 (1996)

The dwelling site of Kärääankangas b is situated on a sandy heath lowering gently to the SE, about 5.2 km N of the Savonlinna church, on the NW shore of Lake Haapavesi. Antti Bilund discovered the site, but Leena Lehtinen (1989b) conducted the first inspection in 1989. Finds were uncovered in the vicinity of a gravel pit. Bilund (1996) distinguished three different find concentrations as independent sites (Kärääankangas a–c). These sites can also be considered as one site with several find clusters. The latter interpretation has been employed by the National Board of Antiquities (Helena Taskinen, pers. comm. 8.4.1999) naming the region Kärääankangas. Bilund was able to observe a strong cultural layer at the site, which is partly destroyed by the gravel pit (Bilund 1996).

The dwelling site of Kärääankangas c, discovered by Antti Bilund, is situated on a sandy heath lowering gently to the SE, about 5.1 km N of the Savonlinna church. The site lies at a slightly lower elevation than the neighbouring Kärääankangas b, which indicates that the latter may be slightly younger than the former. Bilund found asbestos-tempered ceramics and iron slag during his survey. The find material consists of ceramic sherds and quartz. Ceramics are either textile-impressed Textile ceramics or "hole-tempered" Late Neolithic material. Some sherds of asbestos-tempered ceramics were also present. Bilund (1996) dates the site back to the Early Metal Period.

[6] The Iron Age dwelling site of Savonlinna Kylmäniemi should probably have also been included in the group of sites involving Textile ceramics in the Saimaa area. Leena Lehtinen and Timo Sepänmaa have excavated the site at the end of the 1980's and the beginning of the 1990's. Timo Sepänmaa is, however, in the process at completing a study on the site and its ceramics, and it will therefore be omitted here.

75. Savonlinna [101] Pellossalo Pöträmönniemi a

Bsm 4122 11
x = 6841 57 y= 4451 45 z = 78–80 m ASL

Finds 28322:1–2 ceramic sherds, quartz flakes

Studies Sepänmaa, T. & Lehtinen, L., survey 1994

The dwelling site of Pöträmönniemi A is situated on the heath of kangasniemi, on the S slope of Cape Nenäniemi, about 23.7 km S of the Savonlinna church. Only survey has been conducted at the site. Soil at the site is weathered sand, and no cultural layer was possible to observe in it. The potential dwelling site area is very small involving only about 200 m^2.

The ceramic material involves only one sherd of asbestos-, talc- and mica-tempered ceramics. The surface is hatched. Most probably this ceramics can be dated with Textile pottery although definition was difficult due to small size of a sherd.

76. Savonlinna [104] Pihlajaniemi Iso-Kankainen

Bsm 4122 09
x = 6854 78 y = 4443 48 z = 82 m ASL

Finds 28324:1–2 ceramic sherds

Leena Lehtinen and Timo Sepänmaa found the site during their survey around the Lake Pihlajavesi. The site is situated on an island about 8.5 km from the Savonlinna church to SSW, on the NE side of Bay Naistenlahti. Soil is sand. No other studies than survey has been counducted at the site so far.

A large number (144 sherds) of ceramics was picked up from the ditches made for forestry in the area. Two ceramics types can be discerned. Most ceramics is textile-impressed Early Metal Period Textile ceramics, but also Late Neolithic Asbestos ceramics exists in the material. It seems possible that there are two dwelling sites in the island (Sepänmaa & Lehtinen 1994:58–59).

4.20. Savonranta

77. Savonranta [18] Muhola Pyyhiekka 1

Bsm 4214 10
x = 6895 70 y = 4453 80 z = 82 m ASL

Finds 28925:1 a ceramic sherd

Studies Sepänmaa, T., survey 1995 (1995)

The dwelling site of Pyyhiekka 1 is situated on the N part of Lake Pyyvesi about 5.0 km N of the Savonranta church. The site lies on a sand ridge on the foot of the cape between Lake Pyyvesi and the Hietalampi Pond. The ceramic sherd was uncovered from the scarp of a road at an elevation of ca. 82 m. The soil is sand. No further studies have been conducted since Sepänmaa's survey.

4.21. Taipalsaari

78. Taipalsaari [6] Jauhiala Vaateranta

Bsm 3134
x = 6780 72 – 86 y = 559 44 – 82 z = 78.3 m ASL

Finds 9132:1 ceramic sherds
9317:1–20 ceramic sherds, quartz flakes
10316:1–2 a ceramic sherd, a flint implement
10866:1–2 ceramic sherds, flint flakes
18188:1–27 ceramic sherds, slate rings, an amber ring, flint and quartz flakes, burnt bones
18272:1–4 ceramic sherds
19239:1–870 ceramic sherds, amber, flint arrowheads and their fragments, a flint knife, a flint spearhead, flint and quartz implements and flakes, a slate arrowhead, a fragment of an adze, red ocher, a whetstone and their fragments, a hammerstone, quartzite flakes, fragments of stone implements, burnt stones, teeth, burnt bones, charcoal
19620:1–6 ceramic sherds
20659:1–2086 ceramic sherds, a bronze skewer, clay-idols and their fragments, flint arrowheads and their fragments, fragments of stone implements, flint and quartz implements and flakes, flint cores, quartz cores, stone flakes, burnt clay, burnt bones
22845:1–33 ceramic sherds, a burnt bones
25274:1–183 ceramics sherds, flint and quartz implements and flakes, tile fragments
26122:1–880 ceramic sherds, flint and quartz implements and flakes, quartzite flakes, a recent iron fragment, recent porcellain
28316:1–240 ceramic sherds, flint and quartz implements and flakes, a whetstone, fragments of stone implements
28540:1–3 ceramic sherds, flint and quartz flakes
30322:1–1702 ceramic sherds, amber pendants and their fragments, a stone axe, a stone adze, a fragment of an iron pot, an iron ring, flint arrowheads and their fragments, flint and quartz implements and flakes, a clay implement, a quartzite flake, fragments of stone implements, resin, red ocher, slag, asbestos, talc, burnt bones, charcoal
30887:1–1663 ceramic sherds, amber rings, fragments of amber pendants, amber implements and their fragments, slate rings, flint arrowheads and its fragments, flint and quartz implements and flakes, quartzite implements, resin, slag, teeth, unburnt bones, burnt bones, charcoal
Etelä-Karjala Provincial Museum (Lappeenranta)
415, 438, 518–520, 3189–95, 3210, 3240, 3266–79, 3286–92, 3294–98,
3301–10, 3312–17, 3319–38

Studies Ailio, J., excavation 1930 (1930)
Keskitalo, O., inspection 1970 (1971c)
Sarvas, P., inspection 1970 (no report)
Räty, J., excavation 1970 (1970)
Räty, J., excavation 1971 (1974) (256 m^2)
Miettinen, T., survey 1975 (1977)
Taavitsainen, J.-P., excavation 1978 (1994) (332 m^2)
Huurre, M., inspection 1986 (no report)
Jussila, T., excavation 1989 (1989) (41 m^2)
Jussila, T., excavation 1990 (1991b) (175 m^2)
Jussila, T., levelling 1992 (1999)
Vanhatalo, S., excavation 1994 (1995) (80 m^2)
Katiskoski, K, excavation 1997 (1998) (135 m^2)
Katiskoski, K., excavation 1998 (1999a) (83 m^2)
Katiskoski, K., excavation 1999 (1999b) (108 m^2)

Literature Räty 1995

The dwelling site of Vaateranta is situated on a gently sloping sandy beach about 4 km SSE of the Taipalsaari church, on the northern shore of Kirjamoinsalmi. The dwelling site area opens to the SE. A housing area with blocks of flats has been built on the esker of Saimaanharju, which has destroyed the bulk of the site. The part of the site, which is today a public beach, is preserved mostly undisturbed. Vaateranta is a large dwelling site complex measuring 500 x 100 m (Miettinen 1977:14–16). A terrace runs alongside the beach at an elevation of about 80 m ASL. This elevation is the lower limit for the existence of Ka II ceramics. Below this level, material from the Early Metal Period has been found.

The dwelling site became known in 1929 when ceramic sherds were delivered to the National Museum. Julius Ailio carried out the trial excavation at the site in 1930. He found mostly Typical Combed Ware and dated it by virtue of shore displacement chronology to the Neolithic Stone Age, ca. 2500 BC (Ailio 1930). In 1970 amateur archaeologist Keijo Kostianen reported finding an ocher grave at the site. Jouko Räty conducted salvage excavations in 1970, and in 1971 studied three graves (Räty 1970; 1974; 1995). These excavations were continued

by J.-P. Taavitsainen in 1978 and later, in 1989 and 1990, by Timo Jussila. Another salvage excavation was conducted in the area in 1994. Kaarlo Katiskoski carried out the most recent excavations in 1997 for the purpose of studying ocher graves.

The material found at Taipalsaari is extensive and has been examined only cursorily for this study. Most ceramic material at the site was Typical Combed Ware, Ka II. On the NE side of the dwelling surface finds consisting of some sherds of Luukonsaari ceramics were found. Textile ceramics were also present along with a few ceramics from the historical period. A bronze skewer (20659:856) represents the younger phase of habitation at the site. A conspicuously large number of flint arrowheads characterize most likely the habitation of the Typical Combed Ware at the site complex. Three ^{14}C-datings have been obtained from the cemetery: Hel-4129 1250±80 BP, Hela-237 3460±70 BP, Ua-3326 5775±100 BP.

79. Taipalsaari [11] Kilpiänsaari Ketvele

Bsm 3134 11
x = 6784 63–73 y = 3571 66–80 z = 77.5 m ASL

Finds 20057:1–13 ceramic sherds, quartz flakes, burnt bones
27586:1–15 ceramic sherds, a fragment of a clay idol, flint and quartz flakes, iron slag, burnt bones

Studies Miettinen, T., inspection 1975 (1977)
Jussila, T, inspection 1992 (1994a)

The dwelling site of Ketvele is situated about 14 km E of the Taipalsaari church, between the Ketveleenlampi Pond and the Bay of Kylälahti. The site is on the W slope of Mustamäki Hill around the crossroads of Riutanniemi and Päihänniemi. The soil is sand and the trees are mostly pine. Dwelling site finds have been uncovered around the small cape on the border of the forest. Material has also been found about 100 m S of this place. It is probable that both clusters belong to one and the same dwelling site.

The ceramic material is mostly Neolithic Asbestos ceramics – according to Timo Jussila's classification, Kierikki ceramics, and Typical Combed Ware Ka II (Jussila, pro gradu -work). Only one sherd of Early Metal Period ceramics has been found. The rim sherd is most likely Textile ceramics, although its classification is still problematic.

80. Taipalsaari [12] Haikkaanlahti Valkeasaari

Bsm 3134 02
x = 6782 54 y = 3549 22 z = 80–85 m ASL

Finds 17040:1–3 ceramic sherds, flint flakes, a pebble of stone

Studies Huurre, M., inspection 1966 (no report)
Luho, V., copying 1967 (1967)
Miettinen, T., inspection 1975 (1977b)

Literature Kivikäs 1995

The rock painting and dwelling site of Valkeasaari is situated about 8.5 km SSE of the Taipalsaari church. The rock painting is situated on the vertical cliff of Lampuvuori Hill, on the W end of Valkeasaari Island. The painting consists of anthropomorphic figures, two overlapping boats and unclear patches drawn by red ocher (Luho 1967; Kivikäs 1995:150–151). Ceramics and flint have been found on sandy topsoil at the base of the cliff. No further excavations have been made on the site. The rock painting has been documented at least twice.

The ceramics found at the site are of great importance. All ceramics belong to one textile-impressed, heavily profiled vessel. Only the upper part of the vessel is ornamented by comb stamps, the lower part of the vessel being covered with deep textile-impressions. This vessel is a Textile ceramic, although it is not very typical member. The vessel gives one possible dating to the rock painting (Kivikäs 1995:151); still the new shore displacement datings (Jussila 1999) suggest its Neolithic dating.

5. THE KARELIAN ISTHMUS

5.1. Kaukola

Lake Riukjärvi and Piiskunsalmi

The large dwelling site complexes of Lake Riukjärvi and Piiskunsalmi are situated on the W side of Lake Ladoga in the NW part of the former Finnish parish of Kaukola (Севастьяново), about 18 km from the Ojajärvi railway station. This dwelling site complex belongs to the water system of the Vuoksi River. Sites have been connected with Lake Ladoga through long, narrow straits during the Stone Age and even during the Early Metal Period (Saarnisto & Siiriäinen 1970). The site complex includes over 20 separate dwelling sites in six clusters. Four of these – Kankaanmäki, Nököpelto, Kyöstälänharju and Tiitunmäki – are situated around Lake Riukjärvi. The fifth cluster on both sides of the strait of Piiskunsalmi comprises dwelling sites in the field of Lavamäenpelto, Hiekkaharjunpelto, and sites on the SW side of the strait. Two dwelling sites, which remain outside these clusters, are situated on the W side of Tossikanlahti (Kaasalaisen Piiskunpelto) and on the NE side of the Ilmetjoki River (Penttisen rantapelto).[7] The division presented above is based on the dissertation of Sakari Pälsi (1915:kuva 3). The publication "Kaukolaa ja Kaukolalaisii" (1987) has also been used in locating sites and fields. The co-operation with Pirjo Uino has been a great help when trying to identify ceramics on the Karelian Isthmus. Christian Carpelan has also helped author on identifying Early Metal Period and Iron Age ceramic types.

Due to the lack of excavation reports the primary source of information has been Pälsi's dissertation (1915). In the following I have used the place names (which may not be separate dwelling sites, see Uino 1997) given by Pälsi. Julius Ailio began the excavations in the area in 1906, A. M. Tallgren continued them in 1911 and Sakari Pälsi thereafter in 1912 and 1914. No excavations have since been conducted. However, the number of stray finds in the 1910's and 1920's was high in every year. Local farmers found a great number of stone implements and ceramics in their fields.

Because of the very large number of finds, only the number of Textile ceramics had been counted, with other ceramic types being known only qualitatively studied. These other finds had been excluded from the main catalogue. This means that older finds cannot be compared without difficulty with those, which have been listed 90 years later. The find lists should be critically approached and considered only suggestive.

Dwelling sites of Kankaanmäki (Uino KAUK 14)

81. Kaukola Riukjärvi Juho Paavilaisen kartanopelto

Bsm 4114 07
x = 6775 58 y = 486 15 z = 20 m m.p.y.

Finds 4733:12–16 an axe, a half of a perforated stone, whetstones and their fragments
4770:1–11 adzes, a perforated stone and their fragments, a fragment of grindstone, fragments of whetstones, stone implements and their fragments
4813:1–14 ceramic sherds, fragments of whetstones, a sinker, a flint flake, a fragment of an axe, a fragment of an adze
4862:1–8 ceramic sherds, a fragment of slate spearhead, fragments of whetstones, a fragment of a perforated stone, a flint flake, fragments of slate
4910:64–66 a ceramic sherds, fragments of whetstones, fragments of perforated stones, fragments of stone implements

[7] It is possible that Textile ceramics exists also on the E side of River Ilmetjoki (Esko Iivosen Perkiönpelto 7450:121–140). The small size of sherds makes their unambiguous classification impossible.

4915:35–38, 110–120 fragments of perforated stones, adzes, a fragment of an axe, whetstones and their fragments, a fragment of slate knife
4997:1–27 ceramic sherds, an edge fragment of a cradle-runner –formed hoe, flint arrowheads, straight-based adzes, whetstones and their fragments, a perforated stone, pieces of stone implements, flint and quartz implements and flakes
5048:2–3 ceramic sherds, pieces of stone implements
5096:1–30 ceramic sherds, an axe and their fragments, an adze and fragments of adzes, a flint arrowhead, a whetstone and their fragments, fragments of perforated stones, flint implements and flakes
5174:1– 90 ceramic sherds, amber, a boat axe, axes and adzes and their fragments, whetstones and their fragments, a slate spearhead, perforated stones and their fragments, flint arrowheads, a fragment of a slate arrowhead, awls and points, flint and quartz implements and flakes, flint flakes, burnt bones
5239:2–19 ceramic sherds, stone axes and their fragments, a miniature adze, fragments of spearheads and arrowheads, a perforated stone and its fragments, whetstones and their fragments, sinkers, flint flakes
5418:1–12 ceramic sherds, a fragment of a slate arrowhead, a whetstone and their fragments, fragments of axes, a fragment of a perforated stone
5426:6 a straight-based adze
5511:2–10 ceramic sherds, straight-bladed adzes, fragments of whetstones, quartz flakes
5563:2–5,31 ceramic sherds, adzes, fragments of axes, fragments of a perforated stone, pieces of whetstones
5723:3–4 a straight-based adze, a fragment of axe, fragments of whetstones
5844:2–6 an adze, whetstones and their fragments
5893:1–23 ceramic sherds, a fragment of an axe, adzes, fragments of perforated stones, flint and quartz implements, fragments of whetstones, fragments of stone implements, a sinker
6361:1–19 ceramic sherds, axes and adzes and their fragments, perforated stones and their fragments, fragments of spearheads, a hammerstone, fragments of whetstones
6648:1 a fragment of an adze, a fragment of a perforated stone, fragments of whetstones
6907:2–5 ceramic sherds, an axe, a sinker, fragments of polished stone implements, fragments of whetstones

Studies Ailio, J., excavation 1908 (no report)

Literature Ailio 1909; Pälsi 1915; Meinander 1954b; Urban 1978; Uino 1997; Paavilainen (ed.) 1987; Lapshin 1995[8]

The dwelling site at the field of Juho Paavilaisen Kartanopelto is situated on the SW side of Lake Riukjärvi. According to Pälsi, dwelling site material has been found along two long zones (Pälsi 1912:12–13). The first one is called Juho Paavilaisen Kartanopelto and the other one, Juho Paavilaisen rantapelto. They are so close to each other that they form an uninterrupted dwelling zone. Pälsi has, however, divided this over 500 m long zone into several sites. Therefore, they have also been considered as separate sites in this work.

The dwelling site of Juho Paavilaisen Kartanopelto is on the terrace along the SW slope of Kankaanmäki Hill. The terrace opens to the S (according to Pälsi's photograph, Pälsi 1915:10). The whole area is field. Julius Ailio carried out excavations at four separate places (I–IV) in 1908. The largest excavation area, IV, included 80 m^2. Several stone settings were excavated. Both the find material of the excavation and surface collections picked up by the local farmers are abundant.

[8] Probably the most recent Texile ceramics in the area were picked up by the society of amateur archaeologist Jatuli in 2000 (pers. comm. Maija Akkanen 20.6.2000).

Only one Textile ceramic vessel has been distinguished from the material. The majority of ceramic finds belong to Typical Combed Ware and Late Combed Ware. Iron Age Ceramics, turned on a potter's banding wheel, have also been found. Because of the large number of ceramics, they have not been examined in detail.

82. Kaukola Riukjärvi Juho Paavilaisen rantapelto

Bsm 4114 07
x = 6775 58 y = 486 14 z = 23–23.5 m ASL

Finds
4594:9–14 unfinished axes and their fragments
4721:1–22 ceramic sherds, grooved adzes or unfinished adzes, fragments of slate points, pieces of stone implements, a whetstone and their fragments, quartz flakes, burnt bones
4733:1–11 ceramic sherds, stone axes and adzes, fragments of whetstones
4748:6–9 adzes
4829:1–5 adzes and their fragments
4910:73–76 ceramic sherds, pieces of sandstone whetstone, flint flakes
4915:1–34, 107–109 ceramic sherds, miniature adzes, adzes, whetstones and their fragments, unfinished hour-glass-perforated mace-heads, fragments of perforated stones, fragments of slate points, stone knives
4988:1–11 ceramic sherds, an adze, pieces of whetstones, a polishing stone, a hammerstone, flint and quartz flakes
4997:33–46 ceramic sherds, pieces of axes, adzes and their fragments, a half of a perforated stone, flint and quartz implements and flakes, fragments of whetstones, slate point, a sinker
5012:1–11 ceramic sherds, a stone axe, flint and quartz implements and flakes, fragments of whetstones
5096:31–103 ceramic sherds, stone axes and adzes and their fragments, miniature adzes, flint arrowheads and their fragments, a fragment of a slate arrowhead, a fragment of a perforated stone, a stone borer and their fragments, stone sticks and their fragments, flint and quartz flakes, a fragment of a sinker
5174:92–97 ceramic sherds, a fragment of a stone axe, fragments of whetstones, a sinker, a quartz scraper, a flint flake
5239:21–25 ceramic sherds, an axe, fragments of whetstones, slate flakes
5357:4–48 ceramic sherds, axes and their fragments, adzes and their fragments, fragments of perforated stones, a fragment of a sledge-runner, slate arrowheads and their fragments, fragments of whetstones, sinkers, arrowheads, flint and quartz flakes, burnt bones
5426:2–5, 7–17 ceramic sherds, straight-based adzes, an axe, fragments of slate arrowheads, fragments of whetstones, pieces of stone implements, a half of perforated stone, a sinker, fragments of stone implements, a polishing (?) stone, flint
5511:16, 17 ceramic sherds, pieces of whetstone
5628:5–8 a ceramic sherd, a fragment of perforated stone, fragments of whetstones
5723:1–2, 5–10 ceramic sherds, an iron buckle (modern), adzes and axes and their fragments, fragments of arrowheads, fragments of whetstones, a fragment of a point, flint flakes
5844:7–45 ceramic sherds, slate arrowheads and their fragments, adzes and their fragments, a miniature adze, whetstones and their fragments, a fragment of a spearhead, a slate point, a stone pendant, a fragment of a pick, a fragment of a hammerstone, flint flakes
5929:2–5 ceramic sherds, an adze, fragments of whetstones
6121:1–27 ceramic sherds, a stone axe and their fragments, a miniature adze, adzes and their fragments, slate

spearheads, an arrowhead of Pyheensilta type, an awl, slate arrowheads, a fragment of a shank of a fishhook, sinkers, a fragment of a perforated stone, fragments of whetstones
6191:79–236 ceramic sherds, arrowheads and their fragments, axes and adzes and their fragments, knifes and their fragments, fragments of a shank of a fishhook, flint and quartz implements and flakes, a slate point, a polishing stone, a miniature adze, a fragment of a spearhead, awls, sinkers, a fragment of a bone harpoon, fragments of bones implements, hammerstones, whetstones and their fragments, fragments of stone implements, burnt bones
6620:1–8 ceramic sherds, adzes, a half of a perforated stone, fragments of whetstones and other stone implements
6648:2–16 ceramic sherds, adzes, a slate flake, a fragment of an arrowhead, a sinker and its fragment, a flint flake, fragments of whetstones
6907:8–16 ceramic sherds, adzes and their fragments, a stone pendant, a fragment of a perforated stone, fragments of whetstones
6910:1–5 ceramic sherds, flint and stone flakes, a stone point, a grooved stone
8000:1–10 ceramic sherds, a fragment of slate arrowhead, flint implements and flakes, sinkers, a fragment of a slate ring, a half of a perforated stone
8171:1–2 ceramic sherds, fragments of whetstones
8212:16 an adze

Studies Pälsi, S., excavation 1912 (1912)

Literature Ailio 1909; Pälsi 1915; Uino 1997

The dwelling site belongs to the large dwelling site cluster in Kankaaanmäki Hill, on the SW side of Lake Riukjärvi and on the E side of Juho Paavilaisen kartanopelto. The terrace of Rantapelto opens to the E, towards Lake Riukjärvi. The site is on a narrow terrace along the Kankaanmäki Hill. The terrace lies about 8–10 m above the contemporary water level of Lake Riukjärvi (Pälsi 1912:13). Pälsi excavated in three separate places there in 1912. The material is very large, including over 10 000 ceramic sherds.

Ten Textile ceramic vessels have been identified. One sherd of Sirnihta ceramics has been found (Uino 1997:238). The Typical Combed Ware is the largest group of ceramics at the site, but Early and Late Combed Ware also exist. Fragments of Kiukainen type represent the Late Neolithic Period. Similar to Kartanopelto, Iron Age ceramics and ceramics turned on a potter's banding wheel have been found.

The dwelling sites of Nököpelto (Uino KAUK 10)

83. Kaukola Riukjärvi Olli Paavilaisen Nököpelto

Bsm 4114 07
x = 6777 84 y = 485 68 z = 24.0 (lowest limit 20 m) m ASL

Finds
4064:2–3 a gouged adze, a fragment of straight-based adze
4504:5 a straight-based adze
4721:23–26 ceramic sherds, an ice pick, fragments of whetstones, flint and slate flakes
4733:17–31 ceramic sherds, two axes, small gouged adze, a miniature adze, fragments of adzes, fragments of whetstones, flint flakes
4748:3 a gouged adze
4770:17–25 ceramic sherds, miniature adzes, fragments of stone implements
4862:13–25 ceramic sherds, adzes, a fragment of axe, a fragment of spearhead, a slate pendant, a fragment of slate point, fragments of whetstones, fragments of perforated stones, a fragment of a sinker, a flint scraper
4883:1–11 ceramic sherds, straight-bladed adzes, whetstones, a fragment of a perforated stone, a miniature adze, an unfinished fishhook, slate flakes
4885:2–7 unfinished perforated mace-heads, fragments of whetstones, a fragment of an adze, an unfinished sinker
4910:31–34, 38–54 ceramic sherds, an iron knife, a bronze plate, fragments of whetstones, slate points and their fragments, straight-bladed adzes and their fragments, a sinker, flint flakes, fragments of stone implements, burnt bones
4915:41–63, 92–94, 122–124 ceramic sherds, a slate axe, adzes, fragments of perforated stones, fragments of whetstones, fragments of perforated stones, a fragment of a fishhook, fragments of stone implements, a slate point, flint and quartz and slate flakes
4942:1–10 ceramic sherds, fragments of perforated stones, fragments of whetstones, stone flakes
5012:18–24 ceramic sherds, a straight-bladed adze, fragments of whetstones, a fragment of a perforated stone, flint and quartz flakes
5096:135–149 ceramic sherds, a flint arrowhead, axes, a double-adze, a fragment of a perforated stone, pieces of stone implements, whetstones and their fragments, flint and quartz implements and their flakes
5097:1–42 ceramic sherds, axes and their fragments, adzes and their fragments, whetstones and their fragments, a flint awl, stone points, a fragment of a perforated stone, flint and quartz implements and their flakes
5164:4–45 ceramic sherds, gouged adzes, stone axes and adzes, fragments of stone axes and adzes, a fragment of a flint arrowhead, a sinker, fragments of perforated stones, fragments of whetstones, an awl and their fragments, flint implements, and slate flakes, burnt clay
5174:122–131 ceramic sherds, pieces of whetstones, flint flakes, burnt bones
5426:24–30 ceramic sherds, a straight-based adze, a fragment of axe, a fragment of a perforated stone, fragments of whetstones
5511:31–35 ceramic sherds, an straight-bladed adze, fragments of whetstones, flint and quartz flakes
5563:11–16 ceramic sherds, stone axes and adzes and their fragments, fragments of whetstones, perforated stones and their fragments, flint flakes, a sinker, charcoal
5723:14–16 ceramic sherds, an axe, adzes, a miniature axe and their fragments, fragments of perforated stones
5893:31–36 a ceramic sherd, fragments of perforated stones, adzes and their fragments, a whetstone and their fragments
963:739 fragments of whetstones, pieces of stone implements
6121:34 an adze
6648:17–23 ceramic sherds, fragments of whetstones, a fragment of an axe, a fragment of a knife, a flint flake, iron slag, shell
6907:21–25 ceramic sherds, a straight axe, a miniature adze, fragments of whetstones
7450:43–53 ceramic sherds, a flint arrowhead, an adze and their fragments, a fragment of a perforated stone, fragments of whetstones, flint implements and flakes
7815:1–5 ceramic sherds, an adze, flint implements and flakes, fragments of whetstones, fragments of stone implements
8199:9–19 ceramic sherds, slate arrowheads, adzes, a sinker, an adze, a fragment of a spearhead, burnt clay, fragments of whetstones, flint and quartz flakes, burnt clay

Studies Tallgren, A. M., inspection 1907 (1907)
Ailio, J., excavation 1908 (no report)
Urban, Ju., Univ. of Leningrad, trial excavation 1978

Literature Pälsi 1915; Meinander 1954b; Uino 1997; Lapshin 1995

The dwelling site of Nököpelto is situated on the southern slope of the ridge of Piiskulankangas, on the NW side of Lake Riukjärvi. The terrace on the N side of the Piiskulankangas ridge gently slopes into the Nököoja Brook. A great number of Stone Age finds have been found particularly at an elevation of 24 m ASL (Pälsi 1915:33), although the lowest finds (Iron Age) have been uncovered on four metres lower terrace. In 1908 Julius Ailio carried out an excavation at Nököpelto. He studied an area of 48 m^2 and uncovered some stone structures, which indicated habitation at different periods of prehistory. According to Pälsi, the most interesting remains were square-shaped hearths – there is only one other cluster in Kaukola (Pälsi 1915:35).

In 1978 the University of Leningrad conducted a survey and a prospecting by digging trial pits in the Riukjärvi area. The investigation was not restricted only to Nököpelto, but also included the dwelling sites of the Kyöstälänharju area.

Over 11 500 ceramics sherds were found, which indicates the intensity of habitation. Particularly ceramic sherds have been gathered from Nököpelto in greater numbers than from any other dwelling site in Kaukola. The majority of ceramics are Typical Combed Ware. Pälsi mentions one asbestos-tempered vessel, which he interpreted as a sign of later habitation (Pälsi 1915:36). Vessels of Textile ceramics have also been picked up from Nököpelto. A part of this ceramics can be classified as Kalmistonmäki type. It is interesting that also Luukonsaari ceramics have been found at this site. Iron Age ceramics and ceramics turned on a potter's banding wheel are also contained within the material.

Dwelling sites of Kyöstälänharju (Uino KAUK 13)

All dwelling sites of Kyöstälänharju belong to the site complex on the Kyöstälänharju Ridge, on the S and W sides of its slopes. Kyöstälänharju is a relatively low ridge running in the E-W direction. The finds, which can be connected with dwelling sites, have been picked up from an area about 300 m long and 30–60 m wide. All dwelling sites of Kyöstälänharju are on arable land, the soil being fine sand. This soil is very suitable for cultivation.

Sakari Pälsi has separated the dwelling sites of Kyöstälänharju from each other by virtue of excavation places and stray finds alone. The places, which have been designated here as separate sites according to Pälsi's system, are very close to each other, and it would have been more practical to unite them into one site. However, the site names given by Pälsi have been used here.

The sites with Early Metal Period ceramics are the following: Simo Iivosen nummi, Simo Iivosen tontti ja perunamaat (incl. Simo Iivosen vanhan talon paikka), Pekko Iivosen tontti ja (kartano)pelto, Pekko Iivosen rantapelto, Heikki Teräväisen rantapelto, and Heikki Teräväisen kartanopelto. The number of finds is considerable in all find places (or dwelling sites), although not all sites have been excavated. The division of the areas into sites corresponds with the excavation or find places rather than proper dwelling sites. It is difficult to precisely locate each of these places on a map on the basis of the information given by Ailio and Pälsi. The stray finds collected by local in habitants after publication of Pälsi's dissertation are even more difficult to locate.

84. Kaukola Riukjärvi Simo Iivosen nummi

Bsm 4114 07
x = 6776 12 y = 486 62 z = 20 m ASL

Finds
4910:106–107 ceramic sherds, flint flakes
4943:2–4 fragments of whetstones, mica schist
5174:164–312 ceramic sherds, a club, whetstones and their fragments, perforated stones and their fragments, flint and quartz implements and flakes, a slate point, a fragment of a sinker, slate flakes
5898:8 ceramic sherds
5963:345–414 ceramic sherds, adzes, whetstones and their fragments, a sinker, a shank of a fishing hook, flint flakes, burnt bones, charcoal
6062:18 ceramic sherds, a flint flake
6910:6–7 ceramic sherds, fragments of whetstones, flint flakes, burnt bones
7285:56 ceramic sherds
7357:3–4 ceramic sherds, a fragment of a whetstone
7650:32–37 ceramic sherds, a flint knife, a fragment of perforated stone, fragments of whetstones, flint flakes, fragments of stone implements
8047:7 a whetstone, a flint flake

Studies
Ailio, J., excavation 1908 (no report)
Pälsi, S., excavation 1911 (no report)
Urban, Ju., Univ. of Leningrad, trial excavation 1978

Literature Ailio 1908; Pälsi 1915; Paavilainen (ed.) 1987; Uino 1997; Lapshin 1995

Simo Iivosen nummi ("the heath of Simo Iivonen") is on the SE side of the Kyöstälänharju dwelling site complex of by Lake Riukjärvi. The soil is fine sand or silt. In 1908 Julius Ailio excavated an area of 146 m^2 and observed only a few remains of structures at the site, although the number of finds was great. In 1911 Pälsi continued excavations beside Ailio's excavation area. Pälsi was able to locate three square-formed stone settings or hearths, as well as two patches with charcoal and burnt stones. Pälsi called these remains of habitation, "kiinteä asutusjäte", without speculating whether these structures represented remains of dwellings. Pälsi stated that the dwelling site zone lies at an elevation between 21–23.5 m ASL, but that the lowest finds have come from an elevation of 14 m ASL, which is unusual.(Pälsi 1915:39–43.)

According to Pälsi, all ceramics from Simo Iivosen nummi should be classified as Typical Combed Ware (Pälsi 1915:44). However, investigation of the find material has revealed that at least some vessel sherds of Early Metal Period ceramics have been found. Three vessels of Textile ceramics have been identified. Iron Age ceramics and Late Iron Age ceramics turned on a potter's banding wheel are represented as well. Luukonsaari ceramics and some sherds of Early Asbestos Ware are also included.

85. Kaukola Riukjärvi Simo Iivosen tontti ja perunamaat

Bsm 4114 07
x = 6775 51 y = 486 66 z = 15–20 m ASL

Finds
4910:102–105 ceramic sherds, an adze, fragments of whetstones, stone flakes
5106:4 a fragment of a stone implement
5588:4–5, 7–8, 12–13 ceramic sherds, a stone axe, a stone knife, whetstones and their fragments, flint flakes, fragments of stone implements
5898:9–12, 13 ceramic sherds, a fragment of a perforated stone, a flint implement, a fragment of a whetstone, slate flakes
6062:19 ceramic sherds, a flint implement, a fragment of a whetstone
6091:4, 6 ceramic sherds, a fragment of an adze
6122:4–9 ceramic sherds, flint and quartz implements and flakes, whetstones and their fragments
6910:8–11 ceramic sherds, fragments of whetstones, a fragment of an adze, flint and quartz flakes
6691:14–15 ceramic sherds, an axe, flint flakes, fragments of whetstones, stone flakes
7117:23–30 ceramic sherds, a flint arrowhead, an adze, flint implements and flakes, fragments of stone implements, stone flakes
7285:57–63 ceramic sherds, fragments of an axe, an adze, a stone point, flint and quartz implements and flakes, fragments of whetstones, fragments of stone implements

Studies Urban, Ju., Univ. of Leningrad, trial excavation 1978

Literature Ailio 1909; Pälsi 1915; Paavilainen (ed.) 1987; Uino 1987; Lapshin 1995

The dwelling site of Simo Iivosen Tontti ja Perunamaat is situated in the vicinity of the Iivonen farmhouse, on the W side of the dwelling site of Simo Iivosen Nummi. The site is at least 30 m wide, including a garden and a so-called Pihaperunamaa, extending to the SE side of Pekko Iivosen Kotipelto. Before the trial excavation made by the University of Leningrad, no excavations had been carried out at the site and local people picked up all archaeological material as stray finds. The landowner, Simo Iivonen, informed Pälsi about the stone hearth in the garden (Pälsi 1915:38–39).

The majority of the ceramics at the site is Typical Combed Ware, but also some sherds of Textile ceramics and a small number of ceramics turned on a potter's banding wheel have also been found. The two latter ceramic groups occur as exceptions rather than as typical dwelling site material.

86. Kaukola Riukjärvi Pekko Iivosen tontti ja (kartano)pelto

Bsm 4114 07
x = 6776 12 y = 486 62 z = 20 m ASL

Finds
4721:27–28 a fragment of an adze, stone pebbles
4910:77–82 ceramic sherds, flint implements and flakes, fragments of whetstones, fragments of stone implements
5511:39 an adze
6122:1 an adze
6426:13–17 ceramic sherds, adzes and their fragments, a fragment of a perforated stone, fragments of whetstones, a flint flake
7285:37–39 ceramic sherds, flint flakes, fragments of whetstones, stone flakes

Studies
Urba, Ju., Univ. of Leningrad, trial excavation 1978

Literature
Pälsi 1915; Uino 1987; Lapsh 1995

The dwelling site of Pekko Iivosen Tontti and Kotipelto is situated on the W side of the dwelling site of Simo Iivosen tontti ja Perunamaat – between this and Pekko Iivosen Rantapelto. No excavations have been carried out in this area before 1978, and local inhabitants have picked up the archaeological material as stray finds.

Besides the Combed Ware, ceramic material from the site comprises some sherds of Textile ceramics and at least one sherd of Kalmistonmäki type (6426:17). Late Iron Age ceramics have also been found.

87. Kaukola Riukjärvi Pekko Iivosen rantapelto

Bsm 4114 07
x = 6776 12 y = 486 62 z = 14–20 m ASL

Finds
4770:30–33 ceramic sherds, burnt clay, two halves of perforated mace heads, fragments of stone implements, burnt clay
4862:29–32 ceramic sherds, fragments of whetstones, a fragment of an axe
4915:95–99 an iron spur, fragments of perforated stones, fragments of whetstones
5096:151–160 ceramic sherds, a stone pendant, a stone awl, fragments of perforated stones, an unfinished adze, a frgagment of an axe, fragments of whetstones
5174:138–163 ceramic sherds, flint arrowheads and their fragments, a fragment of an adze, fragments of stone points, a fragment of an axe, whetstones and their fragments, flint and slate implements and flakes, burnt bones
5175:3–9 straight-based adzes, flint scraper, a stone awl, fragments of whetstones
5239:32–33 ceramic sherds, fragments of whetstones, slate flakes
5357:57–58 ceramic sherds, a stone weapon, fragments of whetstones
5426:34–41 ceramic sherds, a gouged adze, a miniature adze, a fragment of an axe, flint flakes, fragments of whetstones
5511:38 fragments of whetstones
5563:20–21 ceramic sherds, burnt clay, fragments of axes, fragments whetstones, a fragment of an arrowhead, flint flakes
5628:12–16 ceramic sherds, an adze and their fragments, a fragment of a perforated stone, a fragment of flint arrowhead, fragments of whetstones
5723:17 a whetstone and their fragments
5844:79–84 ceramic sherds, fragments of axes and adzes, a fragment of a perforated stone, fragments of whetstones
5898:7 ceramic sherds, flint and slate flakes
5963:231–344, 729–735 ceramic sherds, fragments of arrowheads, fragments of adzes, fragments of whetstones, a sinker, flint and quartz implements and flakes, a hammerstone, fragments of stone implements, stone flakes, burnt bones
6122:2–3 ceramic sherds, fragments of whetstones
6348:2–11 ceramic sherds, adzes and their fragments, a fragment of a perforated stone, flint implements and flakes, a slate knife, whetstones and their fragments, an awl, fragments of stone implements, stone flakes
6648:28–29 a miniature adze, flint flakes, fragments of whetstones
6691:13 ceramic sherds, a fragment of an arrowhead, fragments of whetstones, flint and quartz flakes
6907:32–33 ceramic sherds, fragments of whetstones
6940:52–54 ceramic sherds, whetstones and their fragments, flint flakes
7117:7–22 ceramic sheds, flint arrowheads, an axe, adzes, a sinker, flint implements and flakes, fragments of stone points, fragments whetstones
7285:27–36 ceramic sherds, a small glass pearl, a slate arrowhead, a sinker and its fragment, a stone point, a half of perforated stone, fragments of whetstones, flint flakes
7650:29–31 ceramic sherds, fragments of a knife, awl, spearhead and arrowhead, flint and quartz implements and flakes, fragments of whetstones
7815:34 a flint implements and flakes
8047:8–11 ceramic sherds, a fragment of an adze, a half of perforated stone, fragments of whetstones
8000:19–21 a fragment of slate arrowhead, an adze, flint flakes

Studies
Ailio, J., excavation 1908 (no report)
Pälsi, S., excavation 1911 (no report)
Urba, Ju., Univ. of Leningrad, trial excavation 1978

Literature
Ailio 1909; Pälsi 1915; Saarnisto & Siiriäinen 1970; Uino 1997; Lapshin 1995

Pekko Iivosen rantapelto is situated on the W side of the dwelling site of Pekko Iivosen Tontti and (Kartano)pelto, on the eastern bank of Lake Riukjärvi. The soil is either fine silt or hard-consolidated clay, the latter caused by the low elevation of the site (14 m ASL), which has made sedimentation possible. Both Ailio (1908) and Pälsi (1911) carried out archaeological excavations here. On the NW side of Ailio's excavation area, Pälsi discovered a patch of charcoal and stones – a possible dwelling pit. The excavations carried out by Pälsi will be presented in connection with the studies made on Heikki Teräväisen rantapelto. It is noteworthy that Saarnisto and Siiriäinen have used the sites of Pekko Iivosen rantapelto ja Heikki Teräväisen rantapelto as one benchmark in their study on the transgression maximum of Lake Ladoga (Saarnisto & Siiriäinen 1970).

The excavations yielded less abundant finds than the dwelling site of Simo Iivosen nummi. Typical Combed Ware is well represented, but an interesting ceramic group is the Early Asbestos Ware, or the Kaunissaari ceramics (Pälsi 1915:55). Textile ceramics are represented by several sherds, and Iron Age Ceramics and ceramics turned on a potter's banding wheel are plentiful.

88. Kaukola Riukjärvi Heikki Teräväisen rantapelto

Bsm 4114 07
x = 6776 12 y = 486 62 z = 14–20 m ASL

Finds

4862:26–28 ceramic sherds, pieces of slate implements, whetstones and their fragments
4883:12 fragments whetstones
4884:2 a fragment of a whetstone
4915:64–67 ceramic sherds, a straight-bladed adze, a miniature adze, a fragment of a perforated stone
4997:58–62 ceramic sherds, whetstones and their fragments, flint and slate flakes
5096:150 pieces of whetstones
5174:133–137 whetstones and their fragments, a fragment of a perforated stone
5175:1–2, 7 ceramic sherds, a fragment of an adze, flint and slate flakes, fragments of whetstones
5426:31 a fragment of an axe
5511:36–37 ceramic sherds, fragments of whetstones
5563:17–19 ceramic sherds, a fragment of a perforated stone, fragments of axes and adzes, fragments of whetstones, flint, sandstone
5628:9–11 ceramic sherds, an adze, fragments of whetstone
5844:73–78 ceramic sherds, a fragment of an axe, an adze, fragments of whetstones
5898:1–6 ceramic sherds, an axe, an adze, flint implements and flakes, fragments of whetstones
5929:11–12 a stone axe, a stone implement
5963:1–230, 718–728 ceramic sherds, flint and slate arrowheads and their fragments, stone axes and adzes and their fragments, sinkers, a fragment of an ice pick, a fragment of a spearhead, slate points, whetstones and their fragments, flint and quartz implements and flakes, fragments of stone implements, hammerstones, stone flakes, burnt bones
6348:1 ceramic sherds, an adze, flint flakes, fragments of whetstones, fragments of stone implements
6620:15–16 ceramic sherds, an adze, a fragment of a perforated stone, fragments of whetstones, stone flakes
6670:1–2 ceramic sherds, an adze, fragments of whetstones, stone flakes
6691:1–3, 8–11 ceramic sherds, an axe, a fragment of an adze, flint implements and flakes, a sinker, fragments of whetstones, stone flake
6907:31 a small sacrificing stone "käärmeenkäräjäkivi"
6940:55–60 an axe, a miniature adze, fragments of an adze, flint and slate flakes, a fragment of a stone point, a whetstone and its fragments
7117:2–6 ceramic sherds, flint flakes, fragments of whetstones, fragments of stone implements
7285:43–54 ceramic sherds, a flint arrowhead and its fragments, a fragment of a flint arrowhead, adzes and their fragments, an awl, flint implements and flakes, fragments of whetstones
7650:3–27 ceramic sherds, an adze and its fragments, fragments of perforated stones, a sinker, a slate fishing hook, flint and quartz implements and flakes, whetstones, fragments of an adze, fragments of stone implements, stone flakes
7815:6–23 ceramic sherds, adzes, flint and quartz implements and sherds, a miniature adze, a sinker and their fragments, slate points, a whetstone and their fragments, fragments of stone implements, flint implements and flakes, stone flakes
8000:22–27 ceramic sherds, a flint arrowhead, flint implements and flakes, a fragment of a sinker, fragments of whetstones
8047:1–6 ceramic sherds, an adze, an unfinished axe, flint implements and flakes, fragments of stone implements
8199:20–24 ceramic sherds, flint arrowheads, an adze and its fragment, flint implements and flakes
8212:19–21 ceramic sherds, fragments of whetstones, flint flakes

Studies Pälsi, S., excavation 1911 (no report)

Literature Pälsi 1915; Saarnisto & Siiriäinen 1970; Uino 1997

Because the dwelling sites in the fields of Pekko Iivosen and Heikki Teräväinen belong more or less together, their separation from each other is perhaps unnecessary. However, Sakari Pälsi conducted three small excavations (I, II and III) "in both fields" (Pälsi 1915:45), and he presents excavation results separately (Pälsi 1915:58–59). The cultural layer at the site was thick and very regular. The patches of cultural layer with postholes gave Pälsi the idea about the existence of possible dwelling pits.

What has been said about the Combed Ware and Kaunissaari ceramics in Pekko Iivosen Rantapelto also holds true for Heikki Teräväisen Rantapelto. Besides Early Asbestos Ware, asbestos-tempered ceramics from the Middle and Late Neolithic were represented. Pöljä ceramics and probably also Jysmä ceramics belong to the inventory. The number of Early Metal Period ceramic types is greatest here. Altogether 15 Textile ceramic vessels have been identified. An important curiosity is the Kalmistonmäki ceramics (NM 6848:11). Luukonsaari ceramics (5563:19) have also been found.

On the basis of Pälsi's dissertation and information on find material elevations, one could speculate that the Luukonsaari ceramics have been found from the lowermost terraces of the Riukjärvi area. Due to lack of more exact information concerning find conditions, this remains, however, only an interesting hypothesis. Its applicability to shore displacement studies is uncertain.



5. Overview from Kyöstälänharju towards Tiitunmäki hill in Kaukola during the pilot survey in 1988. Lake Riukjärvi in the left. Photo: Christian Carpelan.

89. Kaukola Riukjärvi Heikki Teräväisen kartanopelto

Bsm 4114 07
x = 6776 12 y = 486 62 z = 20 m ASL

Finds 6679:5–12 ceramic sherds, a fragment of a chisel, a stone pin, fragments of whetstones, flint flakes, a flint scraper, flint and quartz flakes, fragments of stone implements

Studies no field work

The dwelling site is situated in the field, close to Heikki Teräväisen rantapelto, but on the upper terrace. Pälsi (1915) does not mention the find place in his dissertation. Therefore it is not possible exactly located. Only small amount of material has been found. Ceramics includes some small fragments of Textile ceramics. Some sherds of Slavo-Karelian Ware belongs to the material.

90. Kaukola Riukjärvi Simo Iivosen vanhan talon paikka

Bsm 4114 07
x = 6776 12 y = 486 62 z = 20 m ASL

Finds 6691:6 ceramic sherds, fragments of whetstones, quartz flakes

Studies no field work

Pälsi (1915) does not mention the find place which makes it location difficult. It can be very probably connected with the site by Simo Iivosen Kartanopelto. Only one sherd of Textile ceramics have been found. In addition to this also Iron Age ceramics and Slavo-Karelian Ware exist in the material. No field studies have been coducted there.

Dwelling sites on Tiitunmäki (Uino KAUK 12)

91. Kaukola Riukjärvi Tiitunmäen kallion vieri

Bsm 4114 07
x = 6775 51 y = 486 66 z = 20 m ASL

Finds 5106:1 ceramic sherds (Juho Paavil. maasta santakuopasta Hiekkalahdesta Riukjärven rannalta)
5174:326–332 ceramic sherds, an adze and their fragments, fragments of whetstones
5963:415–501 ceramic sherds, axes, a sinker, adzes and their fragments, a miniature adze, a slate knife, slate arrowheads and their fragments, a miniature adze, burnt lake shell, flint and quartz implements and flakes, slate points and their fragments, a sinker, whetstones and their fragments, a hammerstone, fragments of stone implements, burnt bones
6191:1–78 ceramic sherds, axes and adzes and their fragments, whetstones and their fragments, a bones drill, a barb of a hook, a sinker, an awl, an unfinished perforated stone, flint and quartz implements and their flakes, quartz cores burnt bones

Studies Pälsi, S., excavations 1911 (1911)
Pälsi, S., excavation 1912 (1912)

Literature Pälsi 1915; Uino 1997; Lapshin 1995

The dwelling site, close to the bedrock of Tiitunmäen kallio, opens to the W from the hill. The soil is sand and the site is located on the edge of a sand pit. Tiitunmäen kallio is situated on the southern end of Lake Riukjärvi close to the head of the Haisoja ditch. The terraces rise rapidly towards Tiitunmäki. Sakari Pälsi carried out two excavations at the site in 1911 and 1912. The soil beside the bedrock was loose, fine silt and its colour was an even "dirty" grey. Pälsi thought that a dwelling with a hearth in the middle of a charcoal patch was possible (Pälsi 1915:64). The cultural layer was thick, varying between 40–60 cm. The location of the dwelling site was extraordinary because of the great boulders and bedrock, which shelter the site very effectively towards the east.

Although few ceramics have been found in Tiitunmäki, the variety is conspicuous. Pälsi first paid attention to the thin-walled and textile-impressed ceramic vessels, but he also separated sherds of Kaunissaari type, ceramics with porous temper and Typical Combed Ware (Pälsi 1915:70). Pälsi interpreted the site as having a vertical stratigraphy. He found that Kaunissaari ceramics and Textile ceramics existed in two small, restricted areas and in the upper layers of the cultural layer, which proves that they were brought into the cultural layer later than pieces of Typical Combed Ware. This synchronous existence of Kaunissaari ceramics and textile-impressed ceramics has proved to be wrong. Thus, Pälsi's ceramic types must be reclassified. Iron Age ceramics and ceramics made by turning on a potter's banding wheel have also been found.

92. Kaukola Riukjärvi Antti Varv(p)an (=Heikki Laukkasen) rintapelto

Bsm 4114 07
x = 6775 51 y = 486 66 z = 21 m ASL (19 m)

Finds 4884:22–32 ceramic sherds, unfinished adzes, a flint arrow head, flint and slate implements, fragments of whetstones
4915:74–77 ceramic sherds, a slate knife, fragments of whetstones
4943:8–13 ceramic sherds, fragments of whetstones, pieces of stone implements, flint and quartz flakes
5174:314–325 ceramic sherds, fragments of a whetstones, a fragment of a perforated stone, flint and slate flakes, asbestos, burnt bones
5175:19–34 ceramic sherds, a flint arrowhead, a miniature adze, a fragment of an arrowhead, a fragment of an adze, an awl, a fragment of a sinker, flint and slate implements and flakes, fragments of perforated stones, fragments of a whetstones
5426:47–48 ceramic sherds, fragments of a whetstone, flint and quartz flakes
5563:22–23 ceramic sherds, fragments of whetstones, a fragment of a perforated stone, pieces of flint, fragments of stone implements
5628:28–32 ceramic sherds, pieces of perforated stones, fragments of whetstones, flint flakes
5844:85–91 ceramic sherds, an adze, fragments of axes and adzes, a fragment of a perforated stone, a fragment of a spearhead, fragments of whetstones, flint and quartz flakes, slate flakes
5929:15–17 ceramic sherds, a fragment of an iron spearhead, a fragment of a perforated stone, fragments of whetstones
5963:736–738 ceramic sherds, adzes and their fragments, a flint arrowhead, fragments of whetstones, flint and quartz implements and their fragments
6348:12–20 ceramic sherds, adzes and their fragments, a sinker, a fragment of a perforated stone, fragments of whetstones, flint and quartz implements and sherds
6354:4–7 ceramic sherds, a double adze, adzes, a fragment of a stone pick, flint and stone flakes, fragments of whetstones
6620:19–23 ceramic sherds, an adze, a flint knife, a fragment of a slate ring, an end of a point, flint implements and flakes, fragments of whetstones
6648:30–41 ceramic sherds, adzes, a sinker, a half of a perforated stone, an awl, flint and quartz implements and sherds, whetstones and their fragments, fragments of stone implements
6691:7 ceramic sherds, flint implements and flakes, fragments of whetstones, stone flakes
6907:39–40 ceramic sherds, a fragment of a whetstone
6910:15 ceramic sherds
6940:76–81 ceramic sherds, adzes, flint and stone flakes, a slate awl

Studies Ailio, J., excavation 1908 (no report)
Urban, Ju., Univ. of Leningrad, trial excavation 1978

Literature Pälsi 1915; Meinander 1954b; Uino 1997; Paavilainen (ed.) 1987; Lapshin 1995

The dwelling site on the fields of Antti Varva is situated on the SE side of the Tiitunmäki Hill. A considerable number of ceramic finds was found from an area of ca. 75 x 50 m, which descends gently to the field along the head of Haisoja-ditch. Julius Ailio excavated an area of 33 m^2 in 1908. Although the soil was very stony, the area had been inhabited since the Stone Age. According to Pälsi, a 3 x 4 m stone setting was located in the area. Pälsi considered it to either be the remains of a destroyed hearth or the bottom of a dwelling (Pälsi 1915:72).

The majority of ceramics is Typical Combed Ware, although Early Combed Ware and Late Combed Ware are also present. Pöljä ceramics represent the Middle Neolithic. Thirteen vessels of Textile ceramics have been identified together with Iron Age ceramics and ceramics made by potter's banding wheel.

93. Kaukola Riukjärvi Antti Varvan pihapelto ja koppolipelto

Bsm 4114 07
x = 6775 50 y = 486 66 z = 20 m ASL

Finds 4883:13–19 ceramic sherds, fragments of perforated stones, fragments of whetstones, a fragment of an adze, a flint implement, flint flakes
4910:70–72 ceramic sherds
4943:7 ceramic sherds, a flint sherd, a burnt bone
4997:66 ceramic sherds, fragments of whetstones
5096:161–169 ceramic sherds, a base of a flint arrowhead, a slate point, whetstones and their fragments
5175:35–37 a casting mould from historical time, a flint arrowhead, an adze-like stone implement, fragments of whetstones
5426:44–46 ceramic sherds, fragments of whetstones, a fragment of a perforated stone, quartz flakes
5511:40–42 a miniature adze, fragments of whetstones
6062:20–23 ceramic sherds, a half of a perforated stone, flint implements and flakes, fragments of whetstones
6122:11–13 ceramic sherds, an adze, a whetstone and its fragments, a flint flake

Studies Ailio, J., excavation 1908 (no report)

Literature Pälsi 1915; Lapshin 1995

The dwelling site of Antti Varvan Pihapelto ja Koppolipelto is situated on the SE edge of the Tiitunmäki Hill. Julius Ailio excavated a 30 m long trial trench there in 1908. The slope was stony. Only a small number of ceramic sherds were found. Most ceramics was Typical Combed Ware, but some sherds of asbestos-tempered ceramics were also found. Sherds from one Textile ceramic vessel were present.

94. Kaukola Riukjärvi Antti Varvan maat

Bsm 4114 07
x = 6775 50 y = 486 66 z = 20 m ASL

Finds 4915:100–101 a mace head, a fragment of a whetstone
5106:5–13 ceramic sherds, a miniature adze, pieces of whetstones, an unfinished perforated stone, flint implements and their fragments

Studies no studies

Literature Pälsi 1915; Uino 1997

The location of the finds picked up from Antti Varvan maat remained unclear even for Sakari Pälsi. It is, however, essential to mention that sherds from one vessel of Textile ceramics were found. Sherds of Iron Age ceramics were also identified.

95. Kaukola Riukjärvi Tiitunmäen tienvieri

Bsm 4114 07
x = 6775 50 y = 486 66 z = 20 m ASL

Finds 5174:326–332 ceramic sherds, an adze and its fragments, fragments of whetstones, mica schist

Studies no studies

Literature Pälsi 1915; Uino 1997

The finds under the name Antti Varvan maat and Tiitunmäen tienvieri have been collected by local inhabitants without exact information being available about find places. Both Textile ceramics and Iron Age ceramics have been identified.

Juho Iivosen ja Simo Lankisen perillisten maat[9]

96. Kaukola Simo Lankisen perillisten maat

Bsm 4114 07
x = 6775 50 y = 486 66 z = 17 m ASL

Finds 4721:31–32 a straight-based stone adze, a fragment of a stone implement
4915:72–73 ceramic sherds, a straight-based stone adze, fragments of whetstones
4997:65 fragments of whetstones
5426:42–43 ceramic sherds, fragments of whetstones
5628:20–27 ceramic sherds, a miniature adze, a small flat iron implement, a schist weight of fish hook, fragments of stone implements, flint and quartz flakes, fragments of whetstones

Studies no studies

The dwelling site is situated in the SE shore of Lake Riukjärvi and in the N side of the Tiitunmäki Hill. The find area is a 50–70 m wide zone along the shore. No excavations have been conducted in this area (Pälsi 1915:61–62), but instead by the bedrock of Tiitunmäki. Most ceramics are Typical Combed Ware, but in addition, some sherds from one vessel of Textile ceramics have been found.

Dwelling sites of Piiskunsalmi (Uino KAUK 21)

97. Kaukola Piiskunsalmi Aatami Ruuskan Vehnämaanlahden pelto

Bsm 4114 07
x = 6777 36 y = 485 92 z = 20 m ASL

Finds 4910:113–114 ceramic sherds, burnt clay
5097:59–71 ceramic sherds, an axe and fragments of axes, adzes and their fragments, a sinker, whetstones and their fragments
5164:49–69 ceramic sherds, gouged adzes, an axe and their fragments, adzes, a miniature adze, a fragment of a perforated stone, a fragment of a slate ring, a flint arrowhead, a slate arrowhead, flint implements and flakes, a slate point, a sinker, fragments of whetstones, remains of stone implements
5357:79–84 an axe, a fragment of an axe, a shank of a fishhook, flint and quartz implements and flakes, fragments of whetstones, fragments of stone implements
5426:50–53 a slate arrowhead, an unfinished stone axe, a fragment of a whetstone, a fragment of a stone implement

[9] The finds from the field of Juho Iivonen belong probably to this site. One fragment of Textile ceramics NM 6907:34–38 (37) have been found. To this group can probably be connceted also finds from Antti Lankisen nurmen korpi (NM 8047:12–21) which include Textile ceramics of Kalmistonmäki type.

6910:24 ceramic sherds, flint and stone flakes, fragments of whetstones
7285:84–96 ceramic sherds, axes and adzes and their fragments, flint flakes, fragments of whetstones, stone slakes

Studies no studies

Literature Pälsi 1915

The dwelling site on the field of Aatami Ruuskan Vehnämaanlahdenpelto is situated on the SW shore of Piiskunsalmi. Although the site is rich in prehistoric finds, no excavations have been carried out. Most ceramics are Typical Combed Ware. In addition, some sherds from one vessel of Textile ceramics have been found.

98. Kaukola Piiskunsalmi Olli Kortteen ja Kalle Merosen pellot Piiskunsalmen rannalla

Bsm 4114 07
x = 6777 36 y = 485 92 z = 21 m ASL

Finds
4721:33 an unfinished stoen axe
4885:15–24 ceramic sherds, fragments of perforated stones, fragments of stone implements, a whetstone, fragments of whetstones
4915:79–82,87 ceramic sherds, a miniature adze, fragments of whetstones
6121:35 ceramic sherds, fragments of whetstones
7285:77–83 ceramic sherds, a stone axe, straight-based stone adzes, fragments of whetstones, flint flakes, fragments of stene implements
7815:56–60 ceramic sherds, a miniature adze, flint flakes, fragments of whetstones, a fragment of a stone implement
8000:28–32 ceramic sherds, fragments of clay "bar", flint flakes, fragments of whetstones, a schist weight of a fish hook?
8047:31–36 ceramic sherds, a stone axe, fragments of whetstones, a flint scraper, fragments of stone implements

Studies no studies

The dwelling site is situated in the field on the SW shore of Piiskunsalmi on the NW side of Vehnämaanlahdenpelto. All archaeological material has been picked up as surface finds. No field studies have been made at the site. The ceramic material implies mostly Typical Combed Ware, but also sevela sherds of Textile ceramics have been found.

99. Kaukola Piiskunsalmi Piiksuonkankaan asuinpaikka

Bsm 4114 07
x = 6777 36 y = 485 92 z = 20 m ASL

Finds
4885:8–11 ceramic sherds, an unfinished fragment of a stone adze, fragments of whetstones, a small hammerstone
4910:1–12 ceramic sherds, flint and quartz flakes, fragments of whetstones
4915:78, 103 ceramic sherds
5426:54–88 ceramics sherds, stone adzes, a fragment of a slate arrow head, a weight of a fish hook, flint and quartz flakes, a fragment of a slate kife, a whetstone, fragments of whetstones, a fragment of a perforated stone, burnt bones
6122:15 ceramic sherds, flint flakes, a fragment of a whetstone

Studies Tallgren, A. M., excavation 1907 (1907) (24 m²)
Ailio, J., excavation 1909 (1909b) (40 m²)

The dwelling site is situated on the ridge on the N side of Lake Riukjärvi, and SW side of River Ilmetjoki. A. M. Tallgren excavated an area of 24 m² at the site. One of the most interesting finds was a hut floor about 2.5 x 2.0 m in size. Also culture layer was strong and clearly observable. The size of the dwelling site was ca. 30 x 40 m (Pälsi 1915:75). Julius Ailio excavated an area 40 m² in size. Also he found remains of oval hut floor at the site. A large amount of ceramics were found in both excavations. The ceramic material included except Typical Combed Ware also some sherds of Textile ceramics, and Slavo-Karelian Ware.

Dwelling sites of Piiskunsalmi Lavamäki (Uino KAUK23)

100. Kaukola Piiskunsalmi Lavamäen pelto

Bsm 4114 07
x =6777 72 y = 486 20 z = 25.5 m ASL

Finds
5048:8–14 ceramic sherds, a gouged adze, an unfinished gouged adze, a miniature adze, pieces of whetstones, flint and quartz flakes, pieces of stone implements
5239:53 ceramic sherds, slate flakes
5357:59–78 ceramic sherds, fragments of perforated stones, a straight-based adze and an unfinished adze, a miniature adze, a fragment of a spearhead, a flint arrowhead, an awl, fragments of whetstones, flint and quartz flakes
5511:43–51 ceramic sherds, fragments of flint arrowheads, fragments of whetstones, fragments of stone implements, a fragment of a sinker, flint and quartz implements and flakes
5563:24–25, 27–29 ceramic sherds, a perforated stone and its fragment, an adze, fragments of axes and adzes, fragments of arrowheads, a stone point, fragments of whetstones, flint flakes
5628:33–51 ceramic sherds, adzes, flint and slate finished and unfinished arrowheads and their fragments, fragments of whetstone, perforated stones and their fragments, a sinker, flint flakes
5723:19 ceramic sherds, straight-based axes, flint flakes, fragments of whetstones, a fragment of a perforated stone
5844:92–110 ceramic sherds, a slate knife, an awl, fragments of axes, a slate arrowhead, adzes, fragments of whetstones, fragments of perforated stones, flint and quartz implements and their flakes
5893:38–89 ceramic sherds, flint arrowhead, a slate arrowhead and their fragments, a fragment of a spearhead, adzes, a miniature adze, a fragment of a spearhead, sinkers, awls, flint implements and flakes, whetstones and their fragments, fragments of a perforated stone, a fragment of an ice pick, a slate point, fragments of stone implements, flint and slate flakes
5929:23–32 ceramic sherds, adzes and their fragments, whetstones and their fragments, a half of a perforated stone, an awl, fragments of stone implements
5963:543–715 ceramic sherds, flint arrowheads and their fragments, fragments of stone axes, adzes and their fragments, a straight-based arrowhead, a fragment of a slate ring, a sinker, a fragment of a perforated stone, a slate awl, slate pins, fragments of slate spearheads, a fragment from a knife-shaped slate implement, flint and quartz implements and their fragments, fragments of slate implements, a fragment of horn implement, fragments of whetstones, a hammerstone, stone implements and their fragments, red ocher, burnt bones
6348:22–29 adzes, a fragment of slate arrowhead, an unfinished fishhook, slate points, a fragment of a knife, flint and slate flakes, stone flakes
6385:20–22 ceramic sherds, fragments of whetstones, flint flakes, fragments of stone implements
6907:46–77 ceramic sherds, an axe and their fragments, adzes and their fragments, fragments of arrowheads, a fragment of spearhead, fragments of whetstones, fragments of perforated stones, an awl, a stone pick, whet-

stones and their fragments, stone implements and their fragments, flint flakes

Studies Ailio, J., excavation 1908 (no report)
Pälsi, S., excavation 1911 (no report)

Literature Pälsi 1915; Uino 1997; Lapshin 1995

The dwelling site of Lavamäen pelto is situated on the N side of the strait of Piiskunsalmi. The zone of Stone Age habitation follows a narrow terrace at an elevation of 25–26 m ASL. The soil at Lavamäenpelto is fine silt, and there is a hard-consolidated ferrite pan, which made excavation difficult. Julius Ailio excavated the site in 1908, examining a 35 m long and 1 m wide trial trench. The lowest finds occurred at an elevation of 25.5 m ASL (Pälsi 1915:91).

Although the majority of ceramics belong to Typical Combed Ware, both Early Combed Ware and Late Combed Ware are represented in the material. Sherds from one vessel of Textile ceramics have been identified. Other Metal Period ceramic types are Sirnihta ceramics, Iron Age and ceramics made by potter's banding wheel. A straight-based arrowhead (NM 5963:638) can be mentioned as a curiosity.

101. Kaukola Piiskunsalmi Ville Pessin Riihipelto

Bsm 4114 07
x = 6777 72 y = 486 20 z = 20 m ASL

Finds 3048:12 ceramic sherds

Studies no studies

The dwelling site of Ville Pessin Riihipelto has not been mentioned by Pälsi (1915). The site is situated in Piiskunsalmi, close to the dwelling site of Lavamäenpelto. One Textile ceramic sherd has been picked up from the site. Only stray find have been picked up from the field.

Dwelling sites by the Bay of Tossikanlahti (Uino KAUK 25)

102. Kaukola Piiskunsalmi Antti Kaasalaisen Piiskun-, Tossikan-, and Savilahdenpellot

Bsm 4114 07
x = 6778 7 y = 484 9 z = 20–25 m ASL

Finds 4910:136–146 an axe, an unfinished axe, an adze, fragments of whetstones, fragments of stone implements
5175:38–40 ceramic sherds, an adze, a fragment of perforated stone, fragments of whetstones, flint and slate flakes
5628:52–65 ceramic sherds, a fragment of an axe, an adze, a sinker, a fragment of an arrowhead, fragments of whetstones, fragments of stone implements
5723:21 a fragment of an adze
5844:111–118 ceramic sherds, adzes, fragments of whetstones, fragments of stone implements
5893:90–94 ceramic sherds, an adze, fragments of whetstones, fragments of stone implements
5929:33–39 ceramic sherds, adzes, an unfinished adze, fragments of an axe, adzes, fragments of whetstones, a hammerstone
5963:742 an adze
6091:10–13 adzes, a fragment of slate spearheads
6121:36–39 ceramic sherds, an axe, a fragment of an adze, fragments of whetstones, a slate point, flint and quartz implements and flakes

Studies no studies

Literature Pälsi 1915; Uino 1997

The remains of habitation on the fields of Antti Kaasalaisen Piiskun-, Tossikan- and Savilahdenpellot are situated on the NW side of the Bay of Tossikanlahti. No excavations have been carried out at the site. The site remains outside the dwelling site cluster in the Piiskunsalmi area. Here also the majority of ceramic finds are Typical Combed Ware, but some sherds of Textile ceramics and ceramics made by a potter's banding wheel have been found.

103. Kaukola Piiskunsalmi Matti Kaasalaisen niemenpelto

Bsm 4114 07
x = 6778 7 y = 484 9 z = 20–25 m ASL

Finds 4910:134–135 an adze, a fragment of a whetstone
4997:67–68 fragments of stone implements
5096:176–182 ceramic sherds, an axe, flint and quartz implements and flakes, fragments of whetstones, stone implements and their fragments
5097:44–58 ceramic sherds, an axe and its fragment, an awl, pieces of whetstones, a fragment of a perforated stone, flint implements and flakes, a quartz flake, fragments of stone implements
5174:387–389 ceramic sherds, a straight-based adze, a fragment of a slate point, fragments of whetstones, flint and slate flakes

Studies no studies

Literature Pälsi 1915

The dwelling site on the field of Matti Kaasalaisen niemenpelto belongs to the same cluster of dwelling sites as the four afore-mentioned dwelling sites, being situated on the shore of the strait of Piiskunsalmi. No excavations have been carried out at the site. Instead, the uncertainty with the location of the finds means that a considerable portion of the finds have been attributed to the field of Lavamäenpelto. Along with Neolithic ceramics, at least one sherd of Textile ceramics has been found.

5.2. Kurkijoki

104. Kurkijoki [[87] Kuuppala Kalmistomäki Räkköläinen

Bsm 4114 12
x = 6797 7 y = 495 2 z = 18–25 m ASL

Finds 8784:1–107 ceramic sherds, an iron chain, a cross-formed brooch, an unfinished slate arrowhead, an ornamented fragment of bones artefact, quartz implements and flakes, a brace of a scythe, a bit, an iron implement, burnt clay, unburnt bones, bones from skulls, flint flakes
8784a an unburnt bones (an inhumation grave)
8784b:1–2 fragments of wooden structures (an inhumation grave)
8788:1 a stone implement, unburnt bones
8800:1–3 two iron spearheads and an iron axe
8885:1–72 ceramic sherds, a bit, an iron ring, bronze belt ornaments, iron nails, a riveting board, a steel, a horse bell, a fragment of a penannular brooch, iron spearhead (Petersen M), pieces of bronze plate, a bronze spiral, iron slag, burnt clay, unburnt bones, a fragment of ornamented bones artefact, fragments of stone axes and ice picks, flint and quartz flakes, a smoothing stone
8892:1 two iron rings
10670:1–189 ceramic sherds, a slate arrowhead, a silver penannular brooch, a fragment of a ring-formed slate pendant, burnt clay, an iron ring-formed brooch, a penannular brooch, a fragment of Karelian oval tortoise brooch, a bronze chain holder, a knife handle, iron skewers, fragments of iron objects, iron nails, nails from horseshoes, a piece of bronze, an iron staple, an iron adze, flint and quartz implements and flakes, sinkers, fragments of iron plates, a whetstone and fragments of whetstones, a fragment of a hammerstone, fragments of stone implements, metal slag, unburnt bones, burnt bones
10872:1–118 ceramic sherds, a crucible (clay), an iron knife, a fragment of a slate arrowhead, whetstones and

their fragments, a fragment of a slate knife, an U-shaped iron chape, fragments of iron implements, nails from horseshoes, fragment of harness, a soapstone pearl, a fragment of a hinge, fragments of iron plates, fragments of stone implements, flint and quartz implements and flakes, a pearl, sinkers, fragments of a hammerstones, iron nails, burnt clay, iron slag
12810:1–4 ceramic sherds, a stone adze
KHM 28081

Studies Cleve, N., excavation 1927 (1927) (15 m²)
Cleve, N., excavation 1928 (1928) (91 m²)
Voionmaa, J., excavation 1937 (1938) (98 m²)
Voionmaa, J., excavation 1938 (1938) (102 m²)
Saksa, A., excavations 1985 (1985; 1986a) (38 m²)
Saksa, A., excavation 1986 (1986b) (184 m²)
Saksa, A. & Shumkin, V., excavation 1987 (1987) (140 m²)
Saksa, A. & Timofeev, V., excavation 1995

Literature Leppäaho 1949; Meinander 1954b; Saarnisto & Siiriäinen 1970; Kotskurkina 1981; Vikkula 1987; Saksa 1989; 1994; Saarnisto, Saksa & Taavitsainen 1994; Saksa & Timofeev 1996; Uino 1997

The dwelling site and cemetery of Kuuppala Kalmistomäki Räkköläinen is situated about 2 km SSE of the Kurkijoki church. The hill of Kalmistonmäki is situated on the eastern shore of Laikkalanlahti Bay in the village of Kuuppala. The ancient monuments are on the S slope of the hill. Archaeologists have known the place since the 1870's, but Nils Cleve did not conduct the first archaeological excavation until 1927. It came out during the first excavation season that both Stone Age and Iron Age finds were mixed together. The explanation for this is that the remains of both a Stone Age dwelling site and an Iron Age cemetery were interspersed over the same area. During the excavations in 1928, Cleve was able to discern individual graves generally without grave goods. Most finds from the dwelling site were ceramic sherds. The Stone Age dwelling site has often been designated after the Räkköläinen farmhouse.

In 1937–38 Jouko Voionmaa continued excavations, digging up four areas. Voionmaa uncovered several inhumation graves and the base of one building. Jorma Leppäaho considered these – together with a casting mould and an anvil stone – evidence of a medieval forge (Leppäaho 1949:49). Alexander Saksa began the excavations again in 1985.[10] Saksa found Iron Age graves, in addition to several ceramics from different periods in Prehistory. After three years of excavations, the cemetery and graves were badly damaged by tilling of the field. The cemetery and its graves were dated back to the Viking Age and Crusade period based on metal finds. The most important dating finds are the spearheads of Petersen G-type, Finnish-Russian beard axes, and the equal-armed brooches (Uino 1997).

Ceramics from several periods were found. By virtue of these finds, habitation seems to have begun at the site already during the Early Combed Ware. The largest number of sherds belong to Typical Combed Ware, but Late Combed Ware also has been found. Early Metal period pottery, primarily Textile ceramics, is represented by six vessels, and some Iron Age ceramics were also found. An interesting find is one sherd, which C. Carpelan has recognised as Lovozero ceramics (Uino 1997:246). The youngest ceramics at the site are the pottery made by potter's wheel. The lowest elevation of finds is 18.5 m ASL.

One ^{14}C-dating has been obtained from the flood deposit, which indicates a late transgression of Lake Ladoga. Saarnisto *et al.* (1994:77) have published the recentmost dating 2870±380 BP, calBC 1600 (68.2)500.

[10] An author has seen the excavation material at the Institute of the History of Material Culture in St Petersburg. No Textile ceramics existed in the collection.

5.3. Räisälä

105. Räisälä [1] Hovi Kalmistonmäki[11]

Bsm 4113 08
x = 6757 2 y = 487 7 z = 18.5 m ASL

Finds 2298:150 a socketed spearhead
2490:1–8 ceramic sherds, a copper coin, unburnt human bones, a piece of leather, bark
2556:1 ceramic sherds, a quartz flake, horse's teeth
2845:7–8 ceramic sherds, a half of casting mould of an Ananino axe
6675:1–80 ceramic sherds, a possible fragment of a casting mould, fragments of clay tubes, a bronze ring, an iron knife, iron mounts of a knife, unburnt human bones, burnt clay
7292:2 an iron axe
10821:1–6 ceramic sherds, burnt clay, charcoal

Studies Schwindt, T., excavation 1885
Schwindt, T., excavation 1887
Schwindt, T., excavation 1892
Mether, field mapping 1893
Tallgren, A.M., excavation 1914 (1914) (70 m²)
Pälsi, S., excavation 1935 (87 m²)
Meinander, C.F., trial excavation 1939 (1939b) (35 m²)
Saksa, A., inspection 1984

Literature Schwindt 1893; Tallgren 1914; Hackman 1916; Hackman 1918; Tallgren 1935; Leppäaho 1949; Meinander 1954b; Saarnisto & Siiriäinen 1970; Kotchkurkina 1981; Uino 1997

The dwelling site and cemetery of Räisälä Hovi Kalmistonmäki is situated on the shore of the Vuoksi River. Kalmistonmäki is a relatively small hill rising about 18.5 m above sea level. In this case also a dwelling site and a cemetery are mixed together. Most of the dwelling site is located on the E and SE sides of the hill. Unfortunately, a considerable part of the site was destroyed by sand hauling before the 1880's. Theodor Schwindt carried out the first archaeological excavations at Kalmistonmäki in 1885. He continued excavations in 1887 and 1892. He found some heavily decomposed skeletons, different types of ceramic sherds and half of a casting mould for an Ananino axe.

A.M. Tallgren excavated in 1914 in five different places, studying both the dwelling site and the graves. Most graves proved not to contain finds, but in some cases the boards of coffins were preserved. The sand hauling continued during the 1920's and 30's, destroying the site and the cemetery. Sakari Pälsi and C. F. Meinander carried out small and fruitless salvage excavations in the area towards the end of the 1930's. The fragment of a casting mould (NM 6675:74) has been lost, but according to Tallgren, it had been made of clay. A. M. Tallgren connected the fragments of the casting moulds of Räisälä Kalmistonmäki (NM 2845:8; 6675) with Ananino culture (Tallgren 1914:12; 1935).

A total of 14 Textile ceramic vessels have been separated from the material. Textile ceramics is the largest group at the site, the next largest groups being Late Iron Age ceramics and ceramics made by a potter's wheel. Neolithic ceramics of either Typical Combed Ware or Late Combed Ware exists to a lesser degree. The most interesting ceramic type from the point of view of this study is naturally the one subgroup of Textile ceramics, the Kalmistonmäki type, identified by C. F. Meinander (1954b). Kalmistonmäki ceramics have already been discussed thoroughly in the main text, thus no details will be presented here. It is perhaps interesting to note, however, that not all Textile ceramics from the site are of Kalmistonmäki type (Meinander 1954b:189–190, Tafel 30). Meinander has separated it on the basis of a corded-impression (in <-shaped position).

[11] Also name Kalmistomäki exists (Uino 1997:287–290).

106. Räisälä [no number] Kökkölä

Bsm 4113 08
x = 6757 66 y = 482 88 z = 25 m ASL

Finds 1–38 (catalogued Russian Academy of Sciences, Department of Paleolit in the Institute of the History of Material Culture in St. Petersburg) ceramic sherds, flint and quartz implements and their flakes, burnt bones

Studies Halinen, P., Timofeev, V., Deckwirth, V., Närväinen, N., and Uotila, M. 1999 (Halinen *et al.* 2000)

The dwelling site is situated about 4.3 km WNW of the Räisälä church, and about 0.7 km E from the end of the Kuokkastenlahti bay, on the W side of Lake Valkealampi, and a forest road. The site was found during the survey of Kaukola and Räisälä in 1999. One find spot was located about 130 m of the asphalt road leading to Räisälä. Soil in the area is pine growing fine sand.

Three dwelling depressions were found at the site. The size of the largest depression was ca. 10 x 10 m, the smallest being only ca. 5 x 5 m in size. In one depression was found burnt bones by drilling. Two store terraces were possible to observe at the site. The find material implies Typical Combed Ware, Rhomb-Pit Ware, and Textile ceramics. Stone Age and Early Mertal Period settlement activities were possible to observe in several hundred meter long zone. No further studies have been counducted at the site.

5.4. Tytärsaari

107. Tytärsaari [1] Kaunismäki

Bsm 3031 05
x = 6637 y = 512 6 z = 0–5 m

Finds 3382:1 an equal-armed brooch
5424:1–4 ceramic sherds, burnt bones, charcoal, sand sample
5451:1–10 ceramic sherds, burnt stones, burnt and unburnt bones
8703:1–9 fragments of bronze a strap buckle, fragments of iron plate, burnt bones
8812:1–5 ceramic sherds, steel, burnt bones, charcoal

Studies Cederhvarf, B., inspection 1909 (1910)
Hackman, A., excavation 1909 (see Hackman 1910b)
Hackman, A., excavation 1927 (1927)

Literature Appelgren-Kivalo, Hj. 1897; Hackman 1910a; Nordman 1931; Erä-Esko 1965; Carpelan 1980; Miettinen, T. 1996

The dwelling site of Kaunismäki is situated on the eastern shore of the Island of Tytärsaari. The soil throughout this part of the island is fine sand. The find area is over 1 km long. The site is very heavily flooded and only a hearth was visible in 1927 when A. Hackman carried out a small excavation in the area. A. Hackman carried out the first excavation in 1909 in an effort to localize the find place of a bronze brooch ("Tytärsaari brooch"). A cremation burial has taken place at the site. A strap buckle was found in 1926. The dwelling site of Kaunismäki is situated about 160 m N of the find place.

The most important find is the equal-armed brooch, which has been dated by A. Hackman into 5th century AD. Hackman was disappointed with his excavation 1909. He had initially thought that the hatched faced ceramic sherds belonged to the same period as the brooch (Hackman 1910a:51).One vessel has a flat bottom and its upper part is profiled. The diameter of the rim is ca. 25 cm. No ornamentation exists. The presence of Textile ceramics at the site is uncertain. Very probably, however, the ceramics date back to the Pre-Roman Iron Age, and not the Middle Iron Age as Hackman had assumed.

5.5. Viipuri

108. Viipuri [18] Kärstilä Häyrynmäki

Bsm 4022 06
x = 6736 6 y = 436 0 z = 15 m ASL

Finds 5427:1–254 ceramic sherds, an axe, adzes and their fragments, finished and unfinished slate arrowheads, flint and quartz implements and flakes, a sinker, fragments of whetstones and their fragments, a slate knife, fragments of stone implements, stone flakes, burnt bones, charcoal
5428:1–1219 ceramic sherds, an amber pearl, a clay idol (antropomorphic figure), a flint spearhead, flint arrowheads and their fragments, a flint spearhead and their fragments, slate arrowheads, stone axes and their fragments, adzes and their fragments of adzes, a fragment of a soapstone ring, a sinker, a stone pendant, fragments of perforated stones, a stone point, flint and quartz implements and flakes, stone implements and their fragments, a fragment of a clay implement, a quartzite hammerstone, sinkers, whetstones and their fragments, a tooth, burnt bones, charcoal
5620:1–2971 ceramic sherds, a piece of amber, slate and flint arrow heads and their fragments, a quartz arrow head, stone axes and adzes and their fragments, fragments of stone rings, a fragment of flint knife, fragments of stone implements, flint and quartz implements and their fragments, stone pendants and their fragments, flint sticks, whetstones and their fragments, weights of fish hooks, stone flakes, burnt bones, charcoal
5621:1–274 ceramic sherds, stone arrow heads and their fragments, stone axes and adzes and their fragments, fragments of stone inplements and their fragmens, flint and quartz implements and their fragments, a fragment of a stone ring, stone sticks and their fragments, a whetstone, burnt bones, charcoal

Studies Ailio, J., excavation 1909 (1909)
Soikkeli, K., excavation 1910 (1910)

Literature Pälsi 1915; Meinander 1954b; Kopisto 1967; Uino 1997; Klejmenova *et al.* 1988

The dwelling site of Häyrynmäki is situated on the E side of the city of Viipuri, about 6 km from the Viipuri railway station towards Sortavala. The railroad crosses the hill, which is, according to Ailio, a relatively small about 1 km long ridge. The Häyrynmäki Hill was dug for the building of a railway in the 1890's, but not until 1908 were the first Stone Age finds picked up. Julius Ailio carried out a salvage excavation at the site in 1909. Kaarle Soikkeli continued fieldwork in the following years. The ridge is used for hauling gravel still today, which means that the site is almost completely destroyed. A Finnish-Russian group of archaeologists made an inspection of the site in 1998, but the excavation areas could no longer be located. The pollen of *Urtica, Rumex acetosa, Ranunculus, Plantago, Calluna, Epilobium* and *Pteridium* have been found in the layers of the nearly bog (Klejmenova *et al.* 1988:313). Human inpact seems to begin in Häyrynmäki-Selänkangas area already during the Atlantic period.

The ceramic material at Häyrynmäki is very rich and versatile. Ailio compared it with material excavated in Säräisniemi Nimisjärvi. He also mentioned the straight-based and "kaulaltakaarretut" (fluted neck) ceramic sherds (Ailio 1909). C. F. Meinander paid particular attention to the Corded Ware and its relation to asbestos-tempered Pöljä ceramics (Meinander 1954a:151–152). These ceramics have been found from the lowest dwelling terrace on Häyrynmäki, the elevation being only 12 m ASL (Kopisto 1967:16–18). Ceramics resembling Combed Ware were also present, but they are probably only synchronous with it (Äyräpää 1930:206; Meinander 1954a:151–152). Moreover, Meinander thought that some of the Häyrynmäki ceramics might be classified as Kiukainen ceramics.

The great majority of sherds found belong to Typical Combed Ware and Late Combed Ware. Corded Ware also exists. Textile ceramics are represented by only a few hatched surface sherds. Also some sherds

can possible be connected with Sär 2 ceramics, but their definition is difficult because of the bad condition of sherds. To date, no comprehensive study has been done on the large ceramic material of the site.

109. Viipuri Krasnyj Holm

Bsm –
x = – **y = –** **z = –**

Finds ceramic sherds

Studies Rumjantsev, A. N., survey 1969

Literature Lapshin 1995

The dwelling site of Krasnyj Holm is situated by the Vyborg – Borodinskoe highway. The site lies on an Aeolian sand dune, along the N shore of Krasnoholm close to Lake Zafiksirov (Lapshin 1995:157). A. N. Rumjansev found the site by the survey in his survey 1969 (Rumjantsev 1969). No other information is thus far available about the site.

6. THE RIVER KYMIJOKI WATER SYSTEM

6.1. Anjalankoski

110. Anjalankoski [1] Huruksela Ahvionkoski

Bsm 3024 08
x = 6724 74 **y = 486 24** **y = 22.5–25 m ASL**

Finds 17713:1–4 a ceramic sherd, fragments of a flint fire-striking stone, a whetstone, quartz flakes

Studies Huurre, M, survey 1968 (1968)

The dwelling site of Ahvionkoski is situated about 7.2 km SSW of the Anjalankoski church, by the Anjalankoski Rapids in the Kymijoki River. The finds were collected from a field close to the Koskiranta farmhouse. The soil is a finely grained silt or clay. No further studies have been conducted at the site. Huurre has suggested that the ceramics belongs to the Iron Age; however, they are most probably Textile ceramics. Sherds uncovered in Huurre's survey are small and difficult to identify.

6.2. Asikkala

111. Asikkala [15] Kalkkinen Kotasaari

Bsm 3112 03
x = 6798 50 **y = 425 60** **z = 82.5 m ASL**

Finds 15354:1–8 ceramic sherds, quartz flakes, burnt bones, burnt clay
15466:1–347 ceramic sherds, flint arrowheads and their fragments, an adze, flint implements and flakes, quartz implements and flakes, burnt clay, a whetstone, red ocher, burnt bones, organic material, iron slag (?), hammerstones, a stone implement, charcoal
15789:1–149 ceramic sherds, flint implements, quartz implements and flakes, burnt clay, hammerstones, burnt bones, charcoal
18141:1–361 ceramic sherds, a diabase adze, fragments of casting moulds, flint and quartz implements and flakes, burnt clay, stone flakes, burnt bones
19280:1–3 ceramic sherds, a quartz implement and quartz flakes

Studies Hirviluoto, A.-L., inspection 1962 (1962)
Hirviluoto, A.-L., excavation 1962 (1963c) (ca. 80 m^2)
Holthoer, R., excavation 1962 (1962) (208 m^2)
Kauhanen, I., excavation 1963 (no report)
Huurre, M., survey 1971 (1971)

The dwelling site is situated about 11 km NE of the Asikkala church, on the NE side of the Kalkkistenkoski Rapids. The island of Kotasaari, which exists close to the outlet of Kymijoki, is situated about 800 m from the channel of Kalkkistenkoski. The soil is sand. The site was



6. Kotasaari in Asikkala. Photo: Rostislav Holthoer/National Board of Antiquities.

found when hauling gravel and sand during the construction of the channel of Kalkkinen in the winter of 1962. The engineer of the building project sent an almost complete ceramic vessel and some other ceramic sherds to the National Board of Antiquities. Anna-Liisa Hirviluoto conducted an immediate inspection of the site and interpreted the remains of the anthropogenic structures as an inhumation cemetery (Hirviluoto 1962). A salvage excavation was begun as soon as possible in May 1962, and the area proved not to be a cemetery, but a dwelling site which included remains of habitation from different periods.

During her excavation Hirviluoto found ten stone settings and pits (Hirviluoto 1963c). Rostislaw Holthoer continued the fieldwork in summer 1962 by excavating the area close to the excavation area studied by Hirviluoto earlier. Five hearths and two stone settings were unearthed. Several pits filled with cultural layer material were found. Furthermore, some small pits, which might have been postholes were observed. According to Holthoer, no stratigraphy was evident. However, ceramics were concentrated in such a way that older ceramics were found more from the NE and E sides of the area, on the top of the small hill (Holthoer 1962). Isto Kauhanen continued excavations in 1963. No excavation report of these studies exists. The most important finds during all excavations were fragments of casting moulds, which might be connected with Textile ceramics. All moulds were made of clay.

Hirviluoto observed that ceramics were not concentrated according to elevation, but were scattered sporadically throughout the area. A large variety of ceramic types were found. The earliest ceramics in the inventory are Typical Combed Ware, which was found in various places (see Hirviluoto's excavation map 1963c). Some sherds of Late Neolithic ceramics were also present. The largest ceramic group is, however, Textile ceramics, although some sherds and even whole vessels of Late Bronze Age ceramics and/or Iron Age ceramics have been found.

The dwelling site was rich in flint implements and flakes. Quartz flakes were found in all parts of the excavation area, but flint seemed to concentrate on the NE side of area I and area II. It seems probable that flint finds correlate well with "older" ceramics (Typical Combed Ware). The habitation period at the site covers a period from ca. 3000 BC to 1000 AD (Huurre 1971:5).

6.3. Hankasalmi

112. Hankasalmi [2] Niemisjärvi Autioniemi

Bsm 3214 03
x = 6912 70 y = 464 43 z = 90 m ASL

Finds 11510:1–3 ceramic sherds, a disk-shaped stone implement, a quartz implement
14580:1 a ceramic sherd
14863:1–125 ceramic sherds, a quartz arrowhead, fragments of whetstones, stone axes, an awl, a sinker, a hammerstone and their fragments, a slate pin, fragments of stone implements, flint implements and flakes, quartz implements and flakes
17880:1–7 ceramic sherds, flint scraper
24331:1 quartz flakes

Studies Meinander, C. F., excavation 1959 (1960) (137 m^2)
Sarvas, A., inspection 1969 (1970b)
Sepänmaa, T., survey 1988 (1988a)

Literature Carpelan 1965; Luho 1966; Meinander 1976; Matiskainen 1979; Siiriäinen 1970; Pesonen 1995a

The dwelling site of Autioniemi is situated about 9.5 km SW of the Hankasalmi church, ca. 1 km S of the Mäntyniemi farmhouse. Topographically, the name "Autioniemi" does not correspond to reality because no prominent cape can be observed around the site. The shoreline is quite straight and the soil is sand. According to the excavator, C. F. Meinander, the site is relatively small and already completely excavated. The dwelling site is partly destroyed by summer cottages and a gravel pit (Sepänmaa 1989).

Ceramics at the site are mainly Typical Combed Ware, but C. F. Meinander refes to some sherds as "Mikonsaaren tyyli" (Mikonsaari style) and some others – apparently older ones – as "Säämingin tyyli" (Sääminki style). These two subtypes of Typical Combed Ware often exist together, which implies that they may be more or less synchronous (Meinander 1960). Neither of these types has later been established in the terminology of Finnish archaeology. Meinander does not pay much attention to the asbestos ceramics, which are of relative importance. Early Asbestos Ware and Typical Combed Ware occur together with Sär 2 ceramics and such Asbestos ceramics resembling either Late Neolithic or Early Metal Period ceramics (NM 14863:26). It is possible that material from different periods has been mixed because of the human activities at the site (see Pesonen 1995a:app. I). Only one Textile ceramic vessel has been identified.

6.4. Iitti

113. Iitti [10] Vuolenkoski Silamaniemi

Bsm 3111 12
x = 6768 17 y = 453 33 z = 76 m ASL

Finds 18038:1–6 ceramic sherds, quartz flakes, burnt bones

Studies Keskitalo, O., survey 1969 (1970)

The dwelling site of Silamaniemi is situated about 17 km NW of the Iitti church, on the eastern bank of Lake Arrajärvi. The site is surrounded by a former field. The current size of the site is not known, because no further studies have been conducted since Keskitalo's survey. The ceramics found there are tempered with sharp, medium-sized feldspar particles, which suggest a connection with Textile ceramics. Round pits and hatched surface have been used as ornamentation. Oiva Keskitalo has classified these ceramics as Epineolithic without separating Textile ceramics from the material.

114. Iitti [12] Vuolenkoski Koskenranta

Bsm 3112 10
x = 6775 20–23 y = 455 73–76 z = 85–88 m ASL

Finds 18039:1–4 ceramic sherds, quartz flakes, a burnt bones
26613:1–98 ceramic sherds, quartz implements and flakes, burnt clay, iron slag, fragments of stone implements, quartzite flakes, stone flakes, burnt bones

Studies Keskitalo, O., survey 1969 (1970)
Kankkunen, P., trial excavation 1991 (1991) (trial pits)

The dwelling site of Koskenranta is situated about 18 km WNW of the Jaala church on a gravel ridge. The finds have been uncovered between the large gravel pit and the Jaala-Vierumäki road. Päivi Kankkunen carried out a trial excavation at the site in 1991, discovering that the site was almost totally destroyed by gravel hauling. Only a 50 x 40 m section was preserved undisturbed. Most finds consisted of ceramic sherds of Typical Combed Ware, but some ceramic sherds from the Early Metal Period were also found. Some sherds of Textile ceramics belong to the material, as does one piece of iron slag. Kankkunen (1991:7–8) considered the site to be completely excavated and proposed a classification of class III.

115. Iitti [16] Lyöttilä Keidas

Bsm 3113 03
x = 6766 68 y = 468 28 z = 67 m ASL

Finds 18043:1–2 ceramic sherds
18980:1–4 ceramic sherds, burnt clay, quartz flakes

Studies Keskitalo, O., inspection 1969 (1970)
Huurre, M., inspection 1971 (no report)

The dwelling site of Keidas is situated about 2 km NW of the Iitti church on the northern shore of Lake Pellinginselkä along the neck of land between Hiidensaari and the mainland. There were some shallow

gravel pits close to the road, and a broken hearth was observed between two such pits. Matti Huurre picked up finds on the edge of a small gravel pit. Unfortunately, no further field studies have been conducted at the site. This is a pity because the dwelling site seems "pure" involving only Textile ceramics in its inventory.

6.5. Jaala

116. Jaala [5] Vesala Pukkisaari

Bsm 3114 05
x = 6784 48 y = 478 18 z = 75 m ASL

Finds 19915:1–18 an oval tortoise brooch, fragments of round tortoise brooches, a link of a rod of bronze chain holder, a sleigh bell, a fragment of a bronze necklace, a fragment of an iron axe, glass beads, melted glass beads and their fragments, fragments of bronze spirales, fragments of iron implements, unburnt human bones, teeth, burnt bones, quartz flakes
29097:1– not yet catalogued
29098:1– not yet catalogued

Studies Huurre, M., inspection 1976 (1976)
Miettinen, T., trial excavation 1995 (1996a) (3 m^2)
Miettinen, T., excavation 1994–1995 (1996b) (130 m^2)
Miettinen, T., excavation 1996 (1997) (26 m^2)
Mertanen, T., marine archaeological excavation and survey 1995 (1995)
Mertanen, T., marine archaeological excavation and survey 1996 (1996)

The cemetery and dwelling site of Pukkisaari are situated on the N shore of the island of Pukkisaari in Lake Huhdasjärvi about 14 km NNE of the Jaala church. The size of the island is approximately 100 x 250 m. The trees are mostly pines, and undergrowth vegetation consists of twigs, grass and fern. The soil is sand. Matti Huurre assumed that slash-and-burn cultivation has probably been practised on the island. Huurre found a cemetery, which has been dated back to the Viking Age. A considerable part of the finds are not *in situ* position, because many graves have been destroyed, and because of the erosion of the shore bank. A schoolboy, Mika Niemi, came upon the first prehistoric finds at Pukkisaari in 1976. These and the inspection finds revealed that the cemetery has probably been rich in material. Huurre dug some trial pits at the site when trying to localize the graves on the unbroken shore. The result of trial excavation was negative. According to Huurre, the size of the cemetery is at present only about 5 x 20 m.

In 1995–96 Timo Miettinen carried out excavations at the site. In addition to the excavation of the cemetery Miettinen carried out a trial excavation on the S end of the island, where he discovered a dwelling site with a dwelling pit. The excavation finds include sherds, which might be Textile and Epineolithic ceramics (Miettinen, pers. comm. 3.1.1997). At least a portion of the sherds may belong to Intermediate zone ceramics (Miettinen, pers. comm. 3.1.1997).[12] Later, Miettinen took a sceptical view on the existence of Textile ceramics in the material. Christian Carpelan identified Pöljä ceramics and "uncharacteristic" Corded Ware (Miettinen 1997). Because I have not seen the finds, the question about the existence of textile ceramics remains open.

The main focus of Miettinen's excavation was, however, the cemetery, which has been dated to the beginning of the 10th century. An equal-armed brooch and a Petersen E-type spearhead are the most important finds influencing the dating of the site. The cremation cemetery is of western character (Miettinen 1996b:9–10). Tiina Mertanen from the Provincial Museum of Kymenlaakso conducted diving excavations at the site. Because the riverbank is heavily eroded, several tortoise brooches had fallen into the water. They were subsequently recovered during the diving studies. Finds were also made by the cliff (Mertanen 1996).

[12] Identification made by C. Carpelan.

6.6. Kinnula

117. Kinnula [60] Muhola Häähkäniemi

Bsm 2334 05
x = 7021 45 y = 2555 80 z = 135 (136–137.5) m ASL

Finds 25409:1–18 ceramic sherds, a flint implement, quartz implements and flakes, burnt bones
25804:1–426 ceramic sherds, a fragment of a clay casting mould, a fragment of slate ring, flint and quartz implements and flakes, a fragment of slate implement, iron slag, a hammerstone, fragments of whetstones, quartzite flakes, burnt clay, mica, burnt bones
27199:1 ceramic sherds

Studies Jussila, T., survey 1989 (1990)
Vanhatalo, S., excavation 1990 (1994) (90 m^2)
Miettinen, M. & Saukkonen, J. & Vanhatalo, S., inspection 1992 (no report)

The dwelling site of Häähkäniemi is situated about 10.7 km SSE of the Kinnula church, on the W side of Lake Kivijärvi, between the bay of Hiilinganlahti and the Häähkäjoki River. The site is on a sandy ridge and glaciofluvial delta. Timo Jussila found the site during his survey in 1989. Some parts of the large dwelling site were destroyed by construction of the buildings and a road. Prehistoric material has been found from an over 500 m long zone on the cape. According to Jussila, the site is one of the most important Early Metal period sites in northern Finland (Jussila 1990).

During a salvage excavation in 1990 two partly separate cultural layers and a sand layer between them were detected. These layers were probably formed as a result of flood(s) (Vanhatalo 1994:2). Vanhatalo also stated that the three hearths at the site might be connected with iron furnishing (Vanhatalo 1994:2). The Luukonsaari ceramics and the iron slag are consisted with this context. One hearth from the edge of the terrace, at an elevation of 136.8 m ASL, was dated yielding the ^{14}C-dating (Hel-3056) 5000±120 BP. Textile ceramics have been found from five vessels. Luukonsaari and Textile ceramics represent the majority of the ceramics at the site. Some Combed Ware also exists, but their number is small.

6.7. Korpilahti

118. Korpilahti [10] Putkilahti Hiirola

Bsm 3211 01
x = 6866 46 y = 428 56 z = 85 m ASL

Finds 16366:1–10 ceramic sherds, quartz implements and flakes, burnt bones
20274:1–5 ceramic sherds, burnt clay, quartz flakes, a stone flake

Studies Miettinen, T. & Miettinen, P., survey 1964 (1964)
Matiskainen, H., inspection 1978 (no report)
Jussila, T., inspection 1996 (1996)

The dwelling site of Hiirola is situated about 14 km SSE of the Korpilahti church by Lake Päijänne in the strait of Hiirolansalmi, between the lakes Vanhaselkä and Otavavesi. The field where the finds had been found is a sandy or silty soil, sloping gently to the S and E. Inspection finds have been collected from the small, approximately 60 x 40 m area, 50 m from the contemporary shore. In addition to the catalogued finds, also a stone axe had been found at the site, but then lost. Only inspections have been carried out at the site. Both Textile and Sär 2 ceramics have been identified.

119. Korpilahti [43] Oittila Raidanlahti

Bsm 3211 05
x = 6876 08 y = 3434 44 z = 85 m ASL

Finds 24323:1 ceramic sherds

Studies Miettinen, M., inspection 1988 (1988)

The dwelling site of Raidanlahti is situated about 9.4 km SE of the Korpilahti church on a sandy terrace sloping to the Bay of Raidanlahti. The site was found accidentally by Mirja Miettinen during her trip to inspect another, already known dwelling site in the neighbourhood. Ceramics and burnt bones were found between the edge of a gravel pit and a tractor road. Mirja Miettinen picked up ceramic sherds from a very small area with slightly brown, stoneless sand. No further studies have been carried out at the site. Only a few sherds of Textile ceramics have been found.

120. Korpilahti [48] Raidanlahti Kotiranta

Bsm 3211 05
x = 6976 60 y = 3434 39 z = 85 m ASL

Finds 30839:1–3 ceramic sherds, quartz flakes, burnt bones

Studies Sepänmaa, T., survey 1996 (no report)

The dwelling site is situated about 280 m the N from the Kotiranta farmhouse and about 10 km ESE of the Korpilahti church. Antti Bilund and Timo Sepänmaa picked up finds from the road scarp, on the W side of the road to Pökönlahti and about 20 m N of the old barn. No further studies have been made. Only some small sherds of Textile ceramics have been identified.

6.8. Kotka

121. Kotka (Kymi) [12] Huruksela Töyrylä

Bsm 3024 08
x = 6728 83 y = 486 69 z = 20–25 m ASL

Finds 17509:1–10 ceramic sherds, fragments of whetstones, quartz implements and flakes, burnt bones
19191:1–4 ceramic sherds, quartz implements and flakes, burnt bones

Studies Huurre, M., survey 1967 (1967)
Keskitalo, O., inspection 1970 (maps)

Literature Kokkonen 1978; Rankama 1979; Siiriäinen 1981; Rankama 1982; Ruonavaara 1988; Pesonen 1995a

The dwelling site is situated on the sandy shore about 6 km SW of the Anjalankoski church to the SW on the field of the Töyrylä farmhouse. Signs of habitation have been observed on the shore of the Kymijoki River and in the field. The size of the site is ca. 30 x 70 m. The site is on a relatively high terrace, which is today partly eroded. No further studies, except for inspections, have been conducted.

The majority of the ceramic material at Töyrylä is Typical Combed Ware, but Early Asbestos Ware and even some Corded Ware have also been found. Sherds from one vessel of Textile ceramics have been identified. Early Metal Period asbestos-tempered ceramics (Sär 2) are likely also present. The sherd of the probable Early Metal Period ceramic is, however, very small and its identification has therefore remained inconclusive.

6.9. Laukaa

122. Laukaa [45] Savio Majaniemi b

Bsm 3212 08
x = 6909 05 y = 3448 88 z = 87 m ASL

Finds 30829:1 ceramic sherds

Studies Sepänmaa, T., inspection 1997 (1999)

The dwelling site of Majaniemi b is situated about 15 km S of the Laukaa church. The site is on the cape of Majaniemi, on the ancient shore terrace. There is a path leading to the jetty, where Timo Sepänmaa observed a dwelling depression about 7 x 4 m in size, surrounded by what was clearly a wall. Sepänmaa made a trial pit inside the depression and found small, fragile sherds of ceramics, which he considered to be Textile ceramics. The definition was quite uncertain and it was based on the consistency of the clay and temper. According to my observations, it is very difficult to say whether these ceramics should be classified as Textile pottery.

The site is of particular interest because of its dwelling depression, which can be dated according to shore displacement chronology to the Early Metal Period. No further studies have been conducted.

123. Laukaa [40] Savio Vuontee Juntula

Bsm 3212 09
x = 6912 48 y = 3447 18 z = 83 m ASL

Finds 30824:1–2 ceramic sherds
3354:55 a perforated stone (400 m to the SW from the find place located by Sepänmaa)

Studies Katiskoski, K., inspection 1986 (1987)
Sepänmaa, T., inspection 1997 (2000)

Literature Vuorela *et al.* 1993

The dwelling site of Juntula is situated about 11.5 km S of the Laukaa church, on the S side of the Laukaa-Lievestuore road, about 200 m from the crossroads of Tarvaala. The site lies on the field, where Timo Sepänmaa uncovered some ceramic sherds. The soil is primarily sand and silt with some gravel. The survey finds consisted of Textile ceramics and undefined Sär 2 ceramics.

According to the surveyor, the area is suitable for Iron Age agriculture. On the basis of pollen analysis in the neighbourhood Irmeli Vuorela *et al.* (1993) dated the earliest signs of cultivation into 1000 BC.

6.10. Nastola

124. Nastola [3] Immilä Kovalahti

Bsm 3111 12
x = 6766 40 y = 452 37 z = 76–80.5 m ASL

Finds 26226:1–3 ceramic sherds, quartz flakes
26605:1–164 ceramic sherds, quartz implements and flakes, flint flakes, metal slag, whetstones and their fragments, a fragment of a pestle, stone flakes, fragments of stone implements, burnt clay, burnt bones

Studies Keskitalo, O., survey 1971 (1971d)
Sarvas, A., inspection 1970's (no report)
Raike, E., inspection 1990 (1990)
Vanhatalo, S., excavation 1991 (1994) (45 m^2)
Poutiainen, H., survey 1998 (1999)

The dwelling site of Kovalahti is situated about 12 km NE of the Nastola church on the N shore of Lake Arrajärvi. The Kymijoki River is situated about 2 km E of the site. The site lies between rocks and low hills, in partly clay soil. Oiva Keskitalo made an inspection at the site in 1971, and he considered it to be a Stone Age dwelling site. The finds were located along the shore. Eeva Raike inspected the site in

1990, and she also dug some trial pits for the purpose of defining the borders of habitation. These investigations also revealed that the place was from the Stone Age.

Simo Vanhatalo conducted a trial excavation at the site in 1991. According to Vanhatalo, the habitation is concentrated in two areas, at elevations between 76.3–80.0 m ASL (Vanhatalo 1991:2). It is a bit unusual that the Typical Combed Ware were found from an elevation of 76 m and that Early Metal Period ceramics were found on a higher terrace – between elevations from 76 to 80 m ASL. Vanhatalo considered the soil mixed. The cultural layer was not uniform, and some patches of charcoal were observed.

Sherds from six vessels of Textile ceramics have been discerned from the material. Sherds at the site are usually very small. Luukonsaari ceramics and some sherds of Typical Combed Ware are also present.

6.11. Pihtipudas

125. Pihtipudas [10] Kirkonkylä Majakaarre I (Kumpulainen)

Bsm 3312 03
x = 7030 16 y = 426 50 z = 115 m ASL

Finds 16345:1–39 ceramic sherds, quartz implements and flakes, a hammerstone, burnt bones, resin, charcoal

Studies Hirviluoto, A.-L., inspection 1963 (1964)
Luho, V., excavation 1964 (1965)
Jussila, T., survey 1996 (1997a)

Literature Miettinen, M. 2000
Meinander 1964b

The dwelling site of Majakaarre 1 is situated at the foot of Karjalanmäki Hill about 2.1 km W of the Pihtipudas church. Anna-Liisa Hirviluoto inspected the site in 1963, and found most parts to be destroyed by gravel hauling. Ville Luho carried out a salvage excavation in 1964 to study those structures on the edge of the gravel pit, which were in danger of collapsing. Luho observed two dwelling depressions and several fireplaces. Inside another dwelling depression a low depression, with a diameter of 4 m, was visible. In the middle of it was a stoneless fireplace. Two kinds of ceramics were found in it: Combed Ware with thick walls and Asbestos ceramics with thin walls (Luho 1965:11). The Combed Ware was found in the lower and upper parts of the cultural layer, whereas the Asbestos ceramics came exclusively from the upper side of the cultural layer. Another dwelling pit, partly destroyed prior to the excavations, contained only quartz (Luho 1965:12).

126. Pihtipudas [12] Kirkonkylä Madeneva

Bsm 3312 03
x = 7031 60 y = 427 80 z = 115–116 m ASL

Finds 12520:1–26 ceramic sherds, a clay idol, a fragment of flint arrowhead, a whetstone and its fragments, flint implements and flakes, a stone pick, fragments of stone implements
12589:1–63 ceramic sherds, a fragment of a stone axe, flint and quartz implements and flakes, fragments of whetstones, bones implements, burnt bones
13887:98 ceramic sherds
15460:1–4 ceramic sherds, quartz implements, flint and quartz flakes
15461:1–4 ceramic sherds, quartz implements, flint and quartz flakes
15462:1–2 ceramic sherds, quartz flakes
16422:1–193 ceramic sherds, a stone axe and their fragments, a stone adze, a fragment of an ice pick, fragments of stone spearheads, fragments of flint arrowheads, a quartz arrowhead, a sinker, an iron mounts, fragments of stone implements, flint and quartz implements and flakes, a whetstone, burnt bones
30802:1–39 ceramic sherds, flint and quartz implements and flakes, fragments of stone implements, burnt bones
30978:1–228 ceramic sherds, an amber bead, a clay figurine, jewing resin, a flint arrow head, a miniature adze, flint and quartz implements and flakes, fragments of whetstones, a fragment of a stone implement, slate flakes, burnt clay, mica, asbestos, burnt bones
31502: not yet catalogued
The Museum of Central Finland KSM 641:1–3 ceramic sherds

Studies Meinander, C. F., excavation 1963 (no report)
Luho, V., excavation 1963 (no report)
Hirviluoto, A.-L., inspection 1962 (1963a)
Roine, L., survey 1964 (1964)
Jussila, T., survey 1996 (1997a)
Miettinen, M., trial excavation 1998 (no report yet)
Miettinen, M., trial excavation 1999 (no report yet)

Literature Meinander 1964b; 1976; Carpelan 1965; Miettinen, M. 2000

The dwelling site of Madeneva is situated on both sides of the railway line from Pihtipudas to Haapajärvi about 1.9 km km NNE of the Pihtipudas church. The local inhabitants also call the area by the Heinäjoki River Madeneva or Kanava. Ville Luho carried out excavations in the Ravirata, between the railroad and Lake Alvajärvi. C. F. Meinander excavated beside the small gravel pit on the western side of the Lake Alvajärvi (Hirviluoto 1963a). The soil type is sand, and pine grows throughout the area. The 800–900 m long zone, where the dwelling site material form clusters, gently slopes into the heath of Madeneva. Farmhouses have been present in the area, and after the 1960's, the flat pine ridge terraces have been used for the basement of roads and houses, and thus the dwelling sites are badly damaged.

Some difficulties arise in localizing Meinander's and Luho's excavation sites, and the names of these excavation places are also problematic. Archaeologists (Hirviluoto 1963a; Roine 1964) have connected Luho's excavation area to the Madeneva. In the catalogue maintained by the regional planning association, it has been separated into a site of its own. In this study, Karjalanmäki has been considered as a separate dwelling site. Mirja Miettinen has recently carried out trial excavations in the Madeneva with the purpose of locating Meinander's and Luho's excavation areas. According to Miettinen, Typical Combed Ware and Early Metal Period ceramics (Sär 2) have been found from the same terraces, in contrast to upper shore terraces, which may involve Mesolithic findings (Miettinen, pers. comm. 10.3.2000). Timo Sepänmaa has also carried out inspections in the area.

The great majority of the find material consists of Typical Combed Ware, but Late Comb Ware and asbestos-tempered ceramics, reminiscent of eastern Rhomb-Combed Ware also exists. Sherds from two vessels of Textile ceramics have been found. Furthermore, some sherds of Luukonsaari ceramics and undefined Early Metal Period pottery belong to the ceramic material. Recent excavation finds include a clay idol.

127. Pihtipudas [17] Säkkärämäki Virtala 2

Bsm 3312 08
x = 7032 67 y = 428 45 z = 115–117.5

Finds 3784:21 a quatz implement
3937:1–3 ceramic sherds, stone adzes
3938:2 a miniature adze
4147:1–4 ceramic sherds, a fragment of an adze, piece of slate
5278:1–4 ceramic sherds, a clay (antropomophic) idol, quartz flakes
5414:44–46 a fragment of a stone pick, a fragment of a rhomb-formed axe, a piece of stone
5663:2–3 ceramic sherds, a fragment of a whetstone
5921:1–10 ceramic sherds, a flint arrowhead and their fragments, a quartz arrowhead, a whetstone and its fragments, flint and quartz implements and flakes
16989:1 quartz flakes

Studies Schvindt, T., excavation 1900 (1900)
Ailio, J., excavation 1902 (1902)
Ailio, J., excavation 1911 (1911)
Roine, L., survey 1964 (1964)

Jussila, T., survey 1996 (1997a)
Vanhatalo, S., trial excavation 1997 (1998) (4 m²)

Literature Ailio 1909; Meinander 1964b; Miettinen, M. 2000

The dwelling site of Virtala 2 is situated on the eastern shore of Lake Kolima, on the cape between the Saanijoki River and the Heinäjoki River, about 1.5 km N of the Pihtipudas church. Theodor Schwindt conducted the first excavation at the site, and Julius Ailio continued field studies in 1902 and 1911. According to Meinander, the soil is a coarse moraine and is "not very suitable for habitation" (Meinander 1964b:34). The water level was 3–4 m higher than today during the Combed Ceramic period when the site was in use. Meinander considered the site an excellent base for fishermen (Meinander 1964b:34). The excavations, which were carried out around the main building of the Virtala farmhouse, unearthed possible dwelling pits. The majority of the ceramic finds belong to Typical Combed Ware and Late Combed Ware. Some sherds of Pöljä ceramics exist as well. Three vessels of Textile ceramics have been identified. According to Meinander, the most recent material at the site dates back to the end of the Bronze Age (Meinander 1964b:34–35).

128. Pihtipudas [22] Juntinniemi

Bsm 3312 03
x = 7037 60 y = 429 94 z = 115

Finds 15459:1–2 ceramic sherds, quartz flakes, a stone flake
27858:1–86 ceramic sherds, quart implements and flakes, flint flakes, fragments of stone implements, a whetstone and its fragments, iron ore, stone flakes, burnt bones, charcoal

Studies Hirviluoto, A.-L., inspection 1962 (1963b)
Miettinen, M., trial excavation 1993 (1994) (ca. 20 m²)
Jussila, T., survey 1996 (1997a)

Literature Miettinen, M. 2000

The dwelling site of Juntinniemi is situated about 7.2 km N of the Pihtipudas church by the NW shore of Lake Saanijärvi, close to the mouth of the Raudanjoki River. Anna-Liisa Hirviluoto conducted the first inspection at the site in 1962. She located a Lapp cairn with a depression at its centre. Hirviluoto dated the site still to the Stone Age. In 1993 Mirja Miettinen (2000:44) conducted a trial excavation and came to the conclusion that the site is relatively small. The excavation area is stoneless sand. Miettinen states that the stone structure, which Hirviluoto considered a cairn, was more probably a man-made pit. The ceramics includes except Typical Combed Ware also some sherds of Textile pottery.

129. Pihtipudas [49] Lylysaari

Bsm 3312 05
x = 7025 00 y = 3432 02 z = 113–115 m ASL

Finds 27856:1–13 ceramic sherds, an unfinished adze, quartz implements and flakes, a quartzite flake, a fragment of a whetstone, burnt bones
28367:1–85 ceramic sherds, an adze, a fragment of a flint arrowhead, fragments of stone implements, jewing resin, quartz implements and flakes, fragments of whetstones, red ocher, dental elamen, burnt bones, charcoal
28984:1–50 ceramic sherds, a stone axe, jewing resin, a fragment of a slate arrowhead, quartz implements and flakes, a whetstone, fragments of stone implements, a hammerstone, burnt clay, burnt bones

Studies Miettinen, M., inspection 1993 (1993)
Miettinen, M., trial excavation 1994 (1998)
Miettinen, M., trial excavation 1995 (1998)

Literature Miettinen, M. 1995; Miettinen, M. 2000

The dwelling site of Lylysaari is a small (1300 x 1000 m) island in the Lake Kolimajärvi, on the southern side of the Niemenharju Ridge. In the beginning of 1990's trees were mostly cut down and the soil was harrowed. The soil is sand. Because of harrowing, the possiblilities for observation were excellent (Miettinen 1993). From the furrow ceramics, quartz and burnt stones were found. No clear cultural layer was evident, but several terraces were observed. Some hunting pits were found below the most probable dwelling terrace. Charcoal was observed in the pits by making hand augerings. Another group of hunting pits is located about 300–400 from the aforementioned place. The latter pit differs from the former by its size. It had been in use as a tar pit.

6.11. Saarijärvi

130. Saarijärvi [29] Summassaari Saarenpää

Bsm 2244 07
x = 6951 60–85 y = 2568 95–69 01 z = 110–112 m ASL

Finds 13764:1–9 a stone adze, a stone axe and their fragments, a miniature adze, a whetstone, quartz implements and flakes, burnt bones
18068:1–3 a ceramic sherd, quartz implements and flakes
18766:1 ceramic sherds
23576:1–26 ceramic sherds, quartz implements and flakes, a whetstone, iron slag, a quartzite flake, burnt bones, an unburnt bone, roast
23702:1–124 ceramic sherds, fragments of iron artefacts, a round stone, a flint flake, quartz implements and their flakes, whetstones and their fragments, quartz implements and flakes, iron slag, slate flakes, burnt clay, roast, burnt bones
24339:1–23 ceramic sherds, quartz flakes, a fragment of whetstone, iron slag, burnt clay, burnt bones
29408:1–83 ceramic sherds, an iron implement, quartz implements and flakes, burnt clay, iron ore, burnt bones
The Museum of Saarijärvi 1402:2 an iron spearhead

Studies Luho, V., excavation 1948 (1949) (176 m²)
Luho, V., excavation 1949 (manuscript)
Luho, V. excavation 1959 (1959) (236 m²)
Huurre, M., survey 1969 (1996)
Vanhatalo, S., trial excavation 1979 (1980) (trial pits)
Sepänmaa, T., trial excavation 1986 (1987) (trial pits)
Sepänmaa, T., excavation 1987 (1988b)
Sepänmaa, T., excavation 1988 (1989) (28 m²)
Schulz, H.-P., survey 1993–1995 (1997)
Schulz, H.-P., excavation 1995 (1996c) (32 m²)

Literature Luho 1963; Huurre 1972; Schulz, H.-P. 1996d

The dwelling site of Saarenpää is situated on the island of Summassaari in Lake Saarijärvi. Summassaari is 2.4 km in length and 1.2 m in width. Ville Luho excavated a Mesolithic site at the SSW end of the island in 1948, 1949 and 1958. Simo Vanhatalo carried out a trial excavation at the site before its reconstruction as a "Stone Age Village" for turists. Matti Huurre during his survey found 9 dwelling sites from different periods. Age village in 1979. The results of Vanhatalo's trial excavation were negative. Timo Sepänmaa carried out a trial excavation in 1986 on the E side of Summassaari in the Saarenpää field and continued excavation studies in 1987. The most interesting find was the iron spearhead of K-type. In 1988 Sepänmaa excavated a cairn, which he did not interpret to be a grave. H.-P. Schulz (1997) hypothesised that the dwelling sites had been destroyed as a result of transgressions of Lake Summasjärvi.

With the exception of the Mesolithic material at the SSW end of the island, asbestos- and mica-tempered ceramics dates habitation there back to the Early Metal Period. Most ceramics found during Sepänmaa's excavation are Sär 2 ceramics of Luukonsaari type. Iron slag also belongs to the context of Luukonsaari ceramics. In addition, sherds from one Textile ceramic vessel were found.

131. Saarijärvi [36] Saarijärvi Voudinniemi

Bsm 2244 07
x = 6953 18–70 y = 2567 64–68 02 z = 111–119 m ASL

Finds 8079:1 an adze
9875:1 a shaft (bronze) from a steel strike-a-light
9949:1–27 a quartz arrowhead, quartz implements and flakes, a small horseshoe, burnt bones, charcoal
14537:176 quartz flakes
18070:1–8 flint fire-striking stones, quartz implements and flakes, burnt bones
28216:1–238, 241–1217 not yet catalogued
28216:239–240 not yet catalogued

Studies Äyräpää, A., trial excavation 1934 (1934a)
Huurre, M., survey 1969 (1996)
Miettinen, T., inspection 1981 (no report)
Schulz, H.-P., trial excavation 1993 (1994) (c. 150 m^2+pits)
Schulz, H.-P., survey 1993–1995 (1997)
Schulz, H.-P., field mapping 1994 (1996a)

Literature Äyräpää 1934b; Luho 1956; Schulz 1996d

The dwelling site complex of Voudinniemi is situated about 4 km SE of the Saarijärvi church. Nine separate dwelling clusters have been identified during excavations in 1993. The complex is situated on the slope of the ridge running NW to SE. The cape of Voudinniemi is a 300 m esker oriented to the SSE. The soil is mostly moraine, although fine sand also exists in many places. The topography of the cape is flat. Aarne Äyräpää carried out a trial excavation at the base of Cape Voudinniemi in 1934. Äyräpää located three small depressions, which he considered to be storage pits.

Later excavations have been carried out in 1–5, detailed belows. The list is based on the excavation report by H.-P. Schulz (Schulz 1994).

Area 1
x = 6953 19–25 y = 2567 99–68 01 y = 111–112 m ASL

The most important ancient monument at this site is the iron furnishing pit. Due to the cultural layer covering the pit, it seems very probable that the pit is prehistoric. Because no dateable material has been found at the site, an exact dating is not possible. Since the earliest iron smelting structures in Finland have dated back to the end of the Pre-Roman period, the pit may also be from that age.

Area 2
x = 6953 25–31 y = 2567 94–97 z = 112–114 m ASL

This dwelling site is situated by area 1 on a small terrace (60 x 20 m). A clear red cultural layer was found throughout the terrace. Microliths show that the site has been used during the Mesolithic period. Asbestos ceramics, on the other hand, date its use to the Early Metal Period.

Area 5
x = 6953 44–52 y = 2567 86–91 z = 116–117 m ASL

This dwelling site is thus far the richest known in Voudinniemi. The size of the site is 60 x 35 m. Five pits were identified, and their excavation revealed them to be pit hearths. Located at a depth of 20–30 cm were found a few burnt stones. Some microliths were found which – according to H.-P. Schulz – is consistent with Early Mesolithic habitation (Schulz 1994:14). Some sherds of Typical Combed Ware and Textile ceramics were also identified.

132. Saarijärvi [41] Pyhäjärvi Jänissaari

Bsm 2244 10
x = 6957 19–26 y = 570 43–52 z = 121–122.5 m ASL

Finds 8980:1–7 an half of a battle-axe, an iron arrowhead, an half of an adze, a slate spindle whorl, quartz implements and flakes
12238:1–2 a slate adze, quartz flakes
18083:1–3 ceramic sherds, quartz flakes, burnt bones
28692:1–131 ceramic sherds, a fragment of a leaf-shaped chert arrowhead, a leaf-shaped quartz arrowhead, flint implements and flakes, quartz implements and flakes, fragments of slate implements, iron slag, burnt bones, burnt clay

Studies Pälsi, S., inspection 1928 (1928)
Huurre, M., survey 1969 (1996)
Schulz, H.-P., trial excavation 1994 (1996b) (18 m^2)

The dwelling site is situated on the island of Jänissaari in Lake Pyhäjärvi, about 5 km NE of the Saarijärvi church. Jänissaari is a low stony island (120 x 100 m) in the Bay Koskilahti. Although stony, a field has existed, which is today a forest.

Sakari Pälsi first inspected the island in 1928, because half of a battle-axe had been found there. H.-P. Schulz excavated trial pits on the island and located a dwelling site about 70 x 30 m in size. Schulz interpreted the site as seasonal camp. According to find material, it had been used during the Stone Age, Early Metal Period and Iron Age (Schulz 1996b:24). He assumed that some stone settings and hearths were preserved below the ploughing and the silt layer. No further studies have been conducted on the site.

Two Textile ceramic sherds were found during the trial excavation. Other ceramics in the material is Typical Combed Ware, Luukonsaari ceramics and coarse Iron Age ceramics. In addition, some iron slag was found.

6.12. Virolahti

133. Virolahti [18] Ravijoki Niemistö

Bsm 3042 10
x = 6713 14 y = 532 32 z = 15–30 m ASL

Finds 17418:1–2 ceramic sherds, quartz flakes

Studies Koskimies, M., survey 1967 (1968b)

The dwelling site is situated about 6 km NNE of the Virolahti church, at an elevation of 20 m ASL, on the N side of the bay. There has been a small cape pointing to the S. Today, a road crosses the site, which has, however, remained in good condition. Its size is about 20 x 100 m. Mirja Koskimies found the site during her survey in 1967. No other studies have been conducted.

No ceramics other than Textile pottery have been found at the site. The identification of the ceramic sherds is slightly uncertain due to their small size.

7. THE RIVER KOKEMÄENJOKI WATER SYSTEM

7.1. Hauho

134. Hauho [40] Ilmola Lentolanmäki 7

Bsm 2132 09
x = 6791 38 y = 521 23 z = 96 m ASL

Finds 14264:1–8 ceramic sherds, a profiled ring nail, a fragment of a bronze nail, a fragment of a chain, burnt bones

Studies Keskitalo, O., inspection 1951 (1951)
Salmo, H., inspection 1955 (1955)
Keskitalo, O., excavation 1957 (1957)
Saukkonen, J., survey 1983 (1984)

Literature Nieminen, E.-L. 1980

The dwelling site and the Iron Age grave cairn are situated about 1.2 km N of the Ilmoila church. The site lies at the base of Cape Lentolankärki. Helmer Salmo inspected the site in 1955, and in 1957 Oiva Keskitalo carried out an excavation. Keskitalo excavated one cairn and part of burial cremation field. One Textile ceramic sherd was found in the cairn, on the SE side of the central stone. Some sherds of asbestos-tempered ceramics were also found. Keskitalo excavated ceramics from the lower part of the cultural layer, and stated that the sherds had been "placed to the site during the burial itself" (Saukkonen 1984:80–81).

No dwelling site from the same period has been found in the neighbouring regions thus far. Jyri Saukkonen proposed that the dwelling site might be located just below the cairn itself, because all the sherds were found in the cultural layer. Only a small number of ceramics were found from the burial ground, which lies only 35 m ESE of the cairn. The early finds in the burial ground were from the Roman Iron Age, the most recent from the Viking period (Keskitalo 1957:4–6).

The ceramics from Lentolanmäki (Lentolankärki) include Asbestos, Epineolithic, Kiukainen, Textile (14264:10, 48 59) and Luukonsaari ceramics. Eeva-Liisa Nieminen compared Textile ceramics found at the site with the material of Isosaari in Luopioinen (Nieminen 1980:140–143). Coarse Iron Age ceramics has also been found in Lentolanmäki.

7.2. Janakkala

135. Janakkala [21] Irjala Irjala

Bsm 2131 07
x = 6749 37 y = 2526 31 z = 64 m ASL

Finds 10897:1 ceramic sherds
11062:1–186 ceramic sherds, axes, adzes and their fragments, fragments of stone implements, flint and quartz implements and flakes, whetstones and their fragments, hammerstones, burnt bones, charcoal
11062:187–283 ceramic sherds, a gouged adze, stone axes, fragments of stone implements, quartz implements and flakes, a whetstone, burnt bones
20538:1–5 ceramic sherds, piece of a stone implement, quartz flakes (missing in the catalogue)
22703:1–2 quartz flakes, burnt bones

Studies Pälsi, S., inspection 1938 (no report)
Salmo, H., excavation 1939 (1939) (140 m^2)
Keskitalo, O., excavation 1939 (1939) (43 m^2)
Boström, B., survey 1942 (1943)
Saukkonen, J., survey 1984 (1986)

Literature Meinander 1954b

The dwelling site of Irjala is situated about 8 km SW of the Janakkala church on the lower part of a sandy field, along the southern shore of Lake Haapajärvi. Shore displacement dating for the terraces in Irjala was possible. The lowest terrace today lies 1.5 m above the water level in Lake Haapajärvi. Helmer Salmo carried out an excavation at the site in June 1939, and Oiva Keskitalo continued fieldwork in August of the same year. According to Jyri Saukkonen, who surveyed the parish of Janakkala in 1984, the borders and the size of the site are unknown (Saukkonen 1986:70). The find material is consistent with Stone Age, Early Metal Period and Iron Age habitation.

Helmer Salmo excavated 14 fireplaces, which were either thick (more than one stone layer) or thin (one stone layer). The latter were large and contained no ceramic sherds. Otherwise, ceramics were found throughout the excavation area (Salmo 1939). Oiva Keskitalo's excavation report does not describe the excavation in detail; instead, the finds and their relative positions in the excavation area are liberally discussed. The existence of several fireplaces was recorded (Keskitalo 1939).

Habitation at Irjala began during the Early Combed Ware and continued through the periods of Typical Combed Ware and Late Combed Ware into the Early Metal Period. Four Textile ceramic vessels have been identified. It is interesting that Intermediate zone ceramics are also contained within the material. Furthermore, Epineolithic ceramics – most probably of Morby type – are present.

7.3. Kangasala

The dwelling site complex of Sarsa

The dwelling site complex of Sarsa includes ten separate dwelling sites (which include Textile ceramics) by the ancient Sarsankoski River (see Nurminen 1994). Some of these can be combined into clusters. The complex is situated on the narrow ridge between Lake Vesijärvi, Lake Längelmävesi and Lake Roine. In 1604 a local catastrophe took place in the water system, with the resultant formation of Kostianvirta channel from Pälkänevesi to Mallasvesi. The water level abruptly fell 3 m, and the direction of the water flow reversed. Another catastrophe occurred when a channel, which was intended to connect Lake Längelmävesi and Lake Roine, was dug. The water level of Lake Längelmävesi quickly regressed to the elevation of the water level of Lake Roine, thus producing a change from 89 m ASL to 84 m ASL. Consequently, the Sarsankoski Rapids dried.

All dwelling sites by the ancient Sarsankoski River are situated at an elevation of 88–90 m ASL. The richest dwelling sites are situated in a circle of about 800 m in diameter. Dwelling sites have been excavated between the 1920's and 1970's. The excavated area today covers an area of 1200 m^2. Habitation in the area began already during the Mesolithic.

136. Kangasala [3b] Huutijärvi Autio-Lunden

Bsm 2141 02
x = 6816 02 y = 506 32 z = 89–90 m ASL

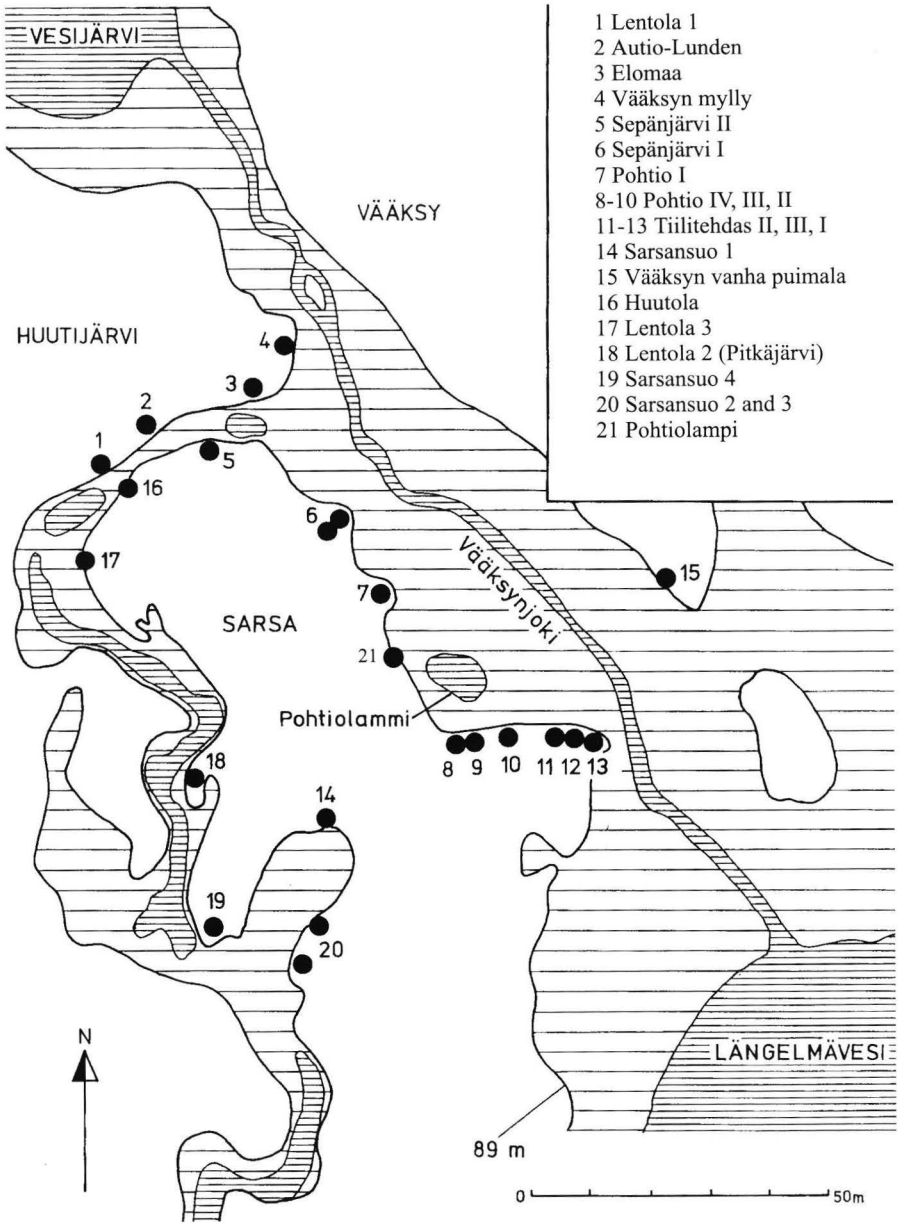
Finds 13433:1–116, 192–193 flint and quartz implements and flakes, a slate spearhead, an adze, a brass button, a piece of fused brass, a fragment of a chalk pipe, a fragment of a metal ferrule, steels from a flint and steel, a fragment of an iron knife, a whetstone, adzes, teeth and burnt bones
18002:306–307 a quartz implement and flakes
18173:1–3 quartz slakes
19263:1–620 ceramic sherds, a copper coin, an iron knife, fragments of iron objects, a fragment of flint arrowhead, a fragment of a slate arrowhead, stone adzes, an unfinished stone axe, flint and quartz and quartzite implements and flakes, a pendant whetstone, whetstones, schist implements and their fragments, iron slag, teeth and their fragments, tinder flint, burnt clay, a faience pearl, bowls of chalk pipes, fragments of chalk pipes, soapstone, tile fragments, a hammerstone, burnt bones

Studies Meinander, C. F., excavation 1954 (1954c) (128 m^2)
Hirviluoto, A.-L., inspection 1969 (no report)
Koskimies, M., survey 1971 (1971)
Koskimies, M., excavation 1972 (no report)
Nurminen, T., survey 1993 (1994)

Literature Meinander 1954b; Salo, U. 1981

The dwelling site of Autio-Lunden is situated about 500 m E of the chapel of the Kangasala graveyard. Autio-Lunden, like all other dwelling sites with Textile ceramics in Kangasala Sarsa, is close to the ancient bed of the Sarsankoski River, about 2.6 km SE of the Kangasala church. The remains of prehistoric habitation have been found on both sides of the crossing of the Orivesi and Sahalahti roads. The site has been partly destroyed by road construction. The site has also been called Sepänjärvi III (Koskimies).

C. F. Meinander excavated four hearths at the site. Two of them were made of small stones the others were set up by flat stone slabs. The material consists of prehistoric and recent finds. Ceramics from the historical era are also present. Textile ceramics are the earliest ceramic type found at the site. Sherds from three vessels have been identified. Mirja Koskimies conducted a survey and an excavation at dwelling site in 1972.



7. Sarsa dwelling site complex in Kangasala. Map published by Unto Salo 1981:107 (kuva 51). Modified by Mika Lavento.

137. Kangasala [3d] Huutijärvi Sepänjärvi II

Bsm 2141 02
x = 6816 02 y = 506 40 z = 90 m ASL

Finds 13433:117–122 quartz flakes
18002:1–305 ceramic sherds, quartz implements and flakes, fragments of slate implements, stone flakes, burnt bones

Studies Meinander, C. F., trial excavation 1954 (1954c)
Koskimies, M., excavation 1969 (1969) (106 m^2)
Koskimies, M., survey 1971 (1971b)
Nurminen, T., survey 1993 (1994)

Literature Salo 1981

The dwelling site of Sepänjärvi II is situated on the E side of the Sahalahti Road. It lies within a small forest about 2.5 km SE of the Kangasala church, and about 600 m E of the chapel of the Kangasala graveyard, on the SE side of Orivesi – Sahalahti crossroads. Today a small forest exists on the S side of Sahalahdentie Road, between the main building of Autio and a field.

In 1969 Mirja Koskimies continued the excavation originally launched in 1954 by C. F. Meinander. The 1969 studies were salvage excavations made prior to road building. No clear structures were observed during the fieldwork, but the area of the site was defined. Meinander had found only quartz from his trial ditches. Koskimies also dug trial pits in the area to obtain information about the dwelling site remains in such places where road construction was scheduled to occur.

Corded Ware and some sherds of Typical Combed Ware were found (Koskimies 1969:3–4). Remains of 16 vessels of Textile ceramics (or Sarsa ceramics) were identified, in addition to some sherds from undefined Early Metal Period ceramics.

138. Kangasala [4a] Vääksy Pohtio I

Bsm 2141 02
x = 6815 80 y = 506 72 z = 88 m ASL

Finds 7746:1–8 ceramic sherds, adzes, a sinker, adzes, whetstones, a slate knife
7757:1–59 ceramic sherds, fragments of arrowhead, axes and their fragments, adzes and their fragments, a fragment of a stone spearhead, hammerstones, whetstones, quartz implements and flakes, red ocher, burnt bones
7964:73–169 ceramic sherds, axes and their fragments, an unfinished stone spearhead, adzes, a flint arrowhead, a miniature adze, a slate arrowhead and their fragments,

flint flakes, a whetstone and their fragments, sinkers, fragments of stone implements, weights, unfinished perforated stones, a hammerstone, fragments of bones implements, burnt bones
8220:1–29 ceramic sherds, an adze, a flint implement, quartz implements and flakes, slate implements and their fragments, burnt bones
11102:1–4 ceramic sherds, quartz flakes, a whetstone, burnt bones
13433:123–191 ceramic sherds, a flint arrowhead, a slate arrowhead, adzes and their fragments, flint and quartz implements and flakes, fragments of stone implements, a sinker, whetstones, burnt bones
17921:8–9 ceramic sherds, quartz flakes
32000:577–829 ceramic sherds, quartz implements and flakes, slate flakes

Studies Pälsi, S., excavation 1920 (1923)
Pälsi, S., excavation 1921 (1923)
Pälsi, S., excavation 1923 (1923)
Luho, V., survey 1939 (1939)
Meinander, C. F., excavation 1954 (1954c) (48 m²)
Hirviluoto, A.-L., inspection 1965 (1965)
Koskimies, M., survey 1971 (1971a)
Nurminen, T., 1993 (1994)
Schulz, E.-L. 1999 (2000)

Literature Pälsi 1923; Meinander 1954b; Koskimies 1968; Huurre 1991b; Luho 1949; Salo 1981; Vikkula 1987; Schulz 1999

The dwelling site of Pohtio I is situated some 400 m SSE of the Autio dwelling site and about 3 km SE of the Kangasala church. The area is a sandy slope, where shore terraces are quite visible. This site was the first known dwelling site in Sarsa, perhaps because of its location by a gravel pit. There is a path to the dwelling site area – with a sign made by the National Board of Antiquities – where the ancient monuments of the site are briefly presented.

Sakari Pälsi carried out the first excavations at the site in the beginning of the 1920's. His excavations comprised altogether 152 m² over three summers. C. F. Meinander conducted his studies in the vicinity of the excavation areas already opened by Pälsi. During these excavations Meinander found nine hearths, and two terraces. Pälsi noted two broken hearths on the lower terrace and drew the conclusion that the terrace and the dwelling site might have been flooded.

The ceramic material at Pohtio I involves types from Ka I 1 to Early Metal Period. It is, however, striking that Typical Combed Ware is represented by only one vessel. There is abundant Late Combed Ware in the material. Also interesting is the existence of Pyheensilta ceramics (Vikkula 1987:101). One arrowhead of Pyheensilta type has also been found. The amount of Textile ceramics at the site is relatively large – sherds from 16 vessels have been identified. Some sherds of undefined Early Metal Period ceramics are also present.

139. Kangasala [4b] Vääksy Pohtio II

Bsm 2141 02
x = 6815 56 y = 506 96 z = 88 m ASL

Finds 16680:1–17 ceramic sherds, a whetstone, burnt bones
16878:1–574 ceramic sherds, adzes and their fragments, slate arrowheads and their fragments, a slate spearhead and their fragments, a slate pendant, stone implements and their fragments, flint and quartz implements and flakes, burnt bones, charcoal
17921:10–20 (Pohtio II–IV) ceramic sherds, an unfinished stone axe, quartz implements and flakes, a burnt bones
19864:1–17 (Pohtio II–IV) ceramic sherds, a fragment of a stone implement, quartz implements and flakes, slate flakes, burnt bones
20609:1 (Pohtio II–IV) 1–2 ceramic sherds, quartz flakes

Studies Koskimies, M., excavation 1965 (1966) (130 m²)
Koskimies, M., survey 1971 (1971a)
Nurminen, T., survey 1993 (1994)

Literature Huurre 1991b; Salo 1981

The dwelling sites of Pohtio II; III and IV are located very close to each other. The dwelling site cluster is situated about 1.2 km SEE of the chapel of the Kangasala graveyard. Teija Nurminen (1994), who carried out the general survey in Kangasala in 1993, put all these sites together. In this work, they have been considered as separate, to aid in the understanding of the spatial distribution of the material. Today, all the sites in Pohtio are situated in a field, with Pohtio II situated on the E side and Pohtio IV on the W. Because the accurate location of the different sites is difficult to establish, the same coordinates have been given for Pohtio II, III and IV.

In 1965 Mirja Koskimies excavated at the site of Pohtio II, and unearthed three unbroken and one broken hearth. All were round and their diameters were 100–125 cm. Most stones were very badly burnt. Although the cultural layer was partly destroyed by the clearing of the field, it was still thick, and strongly coloured, and a large number of finds were excavated. Most finds from the site were quartz, but ceramics were also found abundantly. All main types of Combed Ware are represented, but Textile ceramics and asbestos-tempered ceramics were also found in considerable numbers. Altogether 11 Textile ceramic vessels were identified. Corded Ware and undefined Early Metal Period ceramics as well as one vessel of Intermediate zone ceramics have been found.

140. Kangasala [4b] Vääksy Pohtio III

Bsm 2141 02
x = 6815 56 y = 506 96 z = 88 m ASL

Finds 17104:1–1002 ceramic sherds, axes, adzes, fragments of clay idols, an amber artefact and its fragments, flint and quartz arrowheads and their fragments, slate arrowheads, fragments of slate spearhead, slate rings, flint and quartz implements and their fragments, whetstones and their fragments, fragments of stone implement, a fragment of a bone point, iron slag, iron ocher, turmaline, burnt clay, burnt bones, charcoal

Studies Koskimies, M., excavation 1966 (1967) (188 m²)
Koskimies, M., survey 1971 (1971a)
Nurminen, T., survey 1993 (1994)

Literature Huurre 1991b; Salo 1981

The dwelling site of Pohtio III is situated close to the Pohtio IV dwelling site. The excavation area was mostly on the upper terrace, but also partly between the upper and lower terraces. Four hearths were unearthed during the excavation. The largest one had a diameter of over 2 m. The second largest was rectangular and the remaining two were small and dispersed. The number of ceramic finds was considerable; a total of 6174 sherds were identified. Only one piece of iron slag was present. Flint implements or their fragments were also found abundantly (253). One of the clay idols (25 fragments altogether) was so well preserved that it was easy to reconstruct (Koskimies 1967:8).

A total of over 200 ceramic vessels have been isolated from the material of Pohtio III. The majority of ceramics are either Typical Combed Ware or Late Combed Ware. Some vessels of Early Combed Ware also exist. Several Corded Ware vessels have been distinguished. Six vessels of Textile ceramics have been identified. Intermediate zone ceramics together with undefined Epineolithic ceramics are also present.

141. Kangasala [4b] Vääksy Pohtio IV

Bsm 2141 02
x = 6815 56 y = 506 96 z = 88 m ASL

Finds 17340:1–1157 ceramic sherds, flint and quartz arrowheads, antropomorphic clay idols, a slate point, a slate pendant, adzes, slate spearheads and their fragments, fragments of stone implements, flint and quartz implements and flakes, burnt clay, red ocher, quartzite implements, whetstones and their fragments, iron slag, fragments of bones artefact, burnt bones
18464:1–8 ceramic sherds, quartz implements and sherds, fragments of stone implements, burnt bones
20684:1 a stone with a hole

Studies Koskimies, M., excavation 1967 (1968a) (170 m^2)
Koskimies, M., survey 1971 (1971a)
Nurminen, T., survey 1993 (1994)

Literature Huurre 1991b; Salo 1981

The dwelling site of Pohtio IV is situated about 300 m SSE of the Pohtio I dwelling site, close to the Pohtio III dwelling site. Mirja Koskimies carried out an excavation at the site in 1967, and uncovered two terraces, on which one hearth and two cultural pits were found. The hearth was large (180 cm in diameter). Over 15 000 ceramic sherds were found in addition to 27 fragments of clay figurines. An interesting find was a nutshell (*Córylus avellána*). (Koskimies 1968a:5–6.)

The ceramic material at Pohtio IV is rich, involving ceramic types from Ka I 1 to Early Metal Period ceramics. Neolithic ceramics comprised Ka I 1, Ka II, Ka III, Pyheensilta ceramics, and Corded Ware. The amount of Textile ceramics at the site is relatively large – sherds from 20 vessels have been identified. Intermediate zone, Morby ceramics and undefined Early Metal Period ceramics are also included. Iron slag cannot be connected with any definite period.

142. Kangasala [4c] Vääksy Tiilitehdas I

Bsm 2141 02
x = 6815 54 y = 507 08 z = 88 m ASL

Finds 7964:1–72 ceramic sherds, an adze and their fragments, a slate fragment of a fishhook, a half of a perforated stone, fragments of stone implements, hammerstones, quartz implements and flakes, burnt bones, charcoal
11101:1–3 ceramic sherds, quartz flakes, burnt bones
18464:9–10 (Tiilitehdas I, II and III) quartz flakes, a bead of a chalk pipe

Studies Pälsi, S., excavation 1921 (1923) (100 m^2)
Koskimies, M., survey 1971 (1971a)
Nurminen, T., survey 1993 (1994)

Literature Huurre 1991b; Luho 1949; Salo 1981

The dwelling sites of Tiilitehdas I, II and III belong to a cluster; the exact location of the separate sites is difficult to establish. The cluster is situated about 1.4 km SEE of the chapel of the Kangasala graveyard. Also in this case, all sites have been given the same coordinates. Sites are presented, however, as separate for the reasons already presented for the sites of Pohtio. Today, the dwellings sites are all situated on a cultivated field.

Sakari Pälsi began excavatios at the site in 1921 uncovering one 275 x 240 cm partly destroyed hearth and some small patches of soot, which he interpreted as postholes. Although the excavation material is not very large, its diversity is great. The earliest ceramics are Early Combed Ware. The majority of the ceramics belong to the Typical Combed Ware. A small amount of Corded Ware and Morby ceramics also exist. Ten vessels of Textile ceramics have been identified along with some ceramic sherds which might belong to the Sär 2 family.

143. Kangasala [4c] Vääksy Tiilitehdas II

Bsm 2141 02
x = 6815 54 y = 507 08 z = 88 m ASL

Finds 16854:1–244 ceramic sherds, a fragment of a quartz arrowhead, quartz implements and flakes, burnt bones, fragments of stone implements, a piece of iron
20609:1–2 (between Tiilitehdas II and III) ceramic sherds, quartz flakes

Studies Hirviluoto, A.-L., inspection 1965 (1965)
Koskimies, M., excavation 1965 (1966) (157 m^2)
Koskimies, M., survey 1971 (1971a)
Nurminen, T., survey 1993 (1994)

Literature Salo 1981

The dwelling site of Tiilitehdas II is situated about 100 m E of the Pohtio II dwelling site. Mirja Miettinen excavated in 1965 between the upper and lower terraces. Only one stone setting was found. The excavations resumed rapidly after A.-L. Hirviluoto discovered that a bulldozer was at work filling the ground on the S and SE sides of the Pohtionlampi Pond. The "clearance" was stopped and an excavation launched. Unfortunately, over half of the potential dwelling site area was already destroyed as a result of bulldozing. Koskimies (1966) was able to locate Pälsi's excavation place, Tiilitehdas I, at about 60 m E of the Tiilitehdas II site. Koskimies assumed that the area between Tiilitehdas II and Pohtio II was also inhabited, although she was unable to verify this in trial excavations.

A total of 877 ceramic sherds were found during the excavations. According to Koskimies, the ceramics can be divided in to three groups: 1) Ka I, 2) Ka II 2 and III, 3) sherds which are problematic to define. Only one sherd has a textile-impression. The third group is formed by a minority of the ceramics.(Koskimies 1966:2–4.)

144. Kangasala [4c] Vääksy Tiilitehdas III

Bsm 2141 02
x = 6815 82 y = 506 74 z = 90 m ASL

Finds 17103:1–111 ceramic sherds, quartz implements and flakes, fragments of stone implements, a fragment of a whetstone, burnt bones

Studies Koskimies, M., excavation 1966 (1967) (92 m^2)
Koskimies, M., survey 1971 (1971a)
Nurminen, T., survey 1993 (1994)

The dwelling site is situated on the W side of an old brick works, close to the other excavation sites of Tiilitehdas. Mirja Koskimies excavated at the site in 1966, mostly between the terraces. No remains of stone settings were observed, but stones were scattered over the excavation area. This is in accord with a disturbed cultural layer. Conspicuously, only one flint flake exists in the material. A great deal of burnt bones was also found.

The ceramic material comprises Early Combed Ware, Typical Combed Ware and Late Combed Ware. Corded Ware is consistent within the material. Two Textile ceramic vessels have been identified.

145. Kangasala [6] Vääksy Sepänjärvi I

Bsm 2141 02
x = 6815 90 y = 506 62 z = 90–95 m ASL

Finds 8220:30–38 ceramic sherds, quartz implements and flakes, a base of a slate spearhead, whetstone and their fragments, fragments of stone implements, burnt bones
9604:1–91 ceramic sherds, a piece of copper, axes and their fragments, fragments of spearheads, adzes and their fragments, a miniature adze, flint and quartz flakes, whetstones and their fragments, slate knives, fragments of stone implements, a piece of copper, a tooth, burnt bones

11091:1–2 a stone arrowhead, an axe
17918:1–5 flakes of stones, burnt clay, a quartz implements and flakes, a bones implement

Studies Pälsi, S., excavation 1921 (1923)
Pälsi, S., excavation 1923 (1923)
Pälsi, S., excavation 1932 (1933) (60 m²)
Luho, V., survey 1939 (1939)
Koskimies, M., survey 1971 (1971a)
Nurminen, T., survey 1993 (1994)
Schulz, E.-L. 1999 (2000)

Literature Huurre 1991b; Luho 1949; Salo 1981; Schulz 1999

The dwelling site of Sepänjärvi I is situated about 600 m E of the chapel of the Kangasala graveyard, and 300 m SSE of the Autio site. The environment is a sandy slope with growing pines. Ancient shore terraces are visible because the area has been cleared. The National Board of Antiquities has built a path with an information board at the site.

Sakari Pälsi began excavations at the site in 1921. He continued the studies in 1923 as a trial excavation. In 1932 Pälsi excavated an area of ca. 60 m². Six hearths were found. A small piece of copper was found by one hearth, and it is possible that the hearths and the copper object are from the same period.

Typical Combed Ware represents the majority of ceramics at the site with Corded Ware also being present. Sixteen Textile ceramic vessels and some sherds of undefined Early Metal Period pottery also exist.

146. Kangasala [4d] Vääksy Pohtiolampi

Bsm 2141 02
x = 6815 58–92 y = 506 64–84 z = 87–96 m ASL

Finds 32000:1–576 ceramic shers, a fragment of a clay idol, a fragment of a stone axe, a quartz arrow head, quartz implements and flakes, fragments of whetstones, a hammerstone, burnt clay, burnt bones

Studies Schulz, E.-L. 1999 (2000)

The dwelling site of Pohtiolampi is situated between sites Pohtio I and Pohtio II–IV on the W and SW side of the Pond Pohtiolampi. Before season 1999 no archaeological studies were carried out in this area. Soil is stoneless sand. A shore terrace is clearly visible in the area. The site is in the forest growing mostly pine, although the thick undervegetation gives an impression about grove.

Eeva-Liisa Schuz conducted the first archaeological studies in the area in 1999. A large trial excavation was carried out by digging only trial pits in 10 m intervals. The trial excavation proved that the settlement area continues without break in the area between Pohtio I and Pohtio II–IV, and between Pohtio I and Sepänjärvi. Also the dwelling depression was excavated. The find material dates it to the Bronze Age (Schulz 2000:14) which is extremely interesting observation. The ceramic material implies mainly Textile ceramics. Unfortunately, only a rough investigation has been possible made with this material. The ceramic material includes Early Comberd Ware and Textile ceramics.

147. Kangasala [24] Tiihala Vehoniemenharju 2

Bsm 2141 02
x = 6811 06 y = 508 50 z = 85–90 m ASL

Finds 28081:1–4 a ceramic sherd, quartz flakes, burnt clay, slag

Studies Nurminen, T., survey 1993 (1994)

The dwelling site of Vehoniemenharju 2 is situated about 7.6 km SE of the Kangasala church by Lake Roine, about 100 m SW of the car museum of Vehoniemi. Located during a survey, this site lies on the Vehoniemenharju esker. Two trial pits were excavated, uncovering a stone layer, which was not – according to surveyors – a hearth (Nurminen 1994:80–81). The function of the stone layer remained obscure during the survey, and no later studies have been carried out at the site. The ceramics have a very faint textile-impression on their surface.

7.4. Loppi

148. Loppi [15] Sajaniemi Kavettula

Bsm 2042 09
x = 6730 57 y = 2526 27 z = 111 m ASL

Finds 21716:1–4 a ceramic sherd

Studies Saukkonen, J., survey 1982 (1983)

The dwelling site of Kavettula is situated on the eastern shore of Lake Loppijärvi, about 4.5 km SE of the Loppi church. The find place is situated on a low hill sloping gently to the lake in the SW, between the shore and the Kavettulanmäki Hill. The soil is sand. Jyri Saukkonen found the site during his survey. No other studies have been conducted.

Ceramic sherds from only one vessel have been found. These ceramics are most probably Textile ceramics.

149. Loppi [76] Salo Kuitikas

Bsm 2042 06
x = 6736 50–64 y = 2510 07–15 z = 115 m ASL

Finds 21728:1–11 ceramic sherds, iron slag, quartz implements and flakes, stone flakes, burnt clay, burnt bones
23083:1–16 ceramic sherds, flint, a fragment of stone implement, a quartz implement and flakes, burnt bones
23132:1–5 a flint flake, quartz implements and flakes, burnt bones

Studies Saukkonen, J., survey 1982 (1983)
Jussila, T., inspection 1984 (no report)

The dwelling site of Kuitikas is situated about 13 km W of the Loppi church, along the E shore of Lake Kaartjärvi, at the base of the bay of Kuitikkaanlahti. Finds have been unearthed from the SE corner of the field about 400–450 m SSE of the Riihisalo manor. The Iron Age dwelling site of Salo is situated only 200 m NNE of Kuitikas. The soil is topsoil, which is very favourable for cultivation. The topography is relatively flat, but the area of the dwelling site is somewhat less close to the shore. The site lies near the road from Topeno to Pilpala. Jyri Saukkonen found the site during his survey 1984.

The scarce ceramic material of the Kuitikas dwelling site consists of Textile ceramics and Morby ceramics. There are probably also some sherds from the Late Neolithic period.

7.5. Luopioinen

150. Luopioinen [15] Hietaniemi Hietaniemenkärki (Hietasenkärki)

Bsm 2143 01
x = 6805 70 y = 541 05 z = 90 m ASL

Finds 16356:1–602 ceramic sherds, an anthropomorphic clay figure and their fragments, amber pendants, a slate spearhead and their fragments, adzes and their fragments, an unfinished stone axe and their fragments, flint and quartz implements and flakes, quartzite implements, a sinker, an unfinished perforated stone, hammerstones, fragments of stone implements, quartzite implements, a slate kife, slate flakes, red ocher, soapstone, burnt bones, a tooth, charcoal
16057:1–29 ceramic sherds, amber, an adze, fragments of slate implements, flint flakes, quartz implements and flakes, burnt bones
16822:1–1834 ceramic sherds, clay idols and their fragments, fragments of amber ornament, adzes and their fragments, a flint knife, flint arrowheads and their fragments, a slate arrowhead and their fragments, quartz

arrowheads, flint and quartz implements and flakes, a fragment of a clay figure, a sinker, whetstones and their fragments, hammerstones, burnt clay, turmaline, a quartzite implement and flakes, slate implements and flakes, red ocher, teeth, burnt bones, charcoal
17131:1–1512 ceramic sherds, fragments of antropomorphic and animal clay idols, fragments of amber artefacts, unfinished and fragments of flint arrowheads, quartzite arrowheads, quartz arrowheads, an axe, adzes and their fragments, flint and quartz implements and flakes, a burnt clay disk, hammerstones, a burnt clay disk, whetstones and their fragments, fragments of stone implements, a tooth, burnt clay, red ocher, fragments of bones implements, burnt bones

Studies Miettinen, T. & Miettinen, P., survey 1963 (1963)
Miettinen, T., excavation 1964 (1967) (62 m²)
Miettinen, T., excavation 1965 (1967) (116 m²)
Miettinen, T., excavation 1966 (1967) (100 m²)

Literature Miettinen, T. 1964; Miettinen, T. 1975

The site is situated on a sandy slope about 6 km E of the Luopioinen church. The cape of Hietaniemi is an approximately 60 m sand terrace, ca. 2–3 m above the water level of Lake Kukkianjärvi, and oriented to the SW. The dwelling site is at the base of the cape, on its SE side. This site is large and rich in finds.

The dwelling site was found in the 1963 general survey of the Luopioinen parish by T. and P. Miettinen. In 1964 the site was in danger of being destroyed due to the hauling of gravel from the pit. Salvage excavations were conducted since 1964 over four seasons. The first three excavations were led by Timo Miettinen, and the last one in 1967 by Pekka Miettinen. An amber pendant was found together with a flint arrowhead. The site is known to Finnish archaeologists primarily for its idols (Miettinen, T. 1964; 1975).

According to T. Miettinen (1975:24) 34 881 ceramic sherds are contained within the material. Most Finnish prehistorical ceramic styles are present. Early and Typical Combed Ware exist in addition to some Late Combed Ware. Miettinen believes that Corded Ware also belongs to the material, although only one sherd has been identified. He has calculated the proportions of different ceramic types occurring, and according to him, 400 sherds (6.7 %) of Textile ceramics are present. Miettinen has also discerned a new type, a fabric-impressed Textile ceramics (kangaspainanteinen tekstiilikeramiikka), in the material.[13] Miettinen has identified the existence of five Textile ceramic vessels. I believe this number to be larger – a total of 26 vessels including the new variant. Miettinen has, however, used only a portion of the material (6000 sherds) in his calculations. Furthermore, present in Miettinen's list (Miettinen 1975:25) is one additional group, "Hatched-faced asbestos-ceramics", which is very similar to Textile ceramics. I have also identified Sirnihta ceramics, undefined Sär 2 ceramics, and even some sherds of Morby ceramics and Intermediate zone ceramics in the material.

The ceramic material of Hietaniemi is very large and its careful analysis would require a great deal of time. Thus, my observations – concerning primarily ceramics other than Textile ceramics – should be considered only as preliminary.

[13] Although it has not been mentioned in the text these ceramics might be related to Textile ceramics, as well as Carpelan's Intermediate zone ceramics. Miettinen compares these ceramics with the sherds found at Koivistosveden in Kirkkonummi and Ruoksmaa in Askola. He also notes that textile-impression exists in Corded Ware as well (Miettinen 1975:31, 130).

151. Luopioinen [21] Saksala Isosaari

Bsm 2132 12
x = 6799 18 y = 537 25 z = 90 m ASL

Finds 12883:1–6 ceramic sherds, an adze, quartzite flakes, burnt bones
12884:1–7 ceramic sherds, a fragment of slate spearhead, quartzite flakes, burnt bones
13407:1–124 ceramic sherds, a stone axe, a stone pendant, a stone adze, a perforated stone, a fragment of a slate arrowhead, fragments of stone implements, flint and quartz implements and flakes, burnt bones
15093:1 a straight-bladed axe

Studies Arpo, R., "excavation" 1954 (no report)
Miettinen, T. & Miettinen, P., survey 1963 (1963)

Literature Edgren 1970

The dwelling site is situated about 7 km SE of the Luopioinen church. The find locations lie on the SW end of Isosaari Island in the S end of Lake Kukkiajärvi. Small sand pits exist at the site, where the first finds were uncovered simply by digging the sand. A cultural layer was also observed. The finds were found in 1954 by Kyllikki and Robert Arpo. Robert Arpo carried out a small excavation at the site.

Both Neolithic and Early Metal Period ceramics have been found on Isosaari. Neolithic ceramics include Ka II, Ka III and Corded Ware. According to C. Carpelan, some ceramic sherds, which could be classified as Intermediate zone ceramics are also present (pers. comm. 12.11.1996). Only one Textile ceramic vessel has been identified. Iron Age ceramics has also been found.

7.6. Nakkila

152. Nakkila [15b] Soinila Kaasanmäki I (Jaakkola)

Bsm 1143 04
x = 6801 96 y = 554 83 z = 25 m ASL

Finds 5104:1–20 ceramic sherds, a small golden plate, a tin plate, burnt clay, burnt bones, charcoal
The Satakunta Provincial Museum (SatM) 16545

Studies Tallgren, A. M., excavation 1908 (1908)
Salo, U., survey 1952 (1952)
Kauhanen, I., inspection 1967 (1967)
Tuovinen, T. 1985, inspection (no report)
Jäkärä, T., inspection 1999 (1999)

Literature Meinander 1954b; Salo & Lahtiperä 1970; Salo 1981

The cairn complex of Kaasanmäki is situated about 5.7 km S of the Nakkila church. The cairns lie on a ridge which is partly destroyed by a gravel pit. The area comprises a gently descending low hill between the borders of the Nakkila and Harjavalta parishes. Prehistoric remains have been found in two areas designated Kaasanmäki I and II. The distance between these two distinct areas is about 600 m.

According to Salo (1970:18–20), Kaasanmäki I is about 400 m long and 200 m wide. Altogether 34 cairns have been found, the majority above an elevation of 25 m ASL. Most of the cairns are relatively small, not exceeding 5 m in diameter. A. M. Tallgren excavated cairn 1 in 1908. He found a circular structure with an eye-stone in the middle of the cairn. He was also able to discern a cultural layer below it, which most probably belonged to a dwelling site. The cairn was about 14.5 m in diameter and its height was 1.8 m. Finds consisted of burnt bones and ceramic sherds. The most interesting find was, however, a small golden plate. Tallgren also excavated cairn 2. He considered the filling soil here as a "cultural layer" (Tallgren 1908). This layer was, however, mixed and is very likely in a secondary position.

The site has two periods of use, of which the first is related to a dwelling site and the later one to the cairns. On the basis of shore displacement, Salo dates the beginning of the settlement back to the latter half of the Bronze Age. The cairn very probably belongs to the V Scandinavian period of the Bronze Age (Salo 1981:52). Meinander (1954b:28) and Salo state that the ceramics from the "culture layer"

have a textile-impression on their surface (Salo 1981:314). Since I have not been able the see the finds, I cannot exclude the possibility that the sherds belong to some group other than Textile ceramics.

Kaasanmäki II is especially known for the Seima type of bronze axe (SatM 16 545:1), which was found in 1962 during gravel digging. Isto Kauhanen carried out a small excavation at the site in 1967, but the dwelling site layer was already mostly destroyed before the studies (Salo 1970:21–22).

153. Nakkila [35] Arola Rieskaronmäki (Tollukkaanperä or Himmelisuulinmäki)

Bsm 1143 05
x = 6812 62–70 y = 555 96–556 11 z = 30 m ASL

Finds The Satakunta Provincial Museum (SatM) 16454:1–132 ceramic sherds, a fragment of a casting mould and a crucible(?), a bronze bracelet, a bronze peg, quartz and quartzite implements and flakes, flint implements and flakes, iron slag
SatM 16455:1–67 ceramic sherds, a bronze bracelet, tinder flint, clay gasket, burnt bones
SatM 17102:1–123 ceramic sherds, a bronze comb, bronze twezers, bronze plates, a fragment of a bronze knife, a cubic-formed stone, a fragment of a grindstone, flint flakes, quartz implements and flakes, burnt clay, burnt bones, charcoal
SatM 17459:1–19 ceramic sherds, a cubic-formed stone, quartz implements and flakes, burnt clay, slag, teeth, burnt bones, charcoal

Studies Salo, U., survey 1952 (1952)
Salo, U., excavation 1960 (1962a)
Salo, U., excavation 1961 (1962b)
Salo, U., excavation 1963 (1965)
Salo, U., excavation 1964 (1969)

Literature Salo 1962; Satakunnan museo vuonna 1963; Salo-Lahtiperä 1970; Salo 1970; 1976; 1981; 1985; Uino 1986; Valonen 1975

The dwelling site and cairn complex of Rieskaronmäki (Himmelisuulinmäki) is situated on Rieskaronmäki Hill, about 6 km NNE of the Nakkila church. It is a promontory projecting into the cultivated field in the N. Rieskaronmäki rises over 5 m above the field and the surrounding forest. The soil consists of very coarse rocks. The ancient monuments on the hill are concentrated in a 200 m long and 50 m wide zone. Cairns 85–88, 96 and 108 together with the hut floor and the cultural layer on the SW end of the hill belong to the inhabited area.

Unto Salo conducted the first excavations in the area in 1960–61, and he continued the field work in 1963–64 (Salo 1962; 1970). From our point of view, the most interesting part of these studies is the cultural layer with its ceramic finds. Salo has divided the area into western and eastern group (Salo 1981:64–92). Cairn 88 of the western group is about 5 m in diameter, and it lies relatively low in relation to the surrounding field. It contains a solid circle constructed of stones, and unearthed on the N end of the structure was a partly destroyed stone cist. No remains of the dead or the archaeological material were observed during the excavation. Below the grave layer a 25 cm deep, strong-coloured cultural layer with finds, including a fragment of a bronze implement, a fragment of a casting mould, flint, quartz and quartzite implements and flakes and burnt bones were found. About 200 ceramic sherds were also found. Salo assumes that a bronze smithy had been present on the dwelling site (Salo 1981:74–75). Salo dates the habitation period of the dwelling site to the V period of the Scandinavian Bronze Age. Some of the ceramic sherds have a textile-impression on their surface.

The eastern group involves the foundation of the house, five cairns and the remains of a stone setting (Salo 1981:77). This house foundation is the most well-known Bronze Age house in Finland. Unto Salo has interpreted it as a hall house with a sheep stable. Salo has dated this group by virtue of its bowl-shaped ceramics between the VI–IV Bronze Age periods (Salo 1981:91). The same ceramics have also been found in the western area. The main ceramic types are bowl-shaped ceramics and hatched-faced ceramics with coarse crushed quartz temper. In 1970 Salo wrote about the existence of Textile ceramics in the area:

> "Rieskaronmäen rauniosta 88 on tosin löydetty eräs saviastianpala, jossa saattaa olla tekstiilinjälkeä, k. 152:4, mutta se ei ole riittävän selvää asian varmaan toteamiseen."(Salo 1970:112.)

In 1981 Salo classified also the ceramics sherds from cairn 88 in Rieskaronmäki as Textile ceramics (Salo 1981:314). It is not possible to determine the validity of Salo's claims without personal inspection of the material.

7.7. Ulvila

154. Ulvila [5] Suolisto Peltomäki

Bsm 1143 05
x = 6813 50–55 y = 555 02–07 z = 21.6 m ASL

Finds The University of Turku, Department of Archaeology
TYA 112:1–13 ceramic sherds, a bronze button, burnt bones

Studies Salo, U., inspection 1961 (1961)
Paganus, J., survey 1964 (1964)
Salo, U. & Tuovinen, T., excavation 1978 (1979)
Tuovinen, T., survey 1985 (no report)
Heikkinen, T., survey 1996 (1996)

Literature Salo1981

The cairn complex of Peltomäki is situated about 8 km SEE of the Ulvila church and about 600 m N of the border of Kivialho. The complex lies on a low, westerly oriented forest ridge, which rises about 4 m above the local field. The soil is moraine. The topography on the eastern side of the area is relatively flat. To the W and S the bedrock is covered with clay and silt. The spruce forest has been cut down in the middle of the 1980's. Three cairns are present in the area. Unto Salo and Tapani Tuovinen conducted an excavation at the site in 1978. The size of the stone setting was about 18 x 4 m and its height was 30–60 cm. The diameter of the stones varied between 2 and 20 cm. Gravel and silt had also been used in construction.

Below the cairn was a cultural layer, and on its E side 80 ceramic sherds were found, including both Textile-impressed ceramics and Morby ceramics. Unto Salo considered the habitation period to be quite short, and based on the Morby ceramics he assessed the earliest dating of the site to be the VI period of the Scandinavian Bronze Age. However, Salo states that the most probable dating is the Pre-Roman Iron Age (Salo 1981:96).

7.8. Valkeakoski

155. Valkeakoski [1] Rapola Hirvikallio I and II

Bsm 2132 02
x = 6788 84 y = 2502 43 z = 86–88 m ASL

Finds 6370:210–211 a fragment of a boss of a shield, a bronze ring (HirvikallioI)
6930:1–5 iron spearheads and their fragments (Hirvikallio I)
7089:1–13 ceramic sherds, a smelted bronze implement, burnt clay, iron slag, a tooth, burnt bones (Hirvikallio I)
12693:78–157 ceramic sherds, clay beads, a bronze skewer, a bronze necklace, iron spearheads and their fragments, an iron spiral, fragments from a boss of a shield, a fragment of an iron chain, a bell-formed pendant, a ferrule from an iron axe, iron knives and their fragments, spindle whorls, fragments of clay disks, iron slag, teeth, burnt bones (Hirvikallio I)

22357:1–4 ceramic sherds, quartz flakes, burnt clay (Hirvikallio II)
23031:1–5 ceramic sherds, a fragment of a flint implement, burnt clay, quartz flakes (Hirvikallio II)
24793:1–361 ceramic sherds, fragments of iron artefacts, tinder flint, tinder quartz, fragments of stone artifacts, whetstones, fragments of clay implements, burnt clay, iron slag, tile fragments, glass sherds, faience, iron nails, unburnt bones, burnt bones (Hirvikallio II)

Studies Tallgren, A. M., excavation 1916 (1916)
Rinne, E. (Jutikkala), survey 1929–1930 (1930)
Sarasmo, E., survey 1945 (1947)
Voionmaa, J., excavation 1950 (1951)
Heikkurinen-Montell, T. & Saukkonen, J., survey 1984 (1984)
Heikkurinen-Montell, T., survey 1985 (1987)
Vikkula, A. & Seppälä, S., trial excavation 1989–1990 (1992) (32 m²)

Literature Voionmaa 1953; Hirviluoto1987; Pihlman 1990; Vikkula, A., Seppälä, S.-L. & Lempiäinen, T. 1994; Seppälä 1996

The dwelling site is situated about 1.7 km NW of the Sääksmäki church, only about 0.8 km WNW of the hillfort of Rapola. Today, the site lies ca. 8 m above the water level of Lake Vanajavesi. The soil is stony sand and the site is located on a grazing field. Number I refers to the cairn and number II to the dwelling site. A. M. Tallgren carried out the first excavations of the cairns in 1916, followed by Juhani Rinne, who condcted surveys in 1929 and 1930, and J. Voionmaa, who conducted an excavation in 1950. The site was surveyed and a trial excavation was carried out in 1984 by Tuula Heikkurinen-Montell and Jyri Saukkonen on the SW side of the offering stone. The finds from the test pits were ceramic sherds, flint and quartz flakes and burnt clay. Tuula Heikkurinen-Montell inspected the site once again in 1985 because of the building of the gas pipeline in the area.

In 1989 studies were continued in the Rapola project under the leadership of Anne Vikkula. Patches, which might have been postholes, were observed in the cultural layer. The phosphorous analysis and the low phosphorous values did not support the idea of an intensively inhabited site. By virtue of surface collections, the area of the site has been estimated at 4500 m². Sirkka-Liisa Seppälä suggests several phases of habitation had occurred at the site.(Seppälä 1996:93–95).

Coarse Epineolithic ceramics comprise the majority of the ceramic finds, but finds from the Iron Age are present as well. The Epineolithic sherds often have scratched surfaces and have been tempered with coarse feldspars. It seems probable that one rim sherd belongs to the Textile ceramic group. This sherd has been delivered to the Häme Museum (NM 24793:328). Some pieces of asbestos-tempered ceramics are also contained within the material.

156. Valkeakoski [14] Valkeakoski Linnosaari

Bsm 212 03
x = 6795 70 y = 2502 41 z = 88–90 m ASL

Finds 2501:36 burnt bones
Häme Museum HM 3035:4–5, 10–14 unburnt bones
HM 3055:1–7 an iron arrowhead, iron nails, fragments of iron objects, burnt clay
Finds of 1972, 1977 and 1978 not in the cataloque
HM 3088
27699:1–16 ceramic sherds, armour-piercing arrowhead, iron nails, a piece of iron, a tanged arrowhead, a fragment of a whetstone, a die, flint, copper plates, a staple

Studies Hirsjärvi, V., survey 1882–1883 (no report)
Appelgren-Kivalo, Hj., excavation 1886 (notes and a map) (44 m²)
Ailio, J., inspection 1923 (1923)
Sarasmo, E., survey 1945 (1947)
Sarasmo, E., survey 1971 (1972a)
Sarasmo, E., excavation 1971–1972 (1972b)
Suni, M., survey 1975 (no report)
Sarasmo. E., excavation 1977–1978 (1979)
Taavitsainen, J.-P., inspection 1987 (1987)
Järvinen, T., survey 1999 (1999)

Literature Jaakkola 1926; Vuorinen1972; Taavitsainen1990

The dwelling site of Linnosaari is situated on an island in the middle of the River Apianvirta in front of the town of Valkeakoski, about 250 m SEE of the Valkeakoski church. The island of Linnosaari has a high and steeply-sloping terrain. Vegetation consists of mostly birches. The size of the island is about 80 x 120 m. On its highest peak are three cairns which have been made of stones and sand.

In 1882 V. J. Hirsjärvi suggested that the site had been used as a fortification. The first excavations were organized in 1886 by Hjalmar Appelgren-Kivalo. He paid attention to moats and charred timber constructions, and he thought that these structures dated back to the Middle Age. The site has since been studied a great deal. Esko Sarasmo visited it for the first time in the 1940's, but did not begin the excavations until the beginning and then the middle of the 1970's. The last inspection of the site to date has been conducted by J.-P. Taavitsainen.

After making an inspection at Linnosaari, Julius Ailio assessed the cairns to be from the Migration Period. In 1971 and 1972 Esko Sarasmo excavated three cairns, the remains of a fired wall and a stone hearth. Sarasmo considered the hearth an unexpected finding. Its size was 50 x 90 cm and its height 60 cm. Burnt bones were found inside it in abundance. A log structure or small house had previously existed at the site. The dating of this structure is based on the iron arrowhead, the type of which belongs to the period between ca. 1300–1600 AD (Sarasmo 1972:4–10.) In the beginning of the1900's Appelgren-Kivalo published a small article in the newspaper "Hämäläinen", where he reported finding a house foundation from the Middle Ages from Linnosaari. During the excavations conducted by Sarasmo, cairn 1 was found to be completely destroyed and cairns 2 and 3 were infallibly proved to be graves. It is of some interest that there seems to have been two construction stages on the island (Vuorinen 1972:33) and that "a refortification of the site was for some reason interrupted"(Taavitsainen 1990:227). Only one Textile ceramic sherd has been identified, which implies only to a temporary stay at the site. One Carbon-14 –dating (Su-1711) obtained from a log sample, dates the site to 820±40 BP, implying that the period of use took place during the Crusade period.

7.9. Vammala

157. Vammala [22] (Tyrvää) Vammala Haapakallio

Bsm 2121 07
x =6804 90 y = 2442 70 z = 58.5 m ASL

Finds 10401:1–8 ceramic sherds, a base of a flint arrowhead, a fragment of slate arrowhead, quartz implements and flakes, slate flakes, burnt bones
10657:1–199 ceramic sherds, bases of a flint arrowheads, a fragment of a flint dagger, quartzite arrowheads, a quartz arrowhead, fragments of adzes, flint and quartz implements and flakes, fragments of sinkers, whetstones and their fragments, fragments of stone implements, a slate flake, quartz cores, a hammerstone, fragments of bones implements, burnt bones
14884:1–169 ceramics sherds, stone adzes, a miniature adze, a fragment of a sinker, a point of an awl, flint and quartz implements and flakes, a fragment of a slate pendant, fragments of stone implements, burnt clay, stone flakes
15661:1–187 ceramic sherds, a miniature adze, a hammerstone, flint and quartz implements and flakes, fragments of stone implements, a fragment of a whetstone, fragments of bones implements, burnt bones, burnt clay
31533:1–3 quartz flakes, burnt bones

Studies Nikkilä, E., inspection 1936 (no report)
Äyräpää, A., excavation 1937 (1937)
Erä-Esko, A., survey 1949 (1950)
Sarvas, P., excavation 1960 (no report)
Sarvas, P., excavation 1962 (no report)
Haimila, M., survey 1999 (1999)

Literature Vormisto 1980; Salo, U. 1981; Vikkula 1987

The dwelling site of Haapakallio is situated on the northern shore of Lake Rautavesi, 1.2 km SW of the old church (St. Olav) of Tyrvää. The site lies close to the neck of the Kokemäenjoki River and the Vammaskoski Rapids. It is on a small cape and the bedrock (gneiss) is largely visible. There is only a thin layer of soil covering the bedrock, although in some places, the cultural layer is over 40 cm thick. The lowest elevation of the dwelling site is 58.5 m. Äyräpää has classified the site as a "rock dwelling site" because of its peculiar topography. The site has been used throughout the Stone and Bronze Ages. The water level has remained at practically the same elevation as during the Stone Age, although the hydroelectric power station in Liekovesi has raised the surface slightly. The dwelling site opens to the south. Pekka Sarvas continued field studies in the beginning of the 1960s, with a relatively small find yield.

Ceramics from the Stone Age and the Early Metal Period have been found at the site. Ka I and Ka II are present, and both Uskela ceramics and Pyheensilta Ware have also been found (Vormisto 1980:8–10; Vikkula 1987:99). Kiukainen ceramics and Corded Ware are represented and four Textile ceramic vessels have been identified. Undefined Bronze Age ceramics are also present. Most ceramics are coarse Late Neolithic or Epineolithic type without the textile-impression and other decorative characteristics of Textile ceramics. Profiling of the vessels is very strong. No ornamentation exists.

8. VARSINAIS-SUOMI

8.1. Kaarina

158. Kaarina [12] Hulkkio Tikankontti

Bsm 1043 12
x = 6702 41–49 y = 1578 85–99 z = 22–25 m ASL

Finds 24129:1–3 ceramic sherds, a quartz flake, burnt bones
25377:1–335 ceramic sherds, flint and quartz implements and flakes, clay slag, fragments of stone implements, burnt bones
25781:1–665 ceramic sherds, burnt clay, burnt clay, whetstones and their fragments, flint and quartz implements and flakes, a fragment of a stone implement, fragments of sandstone implements, stone flakes, slag, flint, a slate flake, burnt clay, burnt bones
26576:1–971 ceramic sherds, clay slag, a fragment of a clay implement, an adze, a whetstones and their fragments, flint flakes, a quartzite flake, quartz implements and flakes, a stone cube, fragments of stone implements, stone flakes, burnt clay, burnt bones
27175:1–341 ceramic sherds, burnt clay, clay slag, grinding slabs and their fragments, a flint flake, hammerstones, whetstones and their fragments, quartz implements and flakes, slate, stone flakes, burnt bones
27793:1–284 ceramic sherds, burnt clay, clay slag, a flint flake, quartz implements and flakes, whetstones and their fragments, fragments of stone implements, hammerstones, a grindstone, burnt bones

Studies Poutiainen, H., survey 1987 (no report)
Kontio, P., trial excavation 1989 (1990) (66 m^2)
Strandberg, N., excavation 1990 (1991) (342 m^2)
Strandberg, N., excavation 1991 (1992) (568 m^2)
Strandberg, N., excavation 1992 (1993) (144 m^2)
Tiitinen, T., inspection 1992 (1992)
Strandberg, N., excavation 1993 (1994) (115 m^2)
Lehtonen, K., survey 1998 (1998)

Literature Strandberg 1996

The dwelling site of Hulkkio (Toivola) is situated about 1.5 km SWW of the astronomical observatory of Tuorla, on the N side of highway 1. The dwelling site is on a terrace gently lowering to the S. The soil is sand. Archaeological excavations in several areas have been carried out since 1989 by Päivi Kontio (1989) and Nina Strandberg (1990–1993). The main part of the dwelling site is situated on a potato field. Stone hearths and the remains of house constructions, for instance, house postholes, have been found during excavations. The lower level of the finds is at an elevation of 22.8 m ASL, and the upper level at an elevation of 26.5 m ASL (Strandberg 1991:12). The portion of the dwelling site, situated on the field is extensively destroyed (Kontio 1990:9). A foundation of an Early Metal Period dwelling was excavated.

A pro gradu –work and a short article about the site have recently been published (Strandberg 1996). Three carbon-14 datings available for the site are available: Hel-3572, 1820±100 BP, calAD 80(68.2%)340; Hel-3214, 2580±110 BP, calBC 840(68.2%)510 and Hel-3215, 1520±100 BP, calAD 260(3.5%)280, calAD 330(64.7%)560. Strandberg dates the habitation period between 800 BC and 300 AD. If calibrated, the period is longer, from 840 calBC to 560 AD. According to Strandberg, the ceramic material consists of bowl-shaped Bronze Age ceramics, Textile ceramics, Morby ceramics and unidentifiable Epineolithic ceramics (Strandberg 1996:38–44).



8. Hautvuori in Laitila. Photo: Jussi-Pekka Taavitsainen/National Board of Antiquities.

8.2. Laitila

159. Laitila [321] Laitila Hautvuori

Bsm
x = 6750 54 y = 542 54 z = 30 m ASL

Finds 2500:5–10 ceramic sherds, a flint implement, a seashell, charcoal
3152:1–9 a stone axe, a perforated stone, iron knives, iron spearheads, a bronze bracelet, charcoal and seashells
4274:1–4 ceramic sherds, a whetstone, charcoal
23221:1 a ceramic sherd
24728:1–2 ceramic sherds

Studies Appelgren-Kivalo, Hj., excavation 1887 (no report)
Ailio, J., excavation 1903 (1903)
Hirviluoto, A.-L., survey 1955 (1956)
Taavitsainen, J.-P. & Saukkonen, J., inspection 1986 (1986)
Gestrin, T., Kääriäinen, H. & Saukkonen, J., inspection 1986 (1989)

Literature Appelgren-Kivalo 1891; Meinander 1954b; Kivikoski 1969; Luoto 1987

The ancient hillfort of Hautvuori is situated about 4 km SEE of the Laitila church and about 1 km from the Kirkenlinna hillfort. Hautvuori is a steep hill except on its SW side, where the bedrock is visible, and rises about 20–30 m above the elevation of the surrounding mire and fields. Along the SW side, a wall of round stones has been piled up. On the SW side a kind of yard exists. On the SW side, of the aforementioned wall is a natural stonewall, and on the W side the wall is artificial. The same kind of wall can also be seen on the NE side of the "yard". (Hirviluoto 1956:198–199.)

Julius Ailio carried out the first excavation on the hillfort in 1903. He did not found any cultural layer above the bedrock, which led him to the conclusion that the site has not been permanently inhabited. The ceramics gave him an impression of the Metal Period (Ailio 1903). Three types of ceramics have been found. Six Textile ceramic vessels have been identified, this being the largest ceramic group in the material. Other ceramic groups includeBronze Age ceramics and Morby ceramics. Based upon the ceramics, one can hypothesize that a connection exists between the eastern Early Metal Period and the western Bronze Age cultures.

160. Laitila [89] Untamala Lalla

Bsm
x = 6758 34 y = 532 20 z = 24.5 m ASL

Finds 18196:1–2 ceramic sherds, burnt bones
19265:1–104 ceramic sherds, flint and quartz implements and flakes, burnt clay, burnt bones
19404:1–99 ceramic sherds, an iron object, flint and quartz implements and flakes, stone flakes, burnt bones

Studies Hirviluoto, A.-L., inspection 1970 (1991)
Rönkkö, E., excavation 1973 (no report)
Rönkkö, E., excavation 1974 (no report)

Literature Meinander 1982

The dwelling site of Lalla is situated on the gravel ridge, beside the road of Ropantie, about 8.2 km NW of the Laitila church. The dwelling site is, for the most part, destroyed by a gravel pit. Eino Rönkkö excavated the site in 1973 and 1974, but no excavation reports have been made.

The dwelling site of Lalla has played a role in attempts to establish a *terminus post quem* for Textile ceramics in SW Finland. C.F. Meinander dated it ca 1000 BC (Meinander 1982:28–29).[14] Contem-

[14] In this article (1982:11) Meinander uses also the decriptive concept "Sarsa-syndom", which he dates ca. 1200 BC.

porary shore displacement datings yield an earlier period dating about 3300 BP (Glückert 1989).

Altogether 19 Textile ceramic vessels have been identified. The material is, however, not very diverse. It is interesting that some vessels of Corded Ware and Bronze Age ceramics have also been found. Because Textile ceramics differ from typical Sarsa ceramics and Hautvuori Textile ceramics with respect to detail, the former may originate from Late Neolithic ceramics used in SW Finland.

8.3. Lieto

161. Lieto [17] Vanhalinna

Bsm 2021 11
x = 6695 50 y = 459 84 z = 30 m ASL

Finds

2497:1–15 a ceramic sherd, a fragment of a chalc pipe, iron arrowheads, a cubic-formed bone dice, a lead plate, burnt clay, tiles, charcoal, birch-bark, burnt bones

2670:1–26 ceramic sherds, silved brakteats, silver coins, a cubic-formed bone dice, iron arrowheads, an iron skewer, a bronze key, bronze plates, iron nails, pieces of iron, smelted bronze, burnt clay, an iron spur, a fragment of a horseshoe, tiles, slag, teeth, burnt bones

5452:1–80 ceramic sherds, a silver coin, a bronze pearl, a tin ribbon, burnt clay, fragments of spindle whorls, fragments of bronze plate, iron spearheads and knives, iron arrowheads, an iron hinge, an iron spur, an iron ring buckle, whetstones and their fragments, keys, a rivet, an iron ice shoe, an iron staple, an iron ring, iron bars, fragments of iron implement, an iron chisel, an iron buckle of a strap, a fragment of an iron pipe, an iron nail, a fragment of a grinding stone, tiles, slag, pieces of stone, burnt bones, charcoal

14318:1–458 ceramic sherds, silver coins, glass and bronze beads, pieces of lead, a bronze fingerring, a bronze needle, a bronze horseshoe-formed buckle, a fragment of a bronze plate, iron knives and their fragments, fragments of bronze and iron implements, a cross-formed iron mounts, iron pincets, an iron weight, an iron buckle of a strap, iron mounts, an iron staple, iron arrowheads and their fragments, iron awls, iron rings, iron bars, an iron plate, iron nails, tinder flint, a pendant whetstone, whetstones and their fragments, pieces of flint and quartz, tiles, bark, burnt bones

14644:1–2971 ceramic sherds, silver coins, a silver ring, glass pearls, an enamel pearl, a bronze fibula, copper and iron plates, fragments of copper vessel, a 8-angled bronze buckle, belt buckles, bronze spirals, a fragment of a bronze nail, bronze keys, fragments of bronze plate, an iron strike-a-light, fragments of bronze and iron implements, an iron axe, an iron pendant, iron arrowheads and their fragments, iron knives and their fragments, a base of a sickle, a fragment of an iron bar, iron nail, fragments of iron implements, iron weights, whetstones, staples, iron skewers, an iron ring-ended nail, an iron iron rosette, belt buckles, iron pins, iron rivets, iron hinge, iron ice shoes, an iron double hook, an iron chisel, iron chain, a key bit for a lock, mountings, horseshoes and their fragments, fragments of chalk pipes, iron calks sleeve, an iron ring, tinder flint, a perforated stone, a fragment of a clay disk, burnt clay, tiles, slag, stone spindle whorls and their fragments, glass fragments, a flint flake, a fragment of a "hand"stone, resin, stone pebbles, a cubic stone, tiles and their fragments, leather, teeth, unburnt bones, burnt bones, sea shells, bark, charcoal

17469:1–160 ceramic sherds, glass beads, a bronze montings, a bronze bracelet, a bronze ring, fragments of bronze implements, an iron arrowhead, an iron weight, an iron pipe, fragments of iron plates, fragments of iron implements, iron nails, iron ice shoes, a fragment of a whetstone, a fragment of a wood implement, clay spindle whorls and their fragments, a clay disk, burnt clay, clay slag, fragments of tiles, burnt bones, charcoal

17470:1–132 ceramic sherds, amber, bronze rings, a bronze nail, iron arrowheads, iron ice shoes, iron nails, fragments of iron implements, blead, clay beads, burnt clay, flint and quartz flakes, chalk pieces, burnt bones, iron slag, red ocher, a whetstone, teeth, corn grains, charcoal

17471:1–820 ceramic sherds, amber, a silver coin, a fragment of silver, fragments of fayance, a fragment of a glass bead, glass fragments, a bronze pendant, a bronze horseshoe, bronze buttons, a bronze belt buckle, a bronze skewer, a fragment of an equal-armed fibula, fragments of bronze beads, iron arrowheads, keys and their fragments, an iron knife and their fragments, iron pins, iron ice shoes, iron nails and their fragments, flint and quartz flakes, iron rivets, pieces of iron, iron slag, whetstones and their fragments, a fragment of a chalk pipe, river shells, burnt clay, fossiles, a round stone, burnt bones, teeth, tile, wood, sandstone, a stone weight, bark, charcoal

18138:1–375 ceramic sherds, amber, a silver ring buckle, an equal-armed bronze fibula, a bronze sleigh bell, flint and quartz flakes, fragments of bronze plate, bronze rivets, an iron bar, an iron weight, a fragment of an iron knife, a bolt arrowhead, fragments of iron rings, iron rivets, iron chain, iron skewer, fragments of horseshoes, iron nails and their fragments, fragments of iron implements, garnet, clay stuffing, teeth, burnt grains, glass, bark, a fragment of a clay spinning, pieces of iron, fragments of whetstones, scrolls of birch bark, burnt bones, fossils, iron slag, mica, charcoal

TYA 4:1–229 ceramic sherds, a half of a silver coin, bronze rings and their fragments, a bronze nail, an iron ring, iron rivets, a fragment of a horseshoe, iron skewer, an iron ice shoe, fragments of iron implements, bolt arrowheads and their fragments, an iron hook, pieces of iron, iron nails and their fragments, whetstones and their fragments, quartz flakes, burnt clay, clay slag, bark, iron slag, teeth, burnt bones, tiles, pieces of schist, charcoal

TYA 23:1–275 ceramic sherds, amber, piece of bronze implements, bolt arrowheads, a tanged arrowhead, iron nails, a tube lock and its fragments, an iron knife, iron rivets, iron ice shoes, fragments of horse shoes, fragments of iron plates, frgments of iron pin, a whetstone, iron slag, pieces of iron, quartz flakes, burnt clay, teeth, bark, burnt bones, charcoal samples

TYA 38:1–571 ceramics sherds, amber implements and their fragments, a silver sleigh bell, fragments of glass beads, fragments of bronze plates, a bronze ferrule, a fragment of a sleigh bell, bolt arrowheads and their fragments, horseshoes and their fragments, an iron hook, iron rivets, an iron spoon, iron ice shoes, iron bar, a ring fragment of a coat of mail, iron pins, iron nails, a belt buckle, an iron weight, pieces of iron, flint and quartz flakes, a grooved mace, fragments of spindle whorls, a shell, iron slag, fused metal, burnt clay, burnt clay, teeth, tiles, burnt bones, bark, charcoal

TYA 74:1–763 ceramic sherds, a silver coin, a glass bead, a bronze ring, bronze plates and their fragments, tanged arrowheads, bolt iron arrowheads and their fragments, a fragment of a spiral ring, iron knives and their fragments, a key, iron hooks, iron rivets, iron bars, iron rings, iron horse shoes and their nails, iron nails, a fragment of an iron skewer, fragments of iron implements, iron slag, an iron ice shoe, iron, fragments of chalk pipes, fragments of spindle whorls, a perforated sandstone, a round stone, tiles, teeth, burnt bones, charcoal

TYA 76:1–26 ceramic sherds, nails of horse shoes, iron nails, fragments of iron plates, iron mountings, a fragment of

an iron skewer, fragments of whetstones, flint flakes, burnt clay, burnt bones

TYA 77:1–421 ceramic sherds, amber beads, pieces of amber, a clay bead, a glass bead, fragments of a clay crucibles, a bronze ring flint flakes, a a weight for loom, burnt clay, horse shoes and their nails, pieces of iron, iron ice shoes, iron nails, fragments of iron skewer, fragments of spindle whorls, iron slag, fragments of whetstones, garnet chrystals, cubic stones, quartz flakes, a quartzite stone, a grooved mace, shells, quartzite, fragments of chalk pipes, limestone, tile, resin, burnt bones, charcoal

TYA 84:1–327 ceramic sherds, silver coins, an amber bead, amber, a fragment of a clay crucible, a glass bead, a bronze hook, fragments of bronze implements, bolt arrowheads and their fragments, an iron strike-a-light, iron knives, horse shoes and their nails, fragments of iron implements, iron nails, an iron nail, an iron ice shoe, whetstones and their fragments, iron slag, stones, tinder flint, quartz, oval stones, tile, teeth, unburnt bones, burnt clay, burnt bones, bark, charcoal

Studies Appelgren-Kivalo, Hj., excavation 1886
Appelgren-Kivalo, Hj., excavation 1889
Huurre, M., survey 1954 (1955b)
Rinne, J., excavation 1908 (no report)
Rinne, J., excavation 1909 (no report)
Salo, U., excavation 1957 (1958a) (210 m^2)
Sarasmo, E., excavations 1958 (1968) (262 m^2)
Sarasmo, E., excavation 1959 (1970a) (475 m^2)
Sarasmo, E., excavation 1960 (1970b) (344 m^2)
Varis, M., excavation 1962 (no report)
Luoto, J., excavation 1964 (no report)
Edgren, T., excavation 1967 (no report)
Edgren, T., excavation 1968 (no report)
Edgren, T., excavation 1969 (no report)
Edgren, T., excavation 1970 (no report)
Luoto, J., excavation 1971 (1972) (48 m^2)
Luoto, J., excavation (top) 1972 (1976a) (128 m^2)
Luoto, J., excavation 1973a–c (1975a–b)
(c. 64+32+eastern slope)
Luoto, J., excavation 1974a–b (1975c) (200+24 m^2)
Luoto, J., excavation 1975 (1975d) (64 m^2)
Luoto, J., excavation 1972–1973 (1976b)
Luoto, J., excavation 1973 (1976c) ("eturinne")
Luoto, J., excavation 1974 (1976d) (top)
Luoto, J., excavation 1975 (1976e)

Literature Aspelin 1885; Appelgren-Kivalo 1891; Rinne 1914; Salo 1958b; Luoto & Pihlman 1980; Luoto 1984

The dwelling site and cairns on Vanhalinna Hill have been excavated more exclusively than any other ancient hillfort in Finland. H. G. Porthan first paid attention to the "old castle" in 1785. Hjalmar Appelgren-Kivalo carried out the first archaeological excavations at Vanhalinna in 1886 and 1889. He located a "dwell" and some foundations of buildings. Juhani Rinne continued the studies between 1908 and 1909. In 1957 Unto Salo conducted a large-scale excavation on the hill for the purpose of studying the entire hillfort (Salo 1958:1). Large excavations continued almost every year between 1958 and 1975. According to Luoto (1984:11), 1696 m^2 were excavated over this period. Luoto (1987) choose this hillfort as the subject of his doctor's dissertation.

Luoto separated the periods of usage of Vanhalinna into three phases. The first dates between 1000–400 BC. Luoto considers this period synchronous with Gorodische-hillforts. The middle of the Iron Age, 400–800 AD, represents the second period, and the last period begins during the Viking Age and ends during the 1300s.(Luoto 1984:166.)

Bronze Age habitation at Vanhalinna hillfort is of particular interest in this study, because it is – together with Hautvuori in Laitila – the only site in Finland, which can be connected with the formation of Bronze Age fortification systems in Late Bronze Age Europe. Comparing Vanhalinna with other European Bronze Age hillforts is not, however, without problems. The environment and culture differ tremendously from those in Scandinavia or eastern Europe.

A large and versatile find material has been excavated during the fieldwork. The first remains of habitation date back to the Bronze Age (Luoto 1984). The first ceramic type in the material is Kiukainen ceramics. The number of Textile ceramics is very small. Based on my own observations, the Textile ceramics belong to only five vessels. Bronze Age ceramics of Lausitz type have been found from 18 vessels (Luoto 1984:142). Other types of Bronze Age ceramics are also present. Luoto states that Morby ceramics is not included in the material. Luoto (1984:142) has separated Iron Age ceramics representing the second period of habitation, from 282 vessels. This group includes fingernail-impressed vessels, hard-burnt vessels (Slavic type) and coarse unoriented vessels. The most recent period of use is represented by red-burning ceramics and stone clay ceramics.

Excavations have recently been conducted also in the cemetery of Aittamaki, less than about 100 m SE from the Vanhalinna hillfort. These studies have been lead by Minna Hautio in 1993 (1994), Silja Salminen in 1993 (1994), Ulla Lähdesmäki *et al.* in 1994 (1995), Marja Sipilä in 1995 (1996), and Kristiina Korkeakoski-Väisänen 1995 (1996). Also the environment arount the hillfort has been surveyed (Hautio & Lähdesmäki 1994). These studies do not primarily belong to the connection of the Vanhalinna hillfort.

8.4. Muurla

162. Muurla [17] Kotikoivunummi Haansyrjänpelto

Bsm 2021 11
x = 6695 50 y = 459 84 z = 30 m ASL

Finds 15916:1–4 ceramic sherds, quartz implements and flakes

Studies Huurre, M., survey 1963 (1965)

The dwelling site of Haansyrjänpelto is situated about 7 km N of the Muurla church. It is a sandy field lowering to the E. A gravel pit is present at the site where most ceramics have been found. During his survey, Matti Huurre uncovered a ceramic sherd with textile-impression (Huurre 1965). Sherds from only one vessel have been found. No excavations have been conducted at this site.

Shore displacement chronology yields a dating of 4700–4800 BP, which clearly seems too old. Because limited exists information about find contexts and topography the validity of shore displacement dating cannot be tested.

8.5. Perniö

163. Perniö [88] Preitti 6

Bsm 2012 09
x = 6670 27 y = 2449 82 z = 15–17 m ASL

Finds 30649:1–10 ceramic sherds

Studies Raike, E., survey 1997 (1998)

The dwelling site of Preitti 6 is situated about 180 m NE of the main building of the Preitti farm and about 7.2 km SW of the Perniö church. The site lies between two fields. The soil is clay. The landowner, Kimmo Leikkonen, uncovered the first finds from the field. During her survey of the site, Eeva Raike, found a10 cm thick soot layer below the ploughing surface; in one trial pit, a 25 cm thick cultural layer was detected. Raike (1998:116) estimated the size of the site at 50 x 50 m. The ceramic material includes Textile ceramics, Bronze Age and Epineolithic ceramics of Morby type.

8.6. Salo

Salo Isokylä Ketohaka-area

Salo Isokylä is a dwelling site and cairn complex, which has been studied from the beginning of the 1900's. Because of the great number of finds and different types of excavations conducted by numerous archaeologists, the area has been referred to by many different names. The location of early excavation and survey finds is problematic. Therefore, confusion exists as to which site each NM number refers. In this presentation, the system suggested by Pirjo Uino (1986) has been used.

The ceramic material has not been systematically investigated, because this has already been done by Uino. Furthermore, the analyses used by M. Schauman-Lönnqvist (1988) have been applied. All NM numbers of Ketohaka 1, 2 and other dwelling site remains have been given in the list, thus including all burials, stray finds and dwelling remains.

164. Salo [no number] Salo Ketohaka 1 (Katajamäki)

Bsm 2021 11
x = 6699 55 y = 452 70 z =36–40 m ASL

Finds

6459:1–78 ceramic sherds, fragments of silver bracelets, an arch-formed buckle, a large number of iron objects, an iron sword, iron knives, brooches, spearheads, a bronze nail, bronze bracelets, bronze rods, perforated chain-holders, a bronze endmounts of a ribbon, fused pieces of silver, pieces of iron, a fragment of a whetstone, a pendant whetstone, ceramic sherds, burnt bones, charcoal
6479:1 an oval fire-striking stone
6668:1–24 ceramic sherds, a fragment of an iron implement, an U-shaped bronze chape, fragments of bronze chain, a pendant ring, bronze rings, a bronze button, bronze rings, a fragment of a bronze nail, burnt bones, charcoal
6788:1–8 fragments of bronze ring, fragments of iron artefacts, pieces of bronze rod, blade fragments of iron knives, a fragment of an iron spearhead, a bronze chape, an iron pin
7095:62–66 ceramic sherds, a fragment of a stone implement, a fragment of a whetstone, iron slag
7300:5–7 bit, a fragment of an iron spearhead, burnt clay
8232:8–10 ceramic sherds, a fragment of a whetstone
20251:1–709 ceramic sherds, a miniature adze, burnt clay, flint and quartz implements and flakes, stone flakes, a stone slab, fragments of polished stone implements, iron slag, burnt bones
20558:1–2 a ceramic sherd, quartz flakes
20561:1–1674 ceramic sherds, flint and quartz implements and flakes, a fragment of a stone tool, a stone cube, a stone implement, stone flakes, iron slag, burnt clay, burnt bones

Studies

Europaeus, A., excavation 1913 (1913)
Europaeus, A., excavation 1914 (1914)
Europaeus, A., inspection 1917 (1917)
Europaeus, A., inspection 1923 (1923)
Salonen (Salmo), H., survey 1927 (1927)
Leppäaho, J., survey 1949 (1950)
Carpelan, C., Uino, P. & Schauman-Lönnqvist, M., excavation 1978(1979)
(836 m^2)
Carpelan, C., Uino, P. & Schauman-Lönnqvist, M., excavation 1979 (1980) (812 m^2)

Literature

Europaeus 1914; Carpelan 1979: Carpelan & Jungner 1982; Uino 1979; 1986; Schauman-Lönnqvist 1979; Schauman-Lönnqvist *et al.* 1986; Aalto 1979; 1982; Matiskainen 1982; Tolonen 1979

The dwelling site of Ketohaka 1 is situated on the NW side of central Salo, about 1.8 km SW of the old church, close to the dwelling site of Ketohaka 2. All three sites, which will be briefly presented in the following, belong to the same hilly terrain on the NW slope of the ridge referred as Vanutehtaanmäki, Katajamäki, Ketomäki or Palomäki. The area is one of the most important complexes of Iron Age remains in Finland, and it has been studied by Finnish archaeologists from 1885 onwards. Hj. Appelgren-Kivalo conducted the first excavation, and his work was continued by A.M. Tallgren in 1905. A. Europaeus excavated in 1913 and A. Hackman in Ketohaka in 1914. During the 1910's and 1920's several small excavations were carried out by Tallgren, Europaeus and Salmo. E. Kivikoski continued these excavations in the 1930's. In the 1970's A.-L. Hirviluoto conducted some salvage excavations in the area, and at the end of the 1970's, an archaeological project was organized by the Department of Archaeology at the University of Helsinki (Schauman-Lönnqvist *et al.* 1986; Uino 1986; Schauman-Lönnqvist 1988).

Remains from three houses have been uncovered at the site. The interpretation of Iron Age houses was made on the basis of ditches and postholes (Uino 1986:85–87). There was, however, almost nothing left of the wall constructions of these houses.

The excavations in Ketohaka 1 showed that the site had been in use for a long time. The earliest finds – sherds of Typical Combed Ware – are from the Stone Age. The Late Bronze Age – Early Pre-Roman Period is represented in the pottery. The earliest carbon-14 dating (Hel-1577 2670±100, calBC 1000(66.9 %)760, calBC 680(1.3 %)660) together with the textile-impressed ceramics suggests that habitation had begun again during the Late Bronze Age. The intensive use of the site began at the beginning of the Christian Era. Most carbon-14 and TL-datings are from this period. The third period extends from 2nd century to 4th century AD. The fourth chronological period dates to the fifth and sixth centuries AD. The last habitation period belongs to the Merovingian Period, from the seventh and eight centuries.(Uino 1986:91–94.)

Contained with the material are several vessels with clear textile-impression on their surfaces. These ceramics belong to the earliest material of the site, excluding some sherds from the Stone Age. According to Uino, some of these ceramics belong to the Epineolithic group (Uino 1986:71). Carpelan has dated these sherds to the period between 1200 BC to 300 AD (Carpelan 1979:11). Morby ceramics, which have been identified from the material on the basis of a cat's paw-impression, are also included in this grop. A large number of ceramic sherds are undecorated and belong to the Iron Age.

165. Salo [no number] Salo Ketohaka 2

Bsm 2021 11
x = 6699 65 y = 452 75 z =44 m ASL

Finds

5614:1–8 a bronze brooch, bronze belt buckles and their fragments, fragments of silver belt buckles, a lead ring, fragments of iron implements, iron slag, unburnt bones
6125:12–30 ceramic sherds, fragments of a silver equal-armed fibula, a bronze spiral ring, an iron equal-armed brooch, a blade of an iron knife, a bronze finger-ring, a bronze brooch, a bronze ring, an iron spearhead, a fragment of an iron nail, fragments of bronze belt buckles, fragments of iron and bronze objects, burnt bones
6658:18–177 ceramic sherds, an equal-armed fibula, a fragment of a cancer-formed fibula, ends of triabular nails, bronze bracelets and fibulas and their fragments, a bronze rods and their fragments, bronze spiral finger-rings, chain-holders and other bronze artefacts, fragments of a bronze chain, a bronze mounts of a belt, a bronze bead, fragments of bronze fibula, fragments of spearheads, bronze skewer, fragments of calot-formed plates, a bronze ribet, bronze pinchers, a bronze end mounts, an iron stud, fragments of hazel-nut shells, a belt buckle, a glass bead, fragments of iron knives, a "Sporren" fibula, fragments of bronze and iron nails, fused glass, iron objects and their fragments, charcoal
6669:1–7 a crossbow fibula of bronze, an iron rivet board, fragments of bronze spiral skewer, fragments of bronze rings, a perforated stone, burnt bones

6914:2–103 ceramic sherds, a silver ring and a fragment of silver ring, bronze spiral rings, bronze rings, a bronze spiral finger-ring, fragments of bronze crossbow fibulas, bronze fittings, glass beads, a tooth, a blade of an iron knife and a fragment of a blade of an iron knife, a tang of an iron knife, a wheel-shaped brooch, a lyre-shaped fire-striking steel, an open bronze bracelet with a flat section, a bronze ornament nail, a bronze ornament, fragments of a bronze chain, iron nails, fragments of iron and bronze implements, a whetstone, iron slag, burnt clay, burnt bones
9391:1–21 ceramic sherds, a bronze shepherd's crook pin, a bronze bracelet, a fragment of an iron plate, links of an iron chain, burnt bones, fragments of unburnt bones, charcoal
16135:1–2 ceramic sherds, burnt bones
20252:1–34 ceramic sherds, a bronze skewer, a fragment of an iron implement, fragments of bones comb, a weight stone, fragments of stone implements, a whetstone and their fragments, burnt clay, iron nails, burnt bones
20838:622–1167 ceramic sherds, burnt clay, fragments of a bones comb, a whetstone, burnt bones
21170:1–899 ceramic sherds, an iron knife, iron socketed spearheads, equal-armed fibulas, a glass bead, a stone cube, fragments of iron implements, burnt clay, pieces of leather, fragments of stone implements, a tooth, iron slag, charred wood, charred resin, burnt bones

Studies Tallgren, A. M., excavation 1912 (no report)
Hackman, A., excavation 1914 (1914)
Europaeus, A., excavation 1914 (1914)
Hackman, A., excavation 1915 (1916)
Salonen (Salmo), H., survey 1927 (1927)
Kivikoski, E., excavation 1931 (1931)
Leppäaho, J., survey 1949 (1950)
Hirviluoto, A.-L., inspection 1963
Carpelan, C., Uino, P. & Schauman-Lönnqvist, M., excavation 1980 (1981) (410 m^2)
Carpelan, C., Schauman-Lönnqvist, M. & Uino, P., excavation 1981 (1982) (315 m^2)

Literature Hackman 1915; 1916; 1917; Kivikoski 1973; Tallgren 1931; Meinander 1969; Carpelan 1978; 1979; Carpelan & Jungner 1982; Uino 1979; 1986; Schauman-Lönnqvist 1979; Hirviluoto & Vormisto 1984; Schauman-Lönnqvist *et al.* 1986; Aalto 1979; 1982; Matiskainen 1982; Tolonen 1979

The dwelling site of Ketohaka 2 (Nohteri) is situated on the NW side of central Salo, about 1.8 km SW of the old church, and immediately to the SE of the dwelling site of Ketohaka 1. A. Hackman excavated a 10 x 7 m stone setting in 1914. He interpreted it as the grave, and found two layers of stone slabs enclosing the grave itself. He also found a large number of burnt bones. It is important to note that all artefacts were found beneath the layer of stones (Schauman & Lönnqvist 1988:44). The osteological analysis revealed 19 individuals in the grave (Hirviluoto & Vormisto 1984).

Between 1980–1981 C. Carpelan and P. Uino carried out an excavation at the site for the purpose of uncovering Early Iron Age dwelling remains. These studies revealed 40 postholes and a cultural layer involving over 3 kg of ceramics. The postholes did not form any clear system and it seemed most likely that several structures from different periods were present (Uino 1986:156).

One TL-dating (Keto-17, 2160±160) has been obtained (Uino 1986:Table 4:6) from a textile-impressed vessel (NM 20838:1029). According to this dating, the youngest textile-impressed vessels can be dated between the period (400(68.2%)10 calBC). The textile-impression on the surface of these sherds is very faint (Uino 1986: Fig. 4:24), clearly representing a different kind of impression than that normally connected with Textile ceramics. Moreover, the vessel shape, temper-material and lack of ornamentation clearly distinguish this group from "proper" Textile ceramics. Therefore, I suggest that these ceramics represent Pre-Roman ceramics, which have their roots in Textile ceramics, but have already diverged from them.

With regard to context dating at the site, the earliest TL-dating (Uino 1986:Table 4:6) is apparently from sample Keto 1, 2550±270 (1050(68.2%)250 calBC). If calibrated, most carbon-14 and TL-datings come from the period between 100 calBC and 700 calAD (Uino 1986:Fig. 4:31).

According to Uino (1986:112–115) most of the ceramics can be classified as undecorated Iron Age Common Ceramics. Some Epineolithic and even Bronze Age ceramics are also present. The textile-impression occurs but is uncommon.

166. Salo [no number] Salo The group of dwelling remains at Ketohaka

Bsm 2021 11
x = 6699 49–6699 60 y = 452 71–452 78 z =31–55 m ASL

Finds 20252:4–24 ceramic sherds, an iron implement, a bronze skewer, burnt clay, a fragment of an iron object, burnt bones, iron nails
20562:1–481 ceramic sherds, a flint arrowhead, burnt clay, an iron ring, a whetstone, a whetstone fragment, quartz flakes
20838:1–621 ceramic sherds, a whetstone, quartz implements and flakes, a fragment of bit, iron slag, sinkers, burnt bones

Studies Carpelan, C. & Schauman-Lönnqvist, M., excavation 1978–80

Literature Uino 1986; Schauman-Lönnqvist 1988

The dwelling site of Ketohaka 1 is situated on the NW side of central Salo, about 1.8 km SW of the old church. During excavations a strong cultural layer with Bronze Age material beneath the layer was observed, dating back to the Pre-Roman and Early Iron Age. In addition, structures were observed. All these structures were interpreted to represent Pre-Roman or Early Iron Age settlement.

In area K the cultural layer 201b exists beneath a stone setting. The cultural layer had clear boundaries and had been partly excavated by A. Hackman in 1915. Uino (1986:129) assumed that the site has probably been a location where pottery has been made. The layer has been radiocarbon-dated with the following results (Uino 1986:table 5:2):

Hel-1184, 2870±120	1260(0.3%)1240 calBC
	1220(67.9%)910 calBC
Hel-1190, 2880±130	1260(68.2%)910 calBC

Even more interesting are the TL-datings from the ceramics themselves. The following results have been obtained from the material found in the layer 201b (Uino 1986:Table 5:3):

TL-34	20562:286	3230±320	1950(68.2%))1050 calBC
TL-35	20562:463	2740±270	1350(68.2%))500 calBC

Unfortunately, the uncertainty related to TL-dating is too great to permit the dating of the emergence of textile-impressed ceramics. Conventional carbon-14 datings seem to be more reliable. Other datings from the areas J, K, L and O date back to the Pre-Roman Iron Age or Early Roman Iron Age (Uino 1986:Table 5:2).

Textile-impressed ceramics, the largest group in the material, includes very large sherds. Ornamentation has been achieved by deep pits or very small spots. The ornamentation is very sparse and restricted to just below the rim. Some vessels, have similar characteristics to Corded Ware: the very deep impressions on the rim and also the thickening form. The extremely good quality of the clay temper and excellent burning also point in this direction. Usually the textile-impressed vessels have hatching on their upper halves. Vessels also exist, which have only hatching as a surface finish. The surface has often been worked further after hatching. The method of surface finishing resembles a tar-like paint. Typologically, these vessels might represent the younger end of the Bronze Age material at the site.

8.7. Turku

167. Turku Niuskala Kotirinne

Bsm 3022 01
x = 6708 18–28 y = 572 92–573 04 z = 23 m ASL

Finds TYA 91:16–19 ceramic sherds, flint and quartz flakes, porphyrite fragments
TYA 220:1–9 ceramic sherds, stone flakes, burnt bones, charcoal
TYA 239:1–1693 ceramic sherds, a slate arrowhead, a stone axe, fragments of stone axes and adzes, fragments of stone implements, a whetstone and fragments of whetstones, flint and quartz implements and flakes, stone flakes, burnt clay, burnt bones, red ocher, charcoal
TYA 245:1–2517 ceramic sherds, flint and quartz implements and flakes, fragments of stone axes and dzes, fragments of whetstones, burnt clay, burnt bones, charcoal
TYA 287:1–222 ceramics sherds, a fragment of an idol, flint and quartz implements and flakes, modern iron implements and their fragments, stone flakes, burnt bones, charcoal
TYA 385:1–1179 ceramic sherds, flint and quartz implements and flakes, fragments of whetstones, fragments of stone implements and flakes, burnt bones, charcoal, slag
TYA 446:1–1774 ceramic sherds, amber implements and their fragments, stone flakes, flints and quartz implements and their fragments, fragments of whetstones, burnt bones, burnt stones, charcoal, slag
TYA 489:1–1083 ceramic sherds, flint and quartz implements and flakes, stone implements and their fragments, fragments of whetstones, ocher, slag, charcoal
TYA 582:1–2207 ceramic sherds, stone implements and their fragments, flint and quartz implements and their flakes, quartzite flakes, fragments of stone implements, stone flakes, fragments of whetstones, burnt bones, slag, charcoal

Studies Lehtosalo, V., survey 1961 (1961)
Seppänen, K., archaivs survey 1976 (1976)
Pihlman, S., inspection 1982 (1982) (1983)
Pihlman, S., excavation 1983 (1984) (48 m^2)
Pihlman, S., excavation 1984 (1985) (43.5 m^2)
Korkeakoski-Väisänen, K., excavation 1985 (1986) (34 m^2)
Korkeakoski-Väisänen, K., excavation 1987 (1989) (72 m^2)
Korkeakoski-Väisänen, K., excavation 1988 (1989) (61 m^2)
Korkeakoski-Väisänen, K., excavation 1989 (1989) (40 m^2)
Korkeakoski-Väisänen, K., excavation 1990 (1990) (67 m^2)

Literature Tallgren 1915b; Asplund *et al.* 1989; Soininen 1990; Asplund 1997

The dwelling site of Niuskala Kotirinne is situated in the city of Turku, in the suburb of Oriketo. During the Bronze Age the site was located on an island.

The carbon-14 datings from the site have been considered problematic: one (Hel-2119) 2340±130 dates to Bronze Age, the second (Hel-2415) 2090±110 to the Pre-Roman Iron Age. Although the ceramics is mostly Late Neolitic the later dating suggests that also Bronze Age ceramics would possible to find in the material. Because the large material has not been analysed in detail the question remains open.

The department of archaeology at the University of Turku and the Provincial Museum of Turku has conducted salvage excavations at the site in the middle of 1980s. The find material consists primarily of Kiukainen ceramics implying also some material from Bronze Age showing that the habitation may have continued to ca. 1000 BC (Asplund 1997:27, 39–40).

Henrik Asplund (1997:28–36) has separated the following ceramic types from the material: hatched-faced, textile-impressed, "plastered", smooth-faced and pit-ornamented ceramics.

168. Turku Niuskala 3:14 Polttolaitoksenkatu

Bsm 3022 01
x = 6708 03–09 y = 572 63–572 67 z = 22–25 m ASL

Finds TYA 249:1–2 quartz flakes
TYA 297:1–28 ceramic sherds, tinder flint, flint and quartz flakes, porphyry flakes, slate flakes
TYA 331:1–2238 ceramic sherds, amber, stone implements and their fragments, flint and quartz implements and flakes, burnt clay, iron slag, teeth, burnt bones
NM 23601:1–334 ceramic sherds, an iron barb, copper plates, stone adzes and their fragments, glass, quartz implements and flakes, whetstones and their fragments, hammerstones, iron slag, burnt bones

Studies Pihlman, S., Tiitinen, T., Korkeakoski-Väisänen, K. 1986 (1987) (313 m^2)
Pihlman, S., surface collection 1985 (1985b)
Laukkanen, E., excavation 1987 (1987)

Literature Asplund 1997; Soininen 1990

The dwelling site of Niuskala Polttolaitoskenkatu is situated ca. 350 m SW of the Kotirinne site, and belongs to the same dwelling site complex with it. They both are located in the Late Stone Age and Bronze Age on an island. The field cultivation has mixed the cultural layer in whole area, which makes the interpretation of possible vertical and horisontal stratigraphy difficult. Also gravel hauling has influenced in the cultural layer.

Excavations have closely connected with the project at Kotirinne.

9. UUSIMAA

9.1. Askola

169. Askola [58] Taka-Piskolan Ruoksmaa

Bsm 3022 01
x = 6718 06 y = 423 12 z = 30–46 m ASL

Finds 12010:1–5 piece of clay, quartz implements and flakes
12261:1–25 ceramic sherds, an unfinished adze, quartz implements and flakes, a nut, iron slag
12373:1–7 ceramic sherds, quartz implements and flakes, mica raw-material stone, burnt bones
12599:1–43 ceramic sherds, an iron arrowhead, quartz implements and flakes, fragments of stone implements, a fragment of tinder flint, teeth, unburnt bones, charcoal
12931:1–269 ceramic sherds, axes, adzes, quartz arrowheads, flint and quartz implements and flakes, quartz core, a quartzite implement, whetstones and their fragments, a piece of chewing resin, hammerstones, a tooth, unburnt and burnt bones, charcoal
13067:1–871 ceramic sherds, fragments of amber artifacts, fragments of a bronze ribbon, an iron drill-bit, a quartz arrowhead, a miniature adze, adzes and their fragments, an edge of an iron drill, a fragment of an iron implement, a piece of bronze plate, whetstones and their fragments, quartz arrowheads, a feldspar implement, flint and quartz implements and flakes, hammerstones,

quartzite implements and flakes, burnt clay, a tooth, fragments from a flint strike-a-light, fragments of bones implements, burnt bones, charcoal
13303:1–339 ceramic sherds, adzes, fragments of whetstones, flint and quartz implements and flakes, quartz arrowheads, chewing resin, a fragment of a whetstone pendant, a whetstones and their fragments, quartzite implements and flakes, hammerstones, quartz cores, burnt bones, limonite, charcoal
18928:1–61 ceramic sherds, flint and quartz implements and flakes, a fragment of a stone implement, stone flakes, burnt bones, burnt clay, charcoal

Studies Luho, V., excavation 1949–1953 Taka-Piskulan Ruoksmaa (no reports)
Luho, V., excavation 1949, 1951 Etu-Linnan Ruoksmaa (no reports)
Pohjakallio, L., survey 1971 (1971)
Siiriäinen, A., excavation 1973 (no report)

Literature Meinander 1954b

The dwelling site of Ruoksmaa is situated about 3.8 km N of the Askola church, on the eastern shore of the Porvoonjoki River. Ville Luho carried out several excavations at the site in the 1950's, but the exact locations cannot be found today. The surroundings at Ruoksmaa consists of a flat, cultivated field on clay soil, in the vicinity of the Medieval cemetery of Kalmistonmäki (Pohjakallio 1971).

Ville Luho started excavations in 1949, and continued fieldwork for four years. He divided the area into two places, which are Taka-Piskula Ruoksmaa and Etu-Linnan Ruoksmaa. The former involves the majority of the finds. There is also a cemetery in the area, which dates back to Medieval Time.

Based on the ceramic material, habitation at the site began during the Early Neolithic with Ka I ceramics. Several vessels of Kiukainen ceramics and Corded Ware have been identified. The existence of Late Combed Ware and Pyheensilta ceramics is also possible, although the number of preserved sherds is very small. One Textile ceramic vessel has been separated on the basis of textile-impression (NM 13067:153). Morby ceramics are the largest group, with sherds from over 40 vessels present. Bronze Age ceramics are also represented. The textile-impressed ceramics found at the site have been connected, by C. F. Meinander, with the Kalmistonmäki-Böle-Morby horizon, dating back to the middle of I millennium BC (Meinander 1954b:165, 195).

9.2. Karjaa

170. Karjaa [50] Kroggårds Hagnäs IIb

Bsm 2014 07
x = 6661 82 y = 483 06 z = c. 25 m ASL

Finds 20703:1–3 iron slag, burnt clay, pieces of tile
20872:1–348 ceramic sherds, a flint arrowhead, flint and quartz implements and flakes, quartzite flakes, a nutshell, iron slag, burnt bones

Studies Heikkurinen, T., excavation 1980 (1980) (336 m^2, a+b)

Literature Uino 1986; Heikkurinen & Suominen 1982

The dwelling site of Hagnäs IIb is situated about 7.5 km S of the Karjaa church. The excavation area IIb is about 100 m from the main building of the manor of Hagnäs on the cornfield. The site gently slopes to the S. The cultural layer was mixed, with Combed Ware and Corded Ware occurring together (Heikkurinen 1980:10; Heikkurinen & Suominen 1982). This was the result of the cultivation and ploughing of the soil. The cultural layer was relatively thick, at about 40 cm. Burnt clay suggests dwelling(s) at the site.

Over 4/5 of the ceramic material can be classified as Corded Ware. The rest of the ceramics are either textile-impressed or hatched-faced pottery, which can be further divided into Textile ceramics and Epineolithic ceramics. According to Heikkurinen and Suominen (1982:74–75), these ceramics can be compared with the Textile ceramics found at Laitila Hautvuori. The common denominator between these two sites is that in both cases Textile ceramics occur in a strange environment, thus more representative temporary than permanent habitation.

171. Karjaa [32] Läpp Östergård

Bsm 2014 08
x = 6660 40 y = 480 92 z = 16.5 m ASL

Finds 20700:1–7 ceramic sherds, fragments of iron objects, burnt clay, a perforated stone fragment, tile, iron slag
21238:1–273 ceramic sherds, flint and quartz flakes, a clay pearl, a fragment of a clay disc, fragments of whetstones, iron slag, burnt clay, burnt bones

Studies Heikkurinen, T., excavation 1981 (1981) (324 m^2)

Literature Heikkurinen & Suominen 1982; Uino 1986

The dwelling site of Östergård is situated about 1.5 km SEE of the Karjaa railway station in a cultivated field about 600 m from the Östergård house. Lake Läppsjö is over 300 m S of the site. Tuula Heikkurinen excavated an area of 324 m^2 at the site in 1981. Two excavation areas (A and B) were opened. The cultural layer was not very thick and it was not uniform. Some small hearhts were found (Heikkurinen 1981:6–10). Burnt clay is suggestive of dwelling(s) at the site.

Heikkurinen states that two habitation periods occurred at the dwelling site: the first in the Early Metal Period and the second in the Late Metal Period (Heikkurinen 1981:10). The ceramics linked to the Early Metal Period came from the W side of the excavation area, and the Late Metal Period ceramics came from the E side. Corded Ware also exists. The older ceramics are either textile-impressed or hatched. The ornamentation is very scant and vessels have clear profiling. The younger ceramics can be dated to Merovingian and Viking periods.

Two vessels with a coarse surface and textile-impression have been identified (Heikkurinen & Suominen 1982:77). In addition, several vessels of coarse ceramics without textile-impression have been found. These vessels belong to the Western Bronze Age ceramics. Vessels, which have been polished and have very thin walls, also exist. They belong to Epineolithic ceramics, although it is not possible to connect them with Textile ceramics (NM 21238:46).

The existence of Corded Ware at the site is intriguing. One rim sherd (NM 21238:182) a corded impression on the wall of the vessel and what appears to be a textile-impression below the rim are present. One might assume then that textile-impression has been in use already in Corded Ware, and that its use might have been handed down to Epineolithic and Textile ceramics. On the basis of material found at Östergård, this idea seems likely.

9.3. Kirkkonummi

172. Kirkkonummi [38] Kauhala Koivistosveden

Bsm 2032 09
x =6678 50 y = 527 06 z =35 m ASL

Finds 7734:7–12 ceramic sherds, a boat axe, a whetstone, a hammerstone, burnt bones
7771:2–8 ceramic sherds, axes, an adze and its fragments, a whetstone, a quartz and quartzite flake
7856:1 ceramic sherds, stone flakes
7868:5, 6 ceramic sherds, a stone flake, a fragment of hammerstone
7877:1–8, 15 ceramic sherds, axes, adzes and their fragments, fragments of stone implements
7908:2–5 ceramic sherds, fragments of axes, a fragment of a whetstone
8206:1–3 ceramic sherds, an adze, a fragment of an ice pick
8881:4–9 ceramic sherds, an adze, a clay pendant, a whetstone, a fragment of a stone implement, quartz flakes

9010:6–10 ceramic sherds, an adze, fragments of unfinished stone implements
9107:1–8 ceramic sherds, an axe, a whetstone and its fragments, unfinished stone implements, quartz flakes
9268:5–9 ceramic sherds, adzes, quartz flakes
9767:2 ceramic sherds
9801:1–10 ceramic sherds, an axe, an adze and their fragments, quartz scrapers and flakes, iron slag
10557:1–2 ceramic sherds, stone flakes
10810:13–14 ceramic sherds, a flint flake
11186:9–11 ceramic sherds, quartz flakes, stone flakes
16192:1 ceramic sherds, quartz flakes, slate flakes

Studies Europaeus, A., survey 1920 (see Europaeus 1922)
Lehtosalo, V., survey 1963 (1963)

The dwelling site of Koivistosveden is situated about 2.2 km SEE of the Lapinkylä post office. During Veikko Lehtosalo's survey, this site was located about 400 m NE of the Helsinki–Hanko road, in the garden by the greenhouses between Lakes Lapinkylänjärvi and Loojärvi. A great amount of stray finds have been uncovered here as surface finds. No excavations have been carried out. In Äyräpää's publication (1922) "Fornfynd från Kyrkslätt och Esbo socknar", the chronological position of Koivistosveden has been fixed into the Final Neolithic. With the help of typology, the existence of Corded Ware and by referring to Pälsi, Äyräpää dated the site to the end of the Stone Age (Europaeus 1922:135). Äyräpää mentions textile-impressed sherds, but does not discuss their context or general meaning at length. The context is, however, relevant. In his dissertation on the Boat Axe culture in Russia, Äyräpää put forth the possibility that textile-impression also has its roots in the western or southern side of the Baltic.

9.4. Porvoo

173. Porvoo [40] Munkby Böle

Bsm 3021 06
x = 6702 70 y = 433 35 z = 15–30 m ASL

Finds 12135:1–6 ceramic sherds, a flint arrowhead, a stone axe, burnt clay, burnt bones, mica
12136:1 a stone axe (possibly from Böle)
12359:1–150 ceramic sherds, iron knives, fragments of stone adzes, a clay bead, fragments of whetstones, burnt clay, clay slag, a cubic-formed stone, flint and quartz implements and flakes, a stone cube, iron ore, charcoal
12359:151–154 ceramic sherds, quartz flakes
12359:155–160 ceramic sherds, a grindstone, a hatstone and its fragment, stone implements, quartz flakes
16876:1–10 ceramic sherds, quartz flakes, a piece of a whetstone, burnt bones
16877:1–2 a socketed iron axe, iron slag
17074:1–1020 ceramic sherds, fragments of clay idols, flint and quartz arrowheads, adzes and their fragments, flint and quartz implements and flakes, a fragment of clay implement, burnt clay, burnt bones, fragments of stone implements, iron slag
17387:1–402 ceramic sherds, flint arrowheads, an adze and their fragments, flint and quartz implements and flakes, stone adzes and their fragments, fragments of stone implements, a fragment of a whetstone, burnt clay, burnt bones, charcoal
19385:1–227 ceramic sherds, flint and quartz arrow heads, an unfinished stone adze, flint and quartz implements and flakes, quartzite implements and flakes, burnt bones
19799:1–2281 ceramics sherds, fragments of stone axes, flint and quartz arrow heads and their fragments, a fragment of a clay idol, a clay pin, flint and quartz implements and flakes, quartzite flakes, a fragment from a slate ring, fragments of bones implements, fragments of whetstones, fragments of stone implements, a microlith, stone flakes, burnt clay, burnt bones
20464:1–526 ceramic sherds, flint arrowheads and their fragments, a fragment of a slate ring, fragments of clay idols, clay buttons, flint and quartz implements and flakes, quartzite flakes, a fragment of a stone pendant, a stone flake, burnt clay, burnt bones
20466:1–1305 ceramic sherds, a stone axe, flint arrowheads and their fragments, a fragment of a slate ring, a fragment of a quartzite spearhead, a fragment of a miniature adze, fragments of stone adzes, flint and quartz implements and flakes, quartzite flakes, a quartz core, a whetstone, and their fragments a hammerstone, burnt clay, burnt bones
20529:1–8 ceramic sherds, a quartz implement, flint and quartz flakes, stone flakes, burnt bones
20570:1–3 a stone implement, flint and quartz flakes
21293:1–3097 ceramic sherds, amber, amber fragments,



9. Koivistosveden in Kirkkonummi. Photo: Mika Lavento 1917/ National Board of Antiquities.

flint and quartz arrowheads and their fragments, fragments of slate rings, stone gouged adzes and their fragments, an unfinished axe, a miniature adze and its fragments, stone adzes, flint and quartz implements and flakes, clay buttons, quartzite implements and flakes, whetstones, fragments of slate knives, fragments of stone implements, sinkers, quartz and quartzite points, a fragment of a clay disk, a fragment of a perforated stone, fragments of stone implements, mica, burnt bones, burnt clay
21384:1–13 ceramic sherds, quartz and quartzite flakes, stone flakes, burnt bones
21536:1–5188 ceramic sherds, amber pendants, amber fragments, fragments of perforated stones, fragments of clay idols, flint and quartz arrow heads, straight stone adzes, a stone adze, a miniature adze and their fragments, a stone adze and their fragments, fragments of stone axes and adzes, a fragment of a slate ring, a slate pin, a sinker, unfinished stone artifacts, flint knives, flint and quartz points, quartzite flakes, sinkers, flint and quartz implements and flakes, whetstones and their fragments, quartzite flakes, stone flakes, mica, burnt clay, a clay button, a pyrite fragment, a fragment of a bones implement, a clay ball, burnt bones
22004:1–7246 ceramic sherds, an iron arrow head, an amber pendant and their fragments, amber, a fragment of a slate ring, a fragment of a clay idol, flint and quartz arrow heads, an straight stone axe, stone adzes, miniature adzes, fragments of stone axes and adzes, a fragment from a rhomb-formed perforated stone, flint knives, flint and quartz implements and flakes, flint and quartz points, quartzite points, quartzite flakes, an iron nail, halfes of perforated stones, whetstones and their fragments, fragments of stone implements, stone flakes, a fragment of a clay bead, a porphyrite point, fragments of whetstones, fragments of burnt clay implements, an iron nail, iron slag, burnt clay, clay slag, teeth, red ocher, mica, a fragment of a bones implement, burnt bones
22661:1–21 ceramic sherds, flint and quartz implements and flakes, quartzite flakes, a fragment of a stone implement, stone flakes, burnt bones
27953:1 an unfinished stone adze
28524:1 a straight stone axe
30321:1–2434 ceramic sherds, bronze ribbon, piece of iron, iron slag, a fragment of a clay casting mould, burnt clay, clay slag, flint and quartz implements and flakes, quartzite implements and flakes, a cubic-formed stone, a hammerstone, fragments of stone implements, fragments of bones implements, burnt bones
The museum of Porvoo 55–10 a ceramic sherd
The museum of Porvoo 55–11 a fragment of a stone axe

Studies

Meinander, C.F., excavation 1949 (1950) (215 m²)
Edgren, T., excavations 1966–1967 (no report)
Hirviluoto, A.-L., inspection 1973 (no report)
Anttila, K., excavation 1974 (1974) (400 m²) } (348 m²)
Ruonavaara, L., excavations 1975 (1979) (1180 m²)
Ruonavaara, L., excavations 1976 (1981) (610 m²)
Hirviluoto, A.L., inspection 1976 (no report)
Bergström, M., excavation 1978 (1979a) (525 m²)
Bergström, M., excavation 1979 (1979b) (c. 100 m²)
Ruonavaara, L., excavation 1981 (1982) (c. 300 m²)
Ruonavaara, L., excavation 1982 (1983) (464 m²)
Ruonavaara, L., excavation 1983 (1984) (1180 m²)
Seppälä, S.-L., survey 1994 (1995)
Strandberg, N., excavation 1997 (1998) (445 m²)

Literature Meinander 1954b; Edgren 1969; 1996; Ruonavaara 1988

The dwelling site of Böle is situated about 8 km NE of the Porvoo cathedral. At present, it has been destroyed almost completly by the crossroads of Ilola by the Helsinki-Hamina highway. It was situated on the SE side of the gravel ridge running NW to SE. The ridge has been almost severely damages by gravel hauling for the highway construction. The sites in Böle form a dwelling site complex with several excavation places, which have been examined over a 30-year period. In the following short description of the studies, the Early Metal Period finds at the complex are detailed.

In 1949 C. F. Meinander carried out excavation in four separate sites. Most finds were textile- impressed pottery (numbers 12135 ad 12359 analysed). In Torsten Edgren's salvage excavations, the ceramics represented mostly Early Neolithic pottery. Kaisu Anttila's salvage excavations uncovered some material from the Early Metal Period. Leena Ruonavaara excavated the site in 1976, finding Typical Combed Ware and Late Neolithic ceramics, in addition to some ceramic sherds from the Early Metal Period. Matti Bergström studied Böle in 1978 and 1979. According to his observations, the 1978 finds consisted of Epineolithic ceramics, wheres in 1979 only some pieces of flint and quartz were found, from the cairn which was excavated by C. F. Meinander in 1949. Leena Ruonavaara's salvage excavations in 1981, 1982 and 1983 were very rich in finds, and in this case, her Master's thesis has been used as the source. The great majority of her material was Neolithic ceramics (Early Combed Ware and Typical Combed Ware) with Late Neolithic ceramics and Corded Ware also well represented. The Early Metal Period habitation had been concentrated on the eastern slope of the ridge.(Seppälä 1995:161–164.)

Leena Ruonavaara based her Master's thesis on the early ceramics from Böle. Her particular interest was directed to the period of Early Combed Ware. Ruonavaara has, however, also made observations about Epineolithic or Early Metal Period pottery. Ruonavaara found 502 epineolithic sherds in the material. More than half of these are "weathered". Only 13 ornamented rim sherds were found. One vessel was – according to Ruonavaara – similar to a vessel at Kaukola (Meinander 1954b, Tafel 31c). Nearly all others were "ordinary", hatched-faced pit-ornamented Bronze Age ceramics (Ruonavaara 1988:64). These ceramics resembled the Bronze Age ceramics on the west coast, Nakkila Rieskaronmäki, Harjavalta Kaunismäki or Paimio Toispuolojanummi. Only two sherds of textile-impressed ceramics were uncovered during the excavations in1966–67. In later excavations, the number of Textile ceramics has remained small (Ruonavaara 1988:66). Nina Strandberg's excavations in 1998 have yelded much new Textile ceramics. This material has not been possible to include in this work, however.

C. F. Meinander paid much attention to the textile-impressed ceramics at the site. He compared the textile-impression from A and B areas with the mat-impression of Kiukainen ceramics. According to him, area C is clearly younger, representing the "früheisenzeitlichen" Estonian ceramics (Meinander 1954b:165). He classified these ceramics in the Kalmistonmäki group and dated them to the final period of Textile ceramics in Finland (Meinander 1954b:195). It is important to note his theory about the Kalmistonmäki-Böle-Morby horizon which he has also connected with Asva ceramics in Estonia (Meinander 1954b:195). Areas A and B were from the Bronze Age, whereas area C dated back to the Pre-Roman Iron Age. The remains of a round house construction have been found at area C (Meinander 1954b:161–165; Uino 1986:154). According to Uino, these house remains are younger than the other dwelling site finds in the area.

Four context datings and three datings of ceramics have been obtained from the excavations carried out by Nina Strandberg. ^{14}C-datings: Hel-4094 2870±100; Hel-4095 2200±90; Hel-4096 2290±90; Hel-4097 2230±80; Hela-219 2120±70 (NM 30321:614); Hela-220 2310±65 (NM 30321:1987); Hela-221 3326±65 (NM 30321:1614). Context datings have been taken from hearths and patches of charcoal, AMS-samples date ceramics. The last dating is of special interest, because it dates the Early Textile ceramics (Strandberg, pers. comm. 15.2.2000). Other AMS-datings represent the hatched-faced ceramics.

9.5. Siuntio

174. Siuntio [37] Svartbäck Marsbacken 3

Bsm 2032 06
x = 6672 60–88 y = 2510 32–50 z = 22–40 m ASL

Finds 17500:1 a fragment of a boat axe
27423:1–127 ceramic sherds, a fragment of a casting mould (from historical period), fragments of iron implements, a tinder flint, flint flakes, iron nails from horse's shoes, iron nails, quartz flakes, iron slag, burnt clay, burnt and unburnt bones

Studies Nylund, E., survey 1927 (1927)
Edgren, H., survey 1984 (1985)
Moisanen, J., trial excavation 1992 (1993) (46 m^2)

Marsbacken is a dwelling site on the W side of Lake Tjusträsket about 1.6 km SW of the Siuntio church, on the S side of the parish fire station. The elevation of Lake Tjusträsket is only 3.2 m above Sea level, which means that during the period Marsbacken was actively used, the sea reached the area. Until 1992 only two cairns and one base of a cairn were known in the Marsbacken area. The clearance carried out in 1992 uncovered more ancient monuments in the area.
At present, the following ancient monuments have been identified: a Bronze Age cairn, a cairn from Iron Age, a base of a cairn (a rectangular stone setting), five small cairns, and several small depressions and pits (possible dwelling pits and storage pits). In addition, some ditches, terraces and a stone base were observed. (Moisanen 1993: 5–7.)
Besides cairns, a dwelling site, which dates back into the Bronze Age, was located in Marbacken. The location of the dwelling site was estimated with the help of a phosphorous analyisis (Moisanen 1993:13–14). A grave also lies in the vicinity of the dwelling site. The ceramics include Textile ceramics, Bronze Age ceramics and Coarse Iron Age Ware. Some other finds and remains of house foundations indicate dwellings dating to the 1600s.

9. 6. Vihti

175. Vihti [20] Paksalo Pinolahti

Bsm
x = 6698 26 y = 2508 55 z = 35 m ASL (area B)

Finds 3020:6 a stone adze
11362:1–13 ceramic sherds, a gouged adze, quartz implements and flakes, pieces of stone
11439:1–8 a ceramic sherd, a flint and quartz flake, stone flakes, charcoal (area B)
11439:9–13 a fragment of a stone implement, a flint flake, quartz implements and flakes, stone flakes (from the barley field above the garden)
11530:1–8, 9–11 ceramic sherds, a fragment oa a flint arrowhead, quartz implements and flakes, stone flakes (area B)
11530:12–14, 25–28 ceramic sherds, quartz flakes (area A)
11530:15–19, 29–31 ceramic sherds, a stone axe, fragments of whetsones, a frament of a grinding stone, quartz flakes, stone flakes, burn bones (area C)
11530:20–22, 32–33 hammerstones, a quartz implement and flakes (area D)
11530:23–24, 34–41 ceramic sherds, a quartz implements and flakes, burnt bones (area E)
12341:1–21 ceramic sherds, a gouged adze, quartz implements and flakes, burnt bones
29770:1–5 quartz flakes, burnt bones, a quartz cobble (area E)
29770:6 a quartz flake (area G)

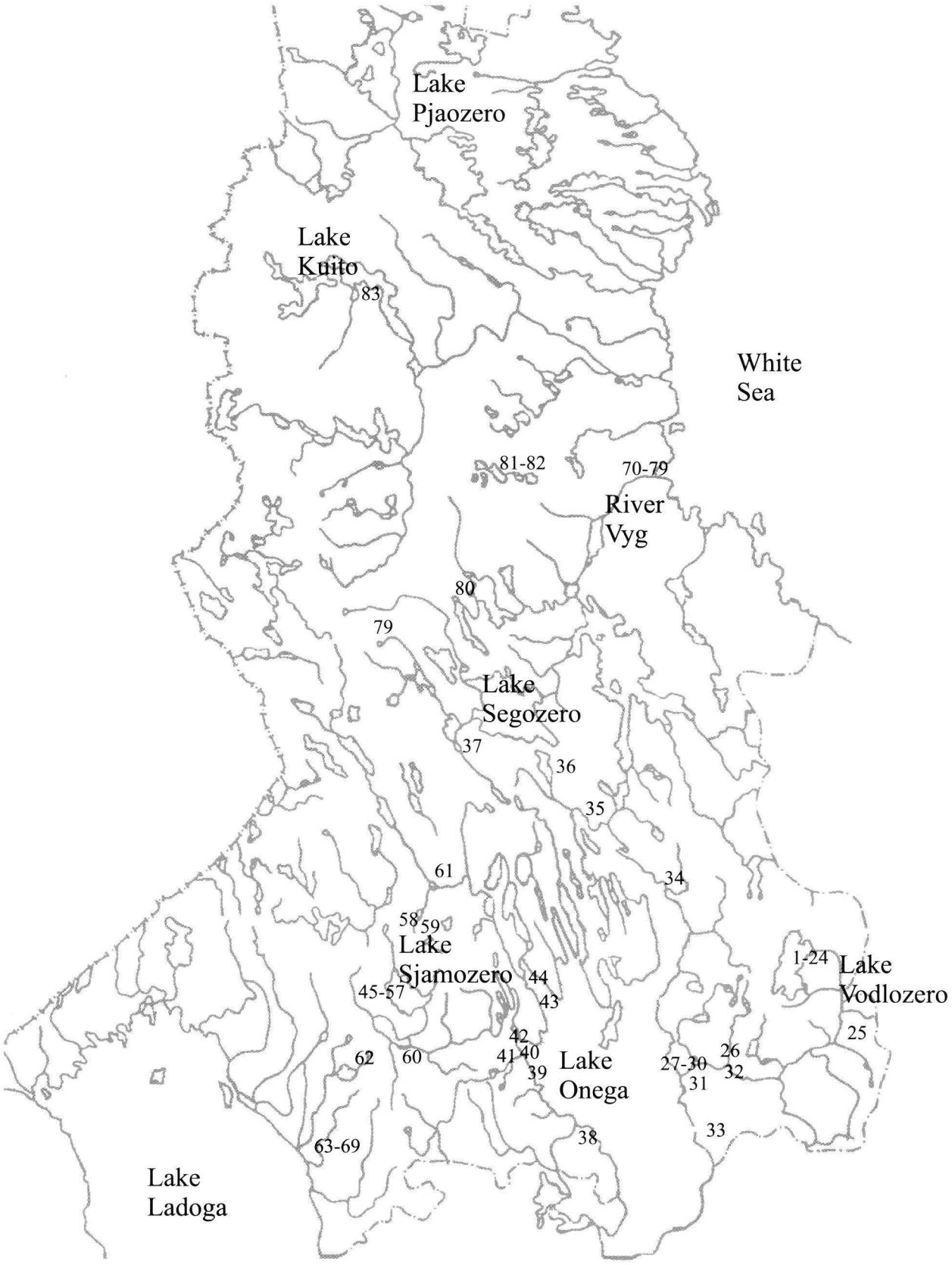
Studies Luho, V., inspection 1945 (1946)
Pesonen, P., survey 1996 (1996f)

Literature Meinander, C.F. 1954b, 1969

The dwelling site of Pinolahti is situated on the northern side of Lake Hiidenvesi, about 16.5 km NNE of the Lohja church, close to the mouth of the Vanjoki River. The area previously belonged to the Lohja community. The site was found when the secretary of the Finnish Parliament, E. Tammio, observed prehistoric material in his garden. Ville Luho conducted an inspection at the site in 1949 and separated 6 find areas (A–F). Area B refers to the garden of Tammio's villa. Located in this garden were the remains of a stone hearth with heavily burnt stones.(Luho 1946.)

Epineolithic ceramics and ceramics with has textile-impression were found in the garden, area B, and Corded Ware in the neighbouring field close by area C. In the vicinity of the site, about 200 m from the garden (area A) Combed Ware Style II:2 was identified. Located in area E were Corded Ware and Typival Combed Ware. Are F included fragments of Corded Ware. No ceramics have been found in area D. Textile-impressed ceramics exist only in area B. Petro Pesonen found one more dwelling site in the area and named it area G (Pesonen 1996:5). This site contained only quartz.

Appendix 2a. Sites with Textile ceramics in the Karelian Republic.



Appendix 2a. The list of dwelling sites in the Karelian Republic where Textile ceramics (Net pottery) have been found. The basis for the description is a list of sites published by Mark Kosmenko (1996b, fig. 45) which includes 83 sites. In addition to these Net pottery exists also in some other dwelling sites.[1]

The Lake Vodlozero

1. Somboma I
Finds: 1844, 1888, 2753, 3000
Studies: Kosmenko, M. G., inspection 1992; Kosmenko, M. G., excavation 1983 348m^2; Kosmenko, M. G., excavation 1984 540 m^2; Kosmenko, M. G., excavation 1995
Literature: Kosmenko 1992; Manyuhin 1991; Kosmenko & Manyuhin 1999; Zhulnikov 1999
Ceramics: The material includes Sperrings ceramics, Pit-Combed Ware, Rhomb-Pit Ware, Kargopol ceramics, Late Kargopol ceramics, "Classical" Asbestos and organic tempered ceramics, Net pottery, Luukonsaari ceramics and Early Middle Age Lepnaja ceramics. The large majority of ceramics (3949 fragm.) belongs to the Late Kargopol type. 186 fragments of Net pottery were found (Kosmenko 1992: 22–26). Traces of iron production were found at the site (Kosmenko & Manyuhin 1999:34).

2. Malaya Poga I
Finds: 386, 441, 1843
Studies: Pankrushev, G. A., survey 1965; Pankrushev, G. A., excavation 1966 128 m^2; Kosmenko, M. G., excavation 1983 192 m^2
Literature: Kosmenko 1992; Kosmenko & Manyuhin 1999; Zhulnikov 1999
Ceramics: The material includes Sperrings Ware, Pit-Combed Ware, Rhomb-Pit Ware, Round-Pit Ceramics, "Classical" Asbestos and organic tempered ceramics, Net pottery and Striated (Strihovannaja) ceramics and Early Middle Age Lepnaja ceramics. 80 fragments of Net and Striated pottery were found. The majority of the ceramic material is Rhomb-Pit Ware (Kosmenko 1992:29). Traces of iron production were found at the site (Kosmenko & Manyuhin 1999).

3. Malaya Poga II
Finds: 1892
Studies: Kosmenko, M. G., excavation 1984 12 m^2
Literature: Manyuhin 1991; Kosmenko 1992
Ceramics: The material includes Pit-Combed Ware, Net pottery and Late Kargopol ceramics. Only 11 fragments of Net pottery were found (Kosmenko 1992:29).

4. Bostilovo II
Finds: 2084, 2198
Studies: Kosmenko, M. G., survey 1985 1 m^2; Kosmenko, M. G., excavation 1987 362 m^2
Literature: Kosmenko 1992
Ceramics: Kosmenko separated three chronological complexes at the site, which represent the Bronze Age, the Early Iron Age and the Early Middle Age. The ceramic material consists of 16 vessels of Net pottery and some Early Middle Age ceramics (Kosmenko 1992:30). Bostilovo II represents an almost clean Net pottery dwelling site.

5. Kevasalma
Finds: 2012, 1849, 2197
Studies: Zuravlev, A. P., survey 1982; Kosmenko, M. G., excavation 1983; Kosmenko, M. G., excavation 1987 30 m^2
Literature: Manyuhin 1991; Kosmenko 1992; Kosmenko & Manyuhin 1999
Ceramics: The earliest ceramic fragments belong to Kargopol and Pit-Combed Ware. Only 11 fragments of Net pottery were found. The large majority of the ceramic fragments belong to the Late Kargopol type (Kosmenko 1992:31). Iron slag was found at the site (Kosmenko & Manyuhin 1999:34).

6. Matkalahta I
Finds: 2016
Studies: Zuravlev, A. P., survey 1982
Literature: –
Ceramics: The ceramic material includes only some fragments of Net pottery. The majority of the ceramics at the site is Neolithic Pit-Combed Ware.

7. Poga I
Finds: 1858
Studies: Kosmenko, M. G., excavation 1984 68 m^2
Literature: Kosmenko & Manyuhin 1999
Ceramics: Only a small number of Net pottery was found in Kosmenko's excavation. Traces of iron slag were found at the site (Kosmenko & Manyuhin 1999).

8. Ohtoma I
Finds: 344, 1861, 2055, 2195
Studies: Kosmenko, M. G., excavation 1983; Kosmenko, M. G., excavation 1984; Kosmenko, M. G., excavation 1985; Kosmenko, M. G., excavation 1987 (about 800 m^2 altogether)
Literature: Manyuhin 1991; Kosmenko 1992; Kosmenko & Manyuhin 1999; Zhulnikov 1999
Ceramics: The material includes Sperrings ceramics, Pit-Combed Ware, organic tempered ceramics of the Kargopol type, Rhomb-Pit ceramics, "Classical" Asbestos and organic tempered ceramics, Net and hatched-faced pottery, Late Kargopol ceramics, Luukonsaari ceramics and Middle Age ceramics of the Lepnaya type (Kosmenko 1992:33). The amount of Net pottery is considerable (474 fragm.). Also one fragment of a clay crucible and a casting mould were found. According to Kosmenko they belong to the context of Late Kargopol ceramics (Kosmenko 1992:33–34; Kosmenko & Manyuhin 1999:34).

9. Ohtoma II
Finds: 346, 1862
Studies: Kosmenko, M. G., survey and trial excavation 1983; Kosmenko, M. G., excavation 1984 72 m^2
Literature: Manyuhin 1991; Kosmenko 1992; Kosmenko & Manyuhin 1999; Zhulnikov 1999
Ceramics: According to Kosmenko the ceramic material involves Sperrings ceramics, Pit-Combed Ware, one fragment of Kargopol ceramics, Rhomb-Pit Ware, "Classical" Asbestos and organic tempered ceramics, Net pottery (83 fragm.), Late Kargopol ceramics and Luukonsaari ceramics (Kosmenko 1992:35). Also fragments of crucibles and iron slag were found. An iron arrowhead belongs also to the find material. Kosmenko (1992:35) connects the iron slag with the Late Kargopol culture.

10. Ohtoma III
Finds: 1851, 1863, 2056, 2196
Studies: Kosmenko, M. G., survey and trial excavation 1983; Kosmenko, M. G., excavation 1984 200 m^2; Kosmenko, M. G., excavation 1985 222 m^2; Kosmenko, M. G., inspection 1987
Literature: Kosmenko 1992; Zhulnikov 1999; Kosmenko & Manyuhin 1999
Ceramics: The amount of find material from the site consists of almost 19 000 ceramic sherds. According to Kosmenko the ceramic material includes Sperrings ceramics, Pit-Combed Ware, Kargopol ceramics, Rhomb-Pit Ware, "Classical" Asbestos and organic tempered ceramics, Net and hatched-faced pottery (420 fragm.), Late Kargopol

[1] In addition to these sites Textile ceramics can be perhaps found at Tunguda XII and Tunguda XV, and at the dwelling sites of Sumozero.

ceramics, Luukonsaari ceramics and Early Middle Age Lepnaya ceramics (Kosmenko 1992:37). The Net pottery finds in Ohtoma III is one of the largest in the Karelian Republic. Also fragments of clay crucibles and casting moulds were found. Kosmenko (1992:32) connects them with the Late Kargopol culture. Most probably iron slag is connected with Early Middle Age activities at the site.

11. Kelka I
Finds: 2199, 2342, 2463
Studies: Kosmenko, M. G., excavation 1987 36 m^2; Kosmenko, M. G., excavation 1989 136 m^2; Kosmenko, M. G., excavation 1990 82 m^2
Literature: Kosmenko 1992; Zhulnikov 1999; Kosmenko & Manyuhin 1999
Ceramics: According to Kosmenko the ceramic material involves Sperrings ceramics, Pit-Combed Ware, Kargopol ceramics, Rhomb-Pit Ware, "Classical" Asbestos and organic tempered ceramics, Net and hatched-faced pottery (420 fragm.), Late Kargopol ceramics, Luukonsaari ceramics, Early Middle Age Lepnaya ceramics and Middle Age ceramics (Kosmenko 1992:37). Some metal objects can be connected with the Iron Age. Iron slag belongs to the Middle Age complex (Kosmenko 1992:41). Traces of iron production were found at the site (Kosmenko & Manyuhin 1999:34).

12. Kelka II
Finds: 2193, 2456, 2580
Studies: Kosmenko, M. G., survey and trial excavation 1987 1 m^2; Kosmenko, M. G., inspection surface collection 1990; Kosmenko, M. G., survey
Literature: –
Ceramics: Only some sherds of Net pottery were found at the site.

13. Kelka III
Finds: 2200, 2268, 2331, 2462, 2553, 2754, 2828
Studies: Kosmenko, M. G., excavation 1987 13 m^2; Kosmenko, M. G., excavation 1988 104 m^2; Kosmenko, M. G., excavation 1989 61 m^2; Kosmenko, M. G., inspection 1990 60 m^2; Kosmenko, M. G., excavation 1991; Kosmenko, M. G., excavation 1992 40 m^2; Kosmenko, M. G., salvage surface collection 1993
Literature: Manyuhin 1991; Kosmenko 1992; Kosmenko & Manyuhin 1999
Ceramics: The find material is one of the richest in Karelia. Particularly interesting is the oval dwelling pit, which can be connected with Net pottery. A carbon-14 dating obtained from the hearth inside the dwelling gave the result (TA-2268, 3100±_70 BP, calBC 340(1.2%)320, calBC 210(64.7%)20, calBC 10(2.4%)1 calAD). The sample from the cultural layer (TA-2269) was dated to 3520±_80 BP, calBC 1950(68.2%)1730. Kosmenko (1992:42) connected this later dating to an Eneolithic context. He separated the following ceramic types in the material: Pit-Combed Ware, Rhomb-Pit Ware, "Classical" Asbestos and organic tempered ceramics, Net and hatched-faced pottery (420 fragm.), Late Kargopol ceramics, Luukonsaari ceramics and Early Middle Age Lepnaya ceramics. Ten fragments of clay casting moulds, an iron arrowhead and fragments of iron slag are also interesting (Kosmenko 1992:44; Kosmenko & Manyuhin 1999:34).

14. Kelka IV
Finds: 2263, 2266
Studies: Kosmenko, M. G., survey and trial excavation 1988 2 m^2; Manyuhin, I.C., trial excavation; Spiridonov, A. M., trial excavation.
Literature: Kosmenko 1992
Ceramics: Ceramics is mostly Neolithic, only some sherds of Net pottery were found.

15. Nizhnyaya Kolonzha I
Finds: 1729
Studies: Pankrushev, G. A. 1966; Pankrushev, G. A. 1967 (altogether 60 m^2), excavation 1981
Literature: Kochkurkina et al. 1988; Manyuhin 1991; Zhulnikov 1999
Ceramics: In the material Sperrings ceramics, Pit-Combed Ware, Asbestos and organic tempered ceramics, Net pottery and Late Kargopol ceramics were separated.

16. Ileksa II
Finds: 383, 426, 1811
Studies: Pankrushev, G., excavation 1965 12 m^2; Pankrushev, G., excavation 1966 88 m^2; Kosmenko, M. G., excavation 1982 32 m^2
Literature: Manyuhin 1991; Kosmenko 1992; Zhulnikov 1999
Ceramics: Kosmenko (1992:55) separated the following ceramic types at the site: Sperrings ceramics, Pit-Combed Ware, "Classical" Asbestos and organic tempered ceramics, Late Kargopol ceramics and Luukonsaari ceramics. The existence of Net pottery is unclear.

17. Tonda I
Finds: 476
Studies: Zuravlev, A., excavation 1967 16 m^2
Literature: Savvateev, 1980; Kosmenko 1992
Ceramics: The material implies 10 large and 75 small fragments of ceramics. According to Savvateev (1980:117) the ceramic types are Pit-Combed Ware, Net and hatched-faced pottery (5 fragm.).

18. Tonda IV
Finds: 2267, 2752
Studies: Kosmenko, M. G., excavation 1988 20 m^2; Kosmenko, M. G., excavation 1992 40 m^2
Literature: Kosmenko 1992
Ceramics: According to Kosmenko (1992:56) the material implies Rhomb-Pit and Net pottery.

19. Koskosalma
Finds: 2010, 1850
Studies: Zuravlev, A. P., excavation 1982; Kosmenko, M. G., survey 1992
Literature: –
Ceramics: The material includes a small number of Net pottery.

20. Vodla I
Finds: 392, 471
Studies: Zuravlev, A. P. 1965, survey; Zuravlev, A. P., excavation 1967 27 m^2
Literature: Manyuhin 1991; Zhulnikov 1999
Ceramics: The find material includes at least Sperrings ceramics, Pit-Combed Ware, Rhomb-Pit Ware, Asbestos ceramics, Net pottery and Late Kargopol ceramics.

21. Suhaja Vodla I
Finds: 484, 935, 2024
Studies: Zuravlev, A. P., survey 1965; Zuravlev, excavation 1967 16 m^2; Zuravlev, A. P. excavation and survey 1972; Zuravlev, A. P., survey 1982
Literature: Savvateev 1980; Manyuhin 1991; Kosmenko & Manyuhin 1999; Zhulnikov 1999
Ceramics: The number of ceramic finds is relatively small. According to Savvateev (1980:116) and Manyuhin (pers. comm. 24.1.1999) ceramic material involves Pit-Combed Ware, Asbestos and organic tempered ceramics, Net pottery (3 fragments), and Late Kargopol ceramics. Also traces of iron production were found (Kosmenko & Manyuhin 1999:34).

22. Suhaya Vodla II
Finds: 635, 2005
Studies: Zuravlev, A. P., excavation 1969 16 m^2; Zuravlev, A. P., excavation 1982
Literature: Manyuhin 1991
Ceramics: The find material includes at least Sperrings ceramics, Pit-Combed Ware, Rhomb-Pit Ware, Net pottery and Late Kargopol ceramics.

23. Shagnozero
Finds: 485
Studies: Pankrushev, G. A., survey 1967
Literature: –
Ceramics: Only some sherds of Net pottery were found.

24. Vodla V
Finds: 396, 480, 636
Studies: Zuravlev, A. P., survey 1965; Zuravlev, A. P., excavation 1967; Zuravlev, A. P., excavation 1969 92 m²
Literature: Savvateev 1980; Zhulnikov 1999
Ceramics: The find material includes Sperrings ceramics, Pit-Combed Ware, Vanvizdinskaya (Neolithic) ceramics, Asbestos and organic tempered ceramics, Net pottery (4 fragments) and Early Middle Age Lepnaya ceramics (Savvateev 1980:111).

The eastern and northern side of the Lake Onega

25. Vodla XXVII
Finds: 1773
Studies: Kotchkurkina, C., survey and trial excavation1982
Literature: Zhulnikov 1999
Ceramics: The excavation material includes Asbestos and organic tempered ceramics and other Neolithic ceramics. Only 3 fragments (1 vessel) of Net pottery were found at the beach.

26. Podporozhe II
Finds: 876, 3077
Studies: Pankrushev, G.A., survey 1971; Lobanova, N. B., excavation 1997
Literature: –
Ceramics: The ceramic material implies Textile ceramics but also Neolithic types.

27. Ust-Vodla I
Finds: 2100, 2364
Studies: Manyuhin, I. C., excavation 1986 16 m²; Lobanova, N. V., excavation 1990
Literature: Manyuhin 1997
Ceramics: The ceramic material includes Net pottery (150 fragm.) and ceramics from the Middle Age; also one fragment of Pit-Combed Ware was found (Manyuhin 1997:160, 175).

28. Ust-Vodla II
Finds: 1598, 2105, 2363
Studies: Savvateev, Ju., survey 1979; Manyuhin, I. C., excavation 1986 20 m²; Lobanova, N. V., excavation 1990
Literature: Manyuhin 1997; Kosmenko & Manyuhin 1999
Ceramics: The ceramic material includes Net pottery (456 fragm.), Late Kargopol ceramics (9 fragm.) and Middle Age ceramics; only two fragments of Pit-Combed Ware were found (Manyuhin 1997:160, 175). Traces of iron production were located at the site (Kosmenko & Manyuhin 1999:39–41).

29. Ust-Vodla IV
Finds: 1600, 2110
Studies: Savvateev, Ju. A., survey 1979; Manyuhin, I. C., trial excavation 1986 1 m²; Lobanova, N. B., excavation 1997
Literature: Manyuhin 1997
Ceramics: The dwelling site of Ust-Vodla IV is situated only about 90 m from Ust-Vodla II. According to Manyuhin (1997:161, 175) the ceramic material involves only Net pottery (17 fragm.).

30. Ust-Vodla V
Finds: 3073
Studies: Manyuhin, I. C., excavation 1997 16 m²
Literature: Manyuhin 1997; Kosmenko & Manyuhin 1999
Ceramics: Ust-Vodla V lies about 250 m to the north of sites II and III. The ceramic material involves Net pottery (58 fragm.) and some fragments (7 fragm.) of Late Kargopol ceramics (Manyuhin 1997:161, 175). Also a fragment of iron slag was found (Kosmenko & Manyuhin 1999:34).

31. Gurij ostrov (malyj)
Finds: 563
Studies: Pankrushev, G.A., survey 1979; Pankrushev, G.A., excavation 1980 12 m²
Literature: –
Ceramics: Only a small number of Net pottery was found in Pankrushev's excavation.

32. Chernaya Rechka V
Finds: 776, 838, 917, 1258, 2758
Studies: Savvateev, Ju. A., survey, surface collection 1971; Savvateev, Ju. A., excavation 1972 44 m²; Savvateev, Ju. A., survey, surface collection 1973; Savvateev, Ju. A., survey, surface collection 1975; Lobanova, N. V., survey, surface collection 1992
Literature: Zhulnikov 1999
Ceramics: The site is destroyed due to the changes in water level. The material includes at least Asbestos and organic tempered ceramics and Net pottery.

33. Muromskoe III
Finds: Collections in St. Petersburg, 533, 609, 1439
Studies: Gurina, N. N. 1958; Gurina, N. N. 1959; Zuravlev, excavation 1968 8 m²; Kotchkurkina, S., excavation 1969 188 m²; Kosmenko, M. G., inspection 1977
Literature: Gurina 1961; Spiridonov's dissertation (autoreferat); Kotchkurkina (Kosmenko & Manyuhin 1999:39–41).
Ceramics: The material implies Sperrings ceramics, Pit-Combed Ware, Poristaja ceramics, Net pottery (73 fragm.), Late Kargopol ceramics (ca. 200 fragm.) and about 400 fragments of Early Middle Age Lepnaya ceramics (the largest collection in Karelia). Traces of iron production were found at the site (Kosmenko & Manyuhin 1999:34).

34. Nemena II
Finds: 2287
Studies: Spiridonov, A., survey 1987
Literature: –
Ceramics: Only few sherds of Net pottery and Lepnaya ceramics were found in Spiridonov's survey. According to his notes the material of Nemena II involves mostly Lepnaya ceramics from the 15th–17th centuries AD.

35. Povenchanka IV
Finds: 1487, 1793
Studies: Savvateev, Ju. A., survey 1978; Lobanova, N. V., excavation 1982 68 m²
Literature: Kotchkurkina *et al.* 1988
Ceramics: The ceramic material consists of Net pottery. The site includes mostly Mesolithic material.

36. Vojnavolok XXXIV
Finds: 324, 2240
Studies: Pankrushev, G. A., excavation 1963 8 m²; Zhulnikov, A. M., excavation 1988 44 m²
Literature: –
Ceramics: The material implies Net pottery and Luukonsaari ceramics. One stone mould was also found.

37. Seletskoe III
Finds: Missing card
Studies: Kosmenko, M. G., survey (?)
Literature: Kosmenko 1996
Ceramics: The ceramic material includes only Net pottery.

The western shore of the Lake Onega and the Lake Syamozero

38. Sheltozero I
Finds: 904
Studies: Pankrushev, G. A., survey 1971; Pankrushev, G. A., excavation 1973 12 m²
Literature: Kotchkurkina *et al.* 1988; Zhulnikov 1999
Ceramics: Net pottery was found only as stray finds. The excavation material included Asbestos ceramics and Iron Age material.

39. Sajnavolok I
Finds: Collections in St. Petersburg
Studies: Gurina, N. N., excavation 1950; Gurina, N. N., excavation 1951 (altogether 104 m²)
Literature: Gurina 1961; Savvateev 1980; Kochkurkina *et al.* 1988
Ceramics: The find material consists of ceramics and stone implements. Also iron slag and a fragment of a clay implement were found. Gurina and Savvateev assume that the site was an iron-smelting workshop (Savvateev 1980:30–31). The same kind of structure was also uncovered in Olonka. According to Savvateev at least Pit-Combed Ware, Asbestos ceramics and Net pottery can be discerned in the material (Savvateev 1980:28–29).

40. Tomitsa
Finds: 782 (Московский государсвенный историчский музей) 11072 (Карельскии государсвенный краеведческий музей)
Studies: Bryusov, A. Ja., excavation 1929; Bryusov, A. Ja., excavation 1930; Bryusov, A. Ja., excavation 1931; Bryusov, A. Ja., excavation 1932
Literature: Bryusov 1940, 1950; Meinander 1954b; Gurina 1961; Pankrushev 1964, 1978b; Kosmenko & Manyuhin 1999
Ceramics: The ridge is now mostly destroyed by gravel pits and contemporary habitation but it is still possible to find small areas of the cultural layer. Bryusov's excavation material includes mostly Net pottery and a small number of Luukonsaari ceramics (pers. comm. I. Manyuhin 17.1.1999). Remains of iron smelting also exist at the site (Kosmenko & Manyuhin 1999:32).

41. Pichevo III
Finds: 1469, 1632
Studies: Savvateev, Ju. A., survey 1978; Kosmenko, M. G., excavation 1979 (altogether 80 m²)
Literature: Kosmenko 1992
Ceramics: According to Kosmenko at least Pit-Combed Ware, Net pottery, Kudama ("Luukonsaari") ceramics and Luukonsaari ceramics (Kosmenko 1992:82) exist at the site. The majority of ceramics is Net pottery.

42. Pichevo VII
Finds: finds missing?
Studies: Pankrushev, G. A., survey 1978
Literature: –
Ceramics: Only some fragments of Net pottery were found. No report.

43. Verhove
Finds: 637
Studies: Zuravlev, A. P. & Pankrushev, G. A., survey and test pit 1969
Literature: –
Ceramics: The material includes Sperrings ceramics, Pit-Combed Ware and Net pottery. One piece of iron slag was also found.

44. Suna VI
Finds: 168, 277, 1113, 1283
Studies: Pankrushev, G. A., survey 1961; Pankrushev, G. A., excavation 1962 (6 fragments of Net pottery); Kosmenko, M. G., excavation 1975 172 m²; Kosmenko, M. G., excavation 1976 100 m²
Literature: Kosmenko 1978, 1992; Kosmenko & Manyuhin 1999; Zhulnikov 1999
Ceramics: Kosmenko separated four types of ceramics at the site: Asbestos ceramics of the "Classical" type, Net pottery, Lepnaya ceramics and Late Middle Age ceramics (Kosmenko 1992:76). Iron working – slag and burnt clay – can be connected with the Early or Late Middle Age phase of habitation (Kosmenko 1992:76–77).

45. Syamozero II
Finds: Collection in St. Petersburg, 169, 76
Studies: Gurina, N. N., excavation 1948; Pankrushev, G. A., survey 1961; Pankrushev, G. A., survey 1962
Literature: Gurina 1961
Ceramics: Gurina's find material dated to the Early Metal Period involving mostly Net pottery (Gurina 1961:299–300). Only one fragment of asbestos tempered ceramics was found.

46. Shapnavolok
Finds: Collection in St. Petersburg, 1389
Studies: Gurina, N. N., excavation 1949; Kosmenko, M. G., survey 1977
Literature: Gurina 1961; Savvateev 1980; Kosmenko & Manyuhin 1999
Ceramics: According to Savvateev (1980:11) ceramic finds include Pit-Combed Ware and Net pottery. Also iron slag was found (Gurina 1961:267); (Kosmenko & Manyuhin 1999:34).

47. Malaya Suna I
Finds: 18/320–328, 116, 159, 216, 422
Studies: Pankrushev, G. A., survey 1957; Pankrushev, G. A., inspection 1960; Pankrushev, G. A., excavation 1961; Pankrushev, G. A., excavation 1962; Pankrushev, G. A., excavation 1965
Literature: Pankrushev 1978; Savvateev 1980; Kosmenko & Manyuhin 1999; Zhulnikov 1999
Ceramics: According to Savvateev the ceramics is mostly Sperrings ceramics and Pit-Combed Ware. A small number of Late Pit-Combed Ware, Asbestos ceramics and Net pottery were found (Savvateev 1980:23–24). Traces of iron slag were found (Kosmenko & Manyuhin 1999:34).

48. Malaya Suna IX
Finds: 124/15–16, 161, 421, 1496
Studies: Pankrushev, G. A., survey 1960; Pankrushev, G. A., excavation 1961 168 m²; Pankrushev, G. A., excavation 1965 100 m²; Kosmenko, M. G., excavation 1978 256 m²
Literature: Kosmenko 1992; Kosmenko & Manyuhin 1999; Zhulnikov 1999
Ceramics: The large ceramic material includes Sperrings ceramics, Pit-Combed Ware, Rhomb-Pit Ware, "Classical" Asbestos ceramics, Net pottery, Luukonsaari ceramics and some fragments of Medieval ceramics (Kosmenko 1992:94–96). The largest number of ceramic fragments (655) can be classified as Net and hatched-faced pottery. Traces of iron slag were found (Kosmenko & Manyuhin 1999:34).

49. Chujnavolok I
Finds: (Карельскии государсвенный краеведческий музей), 128
Studies: Gurina, N. N. survey 1950; Gurina, N. N., excavation 1951 104 m²; Pankrushev, G. A., survey 1960
Literature: Gurina 1961; Zhulnikov 1999
Ceramics: The material includes Pit-Combed Ware, Asbestos and organic tempered ceramics and Net pottery.

50. Chujnavolok II
Finds: (Карельскии государсвенный краеведческий музей), 127, 165
Studies: Gurina, N. N., excavation 1951; Pankrushev, G. A., survey 1960; Pankrushev, G. A., excavation 1961
Literature: Gurina 1961; Zhulnikov 1999
Ceramics: The material includes Asbestos and organic tempered ceramics and Net pottery.

51. Lahta I
Finds: 18/183–190, 24/96–118, 49
Studies: Pankrushev, G., survey 1957; Pankrushev, G. A., excavation 1958; Pankrushev, G. A., excavation 1959 (altogether 120 m²); Kosmenko, M. G. & Manyuhin, I., excavation 1997
Literature: Pankrushev 1964; Kotchkurkina *et al.* 1988; Kosmenko & Manyuhin 1999; Zhulnikov 1999
Ceramics: Pit-Combed Ware, Asbestos and organic tempered ceramics, Net pottery, Luukonsaari ceramics and Middle Age ceramics were found at the site. Also a casting mould made of talc was found. All dwelling sites of Lahta (Lahta I–III) are rich in finds and multi-strata in their characteristics. Traces of iron slag were found (Kosmenko & Manyuhin 1999:34).

52. Lahta II
Finds: 18/191–272, 24/119–251, 50, 155, 215, 608
Studies: Pankrushev, G. A., survey 1957; Pankrushev, G. A., excavation 1958; Pankrushev, G. A., excavation 1959; Pankrushev, G. A., excavation 1961; Anpilogov, A., excavation 1962; Kotchkurkina, S., excavation 1969 (altogether 756 m^2)
Literature: Pankrushev 1964; Kotchkurkina *et al.* 1988; Kosmenko & Manyuhin 1999; Zhulnikov 1999
Ceramics: The find material includes Sperrings, Pit-Combed Ware, Asbestos and organic tempered ceramics, Net pottery and Middle Age ceramics. Pankrushev excavated a dwelling, long and rectangular in its form (5.3. x 3.4 m) the depth of which was ca. 1.4–1.5 m from its upper level. In the southeastern side of another dwelling without clear structures and about 30 m^2 in size a large hearth was unearthed. A mould of a bronze celt was found in Kotchkurkina's excavation. Traces of iron slag were found (Kosmenko & Manyuhin 1999:34).

53. Lahta III
Finds: 18/273–308, 24/252–440, 51, 309, 466
Studies: Pankrushev, G. A., survey1957; Pankrushev, G. A., survey 1958; Anpilogov, A. V., excavation 1959 40 m^2; Titov, Ju. A. excavation 1967 256 m^2
Literature: Pankrushev 1964; Kotchkurkina *et al.* 1988; Zhulnikov 1999
Ceramics: The find material includes Sperrings ceramics, Pit-Combed Ware, Asbestos Ware and Net pottery.

54. Lahta IX
Finds: 59, 3009
Studies: Anpilogov, A. V., survey 1959; Zhulnikov, A. M., trial excavation 1995 (test pit)
Literature: Zhulnikov 1999
Ceramics: Two sherds of Net pottery were found during the survey. Zhulnikov's test excavation yielded Asbestos and organic tempered ceramics.

55. Kudoma IX
Finds: 113, 152, 552
Studies: Pankrushev, G. A., excavation 1960; Anpilogov, A. V., excavation 1961; Pankrushev, G. A., inspection 1968 (altogether 180 m^2)
Literature: Savvateev 1980; Zhulnikov 1999
Ceramics: According to Savvateev (1980:67) the finds of the multiperiod site include Pit-Combed Ware, Asbestos ceramics and Net pottery.

56. Kudoma X
Finds: 114, 153, 220, 518, 1647
Studies: Pankrushev, G. A., survey 1960; Pankrushev, G. A., excavation 1961; Anpilogov, A. V., excavation 1962; Pankrushev, G. A., excavation 1968; Kosmenko, M. G., excavation 1979 (altogether 712 m^2)
Literature: Anpilogov 1966; Kosmenko 1980; Kosmenko 1992; Kosmenko & Manyuhin 1999; Zhulnikov 1999
Ceramics: According to Kosmenko (1992:16–17) the find material includes Sperrings ceramics, Pit-Combed Ware, Rhomb-Pit Ware, "Classical" Asbestos and organic tempered ceramics, Net pottery and Luukonsaari ceramics. Also iron objects were found at the site (Kosmenko & Manyuhin 1999:39).

57. Kudoma XI
Finds: 115, 154, 221, 1301, 1325, 1630
Studies: Pankrushev, G. A., survey 1960; Anpilogov, A. V., excavation 1961; Anpilogov, A. V., excavation 1962; Kosmenko, M. G., excavation 1976 638 m^2; Kosmenko, M. G., excavation 1977 762 m^2; Kosmenko, M. G., excavation 1979 498 m^2 (altogether 2246 m^2)
Literature: Anpilogov 1966; Kosmenko 1980; Kosmenko 1992; Kosmenko & Manyuhin 1999; Zhulnikov 1999
Ceramics: According to Kosmenko (1992:16–17) the find material includes Pit-Combed Ware, "Classical" Asbestos and organic tempered ceramics, Net pottery and Luukonsaari ceramics. Iron furnaces in the shape of rectangular stone boxes were excavated at the site (Kosmenko & Manyuhin 1999:39–41).

The Water Systems of the Rivers Shuja and Suna

58. Cheranga I
Finds: 1437, 1633, 1730
Studies: Pankrushev, G. A., survey 1977; Pankrushev, G. A., survey 1979; Kosmenko, M. G., excavation 1981 (altogether 180 m^2)
Literature: Kosmenko 1992; Kosmenko & Manyuhin 1999; Zhulnikov 1999
Ceramics: According to Kosmenko (1992:16–17) the find material includes Sperrings ceramics, Pit-Combed Ware, "Classical" Asbestos and organic tempered ceramics and Net pottery. Iron objects were found at the site (Kosmenko & Manyuhin 1999:34).

59. Vyatchelskoe II
Finds: 1881
Studies: Kosmenko, M. G., excavation 1984 12 m^2
Literature: Kosmenko 1992; Kosmenko & Manyuhin 1999
Ceramics: According to Kosmenko (1992:16–17) the find material includes Net pottery and Luukonsaari ceramics. Remains of iron production were found (Kosmenko & Manyuhin 1999:39–41).

60. Cvyatozero VIII
Finds: 2049
Studies: Spiridonov, A. M., survey 1985
Literature: –
Ceramics: Very little material including one vessel of Net pottery.

61. Chudozero I
Finds: 15, 26, 33
Studies: Savvateev, Ju. A., survey 1957; Savvateev, Ju. A., excavation 1958 48 m^2; Savvateev, Ju. A., excavation 1959 56 m^2
Literature: Savvateev 1980; Zhulnikov 1999
Ceramics: According to Savvateev (1980:91) the small number of ceramics found includes Asbestos ceramics and Net pottery. Also some sherds of Pit-Combed Ware and Porous ceramics were found.

The Water System of Lake Ladoga

62. Salostrov II
Finds: 654, 840, 2977
Studies: Kotchkurkina, S. I., survey 1969; Pankrushev, G. A., survey, inspection 1970; German, K. Z., inspection 1995
Literature: Kotchkurkina *et al.* 1988
Ceramics: The find material includes mostly Pit-Combed Ware and Rhomb-Pit Ware. Also fragments of one or two Net pottery vessels were found.

63–69. Olonka Ia-VI
Finds: (Карельскии государсвенный краеведческий музей)
Studies: Gurina, N. N., excavation 1952
Literature: Gurina, N. N., MIA 87; Pankrushev 1964
Ceramics: According to Pankrushev (1964) the material includes at least Late Neolithic and Net pottery.

The White Sea Area

70. Gorelyj Most II
Finds: 88 (2–3), 143
Studies: Titov, Ju. V., survey 1960; Savvateev, Ju. A., excavation 1961 112 m^2
Literature: Savvateev, Ju. A., 1977
Ceramics: According to Savvateev (1977:263) the material includes Pit-Combed Ware, Porous ceramics and Net pottery.

71. Gorelyj Most III
Finds: 144
Studies: Savvateev, Ju. A., excavation 1961 428 m^2
Literature: Savvateev, Ju. A. 1977
Ceramics: According to Savvateev (1977:269–275) Pit-Combed Ware, Porous organic tempered ceramics, Late Asbestos ceramics and Net pottery are represented in the material.

72. Gorelyj Most IV
Finds: 148
Studies: Savvateev, Ju. A., excavation 1961 260 m²
Literature: Savvateev, Ju. A. 1977; Kosmenko & Manyuhin 1999
Ceramics: The ceramic material consists of Pit-Combed Ware, Porous organic tempered ceramics, Asbestos ceramics and Net pottery (Savvateev 1977:286). It seems likely that it represents one and the same dwelling site together with Gorelyj Most III and V (see Savvateev 1977, fig. 119). Remains of iron objects were found (Kosmenko & Manyuhin 1999:34).

73. Gorelyj Most V
Finds: 145, 204
Studies: Savvateev, Ju. A., excavation 1961 332 m²; Savvateev, Ju. A., inspection 1962
Literature: Savvateev, Ju. A., 1977; Kosmenko & Manyuhin 1999
Ceramics: According to Savvateev (1977:282–285) the ceramic material includes Pit-Combed Ware and hatched-faced ceramics. Some fragments of Asbestos ceramics and Net pottery were also found. Remains of iron objects were found (Kosmenko & Manyuhin 1999:34).

74. Gorelyj Most VI
Finds: 136, 197
Studies: Savvateev, Ju. A., excavation 1961 116 m²; Savvateev, Ju. A., excavation 1962
Literature: Savvateev, Ju. A., 1977; Kosmenko & Manyuhin 1999
Ceramics: According to Savvateev (1977:252–253) the material includes Pit-Combed Ware, Asbestos ceramics, Corded Ware and Net pottery. Remains of iron objects were found (Kosmenko & Manyuhin 1999:34).

75. Gorelyj Most VII
Finds: 135, 198
Studies: Savvateev, Ju. A., excavation 1961 80 m²; Savvateev, Ju. A., excavation 1962 336 m²
Literature: Savvateev, Ju. A., 1977
Ceramics: According to Savvateev (1977:254–255) the material includes Pit-Combed Ware, Asbestos ceramics and Net pottery.

76. Gorelyj Most VIII
Finds: 134, 199
Studies: Savvateev, Ju. A., excavation 1961 16 m²; Savvateev, Ju. A., excavation 1962 508 m²
Literature: Savvateev, Ju. A., 1977; Kosmenko & Manyuhin 1999
Ceramics: According to Savvateev (1977:260) the material includes Asbestos ceramics, Net pottery and Lepnaya ceramics. Remains of iron objects and iron slag were found (Kosmenko & Manyuhin 1999:34).

77. Zolotets VIII
Finds: 96, 289
Studies: Savvateev, Ju. A., excavation 1960 180 m²; Savvateev, Ju. A., inspection 1963
Literature: Savvateev, Ju. A., 1977; Zhulnikov, A. M. 1999
Ceramics: According to Savvateev (1977:143) the material includes Pit-Combed Ware, Asbestos ceramics and Net pottery.

78. Zolotets XV
Finds: 83
Studies: Savvateev, Ju. A., excavation 1960 24 m²
Literature: Savvateev, Ju. A., 1977; Kosmenko & Manyuhin 1999; Zhulnikov, A. M. 1999
Ceramics: According to Savvateev (1977:142) the material includes Pit-Combed Ware, Asbestos ceramics and Net pottery. Traces of iron slag were also found at the site (Kosmenko & Manyuhin 1999).

79. Sukkozero III
Finds: 2064, (Карельскии государсвенный краеведческий музей)
Studies: Pesonen, P., excavation 1985 12 m²; Zachnovitch, M. M., excavation 1990 92 m² (only flint and quartz); Zachnovitch, M. M., excavation (Sukkozero IIIa)1990 128 m² (Net pottery)
Literature: Kotchkurkina *et al.* 1988
Ceramics: Only 2–3 fragments of Net pottery were found. Most of the material at the site dates to the Mesolithic Period.

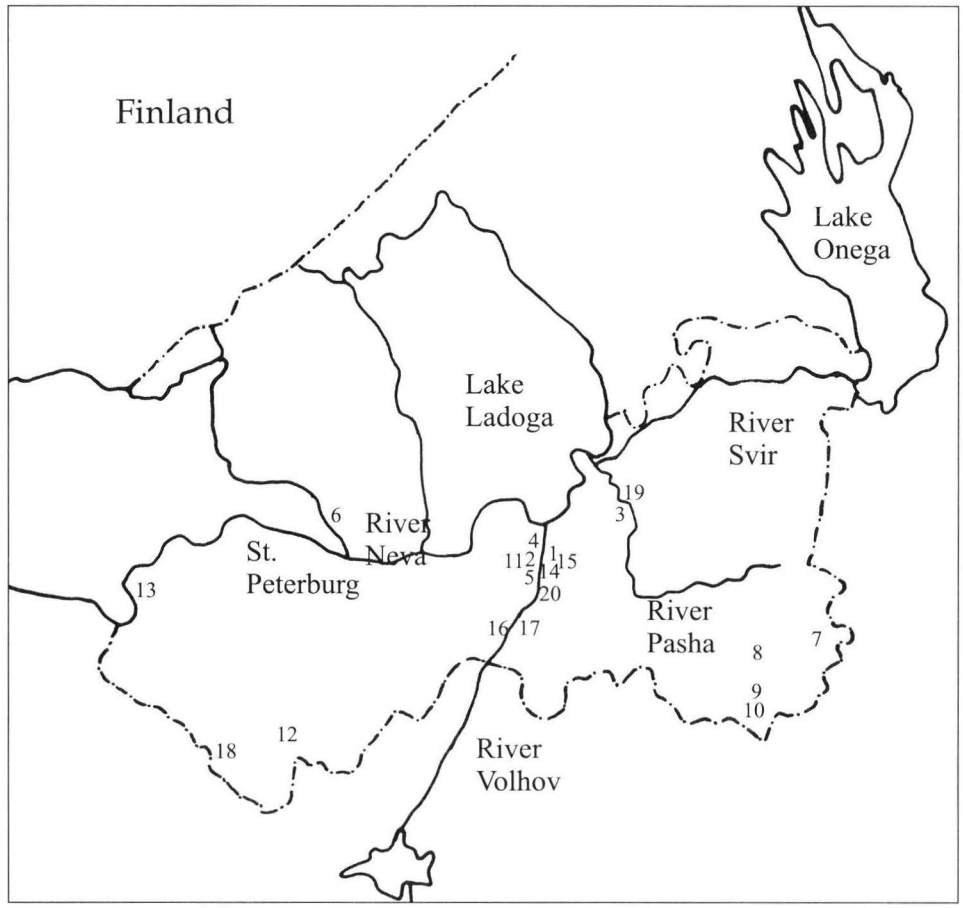
80. Ondozero IV
Finds: 271
Studies: Pankrushev, G. A., survey 1962
Literature: Zhulnikov 1999
Ceramics: The material includes at least Asbestos and organic tempered ceramics and Net pottery.

81. Tunguda III
Finds: 138, 583, 2164, 2237
Studies: Kotchkurkina, C., survey 1961; Savvateev, Ju. A., survey 1968; Zhulnikov, A. M., excavation 1987 644 m²; Zhulnikov, A. M., excavation 1988 400 m²
Literature: Savvateev 1980; Zhulnikov 1999
Ceramics: The material includes at least Asbestos and organic tempered ceramics.

82. Bohta II
Finds: 2433, 2484, 2976
Studies: Zhulnikov, A. M., survey 1990; Zhulnikov, A. M., survey 1991; Zhulnikov, A. M., survey 1995
Literature: Kosmenko & Manyuhin 1999; Zhulnikov, A. M. 1999
Ceramics: The site is destroyed. The material includes Asbestos and organic tempered ceramics and Net pottery. Remains of iron objects were also found (Kosmenko & Manyuhin 1999).

83. Elmenkoski I
Finds: 1661, 1684
Studies: Kosmenko, M. G., excavation 1979; Kosmenko, M. G., excavation 1980 (altogether 88 m²)
Literature: Kosmenko 1982b; Kosmenko & Manyuhin 1999
Ceramics: According to Kosmenko (1982: 99–102) the material includes Asbestos ceramics, Net pottery and Luukonsaari ceramics. Also iron slag was found (Kosmenko & Manyuhin 1999:34).

Appendix 2b. Sites with Textile ceramics in the St. Petersburg region, particularly in the eastern and southern parts of Lake Ladoga.



Appendix 2b. The dwelling sites with Textile ceramics in the St. Petersburg region.

1. Izsady 1 (Issady)
Studies: Gurina, N. N., excavation 1950; Gurina, N. N., excavation 1952 (altogether 360 m^2)
Literature: Gurina 1958; Gurina 1961; Lapshin 1995
Ceramics: According to Gurina (1958:19–20) the material dates to the Early Metal Period and includes mostly Textile ceramics. Gurina has divided the ceramic material of the site into five group. The fifth group represents the Dyakovo type (Gurina 1961:490–498).

2. Izsady 2 (Issady)
Studies: Gurina, N. N., excavation 1950
Literature: Gurina 1961; Lapshin 1995
Ceramics: According to Gurina (1961:502) the material dates to the Early Metal Period and includes Textile and hatched-faced ceramics. The dating of this material is in general later than in Izsady 1.

3. Novaja Derevnja
Studies: Gurina, N. N., excavation 1952–1953.
Literature: Gurina 1961; Lapshin 1995
Ceramics: According to Gurina (1961:484) the small ceramic material resembles much that of found at the dwelling site of Ust-Rybezhna II.

4. Yushkovo (Velsy)
Studies: Gurina, N. N., excavation 1950 142 m^2
Literature: Kalachev, N. V. 1881; Gurina 1961; Orlov 1954; Petrenko 1985; Lapshin 1995
Ceramics: According to Lapshin (1990:6) the ceramic material includes Pit-Combed Ware and Net pottery. Gurina (1961:500) has divided the ceramics into two groups, the first one representing XIII–XIV centuries AD, and the second one the Early Metal Period.

5. Novaja Ladoga 1
Studies: Gurina, N. N., survey 1950
Literature: Gurina 1961; Lapshin 1995
Ceramics: According to Gurina (1961:500) the site includes same kind of ceramic material found at Yushkovo. Material is small, because no excavations have been conducted at the site.

6. Lahta
Studies: Aleksandrov, V. & Vittenberg, V., excavation 1923 39 m^2
Literature: Gurina 1961; Petrenko 1985; Lapshin 1995
Ceramics: According to Lapshin (1995:175) the material includes textile-impressed ceramics. This ceramics have been found in the same context together with iron slag (Gurina 1961:506). Gurina emphasizes that this ceramics discerns from other Early Metal Period pottery in the St. Petersburg region for its organic temper. It dates, probably, to the Early Iron Age.

7. Listvenka 1
Studies: Bashenkin, A. N. survey 1988; Bashenkin, A. N. excavation 1989 10 m^2
Literature: Lapshin 1990
Ceramics: According to Lapshin (1990:6) the ceramic material includes Pit-Combed Ware and Net pottery.

8. Lid 3
Studies: Bashenkin, A. N. survey 1990
Literature: Lapshin 1995
Ceramics: According to Lapshin (1995:10) the ceramic material includes Pit-Combed Ware and Net pottery.

9. Karasinskoe
Studies: Bashenkin, A. N. survey 1990
Literature: Lapshin 1995
Ceramics: According to Lapshin (1995:12–13) the ceramic material includes Pit-Combed Ware, Net pottery and smooth-faced ceramics.

10. Gorjan 2
Studies: Urban, Ju. N. survey 1986
Literature: Lapshin 1995
Ceramics: According to Lapshin (1995:21) the ceramic material includes Pit-Combed Ware, Net pottery and smooth-faced ceramics.

11. Lopino 2
Studies: Orlov, S. N. & Gurina, N. N. 1950 150 m^2
Literature: Orlov, S. N. 1982; Lebedev, G. S. & Sedyh, V. N. 1985; Lapshin 1995
Ceramics: According to Gurina (1961) the ceramic material includes Pit-Combed Ware and Net pottery.

12. Merevo 9 (Merevo II)
Studies: Timofeev, V. I., excavation 1983
Literature: Lapshin 1990
Ceramics: The material includes Narva ceramics, Pit-Combed Ware, Textile ceramics and "Early Russian ceramics" (Lapshin 1990:22).

13. Habolovo (Habolovskaya)
Studies: Timofeev, V. I., survey 1983
Literature: Lapshin 1990
Ceramics: Only Net pottery was found at the site.

14. Pobedischce 5
Studies: Lebedev, G. S. & Sedyh, V. N., survey 1985
Literature: Lapshin 1995
Ceramics: According to Lapshin (1995:134) the material includes Textile ceramics.

15. Podol
Studies: Lebedev, G. S. & Sedyh, V. N., survey 1983
Literature: Lebedev & Sedyh 1985; Lapshin 1995
Ceramics: According to Lapshin (1995:142) the material includes Textile ceramics.

16. Podsope 1
Studies: Gurina, N. N. excavation in the 1950's; Timofeev, V. I., survey 1990
Literature: Gurina 1961; Timofeev 1993; Lapshin 1995
Ceramics: The ceramic material includes Textile ceramics (Gurina 1961:30, 450–454). Also some drops of bronze have been found in some ceramic sherds.

17. Podsope 2
Studies: Orlov, S. N., excavation 1968
Literature: Lapshin 1995
Ceramics: According to Lapshin (1995:145) the material includes Textile ceramics.

18. Syabernaya III (Syabero)
Studies: Timofeev, V. I., survey 1984; Timofeev, V. I., excavation 1988; Timofeev, V. I., excavation 1988
Literature: Timofeev, V. I. 1993a; Lapshin 1990
Ceramics: According to Timofeev (1993a:30–32) the material includes two types of Net pottery. The "early" Textile ceramics has two datings (Le-3133 3480±90 and Le-3138 3595±150 BP). The "early" type is organic tempered. The "later" type has mineral tempers.

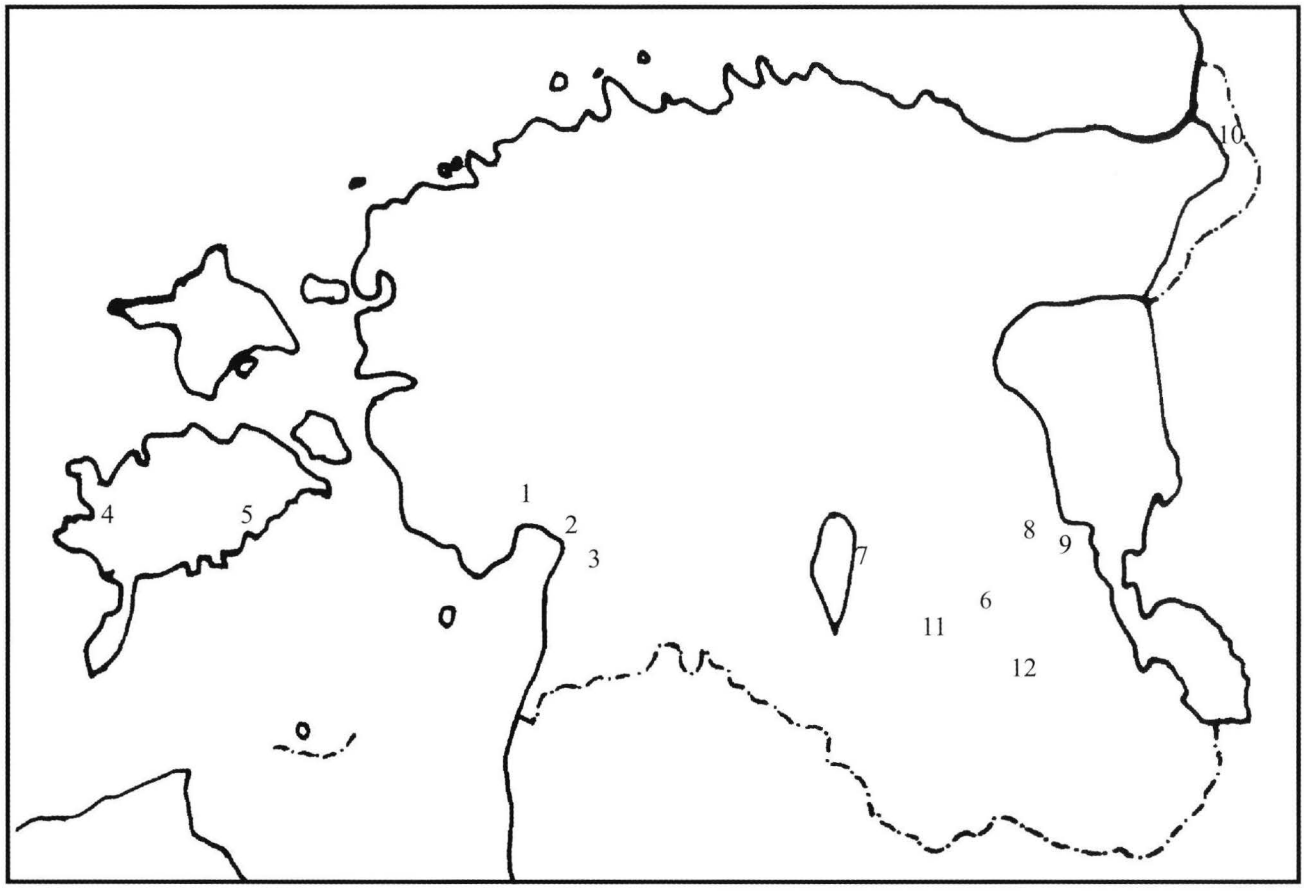
19. Ust-Rybezhna II (and III)
Studies: Gurina, N. N., excavation 1954; Gurina, N. N., excavation 1956; Gurina, N. N., excavation 1958–1959 (altogether 260 m^2)
Literature: Gurina, N. N. 1961; Timofeev 1993a; Lapshin 1995:127
Ceramics: According to Gurina (1961) the ceramic material includes only Net pottery. The ceramic material is large and Gurina (1961:367–483) has divided it into three subgroups.

20. Velicha 2
Studies: Orlov, S. N., survey 1982
Literature: Lebedev, G. S. & Sedyh, V. N. 1985; Orlov, S. N. 1958; 1961; Lapshin 1995:132
Ceramics: The ceramic material includes Pit-Combed Ware, Net pottery and Lepnaya ceramics.

21. Valgoma[2]
Studies: Kamenski, V. I., excavation 1910
Literature: Gurina 1961
Ceramics: According to Gurina (1961:454) the site dates to the Early Metal Period and ceramic material includes mostly Net pottery.

[2] The site was not possible to locate on the map 1.2.

Appendix 2c. Sites with Textile ceramics in Estonia.



Appendix 2c. The dwelling sites with Textile ceramics in Estonia.[3] In addition to the large collection of the Ajaloo Instituudi in Tallinn and the archaeological collections at the University of Tartu there are also other sites involving small fragments of textile-impressed ceramics.[4] Also Valter Lang (2000) has separated Textile ceramics and textile-impressed ceramics from the material in northern Estonia.[5]
Museum collections. AI = Ajaloo Instituudi arheoloogiakogut Tallinnas. Archaeological collections of the Institute of History in Tallinn, PäM = Pärnu Muuseum. Pärnu Museum, TÜ = Tartu Ülikooli Arheoloogia Kabinet. University of Tartu archaeological collections.

<u>Pärnumaa</u>

1. Lemmetsa I
Finds: PäM 14642
Studies: Kriiska, A., survey 1996–1999
Literature: Kriiska *et al.* 1998; Kriiska, A. & Saluäär, U. 2000
Ceramics: According to Kriiska and Saluäär (2000:13–28) the find material includes Typical Combed Ware, Late Combed Ware, Corded Ware, Textile ceramics and Metal Age handmade ceramics.

2. Altküla
Finds: AI, PäM no number
Studies: Lõugas, V., survey 1972; Kriiska, A., survey 1997
Literature: Eesti Esiajalugu; Lõugas, Eesti Talurahva Ajalugu 1992; Kriiska *et al.* 1998
Ceramics: The ceramic material is only Textile ceramics which can be dated to the Early Iron Age (Jaanits *et al.* 1982:176). The settlement was dated to the second half of the 1st millennium BC (Kriiska *et al.* 1998:40–41).

3. Laadi
Finds: PäM no number
Studies: Kriiska, A., survey
Literature: Aun 1992; Kriiska 1998
Ceramics: Some sherds of Textile ceramics exist in the material.

<u>Saaremaa</u>

4. Loona
Finds: AI 4129, 4210
Studies: Jaanits, L., excavation 1956–1959
Literature: Jaanits 1959; Jaanits 1965
Ceramics: According to Jaanits (1959:107–108) the ceramics resembles Kiukainen ceramics in Finland. Jaanits (1965:39) mentions also that the material includes textile-impressed sherds, which he does not connect with Textile ceramics but with Kiukainen ceramics.

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[3] In addition to these sites Silvia Laul presents several sites including Textile ceramics in Estonia. Many of these sites are hillforts, which date to the Iron Age. It is therefore probable that this ceramics belongs to the Dyakovo type. Laul (1997:578–579) mentions the following sites (see also Joonis 1). Emäjogi area: Tamula and Villa; south eastern Estonia: Tamula and Villa; Saaremaa: Loona, Asva and Ridala; northern Estonia: Iru, Koila, Muuksi, Tirma and Iru cemeteries.
[4] Setumaa: Uusvada küla (TÜ 117), Kalatsova (TÜ 128, J. Peets excavation 1993), Tartumaa Külitse "Pähnimägi" (TÜ 8, 231, 417, 433), Viljandimaa: Koksvere (TÜ 405), Makita kalme (TÜ 317).
[5] Tõugu II, Uusküla II, Ilumäe II (dwelling site) (Lang 2000:119, 156, 180–181).

5. Asva
Finds: AI 3307, 3658, 3799, 3994, 4012, 4366
Studies: Indreko, R., excavation 1934, 1936; Vassar, A., excavation ?; Lõugas, V., excavation 1966
Literature: Indreko 1938, 1961; Meinander 1954b, 1968; Lõugas 1970; Jaanits *et al.* 1982; Kriiska 2000
Ceramics: From the large material found at the Asva hillfort Richard Indreko (1961:420) separated Asva ceramics and the Asva culture dating to the Pre-Roman Iron Age. In addition to this, the Asva material includes at least Late Neolithic Corded Ware, Textile ceramics, Asva ceramics and Early Iron Age ceramics.

Tartumaa
6. Röhu II
Finds: TÜ 609
Studies: Vindi, A., survey 1997
Literature: Kiristaja *et al.* 1997
Ceramics: According to Vindi *et al.* (1997:219) the material includes Textile ceramics from the 1st millennium BC and Early Iron Age ceramics.

7. Vehendi
Finds: TÜ 468, 549, 550, 551
Studies: Laul, S., excavation 1975–1976; Tvauri, A. & Vindi, A., survey 1996
Literature: Laul 1978, 1985; Kiristaja *et al.* 1997
Ceramics: The Vehendi cemetery (kivikalme) dates to the 10th–9th centuries BC (Laul 1985:68; 1997:581) and its ceramic material includes mostly Textile ceramics. The dwelling site of Vehendi shows habitation activity inside an area of 250m x 250m. The habitation continues from the Early Metal period to the Middle Age (Kiristaja *et al.* 1997:221).

8. Kullamägi
Finds: AI 3808, 4045
Studies: Indreko, R., survey 1939; Jaanits, L., excavation 1949–1950, 224 m²
Literature: Jaanits 1954; Jaanits 1959; Jaanits 1965
Ceramics: Lembit Jaanits (1959:71–80) separated the following ceramic types in the material: Narva ceramics, Pit-Combed Ware (stone-tempered), Pit-Combed Ware (porous), Corded Ware, Textile ceramics and Early Metal Period ceramics.

9. Akali
Finds: AI 3573, 3661, 3800, 4013
Studies: Indreko, R., excavation 1938–1939; Jaanits, L., excavation 1949–1952, 515 m²
Literature: Jaanits 1954; Jaanits 1959; Jaanits 1965
Ceramics: Lembit Jaanits (1959:32–57) separated the following ceramic types in the material: Narva ceramics, Pit-Combed Ware (stone-tempered), Pit-Combed Ware (porous), Corded Ware, Textile ceramics and Early Metal Period ceramics.

Virumaa
10. Riigiküla XIV
Finds: PäM 2181; NLM 12182
Studies: Kriiska, A., survey 1996; excavation 1998
Literature: Kriiska 1995; 1996b; 1999; 2000
Ceramics: According to Kriiska (2000:65–70) the majority of ceramic material belongs to Corded Ware and also some sherds of Textile ceramics exist at the site.

Võrumaa
11. Ala-Pika
Finds: TÜ 320
Studies: Valk, H., excavation 1995
Literature: Valk 1996; Tvauri 1997
Ceramics: According to Andres Tvauri (1997:163) the settlement of Ala-Pika can be dated to the period between 450–850 AD. The ceramics involves both fine and coarse pottery. Carinated pottery is also represented (Tvauri 1997:162).

Tamula
12. Finds: AI 4118
Studies: Indreko, R., excavation 1938–1946; Moora, H., excavation 1946; Jaanits, L., excavation 1949; Jaanits, L., excavation 198?
Literature: Indreko 1845; Jaanits 1954; 1957; 1959; 1965; 1984
Ceramics: Lembit Jaanits separated Typical Combed Ware, Late Combed Ware, Corded Ware and also some sherds of Textile ceramics from the material (Jaanits 1984:187–192).

Appendix 3. Profiles of Textile ceramics in Finland and on the Karelian Isthmus. The list involves well-preserved rim sherds. The identification number given in parenthesis together with each sherd refers the numbering used in the SURVO database (App. 5). Also NM-numbers and subnumbers are given (Tables 1–9).

TABLE 1

Kemijoki Water System

Kemijärvi Hietalahti	15667:232 (2987)
Kemijärvi Juuniemi	14345:41 (3010)

Oulujoki Water System

Suomussalmi Kellolaisten tuli	14831:921 (179)
Suomussalmi Kellolaisten tuli	14831:919 (183)
Suomussalmi Kellolaisten tuli	14831:1274 (180)
Suomussalmi Kalmosärkkä	14830:675 (81)
Suomussalmi Kalmosärkkä	14830:1298 (88)
Suomussalmi Kalmosärkkä	14830:596 (118)
Suomussalmi Kalmosärkkä	20413:6 (135)
Suomussalmi Kellolaisten tuli	14831:1182 (187)
Suomussalmi Kalmosärkkä	14830:1170 (127)
Suomussalmi Kalmosärkkä	14830:1262 (119)
Suomussalmi Kalmosärkkä	20413:3 (133)
Suomussalmi Kalmosärkkä	20413:4 (134)
Suomussalmi Kellolaisten tuli	14831:334 (186)
Suomussalmi Kellolaisten tuli	14831:293 (214)
Suomussalmi Joenniemi	23701:452 (375)
Suomussalmi Kalmosärkkä	14829:454 (58)
Suomussalmi Joenniemi	23701:457 (382)
Kuhmo Sylväjänniemi	20903:67 (823)
Kuhmo Pajasaari	23700:199 (774)
Kuhmo Vasikkaniemi	25302:175 (792)

TABLE 2

Suomussalmi Tormuan särkkä	18322:997 (321)
Sotkamo Kiikarusniemi	21482:91 (933)
Sotkamo Kiikarusniemi	27239:5 (921)
Vaala Sillankorva	4080:59 (592)
Vaala Sillankorva	4080:12 (533)

Southern Ostrobothnia

Laihia Viirikallio	25010:30 (4531)

Saimaa Water System

Ilomantsi Syväys	17875:48 (1100)
Joensuu Varaslampi	19471:91 (1175)
Joensuu Varaslampi	19471:152 (1187)
Joensuu Varaslampi	19471:166 (1191)
Joensuu Varaslampi	19471:187 (1194)
Joensuu Varaslampi	19471:241 (1204)
Joensuu Varaslampi	19471:278 (1218)
Joensuu Varaslampi	19471:344 (1233)
Joensuu Varaslampi	19471:319 (1237)
Joensuu Varaslampi	19471:499 (1259)
Joensuu Varaslampi	19471:377 (1240)
Joensuu Varaslampi	19471:380 (1241)
Joensuu Varaslampi	19471:423 (1245)
Joensuu Varaslampi	19471:782 (1260)
Joensuu Varaslampi	19471:530 (1273)
Joensuu Varaslampi	19471:531 (1274)
Joensuu Varaslampi	19471:542 (1277)

TABLE 3

Joensuu Varaslampi	19471:813 (1305)
Joensuu Varaslampi	19471:838 (1307)
Joensuu Varaslampi	19471:835 (1308)
Joensuu Varaslampi	19471:856 (1310)
Joensuu Varaslampi	19471:858 (1313)
Joensuu Varaslampi	19471:943 (1326)
Joensuu Varaslampi	19471:964 (1329)
Joensuu Varaslampi	19471:839 (1311)
Joensuu Varaslampi	19471:772 (1334)
Joensuu Varaslampi	19471:1186 (1349)
Joensuu Varaslampi	19471:1262 (1335)
Joensuu Varaslampi	19471:714 (1367)
Joensuu Varaslampi	19471:517 (1369)
Joensuu Varaslampi	19471:1112 (1341)
Kerimäki Vehkaranta	13061:83 (1408)
Polvijärvi Multavieru	17869:1 (1633)
Polvijärvi Multavieru	18266:5 (1649)
Polvijärvi Multavieru	23819:14 (1686)
Pielavesi Meijerinkangas	26617:55 (4582)
Ristiina Pulmionlampi	27382:8 (4617)
Ristiina Kitulansuo d	28960:45 (1620)

TABLE 4

Ristiina Kitulansuo d	27383:1 (4618)
Ristiina Kitulansuo d	28960:67 (4621)
Ristiina Kitulansuo d	28960:247 (4626)
Ristiina Kitulansuo d	28960:318 (4628)
Ristiina Kitulansuo d	28960:411 (4631)
Ristiina Kitulansuo d	28960:480 (4633)
Ristiina Kitulansuo d	28960:525 (4635)
Ristiina Kitulansuo d	28960:1027 (4640)
Ristiina Kitulansuo d	28541:241 (1852)
Ristiina Kitulansuo d	28112:1 (1825)
Ristiina Kitulansuo d	28541:76 (1847)
Ristiina Kitulansuo d	28541:246 (1854)
Ristiina Kitulansuo d	28541:924 (1862)
Ristiina Kitulansuo d	28541:905 (1863)
Ristiina Kitulansuo d	28541:605 (1857)
Ristiina Kitulansuo d	28541:1351 (1868)

TABLE 5

Savonlinna Suvikangas	28324:1 (4659)
Karelian Isthmus	
Kaukola Antti Varvan pelto	5963:731 (2499)
Kaukola Pekko Iivosen rantapelto	5963:282 (2119)
Kaukola Tiitunmäki	6191:44 (2650)
Kaukola Tiitunmäki	6191:17 (2621)
Kaukola Tiitunmäki	6191:15 (2618)
Kaukola Tiitunmäki	8885:25 (2831)
Kaukola Tiitunmäki	6191:28 (2632)
Kaukola Olli Paavilaisen rantapelto	4997:45 (4708)
Aati Ruuskan Vehnämaanlahden p.	6910:24 (4717)
Heikki Teräväisen rantapelto	6348:11 (4764)
Heikki Teräväisen rantapelto	7117:4 (4723)

Räisälä Kalmistonmäki	6675:15 (2966)
Räisälä Kalmistonmäki	6675:42 (2960)
Räisälä Kalmistonmäki	6675:35 (2968)
Räisälä Kalmistonmäki	2490:8 (2947)
Räisälä Kalmistonmäki	2490:8 (2948)

TABLE 6

Räisälä Kalmistonmäki	6675:19 (2966)

Päijänne Water System

Asikkala Kotasaari	15466:34 (3134)
Asikkala Kotasaari	15466:35 (3135)
Asikkala Kotasaari	15466:127 (3140)
Korpilahti Raidanlahti	25198:2 (3303)
Asikkala Kotasaari	15466:202 (3149)
Asikkala Kotasaari	15466:196 (3147)
Asikkala Kotasaari	15466:149 (3141)
Asikkala Kotasaari	15789:33 (3168)
Asikkala Kotasaari	15789:82 (3178)
Asikkala Kotasaari	18141:325 (3209)
Asikkala Kotasaari	18141:183 (3214)
Asikkala Kotasaari	15466:323 (3155)
Korpilahti Raidanlahti	25198:17 (3310)

Kokemäenjoki Water System

Kangasala Aultio-Lunden	13433:40 (3484)
Kangasala Sepänjärvi	9604:7 (3488)
Kangasala Sepänjärvi	9604:29 (3495)

TABLE 7

Kangasala Sepänjärvi	9604:58 (3501)
Kangasala Sepänjärvi	9604:77 (3505)
Kangasala Pohtio	7757:27 (3511)
Kangasala Pohtio	7757:14 (3513)
Kangasala Pohtio	7757:38 (3516)
Kangasala Pohtio	7964:148 (3536)
Kangasala Pohtio	13433:166 (3553)
Kangasala Pohtio	7757:45 (3520)
Kangasala Pohtio III	17104:265 (3750)
Kangasala Pohtio III	17104:650 (3850)
Kangasala Tiilitehdas I	7964:17 (4023)
Kangasala Tiilitehdas I	7964:25 (4025)
Kangasala Sepänjärvi	9604:87 (3504)
Kangasala Tiilitehdas I	7964:28 (4026)
Kangasala Sepänjärvi	9604:36 (3486)
Kangasala Sepänjärvi	9604:7 (3487)
Kangasala Sepänjärvi	9604:29 (3491)
Kangasala Sepänjärvi	9604:87 (3504)

TABLE 8

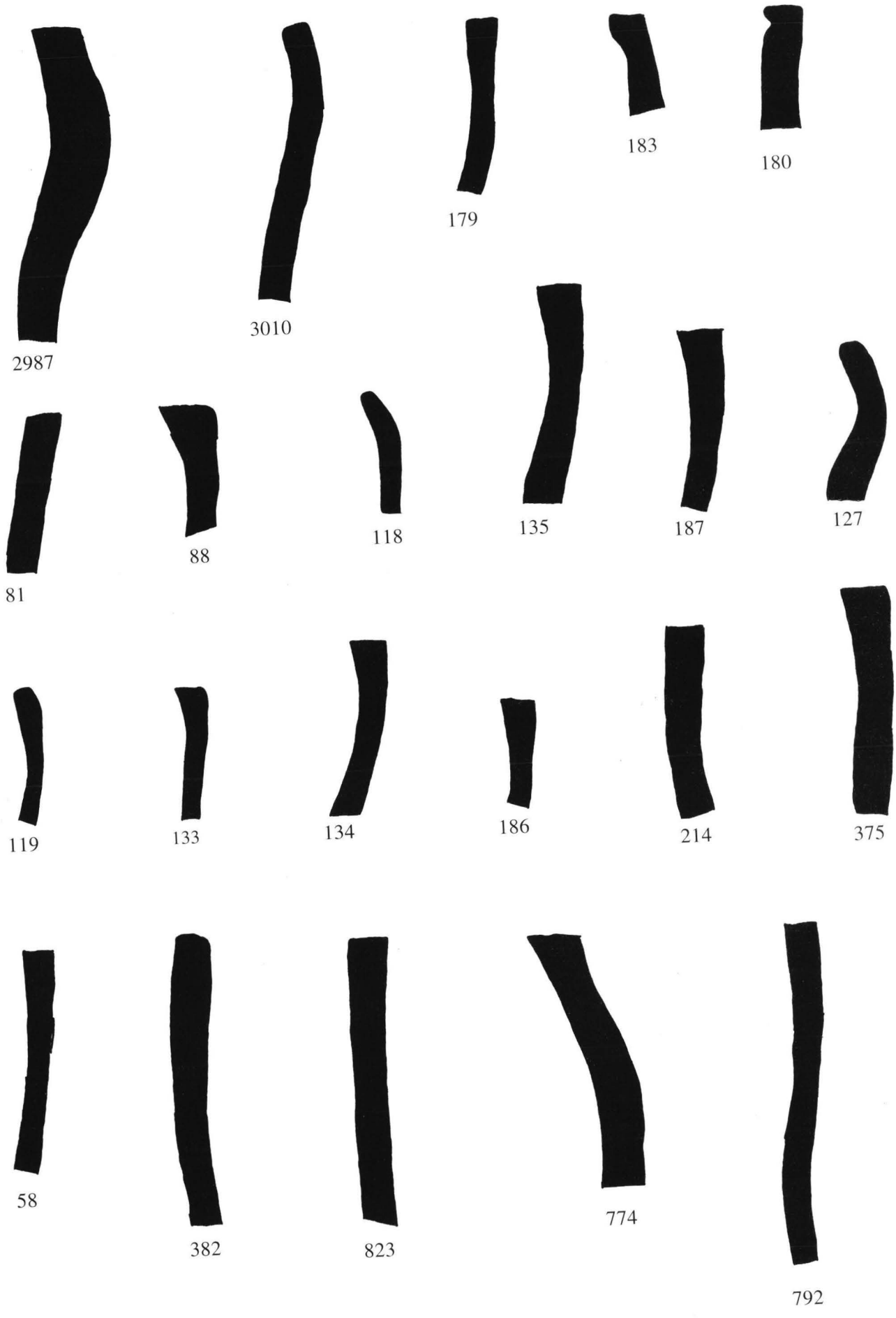
Kangasala Tiilitehdas I	7964:58 (4033)
Kangasala Tiilitehdas I	7964:44 (4031)
Luopioinen Hietaniemi	16356:277 (4089)
Luopioinen Hietaniemi	17131:133 (4124)
Luopioinen Hietaniemi	16356:193 (4083)
Luopioinen Hietaniemi	17131:200 (4128)
Luopioinen Hietaniemi	17131:658 (4167)
Luopioinen Hietaniemi	17131:709 (4173)
Luopioinen Hietaniemi	17131:1113 (4204)
Luopioinen Hietaniemi	17131:1178 (4213)
Luopioinen Hietaniemi	17131:556, 1129, 1114, 1420 (4194)
Luopioinen Isosaari	13407:41 (4260)

Varsinais-Suomi

Laitila Hautvuori	4274:1 (4338)
Laitila Hautvuori	4274:1 (4340)
Laitila Hautvuori	2500:5 (4336)
Laitila Hautvuori	4274:1 (4342)

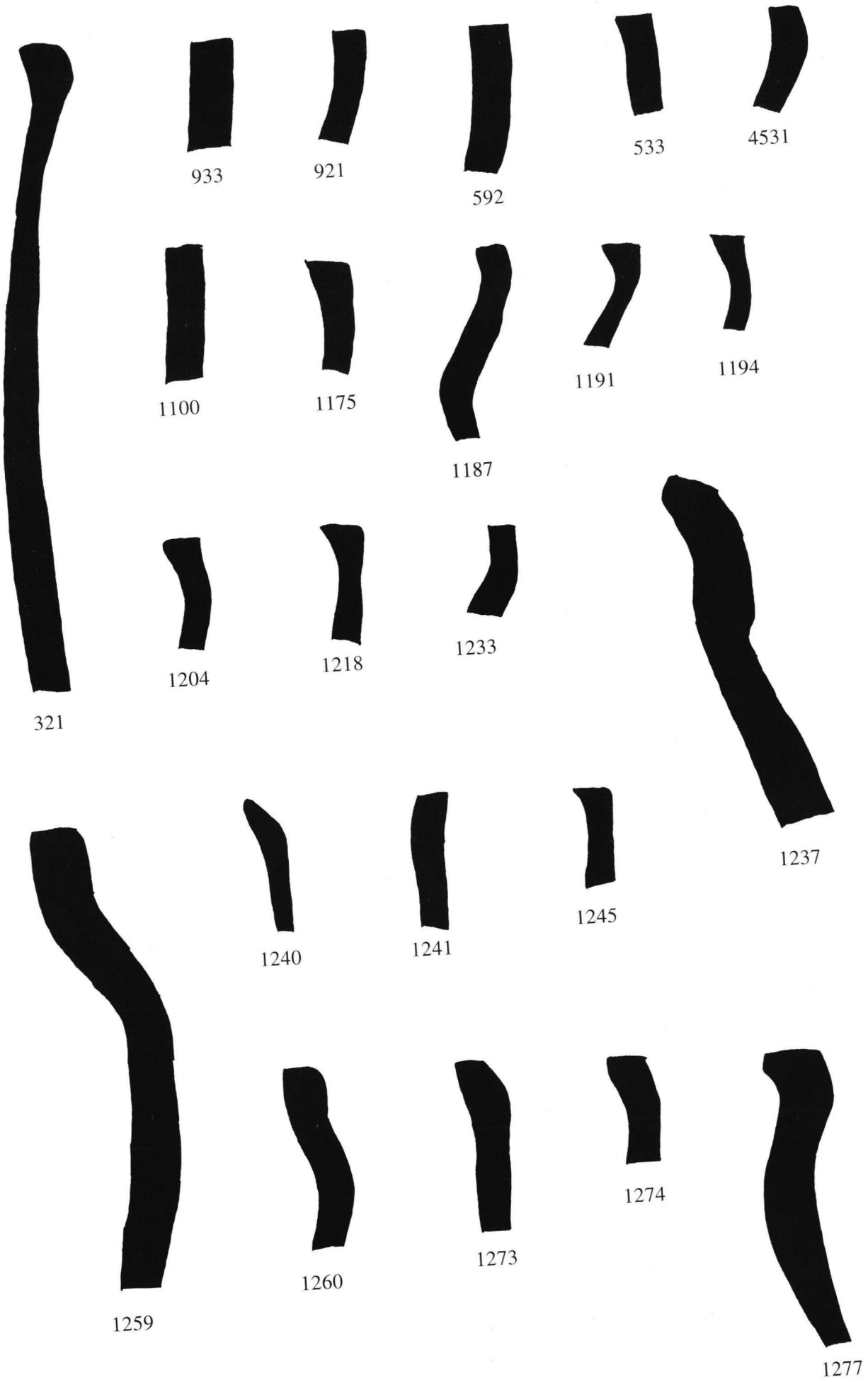
TABLE 9

Laitila Lalla	18196:1 (4344)
Laitila Lalla	19265:79 (4364)
Porvoo Böle	12135:1 (4910)
Suomussalmi Kalmosärkkä	14504:282 (29)
Taipalsaari Valkeasaari	17040:1(1898)



Scale 1:1

TABLE 1



Scale 1:1

TABLE 2

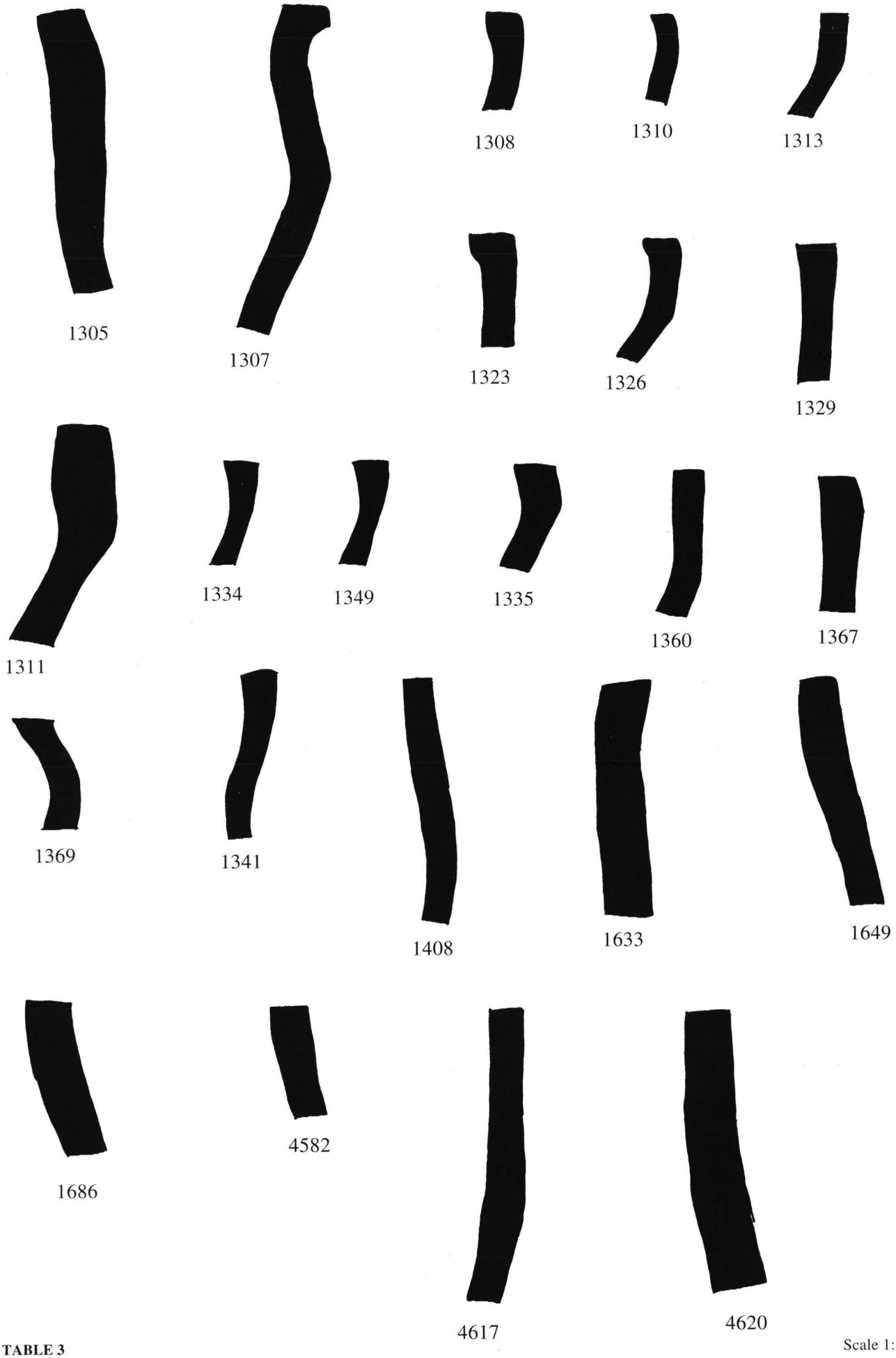


TABLE 3

Scale 1:1

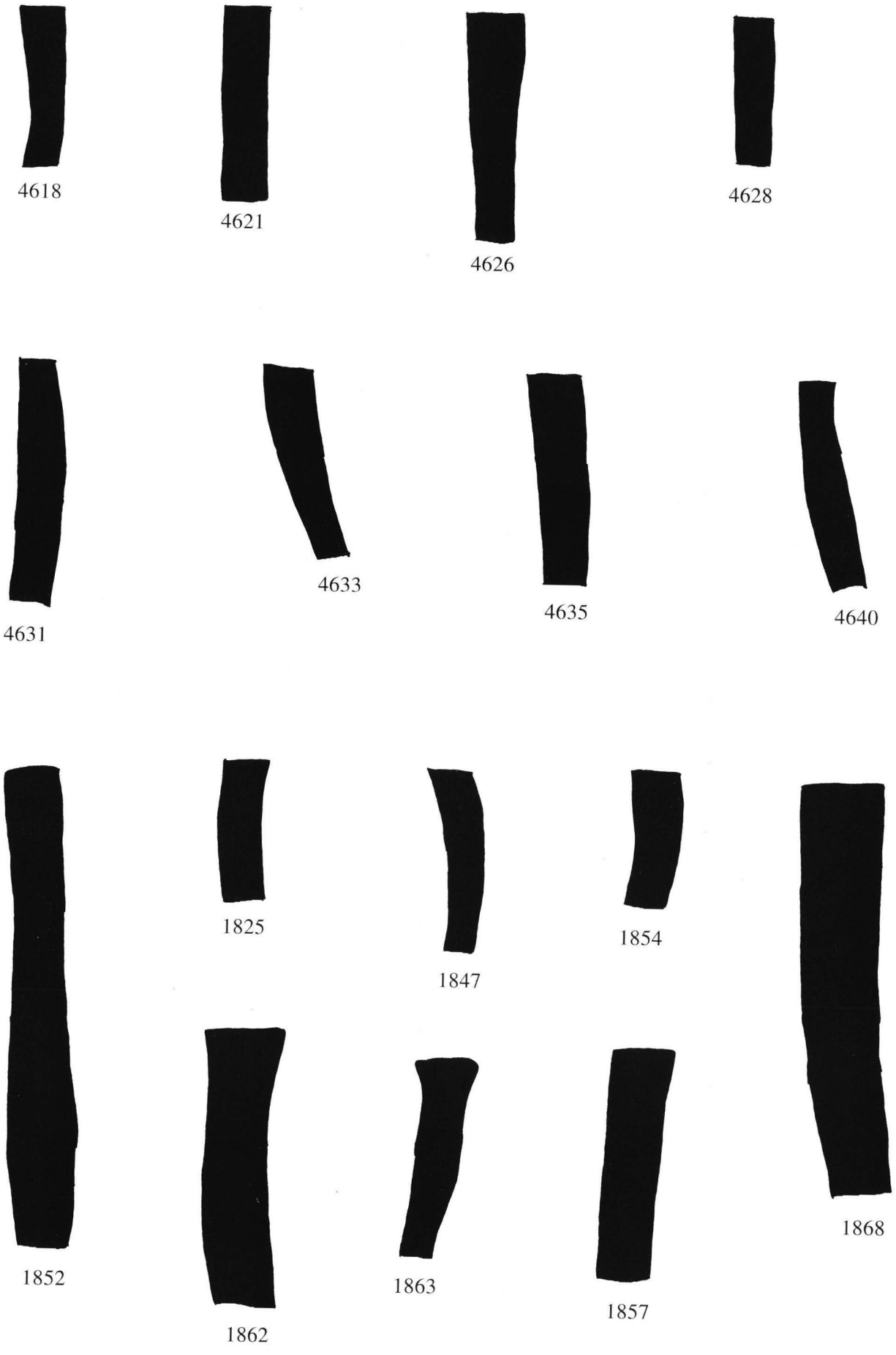


TABLE 4

Scale 1:1

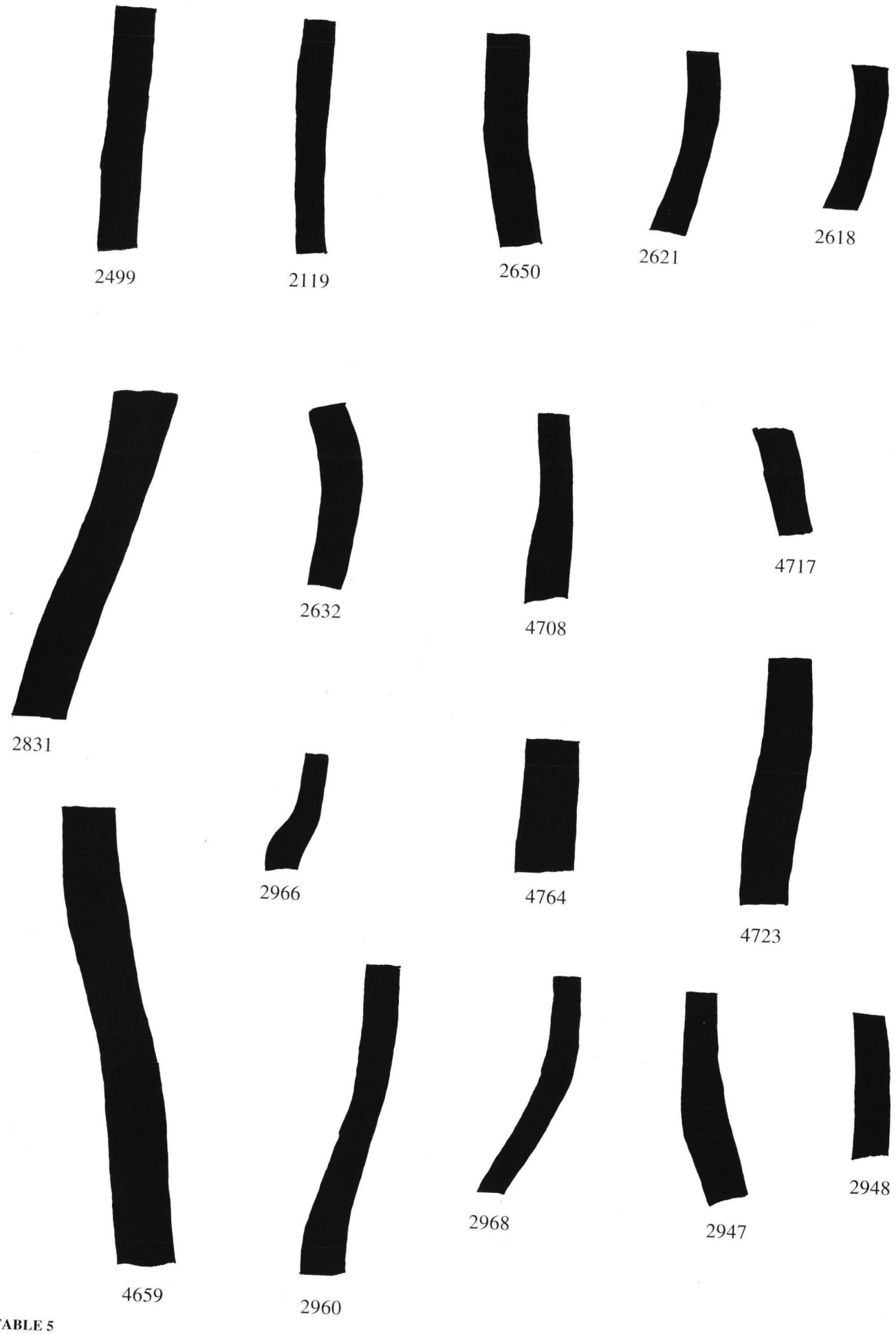


TABLE 5

Scale 1:1

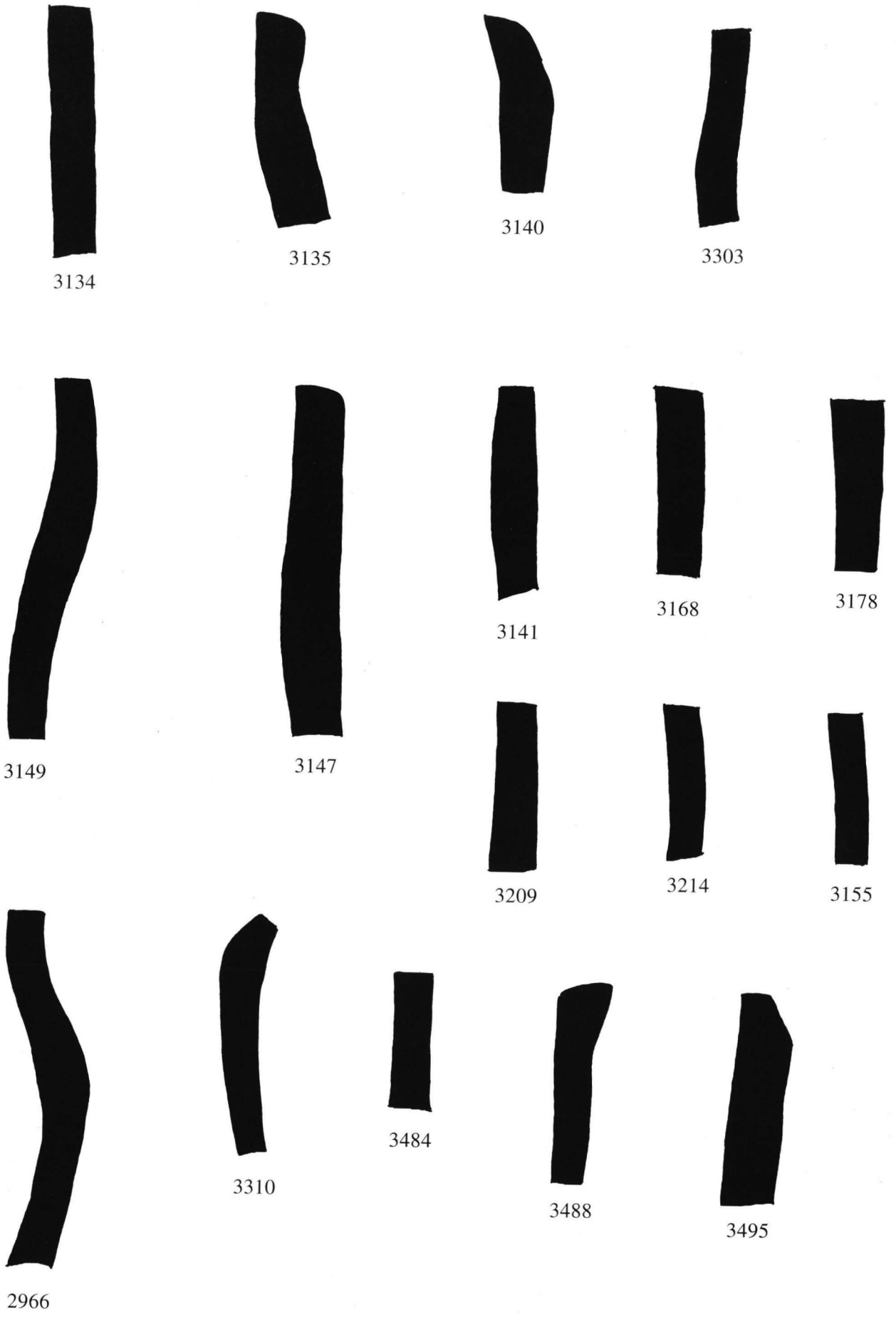


TABLE 6

Scale 1:1

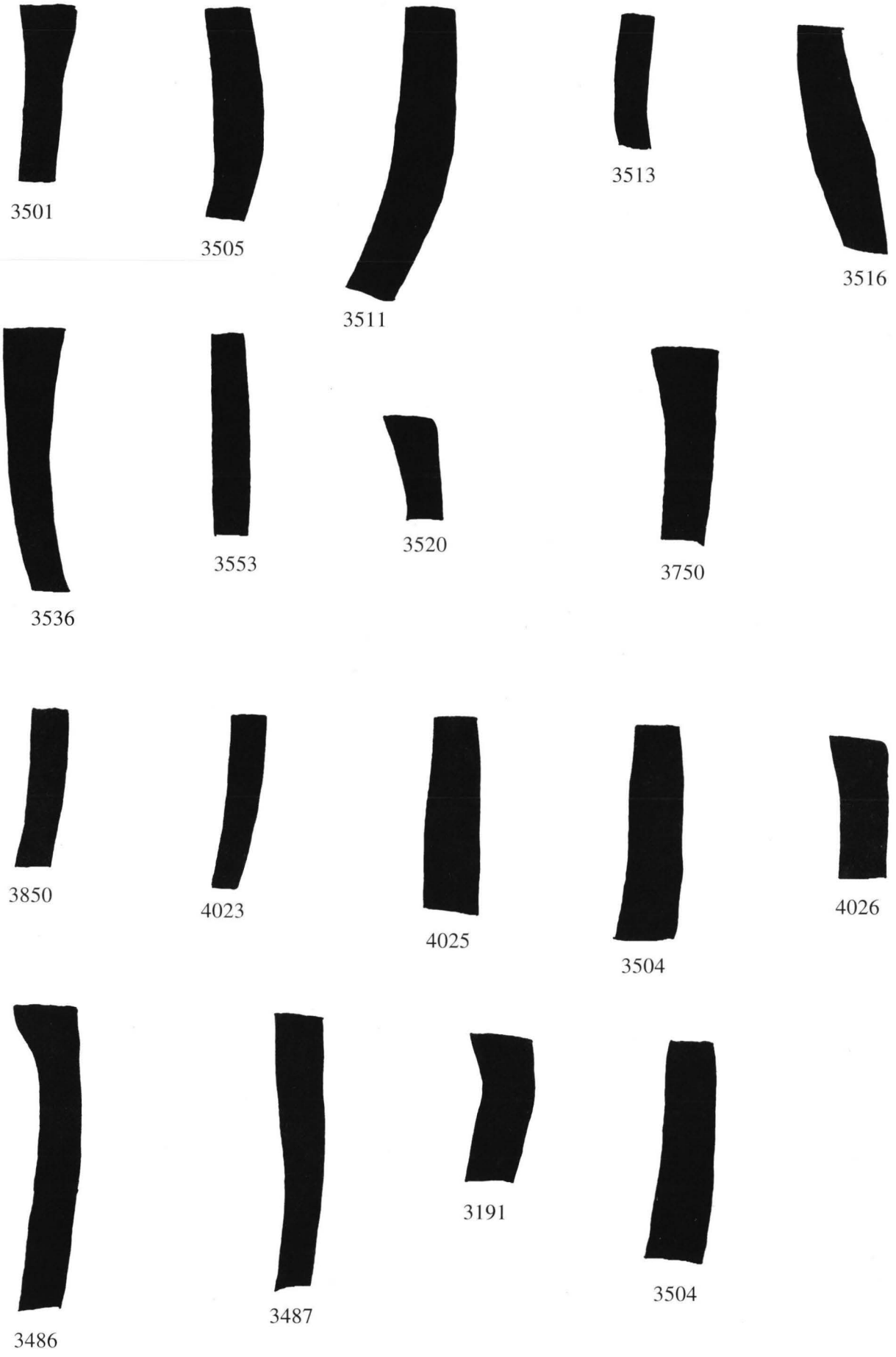


TABLE 7

Scale 1:1

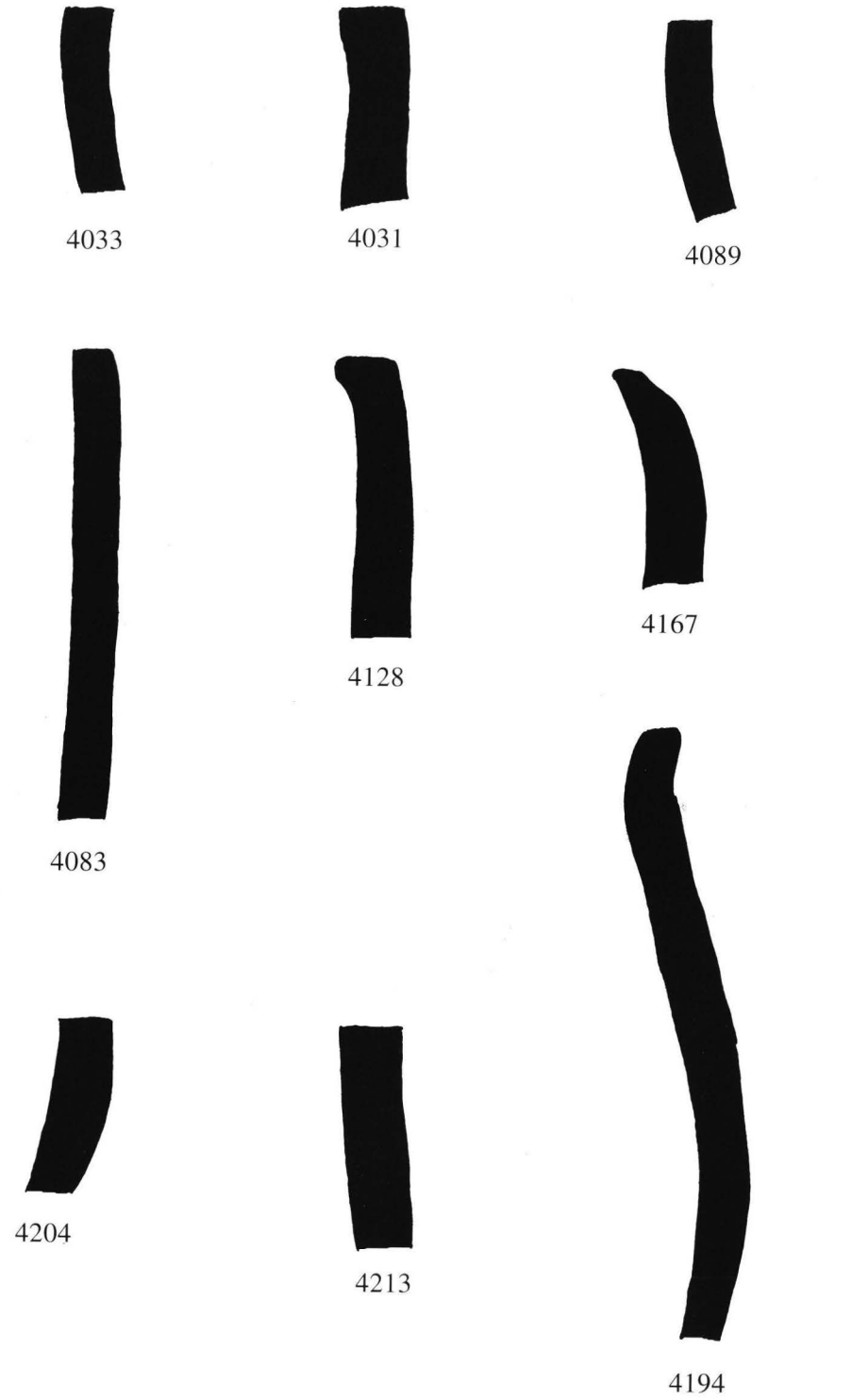


TABLE 8

Scale 1:1

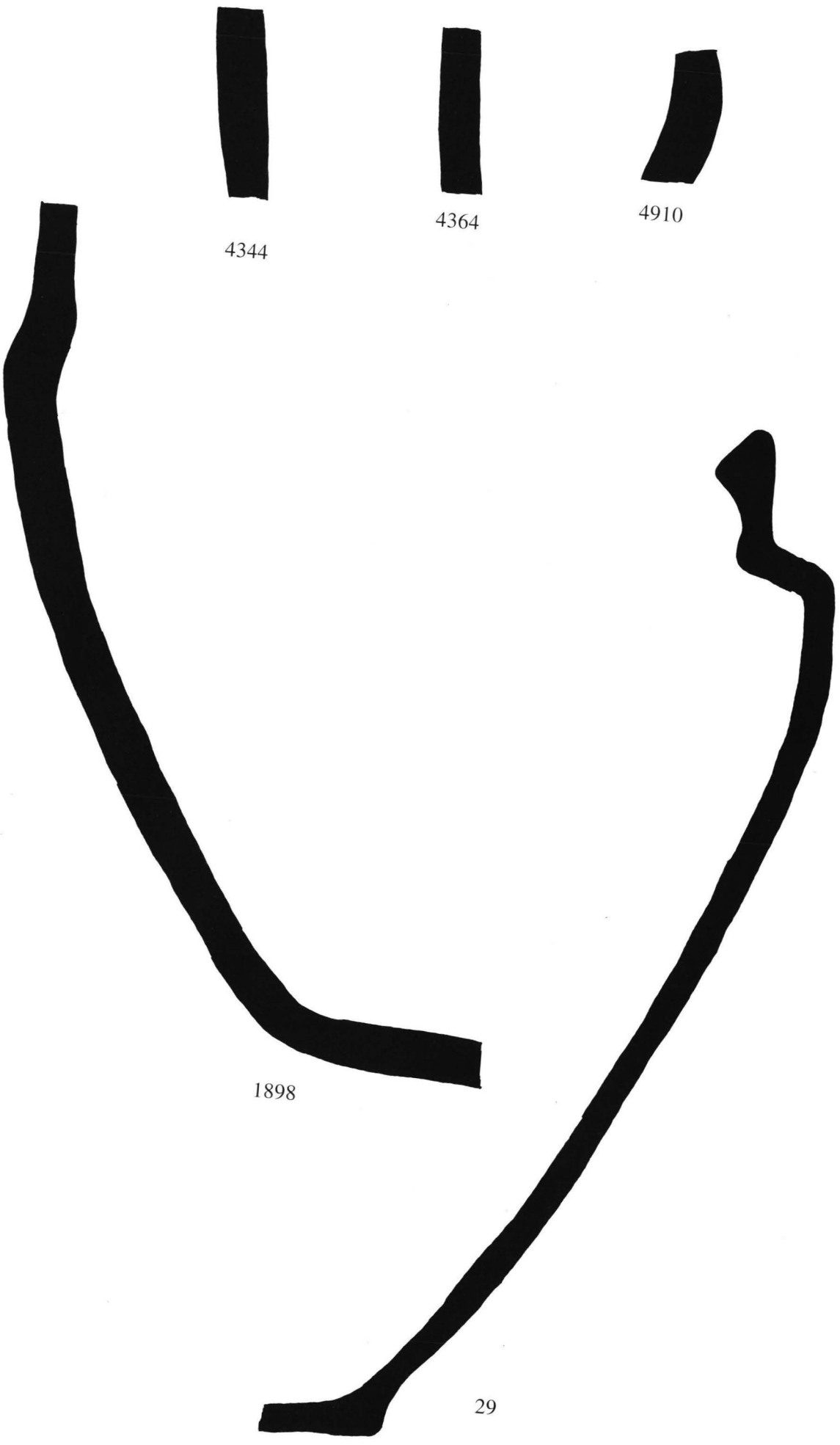


TABLE 9

Scale 1:1

Appendix 4. Coding of attributes used in the statistical analysis of ceramics. Numerical codes of the attributes: the symbols, which are used in coding vessels into the SURVO database (see Appendix 5).

1. Number

2. Site

3. Temper		**(M1)**
Temper material		
M0	no temper	0
M1a	quartz	1
M1b	feldspar	2
M1c	asbestos	3
M1d	talc/soapstone	4
M1e	mica	5
M1f	dark amphiboles	6
M1g	organic temper	7
M1h	chamotte	8
M1i	bone	9
M1j	others	10

4. Amount of temper	**(Q1)**
– no temper	0
– very few	1
– few	2
– moderately	3
– abundantly	4
– much	5
– very much	6

5. Size	**(K1)**
– very fine grained	1
– fine grained	2
– small	3
– moderate	4
– coarse	5
– very coarse	6

6. Porosity	**(SH)**
– very porous	1
– porous	2
– moderately tight	3
– tight	4
– very tight	5

7. Hardness	**(SK)**
– very soft	1
– soft	2
– medium hard	3
– hard	4
– very hard	5

8. Painting	**(PM)**
– no painting	0
– unclear	1
– red	2
– black	3
– other	4

9. Hatching	**(PN)**
– no hatching	0
– very weak	1
– light	2
– sharp	3
– clear	4
– strong	5
– very strong	6

10. Textile-impression	**(PT)**
– no textile-impression	0
– dim (unclear)	1
– check	2
– crescent	3
– needle	4
– round	5
– wavy	6

11. Smoothing	**(PS)**
– no observation	0
– very coarse	1
– coarse	2
– slip	3
– levelled by a wooden implement	4
– smoothened	5
– smoothened and polished	6

12. Firing	**(PO)**
– very weak	1
– weak	2
– imperfect	3
– good	4
– very good	5

13. Form of the rim		**(RM)**
RM0	no observation	0
Rma	inwards down	1
Rmb	inwards straight	2
Rmc	inwards up	3
Rmd	straight upwards	4
Rme	straight	5
Rmf	straight sloping inwards	6
Rmg	straight round	7
Rmh	outwards up	8
Rmi	outwards straight	9
Rmj	outwards down	10
Rmk	straight, thickening down	11
Rml	straight, thickening up	12
Rmm	T-form	13

14. Strength of profiling **(Rf)**

– no observation	0
– not profiled	1
– slight profiling	2
– medium profiling	3
– strong profiling	4
– very strong profiling	5

15. Side form **(Rp)**

RP0	no observation	0
Rpa	unrestricted, straight contour	1
Rpb	rim upwards widening	2
Rpc	unrestricted, simple, convex contour	3
Rpd	restricted, simple, concave contour	4
Rpe	involving the shoulder below the rim	5
Rpf	complex	6

16. Elements of the rim **(RE)**

RE0	no elements	0
Rea	spot	1
Reb	comb stamp	2
Rec	small pit	3
Red	pit	4
Ree	notch	5
Ref	nail-impression	6
Reg	ring-impression	7
Reh	sharp line	8
Rei	blunt line	9
Rej	round furrow	10
Rek	straight based furrow	11
Rel	short, Aworm-impression@	12
Rem	other	13

17. Combined ornamentation motifs of the rim (Ra)

RA0	no element	0
Raa	leaning to the right	1
Rab	learning to the left	2
Rac	straight (cross to rim)	3
Rad	along the rim	4
Rae	zigzag	5
Raf	line along the rim	6
Rag	cross figure	7

18. – 20. Elements of the wall (KE)

KE0	no ornamentation	0
Kea	small spot	1
Keb	large spot	2
Kec	short comb stamp	3
Ked	long comb stamp	4
Kee	deep short comb stamp	5
Kef	deep long comb stamp	6
Keg	bone impression	7
Keh	chain impression	8
Kei	barb	9
Kej	leaflet	10
Small pit		
Kek	round bottom	11
Kel	straight bottom	12
Kem	conical	13
Pit		
Ken	round bottom	14
Keo	straight bottom	15
Kep	conical	16
Notch		
Keq	short	17
Ker	long	18
Nail-impression		
Kes	short	19
Ket	long	20
KEu Ring-impression		21
KEv Fish-bone-impression		22
Other impressions		
KEy D- or C -impression		23
KEx I-, II- or L -impression		24
KEz notched line		25
Corded impression		
KEå twisted-cord -impression		26
KEä corded impression		27
Drawn ornaments		
LINES		
KEö drawn with a sharp implement		28
KEaa drawn with a blunt implement		29
Grooves		
KEab round-bottomed		30
KEac flat-bottomed		31
Grooves made with a drawn comb stamp		
KEad grooved with a sharp comb		32
KEae grooved with a blunt comb		33
Embossed line		
KEaf narrow		34
Keag broad		35
Keah Oval impression		36

21. – 23. Ornamentation motifs of the wall **(Ky)**

KY0	no motifs	0
Pressed ornaments		
Kya	Row of spots	1
Kyb	Row of comb stamp	2
Kyc	Row of pits	3
Kyd	Row of impressions	4
Kye	Row of corded impressions	5
Drawn lines		
KYf	Angled line	6
Kyg	Zone of straight lines	7
KYh	Horizontal furrow	8
KYi	Horizontal stave	9
Kyj	Embossed line	10
Kyk	Finger furrows	11
Kyl	Inside ornamantation	12

24. Density of the ornamentation (Kt)

– no ornamentation	0
– slight decoration	1
– spacious decoration	2
– moderate decoration	3
– dense decoration	4
– very dense decoration	5

25. (X) Thickness of the rim (cm)

26. (Y) Thickness of the wall (cm)

27. (TY) Type

– Early Comb Ware (Ka I 1)	1
– Early Comb Ware (Ka I 2)	2
– Säräisniemi 1 ceramics	3
– Early Asbestos Ware	4
– Typical Comb Ware (Ka II 1)	5
– Typical Comb Ware (Ka II 2)	6
– Late Comb Ware	7
– Pyheensilta ceramics	8
– Organic-tempered ceramics	9
– Kierikki ceramics	10
– Pöljä ceramics	11
– Corded Ware	12
– Kiukainen ceramics	13
– Lovozero ceramics	14
– Jysmä ceramics	15
– Late Neolithic ceramics	16
– Final Neolithic ceramics	17
– Imitated Textlile ceramics	18
– Sarsa-Tomitsa ceramics	19
– Anttila ceramics	20
– Kjelmøy ceramics	21

– Luukonsaari ceramics 22
– Sirnihta ceramics 23
– Bronze Age ceramics 24
– Säräisniemi 2 ceramics 25
– Early Metal Period ceramics 26
– Morby ceramics 27
– Iron Age ceramics 28
– Lepnaja ceramics 29
– Pit ceramics 30
– Middle-zone ceramics 31
– Kalmistonmäki ceramics 32
– Asva ceramics 33
– Textile ceramics of arctic type (Karelian Rep.) 34

27. (VE) Areas and water systems
– Kemijoki Water System 1
– Oulujoki Water System 2
- Southern Ostrobothnia 3
– Saimaa Water System 4
– Karelian Isthmus 5
– Kymijoki Water System 6
– Kokemäenjoki Water System 7
– Varsinais-Suomi 8
– Uusimaa 9
– Karelian Republic 10
– Kuittijärvi Water System 11
– Uikujoki Water System 12
– W side of Lake Onega 13
– E side of Lake Onega 14
– Lake Sjamozero 15
– Lake Vodlozero 16
– N side of Lake Ladoga 17
– E and S sided of Lake Ladoga 18
– Estonia 19

28. Combined ornamentation motif of the wall (Km)

Km0	no motif	0
Kma	oblique lines	1
Kmb	oblique zigzag lines	2
Kmc	oblique lines with pits	3
Kmd	pit zones	4
Kme	horizontal drawn lines	5
Kmf	horizontal zigzag zones	6
Kmg	vertical zones	7
Kmh	framed-frieze	8
Kmi	net-figures	9
Kmj	horizontal and vertical zones	10

29. Size of vessel (diam. of rim in cm) Dm

Appendix 5. Coded observations of ceramics in Finland, on the Karelian Isthmus, the Karelian Republic, Leningrad region and Estonia. The following copy of SURVO-database represents observations of ceramic vessels analysed numerically in this work. Legend: 9 – Organic-tempered ceramics, 10 – Kierikki ceramics, 11 – Pöljä ceramics, 12 – Corded Ware, 13 – Kiukainen ceramics, 14 – Lovozero ceramics, 15 – Jysmä ceramics, 16 – Late Neolithic ceramics, 17 – Final Neolithic ceramics, 18 – Imitated Textlile ceramics, 19 – Textile ceramics, 20 – Anttila ceramics, 21 – Kjelmøy ceramics, 22 – Luukonsaari ceramics, 23 – Sirnihta ceramics, 24 – Bronze Age ceramics, 25 – Undefined Säräisniemi 2 ceramics, 26 – Early Metal Period ceramics. The database includes also Textile ceramics from the Karelian Republic, St. Petersburg region, and Estonia (incl. Asva type). Legend concerning numerical codes of attributes have been given in the appendix 4.

Number	Site	NM-number	M1	Q1	K1	SH	SK	PM	PN	PT	PS	PO	RM	RF	RP	RE	RA	KE1	KE2	KE3	KY1	KY2	KY3	Kt	V	X	Y	TY	VE	Km0	Kma	Kmb	Kmc	Kmd	Kme	Kmf	Kmg	Kmh	Kmi	Kmj	SIZE
4507	Ylitornio Annala	20268:39	4	5	4	5	4	0	3	0	4	3	5	2	4	0	0	31	29	0	9	8	0	2	2	12	8	20	1	0	0	0	0	0	1	0	0	0	0	0	0
2990	Kemijärvi Anttila	14344:36,84	5	4	4	3	2	0	3	0	4	4	7	2	3	0	0	0	0	0	0	0	0	4	0	5	5	14	1	0	0	0	0	0	0	0	0	0	0	0	1
2993	Kemijärvi Anttila	14344:85	5	4	4	5	3	0	1	0	3	4	5	2	3	0	0	17	0	0	4	0	0	4	1	5	5	14	1	0	0	0	0	0	1	0	0	0	0	0	0
2994	Kemijärvi Anttila	14344:85	5	4	3	5	3	0	1	0	3	4	7	2	4	0	0	17	0	0	4	0	0	3	3	5	5	14	1	0	1	0	0	0	0	0	1	0	0	0	1
3004	Kemijärvi Anttila	14344:34	4	5	4	5	4	0	1	0	5	4	8	3	3	0	0	29	2	0	6	7	2	2	4	6	6	20	1	0	1	0	0	0	1	1	0	0	0	0	0
3005	Kemijärvi Anttila	14344:34	4	4	4	5	3	0	0	0	2	4	5	2	3	0	0	28	0	0	9	0	0	3	2	8	6	20	1	0	0	0	0	0	1	0	0	0	0	0	0
3006	Kemijärvi Anttila	14344:5,6	4	4	4	5	3	0	1	0	3	4	7	4	6	0	0	28	0	0	9	0	0	1	1	12	8	20	1	0	0	0	0	0	1	0	0	0	0	0	30
3007	Kemijärvi Anttila	14344:83	4	4	4	3	3	0	2	0	4	4	7	3	4	0	0	28	31	17	8	9	4	1	4	10	7	20	1	0	0	0	0	0	1	1	0	1	0	0	45
2987	Kemijärvi Hietalahti	15667:232	2	4	4	3	3	0	3	0	2	4	5	4	5	2	1	3	15	17	2	3	4	2	4	7	7	19	1	0	1	0	0	0	1	0	0	0	0	1	0
2979	Kemijärvi Jatulinsaari	15492:55,56	3	4	3	3	3	0	0	0	2	4	2	1	1	0	0	0	0	0	0	0	0	3	0	7	5	14	1	0	0	0	0	0	0	0	0	0	0	0	0
2980	Kemijärvi Jatulinsaari	15492:90	3	5	3	4	3	0	0	0	3	4	5	2	4	0	0	12	0	0	3	0	0	3	1	2	2	14	1	0	0	0	0	1	0	0	0	0	0	0	0
3010	Kemijärvi Juuniemi	14345:40	2	4	4	4	3	0	0	0	3	4	8	4	5	0	0	2	11	0	1	3	0	2	3	10	7	19	1	0	1	0	0	1	0	0	0	0	0	0	0
3028	Kemijärvi Neitilä4	15671:494,520,618,62	4	4	4	3	3	0	1	0	2	4	5	2	3	0	0	14	29	0	3	9	0	3	1	5	5	21	1	0	0	0	0	1	1	0	0	0	0	0	0
3029	Kemijärvi Neitilä4	15671:533,542,582,61	4	5	4	4	3	0	0	0	2	4	8	5	6	0	0	15	0	0	3	0	0	4	1	8	8	21	1	0	0	0	0	1	0	0	0	0	0	0	0
3031	Kemijärvi Neitilä4	15671:674	4	5	4	3	3	0	1	0	2	4	5	2	4	0	0	29	0	0	8	0	0	3	1	6	6	14	1	0	0	0	0	0	1	0	0	0	0	0	0
3036	Kemijärvi Neitilä4	16145:17,45,82,496	3	4	3	4	3	0	0	0	1	4	9	2	4	0	0	1	0	0	1	0	0	3	2	10	6	21	1	0	0	0	0	0	1	0	0	1	0	0	0
3039	Kemijärvi Neitilä4	16145:345,1042	7	4	4	2	2	0	2	0	2	3	7	3	3	0	0	29	0	0	8	0	0	3	1	5	5	14	1	0	0	0	0	0	1	0	0	0	0	0	1
3043	Kemijärvi Neitilä4	16145:390,511,573,59	3	4	4	2	2	0	0	0	6	4	5	2	3	0	0	29	0	0	9	0	0	3	1	10	6	14	1	0	0	0	0	0	1	0	0	0	0	0	0
3046	Kemijärvi Neitilä4	16145:263,965	4	5	3	2	2	0	0	0	1	4	5	2	4	0	0	29	0	0	9	0	0	3	4	6	6	14	1	0	0	0	0	0	1	0	0	0	0	0	0
3047	Kemijärvi Neitilä4	16145:239,104	4	5	4	2	2	0	0	0	2	4	5	2	4	0	0	29	30	0	8	9	0	3	3	4	5	21	1	0	0	0	0	0	1	0	0	0	0	0	0
3051	Kemijärvi Neitilä4	16145:1083	4	5	5	3	2	0	0	0	2	4	9	3	4	0	0	0	0	0	0	0	0	3	0	10	6	14	1	0	0	0	0	0	0	0	0	0	0	0	0
3058	Kemijärvi Neitilä4	16553:350,2121	3	4	3	4	2	0	0	0	3	4	8	2	4	0	0	28	0	0	6	0	0	2	3	6	4	14	1	0	0	0	0	0	1	0	0	0	1	0	0
3059	Kemijärvi Neitilä4	16553:41,125,198,286	3	5	3	3	2	0	0	0	6	4	5	3	4	0	0	28	0	0	9	0	0	2	1	8	4	14	1	0	0	0	0	0	1	0	0	0	1	0	0
3062	Kemijärvi Neitilä4	16145:2120	3	5	3	3	3	0	1	0	3	4	5	2	4	0	0	28	0	0	6	0	0	3	3	6	6	14	1	0	0	0	0	0	0	0	0	0	1	0	0
3063	Kemijärvi Neitilä4	16553:476	3	6	3	5	4	2	0	1	4	4	8	2	3	0	0	28	0	0	7	0	0	3	1	8	5	14	1	0	0	0	0	0	1	0	0	0	1	0	0
3064	Kemijärvi Neitilä4	16553:477	3	5	3	5	3	0	0	0	6	4	5	1	1	0	0	28	0	0	7	0	0	3	1	9	5	21	1	0	0	0	0	0	1	0	0	0	0	0	0
3068	Kemijärvi Neitilä4	16553:180	3	3	5	3	0	0	0	4	4	9	3	4	0	0	1	0	0	1	0	0	2	1	1	0	6	14	1	0	0	0	0	0	0	1	0	0	1	0	0
3073	Kemijärvi Neitilä4	16553:1287	3	5	3	5	4	0	0	0	6	4	9	3	5	0	0	28	1	12	8	1	3	3	2	5	2	21	1	0	1	0	0	0	1	1	0	0	0	0	0
3074	Kemijärvi Neitilä4	16553:1288	3	5	3	4	3	2	0	0	3	4	0	0	9	0	0	28	1	0	8	1	0	3	1	6	5	21	1	0	0	0	0	0	1	1	0	0	1	0	0
3075	Kemijärvi Neitilä4	16553:1344	6	5	2	5	3	0	2	0	2	4	5	2	4	0	0	28	0	0	9	0	0	4	1	8	8	21	1	0	0	0	0	0	0	1	0	0	0	0	0
3086	Kemijärvi Neitilä6	16491:31,37	4	5	4	5	2	0	0	0	2	4	8	3	4	0	0	28	1	0	8	1	0	2	2	10	7	13	1	0	0	0	0	0	0	1	1	0	0	0	0
3126	Rovaniemi Säpsä	18003:306,313,315,31	3	4	3	3	3	0	0	0	2	4	5	2	3	0	0	1	0	0	1	0	0	4	2	7	6	14	1	0	0	1	0	0	0	1	0	0	0	0	0
906	Hyrynsalmi Hautalahti	24473:273,274,275	3	5	5	2	2	0	4	0	4	3	8	4	6	0	0	2	12	29	1	2	9	2	1	6	6	21	2	0	1	0	0	1	1	0	0	0	0	0	0
913	Hyrynsalmi Koppeloniemi	20634:125,130,131,13	7	5	3	2	2	0	2	0	2	3	9	2	4	0	0	1	0	0	1	0	0	4	1	8	8	9	2	1	0	0	0	0	0	0	0	0	0	0	0
916	Hyrynsalmi Koppeloniemi	20634:252,253	7	4	4	2	2	0	0	0	2	3	5	1	1	2	1	4	0	0	2	0	0	4	4	14	11	9	2	0	1	0	0	0	0	0	0	0	0	0	0
858	Hyrynsalmi Vonkka I	15082:1	4	6	4	2	2	0	0	0	3	3	8	4	6	0	0	17	28	33	4	7	9	1	2	9	6	20	2	0	0	0	0	0	0	0	0	1	0	0	25
876	Hyrynsalmi Vonkka II	15393:6,755,1023,136	4	3	4	2	1	0	1	0	5	4	7	3	5	0	0	17	30	0	4	9	0	3	1	8	6	20	2	0	0	0	0	0	1	0	0	1	0	0	1
878	Hyrynsalmi Vonkka II	15393:561,1198	7	4	4	3	2	0	0	0	2	4	9	1	1	2	2	0	0	0	0	0	0	4	0	13	10	9	2	1	0	0	0	0	0	0	0	0	0	0	0
879	Hyrynsalmi Vonkka II	15393:1019	2	4	5	5	4	0	0	0	3	4	9	1	1	0	0	1	0	0	1	0	0	3	3	11	7	19	2	0	1	0	0	0	0	0	0	0	0	0	0
4509	Suomussalmi Airikainen	22522:3	4	5	4	3	4	0	0	0	1	3	8	3	4	0	0	30	0	0	9	0	0	3	1	7	7	20	2	0	0	0	0	0	1	0	0	0	0	0	0
797	Kuhmo Lukanniemi	26051:97	3	5	4	2	2	0	0	0	2	4	2	1	1	0	0	0	0	0	0	0	0	5	0	17	0	11	2	1	0	0	0	0	0	0	0	0	0	0	0
774	Kuhmo Pajasaari	23700:199,218,228,23	2	4	4	3	2	0	1	0	3	3	8	4	2	2	1	4	11	0	1	3	0	2	4	9	7	19	2	0	0	0	0	1	1	1	0	0	0	0	0
777	Kuhmo Pajasaari	23700:170	2	4	5	4	3	0	1	0	3	3	5	2	4	0	0	1	0	0	1	0	0	4	2	11	6	19	2	0	1	0	0	2	0	0	0	0	0	0	0
823	Kuhmo Sylväjäniemi	20903:39,40,41,49,50	2	3	5	3	2	0	4	0	3	3	5	3	4	1	1	1	12	28	1	3	7	2	3	10	10	19	2	0	0	0	0	3	1	0	0	0	1	0	0
824	Kuhmo Sylväjäniemi	20903:73,83,94	2	4	5	3	2	0	4	0	3	3	5	3	4	1	7	1	0	0	1	0	0	1	4	10	10	19	2	0	0	0	1	1	0	1	0	0	1	0	0
825	Kuhmo Sylväjäniemi	20903:166,167	2	4	5	4	2	0	0	1	3	4	5	2	3	0	0	0	0	0	0	0	0	2	0	9	8	26	2	1	0	0	0	0	0	0	0	0	0	0	0
826	Kuhmo Sylväjäniemi	20903:177,188	3	5	3	5	3	0	1	0	3	4	3	4	5	0	0	1	0	0	1	0	0	2	4	4	4	19	2	0	1	0	0	1	0	0	0	0	0	0	0
789	Kuhmo Vasikkaniemi	25302:53,54,55	2	4	5	3	3	0	3	0	3	3	5	2	4	1	1	11	0	0	3	0	0	4	1	7	4	19	2	0	0	0	0	1	0	0	0	0	0	0	0
792	Kuhmo Vasikkaniemi	25302:165,166,175,17	4	5	4	3	3	0	1	0	2	3	9	3	6	0	0	18	0	0	4	0	0	2	2	10	6	19	2	0	0	0	0	0	0	0	1	0	0	0	0

Number	Site	NM-number	M1	Q1	K1	SH	SK	PM	PN	PT	PS	PO	RM	RF	RP	RE	RA	KE1	KE2	KE3	KY1	KY2	KY3	Kt	V	X	Y	TY	VE	Km0	Kma	Kmb	Kmc	Kmd	Kme	Kmf	Kmg	Kmh	Kmi	Kmj	SIZE
4515	Kuusamo Somostenperä	17070:6	3	5	3	5	4	0	0	0	3	4	5	2	4	5	3	25	0	0	2	0	0	3	3	8	6	26	2	0	0	0	0	0	1	0	0	0	0	0	0
838	Puolanka Kotalahti	23905:7,34,36,37,47	3	5	3	3	2	0	0	0	2	3	5	1	1	0	0	0	0	0	0	0	0	4	0	8	5	16	2	1	0	0	0	0	0	0	0	0	0	0	0
840	Puolanka Kotalahti	23905:25	3	3	2	3	3	0	0	0	3	4	6	1	1	0	0	0	0	0	0	0	0	4	0	9	5	16	2	1	0	0	0	0	0	0	0	0	0	0	0
847	Puolanka Kotalahti	24539:52,58,60	3	6	6	3	2	1	0	0	1	3	2	1	1	0	0	0	0	0	0	0	0	2	0	15	7	11	2	1	0	0	0	0	0	0	0	0	0	0	0
849	Puolanka Kotalahti	24539:61,62,100,101	3	5	5	2	3	0	5	0	1	3	3	1	1	0	0	0	0	0	0	0	0	5	0	15	7	11	2	0	0	0	0	0	1	0	0	0	0	0	0
850	Puolanka Kotalahti	24539:83	3	4	5	3	2	0	0	0	1	3	5	1	1	0	0	28	0	0	6	0	0	2	0	7	7	14	2	0	0	0	0	0	0	0	0	0	1	0	0
852	Puolanka Kotalahti	24539:93,95,97,106	7	5	4	2	2	0	0	0	1	3	5	1	1	0	0	0	0	0	0	0	0	3	0	11	9	9	2	1	0	0	0	0	0	0	0	0	0	0	0
853	Puolanka Kotalahti	24876:27,28	4	4	4	2	2	0	4	0	1	3	6	1	1	0	0	0	0	0	0	0	0	5	0	7	7	9	2	1	0	0	0	0	0	0	0	0	0	0	0
854	Puolanka Kotilahti	24876:22,23,34,50,53	3	5	5	4	2	0	4	1	2	4	5	1	1	0	0	33	0	0	7	0	0	3	0	13	11	11	2	0	0	0	0	0	0	0	0	0	1	0	0
855	Puolanka Kotilahti	24876:32,38	4	5	5	4	2	0	0	0	3	3	5	1	1	0	0	19	0	0	4	0	0	3	3	15	11	8	2	0	1	0	0	0	0	0	0	0	0	0	0
856	Puolanka Kotilahti	24876:57	3	2	3	3	2	0	0	0	2	3	5	1	1	0	0	0	0	0	0	0	0	4	0	12	9	9	2	1	0	0	0	0	0	0	0	0	0	0	0
927	Sotkamo Kiikarusniemi	21482:30,31,38	4	5	4	3	3	0	2	0	2	4	7	1	1	3	6	0	0	0	0	0	0	4	0	9	9	16	2	1	0	0	0	0	0	0	0	0	0	0	0
931	Sotkamo Kiikarusniemi	21482:69	3	4	4	2	2	2	4	0	3	3	6	1	1	1	2	1	12	0	2	3	0	3	5	9	7	19	2	0	1	0	0	1	0	0	0	0	0	0	0
933	Sotkamo Kiikarusniemi	21482:91	4	5	6	2	3	0	5	0	4	3	5	1	1	0	0	12	0	0	3	0	0	3	1	8	7	19	2	0	0	0	0	0	1	0	0	0	0	0	0
951	Sotkamo Kiikarusniemi	22198:148,151	6	5	4	3	2	0	0	0	3	4	5	1	1	6	1	25	0	0	2	0	0	4	0	5	7	26	2	0	0	0	0	0	0	1	0	0	0	0	0
960	Sotkamo Kiikarusniemi	22198:428,429,430	4	4	4	2	2	0	2	0	1	3	4	2	3	0	0	0	0	0	0	0	0	3	0	10	9	26	2	1	0	0	0	0	0	0	0	0	0	0	0
991	Sotkamo Kiikarusniemi	27239:5	7	4	3	2	3	0	0	0	3	4	7	4	4	0	0	4	0	0	2	0	0	3	5	6	6	19	2	0	1	0	0	1	0	0	0	0	0	0	0
992	Sotkamo Kiikarusniemi	27239:34,35	7	4	3	2	3	0	0	0	3	4	7	4	4	0	0	4	0	0	2	0	0	3	5	6	6	19	2	0	1	0	0	1	0	0	0	0	0	0	0
996	Sotkamo Kiikarusniemi	27239:63	2	6	3	5	3	0	0	0	2	3	8	4	4	0	0	11	0	0	3	0	0	3	2	10	10	26	2	0	0	0	0	1	0	0	0	0	0	0	0
985	Sotkamo Pitkähiekka	25188:1	3	5	3	3	4	0	0	0	2	4	7	3	4	0	0	0	0	0	0	0	0	4	0	3	3	26	2	1	0	0	0	0	0	0	0	0	0	0	0
974	Sotkamo Räätäkangas	22965:227	3	5	5	5	4	0	0	0	3	4	5	1	1	0	0	3	0	0	2	0	0	4	0	5	5	26	2	1	0	0	0	0	0	0	0	0	0	0	0
981	Sotkamo Räätäkangas	22965:162	2	6	4	4	4	0	0	0	1	3	7	1	1	0	0	7	0	0	4	0	0	3	2	7	7	16	2	0	0	0	0	1	0	0	0	0	0	0	1
1	Suomussalmi Autio	120817:1	3	4	5	4	2	0	0	0	2	3	4	2	4	0	0	4	29	12	2	9	3	2	2	7	5	22	2	0	0	0	0	0	0	0	0	1	0	0	0
350	Suomussalmi Joenniemi	20375:7	5	3	4	4	3	0	1	0	2	4	8	4	3	0	0	2	0	0	2	0	0	4	1	4	4	22	2	1	0	0	0	0	0	0	0	0	0	0	0
351	Suomussalmi Joenniemi	20375:3	4	5	5	5	3	0	1	0	3	3	5	2	4	1	0	1	11	21	2	3	4	1	3	6	6	19	2	0	0	0	0	0	1	0	0	0	1	1	0	45
352	Suomussalmi Joenniemi	20375:3	4	4	5	5	3	0	1	0	3	3	5	2	4	1	0	1	11	21	2	3	4	1	3	6	6	19	2	0	0	0	0	0	1	0	0	0	1	1	0	45
353	Suomussalmi Joenniemi	20375:5,6	3	4	3	4	3	0	0	0	2	3	2	1	1	0	0	0	0	0	0	0	0	4	0	12	6	26	2	1	0	0	0	0	0	0	0	0	0	0	0	0
356	Suomussalmi Joenniemi	20375:8	7	4	2	2	3	0	0	0	1	3	5	1	1	2	2	5	0	0	2	0	0	3	4	12	9	8	2	0	1	0	0	0	0	0	0	0	0	0	0	40
358	Suomussalmi Joenniemi	21327:1,5	5	5	5	3	3	0	0	0	2	3	8	4	2	0	0	30	0	0	8	0	0	3	1	8	6	20	2	0	0	0	0	0	5	0	0	0	0	0	0	0
359	Suomussalmi Joenniemi	21327:2	5	5	5	3	3	0	0	0	2	3	8	4	4	0	0	20	0	0	8	0	0	4	1	8	6	20	2	0	0	0	0	0	1	0	0	0	0	0	0	0
369	Suomussalmi Joenniemi	23701:60,62,156	3	5	3	3	3	0	6	0	1	3	2	1	1	13	0	0	0	0	0	0	0	2	0	7	4	11	2	1	0	0	0	0	0	0	0	0	0	0	0	0
375	Suomussalmi Joenniemi	23701:316,452,456	2	3	4	5	4	0	3	0	4	4	9	3	4	1	1	1	12	3	1	3	2	2	4	11	8	19	2	0	0	0	0	2	0	0	0	1	0	1	45
377	Suomussalmi Joenniemi	23701:313,489,490	3	5	3	3	3	0	6	0	1	3	2	1	1	0	0	0	0	0	0	0	0	2	0	20	7	11	2	1	0	0	0	0	0	0	0	0	0	0	55
382	Suomussalmi Joenniemi	23701:453,538	4	5	5	5	3	0	1	0	2	3	5	2	4	1	0	1	11	21	2	3	4	2	3	8	5	19	2	0	0	0	0	1	0	0	0	0	1	0	0
388	Suomussalmi Joenniemi	23701:541	5	6	3	5	3	0	0	0	2	4	7	2	3	0	0	30	0	0	9	0	0	4	0	7	5	20	2	0	0	0	0	0	1	0	0	0	0	0	0
389	Suomussalmi Joenniemi	23701:540	4	4	4	3	2	0	0	0	1	3	2	1	1	2	2	3	0	0	2	0	0	4	4	10	7	8	2	0	1	0	0	0	0	0	0	0	0	0	0
390	Suomussalmi Joenniemi	23701:539	4	3	4	3	2	0	0	0	1	3	2	1	1	2	2	3	0	0	3	0	0	3	4	10	6	8	2	0	1	0	0	0	0	0	0	0	0	0	0
396	Suomussalmi Joenniemi	24506:47,60,61,90	3	4	3	3	3	0	0	0	1	3	3	1	1	0	0	0	0	0	0	0	0	3	0	20	7	11	2	1	0	0	0	0	0	0	0	0	0	0	0
397	Suomussalmi Joenniemi	24506:19,23	3	4	3	3	3	0	0	0	1	3	3	1	1	0	0	0	0	0	0	0	0	2	0	20	7	11	2	1	0	0	0	0	0	0	0	0	0	0	0	0
406	Suomussalmi Joenniemi	24506:228	4	4	5	4	4	0	1	0	4	3	8	3	4	0	0	2	30	0	1	8	0	2	3	6	5	21	2	0	0	0	0	1	0	0	0	1	0	0	30
407	Suomussalmi Joenniemi	24506:181	7	4	3	3	4	0	0	0	5	4	2	1	1	2	2	36	0	0	4	0	0	2	5	11	7	8	2	0	0	1	0	0	0	0	0	0	0	0	45
14	Suomussalmi Kalmosärkkä	14504:181,171,136	7	4	5	2	2	2	0	0	3	4	2	1	1	1	2	4	0	0	2	0	0	3	4	12	9	9	2	0	0	1	0	0	0	0	0	0	0	0	0
15	Suomussalmi Kalmosärkkä	14504:89,88,90,85,99	7	4	5	4	3	0	0	0	3	3	1	1	1	1	1	4	0	0	2	0	0	4	4	18	9	9	2	0	0	1	0	0	0	0	0	0	0	0	35
18	Suomussalmi Kalmosärkkä	14504:263,283	7	3	5	2	2	0	2	0	3	3	5	1	1	1	1	1	0	0	1	0	0	4	4	7	7	19	2	0	0	0	0	0	0	0	0	0	1	1	0
19	Suomussalmi Kalmosärkkä	14504:89,185	7	3	5	2	2	0	0	0	3	0	0	0	0	1	0	1	0	0	1	0	0	5	4	7	6	19	2	0	1	0	0	1	0	0	0	0	0	0	0
20	Suomussalmi Kalmosärkkä	14504:356,354,355	7	3	5	3	3	0	3	0	2	4	5	2	5	1	1	1	28	0	1	7	12	4	5	7	7	19	2	0	0	0	0	0	1	0	0	0	0	0	0
21	Suomussalmi Kalmosärkkä	14504:147,182	0	0	0	4	3	0	2	0	2	4	8	5	6	0	0	18	17	0	4	4	0	3	4	7	7	19	2	0	0	1	0	1	1	0	0	0	0	1	30
22	Suomussalmi Kalmosärkkä	14504:205	0	0	0	4	3	0	3	0	2	4	8	4	4	0	0	12	0	0	3	0	0	4	1	5	5	19	2	0	0	0	0	0	1	0	0	0	0	0	0
23	Suomussalmi Kalmosärkkä	14504:455,456,457	7	2	4	3	2	0	4	0	2	4	5	1	1	0	0	28	12	0	7	3	0	4	5	6	6	19	2	0	0	0	0	1	0	0	0	0	1	0	30

Number	Site	NM-number	M1	Q1	K1	SH	SK	PM	PN	PT	PS	PO	RM	RF	RP	RE	RA	KE1	KE2	KE3	KY1	KY2	KY3	Kt	V	X	Y	TY	VE	Km0	Kma	Kmb	Kmc	Kmd	Kme	Kmf	Kmg	Kmh	Kmi	Kmj	SIZE
25	Suomussalmi Kalmosärkkä	14504:33	7	3	4	3	2	0	4	0	3	4	5	2	1	1	0	1	22	0	1	4	0	4	3	7	7	19	2	0	0	0	1	1	0	0	0	0	0	0	0
26	Suomussalmi Kalmosärkkä	14504:354,356,390	7	2	5	3	2	0	4	0	2	2	5	1	1	1	0	1	0	0	1	0	0	5	1	0	0	19	2	0	1	0	0	1	0	0	0	0	0	0	0
27	Suomussalmi Kalmosärkkä	14504:307,286,340	3	4	5	5	4	0	4	0	3	4	3	1	1	1	1	13	0	1	3	0	3	2	6	6	19	2	0	0	0	0	1	1	0	0	0	0	0	0	40
29	Suomussalmi Kalmosärkkä	14504:282,281	6	4	6	3	2	0	3	2	3	4	2	5	6	1	1	1	2	15	1	1	3	1	4	6	6	19	2	0	0	0	0	1	0	0	0	0	1	0	35
30	Suomussalmi Kalmosärkkä	14504:214	4	1	3	4	2	0	3	0	3	4	8	3	4	0	0	0	0	0	0	0	0	4	0	4	5	19	2	1	0	0	0	0	0	0	0	0	0	0	0
31	Suomussalmi Kalmosärkkä	14504:285	3	2	4	4	3	0	3	0	3	4	7	2	4	0	0	12	0	0	3	0	0	4	1	6	6	19	2	0	0	0	0	1	0	0	0	0	0	0	25
33	Suomussalmi Kalmosärkkä	14504:528	4	3	5	4	3	0	0	0	2	4	5	1	1	1	1	1	0	0	1	0	0	4	3	10	8	19	2	0	0	0	0	1	0	1	0	0	0	0	0
35	Suomussalmi Kalmosärkkä	14504:206,390,454	3	4	2	2	3	0	0	0	2	3	3	1	1	0	0	25	0	0	4	0	0	3	1	14	5	11	2	0	0	0	0	0	0	1	1	0	0	0	35
41	Suomussalmi Kalmosärkkä	14504:529,413,386	5	5	3	5	2	0	0	0	5	3	7	3	5	0	0	17	0	0	4	0	0	4	1	8	4	22	2	0	0	0	0	0	1	0	0	0	0	0	20
42	Suomussalmi Kalmosärkkä	14504:445	5	5	3	5	3	0	2	0	3	4	8	3	4	0	0	29	0	0	7	0	0	4	1	3	4	20	2	0	0	0	0	0	1	0	0	0	0	0	0
43	Suomussalmi Kalmosärkkä	14504:284	3	4	6	3	2	0	0	0	4	3	9	3	4	0	0	28	0	0	6	0	0	3	1	15	4	22	2	0	0	0	0	0	1	0	0	0	0	0	25
44	Suomussalmi Kalmosärkkä	15829:2,4	7	3	5	3	3	0	0	0	2	3	2	1	1	2	5	18	0	0	4	0	0	3	4	20	8	9	2	0	1	0	0	0	0	0	0	0	0	0	40
45	Suomussalmi Kalmosärkkä	14829:140,139,138	7	3	5	3	3	0	0	0	3	3	2	1	1	2	1	7	0	0	2	0	0	3	4	16	6	9	2	0	1	0	0	0	0	0	0	0	0	0	35
46	Suomussalmi Kalmosärkkä	14829:103,138,74,86	7	4	4	3	3	2	0	0	3	3	2	1	1	2	2	4	0	0	2	0	0	3	4	12	5	9	2	0	1	0	0	0	0	0	0	0	0	0	0
47	Suomussalmi Kalmosärkkä	14829:115	7	4	4	3	3	0	0	0	3	3	2	1	1	3	4	4	0	0	2	0	0	3	4	11	7	9	2	0	1	0	0	0	0	0	0	0	0	0	0
49	Suomussalmi Kalmosärkkä	14829:75,94,235	7	3	5	3	3	0	0	0	3	3	3	1	1	2	2	4	0	0	2	0	0	3	4	7	7	9	2	0	0	1	0	0	0	0	0	0	0	0	35
50	Suomussalmi Kalmosärkkä	14829:107,116,75,120	7	3	5	3	3	0	0	0	3	4	6	1	1	5	2	18	0	0	4	0	0	4	3	6	6	9	2	0	1	0	0	0	0	0	0	0	0	0	0
53	Suomussalmi Kalmosärkkä	14829:181,200,201	7	3	6	3	3	0	0	0	3	3	2	1	1	3	6	11	0	0	3	0	0	4	3	6	6	9	2	0	0	1	0	0	0	0	0	0	0	0	0
54	Suomussalmi Kalmosärkkä	14829:157,140	7	3	6	3	3	0	0	0	3	4	5	1	1	3	4	11	0	0	3	0	0	4	4	4	4	9	2	0	0	0	0	1	0	0	0	0	0	0	0
57	Suomussalmi Kalmosärkkä	14829:491,492,480	7	1	3	4	3	0	2	0	3	3	9	2	1	0	0	0	0	0	0	0	0	4	0	7	6	9	2	1	0	0	0	0	0	0	0	0	0	0	0
58	Suomussalmi Kalmosärkkä	14829:454,420	7	3	4	4	3	0	3	0	3	3	7	1	1	0	0	16	0	0	3	0	0	4	0	6	5	9	2	1	0	0	0	0	0	0	0	0	0	0	0
59	Suomussalmi Kalmosärkkä	14829:288	4	4	4	5	3	0	4	0	3	3	5	3	4	1	1	1	0	0	1	0	0	2	4	7	7	19	2	0	0	0	0	1	1	1	0	0	0	0	15
60	Suomussalmi Kalmosärkkä	14829:307	1	1	6	4	4	0	0	0	2	2	5	1	1	5	2	18	11	0	4	3	0	3	3	7	7	19	2	0	0	0	0	1	0	0	0	0	0	0	0
63	Suomussalmi Kalmosärkkä	14829:299	4	1	3	4	2	0	3	0	3	5	7	1	1	0	0	0	0	0	0	0	0	4	0	6	6	19	2	1	0	0	0	0	0	0	0	0	0	0	0
66	Suomussalmi Kalmosärkkä	14829:344,335,336	3	4	2	5	4	0	0	0	4	5	5	4	5	0	0	1	0	0	1	0	0	4	1	5	5	22	2	0	0	0	0	0	0	1	0	0	0	0	15
67	Suomussalmi Kalmosärkkä	14829:456,482,418	5	4	5	4	2	0	2	0	4	3	5	3	5	0	0	29	17	0	7	4	0	5	0	0	5	21	2	0	0	0	0	0	0	1	0	0	0	0	0
69	Suomussalmi Kalmosärkkä	14829:297,277,336	5	5	4	5	3	0	0	0	3	3	5	1	1	0	0	29	0	0	7	0	0	3	2	5	5	25	2	0	0	0	0	0	0	1	0	0	0	0	0
70	Suomussalmi Kalmosärkkä	14829:298,300	3	3	2	4	3	0	0	0	3	0	4	2	3	0	0	0	0	0	0	0	0	4	0	5	5	25	2	1	0	0	0	0	0	0	0	0	0	0	0
73	Suomussalmi Kalmosärkkä	14830:906,647,566	3	4	2	5	4	0	4	0	2	0	2	1	1	0	0	30	0	0	8	0	0	4	1	10	6	22	2	0	0	0	0	0	0	1	0	0	0	0	0
74	Suomussalmi Kalmosärkkä	14830:1460,1016	3	6	2	5	4	0	0	0	2	0	7	1	1	0	0	1	0	0	1	0	0	4	4	7	6	19	2	0	0	0	0	0	1	0	0	1	0	0	1	0
75	Suomussalmi Kalmosärkkä	14830:311,647,377	3	4	1	5	4	0	0	0	4	4	5	1	1	0	0	34	28	0	10	6	0	3	3	10	4	23	2	0	0	0	0	0	0	0	0	1	0	0	0
77	Suomussalmi Kalmosärkkä	14830:1524,527,1261	3	5	2	5	4	0	0	0	4	3	5	2	3	0	0	33	4	0	9	3	0	3	4	12	4	22	2	0	0	0	0	0	0	1	1	0	0	0	0	20
79	Suomussalmi Kalmosärkkä	14830:1570,1569	3	4	6	3	3	0	0	0	1	3	8	3	2	0	0	1	0	0	1	0	0	3	2	5	4	20	2	0	0	0	0	0	0	0	1	0	0	0	0	20
81	Suomussalmi Kalmosärkkä	14830:706,343,675	3	4	6	4	3	0	0	0	2	3	8	2	4	1	1	12	0	0	3	0	0	3	1	12	8	19	2	0	0	0	0	0	2	0	0	0	0	0	0	35
82	Suomussalmi Kalmosärkkä	14830:651,344,1034	3	3	2	5	4	0	0	0	2	3	9	2	4	0	0	32	12	28	8	3	6	3	2	12	4	25	2	0	0	0	0	0	1	1	0	0	0	0	0	0
83	Suomussalmi Kalmosärkkä	14830:1535,1534	3	3	6	3	3	0	0	0	2	3	5	1	1	1	1	1	12	0	1	3	0	3	1	11	6	19	2	0	0	0	0	0	1	0	0	0	0	0	0	0
84	Suomussalmi Kalmosärkkä	14830:617,514,783	3	4	2	5	3	0	0	0	2	4	5	1	1	0	0	0	0	0	0	0	0	4	0	5	5	19	2	1	0	0	0	0	0	0	0	0	0	0	0	0
86	Suomussalmi Kalmosärkkä	14830:245,417,594	3	4	6	4	3	0	0	0	3	4	7	1	1	0	0	0	0	0	0	0	0	4	0	5	5	25	2	1	0	0	0	0	0	0	0	0	0	0	0	0
87	Suomussalmi Kalmosärkkä	14830:646	7	5	5	3	2	0	4	0	4	4	8	3	2	0	0	0	0	0	0	0	0	3	0	4	4	25	2	1	0	0	0	0	0	0	0	0	0	0	0	20
88	Suomussalmi Kalmosärkkä	14830:1298,967,1035	4	3	3	5	3	0	0	0	3	3	9	2	4	1	1	2	14	0	1	3	0	2	4	15	8	19	2	0	0	0	0	0	2	0	0	1	0	0	1	45
91	Suomussalmi Kalmosärkkä	14830:782	5	6	6	4	3	0	0	0	2	4	6	4	4	0	0	2	28	30	1	7	8	2	3	5	8	20	2	0	0	0	0	0	0	0	0	0	1	0	0	30
92	Suomussalmi Kalmosärkkä	14830:671	5	6	6	5	4	0	0	0	2	4	7	4	4	0	0	2	28	30	1	9	8	2	3	8	8	20	2	0	0	0	0	0	0	0	0	0	1	0	0	35
93	Suomussalmi Kalmosärkkä	14830:1421,1634	5	5	5	3	3	0	0	0	2	3	3	5	6	0	0	1	28	30	1	7	8	2	4	8	7	19	2	0	0	0	0	0	1	0	0	1	0	0	20
94	Suomussalmi Kalmosärkkä	14830:926,1553	5	4	5	3	3	0	0	0	2	4	8	5	6	1	1	25	11	0	4	3	0	2	4	9	7	19	2	0	0	0	0	1	1	0	1	0	0	0	30
95	Suomussalmi Kalmosärkkä	14830:15,17	5	6	4	4	2	0	0	0	5	4	7	3	2	0	0	17	28	11	4	7	3	3	3	9	5	21	2	0	0	0	0	0	0	0	0	1	0	0	30
96	Suomussalmi Kalmosärkkä	14830:672,592,480	5	5	5	5	4	0	0	0	5	4	5	2	4	0	0	31	0	0	8	0	0	2	1	10	5	20	2	0	0	0	0	0	0	1	0	0	0	0	0	0
97	Suomussalmi Kalmosärkkä	14830:45,47,46	5	4	4	5	4	0	0	0	3	4	5	2	3	0	0	29	0	0	8	0	0	3	1	9	5	20	2	0	0	0	0	0	0	1	0	0	0	0	0	0
98	Suomussalmi Kalmosärkkä	14830:1618,1559	5	4	4	4	3	0	0	0	2	4	5	3	6	0	0	17	28	11	4	7	3	3	1	9	4	20	2	0	0	0	0	0	1	1	0	0	0	0	0	30
99	Suomussalmi Kalmosärkkä	14830:1014,1131	5	4	4	5	3	0	0	0	5	3	5	3	4	0	0	31	0	0	8	0	0	3	1	10	4	20	2	0	0	0	0	0	0	1	0	0	0	0	0	40

Number	Site	NM-number	M1	Q1	K1	SH	SK	PM	PN	PT	PS	PO	RM	RF	RP	RE	RA	KE1	KE2	KE3	KY1	KY2	KY3	Kt	V	X	Y	TY	VE	Km0	Kma	Kmb	Kmc	Kmd	Kme	Kmf	Kmg	Kmh	Kmi	Kmj	SIZE
101	Suomussalmi Kalmosärkkä	14830:1496,1691	5	4	3	4	3	0	3	0	3	4	5	1	1	0	0	17	28	0	4	6	0	4	1	5	5	22	2	0	0	0	0	0	1	1	0	0	0	0	0
102	Suomussalmi Kalmosärkkä	14830:720,1187,1228	5	4	3	4	3	0	0	0	3	3	8	2	4	0	0	17	0	0	4	0	0	4	1	3	3	25	2	0	0	0	0	0	1	0	0	0	0	0	20
103	Suomussalmi Kalmosärkkä	14830:202,230,345	5	4	3	5	4	0	0	0	4	3	5	1	1	0	0	31	14	0	8	3	0	4	1	6	5	25	2	0	0	0	0	0	1	0	0	0	0	0	0
104	Suomussalmi Kalmosärkkä	14830:16,17	5	3	4	5	2	0	0	0	3	4	5	1	1	0	0	33	0	0	9	0	0	4	1	5	5	25	2	0	0	0	0	0	1	0	0	0	0	0	0
105	Suomussalmi Kalmosärkkä	14830:563,244,348	5	4	4	5	2	0	0	0	5	3	3	3	3	0	0	32	17	0	9	4	0	3	4	5	9	25	2	0	0	0	0	0	1	0	0	0	0	0	0
112	Suomussalmi Kalmosärkkä	14830:798	2	4	6	4	3	0	1	0	3	4	5	3	4	0	0	0	0	0	0	0	0	4	0	5	5	19	2	1	0	0	0	0	0	0	0	0	0	0	0
114	Suomussalmi Kalmosärkkä	14830:1116,1450	2	2	6	4	3	0	0	0	3	3	8	2	5	0	0	17	15	0	4	3	0	3	1	9	5	19	2	0	0	0	0	1	0	0	0	0	0	1	25
115	Suomussalmi Kalmosärkkä	14830:1274,719,918	1	1	4	5	3	3	1	0	2	3	8	3	4	0	0	1	17	11	1	4	3	2	5	10	5	19	2	0	1	0	0	1	1	0	0	1	0	0	15
116	Suomussalmi Kalmosärkkä	14830:1420,718,1115	6	4	4	3	3	0	4	0	2	3	5	3	5	2	1	2	11	17	1	3	4	2	5	10	6	19	2	0	0	0	0	1	1	0	0	0	0	0	20
117	Suomussalmi Kalmosärkkä	14830:1534,905,1641	5	2	3	3	3	0	2	0	1	3	8	4	5	0	0	15	0	0	3	0	0	4	1	5	7	19	2	0	0	0	0	1	0	0	0	0	0	0	20
118	Suomussalmi Kalmosärkkä	14830:596,83,265,620	6	1	3	4	3	0	4	0	2	4	8	3	2	0	0	0	0	0	0	0	0	3	0	3	4	19	2	1	0	0	0	0	0	0	0	0	0	0	15
119	Suomussalmi Kalmosärkkä	14830:1262,1226	2	4	5	4	3	0	4	0	3	4	7	3	4	0	11	0	0	0	3	0	0	3	0	4	5	19	2	0	0	0	0	0	1	0	0	0	0	0	30
123	Suomussalmi Kalmosärkkä	14830:1186,1496	7	3	4	2	2	0	5	0	2	4	5	2	3	0	0	0	0	0	0	0	0	4	0	3	3	26	2	1	0	0	0	0	0	0	0	0	0	0	0
124	Suomussalmi Kalmosärkkä	14830:1557	1	2	3	4	3	2	0	3	3	5	6	2	4	0	0	28	0	0	6	0	0	4	2	6	5	26	2	0	0	0	0	0	0	1	0	0	0	0	0
125	Suomussalmi Kalmosärkkä	14830:783,798,948	0	0	0	2	2	0	1	0	3	3	9	2	4	1	2	25	0	0	4	0	0	4	1	9	6	19	2	0	1	0	0	2	0	0	0	0	0	0	30
126	Suomussalmi Kalmosärkkä	14830:287,647,1262	7	3	2	2	2	0	0	0	2	2	2	3	1	0	0	29	0	0	9	0	0	4	1	11	6	9	2	0	0	0	0	0	1	0	0	0	0	0	0
127	Suomussalmi Kalmosärkkä	14830:1170,1186	2	4	6	2	1	0	0	6	1	2	8	5	2	0	0	14	0	0	3	0	0	3	1	6	8	19	2	0	0	0	0	3	0	0	0	0	0	0	35
128	Suomussalmi Kalmosärkkä	14830:1560,1691	6	5	5	3	2	0	0	6	1	3	5	1	1	0	0	1	0	0	1	0	0	4	1	10	8	19	2	0	0	0	0	2	1	1	0	0	0	0	1
133	Suomussalmi Kalmosärkkä	20413:3	1	3	5	3	3	0	1	0	2	3	9	2	4	1	7	1	11	0	1	3	0	2	8	6	5	19	2	0	0	0	0	1	0	0	0	0	1	1	35
134	Suomussalmi Kalmosärkkä	20413:4	1	5	5	3	3	0	3	0	4	3	9	3	5	0	0	17	12	0	4	3	0	3	1	10	6	19	2	0	0	0	0	2	0	0	0	0	0	1	35
135	Suomussalmi Kalmosärkkä	20413:6	2	3	4	3	3	0	0	0	3	3	9	3	4	1	1	4	11	0	2	3	0	3	3	11	8	19	2	0	0	0	1	2	0	0	0	0	0	0	30
136	Suomussalmi Kalmosärkkä	20413:10	0	0	0	5	3	0	4	0	2	4	8	4	4	0	0	0	0	0	0	0	0	4	0	4	4	25	2	1	0	0	0	0	0	0	0	0	0	0	0
137	Suomussalmi Kalmosärkkä	20413:11	4	2	3	4	2	0	4	0	3	4	7	1	1	0	0	0	0	0	0	0	0	4	0	4	4	26	2	1	0	0	0	0	0	0	0	0	0	0	0
138	Suomussalmi Kalmosärkkä	21316:1	2	3	4	3	3	2	0	0	5	3	5	1	1	2	1	4	0	0	2	0	0	4	5	11	8	19	2	1	0	0	0	0	0	0	0	0	0	0	0
140	Suomussalmi Kalmosärkkä	21732:1	3	5	5	3	2	0	0	0	3	3	3	3	3	0	0	0	0	0	0	0	0	4	0	5	7	11	2	1	0	0	0	0	0	0	0	0	0	0	0
141	Suomussalmi Kalmosärkkä	21732:2	4	3	4	3	2	0	3	0	3	4	8	3	4	0	0	0	0	0	0	0	0	4	0	5	7	26	2	1	0	0	0	0	0	0	0	0	0	0	0
165	Suomussalmi Kalmosärkkä	28061:56,57	4	2	3	3	2	0	0	0	2	4	9	2	3	0	0	0	0	0	0	0	0	4	0	5	4	20	2	1	0	0	0	0	0	0	0	0	0	0	0
167	Suomussalmi Kalmosärkkä	28061:66	4	4	4	4	2	0	0	0	3	3	5	2	3	0	0	0	0	0	0	0	0	4	0	5	4	20	2	1	0	0	0	0	0	0	0	0	0	0	0
752	Suomussalmi Kalmosärkkä	14829:455	7	5	4	3	3	0	3	0	2	4	9	2	5	0	0	1	0	0	1	0	0	2	4	10	8	19	2	0	0	0	0	1	0	0	0	0	0	0	0
754	Suomussalmi Kalmosärkkä	14504:495	3	5	4	3	3	0	0	0	1	3	3	1	1	0	0	0	0	0	0	0	0	4	0	17	7	11	2	1	0	0	0	0	0	0	0	0	0	0	0
179	Suomussalmi Kellotuli	14831:921,993	1	6	5	5	4	0	2	0	2	3	5	2	5	2	1	1	5	12	1	2	3	2	5	10	7	19	2	0	0	0	0	1	0	0	0	0	1	1	30
180	Suomussalmi Kellotuli	14831:1204,1274	1	5	5	3	3	0	5	0	2	4	5	2	5	2	1	4	36	0	2	4	0	2	4	12	10	19	2	0	0	1	0	2	0	0	0	1	0	0	35
182	Suomussalmi Kellotuli	14831:185	1	5	5	5	2	0	1	0	2	3	5	1	1	6	1	12	0	0	3	0	0	3	1	10	8	19	2	0	0	0	0	1	0	0	0	0	0	0	35
183	Suomussalmi Kellotuli	14831:919,922	1	4	5	5	3	0	0	0	5	2	2	4	1	2	7	2	0	0	1	0	0	3	5	10	7	19	2	0	0	1	0	1	0	0	0	1	0	0	35
184	Suomussalmi Kellotuli	14831:824,1022,901	1	4	4	4	3	0	4	0	2	5	5	2	5	0	0	0	0	0	0	0	0	3	0	6	8	26	2	1	0	0	0	0	0	0	0	0	0	0	0
185	Suomussalmi Kellotuli	14831:514	1	4	4	5	3	0	0	0	3	4	9	2	3	2	1	2	12	0	2	3	0	3	3	10	8	19	2	0	0	0	0	1	1	0	0	0	0	0	30
186	Suomussalmi Kellotuli	14831:334,335,222	2	5	4	4	5	3	0	4	0	2	9	2	4	1	1	1	0	0	1	0	0	4	0	9	7	19	2	1	0	0	0	2	0	0	0	0	0	0	20
187	Suomussalmi Kellotuli	14831:1182,1327	2	5	5	4	4	0	4	0	2	3	9	3	5	1	7	1	4	0	1	2	0	1	4	10	5	19	2	0	1	0	0	0	0	0	0	0	1	0	25
188	Suomussalmi Kellotuli	14831:637,522,677	2	5	5	4	4	0	5	0	1	3	5	3	5	0	0	36	2	0	4	3	0	2	0	10	5	19	2	0	0	0	0	1	0	0	1	0	0	0	35
189	Suomussalmi Kellotuli	14831:1341,1314	5	5	2	4	3	0	1	0	2	3	5	2	3	0	0	28	30	0	7	8	0	5	1	6	8	20	2	0	0	0	0	0	1	0	0	0	0	0	20
190	Suomussalmi Kellotuli	14831:1414,1415	5	5	5	5	3	0	0	0	2	3	8	3	4	0	0	28	2	0	7	1	0	2	1	6	8	20	2	0	0	0	0	0	1	0	0	1	0	0	45
191	Suomussalmi Kellotuli	14831:1401,1426	5	6	2	5	3	0	0	0	5	3	5	2	4	0	0	28	30	0	7	8	0	3	1	8	8	20	2	0	0	0	0	0	1	0	0	0	0	0	25
192	Suomussalmi Kellotuli	14831:679,642,1340	5	5	4	5	3	0	0	0	2	3	8	3	4	0	0	0	0	0	0	0	0	3	0	5	5	17	2	1	0	0	0	0	0	0	0	0	0	0	45
193	Suomussalmi Kellotuli	14831:1343,1304	5	5	4	4	3	0	0	0	2	3	5	4	5	0	0	28	30	0	9	8	0	2	1	8	6	20	2	0	0	0	0	0	1	0	0	0	0	0	35
194	Suomussalmi Kellotuli	14831:407,405,822	5	4	2	5	3	0	0	0	4	4	5	1	1	0	0	28	30	0	9	8	0	4	1	6	5	25	2	0	0	0	0	0	1	0	0	0	0	0	0
195	Suomussalmi Kellotuli	14831:40,566,105,541	5	5	4	4	3	0	0	0	3	4	8	3	4	0	0	0	0	0	0	0	0	4	0	5	4	26	2	1	0	0	0	0	0	0	0	0	0	0	0
196	Suomussalmi Kellotuli	14831:1307,1337	7	1	0	0	2	0	0	0	2	3	5	2	4	0	0	29	30	0	7	8	0	3	1	7	5	20	2	0	0	0	0	0	1	0	0	0	0	0	20
197	Suomussalmi Kellotuli	14831:1794,992,868	7	1	0	3	3	0	0	0	3	3	2	1	1	2	1	2	0	0	2	0	0	3	4	17	5	19	2	0	0	1	0	0	0	0	0	0	0	0	35
198	Suomussalmi Kellotuli	14831:728,899,744	9	1	1	2	2	0	4	0	2	3	6	1	1	1	1	1	0	0	1	0	0	4	1	8	6	19	2	0	0	0	0	2	0	0	0	0	0	0	0

Number	Site	NM-number	M1	Q1	K1	SH	SK	PM	PN	PT	PS	PO	RM	RF	RP	RE	RA	KE1	KE2	KE3	KY1	KY2	KY3	Kt	V	X	Y	TY	VE	Km0	Kma	Kmb	Kmc	Kmd	Kme	Kmf	Kmg	Kmh	Kmi	Kmj	SIZE
199	Suomussalmi Kellotuli	14831:901,1538,870	4	3	4	4	3	0	4	0	2	3	5	1	1	0	0	0	0	0	0	0	0	4	0	5	5	16	2	1	0	0	0	0	0	0	0	0	0	0	0
205	Suomussalmi Kellotuli	14831:1433	3	3	2	4	3	0	2	0	4	4	5	1	1	0	0	0	0	0	0	0	0	3	0	6	5	25	2	1	0	0	0	0	0	0	0	0	0	0	35
206	Suomussalmi Kellotuli	14831:994,743	3	4	6	3	4	0	4	0	2	4	8	5	2	0	0	0	0	0	0	0	0	2	0	2	6	22	2	1	0	0	0	0	0	0	0	0	0	0	20
207	Suomussalmi Kellotuli	14831:1119,1064	3	3	2	3	4	0	4	0	2	4	8	4	4	0	0	0	0	0	0	0	0	3	0	2	6	22	2	1	0	0	0	0	0	0	0	0	0	0	20
209	Suomussalmi Kellotuli	14831:1316	3	4	4	4	3	0	0	0	3	4	9	1	1	0	0	11	0	0	3	0	0	3	0	4	4	16	2	0	0	0	0	0	1	0	0	0	0	0	0
210	Suomussalmi Kellotuli	14831:1283,1434	3	5	5	4	3	0	1	0	3	4	2	1	3	0	0	0	0	0	0	0	0	4	0	10	5	16	2	1	0	0	0	0	0	0	0	0	0	0	0
211	Suomussalmi Kellotuli	14831:1021	3	2	3	3	2	0	2	0	3	3	5	1	1	0	0	0	0	0	0	0	0	4	0	6	3	26	2	1	0	0	0	0	0	0	0	0	0	0	0
212	Suomussalmi Kellotuli	14831:1579,1557	3	4	5	3	2	0	2	0	2	3	5	1	1	0	0	2	15	0	1	3	0	3	1	3	3	25	2	0	0	0	0	1	0	0	0	0	0	0	45
213	Suomussalmi Kellotuli	14831:1819,1282	7	3	3	2	3	0	0	0	3	4	2	2	3	3	2	17	0	0	4	0	0	2	3	14	8	9	2	0	1	0	0	0	0	0	0	0	0	0	45
214	Suomussalmi Kellotuli	14831:293,961,434	7	3	3	2	4	0	5	0	2	3	5	1	1	0	0	9	14	0	4	3	0	3	1	9	12	19	2	0	0	0	0	3	0	0	0	0	0	0	35
215	Suomussalmi Kellotuli	14831:1475,1432	4	3	5	4	3	0	5	0	2	4	5	1	1	2	1	15	0	0	3	0	0	3	1	12	9	19	2	0	0	0	0	2	0	0	0	0	0	0	35
217	Suomussalmi Kellotuli	14831:1402,1494	4	3	5	4	2	0	0	0	2	4	9	2	4	0	0	28	0	0	6	0	0	3	4	10	5	14	2	0	0	0	0	0	0	0	0	0	1	0	0
218	Suomussalmi Kellotuli	14831:1831,792	3	4	4	4	3	0	3	0	2	4	9	2	4	0	0	28	0	0	6	0	0	3	2	4	3	14	2	0	0	0	0	0	0	0	0	0	1	0	0
220	Suomussalmi Kellotuli	14831:1706,1776	4	5	4	4	3	0	3	0	2	3	5	1	1	0	0	0	0	0	0	0	0	4	0	9	7	26	2	0	1	0	0	0	0	0	0	0	0	0	30
229	Suomussalmi Mikonsärkkä	19879:9	5	5	4	5	3	0	0	0	3	3	5	3	4	0	0	30	0	0	8	0	0	2	1	10	8	20	2	0	0	0	0	0	1	0	0	0	0	0	35
230	Suomussalmi Mikonsärkkä	19879:10,11	5	4	4	3	3	0	0	0	5	4	8	2	4	0	0	2	0	0	1	0	0	3	3	7	6	20	2	0	0	0	0	0	0	0	0	1	0	0	0
231	Suomussalmi Mikonsärkkä	19879:13	4	5	4	3	3	0	0	0	5	3	8	3	5	0	0	28	29	0	7	6	0	3	3	7	7	20	2	0	0	0	0	0	0	1	1	0	0	0	35
232	Suomussalmi Mikonsärkkä	19879:11,15	5	5	4	4	2	0	0	0	3	3	7	2	5	0	0	0	0	0	0	0	0	3	0	10	8	20	2	1	0	0	0	0	0	0	0	0	0	0	35
233	Suomussalmi Mikonsärkkä	19879:14	5	4	4	4	2	0	0	0	3	3	5	1	1	0	0	0	0	0	0	0	0	4	0	5	8	20	2	1	0	0	0	0	0	0	0	0	0	0	0
236	Suomussalmi Mikonsärkkä	19879:22	3	2	3	4	2	0	0	0	3	4	8	3	4	0	0	0	0	0	0	0	0	4	0	8	5	26	2	0	0	0	0	0	1	0	0	0	0	0	0
237	Suomussalmi Mikonsärkkä	19879:25,26,27,24	2	5	4	5	4	0	4	0	4	4	5	1	1	0	0	0	0	0	0	0	0	4	0	6	6	25	2	1	0	0	0	0	0	0	0	0	0	0	0
238	Suomussalmi Mikonsärkkä	19879:23	1	1	1	5	2	0	4	0	4	4	5	1	1	0	0	2	15	0	1	3	0	3	1	4	4	25	2	0	0	0	0	1	0	0	0	0	0	0	35
239	Suomussalmi Mikonsärkkä	19879:16	4	5	3	5	2	0	0	0	2	4	7	1	1	0	0	17	0	0	4	0	0	4	1	7	7	20	2	0	0	0	0	0	1	0	0	0	0	0	35
753	Suomussalmi Mikonsärkkä	14831:1352	5	5	2	5	3	0	0	0	5	3	6	3	4	9	6	28	30	0	7	9	0	3	1	8	8	20	2	0	0	0	0	0	1	0	0	0	0	0	0
755	Suomussalmi Mikonsärkkä	14831:1209	7	3	4	3	4	0	0	0	3	4	2	1	1	0	0	18	0	0	4	0	0	3	3	15	8	14	2	0	1	0	0	0	0	0	0	0	0	0	0
408	Suomussalmi Joenniemi	25423:181	3	5	5	4	3	0	0	0	1	3	5	1	1	5	1	4	0	0	2	0	0	2	5	15	7	11	2	0	0	1	0	0	0	0	0	0	0	0	40
438	Suomussalmi Kukkosaari	20593:72,76,140	3	4	1	3	3	0	4	0	2	3	2	1	1	0	0	33	0	0	9	0	0	4	1	11	6	26	2	0	0	0	0	0	1	0	0	0	0	0	0
460	Suomussalmi Kukkosaari	23332:1,7,13	3	4	4	2	3	0	0	0	1	3	3	1	1	0	0	4	0	0	2	0	0	2	0	0	0	15	2	0	1	0	0	0	0	0	0	0	0	0	0
471	Suomussalmi Kukkosaari	25423:2	3	4	3	4	3	0	0	0	2	4	2	1	1	0	0	0	0	0	0	0	0	4	0	8	4	11	2	0	1	0	0	0	0	0	0	0	0	0	0
225	Suomussalmi Maikonsärkkä	21735:1	3	3	3	3	3	0	3	0	2	4	1	2	4	0	0	2	0	0	2	0	0	3	4	6	6	22	2	0	0	0	0	0	0	0	1	0	0	0	0
241	Suomussalmi Mikonsärkkä	20414:24,25	5	4	3	5	4	0	0	0	2	3	5	2	5	0	0	28	30	0	9	8	0	2	1	6	8	20	2	0	0	0	0	0	1	0	0	0	0	0	35
245	Suomussalmi Mikonsärkkä	20414:15	3	5	3	5	3	0	0	0	5	4	9	2	4	0	0	28	11	1	7	3	1	2	3	11	4	22	2	0	0	1	0	1	1	1	0	0	0	0	35
247	Suomussalmi Mikonsärkkä	20414:17	5	4	2	4	3	0	0	0	5	3	5	2	4	0	0	1	0	0	2	0	0	3	4	4	4	20	2	0	0	0	0	0	0	0	0	1	1	0	0
249	Suomussalmi Mikonsärkkä	21018:9	4	4	4	3	3	0	3	0	3	3	7	1	1	0	0	2	0	0	1	0	0	3	1	5	5	25	2	0	0	0	0	1	0	0	0	0	0	0	35
252	Suomussalmi Mikonsärkkä	21018:15	5	3	3	4	3	0	0	0	5	3	7	2	4	0	0	28	0	0	7	0	0	3	1	6	6	20	2	0	0	0	0	0	1	0	0	0	0	0	30
256	Suomussalmi Mikonsärkkä	21018:10,11	3	5	2	5	3	0	0	0	2	4	9	1	1	0	0	0	0	0	0	0	0	4	0	7	4	22	2	1	0	0	0	0	0	0	0	0	0	0	0
267	Suomussalmi Mikonsärkkä	22065:24	3	4	4	3	3	0	0	0	3	3	5	1	1	0	0	1	0	0	1	0	0	5	1	0	0	21	2	0	0	0	0	0	1	0	0	0	0	0	0
312	Suomussalmi Mikonsärkkä	26341:36,39,40	5	5	5	3	2	0	0	0	2	3	7	2	4	0	0	0	0	0	0	0	0	4	0	6	6	20	2	0	0	0	0	0	0	0	0	0	0	0	0
5	Suomussalmi Niemenkangas	22930:1	4	5	5	5	3	0	0	0	3	3	9	4	4	0	0	17	29	0	4	8	0	2	2	7	5	20	2	0	0	0	0	0	0	0	0	1	0	0	0
6	Suomussalmi Niemenkangas	22930:2	4	4	5	4	3	0	0	0	3	3	5	3	4	0	0	29	0	0	6	0	0	3	2	5	5	22	2	0	0	0	0	0	0	0	0	1	0	0	0
757	Suomussalmi Sillankorva	7620:2	4	5	3	5	4	0	0	0	2	5	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	20	2	1	0	0	0	0	0	0	0	0	0	0	0
287	Suomussalmi Nuolisärkkä	19538:6	5	1	1	5	4	0	0	0	5	4	5	2	4	0	0	31	28	0	8	7	0	3	1	8	6	20	2	0	0	0	0	0	1	0	0	0	0	0	0
291	Suomussalmi Nuolisärkkä	19843:63,64	5	3	4	4	3	0	0	0	1	4	7	1	1	0	0	0	0	0	0	0	0	4	0	5	5	20	2	1	0	0	0	0	0	0	0	0	0	0	1
292	Suomussalmi Nuolisärkkä	19843:86,87	5	3	4	4	3	0	0	0	3	3	5	1	1	0	0	29	0	0	9	0	0	4	1	5	5	20	2	0	0	0	0	0	1	0	0	0	0	0	0
293	Suomussalmi Nuolisärkkä	19843:89	2	4	1	5	3	0	0	0	4	3	8	2	4	0	0	0	0	0	0	0	0	4	0	3	4	25	2	1	0	0	0	0	0	0	0	0	0	0	0
294	Suomussalmi Nuolisärkkä	19880:1	3	4	1	5	3	0	0	0	2	4	9	2	4	0	0	0	0	0	0	0	0	3	0	6	4	22	2	0	0	0	0	0	1	1	0	0	0	0	0
415	Suomussalmi Pääskynen	23328:82,208,257	5	2	4	3	3	0	0	0	2	3	2	1	1	6	2	0	0	0	0	0	0	4	0	13	6	11	2	1	0	0	0	0	0	0	0	0	0	0	0
8	Suomussalmi Sotasaari	14841:24,31,33,41	5	4	1	5	4	1	2	0	5	3	5	4	5	0	0	17	30	23	4	6	4	1	4	3	4	22	2	0	0	0	0	0	0	1	0	0	0	1	0
751	Suomussalmi Tormuansärkkä	18322:858	3	4	5	5	4	0	1	0	4	5	6	4	5	0	0	1	32	15	1	7	3	2	3	5	4	21	2	0	0	1	0	1	1	0	0	0	0	0	0

Number	Site	NM-number	M1	Q1	K1	SH	SK	PM	PN	PT	PS	PO	RM	RF	RP	RE	RA	KE1	KE2	KE3	KY1	KY2	KY3	Kt	V	X	Y	TY	VE	Km0	Kma	Kmb	Kmc	Kmd	Kme	Kmf	Kmg	Kmh	Kmi	Kmj	SIZE
317	Suomussalmi Tormuansärkkä	18322:197	6	4	4	4	4	0	0	0	3	4	5	2	4	1	1	25	17	0	4	4	0	3	4	8	7	19	2	0	0	0	0	0	1	0	0	0	0	0	0
321	Suomussalmi Tormuansärkkä	18322:996,997	3	4	5	3	2	0	4	0	4	3	9	2	5	1	7	1	12	0	2	3	0	1	4	6	5	19	2	0	1	0	0	1	1	0	0	0	1	0	40
322	Suomussalmi Tormuansärkkä	18322:996,997	3	4	5	3	2	0	4	0	4	3	9	2	4	1	7	1	12	0	2	3	0	1	4	6	5	19	2	0	1	0	0	1	0	0	0	0	1	0	40
325	Suomussalmi Tormuansärkkä	18322:349,794,856	2	4	3	5	4	3	0	0	3	4	2	1	1	0	0	26	16	0	5	3	0	2	4	12	7	26	2	0	0	0	0	1	1	0	0	0	0	0	35
327	Suomussalmi Tormuansärkkä	18322:369,704,821	3	4	5	2	2	0	0	0	2	3	9	2	4	0	0	29	0	0	7	0	0	2	2	13	5	21	2	0	0	0	0	0	0	0	0	0	1	0	0
328	Suomussalmi Tormuansärkkä	18322:370,416,417	7	5	1	5	4	0	1	0	3	4	9	2	4	2	1	4	3	15	2	2	3	2	3	10	7	19	2	0	0	0	0	1	1	0	0	0	0	0	40
329	Suomussalmi Tormuansärkkä	18322:861	7	5	1	5	4	0	1	0	3	4	9	2	4	2	1	4	3	15	2	2	3	2	3	10	8	21	2	0	0	0	0	1	1	0	0	0	0	0	2
338	Suomussalmi Tormuansärkkä	18322:780	9	5	5	2	2	0	2	0	3	3	5	1	1	0	0	2	16	0	1	3	0	2	4	10	10	9	2	0	0	0	0	1	1	0	0	0	0	0	0
339	Suomussalmi Tormuansärkkä	18322:825	3	4	5	3	2	0	0	0	2	3	8	3	5	0	0	1	12	0	1	3	0	1	2	3	7	21	2	0	0	1	0	3	0	0	0	0	0	0	25
340	Suomussalmi Tormuansärkkä	18322:827,828	3	3	5	3	2	0	0	0	2	3	8	3	5	0	0	1	29	21	1	7	4	5	2	5	4	21	2	0	1	0	0	1	1	0	0	0	0	0	0
342	Suomussalmi Tormuansärkkä	18322:859,902,953	3	4	5	3	3	0	3	0	2	3	8	3	5	0	0	1	29	0	1	7	0	4	2	5	5	19	2	0	1	0	0	1	1	0	0	0	0	0	0
730	Vaala Muinaiskirkko	15839:2	3	6	6	4	4	0	0	0	1	3	3	1	1	2	2	0	0	0	0	0	0	4	0	15	6	11	2	1	0	0	0	0	0	0	0	0	0	0	0
507	Vaala Sillankorva	3713:40	4	6	3	5	3	0	0	0	2	4	2	0	0	0	0	0	0	0	0	0	0	4	0	17	8	11	2	0	0	0	0	0	0	0	0	0	0	0	0
508	Vaala Sillankorva	4080:6	4	5	4	5	3	0	0	0	5	4	8	4	4	0	0	31	28	34	8	7	10	3	1	6	6	20	2	0	0	0	0	0	1	0	0	0	0	0	0
514	Vaala Sillankorva	4080:12	4	5	4	5	3	0	0	0	5	4	5	3	4	0	0	31	17	28	8	4	7	4	1	6	6	20	2	0	0	0	0	0	1	0	0	0	0	0	0
515	Vaala Sillankorva	4080:7	4	5	5	4	3	0	1	0	1	3	5	1	1	0	0	11	0	0	3	0	0	4	3	10	7	26	2	0	0	0	0	1	0	0	0	0	0	0	0
525	Vaala Sillankorva	4080:31	4	5	3	5	3	0	0	0	2	4	2	4	4	0	0	31	28	0	8	7	0	3	1	10	7	20	2	0	0	0	0	0	1	0	0	0	0	0	0
531	Vaala Sillankorva	4080:12	3	6	4	5	4	0	0	0	5	4	8	3	2	0	0	1	31	0	1	8	0	2	4	5	5	20	2	0	0	0	0	0	1	0	0	1	0	0	0
533	Vaala Sillankorva	4080:12	4	4	3	4	2	0	0	0	2	4	9	2	3	0	0	17	28	0	4	9	0	4	1	3	2	19	2	0	0	0	0	0	1	0	0	0	0	0	0
535	Vaala Sillankorva	4080:12	4	4	3	3	2	0	0	0	3	3	5	2	6	0	0	29	17	0	7	4	0	3	4	5	6	20	2	0	0	0	0	0	1	0	0	0	0	0	0
536	Vaala Sillankorva	4080:14	4	4	2	4	3	0	2	0	2	3	5	2	3	0	0	29	17	0	9	4	0	3	3	8	6	20	2	0	0	0	0	0	1	0	0	0	0	0	0
539	Vaala Sillankorva	4080:19	2	3	3	3	3	0	0	0	2	4	5	3	4	0	0	17	0	0	4	0	0	4	4	8	8	26	2	0	1	0	0	0	0	0	0	0	0	0	0
541	Vaala Sillankorva	4080:19	4	5	4	3	2	0	3	0	5	4	5	2	3	0	0	29	17	29	7	4	6	3	4	5	7	22	2	0	0	0	0	0	0	1	0	1	0	1	0
542	Vaala Sillankorva	4080:19	7	5	4	2	3	0	0	0	3	4	8	3	4	0	0	0	0	0	0	0	0	3	0	8	8	20	2	1	0	0	0	0	0	0	0	0	0	0	0
544	Vaala Sillankorva	4080:23	4	4	2	4	3	0	2	0	2	3	5	2	4	0	0	29	17	30	9	4	8	2	3	7	7	20	2	0	0	0	0	0	1	0	0	1	0	0	0
545	Vaala Sillankorva	4080:24	4	5	2	4	3	0	2	0	2	3	5	3	5	0	0	29	17	30	9	4	8	2	3	7	4	20	2	0	0	0	0	0	1	0	0	1	0	0	0
549	Vaala Sillankorva	4080:23	4	5	3	5	3	0	0	0	2	3	4	2	3	0	0	2	0	0	2	0	0	4	4	7	7	21	2	0	1	0	0	0	0	0	0	0	0	0	0
551	Vaala Sillankorva	4080:26	7	3	3	2	2	0	0	0	2	4	6	1	1	0	0	1	0	0	1	0	0	4	3	13	7	9	2	0	1	0	0	0	0	0	0	0	0	0	0
555	Vaala Sillankorva	4080:27	7	5	3	2	4	0	0	0	4	4	9	3	4	0	0	30	0	0	8	0	0	4	0	7	5	26	2	0	0	0	0	0	1	0	0	0	0	0	0
556	Vaala Sillankorva	4080:27	4	3	4	3	3	0	0	0	2	3	7	1	1	0	0	1	0	0	1	0	0	4	3	6	6	26	2	0	1	0	0	0	0	0	0	0	0	0	0
559	Vaala Sillankorva	4080:30	3	5	3	3	2	0	0	0	2	4	5	3	4	0	0	30	0	0	8	0	0	4	0	5	5	20	2	0	0	0	0	0	1	0	0	0	0	0	0
562	Vaala Sillankorva	4080:34	8	5	3	2	2	0	0	0	1	3	5	2	4	0	0	30	15	0	8	3	0	4	0	7	11	9	2	1	0	0	0	0	0	0	0	0	0	0	0
568	Vaala Sillankorva	4080:44	3	4	4	3	2	0	0	0	2	4	5	1	1	0	0	11	7	0	3	4	0	4	1	0	0	21	2	1	0	0	0	0	0	0	0	0	0	0	0
572	Vaala Sillankorva	4080:43,50	3	6	4	5	2	0	0	0	2	4	2	1	1	2	1	4	0	0	2	0	0	4	0	13	4	11	2	0	0	0	0	0	1	0	0	0	0	0	0
577	Vaala Sillankorva	4080:49	4	5	3	5	3	0	2	0	4	4	5	3	4	0	0	28	17	30	7	8	9	2	3	6	7	20	2	0	0	0	0	0	1	0	0	1	0	0	0
580	Vaala Sillankorva	4080:50	3	4	4	4	3	0	0	0	1	4	2	1	1	0	0	0	0	0	0	0	0	4	0	0	11	0	2	1	0	0	0	0	0	0	0	0	0	0	0
581	Vaala Sillankorva	4080:51	4	6	3	5	3	0	0	0	4	4	5	3	4	0	0	29	30	0	7	8	0	2	1	10	10	21	2	0	0	0	0	0	1	0	0	0	0	0	0
582	Vaala Sillankorva	4080:51	4	5	4	5	3	0	0	0	2	4	8	3	4	0	0	30	0	0	8	0	0	4	0	5	5	20	2	1	0	0	0	0	1	0	0	0	0	0	0
584	Vaala Sillankorva	4080:52	4	6	3	5	4	3	1	0	5	5	5	2	3	0	0	17	29	19	4	8	6	2	4	5	5	20	2	0	0	0	0	0	1	0	0	1	0	1	0
590	Vaala Sillankorva	4080:56	4	5	3	5	4	0	0	0	4	4	5	3	4	0	0	29	31	0	8	9	0	3	1	6	9	20	2	0	0	0	0	0	1	0	0	0	0	0	0
592	Vaala Sillankorva	4080:59	2	5	5	4	4	0	0	0	3	4	5	2	5	1	2	1	0	0	1	0	0	3	4	11	11	19	2	0	0	0	0	0	1	1	0	0	0	0	0
595	Vaala Sillankorva	4080:63	0	0	1	3	4	0	0	0	1	4	5	1	1	0	0	0	0	0	0	0	0	0	3	0	8	7	20	2	0	0	0	0	0	1	0	0	0	0	0	0
599	Vaala Sillankorva	7619:21	4	4	4	5	3	0	4	0	2	4	5	1	1	0	0	0	0	0	0	0	0	4	0	7	7	20	2	0	0	0	0	0	0	0	0	0	0	0	1	0
600	Vaala Sillankorva	7619:21	3	5	4	5	4	0	0	0	2	4	2	1	1	6	5	0	0	0	0	0	0	4	0	14	8	22	2	0	0	0	0	0	0	1	0	0	0	0	0	0
601	Vaala Sillankorva	7619:21	7	5	3	3	3	0	0	0	2	4	2	1	1	0	0	0	0	0	0	0	0	4	0	8	7	22	2	0	0	0	0	0	0	1	0	0	0	0	0	0
603	Vaala Sillankorva	7619:21	3	5	5	2	2	0	1	0	2	4	2	1	1	0	0	4	0	0	2	0	0	3	5	10	8	9	2	0	1	0	0	0	0	0	0	0	0	0	0	0
606	Vaala Sillankorva	7619:21	4	5	4	4	2	0	0	0	2	4	5	1	1	0	0	28	17	0	7	4	0	4	1	11	9	20	2	0	1	0	0	0	1	0	0	0	0	0	0	0
610	Vaala Sillankorva	7619:26	4	5	2	6	4	0	2	0	4	5	2	2	4	6	1	33	12	29	9	3	7	2	5	11	7	22	2	0	1	0	0	1	1	0	0	0	0	0	0	0
611	Vaala Kökkölä	7619:34	7	3	3	3	3	0	0	0	2	4	7	3	4	0	0	31	0	0	8	0	0	3	1	7	7	26	2	0	0	0	0	0	1	0	0	0	0	0	0	0

Number	Site	NM-number	M1	Q1	K1	SH	SK	PM	PN	PT	PS	PO	RM	RF	RP	RE	RA	KE1	KE2	KE3	KY1	KY2	KY3	Kt	V	X	Y	TY	VE	Km0	Kma	Kmb	Kmc	Kmd	Kme	Kmf	Kmg	Kmh	Kmi	Kmj	SIZE
614	Vaala Sillankorva	8645:14	0	1	1	4	5	0	0	0	3	5	5	2	3	0	0	1	0	0	1	0	0	4	1	9	9	26	2	1	0	0	0	0	0	0	0	0	0	0	0
620	Vaala Sillankorva	8645:12	4	5	3	5	3	0	1	0	4	4	8	3	5	0	0	30	29	0	9	8	0	4	1	3	8	20	2	0	0	0	0	0	1	0	0	0	0	0	0
623	Vaala Puhakka	9364:9	4	4	3	4	3	0	0	0	2	4	5	2	4	0	0	29	0	0	7	0	0	4	1	4	2	20	2	0	0	0	0	0	1	0	0	0	0	0	0
632	Vaala Sillankorva	3147:15	4	5	4	5	2	0	0	0	2	3	8	2	4	0	0	0	0	0	0	0	0	4	0	5	5	26	2	1	0	0	0	0	0	0	0	0	0	0	0
633	Vaala Sillankorva	3147:15	4	5	3	5	2	0	0	0	2	3	8	3	5	0	0	1	17	0	1	4	0	2	2	7	7	20	2	0	0	0	0	0	0	0	0	1	1	0	0
634	Vaala Sillankorva	3147:15	4	5	3	5	2	0	0	0	3	4	8	3	5	0	0	29	30	0	9	8	0	4	1	8	9	20	2	0	0	0	0	0	1	0	0	0	0	0	0
635	Vaala Sillankorva	3147:15	4	5	3	5	2	0	0	0	1	5	8	3	5	0	0	28	17	30	7	6	9	2	3	8	7	20	2	0	0	0	0	0	0	0	0	1	0	0	0
636	Vaala Sillankorva	3147:15	4	6	4	5	2	0	0	0	5	4	8	3	3	0	0	17	28	0	4	8	0	3	2	7	7	20	2	0	0	0	0	0	0	0	0	1	0	0	0
640	Vaala Sillankorva	3147:15	2	6	3	5	4	0	0	0	2	4	5	2	1	9	6	0	0	0	0	0	0	4	0	10	13	20	2	1	0	0	0	0	0	0	0	0	0	0	0
641	Vaala Sillankorva	3147:15	4	5	2	5	5	3	0	0	5	5	8	2	4	0	0	28	17	0	7	4	0	3	4	5	5	21	2	0	0	0	0	0	0	0	0	0	0	1	0
644	Vaala Sillankorva	3147:15	4	5	5	5	3	0	0	0	2	3	5	2	4	0	0	30	0	0	9	0	0	4	0	6	6	20	2	1	0	0	0	0	0	0	0	0	0	0	0
645	Vaala Sillankorva	3147:15	4	5	5	5	3	0	0	0	3	4	6	1	1	0	0	0	0	0	0	0	0	5	0	0	0	22	2	1	0	0	0	0	0	0	0	0	0	0	0
646	Vaala Sillankorva	3147:15	4	5	5	2	2	0	0	0	2	4	5	2	4	0	0	0	0	0	0	0	0	4	1	8	8	16	2	1	0	0	0	0	0	0	0	0	0	0	0
647	Vaala Sillankorva	3147:15	4	5	4	4	2	0	0	0	3	4	5	2	4	0	0	17	30	28	4	9	7	3	1	8	8	20	2	0	0	0	0	0	0	0	0	1	0	0	0
651	Vaala Sillankorva	3147:15	3	5	4	5	3	0	0	0	4	4	8	3	2	0	0	29	0	0	7	0	0	3	0	7	7	25	2	0	0	0	0	0	1	0	0	0	0	0	0
656	Vaala Sillankorva	3147:15	4	5	4	5	4	0	5	0	3	4	5	1	1	0	0	29	17	0	7	4	0	4	4	8	8	20	2	0	0	0	0	1	1	0	0	0	0	0	0
660	Vaala Sillankorva	3147:16	4	5	4	5	3	0	0	0	3	4	3	2	3	0	0	17	28	0	4	7	0	3	2	7	7	20	2	0	0	0	0	0	1	0	0	1	0	0	0
664	Vaala Sillankorva	3147:16	7	4	4	3	4	0	0	0	2	3	5	2	3	0	0	0	0	0	0	0	0	4	0	11	11	26	2	0	1	0	0	0	0	0	0	0	0	0	0
666	Vaala Sillankorva	3461:6	4	5	3	5	2	0	0	0	2	4	5	2	4	0	0	17	0	0	4	0	0	2	4	4	5	20	2	0	0	0	0	0	0	0	0	1	0	0	0
667	Vaala Sillankorva	3461:5	5	5	4	5	2	0	0	0	5	2	5	2	4	0	0	17	0	0	4	0	0	2	4	5	5	20	2	0	0	0	0	0	0	0	0	1	0	0	0
668	Vaala Sillankorva	3461:5	4	5	4	4	2	0	0	0	3	3	5	1	1	0	0	17	0	0	4	0	0	3	4	3	4	20	2	0	0	0	0	0	1	0	0	0	0	0	0
669	Vaala Sillankorva	3461:5	4	5	4	4	2	0	0	0	2	4	7	2	3	0	0	30	0	0	9	0	0	4	0	8	8	20	2	1	0	0	0	0	0	0	0	0	0	0	0
670	Vaala Sillankorva	3461:5	4	5	4	5	2	0	0	0	3	3	8	3	5	0	0	29	0	0	9	0	0	3	4	5	26	20	2	1	0	0	0	0	1	0	0	1	0	0	0
675	Vaala Sillankorva	5862:3	4	5	3	5	4	0	0	0	5	5	5	1	1	0	0	29	32	0	8	7	0	2	1	8	8	20	2	0	0	0	0	0	1	0	0	0	0	0	0
683	Vaala Sillankorva	7620:9	3	5	4	3	3	0	1	0	2	4	7	2	4	0	0	1	0	0	1	0	0	4	2	8	8	19	2	0	1	0	0	3	0	0	0	0	0	0	0
684	Vaala Sillankorva	7620:20	4	5	3	3	2	0	3	0	2	4	7	2	1	0	0	29	0	0	8	0	0	4	1	6	6	20	2	0	0	0	0	0	1	0	0	0	0	0	0
687	Vaala Sillankorva	7620:26	4	4	4	2	2	0	0	0	1	4	5	2	4	0	0	17	0	0	4	0	0	3	2	7	7	20	2	0	0	0	0	0	0	0	0	1	0	0	0
689	Vaala Sillankorva	7620:49	4	4	3	6	3	0	0	0	5	5	6	2	4	0	0	2	0	0	1	0	0	4	3	2	10	22	2	0	0	0	0	0	1	0	0	0	0	0	0
690	Vaala Sillankorva	7620:53	4	5	4	3	4	0	3	0	4	5	8	3	5	0	0	4	17	1	2	4	1	2	4	5	9	20	2	0	0	1	0	3	1	0	0	1	0	0	0
692	Vaala Sillankorva	7620:56	4	4	4	4	3	0	0	0	2	4	5	2	1	0	0	1	0	0	1	0	0	4	3	8	7	26	2	0	0	0	0	0	3	0	0	0	0	0	0
693	Vaala Sillankorva	7620:55	4	6	3	5	4	0	0	0	2	4	8	3	5	0	0	2	28	0	1	7	0	3	4	7	6	20	2	0	0	0	0	0	1	1	0	0	0	0	0
696	Vaala Sillankorva	7620:89	9	4	3	2	2	0	0	0	2	4	5	2	4	0	0	28	0	0	9	0	0	4	2	9	7	20	2	0	0	0	0	0	1	0	0	0	0	0	0
697	Vaala Sillankorva	7620:95	4	5	3	5	2	0	0	0	2	3	5	1	1	0	0	2	11	0	1	3	0	2	5	6	5	19	2	0	0	0	0	1	0	0	0	1	0	0	0
698	Vaala Sillankorva	7620:98	3	5	5	4	3	0	0	0	3	4	5	2	5	0	0	1	0	0	1	0	0	3	2	4	4	19	2	0	1	0	0	0	0	0	0	0	0	0	0
699	Vaala Sillankorva	7620:98	4	4	2	5	2	0	0	0	3	4	5	1	1	0	0	1	0	0	1	0	0	4	2	7	7	20	2	0	0	0	0	0	1	0	0	0	0	0	0
705	Vaala Sillankorva	7620:141	4	6	4	6	5	0	5	0	4	4	5	2	5	8	4	20	0	0	4	0	0	2	3	7	7	20	2	0	1	0	0	3	0	0	0	0	0	0	0
706	Vaala Sillankorva	7620:–	3	4	4	3	3	0	1	1	1	4	5	1	1	0	0	0	0	0	0	0	0	4	0	6	6	26	2	1	0	0	0	3	0	0	0	0	0	0	0
707	Vaala Sillankorva	7620:54	3	4	4	4	3	0	0	0	2	4	2	1	1	0	0	0	0	0	0	0	0	4	0	7	7	26	2	1	0	0	0	0	0	0	0	0	0	0	0
710	Vaala Sillankorva	7526:16	4	5	3	5	4	0	0	0	5	4	5	3	4	0	0	31	29	0	9	8	0	2	1	10	10	20	2	0	0	0	0	0	1	0	0	0	0	0	0
711	Vaala Sillankorva	7526:16	4	5	3	5	4	0	0	0	3	4	8	4	5	0	0	31	0	0	9	0	0	3	0	5	10	20	2	0	0	0	0	0	1	0	0	0	0	0	0
719	Vaala Sillankorva	7683:13	3	5	2	5	2	0	3	0	2	3	8	4	4	0	0	28	0	0	7	0	0	4	1	5	10	21	2	0	0	0	0	0	1	0	0	0	0	0	0
720	Vaala Sillankorva	7683:13	4	5	4	2	2	0	0	0	3	4	5	4	5	0	0	1	17	0	1	4	0	2	3	9	7	20	2	0	0	0	0	2	1	0	0	1	0	0	0
723	Vaala Niemelänniemi	7683:18	3	6	2	6	5	0	0	0	5	5	11	4	6	0	0	18	25	0	4	4	0	2	3	5	12	20	2	0	0	0	0	0	1	1	0	0	0	0	0
724	Vaala Niemelänniemi	7683:18	3	5	3	6	5	0	0	0	3	5	11	1	1	2	5	2	0	0	1	0	0	2	2	5	8	22	2	0	1	0	0	0	0	0	0	0	1	0	0
725	Vaala Sillankorva	7683:23	4	5	4	2	2	0	0	0	2	3	6	1	1	0	0	2	0	0	1	0	0	3	1	8	8	26	2	0	0	0	0	1	0	0	0	0	0	0	0
740	Vaala Sillankorva	4080:38	4	5	4	4	2	0	3	0	2	3	8	4	4	9	6	17	28	0	4	7	0	2	3	7	7	19	2	0	0	0	0	0	0	0	0	1	0	0	0
741	Vaala Sillankorva	4080:9	5	6	5	5	5	3	2	0	1	3	3	4	6	0	0	17	26	0	4	5	0	1	3	10	10	20	2	0	0	0	0	0	1	0	0	1	0	0	0
742	Vaala Sillankorva	4080:35	4	6	3	2	2	0	0	0	1	3	5	3	4	0	0	1	0	0	1	0	0	3	1	9	9	20	2	0	0	0	0	0	1	0	0	1	0	0	0
747	Vaala Kaitanen	21997:1	4	5	4	4	2	0	0	0	1	3	5	4	5	0	0	29	17	0	7	4	0	2	1	6	6	20	2	0	0	0	0	3	1	0	0	0	0	0	0

Number Site	NM-number	M1	Q1	K1	SH	SK	PM	PN	PT	PS	PO	RM	RF	RP	RE	RA	KE1	KE2	KE3	KY1	KY2	KY3	Kt	V	X	Y	TY	VE	Km0	Kma	Kmb	Kmc	Kmd	Kme	Kmf	Kmg	Kmh	Kmi	Kmj	SIZE
1019 Vaala Sillankorva	3713:40	4	6	4	6	4	0	3	1	2	3	8	0	0	0	0	0	0	0	0	0	0	4	0	6	6	20	2	0	0	0	0	3	0	0	0	0	0	0	0
1020 Vaala Sillankorva	3713:40	4	4	4	4	3	0	1	0	2	4	8	0	0	0	0	29	28	0	7	9	0	3	1	10	10	20	2	0	0	0	0	0	1	0	0	0	0	0	0
1021 Vaala Sillankorva	3713:40	4	3	3	3	2	0	1	0	4	3	2	3	3	0	0	0	0	0	0	0	0	3	0	13	5	11	2	0	0	0	0	0	0	0	0	0	0	0	0
1029 Vaala Uusitalo	3663:8	2	4	5	4	4	0	0	0	2	4	5	0	0	0	0	4	13	0	2	3	0	3	3	9	9	16	2	0	1	0	1	0	0	0	0	0	0	0	0
1030 Vaala Sillankorva	3663:8	4	5	4	2	2	0	1	0	5	4	5	2	5	0	0	28	14	0	9	3	0	3	1	8	7	22	2	0	0	0	0	0	1	0	0	0	0	0	0
4535 Nilsiä Autiosaari	18273:2	3	6	2	5	5	0	3	0	4	4	6	1	1	0	0	0	0	0	0	0	0	5	0	8	8	22	3	0	0	0	0	0	0	0	0	0	0	0	0
4412 Alahärmä Karkaus	17458:1	7	5	4	2	3	0	5	0	2	4	5	1	1	0	0	0	0	0	0	0	0	4	0	9	9	26	3	0	0	0	0	0	0	0	0	0	0	0	0
4493 Uusikaarlepyy Råbacken	24015:18,19	3	5	3	4	3	0	0	0	3	4	12	2	4	0	0	33	0	0	7	0	0	3	3	6	3	22	3	0	0	0	0	0	1	0	1	0	0	0	0
4524 Laihia Viirikallio	24366:33	5	3	5	5	3	0	0	2	2	3	5	2	5	0	0	4	0	0	2	0	0	3	3	7	6	19	3	0	1	0	0	0	1	0	0	0	0	0	0
4526 Laihia Viirikallio	24366:78,79	7	4	3	3	3	0	0	6	2	4	5	1	1	0	0	0	0	0	0	0	0	5	1	7	7	19	3	0	0	0	0	0	1	0	0	0	0	0	0
4531 Laihia Viirikallio	25010:30,31	5	5	4	4	3	0	0	0	6	4	8	4	4	0	0	1	0	0	1	0	0	3	4	6	5	19	3	0	0	0	0	0	0	0	0	1	0	0	0
4423 Närpiö Stenrosbacken	12221:17	2	4	4	4	3	0	0	0	3	4	7	1	1	0	0	12	0	0	3	0	0	3	1	8	7	24	3	0	0	0	0	0	1	0	0	0	0	0	1
4424 Närpiö Stenrosbacken	12221:17	2	4	4	4	3	0	0	0	4	4	5	3	4	0	0	14	30	0	3	9	0	3	2	8	8	13	3	0	0	0	0	0	1	1	0	0	0	0	0
4425 Närpiö Stenrosbacken	12221:44	2	4	4	5	3	0	0	0	3	4	5	1	1	0	0	15	0	0	3	0	0	3	2	6	6	13	3	0	0	0	0	0	1	0	0	0	0	0	0
4427 Närpiö Stenrosbacken	12221:50	2	5	4	5	3	0	3	0	4	4	5	2	3	0	0	6	15	0	2	3	0	2	3	4	6	13	3	0	0	0	0	0	1	1	0	0	0	0	0
4428 Närpiö Stenrosbacken	12221:57	2	5	4	4	3	0	3	0	3	4	8	4	3	0	0	15	0	0	3	0	0	2	2	12	9	13	3	0	0	0	0	0	1	0	0	0	0	0	0
4430 Närpiö Stenrosbacken	12545:14,25	2	5	3	5	3	0	0	0	3	4	5	1	1	0	0	2	15	0	1	3	0	3	3	9	9	13	3	0	0	0	0	0	1	1	0	0	0	0	0
4433 Närpiö Stenrosbacken	12545:15	2	4	5	5	4	0	0	0	3	4	5	2	4	0	0	13	29	0	3	8	0	3	3	8	8	13	3	0	0	0	0	0	1	1	1	0	0	0	0
4434 Närpiö Stenrosbacken	12545:17	2	3	6	5	4	0	0	0	3	4	8	3	4	0	0	15	28	0	3	6	0	3	2	7	9	13	3	0	0	0	0	0	1	0	0	0	1	0	0
4435 Närpiö Stenrosbacken	12545:21	2	4	5	4	3	0	0	0	3	4	8	3	4	0	0	15	28	0	3	6	0	3	3	7	10	13	3	0	0	0	0	0	1	0	0	0	1	0	0
4436 Närpiö Stenrosbacken	12545:7,18,20	2	3	5	5	4	0	0	0	3	4	8	3	4	0	0	29	15	0	8	3	0	1	3	10	7	13	3	0	0	0	0	0	1	0	0	0	0	1	0
4438 Närpiö Stenrosbacken	12545:22	2	4	4	3	3	0	3	0	2	4	8	3	4	4	4	11	29	0	3	8	0	3	2	10	7	13	3	0	0	0	0	0	1	0	0	0	0	0	0
4440 Närpiö Stenrosbacken	12545:37	2	3	5	5	4	0	0	0	3	4	7	1	1	0	0	25	11	0	2	3	0	3	3	5	7	13	3	0	0	0	0	0	1	1	0	0	0	0	1
4443 Närpiö Stenrosbacken	12545:55	2	3	5	5	4	0	0	0	2	4	5	1	1	0	0	12	0	0	3	0	0	4	1	6	6	13	3	0	0	0	0	0	1	0	0	0	0	0	0
4445 Närpiö Stenrosbacken	12545:56	2	3	6	5	4	0	1	0	3	4	5	1	1	0	0	12	0	0	3	0	0	2	2	8	7	13	3	0	0	0	0	0	1	0	0	0	0	0	0
4446 Närpiö Stenrosbacken	12545:53	2	5	5	4	4	0	0	0	2	4	5	1	1	0	0	12	0	0	3	0	0	3	3	7	7	13	3	0	0	0	0	0	1	0	0	0	0	0	0
4447 Närpiö Stenrosbacken	12545:58	2	4	4	5	3	0	0	0	3	4	5	3	3	0	0	12	0	0	3	0	0	2	2	7	9	13	3	0	0	0	0	0	1	0	0	0	0	0	0
4448 Närpiö Stenrosbacken	12545:51	2	3	3	4	3	0	2	0	3	4	5	3	3	0	0	8	12	0	2	3	0	4	2	7	7	13	3	0	0	0	0	0	1	1	0	0	0	0	0
4450 Närpiö Stenrosbacken	12545:68,63	2	4	3	5	4	0	0	0	3	4	8	2	4	0	0	12	29	0	2	3	0	2	3	8	7	13	3	0	0	0	0	0	1	0	0	0	1	0	0
4451 Närpiö Stenrosbacken	12545:71	2	4	3	5	3	0	0	0	3	4	7	1	1	0	0	15	0	0	3	0	0	3	2	8	8	13	3	0	0	0	0	0	1	0	0	0	0	0	1
4452 Närpiö Stenrosbacken	12545:79	2	5	3	4	3	0	0	0	3	4	5	1	1	0	0	0	0	0	0	0	0	1	0	7	7	13	3	0	0	0	0	0	0	0	0	0	0	0	0
4479 Reisjärvi Luotola	14210:371	0	1	1	6	5	0	0	0	6	4	5	1	1	0	0	0	0	0	0	0	0	3	0	5	5	12	3	0	0	0	0	0	0	0	0	0	0	0	0
4488 Reisjärvi Luotola	14210:417,418	3	5	6	3	3	0	0	0	3	4	2	1	1	0	0	0	0	0	0	0	0	2	0	20	7	11	3	0	0	0	0	0	0	0	0	0	0	0	0
4537 Enonkoski Pöytälahti-a	27260:1	3	6	6	4	3	0	0	0	1	3	13	2	4	0	0	29	0	0	8	0	0	3	2	13	7	15	4	0	0	0	0	0	0	1	0	0	0	0	0
4538 Enonkoski Pöytälahti-a	27260:2	3	6	5	5	3	0	0	0	3	4	8	4	2	0	0	0	0	0	0	0	0	3	0	2	2	17	4	0	0	0	0	0	0	0	0	0	0	0	0
1083 Iisalmi Huotari	18565:1	3	5	1	5	4	0	0	0	4	5	8	2	2	0	0	3	0	0	2	0	0	2	3	6	6	22	4	0	0	1	0	0	0	0	0	0	0	0	0
1044 Iisalmi Jysmä	13043:2	3	5	5	5	3	0	6	0	1	4	2	1	1	0	0	0	0	0	0	0	0	1	0	24	7	11	4	0	0	0	0	0	0	0	0	0	0	0	0
1046 Iisalmi Jysmä	13458:4	3	5	3	5	4	0	0	0	2	4	3	1	1	2	1	4	0	0	2	0	0	3	0	6	3	11	4	0	1	0	0	0	0	0	0	0	0	0	0
1047 Iisalmi Jysmä	13944:10,13,16	3	6	5	3	4	0	0	0	2	4	12	1	1	6	1	0	0	0	0	0	0	3	0	17	6	15	4	0	0	0	0	0	0	0	0	0	0	0	0
1049 Iisalmi Jysmä	13944:25,28,30,35	3	5	3	3	3	0	0	0	2	3	3	1	1	2	1	4	0	0	2	0	0	3	3	15	7	11	4	0	0	0	0	0	0	0	0	0	0	1	0
1053 Iisalmi Jysmä	13944:68	3	5	3	5	4	0	0	0	2	4	12	2	3	11	1	0	0	0	0	0	0	3	0	22	7	15	4	0	0	0	0	0	0	0	0	0	0	0	0
1075 Iisalmi Jysmä	17296:10	3	3	4	1	2	0	0	0	1	2	8	3	4	2	2	3	0	0	2	0	0	3	3	15	10	16	4	0	1	0	0	0	0	0	0	0	0	0	0
1076 Iisalmi Jysmä	17296:12	4	4	4	5	4	0	0	0	6	4	6	1	1	2	1	3	11	0	2	3	0	4	2	15	7	9	4	0	1	0	0	1	0	0	0	0	0	0	0
1078 Iisalmi Jysmä	17296:15	3	6	3	5	4	0	5	0	2	3	13	1	1	0	0	0	0	0	0	0	0	2	0	14	10	15	4	0	0	0	0	0	0	0	0	0	0	0	0
1079 Iisalmi Jysmä	17296:15	3	5	5	3	4	0	0	0	2	4	3	1	1	0	0	0	0	0	0	0	0	3	0	6	5	11	4	0	0	0	0	0	0	0	0	0	0	0	0
1081 Iisalmi Jysmä	18611:2	5	3	6	3	2	0	0	0	2	3	5	3	5	0	0	12	0	0	3	0	0	3	0	9	6	16	4	0	0	0	0	1	0	0	0	0	0	0	0
1162 Ilomantsi Suiponniemi	23382:1,5,14	3	5	4	5	3	0	0	0	2	4	2	2	3	6	1	3	0	0	2	0	0	3	0	12	5	11	4	0	0	1	0	0	0	0	0	0	0	0	0
1163 Ilomantsi Suiponniemi	23382:17	3	5	4	4	3	0	0	0	2	3	12	1	1	6	2	0	0	0	0	0	0	3	0	12	5	17	4	0	0	0	0	0	0	0	0	0	0	0	0
1164 Ilomantsi Suiponniemi	23382:18,22	3	3	3	3	3	0	0	0	2	3	1	1	1	6	5	0	0	0	0	0	0	4	0	6	5	17	4	0	0	0	0	0	0	0	0	0	0	0	0

Number Site	NM-number	M1	Q1	K1	SH	SK	PM	PN	PT	PS	PO	RM	RF	RP	RE	RA	KE1	KE2	KE3	KY1	KY2	KY3	Kt	V	X	Y	TY	VE	Km0	Kma	Kmb	Kmc	Kmd	Kme	Kmf	Kmg	Kmh	Kmi	Kmj	SIZE
1168 Ilomantsi Suiponniemi	23382:84,86,87	3	3	4	3	3	0	0	0	2	4	2	1	2	0	0	29	0	0	7	0	0	4	1	10	5	17	4	0	0	0	0	0	1	0	0	0	0	0	0
1169 Ilomantsi Suiponniemi	23382:83	3	3	5	3	3	0	0	0	2	4	12	2	4	0	0	3	0	0	2	0	0	2	1	9	5	17	4	0	0	0	0	0	0	0	1	0	0	0	0
1170 Ilomantsi Suiponniemi	23382:88	3	5	5	3	3	0	0	0	3	0	2	1	1	0	0	4	0	0	2	0	0	4	2	9	7	17	4	0	0	0	0	0	0	0	1	0	0	0	0
1092 Ilomantsi Syväys	17875:29,46	3	6	3	6	5	0	0	0	6	4	8	3	2	0	0	33	17	29	9	4	9	2	4	5	5	22	4	0	0	0	0	0	1	0	1	0	0	10	0
1093 Ilomantsi Syväys	17875:30	3	4	2	5	4	0	1	0	5	3	5	1	1	0	0	28	0	0	7	0	0	4	1	7	6	22	4	0	0	0	0	0	1	0	0	0	0	0	0
1100 Ilomantsi Syväys	17875:48	4	5	4	2	2	0	0	5	2	4	5	1	1	0	0	2	0	0	1	0	0	3	4	10	10	19	4	0	0	0	0	0	1	0	0	0	0	0	0
1111 Ilomantsi Syväys	18200:18,26,61,80	4	5	5	5	4	0	3	0	4	4	5	3	4	0	0	17	2	0	4	1	0	0	4	5	7	19	4	0	0	0	0	0	1	0	0	0	0	1	0
1117 Ilomantsi Syväys	18200:297,327	2	5	5	5	4	0	0	0	3	4	5	1	1	5	1	16	0	0	3	0	0	4	4	8	7	30	4	0	0	0	0	1	0	0	0	0	0	0	0
1125 Ilomantsi Syväys	18200:96	2	5	6	3	3	0	0	1	2	3	5	1	1	0	0	1	0	0	1	0	0	4	1	9	9	19	4	0	0	0	0	0	1	0	0	0	0	0	0
1138 Ilomantsi Syväys	18200:229,231	2	4	5	4	4	0	0	0	6	4	8	2	3	0	0	3	17	0	2	4	0	2	4	7	7	22	4	0	1	0	0	0	1	0	1	0	0	0	0
1175 Joensuu Varaslampi	19471:91	4	4	5	4	3	0	0	0	4	5	5	2	4	1	2	1	0	0	1	0	0	4	3	7	5	19	4	0	0	1	0	0	1	0	0	1	0	0	4
1185 Joensuu Varaslampi	19471:139,144,193	4	5	5	4	2	0	0	0	3	4	5	4	5	1	1	1	0	0	1	0	0	3	4	9	8	19	4	0	0	0	0	0	1	0	0	1	0	0	0
1187 Joensuu Varaslampi	19471:152	4	5	5	3	3	0	2	0	2	3	5	5	6	1	2	1	0	0	1	0	0	3	4	6	6	19	4	0	0	1	0	0	0	0	0	1	0	0	0
1189 Joensuu Varaslampi	19471:155,171,172	4	4	4	5	4	0	2	0	2	4	8	5	6	1	5	1	0	0	1	0	0	3	4	9	5	19	4	0	0	0	0	0	1	0	0	1	0	0	0
1194 Joensuu Varaslampi	19471:187	4	3	4	3	3	2	0	0	2	4	5	3	5	1	5	1	0	0	1	0	0	4	4	7	4	19	4	0	0	0	0	0	0	0	0	1	0	0	3
1199 Joensuu Varaslampi	19471:204,205	4	3	4	3	2	0	0	0	2	4	4	2	3	1	2	1	0	0	1	0	0	3	3	10	7	19	4	1	1	0	0	0	0	0	0	0	0	1	0
1201 Joensuu Varaslampi	19471:234	4	3	3	5	4	0	0	0	3	4	9	4	6	1	1	29	0	0	6	0	0	5	3	8	6	19	4	0	0	0	0	0	0	0	0	1	0	0	0
1202 Joensuu Varaslampi	19471:237,277,338	6	4	5	5	4	0	0	0	5	4	5	2	6	1	2	1	15	0	1	3	0	2	4	8	8	19	4	0	0	0	0	1	1	0	0	1	0	0	7
1204 Joensuu Varaslampi	19471:241	4	4	5	4	3	0	0	0	2	4	5	3	4	1	5	19	0	0	4	0	0	3	3	12	7	19	4	0	0	0	0	0	0	0	1	0	0	0	0
1218 Joensuu Varaslampi	19471:265,278,280	4	5	3	5	4	0	0	0	2	4	9	2	4	1	5	1	0	0	1	0	0	3	4	9	7	19	4	0	0	0	0	0	1	0	0	1	0	0	0
1222 Joensuu Varaslampi	19471:296,333,366	3	6	2	5	5	0	2	0	4	5	8	3	2	0	0	33	0	0	7	0	0	2	4	7	5	22	4	0	0	0	0	0	1	0	0	0	0	0	0
1233 Joensuu Varaslampi	19471:344,345,354	4	5	5	3	3	0	5	2	4	4	5	4	4	1	5	1	13	2	1	3	3	3	3	8	10	19	4	0	0	0	0	1	1	0	0	1	0	0	4
1237 Joensuu Varaslampi	19471:319,369,384	4	5	4	5	4	0	3	3	4	4	8	3	6	0	0	30	0	0	9	0	0	1	1	10	10	19	4	0	0	0	0	0	1	0	0	0	0	0	6
1239 Joensuu Varaslampi	19471:318,378	4	4	4	4	2	0	1	0	3	3	9	4	6	4	4	1	12	0	1	2	0	3	4	7	6	19	4	0	0	0	0	1	0	1	0	0	1	0	0
1240 Joensuu Varaslampi	19471:377,379,381	3	6	1	2	2	0	3	0	2	4	8	3	2	0	0	12	0	0	3	0	0	3	1	9	3	22	4	0	0	0	0	1	0	0	0	0	0	0	0
1241 Joensuu Varaslampi	19471:380	6	4	5	4	4	0	0	0	3	4	5	2	4	6	1	1	0	0	1	0	0	3	4	6	8	19	4	0	1	0	0	0	1	0	0	0	0	0	0
1245 Joensuu Varaslampi	19471:423,655	4	4	3	5	3	0	0	0	5	4	9	3	4	1	5	1	0	0	1	0	0	3	3	8	6	19	4	0	0	0	0	0	1	0	0	1	0	0	0
1255 Joensuu Varaslampi	19471:238,493	4	4	4	3	2	0	4	0	2	4	9	3	4	1	1	1	0	0	1	0	0	4	2	8	6	19	4	0	0	0	0	0	1	0	0	0	0	0	0
1259 Joensuu Varaslampi	19471:499	4	5	6	4	3	0	5	2	2	3	5	5	6	1	5	1	0	0	1	0	0	1	3	10	5	10	4	0	0	1	0	0	0	0	0	1	0	0	0
1260 Joensuu Varaslampi	19471:500,648,782	4	4	5	4	3	0	1	1	3	4	5	5	6	1	5	1	0	0	1	0	0	2	4	9	8	19	4	0	0	1	0	0	1	0	0	1	0	0	0
1262 Joensuu Varaslampi	19471:503	4	4	3	3	2	0	0	0	2	4	5	2	4	1	1	1	0	0	1	0	0	3	3	7	6	19	4	0	1	0	0	0	0	0	0	0	0	0	0
1269 Joensuu Varaslampi	19471:508,841,864	4	4	4	3	3	0	2	0	4	4	9	5	6	1	2	1	2	0	1	1	0	3	4	10	4	19	4	0	0	0	0	1	1	0	0	1	0	0	0
1273 Joensuu Varaslampi	19471:530,714	4	3	5	4	3	0	4	0	3	4	5	3	5	1	5	1	2	0	1	1	0	3	4	7	5	19	4	0	0	0	0	1	1	0	0	1	0	0	0
1274 Joensuu Varaslampi	19471:531	4	4	4	4	3	0	1	0	3	4	8	3	4	1	5	1	0	0	1	0	0	3	3	9	6	19	4	0	0	0	0	0	1	0	0	1	0	0	0
1276 Joensuu Varaslampi	19471:534	4	4	5	3	2	0	0	0	2	4	9	5	5	1	1	1	0	0	1	0	0	3	3	8	10	19	4	0	0	0	0	0	1	0	0	1	0	0	0
1277 Joensuu Varaslampi	19471:542,985,1069	4	4	4	5	4	0	1	0	4	4	9	5	6	1	5	1	13	0	1	3	0	3	3	8	5	19	4	0	0	0	0	1	1	0	0	1	0	0	0
1292 Joensuu Varaslampi	19471:672,674,694	3	5	2	6	5	0	0	0	4	5	8	3	2	1	1	33	1	17	7	1	12	3	5	6	3	22	4	0	1	0	0	0	1	0	0	0	0	0	0
1299 Joensuu Varaslampi	19471:724	4	5	5	5	3	0	0	0	3	4	5	4	5	1	1	1	0	0	1	0	0	3	2	7	7	19	4	0	0	0	0	0	1	0	0	1	0	0	0
1305 Joensuu Varaslampi	19471:813,857,863	4	4	4	4	3	0	4	0	4	4	5	3	5	1	1	1	0	0	1	0	0	2	4	8	6	19	4	0	0	0	0	0	1	0	0	1	0	0	0
1306 Joensuu Varaslampi	19471:814	4	4	3	3	3	0	2	0	2	4	5	3	4	1	1	1	0	0	1	0	0	4	4	8	6	19	4	0	0	0	0	0	1	0	0	1	0	0	0
1307 Joensuu Varaslampi	19471:815,826,838	4	4	6	3	3	0	2	0	4	4	9	5	6	1	5	1	0	0	1	0	0	2	4	9	5	19	4	0	0	0	0	0	1	0	0	1	1	0	0
1308 Joensuu Varaslampi	19471:835	4	4	5	5	3	0	0	0	3	4	9	3	5	1	5	1	0	0	1	0	0	4	2	10	6	19	4	0	0	0	0	0	1	0	0	0	0	0	0
1309 Joensuu Varaslampi	19471:836	4	5	3	3	3	0	3	0	3	4	5	4	5	1	1	1	0	0	1	0	0	3	4	8	6	19	4	0	0	0	0	0	1	0	0	1	0	0	0
1310 Joensuu Varaslampi	19471:837,856	4	4	5	5	3	0	4	0	4	4	5	4	5	1	1	1	0	0	1	0	0	2	4	8	6	19	4	0	0	1	0	0	1	0	0	1	0	0	0
1311 Joensuu Varaslampi	19471:839,860,892	4	4	5	3	3	0	3	0	3	4	5	4	4	0	0	30	0	0	9	0	0	0	0	11	11	19	4	0	0	0	0	0	5	0	0	0	0	0	0
1312 Joensuu Varaslampi	19471:842	4	3	5	3	3	0	3	3	4	4	8	4	5	0	0	30	0	0	11	0	0	2	0	12	9	19	4	0	0	0	0	0	5	0	0	0	0	0	0
1314 Joensuu Varaslampi	19471:859	4	4	4	3	3	0	0	0	2	4	5	3	5	1	1	1	29	0	1	7	0	4	3	7	6	19	4	0	0	0	0	0	1	0	0	1	0	0	0
1321 Joensuu Varaslampi	19471:884	4	4	4	4	4	0	3	0	4	4	5	3	4	1	5	1	0	0	1	0	0	3	3	10	7	19	4	0	0	0	0	0	1	0	0	1	0	0	0
1326 Joensuu Varaslampi	19471:943	4	4	4	4	3	0	2	0	4	4	9	4	6	1	1	1	0	0	1	0	0	3	2	10	4	19	4	0	0	0	0	0	1	0	0	0	0	0	0

Number Site	NM-number	M1	Q1	K1	SH	SK	PM	PN	PT	PS	PO	RM	RF	RP	RE	RA	KE1	KE2	KE3	KY1	KY2	KY3	Kt	V	X	Y	TY	VE	Km0	Kma	Kmb	Kmc	Kmd	Kme	Kmf	Kmg	Kmh	Kmi	Kmj	SIZE
1329 Joensuu Varaslampi	19471:964	4	5	4	5	4	0	2	0	4	4	5	3	5	1	1	1	29	0	1	8	0	3	4	8	6	19	4	0	0	0	0	0	1	0	0	1	0	0	0
1334 Joensuu Varaslampi	19471:772,992	4	5	3	5	4	0	2	0	4	4	9	3	5	1	5	1	0	0	1	0	0	3	1	9	5	19	4	0	0	0	0	0	1	0	0	0	0	0	0
1335 Joensuu Varaslampi	19471:1000	2	4	3	4	3	0	2	0	4	4	5	4	5	1	1	1	15	0	1	3	0	3	4	9	7	19	4	0	0	0	0	1	1	0	0	1	0	0	0
1336 Joensuu Varaslampi	19471:1029	3	6	2	6	5	0	3	0	4	5	8	3	2	0	0	33	19	0	9	4	0	3	3	10	10	22	4	0	0	0	0	1	1	0	0	0	0	0	0
1341 Joensuu Varaslampi	19471:1112	4	5	3	5	4	0	0	0	3	4	9	4	5	1	1	1	0	0	1	0	0	3	1	8	5	19	4	0	0	0	0	0	1	0	0	0	0	0	0
1343 Joensuu Varaslampi	19471:1117,1139	4	5	4	4	3	0	1	0	2	4	6	2	4	0	0	1	15	0	1	3	0	3	4	11	6	19	4	0	0	0	0	0	1	0	0	1	0	0	0
1359 Joensuu Varaslampi	19471:1246	2	5	3	3	4	0	0	0	4	4	5	1	1	0	0	0	0	0	0	0	0	4	3	7	8	19	4	0	0	0	0	0	0	0	0	0	0	0	0
1360 Joensuu Varaslampi	19471:1255,1257	4	5	4	4	3	0	3	0	4	4	5	3	5	1	1	1	12	0	1	3	0	2	3	8	5	19	4	0	1	0	0	0	1	0	0	1	0	0	0
1362 Joensuu Varaslampi	19471:1272	3	5	2	5	4	0	0	0	2	5	8	2	2	0	0	3	0	0	9	0	0	4	3	3	3	22	4	0	0	0	0	0	0	0	1	0	0	0	0
1366 Joensuu Varaslampi	19471:332	4	3	5	5	3	0	0	0	2	4	9	3	4	1	5	1	0	0	1	0	0	3	1	10	8	19	4	0	0	0	0	0	1	0	0	0	0	0	4
1367 Joensuu Varaslampi	19471:714,716,800	5	4	5	3	3	0	4	0	4	4	9	2	5	1	5	1	0	0	1	0	0	2	4	8	8	19	4	0	0	1	0	0	1	0	0	1	0	0	0
1369 Joensuu Varaslampi	19471:517	4	5	6	3	4	0	1	0	4	4	5	4	5	1	1	1	12	0	1	3	0	3	4	10	8	19	4	0	0	0	0	0	1	0	0	1	0	0	0
1378 Joensuu Varaslampi	20731:57,58,75,93	4	5	4	5	3	0	2	0	2	4	5	3	4	1	5	1	0	0	1	0	0	4	4	7	7	19	4	0	0	0	0	0	1	0	0	1	0	0	0
1379 Joensuu Varaslampi	20731:65,102	3	5	3	5	5	0	0	0	4	5	8	3	2	0	0	33	3	0	9	2	0	3	5	12	7	22	4	0	0	0	0	0	1	0	0	0	0	0	0
1381 Joensuu Varaslampi	20731:63	4	4	4	4	4	0	0	0	3	4	9	2	4	1	1	1	0	0	1	0	0	3	2	8	6	19	4	0	0	0	0	0	1	0	0	0	0	0	0
1385 Joensuu Varaslampi	20731:76	4	4	4	4	4	0	2	0	4	4	5	2	4	1	1	1	0	0	1	0	0	4	4	6	5	19	4	0	0	0	0	0	1	0	0	1	0	0	0
1392 Kerimäki Vehkaranta	13061:1	2	5	4	3	3	0	0	0	2	4	6	1	1	2	1	20	15	0	4	3	0	3	3	15	10	16	4	0	0	0	1	0	0	0	0	0	0	0	0
1395 Kerimäki Vehkaranta	13061:6	7	3	2	2	2	0	0	0	2	4	5	1	1	2	1	3	12	0	2	3	0	3	4	10	7	16	4	0	0	0	1	0	0	0	0	0	0	0	0
1396 Kerimäki Vehkaranta	13061:9	2	3	4	2	2	0	0	0	2	4	5	1	1	0	0	2	15	17	1	3	4	3	3	7	7	16	4	0	0	0	0	1	0	0	1	0	0	0	0
1403 Kerimäki Vehkaranta	13061:69	3	5	5	3	3	0	0	0	3	4	6	2	4	0	0	3	0	0	2	0	0	1	4	7	7	17	4	0	0	1	0	0	0	0	0	0	1	0	0
1408 Kerimäki Vehkaranta	13061:83	2	3	4	6	4	0	4	1	4	4	5	3	4	0	0	0	0	0	0	0	0	4	0	8	8	19	4	0	0	0	0	0	0	0	0	0	0	0	0
1413 Kerimäki Vehkaranta	13061:139	3	2	3	3	3	0	0	0	3	4	2	1	1	0	0	4	0	0	2	0	0	4	2	11	7	11	4	0	0	0	0	0	1	0	0	0	0	0	0
1436 Kesälahti Sirnihta	18910:4,146	3	2	4	2	2	0	5	0	1	3	5	2	4	0	0	29	0	0	7	0	0	4	0	11	11	26	4	0	0	0	0	0	1	0	0	0	0	0	0
1438 Kesälahti Sirnihta	18910:6	2	5	5	2	2	0	5	1	1	4	5	2	3	0	0	0	0	0	0	0	0	3	0	4	4	19	4	0	0	0	0	0	0	0	0	0	0	0	0
1439 Kesälahti Sirnihta	18910:7,8	3	4	5	2	2	0	5	0	1	4	5	1	1	6	1	25	0	0	2	0	0	3	3	12	7	22	4	0	0	0	0	0	1	0	0	0	0	0	0
1452 Kesälahti Sirnihta	18910:59,77,134,136	3	4	3	2	2	0	0	0	1	4	2	1	1	0	0	25	12	0	2	3	0	2	3	8	8	11	4	0	0	1	0	1	0	0	0	0	0	0	0
1469 Kesälahti Sirnihta	18910:211,212	3	5	2	3	3	0	0	0	2	4	2	1	1	2	1	4	0	0	2	0	0	3	1	17	6	11	4	0	0	0	0	0	0	0	1	0	0	0	0
1470 Kesälahti Sirnihta	18910:228,229	3	6	3	3	3	0	0	0	2	3	2	3	3	0	0	29	0	0	7	0	0	2	2	9	5	23	4	0	0	0	0	0	1	0	0	0	0	0	0
1472 Kesälahti Sirnihta	18910:218	2	4	4	5	4	0	3	0	2	4	2	1	1	5	1	16	0	0	3	0	0	3	4	14	9	30	4	0	0	0	0	0	1	0	0	0	0	0	0
1473 Kesälahti Sirnihta	18910:223,233,260	3	6	5	5	3	0	1	0	4	3	8	4	5	0	0	35	21	0	10	4	0	3	2	6	6	23	4	0	0	0	0	0	1	1	0	0	0	0	0
1476 Kesälahti Sirnihta	18910:255,277	3	4	2	3	3	0	0	0	2	3	8	5	5	0	0	35	4	0	10	2	0	2	4	12	8	23	4	0	0	0	0	0	1	1	0	0	1	0	0	0
1513 Kitee Turusenniemi	19253:12	3	3	3	5	4	0	0	0	2	4	2	1	1	6	1	29	0	0	4	0	0	4	1	13	6	11	4	0	1	0	0	0	0	0	0	0	0	0	0
1532 Kitee Turusenniemi	19254:4	7	5	4	2	2	0	0	0	2	4	5	1	1	5	3	3	0	0	2	0	0	4	3	12	11	9	4	0	0	0	0	0	0	0	1	0	0	0	0
1552 Kiuruvesi Tuliniemi	15743:25,56,62,81	3	6	2	3	4	0	0	0	4	4	8	4	4	0	0	32	17	0	9	4	0	2	3	5	7	22	4	0	0	0	0	0	1	1	0	0	0	0	0
1571 Kuopio Luukonsaari	15517:1	3	6	2	5	4	0	4	0	4	4	8	4	2	10	6	33	3	0	9	2	0	1	4	15	8	22	4	0	0	0	0	0	0	1	0	1	0	0	0
1573 Kuopio Luukonsaari	15517:1,2	3	6	2	5	4	0	4	0	4	4	8	4	2	1	5	33	1	0	9	1	0	2	1	14	5	22	4	0	0	0	0	0	1	1	0	0	0	0	0
1575 Kuopio Luukonsaari	16492:1	3	5	3	5	4	0	0	0	2	4	9	3	3	0	0	33	29	2	7	8	1	0	4	14	5	22	4	0	0	0	0	0	1	1	1	0	0	0	0
1578 Kuopio Luukonsaari	16492:5	3	5	2	4	4	0	1	0	4	4	8	4	2	0	0	0	0	0	0	0	0	4	0	6	4	22	4	0	0	0	0	0	0	0	0	0	0	0	0
1579 Kuopio Luukonsaari	16492:6	3	4	2	5	4	0	0	0	2	4	8	4	2	8	6	2	0	0	1	0	0	2	3	10	5	22	4	0	1	0	0	0	0	0	0	0	0	0	0
1582 Kuopio Luukonsaari	16492:1	3	5	3	5	4	0	0	0	2	4	9	3	2	0	0	33	29	2	9	6	1	1	4	14	5	22	4	0	0	0	0	0	1	1	1	0	0	0	0
1583 Kuopio Luukonsaari	16492:2	3	5	3	5	4	0	0	0	4	4	9	3	3	0	0	33	17	0	9	4	0	2	3	14	5	22	4	0	0	0	0	0	1	1	0	0	0	0	45
1584 Lieksa Viensuunniemi	14690:1	3	5	3	6	4	0	0	0	5	4	8	4	2	0	0	2	29	0	1	7	0	2	4	9	8	22	4	0	0	0	0	0	0	0	1	0	0	0	0
1585 Liperi Juvonen	14254:1	3	4	3	5	4	0	4	0	4	4	8	3	2	0	0	33	3	2	9	2	1	2	4	14	6	22	4	0	0	0	0	0	1	1	1	0	0	0	0
1587 Liperi Juvonen	14554:1	3	5	2	4	4	0	0	0	2	4	8	4	2	0	0	2	33	2	1	9	6	2	4	10	5	22	4	0	0	0	0	0	1	1	1	0	0	0	0
1594 Liperi Juvonen	14554:20	3	6	3	4	3	0	0	0	2	4	9	2	3	0	0	2	33	0	1	9	0	3	3	12	5	22	4	0	1	0	0	1	1	0	0	0	0	0	0
1595 Liperi Juvonen	14554:21	3	6	3	3	4	0	0	0	2	4	8	3	2	0	0	33	3	0	9	1	0	2	3	11	4	22	4	0	0	0	0	0	0	1	0	0	0	0	0
1597 Liperi Juvonen	14554:19	3	5	4	4	3	0	0	0	3	3	6	1	1	1	5	1	0	0	1	0	0	3	1	12	9	22	4	0	0	0	0	0	0	0	1	0	0	0	0
1612 Liperi Juvonen	16131:19	3	6	1	5	4	0	0	0	4	4	9	2	2	0	0	33	1	0	9	1	0	3	2	8	5	22	4	0	0	0	0	0	0	1	0	0	0	0	0	0
1615 Liperi Juvonen	21090:1,2	3	5	2	4	4	0	1	0	4	4	9	3	2	0	0	1	33	0	1	9	0	3	3	12	5	22	4	0	0	0	0	0	0	1	1	0	0	0	0	0

Number Site	NM-number	M1	Q1	K1	SH	SK	PM	PN	PT	PS	PO	RM	RF	RP	RE	RA	KE1	KE2	KE3	KY1	KY2	KY3	Kt	V	X	Y	TY	VE	Km0	Kma	Kmb	Kmc	Kmd	Kme	Kmf	Kmg	Kmh	Kmi	Kmj	SIZE
1616 Liperi Juvonen	21090:2	3	5	3	4	4	0	1	0	4	4	6	2	2	0	0	33	1	0	9	1	0	4	3	6	6	22	4	0	0	0	0	0	1	0	0	0	0	0	0
1618 Liperi Jyrinlahti	28400:2	3	5	2	5	4	0	3	0	2	4	8	2	2	0	0	33	2	0	7	1	0	4	3	9	4	22	4	0	0	0	0	0	1	0	1	0	0	0	0
1623 Outokumpu Kuokkastenkoski	15163:2	3	4	3	3	3	0	4	0	4	4	2	3	3	0	0	0	0	0	0	0	0	3	0	11	6	15	4	0	0	0	0	0	0	0	0	0	0	0	0
1796 Parikkala Kaunissaari	5176:7	2	3	4	3	2	0	0	0	2	3	5	1	1	0	0	4	0	0	2	0	0	3	3	15	10	9	4	0	1	0	0	0	0	0	0	0	0	0	0
1805 Parikkala Kaunissaari	5427:266	2	5	5	3	3	0	0	0	2	2	3	2	3	0	0	0	0	0	0	0	0	2	0	6	9	16	4	0	0	0	0	0	0	0	0	0	0	0	15
1809 Parikkala Kaunissaari	5427:266	2	4	4	5	4	0	0	0	3	4	5	1	1	0	0	17	0	0	4	0	0	3	3	7	7	16	4	0	0	0	0	1	0	0	1	0	0	0	0
4579 Pielavesi Meijerinkangas	26088:46	3	6	3	5	5	0	3	0	4	4	8	3	2	0	0	33	17	0	7	3	0	3	3	8	8	22	4	0	0	0	0	0	1	0	0	0	0	0	0
4580 Pielavesi Meijerinkangas	26088:24	3	6	3	5	5	0	3	0	4	4	8	2	1	0	0	33	3	2	7	2	1	3	3	10	5	22	4	0	0	0	0	0	1	1	0	0	0	0	0
4581 Pielavesi Meijerinkangas	26617:27,28,139	3	5	3	5	4	0	0	0	2	4	5	1	1	2	2	0	0	0	0	0	0	4	0	8	8	24	4	0	0	0	0	0	0	0	0	0	0	0	0
4582 Pielavesi Meijerinkangas	26617:55	7	5	5	3	3	0	0	0	3	4	5	2	3	1	5	28	11	0	6	3	0	3	3	8	8	26	4	0	0	0	0	0	1	0	1	0	0	0	0
4610 Pielavesi Meijerinkangas	26617:520	3	6	2	5	4	0	0	0	3	4	8	2	4	0	0	33	12	0	9	3	0	3	3	8	6	22	4	0	0	0	0	0	0	1	0	1	0	0	0
4549 Pielavesi Virranniska	7618:37	6	5	6	5	4	0	3	0	4	4	5	5	6	0	0	15	0	0	3	0	0	3	1	7	7	41	4	0	0	0	0	0	1	0	0	0	0	0	0
4567 Pielavesi Virranniska	7618:161	3	6	3	4	3	0	3	0	4	3	5	2	4	0	0	4	0	0	4	0	0	4	3	8	5	17	4	0	1	0	0	0	0	0	0	0	0	0	0
4967 Pielavesi Virranniska	18026:2	2	3	4	3	2	0	1	5	2	3	5	4	5	5	2	2	14	0	1	3	0	3	3	6	6	19	4	0	0	0	0	0	0	0	1	0	0	0	0
1633 Polvijärvi Multavieru	17969:1	2	4	4	4	3	0	3	0	3	3	9	3	4	1	1	3	14	0	2	3	0	2	4	10	8	19	4	0	0	0	0	0	1	0	0	1	0	0	0
1635 Polvijärvi Multavieru	17969:8,10	3	5	3	3	2	0	1	0	3	4	8	3	4	0	0	28	0	0	7	0	0	4	1	12	10	16	4	0	0	0	0	0	0	1	0	0	0	0	0
1648 Polvijärvi Multavieru	17969:26	6	5	4	5	4	0	0	0	1	4	5	1	1	0	0	0	0	0	0	0	0	4	0	9	7	26	4	0	0	0	0	0	0	0	0	0	0	0	0
1649 Polvijärvi Multavieru	18266:5,6	5	3	5	3	4	0	5	6	2	4	3	2	3	2	1	25	14	15	2	3	12	2	4	7	6	19	4	0	1	0	0	0	1	0	0	0	0	0	0
1662 Polvijärvi Multavieru	18266:20	2	5	4	3	3	0	0	0	2	4	5	1	1	1	6	11	0	0	3	0	0	4	1	6	6	16	4	0	1	0	0	1	0	0	0	0	0	0	0
1685 Polvijärvi Multavieru	23819:13	2	6	5	6	5	0	0	0	1	5	9	5	6	0	0	0	0	0	0	0	0	3	0	9	5	29	4	0	0	0	0	0	0	0	0	0	0	0	0
1686 Polvijärvi Multavieru	23819:14,15	1	5	5	4	3	0	3	1	4	4	9	4	5	2	2	11	17	11	3	4	12	3	3	8	8	19	4	0	0	0	0	0	1	1	0	0	0	0	0
1702 Punkaharju Kaarniemi	17606:18,29,30,31	3	4	4	3	3	0	1	0	1	3	2	1	1	0	0	4	0	0	2	0	0	3	1	8	6	11	4	0	0	0	0	0	0	0	1	0	0	0	0
1711 Punkaharju Kaarniemi	17606:108,114,152	7	5	4	2	3	0	0	0	2	4	5	1	1	0	0	18	16	0	7	3	0	3	2	13	12	9	4	0	0	1	1	0	0	0	0	0	0	0	0
1733 Punkaharju Kaarniemi	17606:206	3	5	3	3	4	0	0	0	1	4	13	1	1	0	0	0	0	0	0	0	0	5	0	20	6	16	4	0	0	0	0	0	0	0	0	0	0	0	0
1738 Punkaharju Kaarniemi	17606:225	9	4	4	2	3	0	0	0	2	3	2	2	3	0	0	0	0	0	0	0	0	4	0	8	5	9	4	0	0	0	0	0	0	0	0	0	0	0	0
1751 Punkaharju Kaarniemi	17606:288,305	7	5	3	2	2	0	0	0	2	4	2	1	1	0	0	0	0	0	0	0	0	3	0	15	6	9	4	0	0	0	0	0	0	0	0	0	0	0	0
1755 Punkaharju Kaarniemi	17606:319	9	5	2	2	3	0	0	0	2	4	5	2	4	0	0	26	0	0	5	0	0	4	0	5	7	11	4	0	0	0	0	0	1	0	1	0	0	0	0
1757 Punkaharju Kaarniemi	17606:320	3	5	4	3	4	0	0	0	2	4	7	1	1	0	0	0	0	0	0	0	0	4	0	7	8	11	4	0	0	0	0	0	0	0	0	0	0	0	1
1762 Punkaharju Kaarniemi	17606:367	3	3	3	3	3	0	0	0	2	4	2	2	3	6	1	18	0	0	4	0	0	3	0	9	7	17	4	0	0	0	0	0	0	0	1	0	0	1	0
1779 Punkaharju Kaarniemi	17606:395,397,401	3	5	4	3	3	0	0	0	2	4	2	2	3	0	0	0	0	0	0	0	0	3	0	17	8	11	4	0	0	0	0	0	0	0	0	0	0	0	0
1825 Ristiina Kitulansuo	28112:1,23,89	2	4	4	3	3	0	2	0	4	4	5	1	1	0	0	7	15	0	2	3	0	3	3	7	7	19	4	0	0	0	0	0	1	0	0	0	0	1	0
1829 Ristiina Kitulansuo	28112:23	6	5	5	3	3	0	3	0	4	4	5	1	1	0	0	17	0	0	4	0	0	4	4	8	7	19	4	0	1	0	0	0	0	0	0	0	0	0	0
1834 Ristiina Kitulansuo	28112:32	2	5	4	3	3	0	4	0	2	4	5	2	4	0	0	0	0	0	0	0	0	4	0	9	7	19	4	0	0	0	0	0	0	0	0	0	0	0	0
1847 Ristiina Kitulansuo	28541:18,25,33,76,28	2	4	5	3	3	0	2	0	4	4	5	3	4	2	1	4	0	0	2	0	0	3	4	7	7	19	4	0	1	0	0	0	0	0	0	0	0	0	0
1852 Ristiina Kitulansuo	28541:241	2	5	6	4	3	0	3	0	4	4	5	2	4	0	0	16	0	0	3	0	0	2	1	9	11	19	4	0	0	0	0	1	0	0	0	0	0	0	0
1854 Ristiina Kitulansuo	28541:246	2	4	5	3	3	0	0	0	3	4	5	1	1	0	0	2	0	0	1	0	0	3	1	8	7	19	4	0	1	0	0	0	0	0	0	0	0	0	0
1855 Ristiina Kitulansuo	28541:298,300	2	3	4	2	3	0	3	0	3	4	5	1	1	2	1	5	14	0	4	3	0	3	4	8	8	19	4	0	0	1	0	1	0	0	0	0	0	0	0
1857 Ristiina Kitulansuo	28541:285,387,605	7	4	3	3	3	0	4	0	4	4	5	1	1	2	2	22	14	0	4	3	0	2	4	8	8	19	4	0	0	0	0	0	0	0	1	0	0	1	0
1858 Ristiina Kitulansuo	28541:461,463,654	2	5	5	3	3	0	2	0	4	4	5	1	1	2	2	4	0	0	2	0	0	2	4	13	10	19	4	0	0	0	0	0	0	0	1	0	0	1	0
1861 Ristiina Kitulansuo	28541:1614,1665	2	4	4	3	3	0	4	5	2	4	3	3	3	0	0	3	15	0	2	3	0	2	3	8	9	19	4	0	0	1	0	1	0	0	0	0	0	0	0
1862 Ristiina Kitulansuo	28541:921,924,1330	6	5	5	3	3	0	0	0	3	4	3	3	3	2	1	4	14	0	2	3	0	4	4	14	11	19	4	0	0	1	0	1	0	0	0	0	0	0	0
1863 Ristiina Kitulansuo	28541:905	6	5	4	3	3	0	0	0	4	4	13	2	4	0	0	4	0	0	2	0	0	4	4	11	7	19	4	0	0	1	0	0	0	0	0	0	0	0	0
1868 Ristiina Kitulansuo	28541:1351	2	4	3	3	3	0	5	0	4	4	5	1	1	0	0	14	0	0	3	0	0	2	1	14	12	19	4	0	0	0	0	1	0	0	0	0	0	0	0
4618 Ristiina Kitulansuo	27383:1	6	5	3	4	3	0	3	0	4	4	5	2	4	0	0	0	0	0	0	0	0	4	0	7	5	19	4	0	0	0	0	0	0	0	0	0	0	0	0
4619 Ristiina Kitulansuo	27383:5	2	4	4	4	4	0	1	0	3	4	5	2	5	2	2	1	0	0	1	0	0	3	3	10	7	19	4	0	1	0	0	0	0	0	0	0	0	0	0
4620 Ristiina Kitulansuo	28960:45	2	4	4	5	3	0	4	0	3	4	5	1	1	1	1	7	12	0	2	3	0	2	4	8	9	19	4	0	0	0	0	0	0	0	1	0	0	0	0
4621 Ristiina Kitulansuo	28960:51,59,67	2	4	4	3	3	0	2	0	3	4	5	1	1	1	1	1	12	0	1	3	0	0	4	10	8	19	4	0	0	1	0	1	0	0	0	0	0	0	0
4623 Ristiina Kitulansuo	28960:78	2	5	4	4	3	0	2	0	2	4	5	1	1	2	5	4	0	0	2	0	0	3	4	8	9	19	4	0	0	1	0	0	0	0	0	0	0	0	0
4626 Ristiina Kitulansuo	28960:247	5	4	5	2	3	0	0	0	2	4	5	1	1	0	0	4	0	0	2	0	0	3	3	13	9	19	4	0	0	1	0	0	0	0	0	0	0	0	0

Number Site	NM-number	M1	Q1	K1	SH	SK	PM	PN	PT	PS	PO	RM	RF	RP	RE	RA	KE1	KE2	KE3	KY1	KY2	KY3	Kt	V	X	Y	TY	VE	Km0	Kma	Kmb	Kmc	Kmd	Kme	Kmf	Kmg	Kmh	Kmi	Kmj	SIZE
4628 Ristiina Kitulansuo	28960:318	2	5	4	4	4	0	3	0	2	4	5	1	1	0	0	4	15	0	2	3	0	3	3	7	7	19	4	0	0	1	0	0	0	0	0	0	0	0
4629 Ristiina Kitulansuo	28960:320,345	2	5	4	4	4	0	3	0	2	4	5	1	1	0	0	4	15	0	2	3	0	3	3	8	7	19	4	0	0	1	0	0	0	0	0	0	0	0
4631 Ristiina Kitulansuo	28960:411	2	5	5	2	3	0	3	0	4	3	5	1	1	0	0	14	0	0	3	0	0	3	1	9	9	24	4	0	0	0	0	1	0	0	0	0	0	0
4632 Ristiina Kitulansuo	28960:449,454	7	5	3	2	3	0	0	2	3	8	2	4	0	0	0	14	0	0	3	0	0	3	1	10	7	24	4	0	0	0	0	1	0	0	0	0	0	0
4633 Ristiina Kitulansuo	28960:480,489	6	5	4	2	3	0	4	0	2	4	5	3	3	2	1	6	12	0	2	3	0	3	3	10	7	19	4	0	1	0	0	1	0	0	0	0	0	0
4634 Ristiina Kitulansuo	28960:512	7	5	3	3	3	0	3	0	2	4	5	1	1	2	1	4	12	0	2	3	0	3	3	10	6	24	4	0	1	0	0	1	0	0	0	0	0	0
4635 Ristiina Kitulansuo	28960:525,543	5	4	4	3	3	0	4	0	2	3	9	1	1	0	0	36	12	0	4	3	0	3	3	10	6	24	4	0	0	0	0	1	0	0	0	0	0	1	0
4637 Ristiina Kitulansuo	28960:636	6	3	5	3	3	0	3	0	4	4	5	2	4	2	2	4	12	0	2	3	0	4	3	9	8	19	4	0	1	0	0	1	0	0	0	0	0	0	0
4640 Ristiina Kitulansuo	28960:753,763,777	2	6	4	4	3	0	4	0	3	4	5	1	1	2	2	4	14	0	2	3	0	3	3	8	8	19	4	0	0	1	0	1	0	0	0	0	0	0	0
4643 Ristiina Kitulansuo	28960:2639	6	5	3	4	4	0	0	0	3	4	5	5	6	0	0	0	0	0	0	0	0	1	0	6	6	24	4	0	0	0	0	0	0	0	0	0	0	0	0
4644 Ristiina Kitulansuo	28960:2629	3	6	5	3	3	0	0	0	1	4	8	3	4	0	0	29	0	0	7	0	0	4	1	7	7	22	4	0	0	0	0	0	1	0	0	0	0	0	0
4645 Ristiina Kitulansuo	28960:825	6	5	4	3	3	0	3	0	4	4	5	1	1	0	0	4	11	0	2	3	0	3	3	7	7	19	4	0	0	1	0	1	0	0	0	0	0	0	0
4651 Ristiina Kitulansuo	28960:2620	6	6	3	3	3	0	0	0	1	4	8	3	4	0	0	14	0	0	3	0	0	4	1	9	8	24	4	0	0	0	0	1	0	0	0	0	0	0	0
4652 Ristiina Kitulansuo	28960:2630	2	5	5	3	3	0	6	0	2	4	5	2	3	0	0	14	0	0	3	0	0	5	1	8	7	19	4	0	0	0	0	1	0	0	0	0	0	0	0
4617 Ristiina Pulmionlampi	27382:2	3	5	5	5	4	0	4	0	4	4	2	3	5	0	0	4	0	0	2	0	0	3	5	10	8	19	4	0	0	1	0	0	0	0	0	0	0	0	0
1873 Ruokolahti Alatalo	15476:1	3	5	3	5	3	0	4	0	2	4	8	3	5	0	0	4	11	0	2	3	0	2	3	4	4	22	4	0	0	0	0	1	1	0	0	1	0	0	0
1896 Savonlinna Haukilahti	27582:1	3	6	5	4	4	0	0	1	2	4	5	2	4	6	2	15	0	0	3	0	0	3	2	10	5	19	4	0	0	0	0	1	0	0	0	0	0	0	0
4656 Savonlinna Hiekkaniemi	28321:3	3	6	4	4	3	0	0	0	2	4	13	2	3	9	5	29	0	0	7	0	0	3	2	16	6	11	4	0	0	0	0	0	0	0	0	0	1	0	0
7657 Savonlinna Pyyhiekka1	28925:1	6	5	5	3	3	0	0	1	4	4	8	2	4	3	4	2	0	0	1	0	0	3	3	8	6	19	4	0	0	0	0	1	0	0	0	0	0	0	0
4659 Savonlinna Suvikangas	28324:1	2	5	4	4	2	0	0	2	2	3	5	3	5	0	0	11	0	0	3	0	0	3	2	9	10	19	4	0	0	0	0	1	0	0	0	0	0	0	0
1905 Taipalsaari Ketvele	27586:5	7	5	4	2	3	0	0	0	4	4	5	1	1	5	1	29	15	0	4	3	0	4	1	10	10	16	4	0	1	0	0	0	0	0	0	0	0	0	0
1910 Taipalsaari Vaateranta	19239:868	3	5	3	5	5	0	0	0	2	0	8	3	2	0	0	33	3	2	9	2	1	2	3	15	7	22	4	0	0	0	0	0	1	1	0	1	0	0	0
1898 Taipalsaari Valkeasaari	17040:1	2	4	5	5	4	0	4	6	1	4	9	5	6	1	5	1	23	11	1	3	3	1	5	10	12	19	4	0	0	0	0	0	1	1	0	0	1	0	0
4699 Kaukola Iivosennummi	4943:8	7	5	4	4	4	0	3	0	3	4	8	4	4	0	0	2	14	0	1	3	0	3	3	6	6	19	5	0	0	0	0	1	0	0	0	0	0	0	0
4700 Kaukola Iivosennummi	6910:6	2	4	3	5	4	0	4	0	4	4	5	2	4	8	2	11	0	0	3	0	0	3	2	5	5	19	5	0	0	0	0	1	0	0	0	0	0	0	0
4702 Kaukola P. Iivosen rantap.	6348:1	2	5	4	3	3	0	3	0	4	3	5	2	5	2	1	4	11	0	2	3	0	3	3	6	5	19	5	0	0	0	0	0	1	0	0	0	0	0	0
4721 Kaukola M. Kaasalainen	5097:56	7	4	3	3	3	0	0	4	2	4	5	3	4	0	0	0	0	0	0	0	0	3	0	9	8	19	5	0	0	0	0	0	0	0	0	0	0	0	0
2874 Kurkijoki Kuuppala	10670:42	2	3	3	6	4	0	0	0	3	4	5	1	1	0	0	17	0	0	4	0	0	4	3	6	6	19	5	0	0	0	0	0	0	0	1	0	0	0	0
2318 Kaukola Lavamäenpelto	5963:573	7	6	2	2	4	0	4	0	2	4	5	1	1	0	0	16	0	0	2	0	0	3	1	9	7	26	5	0	0	0	0	1	0	0	0	0	0	0	0
4663 Kaukola Nököpelto	5164:30	2	4	4	3	3	0	0	2	2	4	5	2	1	0	0	27	17	0	5	4	0	3	3	6	5	19	5	0	1	0	0	1	0	0	1	0	0	0	0
4666 Kaukola Nököpelto	5012:22	6	3	3	5	4	0	5	0	4	4	8	2	4	5	4	14	0	0	3	0	0	3	1	8	8	19	5	0	0	0	0	1	0	0	0	0	0	0	0
4667 Kaukola Nököpelto	5097:147	2	4	4	5	4	0	4	6	2	4	5	2	3	0	0	14	0	0	3	0	0	3	1	4	5	19	5	0	0	0	0	1	0	0	0	0	0	0	0
4669 Kaukola Nököpelto	5997:41	6	4	4	3	4	0	0	0	3	3	5	2	4	2	2	0	0	0	0	0	0	4	0	6	6	19	5	0	0	0	0	0	0	0	0	0	0	0	0
4675 Kaukola Nököpelto	6907:25	2	5	5	4	3	0	4	6	2	4	5	1	1	2	2	2	0	0	1	0	0	3	2	8	6	19	5	0	0	1	0	0	0	0	0	0	0	0	0
4708 Kaukola Paavilaisen rantap.	4997:45	6	4	4	3	4	0	4	4	2	4	5	4	5	0	0	11	0	0	3	0	0	3	2	6	6	19	5	0	0	0	0	1	0	0	0	0	0	0	0
4710 Kaukola Paavilaisen rantap.	5929:5	7	5	3	3	3	0	2	0	3	4	7	2	4	0	0	2	0	0	1	0	0	3	2	6	6	19	5	0	0	0	0	1	0	0	0	0	0	0	1
4713 Kaukola Paavilaisen rantap.	5096:97	7	4	3	3	3	0	3	2	2	4	6	2	3	2	7	2	0	0	1	0	0	3	3	8	5	19	5	0	0	0	0	1	0	0	0	0	0	0	0
4714 Kaukola Paavilaisen rantap.	5096:97	7	3	3	3	4	0	0	1	2	4	5	1	1	2	2	14	0	0	3	0	0	3	1	6	6	19	5	0	0	0	0	1	0	0	0	0	0	0	0
2790 Kaukola Paavilaisen rantap.	6191:219	2	4	3	4	2	0	3	4	4	4	5	1	1	0	0	0	0	0	0	0	0	3	0	9	9	19	5	0	0	0	0	0	0	0	0	0	0	0	0
4723 Kaukola H. Teräväisen r.-p.	7117:4	2	5	5	5	4	0	1	4	2	4	5	3	5	2	2	3	14	0	2	3	0	3	2	8	9	19	5	0	1	0	0	1	0	0	0	0	0	0	0
4724 Kaukola H. Teräväisen r.-p.	7117:4	3	5	2	5	4	0	0	0	3	4	5	2	3	0	0	11	0	0	3	0	0	4	2	4	6	19	5	0	0	0	0	1	0	0	0	0	0	0	0
4732 Kaukola H. Teräväisen r.-p.	7815:7	2	6	5	4	2	0	0	1	2	3	5	2	4	0	0	4	16	0	2	3	0	3	4	8	8	19	5	0	1	0	0	1	0	0	0	0	0	0	0
4734 Kaukola Juho Leppäsen maa	7815:48	7	2	3	4	3	0	0	0	6	4	3	1	1	0	0	26	0	0	5	0	0	3	4	6	6	24	5	0	0	0	0	0	1	0	0	0	0	0	0
4738 Kaukola H. Teräväisen r.-p.	8000:25	2	6	4	4	3	0	0	6	2	4	5	1	1	0	0	0	0	0	0	0	0	3	0	9	7	19	5	0	0	0	0	0	0	0	0	0	0	0	0
4764 Kaukola H. Teräväisen r.-p.	6348:11	2	4	4	4	4	0	0	0	3	4	5	1	1	0	0	26	11	0	5	3	0	3	4	11	11	32	5	0	0	1	0	0	0	0	0	0	0	0	0
1939 Kaukola Teräväinen	5963:4	6	5	5	4	2	3	2	2	3	4	3	2	3	2	1	3	2	0	2	1	0	3	5	10	10	19	5	0	0	0	0	1	0	0	1	0	0	0	0
2016 Kaukola Teräväinen	5963:89	2	5	4	3	4	0	0	1	2	4	7	3	3	0	0	0	0	0	0	0	0	4	0	5	11	16	5	0	0	0	0	0	0	0	0	0	0	0	0
2018 Kaukola Teräväinen	5963:89	0	0	0	0	0	0	0	2	1	4	5	2	5	0	0	11	0	0	3	0	0	3	2	4	4	19	5	0	0	0	0	1	0	0	0	0	0	0	0
2024 Kaukola Teräväinen	5963:104	7	3	4	3	3	0	3	0	3	4	5	2	3	2	3	11	3	0	3	2	0	3	3	7	5	19	5	0	1	0	0	1	0	0	0	0	0	0	0

Number Site	NM-number	M1	Q1	K1	SH	SK	PM	PN	PT	PS	PO	RM	RF	RP	RE	RA	KE1	KE2	KE3	KY1	KY2	KY3	Kt	V	X	Y	TY	VE	Km0	Kma	Kmb	Kmc	Kmd	Kme	Kmf	Kmg	Kmh	Kmi	Kmj	SIZE
2027 Kaukola Teräväinen	5963:107	2	5	4	3	4	0	0	0	2	4	3	3	5	2	1	4	0	0	2	0	0	4	4	6	5	9	5	0	0	0	0	0	0	0	1	0	0	0	0
2105 Kaukola Teräväinen	5963:241	6	3	5	3	2	0	0	2	4	4	5	2	3	0	0	0	0	0	0	0	0	5	0	5	5	19	5	0	0	0	0	0	0	0	0	0	0	0	0
2116 Kaukola Teräväinen	5963:264	7	3	3	3	2	0	0	0	3	3	3	3	3	0	0	1	0	0	1	0	0	4	4	4	4	19	5	0	0	0	0	0	0	0	1	0	0	0	0
2119 Kaukola Teräväinen	5963:282	6	5	5	5	4	0	2	0	3	4	3	1	3	0	0	11	4	0	3	2	0	3	4	7	6	19	5	0	1	0	0	1	0	0	0	0	0	0	0
2132 Kaukola Teräväinen	5963:304,330	2	6	3	6	5	0	1	0	1	5	9	5	6	0	0	0	0	0	0	0	0	3	0	9	5	29	5	0	0	0	0	0	0	0	0	0	0	0	0
2142 Kaukola Teräväinen	5963:313	6	5	5	4	3	0	4	3	2	4	5	2	3	8	2	16	0	0	3	0	0	4	1	6	7	19	5	0	0	0	0	1	0	0	0	0	0	0	0
4696 Kaukola H. Teräväisen r.-p.	7815:7	2	5	3	6	5	0	0	0	3	4	5	1	1	0	0	3	0	0	2	0	0	4	2	7	5	22	5	0	1	0	0	0	0	0	0	0	0	0	0
4698 Kaukola H. Teräväisen r.-p.	7815:7	7	4	4	3	2	0	0	0	3	3	5	2	3	0	0	17	2	0	4	1	0	3	4	5	6	19	5	0	0	0	0	0	1	0	0	0	0	1	0
2250 Kaukola Tiitunmäki	5963:429	7	2	2	5	4	0	0	0	6	4	3	4	5	0	0	7	0	0	4	0	0	3	4	4	4	19	5	0	0	0	0	0	0	0	1	0	0	0	0
2256 Kaukola Tiitunmäki	5963:448	2	3	5	5	4	0	0	3	2	4	5	2	4	0	0	0	0	0	0	0	0	4	0	6	6	19	5	0	0	0	0	0	0	0	0	0	0	0	0
2258 Kaukola Tiitunmäki	5963:455	2	4	5	5	3	0	3	0	4	4	5	2	5	0	0	14	28	0	3	7	0	2	4	9	9	19	5	0	1	0	0	1	1	0	0	0	0	1	0
2296 Kaukola Tiitunmäki	5963:511	2	2	1	6	5	0	0	0	6	5	1	5	3	0	0	0	0	0	0	0	0	4	0	6	6	16	5	0	0	0	0	0	0	0	0	0	0	0	0
2377 Kaukola Tiitunmäki	5963:658	0	0	0	5	3	0	2	0	3	4	5	2	3	0	0	11	28	0	3	6	0	4	3	3	5	26	5	0	0	0	0	1	0	1	0	0	0	0	0
2605 Kaukola Tiitunmäki	6191:11,17,18,19,21	7	4	3	2	2	0	4	6	2	4	5	2	5	0	0	4	14	0	2	12	0	3	1	7	7	19	5	0	0	0	0	1	0	0	0	0	0	0	0
2617 Kaukola Tiitunmäki	6191:16	7	2	3	3	3	1	2	6	2	4	8	3	4	1	5	4	0	0	2	0	0	3	4	7	6	19	5	0	0	0	0	0	1	0	0	0	0	0	0
2621 Kaukola Tiitunmäki	6191:17,53,59	2	5	5	3	3	0	1	6	2	4	8	5	5	1	1	14	17	0	3	4	0	3	3	12	10	19	5	0	0	0	0	1	0	0	0	0	0	1	0
2632 Kaukola Tiitunmäki	6191:44,28,50	2	2	2	3	2	0	3	5	2	4	8	3	5	1	5	4	12	0	2	3	0	3	4	5	5	19	5	0	0	0	0	0	1	0	0	0	0	0	0
2650 Kaukola Tiitunmäki	6191:44,18,72	7	5	3	2	2	0	6	2	2	4	5	3	5	1	1	14	0	0	3	0	0	3	1	9	6	19	5	0	0	0	0	1	0	0	0	0	0	0	0
2653 Kaukola Tiitunmäki	6191:54	7	4	3	3	2	0	3	0	2	4	8	3	5	0	0	29	0	0	7	0	0	3	1	5	5	16	5	0	0	0	0	0	1	0	0	0	0	0	0
2654 Kaukola Tiitunmäki	6191:54	3	4	2	5	2	0	0	0	2	4	5	3	5	2	3	12	0	0	3	0	0	3	4	6	5	16	5	0	0	0	0	0	1	0	0	0	0	0	0
2655 Kaukola Tiitunmäki	6191:53,54,55,56,59	7	3	3	3	3	0	3	0	2	4	5	3	5	2	1	3	0	0	2	0	0	3	3	13	10	19	5	0	1	0	0	0	0	0	0	0	0	0	0
2662 Kaukola Tiitunmäki	6191:28	5	4	3	3	2	0	4	0	2	3	9	3	4	4	3	11	4	0	3	2	0	3	2	12	4	16	5	0	0	0	0	1	0	0	1	0	0	0	0
2430 Kaukola A. Varvan pelto	5963:720	2	3	3	5	5	0	0	0	2	4	9	5	6	0	0	0	0	0	0	0	0	3	0	6	6	29	5	0	0	0	0	0	0	0	0	0	0	0	0
2482 Kaukola A. Varvan pelto	5963:729	2	4	3	6	5	0	1	0	2	4	2	2	3	0	0	0	0	0	0	0	0	3	0	5	5	29	5	0	0	0	0	0	0	0	0	0	0	0	0
2483 Kaukola Varvanpelto	5963:729	2	4	3	6	5	0	1	0	2	4	2	5	6	0	0	0	0	0	0	0	0	3	0	6	6	29	5	0	0	0	0	0	0	0	0	0	0	0	0
2485 Kaukola Varvanpelto	5963:729	2	5	4	3	2	0	0	0	3	4	5	1	1	0	0	17	29	0	4	8	0	4	3	5	6	26	5	0	0	0	0	0	1	0	0	0	0	1	0
2489 Kaukola Varvanpelto	5963:729	7	2	3	3	4	0	0	0	6	4	9	5	6	0	0	0	0	0	0	0	0	3	0	6	6	29	5	0	0	0	0	0	0	0	0	0	0	0	0
2499 Kaukola Varvanpelto	5963:731	6	5	3	5	4	0	4	6	2	4	3	2	5	2	2	18	0	0	4	0	0	3	3	8	8	19	5	0	1	0	0	0	0	0	1	0	0	0	0
2511 Kaukola Varvanpelto	5963:732	7	4	3	2	2	0	1	0	4	4	5	2	3	0	0	25	0	0	2	0	0	3	1	11	9	9	5	0	0	0	0	0	0	0	1	0	0	0	0
2514 Kaukola Varvanpelto	5963:734	6	4	3	4	3	0	0	1	2	4	9	2	4	0	0	11	0	0	3	0	0	3	2	10	6	19	5	0	0	0	0	0	1	0	0	0	0	0	0
4679 Kaukola A. Varvan pelto	6620:23	2	6	4	4	4	0	2	4	3	4	5	2	3	1	2	17	1	0	4	1	0	3	3	8	7	19	5	0	0	0	0	0	1	0	0	0	0	0	0
4717 Kaukola A. Ruuskan Vehnäm.	6910:24	2	3	2	5	4	0	3	0	4	4	6	1	1	5	1	17	11	0	4	3	0	3	2	9	8	24	5	0	1	0	0	0	0	0	0	0	0	0	0
2875 Kurkijoki Kuuppala	10670:42,65,66	0	4	4	5	3	0	3	4	2	4	5	3	5	4	3	11	4	0	3	2	0	3	2	11	11	19	5	0	1	0	0	1	0	0	0	0	0	0	0
2888 Kurkijoki Kuuppala	10670:64	2	4	4	4	3	0	0	5	3	4	5	1	1	1	3	0	0	0	0	0	0	4	0	6	6	16	5	0	0	0	0	0	0	0	0	0	0	0	0
2927 Kurkijoki Kuuppala	10872:64,71	2	4	4	4	3	0	6	3	1	4	5	4	6	0	0	15	0	0	3	0	0	4	1	5	5	19	5	0	0	0	0	0	1	0	0	0	0	0	0
2930 Kurkijoki Kuuppala	10872:64	2	2	3	5	4	0	1	0	4	4	5	2	4	0	0	0	0	0	0	0	0	3	0	7	7	26	5	0	0	0	0	0	0	0	0	0	0	0	0
2932 Kurkijoki Kuuppala	10872:88	2	4	3	5	5	0	0	0	2	4	9	5	4	0	0	0	0	0	0	0	0	3	0	10	5	29	5	0	0	0	0	0	0	0	0	0	0	0	0
2933 Kurkijoki Kuuppala	10872:89	2	4	4	4	4	0	1	0	4	4	6	2	3	0	0	0	0	0	0	0	0	3	0	6	4	28	5	0	0	0	0	0	0	0	0	0	0	0	0
2935 Kurkijoki Kuuppala	10872:96	2	5	4	4	3	0	0	0	1	4	5	3	6	0	0	0	0	0	0	0	0	3	0	7	8	28	5	0	0	0	0	0	0	0	0	0	0	0	0
2936 Kurkijoki Kuuppala	19872:105,115	2	3	4	5	3	0	0	0	2	4	5	3	4	0	0	0	0	0	0	0	0	3	0	6	7	28	5	0	0	0	0	0	0	0	0	0	0	0	0
2942 Kurkijoki Kuuppala	12810:4	2	5	3	6	5	0	1	0	4	5	8	5	6	0	0	0	0	0	0	0	0	3	0	8	5	29	5	0	0	0	0	0	0	0	0	0	0	0	45
2943 Räisälä Kalmistonmäki	2490:8	2	5	4	5	4	0	1	0	2	4	7	5	6	0	0	0	0	0	0	0	0	2	0	7	5	29	5	0	0	0	0	0	0	0	0	0	0	0	20
2944 Räisälä Kalmistonmäki	2490:8	2	4	4	5	3	0	4	6	2	4	5	3	4	0	0	14	0	0	3	0	0	3	0	5	5	19	5	0	0	0	0	0	1	0	0	0	0	0	0
2945 Räisälä Kalmistonmäki	2490:2	2	3	4	4	3	0	0	0	2	4	9	2	4	0	0	25	0	0	2	0	0	3	1	7	5	25	5	0	0	0	0	0	1	0	0	0	0	0	0
2947 Räisälä Kalmistonmäki	2490:8	2	5	4	5	4	0	3	6	2	3	5	4	6	0	0	6	14	0	2	3	0	2	4	6	10	19	5	0	1	0	0	1	1	0	0	1	0	0	0
2948 Räisälä Kalmistonmäki	2490:8	2	3	3	3	4	0	1	0	2	4	8	3	2	0	0	1	17	0	1	4	0	3	3	8	7	19	5	0	0	0	0	1	1	0	0	0	0	0	0
2949 Räisälä Kalmistonmäki	2556:1	2	5	4	3	3	0	0	0	3	4	3	2	3	0	0	14	29	0	3	8	0	3	2	10	10	19	5	0	0	0	0	1	0	0	0	0	0	0	0
2954 Räisälä Kalmistonmäki	2556:1	4	4	4	5	3	0	4	0	4	4	5	2	4	0	0	28	0	0	9	0	0	3	3	6	7	26	5	0	0	0	0	0	1	0	0	0	0	0	0
2960 Räisälä Kalmistonmäki	6675:19,26,42,45,46	2	5	5	3	3	0	3	6	2	4	5	3	5	0	0	18	14	0	3	3	0	2	3	7	9	19	5	0	0	0	0	1	0	0	0	0	0	0	0

Number Site	NM-number	M1	Q1	K1	SH	SK	PM	PN	PT	PS	PO	RM	RF	RP	RE	RA	KE1	KE2	KE3	KY1	KY2	KY3	Kt	V	X	Y	TY	VE	Km0	Kma	Kmb	Kmc	Kmd	Kme	Kmf	Kmg	Kmh	Kmi	Kmj	SIZE
2963 Räisälä Kalmistonmäki	6675:73	7	3	3	3	2	0	4	0	2	4	9	2	4	0	0	4	0	0	2	0	0	3	1	7	6	19	5	0	1	0	0	0	0	0	0	0	0	0	0
2966 Räisälä Kalmistonmäki	6675:15,19	6	4	4	5	3	0	1	0	2	4	5	4	6	0	0	11	0	0	3	0	0	2	1	3	4	19	5	0	0	0	0	1	0	0	0	0	0	0	0
2967 Räisälä Kalmistonmäki	6675:11,13,24,28	2	5	4	5	4	0	0	0	2	4	8	5	6	0	0	0	0	0	0	0	0	3	0	7	7	29	5	0	0	0	0	0	0	0	0	0	0	0	0
2968 Räisälä Kalmistonmäki	6675:23,29,34,35,48	2	4	4	3	4	0	3	3	2	4	9	4	5	0	0	26	15	0	5	3	0	4	3	6	6	32	5	0	0	1	0	1	0	0	0	0	0	0	0
2972 Räisälä Kalmistonmäki	6675:70,79	2	5	3	5	4	0	0	0	2	4	3	5	6	0	0	0	0	0	0	0	0	3	0	8	6	29	5	0	0	0	0	0	0	0	0	0	0	0	0
2977 Räisälä Kalmistonmäki	6675:68	2	4	3	2	3	0	4	6	4	4	5	3	5	0	0	26	11	0	5	3	0	4	3	7	6	32	5	0	0	0	0	1	1	0	1	0	0	0	0
2978 Räisälä Kalmistonmäki	6675:47	2	3	3	5	4	0	6	0	2	4	8	3	4	0	0	28	17	0	9	4	0	2	4	8	7	17	5	0	0	0	0	0	1	0	0	0	0	0	0
3241 Hankasalmi Autioniemi	14863:26	3	6	4	3	3	0	0	0	2	4	5	1	1	0	0	1	0	0	1	0	0	3	2	10	6	26	6	0	0	0	0	1	0	0	1	0	0	0	0
3235 Hankasalmi Salo	5427:299	3	5	3	5	3	0	0	0	2	4	8	3	2	0	0	29	0	0	6	0	0	1	2	15	7	23	6	0	0	0	0	0	1	0	0	1	1	0	0
3266 Kinnula Häähkäniemi	25804:6	2	6	5	3	3	0	0	0	1	3	8	4	6	0	0	0	0	0	0	0	0	2	0	9	11	28	6	0	0	0	0	0	0	0	0	0	0	0	0
3269 Kinnula Häähkäniemi	25804:116,200,227	3	6	3	5	5	0	0	0	4	4	8	5	2	0	0	32	17	0	7	4	0	2	3	8	6	22	6	0	0	0	0	0	1	0	1	0	0	0	0
3283 Kinnula Häähkäniemi	25804:261	3	6	3	4	3	0	0	0	2	3	8	4	2	0	0	0	0	0	0	0	0	4	0	0	10	22	6	0	0	0	0	0	0	0	0	0	0	0	0
3285 Kinnula Häähkäniemi	25804:233	3	6	3	5	4	0	0	0	4	4	8	3	3	0	0	32	17	0	4	3	0	3	3	11	6	22	6	0	0	0	0	0	1	0	0	0	0	0	0
3289 Kinnula Häähkäniemi	25804:308	3	6	3	3	3	0	0	0	2	4	8	3	4	0	0	28	29	0	8	8	0	3	2	7	4	22	6	0	0	0	0	0	1	0	0	0	0	0	0
3303 Laukaa Raidanlahti	25198:2	2	5	4	4	3	0	1	0	2	4	5	1	1	1	3	9	0	0	4	0	0	2	3	8	6	19	6	0	0	0	0	0	1	0	0	1	0	0	0
3310 Laukaa Raidanlahti	25198:17	3	6	3	5	5	0	1	0	4	4	8	4	4	0	0	1	15	31	1	3	9	3	2	5	5	19	6	0	0	0	0	0	1	1	0	1	0	0	0
3312 Nastola Kovalahti	26605:18,29,30,39,77	2	5	5	5	4	0	0	0	4	4	5	2	4	1	2	32	17	3	9	4	3	3	5	7	7	22	6	0	1	0	0	0	1	0	1	0	0	0	0
3313 Nastola Kovalahti	26605:20,36	7	5	3	2	3	0	3	0	3	4	9	3	4	2	2	8	0	0	4	0	0	3	3	7	6	19	6	0	1	0	0	0	0	0	1	0	0	0	0
3314 Nastola Kovalahti	26605:36	7	5	3	3	3	1	4	0	4	3	5	2	2	2	2	0	0	0	0	0	0	3	0	8	7	22	6	0	0	0	0	0	1	0	1	0	0	0	0
3315 Nastola Kovalahti	26605:41,52,85,106	7	4	3	3	3	0	4	0	4	4	5	2	3	2	2	7	0	0	4	0	0	3	3	7	6	19	6	0	1	0	0	0	1	0	1	0	0	0	0
7632 Pihtipudas Hämeensaari	27198:90	2	3	5	3	3	0	0	0	2	3	5	2	4	0	0	0	0	0	0	0	0	2	0	6	9	28	6	0	0	0	0	0	0	0	0	0	0	0	0
3326 Pihtipudas Karjalanmäki	13887:71	3	5	4	5	3	0	0	0	2	4	2	1	1	6	1	29	0	0	8	0	0	3	1	13	2	11	6	0	1	0	0	0	0	0	0	0	0	0	0
3327 Pihtipudas Karjalanmäki	13887:86,98	4	5	3	3	2	0	1	6	2	3	5	2	3	0	0	1	17	0	1	4	0	3	3	7	5	19	6	0	0	0	0	0	1	0	0	1	0	0	0
3328 Pihtipudas Karjalanmäki	13887:98	7	6	5	1	3	0	5	0	4	3	5	5	5	0	0	1	0	0	1	0	0	3	3	8	10	19	6	0	0	0	0	0	1	0	0	1	0	0	0
3360 Pihtipudas Madeneva	16422:15	2	5	4	3	3	0	0	0	2	4	2	1	1	2	1	12	3	0	3	12	0	3	2	20	8	16	6	0	1	0	0	1	0	0	0	0	0	0	0
3368 Pihtipudas Madeneva	16422:53	3	5	2	5	5	0	0	0	3	5	8	4	2	0	0	33	2	11	9	1	3	3	3	3	6	22	6	0	0	0	0	1	1	1	1	0	0	0	0
3382 Pihtipudas Madeneva	16422:185	2	3	4	3	4	0	0	0	3	4	3	2	3	0	0	0	0	0	0	0	0	4	0	7	7	28	6	0	0	0	0	0	0	0	0	0	0	0	0
3383 Pihtipudas Madeneva	16422:186	6	3	4	2	4	0	0	0	2	4	3	3	4	0	0	0	0	0	0	0	0	3	0	7	5	26	6	0	0	0	0	0	0	0	0	0	0	0	0
3329 Pihtipudas Majakaarre2	16345:76	3	3	2	2	3	0	0	0	4	4	10	4	4	0	0	1	29	12	1	8	3	3	2	10	5	21	6	0	0	0	0	1	1	0	0	1	0	0	0
3394 Pihtipudas Virtala	5921:1	7	4	4	3	3	0	1	0	4	4	9	3	4	0	0	1	0	0	1	0	0	3	3	13	8	19	6	0	0	0	0	0	1	0	0	0	0	0	0
3395 Pihtipudas Virtala	5921:1	3	5	3	5	4	0	2	0	4	4	5	4	6	0	0	17	0	0	4	0	0	3	4	6	8	19	6	0	0	0	0	0	1	0	0	0	0	0	0
3409 Saarijärvi Summassaari	23702:44	3	6	3	3	4	0	1	0	2	4	8	3	4	0	0	28	0	0	6	0	0	4	1	7	7	26	6	0	0	0	0	0	0	0	1	0	0	0	0
3411 Saarijärvi Summassaari	23702:72	3	5	3	5	4	0	4	0	3	4	9	4	4	0	0	33	0	0	9	0	0	4	2	7	3	26	6	0	0	0	0	0	0	1	0	0	0	0	0
3413 Saarijärvi Summassaari	23702:87,92	3	5	4	4	3	0	0	0	2	4	8	3	4	0	0	1	2	0	0	3	0	0	4	1	7	5	22	6	0	0	0	0	1	0	0	0	0	0	0
3127 Asikkala Kotasaari	15354:1	2	5	5	5	4	0	0	0	2	4	5	4	5	0	0	1	0	0	1	0	0	1	0	5	5	28	7	0	0	0	0	0	0	0	0	0	0	0	0
3128 Asikkala Kotasaari	15354:2	2	5	5	5	4	0	0	0	2	4	5	4	5	0	0	0	0	0	0	0	0	1	0	7	7	28	7	0	0	0	0	0	0	0	0	0	0	0	10
3129 Asikkala Kotasaari	15354:3	2	5	5	5	4	0	0	0	2	4	5	4	5	0	0	0	0	0	0	0	0	1	0	8	8	28	7	0	0	0	0	0	0	0	0	0	0	0	20
3130 Asikkala Kotasaari	15466:2	3	5	3	4	3	0	0	0	2	4	8	3	4	0	0	2	1	0	1	0	0	3	2	6	6	19	7	0	0	0	0	0	1	0	1	0	0	0	0
3134 Asikkala Kotasaari	15466:34	2	4	4	4	3	0	0	0	2	4	1	1	1	6	1	3	15	0	2	3	0	2	3	9	9	19	7	0	0	1	0	1	0	0	0	0	0	0	0
3135 Asikkala Kotasaari	15466:35	7	5	3	3	3	0	0	2	2	4	1	2	3	0	0	14	0	0	3	0	0	2	1	9	8	19	7	0	0	0	0	1	0	0	0	0	0	0	0
3136 Asikkala Kotasaari	15466:95	2	5	5	5	4	0	0	0	1	4	8	4	5	0	0	0	0	0	0	0	0	3	0	8	4	28	7	0	0	0	0	0	0	0	0	0	0	0	0
3139 Asikkala Kotasaari	15466:102,130	3	6	3	5	5	0	0	0	2	5	8	4	2	0	0	32	2	12	7	1	1	2	2	10	6	22	7	0	0	0	0	1	1	1	0	0	0	0	0
3140 Asikkala Kotasaari	15466:127	1	6	5	4	4	0	3	0	4	4	9	2	4	0	0	2	32	1	3	7	3	2	1	9	8	19	7	0	0	0	0	1	0	0	0	0	0	0	0
3141 Asikkala Kotasaari	15466:149	5	4	5	4	4	0	4	4	4	4	9	4	6	2	2	3	12	0	2	3	0	2	4	9	7	19	7	0	0	0	1	0	1	0	0	0	0	0	0
3144 Asikkala Kotasaari	15466:178	3	5	2	5	5	0	4	0	2	4	8	5	6	0	0	32	3	0	7	2	0	3	3	16	5	22	7	0	0	0	0	0	1	0	1	0	0	0	0
3145 Asikkala Kotasaari	15466:190,202	5	6	4	5	4	0	1	0	2	4	9	2	4	0	0	12	0	0	3	0	0	2	1	10	9	31	7	0	0	0	0	0	1	0	0	0	0	0	0
3147 Asikkala Kotasaari	15466:196	5	5	5	3	4	0	1	0	2	4	7	2	3	0	0	15	29	19	3	8	4	2	2	8	11	24	7	0	1	0	0	1	1	0	0	0	0	0	20
3149 Asikkala Kotasaari	15466:202	5	4	4	5	3	0	4	4	2	4	5	4	5	2	2	12	0	0	3	0	0	2	3	5	7	19	7	0	0	0	0	0	1	0	0	0	0	0	0
3152 Asikkala Kotasaari	15466:223	5	5	4	5	4	0	0	0	3	4	5	3	5	2	2	3	0	0	2	0	0	2	4	6	7	19	7	0	0	1	0	0	0	0	0	0	0	0	0

Number Site	NM-number	M1	Q1	K1	SH	SK	PM	PN	PT	PS	PO	RM	RF	RP	RE	RA	KE1	KE2	KE3	KY1	KY2	KY3	Kt	V	X	Y	TY	VE	Km0	Kma	Kmb	Kmc	Kmd	Kme	Kmf	Kmg	Kmh	Kmi	Kmj	SIZE
3155 Asikkala Kotasaari	15466:323	5	4	4	5	4	0	3	0	4	4	9	2	4	2	1	2	12	0	2	3	0	3	3	5	5	19	7	0	0	0	0	1	1	0	0	0	0	0	0
3156 Asikkala Kotasaari	15466:313	3	6	4	5	5	0	0	0	3	4	8	3	2	0	0	29	1	17	9	1	4	3	4	12	4	22	7	0	0	0	0	0	1	0	1	0	0	0	0
3157 Asikkala Kotasaari	15466:314	5	3	4	4	4	0	0	2	3	4	5	3	5	1	1	1	12	0	1	3	0	4	3	5	5	19	7	0	0	0	0	1	0	0	1	0	0	0	0
3158 Asikkala Kotasaari	15366:347	5	4	4	4	3	0	3	0	4	4	9	2	4	0	0	12	0	0	3	0	0	3	1	6	5	31	7	0	0	0	0	1	0	0	0	0	0	0	0
3160 Asikkala Kotasaari	15466:327	3	5	4	4	4	0	0	0	4	4	8	4	2	0	0	32	0	0	7	0	0	3	3	10	3	22	7	0	0	0	0	0	1	0	0	0	0	0	0
3162 Asikkala Kotasaari	15789:5	2	5	4	4	4	0	2	0	2	4	5	1	3	2	1	8	12	0	2	3	0	4	3	5	5	19	7	0	1	0	0	1	0	0	0	0	0	0	0
3163 Asikkala Kotasaari	15789:6	2	5	4	3	3	0	0	0	2	3	5	1	1	0	0	0	0	0	0	0	0	4	0	10	10	19	7	0	0	0	0	0	0	0	0	0	0	0	0
3165 Asikkala Kotasaari	15789:14	5	5	5	5	4	0	3	0	3	4	2	1	1	1	2	18	1	0	4	1	0	4	3	9	6	19	7	0	1	0	0	1	0	0	0	0	0	0	0
3166 Asikkala Kotasaari	15789:23	2	5	4	5	4	0	3	0	3	4	6	3	6	1	1	18	4	0	4	2	0	3	5	10	7	19	7	0	0	0	0	0	0	1	1	0	0	0	0
3167 Asikkala Kotasaari	15789:32,43	7	4	5	2	3	0	3	0	3	4	2	1	1	1	2	4	0	0	2	0	0	3	3	11	6	19	7	0	1	0	0	0	0	0	0	0	0	0	0
3168 Asikkala Kotasaari	15789:33	2	5	5	3	3	0	4	0	2	3	5	1	1	1	2	27	11	0	5	3	0	3	4	8	8	19	7	0	0	1	0	1	0	0	0	0	0	0	0
3169 Asikkala Kotasaari	15789:34	2	5	6	4	3	0	4	0	2	3	5	1	1	0	0	14	29	0	3	4	0	3	2	10	7	13	7	0	0	0	0	1	1	0	0	0	0	0	0
3171 Asikkala Kotasaari	15789:44	2	5	3	4	3	0	3	0	2	3	5	1	1	0	0	29	0	0	7	0	0	3	1	8	6	31	7	0	0	0	0	0	1	0	0	0	0	0	0
3173 Asikkala Kotasaari	15789:58	7	4	3	2	2	0	4	4	2	3	5	1	1	0	0	0	0	0	0	0	0	4	0	6	6	19	7	0	0	0	0	0	0	0	0	0	0	0	0
3174 Asikkala Kotasaari	15789:57	7	5	5	4	3	0	4	0	2	3	5	1	1	0	0	0	0	0	0	0	0	4	0	9	9	19	7	0	0	0	0	0	0	0	0	0	0	0	0
3176 Asikkala Kotasaari	15789:72	7	5	4	3	3	0	3	4	3	4	8	3	4	0	0	17	0	0	4	0	0	3	0	6	6	19	7	0	0	0	0	0	0	0	1	0	0	0	0
3178 Asikkala Kotasaari	15789:82	2	5	6	3	3	0	4	1	2	3	5	1	1	0	0	29	0	0	7	0	0	3	1	8	6	26	7	0	0	0	0	0	1	0	0	0	0	0	0
3179 Asikkala Kotasaari	15789:111	2	5	5	3	3	0	1	0	3	4	5	1	1	2	2	4	14	0	2	3	0	3	5	9	6	19	7	0	0	1	0	1	0	0	0	0	0	0	0
3180 Asikkala Kotasaari	15789:111	7	5	6	3	3	0	1	0	2	3	5	1	1	0	0	17	0	0	4	0	0	4	2	7	7	19	7	0	0	0	0	1	0	0	0	0	0	0	0
3181 Asikkala Kotasaari	15789:127	2	4	4	5	4	0	2	0	3	4	5	1	1	2	1	3	14	0	2	3	0	3	4	7	8	19	7	0	0	1	0	1	0	0	0	0	0	0	0
3182 Asikkala Kotasaari	15789:139	5	4	4	4	3	0	1	0	3	4	6	1	1	2	2	7	11	0	4	3	0	3	3	5	5	19	7	0	0	0	0	1	0	0	1	0	0	0	0
3183 Asikkala Kotasaari	15789:144	3	6	2	6	4	0	2	0	3	5	8	4	2	0	0	32	3	0	7	2	0	3	3	6	5	22	7	0	0	0	0	0	1	1	0	0	0	0	0
3192 Asikkala Kotasaari	18141:110	2	4	4	5	3	0	0	0	3	4	5	1	1	0	0	7	0	0	4	0	0	4	4	4	4	19	7	0	0	0	0	0	0	0	1	0	0	0	0
3199 Asikkala Kotasaari	18141:236,244,269	2	5	5	5	4	0	0	0	6	4	5	1	1	0	0	1	2	0	1	1	0	3	4	7	5	19	7	0	0	0	0	0	1	0	0	1	0	0	0
3201 Asikkala Kotasaari	18141:236	2	5	5	4	3	0	0	0	6	4	6	1	1	1	1	1	0	0	1	0	0	4	4	11	8	19	7	0	0	1	0	0	0	0	0	0	0	0	0
3204 Asikkala Kotasaari	18141:252,253,250	2	5	5	3	4	0	2	1	3	4	8	4	6	1	5	1	12	0	1	3	0	3	4	6	6	19	7	0	0	0	0	0	1	0	0	1	0	0	0
3206 Asikkala Kotasaari	18141:274	2	5	5	5	4	0	0	0	3	4	9	2	3	0	0	1	12	0	1	3	0	4	2	5	4	19	7	0	0	0	0	1	1	0	0	0	0	0	0
3209 Asikkala Kotasaari	18141:325	2	5	4	4	3	0	0	0	2	3	5	1	1	0	0	4	0	0	2	0	0	3	3	6	9	19	7	0	1	0	0	0	0	0	0	0	0	0	0
3212 Asikkala Kotasaari	18141:267	2	5	4	4	3	0	0	1	2	4	5	2	4	2	1	4	12	0	2	3	0	3	4	6	6	19	7	0	0	1	0	1	0	0	0	0	0	0	0
3213 Asikkala Kotasaari	18141:30	2	5	5	4	4	0	1	0	2	3	5	3	4	0	0	0	0	0	0	0	0	4	0	6	6	28	7	0	0	0	0	0	0	0	0	0	0	0	0
3214 Asikkala Kotasaari	18141:183,264	2	5	3	4	3	0	1	0	2	3	5	2	4	0	0	12	0	0	3	0	0	3	1	8	7	31	7	0	0	0	0	0	1	0	0	0	0	0	0
3215 Asikkala Kotasaari	18141:126	2	0	0	0	4	0	1	0	4	4	9	3	4	0	0	1	0	0	1	0	0	3	4	5	4	19	7	0	1	0	0	0	0	0	0	0	1	0	0
7180 Harjavalta	4919:9	2	4	5	3	3	0	1	0	4	3	2	2	3	4	4	12	0	0	3	0	0	3	3	12	11	13	7	0	0	0	0	1	0	0	0	0	0	0	0
7181 Harjavalta	4919:9	2	5	5	3	2	0	1	0	4	3	5	1	1	0	0	12	0	0	3	0	0	3	1	11	14	13	7	0	0	0	0	1	0	0	0	0	0	0	0
7183 Harjavalta	5356:6	2	4	5	3	3	0	1	0	4	3	8	3	4	0	0	31	0	0	8	0	0	3	1	12	12	13	7	0	0	0	0	0	1	0	0	0	0	0	0
7184 Harjavalta	5554:4	2	5	5	3	3	0	1	0	4	3	8	3	4	0	0	0	0	0	0	0	0	3	0	5	10	13	7	0	0	0	0	0	0	0	0	0	0	0	0
7391 Harjavalta Kaunismäki	12616:25	2	4	4	4	4	0	2	0	3	4	5	1	1	0	0	12	0	0	3	0	0	3	2	9	7	13	7	0	0	0	0	1	0	0	0	0	0	0	0
7393 Harjavalta Kaunismäki	12816:48	7	3	3	3	3	0	0	4	4	4	3	1	1	0	0	12	0	0	3	0	0	3	2	9	8	13	7	0	0	0	0	1	0	0	0	0	0	0	0
7394 Harjavalta Kaunismäki	12816:39	2	4	5	4	4	0	0	1	4	4	5	1	1	0	0	0	0	0	0	0	0	3	0	7	8	13	7	0	0	0	0	0	0	0	0	0	0	0	0
7395 Harjavalta Kaunismäki	12816:39	2	5	6	4	4	0	0	0	2	3	5	1	1	0	0	15	0	0	3	0	0	3	1	8	8	24	7	0	0	0	0	1	0	0	0	0	0	0	0
7400 Harjavalta Kaunismäki	12816:72	2	5	5	3	4	0	0	0	3	4	5	1	1	0	0	12	0	0	3	0	0	3	2	10	11	13	7	0	0	0	0	1	0	0	0	0	0	0	0
7401 Harjavalta Kaunismäki	12816:71	2	4	5	4	4	0	0	0	5	4	5	1	1	0	0	32	12	0	9	3	0	3	2	7	7	13	7	0	0	0	0	1	1	0	0	0	0	0	0
7402 Harjavalta Kaunismäki	12816:77	7	4	4	2	3	0	4	0	4	4	5	1	1	0	0	12	0	0	3	0	0	3	2	8	9	13	7	0	0	0	0	1	0	0	0	0	0	0	0
7412 Harjavalta Kaunismäki	12816:143	2	4	6	4	4	0	0	0	2	3	5	1	1	0	0	0	0	0	0	0	0	3	0	6	6	13	7	0	0	0	0	0	0	0	0	0	0	0	0
7413 Harjavalta Kaunismäki	12816:127	7	3	3	2	3	0	0	0	2	3	5	1	1	0	0	12	0	0	3	0	0	3	1	8	7	24	7	0	0	0	0	1	0	0	0	0	0	0	0
3418 Hauho Lentolanmäki	14264:3	2	4	6	5	4	0	2	0	2	3	2	1	1	0	0	0	0	0	0	0	0	4	0	10	6	28	7	0	0	0	0	0	0	0	0	0	0	0	0
3420 Hauho Lentolanmäki	14264:8	2	3	3	5	4	0	1	0	4	4	5	1	1	0	0	0	0	0	0	0	0	4	0	5	5	28	7	0	0	0	0	0	0	0	0	0	0	0	0
3421 Hauho Lentolanmäki	14264:10	5	5	5	5	4	0	1	0	2	4	5	2	3	1	2	11	4	0	3	2	0	3	3	8	6	19	7	0	1	0	0	1	0	0	0	0	0	0	0
3424 Hämeenlinna Hätilä	13778:1	2	5	2	5	4	0	0	0	3	4	8	5	6	0	0	28	0	0	6	9	0	2	3	5	6	28	7	0	0	0	0	0	1	1	0	1	0	0	0

Number Site	NM-number	M1	Q1	K1	SH	SK	PM	PN	PT	PS	PO	RM	RF	RP	RE	RA	KE1	KE2	KE3	KY1	KY2	KY3	Kt	V	X	Y	TY	VE	Km0	Kma	Kmb	Kmc	Kmd	Kme	Kmf	Kmg	Kmh	Kmi	Kmj	SIZE
3427 Hämeenlinna Kirstula	12698:39	3	5	2	5	4	0	0	0	6	4	8	3	4	5	3	29	0	0	9	6	0	3	2	6	5	26	7	0	0	0	0	0	1	1	0	0	0	0	0
3428 Hämeenlinna Kirstula	12698:36	2	5	4	4	3	0	0	0	1	3	8	4	4	0	0	0	0	0	0	0	0	3	0	6	10	28	7	0	0	0	0	0	0	0	0	0	0	0	0
3429 Hämeenlinna Kirstula	12698:58	2	5	4	4	3	0	0	0	1	3	8	4	4	0	0	0	0	0	0	0	0	3	0	6	9	28	7	0	0	0	0	0	0	0	0	0	0	0	0
3432 Hämeenlinna Kirstula	12698:20	3	6	1	5	4	0	0	1	2	4	5	2	4	0	0	3	0	0	2	0	0	3	1	3	3	26	7	0	0	0	0	0	1	0	0	0	0	0	0
3451 Janakkala Irjala	11062:130,131	2	3	3	5	4	0	3	0	3	4	5	2	3	0	0	11	8	0	3	4	0	3	2	7	7	19	7	0	1	0	0	1	0	0	0	0	0	0	0
3434 Janakkala Irjala	11062:152	2	6	4	4	4	0	0	0	3	4	5	1	1	0	0	0	0	0	0	0	0	4	0	7	10	26	7	0	0	0	0	0	0	0	0	0	0	0	0
3459 Janakkala Irjala	11062:164,167	2	6	4	4	3	0	1	0	4	4	5	1	1	0	0	14	29	0	3	9	0	3	3	8	8	13	7	0	0	0	0	1	1	0	0	0	0	0	0
3464 Janakkala Irjala	11062:207	2	5	4	4	3	0	0	0	2	4	8	4	5	0	0	0	0	0	0	0	0	4	0	4	4	28	7	0	0	0	0	0	0	0	0	0	0	0	0
3478 Janakkala Lehtimäki	23084:2,6	7	2	2	6	5	0	0	0	6	5	8	4	4	0	0	27	0	0	5	0	0	3	3	5	7	12	7	0	0	0	0	0	1	0	0	0	0	0	0
3635 Kanagsala Sarsa	17340:588	9	4	4	3	4	0	0	0	3	4	6	1	1	5	1	17	0	0	4	0	0	3	3	5	6	12	7	0	0	0	0	0	0	0	1	0	0	0	0
3484 Kangasala Sarsa	13433:40	2	4	4	4	4	0	1	0	4	4	5	2	4	0	0	4	14	0	2	3	0	3	3	6	6	19	7	0	1	0	0	1	0	0	0	0	0	0	0
3486 Kangasala Sarsa	9604:4,36	5	4	4	5	4	0	0	0	3	4	9	4	4	2	1	4	3	15	2	2	3	2	5	10	5	19	7	0	1	0	0	1	1	1	1	0	0	0	0
3487 Kangasala Sarsa	9604:7	2	5	4	4	3	0	4	6	2	4	5	2	4	5	2	1	28	0	1	6	0	2	2	6	6	19	7	0	0	1	0	0	1	0	0	0	0	0	0
3488 Kangasala Sarsa	9604:7	2	5	4	5	3	0	0	6	2	3	3	2	3	0	0	0	0	0	0	0	0	3	0	6	6	19	7	0	0	0	0	0	0	0	0	0	0	0	0
3489 Kangasala Sarsa	9604:9	5	3	5	5	2	0	0	0	3	4	9	3	4	2	2	11	0	0	3	0	0	3	4	7	4	19	7	0	0	0	0	1	0	0	1	0	0	0	0
3491 Kangasala Sarsa	9604:29	9	5	4	2	2	0	0	0	1	4	9	4	4	1	2	1	12	12	1	3	12	3	3	11	8	19	7	0	1	0	0	1	0	0	0	0	0	0	0
3495 Kangasala Sarsa	9604:29	2	5	5	4	3	0	3	0	4	4	6	2	4	2	1	4	0	0	2	0	0	3	4	9	9	19	7	0	0	1	0	0	0	0	0	0	0	0	0
3501 Kangasala Sarsa	9604:58	2	5	4	5	4	0	1	0	3	4	5	2	4	2	1	8	11	0	2	3	0	3	3	8	6	19	7	0	1	0	1	0	0	0	0	0	0	0	0
3503 Kangasala Sarsa	9604:74	2	5	4	5	4	0	0	0	3	4	9	4	3	0	0	28	0	0	6	0	0	2	0	6	7	19	7	0	0	1	0	0	0	0	0	0	0	0	0
3504 Kangasala Sarsa	9604:74,85,87	2	5	4	5	4	0	3	0	4	4	5	3	5	2	1	4	11	0	2	3	0	3	4	7	7	19	7	0	1	0	0	1	1	0	0	0	0	0	0
3505 Kangasala Sarsa	9604:77	2	4	5	5	4	0	0	2	2	4	2	1	1	2	2	1	0	0	1	0	0	4	0	13	10	19	7	0	1	0	0	0	0	0	0	0	0	0	0
3511 Kangasala Sarsa	7757:11,13,27,59	2	5	4	4	3	0	4	2	2	3	5	3	3	0	0	12	0	0	3	0	0	2	1	9	7	19	7	0	0	0	0	1	0	0	0	0	0	0	0
3513 Kangasala Sarsa	7757:14	7	5	3	2	2	0	0	0	2	3	5	2	3	0	0	0	0	0	0	0	0	4	0	5	5	19	7	0	0	0	0	0	0	0	0	0	0	0	0
3516 Kangasala Sarsa	7757:38	7	6	3	2	2	0	3	0	1	3	5	4	6	9	4	29	0	0	7	0	0	4	2	8	7	19	7	0	1	0	0	0	0	0	0	0	0	0	0
3520 Kangasala Sarsa	7757:45	7	3	3	3	3	0	3	0	4	4	9	3	4	2	5	1	0	0	1	0	0	3	4	5	7	19	7	0	0	1	0	0	0	0	0	0	0	0	0
3522 Kangasala Sarsa	7757:45	2	5	3	5	4	0	0	0	2	4	5	1	1	0	0	29	11	0	8	3	0	3	2	8	8	31	7	0	0	0	0	1	1	0	0	0	0	0	0
3525 Kangasala Sarsa	7757:99	2	5	3	3	2	0	0	2	2	3	8	1	1	5	1	1	12	0	1	3	0	0	2	6	6	19	7	0	1	0	0	1	0	0	0	0	0	0	0
3526 Kangasala Sarsa	7757:59	7	5	3	2	2	0	0	0	3	3	5	1	1	2	2	4	0	0	2	0	0	3	1	18	15	9	7	0	1	0	0	0	0	0	0	0	0	0	0
3529 Kangasala Sarsa	7964:73	2	5	3	4	4	0	0	0	3	4	5	2	4	0	0	17	0	0	4	0	0	4	4	10	10	19	7	0	0	0	0	0	0	0	1	0	0	0	0
3530 Kangasala Sarsa	7964:74	2	3	3	4	3	0	0	0	2	3	7	2	3	0	0	0	0	0	0	0	0	3	0	7	8	26	7	0	0	0	0	0	0	0	0	0	0	0	1
3531 Kangasala Sarsa	7964:74	2	5	4	4	3	0	0	0	3	4	2	2	3	6	2	29	0	0	8	0	0	3	2	9	8	19	7	0	1	0	0	0	0	0	0	0	0	0	0
3536 Kangasala Sarsa	7964:148	9	3	4	3	2	0	4	0	3	3	2	2	3	0	0	0	0	0	0	0	0	3	0	10	8	19	7	0	0	0	0	0	0	0	0	0	0	0	0
3549 Kangasala Sarsa	13433:139	2	3	5	5	4	0	0	0	3	4	5	2	3	5	1	29	0	0	7	0	0	4	0	10	10	28	7	0	0	0	0	0	1	0	0	0	0	0	0
3552 Kangasala Sarsa	13433:152,156	9	4	4	2	3	0	0	0	3	4	5	3	4	0	0	1	0	0	1	0	0	3	3	7	7	16	7	0	1	0	0	1	0	0	0	0	0	0	0
3553 Kangasala Sarsa	13433:166	5	3	3	3	4	0	0	0	3	4	9	2	4	1	2	1	12	0	1	3	12	4	4	7	6	19	7	0	0	0	0	0	0	0	0	0	1	0	0
3558 Kangasala Sarsa	13433:184	2	4	5	5	4	0	0	0	6	4	5	2	3	5	1	7	0	0	4	0	0	3	3	10	7	16	7	0	0	0	0	0	0	0	1	0	0	0	0
3565 Kangasala Sarsa	17340:85,93	0	1	1	6	4	0	0	0	3	4	8	3	4	0	0	27	0	0	5	0	0	3	3	7	6	12	7	0	0	0	0	0	1	0	0	0	0	0	0
3567 Kangasala Sarsa	17340:114	7	2	3	3	3	0	1	0	3	4	2	1	1	1	1	1	0	0	1	0	0	4	4	19	6	19	7	0	1	1	0	0	0	0	0	0	1	0	0
3568 Kangasala Sarsa	17340:94,95,114,153	2	2	2	3	5	4	0	0	0	4	7	2	3	0	0	27	0	0	5	0	0	3	3	8	6	12	7	0	0	0	0	1	0	0	0	0	0	0	0
3569 Kangasala Sarsa	17340:111,122,139	7	2	3	3	4	0	0	0	3	4	5	4	5	0	0	10	0	0	4	0	0	4	3	10	10	27	7	0	0	0	0	0	0	0	1	0	0	0	0
3570 Kangasala Sarsa	17340:105,115	2	5	4	4	4	0	5	0	2	3	2	2	4	9	6	15	0	0	3	0	0	3	1	8	7	31	7	0	0	0	0	1	0	0	1	0	0	0	0
3575 Kangasala Sarsa	17340:127	0	1	1	3	5	4	0	0	6	4	5	3	3	0	0	20	0	0	4	0	0	3	4	5	5	12	7	0	1	0	0	0	0	0	0	0	1	0	0
3576 Kangasala Sarsa	17340:127	0	1	1	5	4	0	0	0	6	4	8	3	3	0	0	17	0	0	4	0	0	3	3	5	6	12	7	0	0	0	0	1	0	0	0	0	0	0	0
3591 Kangasala Sarsa	17340:240	0	1	1	3	4	0	1	0	6	4	8	4	4	0	0	28	0	0	7	0	0	3	3	9	7	12	7	0	0	1	0	0	0	0	0	0	0	0	0
3607 Kangasala Sarsa	17340:351	7	4	3	3	3	0	0	0	3	4	5	1	1	5	1	7	14	0	4	3	0	3	3	10	8	16	7	0	0	0	0	1	0	0	0	0	0	0	0
3609 Kangasala Sarsa	17340:368	9	5	5	2	3	0	0	2	3	4	3	3	3	0	0	0	0	0	0	0	0	3	0	5	7	12	7	0	0	0	0	0	0	0	0	0	0	0	0
3610 Kangasala Sarsa	17340:368	2	3	3	3	3	0	0	0	3	4	9	1	1	2	1	3	0	0	2	0	0	4	5	10	7	26	7	0	0	0	0	0	0	0	1	0	0	1	0
3620 Kangasala Sarsa	17340:440	0	1	1	3	4	0	0	0	6	4	8	3	4	0	0	28	0	0	7	0	0	3	3	6	4	12	7	0	0	1	0	0	0	0	0	0	0	0	0
3621 Kangasala Sarsa	17340:419	2	5	5	5	4	0	0	0	3	4	5	1	1	0	0	11	0	0	3	0	0	4	2	7	7	26	7	0	0	0	0	1	0	0	0	0	0	0	0

Number Site	NM-number	M1	Q1	K1	SH	SK	PM	PN	PT	PS	PO	RM	RF	RP	RE	RA	KE1	KE2	KE3	KY1	KY2	KY3	Kt	V	X	Y	TY	VE	Km0	Kma	Kmb	Kmc	Kmd	Kme	Kmf	Kmg	Kmh	Kmi	Kmj	SIZE
3636 Kangasala Sarsa	17340:587	7	5	3	2	4	0	0	0	2	4	8	4	4	0	0	0	0	0	0	0	0	4	0	6	5	26	7	0	0	0	0	0	0	0	0	0	0	0	0
3638 Kangasala Sarsa	17340:596	7	2	2	5	4	0	0	0	6	4	8	3	4	0	0	28	0	0	7	0	0	3	3	5	4	12	7	0	0	1	0	0	0	0	0	0	0	0	0
3648 Kangasala Sarsa	17340:667	9	5	4	3	3	0	4	0	2	4	8	4	4	0	0	0	0	0	0	0	0	3	0	11	11	31	7	0	0	0	0	0	0	0	0	0	0	0	0
3649 Kangasala Sarsa	17340:678	9	5	3	5	4	0	0	0	6	4	5	1	1	5	3	17	0	0	4	0	0	4	2	6	6	12	7	0	0	0	0	0	0	0	0	0	0	1	0
3660 Kangasala Sarsa	17340:736	7	1	5	4	4	0	0	0	6	4	12	2	4	6	2	28	0	0	7	0	0	3	1	12	6	12	7	0	1	0	0	0	0	0	0	0	0	0	0
3666 Kangasala Sarsa	17340:750	0	1	1	5	4	0	0	0	6	4	3	3	3	0	0	3	0	0	2	0	0	3	2	8	6	12	7	0	1	0	0	0	0	0	0	0	0	0	0
3680 Kangasala Sarsa	17340:894	9	4	4	3	3	0	0	0	6	3	12	1	1	0	0	1	0	0	1	0	0	3	3	18	10	19	7	0	0	0	0	0	0	0	0	0	1	0	0
3685 Kangasala Sarsa	17340:908	7	4	4	3	4	0	5	0	3	4	5	3	3	0	0	0	0	0	0	0	0	3	0	8	8	31	7	0	0	0	0	0	0	0	0	0	0	0	0
3691 Kangasala Sarsa	17340:1024	9	5	4	3	3	0	0	0	3	4	5	1	1	2	1	4	29	0	2	8	0	3	2	15	8	13	7	0	0	0	0	0	1	0	0	0	1	0	0
3704 Kangasala Sarsa	17104:25,37	7	4	3	3	4	0	0	0	3	4	5	2	3	0	0	1	28	0	1	7	0	3	1	5	5	28	7	0	1	0	0	0	1	0	0	0	0	0	0
3712 Kangasala Sarsa	17104:89	2	3	3	4	3	0	0	0	3	4	9	3	4	0	0	13	17	0	3	4	0	3	2	6	5	8	7	0	0	0	0	1	0	0	1	0	0	0	0
3719 Kangasala Sarsa	17104:89	9	4	4	3	3	0	0	0	0	4	2	3	3	6	1	12	0	0	3	0	0	3	2	6	4	31	7	0	0	0	0	1	0	0	0	0	0	0	0
3720 Kangasala Sarsa	17104:89	2	4	4	3	4	0	5	0	2	4	5	2	3	0	0	14	0	0	12	0	0	5	1	9	8	9	7	0	0	0	0	1	0	0	0	0	0	0	0
3721 Kangasala Sarsa	17104:90	7	3	3	3	4	0	0	0	3	4	3	4	3	0	0	11	0	0	3	0	0	3	3	6	6	24	7	0	0	0	0	1	0	0	0	0	0	0	0
3735 Kangasala Sarsa	17104:149,192	0	1	1	5	4	0	1	0	3	4	2	3	3	6	1	11	17	0	3	4	0	3	2	6	4	31	7	0	0	0	0	1	0	0	0	0	0	1	0
3750 Kangasala Sarsa	17104:264,265,270	7	3	3	4	4	0	5	2	2	4	3	4	6	0	0	14	0	0	3	0	0	3	1	7	6	19	7	0	0	0	0	1	0	0	0	0	0	0	0
3764 Kangasala Sarsa	17104:270	2	4	6	3	2	0	1	0	3	4	6	1	1	2	5	4	11	11	2	3	12	3	4	8	8	19	7	0	0	0	1	0	1	0	0	0	0	0	0
3771 Kangasala Sarsa	17104:318	7	5	4	3	3	0	4	5	4	4	5	2	4	0	0	1	0	0	1	0	0	3	1	6	6	19	7	0	1	0	0	0	1	0	0	0	0	0	0
3772 Kangasala Sarsa	17104:318,337	2	5	5	5	4	0	0	0	3	4	2	1	1	6	1	28	0	0	7	0	0	3	3	11	8	12	7	0	1	0	0	0	0	0	0	0	1	0	0
3787 Kangasala Sarsa	17104:388	7	4	3	3	3	0	1	0	3	4	5	2	4	0	0	11	0	0	3	0	0	3	2	6	6	13	7	0	0	0	0	1	0	0	0	0	0	0	0
3791 Kangasala Sarsa	17104:414	9	4	4	3	3	0	0	0	3	4	3	2	3	0	0	2	0	0	1	0	0	3	2	7	8	12	7	0	0	0	0	1	0	0	0	0	0	0	0
3798 Kangasala Sarsa	17104:426	7	5	3	4	3	0	3	4	2	4	5	2	3	0	0	14	0	0	3	0	0	3	1	7	7	19	7	0	0	0	0	1	0	0	0	0	0	0	0
3799 Kangasala Sarsa	17104:427	7	5	3	4	3	0	0	0	3	4	5	1	1	2	3	10	11	0	4	3	0	4	3	7	7	8	7	0	0	0	0	1	0	0	0	0	0	0	0
3811 Kangasala Sarsa	17104:450	7	4	3	3	2	0	0	0	3	4	7	1	1	0	0	11	0	0	3	0	0	3	3	6	6	31	7	0	0	0	0	1	0	0	0	0	0	0	0
3818 Kangasala Sarsa	17104:478	7	2	2	5	4	0	0	0	3	4	5	2	3	0	0	14	0	0	3	0	0	3	1	4	4	24	7	0	0	0	0	1	0	0	0	0	0	0	0
3820 Kangasala Sarsa	17104:182	7	4	3	3	2	0	0	0	2	4	5	3	4	1	7	4	11	0	2	3	0	3	4	10	6	19	7	0	0	0	0	1	0	0	1	0	0	0	0
3850 Kangasala Sarsa	17104:350,358	7	5	3	3	3	0	5	2	3	4	8	4	6	0	0	14	0	0	12	0	0	3	1	6	8	19	7	0	0	0	0	1	0	0	0	0	0	0	0
3855 Kangasala Sarsa	17104:682	7	3	3	3	3	0	2	0	3	4	2	2	3	0	0	17	0	0	4	0	0	5	3	6	5	12	7	0	0	0	0	0	0	1	0	0	0	0	0
3862 Kangasala Sarsa	17104:724	2	4	3	5	4	0	0	0	3	4	2	1	1	1	1	2	0	0	1	0	0	4	2	8	6	16	7	0	0	0	0	0	1	0	0	0	0	0	0
3864 Kangasala Sarsa	17104:778	2	5	3	5	4	0	0	0	3	4	2	1	1	2	5	4	14	29	2	3	8	3	4	12	8	26	7	0	0	0	0	0	1	1	0	0	0	0	1	0
3874 Kangasala Sarsa	17104:843,780	7	4	3	4	4	0	0	0	3	4	6	2	3	0	0	11	0	0	3	0	0	4	3	7	5	16	7	0	0	0	0	0	1	0	0	0	0	0	0
3883 Kangasala Sarsa	17104:866	8	4	3	3	3	0	0	1	3	4	5	2	4	1	1	1	0	0	1	0	0	3	3	8	8	16	7	0	1	0	0	0	0	0	0	0	0	0	0
3884 Kangasala Sarsa	17104:856	7	3	3	3	3	0	0	0	3	4	5	1	1	2	2	3	0	0	3	0	0	3	3	6	6	19	7	0	1	0	0	0	0	0	0	0	0	0	0
3909 Kangasala Sarsa	17104:941	0	1	1	5	4	0	0	0	3	4	8	4	4	0	0	29	0	0	7	0	0	3	4	7	7	12	7	0	1	0	0	0	0	0	0	0	0	0	0
3935 Kangasala Sarsa	16878:50	2	5	3	5	4	0	0	0	3	3	2	1	1	2	2	1	0	0	1	0	0	4	4	8	5	19	7	0	1	0	0	0	0	0	0	0	0	0	0
3967 Kangasala Sarsa	16878:232,246,334	3	6	3	5	4	0	1	0	4	4	8	2	4	7	4	32	11	0	9	3	0	0	3	12	4	22	7	0	0	0	0	1	1	0	1	0	0	0	0
3980 Kangasala Sarsa	16878:486,519	2	3	3	3	4	0	6	6	2	4	13	3	4	0	0	14	29	0	3	8	0	3	1	12	5	19	7	0	0	0	0	1	0	1	0	0	0	0	0
3997 Kangasala Sarsa	16680:3	9	4	5	4	4	0	0	0	3	4	2	1	1	5	7	18	16	0	7	3	0	3	4	15	13	12	7	0	1	0	0	1	0	0	0	0	0	0	0
4001 Kangasala Sarsa	16680:15	7	4	4	3	4	0	0	0	3	4	3	1	1	0	0	0	0	0	0	0	0	3	0	6	6	28	7	0	0	0	0	0	0	0	0	0	0	0	0
4011 Kangasala Sarsa	17103:29	2	5	4	5	4	0	0	0	3	4	5	1	1	5	2	17	0	0	4	0	0	3	2	6	6	8	7	0	0	0	0	0	0	1	0	0	0	0	0
4012 Kangasala Sarsa	17103:29	2	5	4	3	3	0	0	0	3	4	5	1	1	6	1	17	0	0	4	0	0	4	2	8	8	8	7	0	0	0	0	0	0	1	0	0	0	0	0
4021 Kangasala Sarsa	7964:5,13	7	4	4	4	3	0	4	0	2	4	3	4	3	0	0	14	0	0	3	0	0	3	2	9	6	24	7	0	0	0	0	0	1	0	0	0	0	0	0
4023 Kangasala Sarsa	7964:17	2	5	5	5	4	0	1	0	3	4	5	4	4	0	0	1	0	0	1	0	0	3	3	5	4	19	7	0	0	0	0	0	0	1	0	0	1	0	0
4024 Kangasala Sarsa	7964:25	2	5	4	4	3	0	3	4	2	4	5	2	4	0	0	1	0	0	1	0	0	3	3	6	7	19	7	0	1	0	0	0	0	0	0	0	0	0	0
4025 Kangasala Sarsa	7964:25	2	5	4	4	3	0	2	2	2	4	5	1	1	0	0	1	12	0	1	3	0	2	3	9	6	19	7	0	0	1	0	0	0	0	0	0	0	0	0
4026 Kangasala Sarsa	2964:28	5	5	5	5	4	0	4	0	3	4	9	3	4	2	5	1	0	0	1	0	0	3	3	10	6	19	7	0	0	1	0	0	0	0	0	0	0	0	0
4027 Kangasala Sarsa	7964:30	2	5	5	5	4	0	3	4	4	4	5	3	4	0	0	1	0	0	1	0	0	3	3	4	4	19	7	0	1	0	0	0	1	0	0	0	0	0	0
4029 Kangasala Sarsa	7964:44	2	3	3	5	4	0	0	0	3	4	2	3	3	5	1	29	21	0	7	4	0	2	3	7	5	13	7	0	1	0	0	1	0	0	0	0	0	0	0
4030 Kangasala Sarsa	7964:45	7	3	3	4	4	0	3	0	4	2	2	1	1	0	0	1	16	0	1	3	0	3	5	7	6	19	7	0	1	0	0	1	0	0	0	0	0	0	0

Number Site	NM-number	M1	Q1	K1	SH	SK	PM	PN	PT	PS	PO	RM	RF	RP	RE	RA	KE1	KE2	KE3	KY1	KY2	KY3	Kt	V	X	Y	TY	VE	Km0	Kma	Kmb	Kmc	Kmd	Kme	Kmf	Kmg	Kmh	Kmi	Kmj	SIZE
4031 Kangasala Sarsa	7964:44	7	3	3	4	2	0	3	0	4	4	9	2	4	2	2	1	0	0	1	0	0	3	3	8	7	19	7	0	0	1	0	0	0	0	0	0	0	0	0
4033 Kangasala Sarsa	7964:50	2	4	6	3	4	0	0	6	2	4	8	3	4	0	0	0	0	0	0	0	0	3	0	4	5	19	7	0	0	0	0	0	0	0	0	0	0	0	0
4034 Kangasala Sarsa	7964:52,57,71	2	5	3	5	4	0	0	0	2	4	5	2	3	0	0	21	0	0	4	0	0	3	3	4	6	13	7	0	0	0	0	1	0	0	0	0	0	0	0
4036 Kangasala Sarsa	7964:53	2	5	6	5	4	0	3	1	2	4	5	3	4	0	0	1	0	0	1	0	0	4	2	6	7	19	7	0	1	0	0	0	0	0	0	0	0	0	0
4037 Kangasala Sarsa	7964:56	2	4	5	3	3	0	0	6	2	3	9	2	4	0	0	1	28	0	1	7	0	3	2	8	8	19	7	0	1	0	0	0	0	0	0	0	0	0	0
4039 Kangasala Sarsa	7964:58,63	2	3	5	4	3	0	1	0	3	3	3	4	6	0	0	0	0	0	0	0	0	2	0	4	7	28	7	0	0	0	0	0	0	0	0	0	0	0	0
4041 Kangasala Sarsa	7964:56	2	4	4	5	4	0	0	0	2	4	5	2	3	0	0	0	0	0	0	0	0	3	0	7	7	16	7	0	0	0	0	0	0	0	0	0	0	0	0
4045 Kangasala Sarsa	7964:34	2	5	3	5	4	0	0	0	3	4	3	2	3	0	0	11	0	0	3	0	0	0	4	7	4	12	7	0	0	0	0	1	0	0	0	0	0	0	0
4046 Kangasala Sarsa	7964:17	2	4	4	5	4	0	0	0	3	4	8	3	4	0	0	1	0	0	1	0	0	3	4	6	5	19	7	0	0	0	0	0	1	0	0	1	0	0	0
4053 Kangasala Sarsa	19263:185	8	4	3	4	4	0	0	0	2	4	3	5	6	0	0	0	0	0	0	0	0	3	0	6	5	28	7	0	0	0	0	0	0	0	0	0	0	0	0
4058 Kangasala Sarsa	27047:357,283	2	2	2	5	5	0	0	0	6	4	8	4	6	0	0	9	0	0	4	0	0	1	2	13	7	12	7	0	0	0	0	0	0	0	0	0	0	1	35
4059 Kangasala Sarsa	27047:252,253,256	2	2	2	5	5	0	0	0	6	4	8	4	6	0	0	9	0	0	4	0	0	3	2	7	15	12	7	0	0	0	0	0	0	0	0	0	0	1	0
7155 Kiukainen Uotinmäki	2470:5	2	4	3	3	3	0	0	0	3	3	2	1	1	2	2	14	0	0	3	0	0	3	1	16	13	13	7	0	0	0	0	1	0	0	0	0	0	0	0
7156 Kiukainen Uotinmäki	3470:5	2	5	5	4	4	0	0	0	3	3	5	1	1	0	0	14	0	0	3	0	0	3	1	9	11	13	7	0	0	0	0	1	0	0	0	0	0	0	0
7158 Kiukainen Uotinmäki	3574:369	2	5	5	3	3	0	0	2	2	4	7	1	1	0	0	0	0	0	0	0	0	4	0	11	11	13	7	0	0	0	0	0	0	0	0	0	0	0	0
7159 Kiukainen Uotinmäki	4275:63	2	5	5	3	3	0	0	2	4	3	2	2	3	8	1	29	30	0	7	9	0	3	2	11	10	13	7	0	1	0	0	0	1	0	0	0	0	0	0
7160 Kiukainen Uotinmäki	4275:63	2	4	4	3	3	0	0	0	3	3	5	1	1	9	4	29	21	0	7	4	0	3	3	9	9	13	7	0	0	0	0	1	1	0	0	0	0	0	0
7161 Kiukainen Uotinmäki	4275:63	2	4	4	3	3	0	1	0	4	3	7	2	3	8	1	12	0	0	3	0	0	3	2	7	8	13	7	0	0	0	0	1	0	0	0	0	0	0	0
7163 Kiukainen Uotinmäki	4275:63	2	2	4	3	3	0	0	0	5	3	9	2	3	0	0	12	0	0	3	0	0	3	1	13	10	13	7	0	0	0	0	1	0	0	0	0	0	0	0
7165 Kiukainen Uotinmäki	4275:63	2	5	5	3	3	0	0	0	3	3	5	2	3	0	0	11	0	0	3	0	0	3	1	9	10	13	7	0	0	0	0	1	0	0	0	0	0	0	0
7167 Kiukainen Uotinmäki	4275:63	2	4	4	4	4	0	1	0	3	3	5	1	1	4	4	29	12	0	7	3	0	3	2	8	10	13	7	0	0	0	0	1	0	0	0	0	0	0	0
7168 Kiukainen Uotinmäki	4275:63	2	5	5	3	3	0	0	0	3	4	5	2	3	0	0	21	0	0	4	0	0	3	1	10	8	13	7	0	0	0	0	1	0	0	0	0	0	0	0
7169 Kiukainen Uotinmäki	4275:63	7	5	5	2	2	0	0	0	2	3	1	1	1	0	0	0	0	0	0	0	0	3	0	12	12	13	7	0	0	0	0	0	0	0	0	0	0	0	0
7170 Kiukainen Uotinmäki	4275:74	2	4	5	3	3	0	0	0	3	2	5	2	3	7	1	12	0	0	3	0	0	3	2	11	10	13	7	0	0	0	0	1	0	0	0	0	0	0	0
7171 Kiukainen Uotinmäki	4570:13	2	4	5	3	3	0	0	0	2	3	5	1	1	7	1	29	0	0	7	0	0	3	1	8	9	13	7	0	1	0	0	0	1	0	0	0	0	0	0
7174 Kiukainen Uotinmäki	4570:28	2	6	6	3	3	0	1	0	4	3	5	2	3	0	0	9	0	0	6	0	0	3	2	8	10	13	7	0	0	1	0	0	0	0	0	0	0	0	0
7175 Kiukainen Uotinmäki	4570:28	2	5	5	4	4	0	0	1	4	3	5	2	3	0	0	12	0	0	3	0	0	3	2	12	8	13	7	0	0	0	0	0	1	0	0	0	0	0	0
7176 Kiukainen Uotinmäki	4571:5	2	5	5	4	4	0	1	0	4	3	7	1	1	0	0	12	0	0	3	0	0	3	1	10	11	13	7	0	0	0	0	0	1	0	0	0	0	0	0
7177 Kiukainen Uotinmäki	4718:13	7	4	4	2	2	0	1	0	4	3	5	1	1	0	0	12	0	0	3	0	0	3	1	8	8	13	7	0	0	0	0	0	1	0	0	0	0	0	0
7178 Kiukainen Uotinmäki	4917:24	2	4	5	3	3	0	0	0	3	3	7	1	1	4	4	29	0	0	7	0	0	3	2	10	10	13	7	0	1	0	0	0	0	0	0	0	0	0	0
7179 Kiukainen Uotinmäki	4917:38	2	4	5	4	4	0	1	0	4	3	5	1	1	0	0	29	0	0	7	0	0	3	1	9	8	13	7	0	0	0	0	0	1	0	0	0	0	0	0
7192 Kiukainen Uotinmäki	5843:8	2	5	6	4	3	0	1	0	4	4	5	1	1	4	4	12	0	0	3	0	0	3	1	8	8	13	7	0	0	0	0	0	1	0	0	0	0	0	0
7193 Kiukainen Uotinmäki	5843:8	2	4	4	4	4	0	0	0	5	4	5	1	1	0	0	29	0	0	7	0	0	3	3	7	7	13	7	0	0	1	0	0	1	1	0	0	0	0	0
7194 Kiukainen Uotinmäki	5843:8	7	5	4	2	2	0	0	0	3	3	5	1	1	0	0	12	0	0	3	0	0	3	1	8	8	18	7	0	0	0	0	0	1	0	0	0	0	0	0
7197 Kiukainen Uotinmäki	5629:77	2	4	4	3	3	0	0	0	3	3	5	1	1	0	0	12	0	0	3	0	0	3	2	9	9	13	7	0	0	0	0	0	1	0	0	0	0	0	0
7198 Kiukainen Uotinmäki	5629:77	2	5	5	3	3	0	0	4	4	3	2	1	1	0	0	4	0	0	2	0	0	3	4	12	11	13	7	0	1	0	0	0	0	0	0	0	0	0	0
7199 Kiukainen Uotinmäki	5629:102	2	5	5	3	3	0	0	0	2	3	5	1	1	0	0	12	0	0	3	0	0	3	1	10	8	13	7	0	0	0	0	0	1	0	0	0	0	0	0
7200 Kiukainen Uotinmäki	5629:114	2	5	6	3	3	0	1	0	2	3	5	2	4	2	5	4	12	0	2	3	0	3	3	8	10	13	7	0	0	0	0	0	1	0	0	0	0	1	0
7201 Kiukainen Uotinmäki	5629:127	2	5	6	4	4	0	0	0	5	4	5	1	1	0	0	15	0	0	3	0	0	3	1	7	9	13	7	0	0	0	0	0	1	0	0	0	0	0	0
7204 Kiukainen Uotinmäki	5629:143	2	5	5	3	3	0	0	0	5	3	5	2	3	7	5	12	0	0	3	0	0	3	1	9	9	13	7	0	0	0	0	0	1	0	0	0	0	0	0
7207 Kiukainen Uotinmäki	5629:134	2	5	6	4	4	0	2	0	3	3	5	2	3	7	1	29	0	0	7	0	0	3	2	10	9	18	7	0	1	0	0	0	0	0	0	0	0	0	0
7208 Kiukainen Uotinmäki	5629:56	2	5	6	4	4	0	1	0	4	4	8	2	4	0	0	12	29	0	3	7	0	3	4	8	9	13	7	0	1	0	0	1	1	0	0	0	0	0	0
7209 Kiukainen Uotinmäki	5629:162	2	5	6	3	3	0	1	2	4	4	5	1	1	0	0	12	0	0	3	0	0	3	1	9	10	13	7	0	0	0	0	1	0	0	0	0	0	0	0
7210 Kiukainen Uotinmäki	5629:115	2	5	6	4	3	0	0	0	5	3	2	2	3	0	0	29	0	0	7	0	0	3	1	14	10	13	7	0	0	0	0	0	1	0	0	0	0	0	0
7211 Kiukainen Uotinmäki	5629:167	2	5	5	3	4	0	0	0	3	3	5	1	1	6	3	20	0	0	4	0	0	3	2	12	12	13	7	0	0	0	0	1	0	0	0	0	0	0	0
7213 Kiukainen Uotinmäki	5629:184	2	5	5	4	4	0	0	0	3	3	5	1	1	3	4	6	0	0	2	0	0	3	2	10	11	13	7	0	0	1	0	0	0	0	0	0	0	0	0
7215 Kiukainen Uotinmäki	5629:196	2	5	5	4	4	0	2	1	4	3	5	1	1	7	5	15	0	0	3	0	0	2	2	14	14	13	7	0	0	0	0	1	0	0	0	0	0	0	35
7217 Kiukainen Uotinmäki	5629:208	7	4	4	2	3	0	0	0	3	3	5	2	3	2	1	12	0	0	3	0	0	3	2	9	11	13	7	0	0	0	0	1	0	0	0	0	0	0	0
7218 Kiukainen Uotinmäki	5629:221	2	5	5	4	4	0	0	0	3	4	9	2	3	0	0	29	0	0	7	0	0	3	1	12	11	13	7	0	1	0	0	0	0	0	0	0	0	0	0

Number Site	NM-number	M1	Q1	K1	SH	SK	PM	PN	PT	PS	PO	RM	RF	RP	RE	RA	KE1	KE2	KE3	KY1	KY2	KY3	Kt	V	X	Y	TY	VE	Km0	Kma	Kmb	Kmc	Kmd	Kme	Kmf	Kmg	Kmh	Kmi	Kmj	SIZE
7219 Kiukainen Uotinmäki	5629:220	2	5	4	4	3	0	0	0	3	3	5	1	1	0	0	21	0	0	4	0	0	3	1	8	7	13	7	0	0	0	0	1	0	0	0	0	0	0	0
7220 Kiukainen Uotinmäki	5629:221	7	5	4	2	2	0	0	0	5	3	5	2	3	4	4	12	0	0	3	0	0	3	1	7	13	13	7	0	0	0	0	1	0	0	0	0	0	0	0
7221 Kiukainen Uotinmäki	5629:214	2	5	5	4	4	0	1	0	3	4	3	1	1	0	0	12	0	0	3	0	0	33	1	10	12	13	7	0	0	0	0	1	0	0	0	0	0	0	0
7222 Kiukainen Uotinmäki	5843:14	2	5	5	4	4	0	1	0	2	3	5	1	1	0	0	21	0	0	4	0	0	3	1	10	7	13	7	0	0	0	0	1	0	0	0	0	0	0	0
7224 Kiukainen Uotinmäki	6192:3	2	4	5	4	4	0	0	0	5	4	2	1	1	10	4	27	12	0	5	3	0	3	3	11	7	12	7	0	0	0	0	1	1	0	0	0	0	0	0
7225 Kiukainen Uotinmäki	6192:3	2	5	5	4	3	0	1	0	3	4	5	1	1	0	0	15	0	0	3	0	0	2	1	7	10	13	7	0	0	0	0	1	0	0	0	0	0	0	0
7226 Kiukainen Uotinmäki	6192:3	2	5	5	3	4	0	1	0	2	4	6	2	6	0	0	12	0	0	3	0	0	3	1	6	9	13	7	0	0	0	0	1	0	0	0	0	0	0	0
7227 Kiukainen Uotinmäki	6126:33	7	5	5	2	2	0	0	0	3	3	5	1	1	0	0	12	0	0	3	0	0	3	1	7	9	13	7	0	0	0	0	1	0	0	0	0	0	0	0
7228 Kiukainen Uotinmäki	6126:34	2	5	5	4	4	0	1	1	4	4	6	1	1	7	1	15	0	0	3	0	0	2	1	8	15	13	7	0	0	0	0	1	0	0	0	0	0	0	0
7230 Kiukainen Uotinmäki	6496:4	2	3	4	4	4	0	2	0	3	4	5	1	1	2	2	4	12	0	2	3	0	3	3	10	7	13	7	0	1	0	0	1	0	0	0	0	0	0	0
7233 Säkkijärvi Ravi	898:55	2	4	5	4	4	0	0	0	5	4	5	1	2	2	4	27	12	2	5	2	3	3	4	8	7	12	7	0	0	0	0	1	1	1	0	0	0	0	0
7234 Säkkijärvi Ravi	7946:6	7	3	4	2	3	0	0	0	2	3	5	2	3	0	0	17	12	0	4	3	0	3	2	8	10	13	7	0	0	0	0	1	0	0	0	0	0	0	0
7277 Kiukainen Uotinmäki	11500:6	2	4	4	3	3	0	2	0	4	3	5	1	1	4	4	12	0	0	3	0	0	3	2	10	10	13	7	0	0	0	0	1	0	0	0	0	0	0	0
7279 Kiukainen Uotinmäki	11500:9	2	5	5	4	4	0	0	0	2	3	2	2	3	0	0	21	0	0	4	0	0	2	2	15	12	13	7	0	0	0	0	1	0	0	0	0	0	0	0
7280 Kiukainen Uotinmäki	11500:24	2	5	5	3	3	0	2	0	4	3	5	2	3	0	0	12	0	0	3	0	0	2	2	11	10	13	7	0	0	0	0	1	0	0	0	0	0	0	0
7281 Kiukainen Uotinmäki	11500:25	2	5	5	3	4	0	0	0	3	3	5	1	1	0	0	0	0	0	0	0	0	33	0	12	10	13	7	0	0	0	0	0	0	0	0	0	0	0	0
7283 Kiukainen Uotinmäki	11500:38	2	5	5	4	4	0	0	0	3	3	6	1	1	7	1	29	28	12	7	7	3	3	2	10	9	13	7	0	1	0	0	1	1	0	0	0	0	0	0
7284 Kiukainen Uotinmäki	11500:32	2	4	4	4	4	0	0	0	3	3	5	1	1	6	3	29	0	0	7	0	0	3	1	9	9	13	7	0	0	0	0	0	1	0	0	0	0	0	0
7285 Kiukainen Uotinmäki	11500:32	2	4	5	4	4	0	0	0	3	4	5	2	3	0	0	12	0	0	3	0	0	3	1	15	12	13	7	0	0	0	0	1	0	0	0	0	0	0	0
7287 Kiukainen Uotinmäki	11500:17	2	5	5	4	3	0	2	0	4	3	5	1	1	4	4	15	0	0	3	0	0	3	1	10	10	13	7	0	0	0	0	1	0	0	0	0	0	0	0
7288 Kiukainen Uotinmäki	11500:68	2	4	5	3	3	0	0	0	3	3	5	1	1	0	0	21	0	0	4	0	0	3	4	9	11	13	7	0	0	0	0	1	0	0	0	0	0	0	0
7290 Kiukainen Uotinmäki	11500:68	2	5	4	3	4	0	2	0	4	3	7	2	3	6	5	20	0	0	4	0	0	3	1	10	8	13	7	0	1	0	0	0	0	0	0	0	0	0	0
7292 Kiukainen Uotinmäki	11500:111	2	3	5	2	3	0	1	0	4	4	5	1	1	0	0	12	0	0	3	0	0	3	1	7	6	13	7	0	0	0	0	1	0	0	0	0	0	0	0
7293 Kiukainen Uotinmäki	11500:106	2	3	5	2	3	0	1	0	4	4	5	1	1	0	0	12	29	0	3	7	0	3	2	7	6	13	7	0	0	0	0	1	0	0	0	0	0	0	0
7294 Kiukainen Uotinmäki	11500:116	2	4	4	3	3	0	2	0	4	3	5	2	3	0	0	15	0	0	3	0	0	3	2	5	11	13	7	0	0	0	0	1	0	0	0	0	0	0	0
7297 Harjavalta Kaunismäki	11506:29	2	5	5	3	3	0	0	0	2	3	5	1	1	0	0	15	0	0	3	0	0	3	1	8	11	24	7	0	0	0	0	1	0	0	0	0	0	0	0
7298 Harjavalta Kaunismäki	11594:21	2	5	5	4	4	0	0	0	3	3	5	1	1	0	0	12	0	0	3	0	0	3	1	8	10	13	7	0	0	0	0	1	0	0	0	0	0	0	0
7307 Harjavalta Kaunismäki	11594:217	2	4	5	3	3	0	0	0	3	3	5	1	1	5	3	29	0	0	7	0	0	3	2	10	7	13	7	0	1	0	0	0	0	0	0	0	0	0	0
7308 Harjavalta Kaunismäki	11594:237	2	4	4	4	4	0	4	0	4	3	5	1	1	0	0	15	0	0	3	0	0	3	2	11	10	13	7	0	0	0	0	1	0	0	0	0	0	0	0
7316 Harjavalta Kaunismäki	11594:361	7	3	4	2	3	0	1	0	3	4	5	1	1	0	0	31	0	0	8	0	0	3	1	10	10	13	7	0	0	0	0	0	1	0	0	0	0	0	0
7317 Harjavalta Kaunismäki	11594:372	2	3	4	4	4	0	0	0	3	3	8	3	6	0	0	0	0	0	0	0	0	3	0	9	12	26	7	0	0	0	0	0	0	0	0	0	0	0	0
4066 Luopioinen Hietaniemi	16356:70	2	5	4	5	4	0	3	0	2	3	11	1	1	0	0	10	0	0	4	0	0	0	2	7	9	27	7	0	1	0	0	0	0	0	0	0	0	0	0
4075 Luopioinen Hietaniemi	16356:152	2	6	5	4	3	0	0	2	2	3	5	2	4	0	0	11	0	0	3	0	0	4	2	8	8	19	7	0	0	0	0	1	0	0	0	0	0	0	0
4076 Luopioinen Hietaniemi	16356:154	3	5	3	3	2	0	0	0	2	4	5	2	4	0	0	12	0	0	3	0	0	4	2	7	6	13	7	0	0	0	0	1	0	0	0	0	0	0	0
4079 Luopioinen Hietaniemi	16356:171	7	4	3	4	4	0	0	0	3	4	5	2	3	0	0	1	0	0	1	0	0	4	3	3	3	12	7	0	1	0	0	0	0	0	0	0	0	0	0
4083 Luopioinen Hietaniemi	16356:193	9	5	3	4	4	0	2	4	2	4	5	2	6	0	0	0	0	0	0	0	0	2	0	4	6	19	7	0	0	0	0	0	0	0	0	0	0	0	0
4087 Luopioinen Hietaniemi	16356:251	3	3	3	3	3	0	0	0	2	4	5	1	1	0	0	2	0	0	1	0	0	3	1	5	7	12	7	0	0	0	0	1	0	0	0	0	0	0	0
4089 Luopioinen Hietaniemi	16356:277	5	3	3	3	3	0	0	0	2	3	5	2	3	2	2	1	12	0	1	3	0	0	3	6	6	19	7	0	0	1	0	1	0	0	0	0	0	0	0
4118 Luopioinen Hietaniemi	16356:531	2	5	3	5	4	0	0	2	1	4	3	3	6	0	0	26	0	0	5	0	0	3	0	6	6	16	7	0	0	0	0	0	0	0	0	0	0	0	0
4122 Luopioinen Hietaniemi	17131:64,93,108	3	6	3	5	4	0	0	0	3	4	8	4	6	0	0	34	25	0	10	4	0	4	2	7	5	23	7	0	0	0	0	0	1	1	0	0	0	0	0
4123 Luopioinen Hietaniemi	17131:105	2	5	4	5	2	0	1	0	3	4	9	2	4	0	0	11	0	0	3	0	0	3	1	9	6	24	7	0	0	0	0	1	0	0	0	0	0	0	0
4124 Luopioinen Hietaniemi	17131:133	7	5	3	2	2	0	0	0	2	4	9	4	6	2	2	5	0	0	2	0	0	3	4	8	5	19	7	0	1	0	0	0	0	0	1	0	0	1	0
4128 Luopioinen Hietaniemi	17131:200	9	4	4	3	4	4	3	4	2	4	2	2	3	2	2	0	0	0	0	0	0	3	0	6	6	19	7	0	0	0	0	0	0	0	0	0	0	0	0
4130 Luopioinen Hietaniemi	17131:231	7	3	3	5	4	0	0	0	3	4	2	1	1	2	1	1	3	0	1	2	0	3	4	7	4	19	7	0	1	0	0	1	1	0	0	0	0	0	0
4132 Luopioinen Hietaniemi	17131:241	7	3	3	4	3	0	0	0	3	4	2	4	4	2	2	5	0	0	2	0	0	3	4	8	5	19	7	0	0	1	0	0	0	0	0	0	0	0	0
4141 Luopioinen Hietaniemi	17131:338	2	4	5	3	5	0	0	0	3	4	5	1	1	0	0	15	28	0	3	7	0	3	1	11	10	31	7	0	0	0	0	1	1	0	0	0	0	0	0
4142 Luopioinen Hietaniemi	17131:340,341	2	6	3	5	4	0	0	0	2	4	5	1	1	0	0	2	0	0	3	0	0	4	1	7	7	24	7	0	0	0	0	1	0	0	0	0	0	0	0
4146 Luopioinen Hietaniemi	17131:657	7	4	3	3	3	0	0	0	3	4	8	3	4	2	1	7	0	0	2	0	0	3	4	16	7	19	7	0	0	0	0	0	0	0	0	0	0	1	0
4156 Luopioinen Hietaniemi	17131:408	7	3	3	5	4	0	0	0	3	4	5	1	1	5	5	12	3	0	3	2	0	1	3	7	6	12	7	0	0	0	0	1	1	0	0	0	0	1	0

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4167 Luopioinen Hietaniemi	17131:658	9	3	4	3	2	0	2	0	3	4	8	4	4	2	1	6	0	0	2	0	0	3	5	11	7	19	7	0	0	1	0	0	0	0	0	0	0	0	0
4169 Luopioinen Hietaniemi	17131:685	2	3	3	5	4	0	0	0	2	4	5	1	1	0	0	14	30	0	3	8	0	4	2	11	8	13	7	0	0	0	0	1	1	0	0	0	0	0	0
4173 Luopioinen Hietaniemi	17131:683	2	3	4	4	3	0	4	0	2	4	8	3	2	2	2	4	0	0	2	0	0	2	4	8	7	19	7	0	0	1	0	0	0	0	0	0	0	0	0
4180 Luopioinen Hietaniemi	17131:791	2	2	2	5	4	0	0	0	3	4	5	1	1	5	1	29	0	0	7	0	0	3	2	7	5	12	7	0	1	0	0	0	0	0	0	0	0	0	0
4182 Luopioinen Hietaniemi	17131:796	7	4	4	3	3	0	0	0	3	4	6	1	1	5	1	17	15	0	4	3	0	3	3	10	10	12	7	0	0	0	0	0	0	0	0	0	0	1	0
4188 Luopioinen Hietaniemi	17131:848	3	6	2	5	4	0	0	0	3	4	8	4	2	0	0	28	4	34	9	2	10	1	2	11	4	23	7	0	0	0	0	0	1	1	0	0	0	0	0
4190 Luopioinen Hietaniemi	17131:872	2	3	3	5	4	0	0	0	3	4	9	3	4	2	2	7	0	0	4	0	0	4	3	9	7	24	7	0	0	0	0	1	0	0	0	0	0	0	0
4191 Luopioinen Hietaniemi	17131:874	7	3	3	5	4	0	0	0	3	4	8	4	4	2	1	4	4	0	2	12	0	3	2	10	7	16	7	0	1	0	0	0	0	0	0	0	0	0	0
4194 Luopioinen Hietaniemi	17131:944	7	5	3	4	4	0	2	0	3	4	8	4	6	0	0	4	17	14	2	4	3	1	5	5	5	13	7	0	0	1	0	1	1	0	0	0	0	0	0
4203 Luopioinen Hietaniemi	17131:1113	6	5	5	5	4	0	0	0	3	4	2	1	1	2	4	3	0	0	2	12	0	3	4	7	6	19	7	0	0	1	0	0	0	0	0	0	0	0	0
4204 Luopioinen Hietaniemi	17131:1113	2	4	4	4	4	0	0	0	3	4	5	3	4	2	1	4	0	0	2	12	0	4	4	7	7	19	7	0	1	0	0	0	0	0	0	0	0	0	0
4205 Luopioinen Hietaniemi	17131:1113	2	5	4	4	3	0	0	0	3	4	5	1	1	2	2	4	0	0	2	0	0	4	4	5	7	19	7	0	1	0	0	0	0	0	0	0	0	0	0
4207 Luopioinen Hietaniemi	17131:1163	2	5	4	5	4	0	0	0	3	4	9	1	1	2	2	4	0	0	2	0	0	4	4	6	5	19	7	0	1	0	0	0	0	0	0	0	0	0	0
4209 Luopioinen Hietaniemi	17131:1188	6	5	3	4	4	0	0	0	2	4	5	1	1	5	1	17	0	0	4	0	0	3	3	6	7	12	7	0	0	0	0	1	0	0	0	0	0	0	0
4210 Luopioinen Hietaniemi	17131:1169	9	4	3	4	3	0	0	0	3	4	8	3	4	0	0	5	0	0	2	0	0	3	3	10	6	24	7	0	0	1	0	0	0	0	0	0	0	0	0
4213 Luopioinen Hietaniemi	17131:1178	7	5	4	2	3	0	0	0	3	4	5	1	1	2	1	4	4	0	2	12	0	3	4	8	8	19	7	0	1	0	0	0	0	0	0	0	0	0	0
4216 Luopioinen Hietaniemi	17131:1242	7	4	4	4	3	0	0	0	3	4	5	1	1	2	1	4	12	31	2	3	8	3	4	10	6	12	7	0	1	0	0	1	0	0	0	0	0	0	0
4227 Luopioinen Hietaniemi	17131:1340	2	3	3	5	4	0	0	0	3	4	5	1	1	5	1	17	0	0	4	0	0	3	4	5	6	12	7	0	1	0	0	0	0	0	0	0	0	0	0
4251 Luopioinen Isosaari	13407:32	0	1	1	6	4	0	0	0	3	4	8	4	3	5	3	28	0	0	7	0	0	3	4	8	6	12	7	0	1	0	0	0	0	0	0	0	0	0	0
4252 Luopioinen Isosaari	13407:32	7	4	3	3	3	0	0	0	3	4	5	1	1	0	0	0	0	0	0	0	0	3	0	7	6	28	7	0	0	0	0	0	0	0	0	0	0	0	0
4253 Luopioinen Isosaari	13407:39	7	4	3	3	3	0	0	0	3	4	2	1	1	0	0	0	0	0	0	0	0	3	0	8	6	28	7	0	0	0	0	0	0	0	0	0	0	0	0
4254 Luopioinen Isosaari	13407:39	7	4	3	4	3	0	0	0	3	4	2	1	1	5	3	0	0	0	0	0	0	3	0	9	7	12	7	0	0	0	0	0	0	0	0	0	0	0	0
4255 Luopioinen Isosaari	13407:39	7	5	4	3	3	0	0	0	2	4	2	1	1	2	1	12	0	0	3	0	0	3	1	10	7	31	7	0	0	0	0	0	1	0	0	0	0	0	0
4256 Luopioinen Isosaari	13407:39	7	5	2	4	4	0	3	0	4	4	5	1	1	5	3	0	0	0	0	0	0	3	0	10	9	12	7	0	0	0	0	0	0	0	0	0	0	0	0
4257 Luopioinen Isosaari	13407:39	7	5	2	4	4	0	0	0	3	4	8	4	4	5	3	0	0	0	0	0	0	3	0	20	8	12	7	0	0	0	0	0	0	0	0	0	0	0	0
4260 Luopioinen Isosaari	13407:40,41	5	4	5	5	4	0	4	0	2	4	5	1	1	2	2	4	12	0	2	3	0	3	4	8	7	19	7	0	1	0	0	1	0	0	0	0	0	0	0
4263 Luopioinen Isosaari	13407:48	7	5	3	4	3	0	3	0	4	4	8	4	2	0	0	0	0	0	0	0	0	3	0	7	5	24	7	0	0	0	0	0	0	0	0	0	0	0	0
4265 Luopioinen Isosaari	13407:45	7	2	2	5	4	0	3	0	4	4	8	4	4	0	0	0	0	0	0	0	0	4	0	7	7	12	7	0	0	0	0	0	0	0	0	0	0	0	0
4269 Luopioinen Isosaari	13407:65	2	5	3	5	4	0	0	0	2	4	8	4	4	0	0	0	0	0	0	0	0	3	0	5	5	28	7	0	0	0	0	0	0	0	0	0	0	0	0
7503 Nakkila Penttala	5851:40	2	4	4	4	4	0	0	0	5	4	8	4	6	0	0	0	0	0	0	0	0	3	0	8	10	24	7	0	0	0	0	0	0	0	0	0	0	0	0
4275 Pälkäne Hylli	14545:48	5	5	5	5	4	0	0	0	3	4	5	1	1	0	0	0	0	0	0	0	0	4	0	6	6	28	7	0	0	0	0	0	0	0	0	0	0	0	0
4276 Pälkäne Hylli	14545:51	6	5	5	5	4	0	0	0	2	4	5	1	1	0	0	0	0	0	0	0	0	5	0	6	6	26	7	0	0	0	0	0	0	0	0	0	0	0	0
4278 Pälkäne Hylli	14545:54,65	6	5	5	4	4	0	0	0	2	4	5	1	1	0	0	0	0	0	0	0	0	4	0	7	7	28	7	0	0	0	0	0	0	0	0	0	0	0	0
4279 Pälkäne Hylli	14545:56	2	5	4	5	4	0	0	0	2	4	5	1	1	0	0	0	0	0	0	0	0	3	0	6	6	28	7	0	0	0	0	0	0	0	0	0	0	0	0
4281 Pälkäne Hylli	14545:88,90	2	5	5	5	4	0	0	0	2	4	5	1	1	0	0	0	0	0	0	0	0	3	0	5	6	28	7	0	0	0	0	0	0	0	0	0	0	0	0
4282 Pälkäne Hylli	14545:102	2	4	5	5	4	0	0	0	2	4	3	2	4	0	0	0	0	0	0	0	0	3	0	6	6	28	7	0	0	0	0	0	0	0	0	0	0	0	0
4286 Pälkäne Hylli	14545:176	3	6	2	5	3	0	0	0	3	4	8	5	2	0	0	0	0	0	0	0	0	3	0	4	4	28	7	0	0	0	0	0	0	0	0	0	0	0	0
4287 Pälkäne Hylli	14545:230	2	5	4	5	4	0	0	0	2	4	5	1	1	0	0	0	0	0	0	0	0	3	0	3	6	28	7	0	0	0	0	0	0	0	0	0	0	0	0
4292 Pälkäne Hylli	14545:245	2	5	4	5	4	0	0	0	2	4	5	1	1	0	0	0	0	0	0	0	0	4	0	6	6	28	7	0	0	0	0	0	0	0	0	0	0	0	0
4293 Pälkäne Hylli	14545:251	5	5	4	4	4	0	0	0	2	4	5	1	1	0	0	0	0	0	0	0	0	3	0	7	7	28	7	0	0	0	0	0	0	0	0	0	0	0	0
4297 Pälkäne Hylli	14545:160,188	2	4	3	4	4	0	0	0	2	4	5	2	6	0	0	0	0	0	0	0	0	3	0	2	2	28	7	0	0	0	0	0	0	0	0	0	0	0	0
4300 Pälkäne Hylli	14545:276	5	5	3	5	4	0	0	0	2	4	5	1	1	0	0	0	0	0	0	0	0	3	0	5	5	28	7	0	0	0	0	0	0	0	0	0	0	0	0
4301 Pälkäne Hylli	14545:291	5	5	5	5	4	0	0	0	2	4	5	4	2	0	0	0	0	0	0	0	0	2	0	8	8	28	7	0	0	0	0	0	0	0	0	0	0	0	0
4302 Pälkäne Hylli	14545:325,329	5	5	4	4	4	0	0	0	2	4	5	1	1	0	0	0	0	0	0	0	0	2	0	7	7	28	7	0	0	0	0	0	0	0	0	0	0	0	0
4305 Pälkäne Hylli	14545:315	5	5	5	5	4	0	0	0	2	4	5	1	1	0	0	0	0	0	0	0	0	3	0	5	9	28	7	0	0	0	0	0	0	0	0	0	0	0	0
4306 Pälkäne Hylli	14545:363	5	5	4	4	4	0	0	0	2	5	5	1	1	0	0	0	0	0	0	0	0	3	0	5	5	28	7	0	0	0	0	0	0	0	0	0	0	0	0
4307 Pälkäne Hylli	14545:408	2	4	5	4	4	0	0	0	2	5	5	1	1	0	0	0	0	0	0	0	0	3	0	5	5	28	7	0	0	0	0	0	0	0	0	0	0	0	0
4311 Pälkäne Hylli	14545:417	5	5	4	5	4	0	0	0	2	5	8	3	4	0	0	0	0	0	0	0	0	3	0	4	6	28	7	0	0	0	0	0	0	0	0	0	0	0	0
4312 Pälkäne Hylli	14545:317	5	6	3	4	4	0	0	0	2	4	5	3	4	0	0	0	0	0	0	0	0	3	0	6	10	28	7	0	0	0	0	0	0	0	0	0	0	0	0

Number Site	NM-number	M1	Q1	K1	SH	SK	PM	PN	PT	PS	PO	RM	RF	RP	RE	RA	KE1	KE2	KE3	KY1	KY2	KY3	Kt	V	X	Y	TY	VE	Km0	Kma	Kmb	Kmc	Kmd	Kme	Kmf	Kmg	Kmh	Kmi	Kmj	SIZE
4313 Pälkäne Hylli	14545:417	2	6	3	4	4	0	0	0	2	4	11	3	4	0	0	0	0	0	0	0	0	3	0	7	9	28	7	0	0	0	0	0	0	0	0	0	0	0	0
4315 Pälkäne Hylli	14545:439	5	5	4	4	4	0	0	0	2	4	5	2	4	0	0	0	0	0	0	0	0	3	0	5	5	28	7	0	0	0	0	0	0	0	0	0	0	0	0
4316 Pälkäne Hylli	14545:439	5	4	4	4	4	0	0	0	2	4	8	3	2	0	0	0	0	0	0	0	0	3	0	7	7	28	7	0	0	0	0	0	0	0	0	0	0	0	0
4318 Valkeakoski Hirvikallio	24793:328	2	2	3	3	3	0	6	0	4	4	8	3	4	2	2	2	0	0	1	0	0	4	0	7	8	24	7	0	1	0	0	0	0	0	0	0	0	0	0
4335 Laitila Hautvuori	2500:5	2	5	5	5	4	0	0	0	3	4	9	4	2	0	0	1	12	0	2	3	0	3	2	6	5	19	8	0	0	0	0	1	1	0	0	1	0	0	0
4336 Laitila Hautvuori	2500:5	2	5	4	4	3	2	0	2	2	4	5	3	2	0	0	1	0	0	1	0	0	4	2	5	5	19	8	0	0	1	0	0	0	0	0	0	0	0	0
4338 Laitila Hautvuori	4274:1	2	4	4	4	3	0	0	0	3	4	8	4	4	0	0	1	12	0	2	3	0	3	4	7	7	19	8	0	0	0	0	1	1	0	0	1	0	0	0
4339 Laitila Hautvuori	4274:1	2	5	4	4	3	0	0	0	3	4	5	3	4	0	0	1	12	0	2	3	0	3	3	7	5	19	8	0	0	0	0	1	1	0	0	1	0	0	0
4340 Laitila Hautvuori	4274:1	2	4	5	5	3	0	0	1	2	4	5	3	4	0	0	1	0	0	1	0	0	2	5	7	6	19	8	0	0	1	0	0	1	0	0	0	0	0	0
4342 Laitila Hautvuori	4274:1	2	5	4	4	3	0	0	0	2	4	8	4	4	0	0	15	0	0	3	0	0	4	2	5	7	19	8	0	0	0	0	1	0	0	0	0	0	0	0
4343 Laitila Hautvuori	4274:3	2	5	5	5	3	0	0	1	2	4	5	2	4	0	0	1	12	0	2	3	0	3	3	7	5	19	8	0	0	0	0	1	0	0	0	1	0	0	0
4344 Laitila Lalla	18196:1	7	5	3	2	2	0	3	0	2	4	5	3	3	6	2	18	15	0	4	12	0	3	3	9	8	19	8	0	0	1	0	1	0	0	0	0	0	0	0
4345 Laitila Lalla	18196:1	2	5	4	4	3	0	0	0	2	4	8	4	4	6	1	4	0	0	2	0	0	4	4	7	9	19	8	0	1	0	0	0	0	0	0	0	0	0	0
4348 Laitila Lalla	19265:15	7	4	3	5	4	0	0	0	3	4	5	1	1	0	0	14	0	0	3	0	0	4	1	8	8	13	8	0	0	0	0	1	0	0	0	0	0	0	0
4354 Laitila Lalla	19265:41,57	6	5	4	3	3	0	1	0	3	4	8	3	6	2	2	1	4	12	1	2	12	2	5	7	7	19	8	0	1	1	0	0	1	0	0	0	0	0	0
4355 Laitila Lalla	19265:45	7	3	3	3	3	0	0	0	3	4	5	4	2	2	1	6	11	0	2	3	0	4	2	8	6	19	8	0	1	0	0	1	0	0	0	0	0	0	0
4357 Laitila Lalla	19265:48	2	6	4	3	3	0	0	0	3	4	5	1	1	2	2	4	15	0	2	3	0	4	4	6	6	12	8	0	0	1	0	1	0	0	0	0	0	0	0
4364 Laitila Lalla	19265:79	2	5	4	4	3	0	0	0	2	3	5	2	3	4	1	14	0	0	3	0	0	5	1	7	5	19	8	0	0	0	0	1	0	0	0	0	0	0	0
4368 Laitila Lalla	19265:98	6	4	3	3	3	0	0	0	3	4	5	2	4	2	1	4	14	11	2	12	12	3	4	8	8	19	8	0	1	0	0	1	0	0	0	0	0	0	0
4370 Laitila Lalla	19404:10	7	5	4	2	2	0	0	0	5	3	8	3	3	2	4	4	14	12	2	3	12	2	4	7	10	19	8	0	0	1	0	1	1	0	0	0	0	0	0
4371 Laitila Lalla	19404:12,14	7	4	3	3	3	0	0	0	3	4	5	1	1	2	1	4	0	0	2	0	0	4	5	5	5	19	8	0	0	1	0	0	0	0	0	0	0	0	0
4374 Laitila Lalla	19404:37	7	4	3	3	2	0	0	0	3	3	5	1	1	2	1	3	0	0	2	0	0	4	4	8	8	27	8	0	0	1	0	0	0	0	0	0	0	0	0
4319 Laitila Uskelantie	22008:8	7	3	2	5	3	0	0	0	6	4	8	4	6	0	0	11	34	0	3	10	0	2	2	15	9	12	8	0	0	0	0	1	0	0	0	0	0	0	0
4321 Laitila Uskelantie	22008:23,40,45	7	4	3	3	3	0	0	0	3	4	8	4	6	0	0	7	17	0	4	4	0	2	2	11	20	12	8	0	0	0	0	1	0	0	0	0	0	0	0
4322 Laitila Uskelantie	22008:48	5	4	3	3	3	0	0	0	3	4	5	1	1	0	0	17	28	0	4	9	0	3	2	4	4	12	8	0	0	0	0	1	1	0	0	0	0	0	0
4324 Laitila Uskelantie	22008:78,90	7	3	3	3	3	0	0	0	3	4	5	3	3	0	0	14	34	0	3	10	0	3	3	10	13	12	8	0	0	0	0	0	1	0	0	0	0	0	0
4325 Laitila Uskelantie	22008:121	2	3	3	4	3	0	0	0	3	4	8	3	4	0	0	11	28	0	3	9	0	3	4	5	4	13	8	0	0	0	0	0	1	1	0	0	0	0	0
4326 Laitila Uskelantie	22008:146	7	4	4	2	2	0	0	0	2	3	5	4	3	5	3	14	0	0	3	0	0	2	4	10	13	12	8	0	0	0	0	0	1	0	0	0	0	0	0
4327 Laitila Uskelantie	22008:158,157	7	4	3	4	4	0	0	0	6	4	5	4	6	0	0	17	34	0	4	10	0	2	3	15	12	12	8	0	0	0	0	0	1	0	0	0	0	0	0
4328 Laitila Uskelantie	22008:154	7	4	4	3	3	0	0	0	2	4	2	2	4	0	0	27	0	0	5	0	0	4	5	31	8	12	8	0	0	0	0	0	0	1	0	0	0	0	0
4330 Laitila Uskelantie	22008:162,203	2	2	2	5	4	0	0	0	6	4	8	2	3	0	0	12	0	0	3	0	0	2	3	14	13	12	8	0	0	0	0	1	0	0	0	0	0	0	0
7238 Maaria Kärsämäki	8068:69	7	5	5	1	2	0	0	0	5	3	5	1	1	0	0	4	12	0	2	3	0	3	3	9	8	13	8	0	1	0	0	1	0	0	0	0	0	0	0
7240 Maaria Kärsämäki	8068:102	2	4	4	3	3	0	0	0	5	3	5	1	1	0	0	0	0	0	0	0	0	4	0	9	9	13	8	0	0	0	0	0	0	0	0	0	0	0	0
7241 Maaria Kärsämäki	8068:112	7	5	5	1	2	0	0	0	3	3	6	1	1	2	2	4	0	0	2	0	0	3	1	10	11	13	8	0	1	0	0	0	0	0	0	0	0	0	0
7242 Maaria Kärsämäki	8068:145	7	5	5	1	2	0	0	0	5	3	6	1	1	2	1	4	12	0	2	3	0	3	3	9	9	13	8	0	1	0	0	1	0	0	0	0	0	0	0
7243 Maaria Kärsämäki	8068:81	7	4	4	2	2	0	0	0	5	3	9	1	1	7	2	29	12	0	7	3	0	3	3	11	8	13	8	0	0	1	0	1	0	0	0	0	0	0	0
7244 Maaria Kärsämäki	8076:49	7	4	4	2	2	0	0	0	5	3	5	1	1	0	0	4	12	0	2	3	0	3	3	7	9	13	8	0	1	0	0	1	0	0	0	0	0	0	0
7251 Maaria Kärsämäki	8773:137	2	5	5	3	3	0	0	0	5	3	5	2	4	4	4	0	0	0	0	0	0	2	0	11	7	13	8	0	0	0	0	1	0	0	0	0	0	0	0
7252 Maaria Kärsämäki	8773:142	7	5	5	2	2	0	0	0	5	3	5	1	1	0	0	29	12	0	7	3	0	3	2	10	10	13	8	0	0	0	0	0	1	1	0	0	0	0	0
7254 Maaria Kärsämäki	8773:262	7	4	4	2	3	0	0	0	2	3	5	2	3	0	0	4	12	0	2	3	0	3	3	8	7	13	8	0	1	0	0	1	0	0	0	0	0	0	0
7256 Maaria Kärsämäki	8773:452	2	4	4	3	3	0	0	0	3	3	5	2	3	0	0	0	0	0	0	0	0	4	0	7	8	13	8	0	0	0	0	0	0	0	0	0	0	0	0
7258 Maaria Kärsämäki	8773:671	2	5	5	4	4	0	4	3	4	3	5	1	1	4	4	12	0	0	3	0	0	1	3	7	12	13	8	0	0	0	0	1	0	0	0	0	0	0	0
7260 Maaria Kärsämäki	8773:665	7	5	5	2	2	0	1	0	5	3	5	2	3	2	2	12	0	0	3	0	0	2	3	8	11	13	8	0	0	0	0	1	0	0	0	0	0	0	0
7263 Maaria Kärsämäki	8773:719	7	3	3	3	3	0	0	0	5	4	5	1	1	2	2	12	0	0	3	0	0	3	1	8	8	13	8	0	0	0	0	1	0	0	0	0	0	0	0
7264 Maaria Kärsämäki	8773:749	2	5	5	4	4	0	0	0	3	3	8	3	6	0	0	2	0	0	1	0	0	3	1	6	6	13	8	0	0	0	0	1	0	0	0	0	0	0	0
7270 Maaria Kärsämäki	8772:21	2	5	5	3	4	0	2	1	4	4	5	2	4	0	0	15	0	0	3	0	0	3	1	10	12	13	8	0	0	0	0	1	0	0	0	0	0	0	0
7271 Maaria Kärsämäki	8772:21	7	5	5	2	3	0	0	0	2	3	6	2	3	4	4	12	0	0	3	0	0	3	1	11	10	13	8	0	0	0	0	1	0	0	0	0	0	0	0
7272 Uskela Pirtinpelto	10490:8	7	4	4	2	2	0	0	0	2	3	6	1	1	0	0	15	0	0	3	0	0	3	1	11	9	13	8	0	0	0	0	1	0	0	0	0	0	0	0
7329 Dragsfjärd Jordbro	11720:55,59	7	5	5	1	2	0	0	0	3	3	5	1	1	0	0	29	12	0	7	3	0	3	2	9	11	13	8	0	0	0	0	1	1	0	0	0	0	0	0

Number Site	NM-number	M1	Q1	K1	SH	SK	PM	PN	PT	PS	PO	RM	RF	RP	RE	RA	KE1	KE2	KE3	KY1	KY2	KY3	Kt	V	X	Y	TY	VE	Km0	Kma	Kmb	Kmc	Kmd	Kme	Kmf	Kmg	Kmh	Kmi	Kmj	SIZE
7385 Maaria Kärsämäki	12882:479	2	4	4	4	3	0	1	0	4	3	9	2	4	4	4	12	0	0	3	0	0	3	1	9	6	24	8	0	0	0	0	1	0	0	0	0	0	0	0
7386 Maaria Kärsämäki	12882:466	2	4	3	4	4	0	0	0	2	4	5	1	1	6	1	12	0	0	3	0	0	3	1	9	9	13	8	0	0	0	0	1	0	0	0	0	0	0	0
7387 Maaria Kärsämäki	12882:497	2	4	3	4	4	0	0	0	3	4	9	3	4	6	2	12	0	0	3	0	0	3	1	11	4	13	8	0	0	0	0	1	0	0	0	0	0	0	0
7389 Maaria Kärsämäki	12882:511	7	5	4	2	2	0	1	1	4	3	6	1	1	0	0	12	0	0	3	0	0	3	2	8	11	13	8	0	0	0	0	1	0	0	0	0	0	0	0
7417 Maaria Kärsämäki	12816:85	7	5	4	2	3	0	0	0	3	3	5	1	1	0	0	15	0	0	3	0	0	3	1	10	11	13	8	0	0	0	0	1	0	0	0	0	0	0	0
7421 Maaria Kärsämäki	12816:177	7	4	3	2	3	0	2	0	5	3	8	2	4	0	0	12	0	0	3	0	0	3	1	8	8	13	8	0	0	0	0	1	0	0	0	0	0	0	0
7425 Maaria Kärsämäki	12816:381	2	5	5	4	4	0	4	0	4	3	8	4	6	0	0	0	0	0	0	0	0	3	0	6	8	26	8	0	0	0	0	0	0	0	0	0	0	0	0
7428 Maaria Kärsämäki	13075:42	2	5	4	4	4	0	0	0	3	3	5	1	1	0	0	12	0	0	3	0	0	3	2	9	9	13	8	0	0	0	0	1	0	0	0	0	0	0	0
7429 Maaria Kärsämäki	13075:54	2	4	4	4	4	0	0	0	5	4	5	1	1	0	0	15	0	0	3	0	0	3	1	7	7	13	8	0	0	0	0	1	0	0	0	0	0	0	0
7430 Maaria Kärsämäki	13075:52	7	4	3	2	3	0	0	0	3	3	8	3	4	0	0	12	29	0	3	7	0	3	2	17	12	13	8	0	0	0	0	1	1	0	0	0	0	0	0
7432 Maaria Kärsämäki	13075:85	7	4	4	2	3	0	2	0	4	3	9	2	4	4	4	12	29	0	3	7	0	3	2	11	5	13	8	0	0	0	0	1	1	0	0	0	0	0	0
7433 Maaria Kärsämäki	13075:192	2	5	5	4	4	0	0	0	5	4	3	2	3	0	0	4	12	0	2	3	0	3	2	9	8	13	8	0	1	0	0	1	1	0	0	0	0	0	0
7434 Maaria Kärsämäki	13075:216	2	5	5	4	4	0	1	0	5	3	5	1	1	2	2	4	12	0	2	3	0	3	4	10	8	13	8	0	0	1	0	1	0	0	0	0	0	0	0
7439 Maaria Kärsämäki	13075:252	2	3	4	3	3	0	2	0	2	3	9	2	4	6	1	32	17	0	9	4	0	3	3	11	8	13	8	0	0	0	0	1	1	0	0	0	0	0	0
7440 Maaria Kärsämäki	13075:250	2	4	5	4	4	0	0	0	6	3	7	1	1	2	5	4	15	0	2	3	0	3	3	9	8	13	8	0	1	0	0	1	1	0	0	0	0	0	0
7441 Maaria Kärsämäki	13075:263	2	3	4	4	4	0	0	0	6	3	5	1	1	0	0	22	0	0	4	0	0	3	2	7	7	13	8	0	0	0	0	1	0	0	0	0	0	0	0
7442 Maaria Kärsämäki	13075:272	7	4	4	2	2	0	1	0	3	3	5	1	1	0	0	15	29	0	3	7	0	3	2	11	6	13	8	0	0	0	0	1	1	0	0	0	0	0	0
7443 Maaria Kärsämäki	13075:288,333	7	4	4	2	3	0	2	0	4	3	5	1	1	0	0	4	0	0	2	0	0	3	3	7	9	13	8	0	0	1	0	0	0	0	0	0	0	0	0
7444 Maaria Kärsämäki	13075:324	2	5	3	4	4	0	0	0	2	3	7	1	1	0	0	4	12	0	2	3	0	3	3	7	8	13	8	0	0	0	1	0	0	0	0	0	0	0	0
7445 Maaria Kärsämäki	13075:323	2	5	4	4	4	0	1	0	5	4	2	2	3	0	0	15	0	0	3	0	0	3	1	8	9	13	8	0	0	0	0	1	0	0	0	0	0	0	0
7446 Maaria Kärsämäki	13075:325	7	3	3	2	3	0	0	0	3	4	5	1	1	0	0	21	0	0	4	0	0	3	1	6	6	13	8	0	0	0	0	1	0	0	0	0	0	0	0
7447 Maaria Kärsämäki	13075:354	7	3	4	2	3	0	0	0	5	4	5	1	1	0	0	12	0	0	3	0	0	3	1	8	10	13	8	0	0	0	0	1	0	0	0	0	0	0	0
7449 Maaria Kärsämäki	13075:457	7	4	4	2	3	0	0	0	3	3	5	1	1	0	0	12	0	0	3	0	0	3	2	11	10	13	8	0	0	0	0	1	0	0	0	0	0	0	0
7450 Maaria Kärsämäki	13075:476,477,470	2	5	5	4	4	0	0	0	2	3	8	2	6	0	0	4	12	0	2	3	0	3	4	9	9	13	8	0	1	0	0	1	1	0	0	0	0	0	0
7451 Maaria Kärsämäki	13075:176	7	4	4	2	3	0	0	0	3	3	8	1	1	2	2	4	12	0	2	3	0	3	3	8	7	13	8	0	1	0	0	1	1	0	0	0	0	0	0
7453 Maaria Kärsämäki	13075:–	7	4	5	2	3	0	0	0	3	3	8	3	4	0	0	12	0	0	3	0	0	3	1	7	11	13	8	0	0	0	0	1	0	0	0	0	0	0	0
7459 Maaria Kärsämäki	13075:845	7	4	4	2	3	0	2	0	4	3	5	1	1	0	0	12	0	0	3	0	0	3	1	8	11	24	8	0	0	0	0	1	0	0	0	0	0	0	0
7460 Maaria Kärsämäki	13075:865	7	4	4	2	3	0	1	0	3	3	5	1	1	0	0	12	0	0	3	0	0	3	1	6	7	13	8	0	0	0	0	1	0	0	0	0	0	0	0
7467 Maaria Kärsämäki	13075:1245	2	4	6	3	4	0	2	0	4	4	5	2	3	4	4	12	0	0	3	0	0	3	2	7	7	24	8	0	0	0	0	1	0	0	0	0	0	0	0
7469 Maaria Kärsämäki	13075:1293	7	3	3	3	3	0	1	0	3	4	9	1	1	0	0	12	29	0	3	7	0	3	2	10	7	13	8	0	0	0	0	1	1	0	0	0	0	0	0
7472 Maaria Kärsämäki	13075:1431	7	4	3	2	3	0	2	0	3	4	8	2	4	2	2	4	12	0	2	3	0	3	3	10	7	13	8	0	0	0	0	1	1	0	0	0	0	0	0
7473 Maaria Kärsämäki	13075:1426	7	2	3	3	4	0	1	0	3	3	5	1	1	0	0	12	15	0	3	3	0	3	3	9	9	13	8	0	0	0	0	1	0	0	0	0	0	0	0
7474 Maaria Kärsämäki	13075:1448	7	3	3	3	3	0	0	0	3	3	5	1	1	0	0	12	0	0	3	0	0	3	2	10	11	13	8	0	0	0	0	1	0	0	0	0	0	0	0
7478 Maaria Kärsämäki	13075:1448	7	3	3	3	3	0	1	0	4	4	5	1	1	0	0	4	12	0	2	3	0	3	2	10	8	24	8	0	1	0	0	1	0	0	0	0	0	0	0
7480 Maaria Kärsämäki	13075:1561	7	2	2	3	2	0	0	0	2	3	9	1	1	2	2	4	1	0	2	3	0	3	3	13	9	13	8	0	0	0	0	1	1	0	0	0	0	0	0
7482 Maaria Kärsämäki	13075:1561	7	3	3	2	3	0	0	0	2	3	5	1	1	0	0	12	0	0	3	0	0	4	2	9	8	13	8	0	0	0	0	1	0	0	0	0	0	0	0
7483 Maaria Kärsämäki	13075:1565	2	3	3	3	3	0	0	0	3	3	5	1	1	0	0	15	0	0	3	0	0	4	1	6	9	24	8	0	0	0	0	1	0	0	0	0	0	0	0
7485 Maaria Kärsämäki	13075:1628	7	3	3	3	3	0	2	2	4	4	3	3	3	0	0	12	0	0	3	0	0	3	2	8	7	13	8	0	0	0	0	1	0	0	0	0	0	0	0
7486 Maaria Kärsämäki	13075:1604	2	4	3	4	4	0	1	0	5	3	5	1	1	0	0	12	28	0	3	2	0	3	2	8	9	13	8	0	0	0	0	1	1	0	0	0	0	0	0
7487 Maaria Kärsämäki	13075:1645	7	3	3	3	2	0	0	0	3	3	5	1	1	0	0	4	12	0	2	3	0	3	2	10	9	13	8	0	1	0	0	1	0	0	0	0	0	0	0
7488 Maaria Kärsämäki	13075:1652	7	4	4	2	3	0	2	4	4	3	9	1	1	6	1	15	0	0	3	0	0	3	1	12	9	13	8	0	0	0	0	1	0	0	0	0	0	0	0
7489 Maaria Kärsämäki	13075:1652	7	3	3	3	2	0	2	0	4	3	5	1	1	6	2	29	12	0	7	3	0	3	1	9	9	13	8	0	0	0	0	1	1	0	0	0	0	0	0
7492 Maaria Kärsämäki	13075:1659	7	4	5	2	3	0	0	0	2	3	5	1	1	0	0	12	0	0	3	0	0	2	2	13	12	13	8	0	0	0	0	1	0	0	0	0	0	0	0
7493 Maaria Kärsämäki	13075:1767	7	3	3	3	2	0	0	0	3	3	5	1	1	2	2	12	0	0	3	0	0	4	1	11	8	13	8	0	0	0	0	1	0	0	0	0	0	0	0
7497 Maaria Kärsämäki	13075:1924	7	3	3	3	3	0	0	0	3	4	5	1	1	0	0	12	9	0	3	7	0	3	2	7	10	13	8	0	0	0	0	1	1	0	0	0	0	0	0
7499 Maaria Kärsämäki	13075:1901	7	4	4	2	2	0	0	0	4	3	5	1	1	0	0	12	0	0	3	0	0	3	1	8	6	13	8	0	0	0	0	1	0	0	0	0	0	0	0
4388 Nousiainen Koivumäki	19349:134	2	3	4	3	3	0	5	0	2	4	9	5	6	13	6	27	22	36	5	4	4	2	3	8	11	27	8	0	0	0	0	1	1	0	0	0	0	0	0
4389 Nousiainen Koivumäki	13349:142	2	4	5	5	3	0	3	0	3	4	9	5	5	5	6	27	0	0	5	0	0	1	2	9	14	27	8	0	0	0	0	0	0	1	0	0	0	0	0
4391 Nousiainen Koivumäki	19349:216	2	3	3	3	3	0	4	0	4	3	5	1	1	0	0	0	0	0	0	0	0	4	0	8	8	27	8	0	0	0	0	0	0	0	0	0	0	0	0

Number Site	NM-number	M1	Q1	K1	SH	SK	PM	PN	PT	PS	PO	RM	RF	RP	RE	RA	KE1	KE2	KE3	KY1	KY2	KY3	Kt	V	X	Y	TY	VE	Km0	Kma	Kmb	Kmc	Kmd	Kme	Kmf	Kmg	Kmh	Kmi	Kmj	SIZE
4394 Nousiainen Koivumäki	19349:232,276	2	4	4	4	3	0	4	0	4	4	9	3	4	0	0	0	0	0	0	0	0	4	0	7	4	27	8	0	0	0	0	0	0	0	0	0	0	0	0
4404 Nousiainen Koivumäki	19349:435	7	4	3	3	3	0	0	0	3	4	11	1	1	0	0	20	0	0	4	0	0	4	2	7	9	12	8	0	0	0	0	0	0	0	0	0	0	1	0
4405 Nousiainen Koivumäki	19349:443	7	4	3	3	3	0	0	0	2	4	5	4	4	0	0	0	0	0	0	0	0	3	0	6	7	27	8	0	0	0	0	0	0	0	0	0	0	0	0
7507 Paimio Toispuolojanummi	8955:15	2	4	4	3	3	0	0	0	3	3	3	3	3	0	0	0	0	0	0	0	0	1	0	8	10	24	8	0	0	0	0	0	0	0	0	0	0	0	0
7510 Paimio Toispuolojanummi	8955:38	2	4	5	4	4	0	1	0	5	4	9	1	1	0	0	4	0	0	2	0	0	2	1	10	5	24	8	0	0	0	0	0	0	1	0	0	0	0	0
7515 Paimio Toispuolojanummi	8955:123	7	5	4	2	3	0	0	0	5	3	3	2	3	6	2	29	12	0	7	2	0	2	4	11	13	8	8	0	0	1	0	1	1	0	0	0	0	0	0
7516 Paimio Toispuolojanummi	8955:132	2	4	5	2	2	0	0	0	5	3	5	1	1	0	0	29	0	0	7	0	0	3	3	10	12	8	8	0	1	0	0	0	0	0	0	0	0	0	0
7517 Paimio Toispuolojanummi	8955:163	7	5	4	2	3	2	0	0	5	3	3	2	3	0	0	29	15	0	7	2	0	3	3	10	9	8	8	0	0	1	0	1	0	0	0	0	0	0	0
7518 Paimio Toispuolojanummi	8955:163	2	3	5	3	3	0	0	0	5	4	7	1	1	0	0	4	0	0	2	0	0	3	2	8	15	24	8	0	0	1	0	0	0	0	0	0	0	0	0
7520 Paimio Toispuolojanummi	8955:163	2	4	5	2	3	0	0	0	5	3	5	1	1	0	0	2	0	0	1	0	0	0	2	8	8	24	8	0	0	0	0	1	0	0	0	0	0	0	0
7523 Paimio Toispuolojanummi	8955:245	2	3	3	4	4	0	1	0	5	4	8	3	4	0	0	0	0	0	0	0	0	0	0	7	10	24	8	0	0	0	0	0	0	0	0	0	0	0	0
7526 Paimio Toispuolojanummi	9390:4	2	5	4	2	3	0	0	0	5	3	5	1	1	0	0	29	15	0	7	3	0	0	3	11	13	24	8	0	0	1	0	1	0	0	0	0	0	0	0
7528 Paimio Toispuolojanummi	9390:14	7	5	4	2	3	0	0	0	5	3	5	1	1	0	0	29	14	0	6	3	0	3	3	13	15	8	8	0	0	1	0	1	0	0	0	0	0	0	0
7529 Paimio Toispuolojanummi	9390:22	2	4	4	3	3	0	0	0	5	5	5	1	1	0	0	25	12	0	2	3	0	3	3	5	5	8	8	0	0	1	0	1	0	0	0	0	0	0	0
7530 Paimio Toispuolojanummi	9390:26	2	5	4	4	4	0	0	0	3	5	5	1	1	0	0	13	29	0	3	6	0	4	4	8	8	8	8	0	0	0	0	1	0	0	0	0	0	1	0
7531 Paimio Toispuolojanummi	9390:9	10	4	3	3	3	0	0	0	3	3	5	1	1	0	0	14	29	0	3	7	0	3	3	10	9	13	8	0	0	0	0	1	0	0	0	0	0	1	0
7537 Paimio Toispuolojanummi	9390:58	10	4	4	2	3	0	1	0	5	4	5	1	1	0	0	29	14	0	7	3	0	3	4	8	10	8	8	0	1	0	0	1	0	0	0	0	0	0	0
7540 Paimio Toispuolojanummi	9390:78	0	0	0	4	4	0	0	0	5	5	5	2	4	0	0	2	0	0	1	0	0	4	3	7	8	13	8	0	0	0	0	1	0	0	0	0	0	0	0
7541 Paimio Toispuolojanummi	9390:120	2	3	4	4	4	0	0	0	5	3	5	1	1	0	0	29	16	0	7	3	0	2	3	8	10	13	8	0	0	1	0	1	0	0	0	0	0	0	0
7543 Paimio Toispuolojanummi	9390:120	2	3	4	3	3	0	0	0	5	4	5	1	1	0	0	29	16	0	7	3	0	3	3	7	10	13	8	0	0	1	0	1	1	0	0	0	0	0	0
7545 Paimio Toispuolojanummi	9390:124	7	4	4	2	3	0	0	0	5	3	7	1	1	0	0	16	0	0	3	0	0	4	1	17	17	24	8	0	0	0	0	1	0	0	0	0	0	0	0
7546 Paimio Toispuolojanummi	9390:124	2	4	4	4	4	0	0	0	5	4	5	1	1	0	0	29	16	0	7	3	0	2	4	9	10	13	8	0	0	1	0	1	0	0	0	0	0	0	0
7547 Paimio Toispuolojanummi	9390:128	2	4	4	4	3	2	0	0	5	3	6	1	1	0	0	3	12	0	2	3	0	4	3	9	15	24	8	0	1	0	0	1	0	0	0	0	0	0	0
7552 Paimio Toispuolojanummi	9390:130	10	3	3	3	3	2	0	0	5	3	7	1	1	0	0	29	13	0	7	3	0	3	3	10	13	13	8	0	0	1	0	1	0	0	0	0	0	0	0
7556 Paimio Toispuolojanummi	9390:153	7	4	4	2	2	0	0	0	5	3	5	1	1	0	0	36	11	0	4	3	0	2	4	11	11	13	8	0	0	1	0	1	0	0	0	0	0	0	0
7557 Paimio Toispuolojanummi	9390:128	2	4	4	4	4	0	0	0	5	4	5	1	1	0	0	29	0	0	7	0	0	3	3	11	12	13	8	0	0	0	0	0	1	0	1	0	0	0	0
7574 Paimio Toispuolojanummi	9390:204	7	4	4	2	2	0	0	0	5	3	5	1	1	9	2	29	0	0	7	0	0	4	3	13	12	13	8	0	1	0	0	0	0	0	0	0	0	0	0
7578 Paimio Toispuolojanummi	9390:241	2	4	5	4	4	0	0	0	5	4	6	2	3	8	1	13	0	0	3	0	0	4	1	15	12	13	8	0	0	0	0	0	1	0	0	0	0	0	0
7595 Paimio Toispuolojanummi	9605:12	10	4	4	3	3	0	0	0	5	3	5	1	1	0	0	29	13	0	7	3	0	2	3	5	10	13	8	0	0	0	0	1	0	0	0	0	0	1	0
4979 Salo Ketohaka	20562:253	2	6	5	3	3	0	4	0	4	4	8	3	5	4	4	16	7	0	3	4	0	2	1	7	13	24	8	0	0	0	0	1	0	0	0	0	0	0	0
4981 Salo Ketohaka	20562:284	2	4	3	3	3	0	0	3	2	4	5	1	1	0	0	16	0	0	1	0	0	2	1	9	9	19	8	0	0	0	0	1	0	0	0	0	0	0	0
4985 Salo Ketohaka	20562:288	2	6	5	3	3	0	0	3	2	4	11	1	1	0	0	16	0	0	3	0	0	3	1	8	11	19	8	0	0	0	0	1	0	0	0	0	0	0	0
4986 Salo Ketohaka	20562:291	2	4	4	3	3	0	1	0	2	3	8	3	5	0	0	16	0	0	3	0	0	3	1	7	7	24	8	0	0	0	0	0	0	0	0	0	0	0	0
4988 Salo Ketohaka	20562:311	2	4	4	4	4	0	2	0	4	4	9	3	5	4	4	16	0	0	3	0	0	3	1	8	8	24	8	0	0	0	0	1	0	0	0	0	0	0	0
4989 Salo Ketohaka	20562:310	2	4	5	4	4	0	2	4	2	4	7	3	5	0	0	16	0	0	3	0	0	2	1	8	10	19	8	0	0	0	0	1	0	0	0	0	0	0	0
4990 Salo Ketohaka	20562:358	2	4	4	4	4	0	2	4	2	4	8	3	5	0	0	16	0	0	3	0	0	1	1	10	14	19	8	0	0	0	0	1	0	0	0	0	0	0	0
4991 Salo Ketohaka	20562:358	2	6	5	4	4	0	2	5	3	4	5	4	5	0	0	16	0	0	3	0	0	2	1	10	12	19	8	0	0	0	0	1	0	0	0	0	0	0	0
4993 Salo Ketohaka	20562:402	8	4	4	4	4	0	0	0	5	4	8	5	6	0	0	2	0	0	1	0	0	3	1	6	6	24	8	0	0	0	0	1	0	0	0	0	0	0	0
4994 Salo Ketohaka	20562:476	2	3	4	4	4	0	1	0	3	4	2	1	1	0	0	0	0	0	0	0	0	3	0	11	7	24	8	0	0	0	0	0	0	0	0	0	0	0	0
4976 Vammala Haapakallio	15661:129	8	3	3	4	4	0	2	0	4	4	9	3	6	0	0	0	0	0	0	0	0	3	0	8	6	27	8	0	0	0	0	0	0	0	0	0	0	0	0
4977 Vammala Haapakallio	15661:111	8	4	3	4	4	0	2	0	4	4	8	3	6	0	0	0	0	0	0	0	0	3	0	6	6	27	8	0	0	0	0	0	0	0	0	0	0	0	0
4815 Askola Rahkoissuo	13303:125	2	5	5	0	0	0	6	5	8	4	2	0	0	28	0	0	7	0	0	0	0	3	4	7	6	12	9	0	1	0	0	0	0	0	0	0	0	0	0
4819 Askola Rahkoissuo	13303:257	2	4	3	3	4	0	1	0	6	4	5	3	4	0	0	0	0	0	0	0	0	3	0	4	5	28	9	0	0	0	0	0	0	0	0	0	0	0	0
4820 Askola Rahkoissuo	13303:256	2	4	3	3	4	0	1	0	6	5	8	5	6	0	0	0	0	0	0	0	0	3	0	4	6	28	9	0	0	0	0	0	0	0	0	0	0	0	0
4776 Askola Rahkoissuo	12373:3	5	6	4	4	2	0	1	0	2	4	5	2	4	0	0	0	0	0	0	0	0	3	0	6	8	28	9	0	0	0	0	0	0	0	0	0	0	0	0
4777 Askola Rahkoissuo	12373:23	2	5	3	5	4	0	2	0	4	4	5	3	4	0	0	0	0	0	0	0	0	3	0	5	4	28	9	0	0	0	0	0	0	0	0	0	0	0	0
4783 Askola Rahkoissuo	12931:45	2	4	4	3	3	0	1	0	2	3	5	2	3	0	0	0	0	0	0	0	0	3	0	4	4	28	9	0	0	0	0	0	0	0	0	0	0	0	0
4784 Askola Rahkoissuo	12931:94	2	5	5	5	4	0	5	0	4	4	8	4	6	0	0	0	0	0	0	0	0	3	0	6	6	27	9	0	0	0	0	0	0	0	0	0	0	0	0
4787 Askola Rahkoissuo	12931:172	2	5	4	4	3	0	0	0	3	4	5	2	3	0	0	1	0	0	1	0	0	4	1	7	7	28	9	0	0	0	0	0	1	0	0	0	0	0	0

Number Site	NM-number	M1	Q1	K1	SH	SK	PM	PN	PT	PS	PO	RM	RF	RP	RE	RA	KE1	KE2	KE3	KY1	KY2	KY3	Kt	V	X	Y	TY	VE	Km0	Kma	Kmb	Kmc	Kmd	Kme	Kmf	Kmg	Kmh	Kmi	Kmj	SIZE
4788 Askola Rahkoissuo	12931:175	2	5	4	4	2	0	1	0	4	4	8	4	4	0	0	0	0	0	0	0	0	3	0	5	6	28	9	0	0	0	0	0	0	0	0	0	0	0	0
4791 Askola Rahkoissuo	12931:225	2	5	4	3	2	0	3	0	4	3	8	4	4	0	0	0	0	0	0	0	0	3	0	8	6	27	9	0	0	0	0	0	0	0	0	0	0	0	0
4804 Askola Rahkoissuo	13067:266	2	6	5	4	4	0	1	0	2	4	8	4	6	0	0	0	0	0	0	0	0	33	0	8	7	28	9	0	0	0	0	0	0	0	0	0	0	0	0
4807 Askola Rahkoissuo	13067:322	2	5	4	4	4	0	0	0	2	4	8	5	6	0	0	0	0	0	0	0	0	33	0	8	7	28	9	0	0	0	0	0	0	0	0	0	0	0	0
4809 Askola Rahkoissuo	13303:12	2	4	4	5	5	0	2	0	4	4	8	5	6	0	0	0	0	0	0	0	0	33	0	7	7	26	9	0	0	0	0	0	0	0	0	0	0	0	0
4810 Askola Rahkoissuo	13303:12	2	4	3	5	5	0	2	0	4	4	8	5	6	0	0	0	0	0	0	0	0	33	0	6	6	27	9	0	0	0	0	0	0	0	0	0	0	0	0
4811 Askola Rahkoissuo	13303:16	2	5	4	4	4	0	0	0	2	4	8	5	6	0	0	0	0	0	0	0	0	3	0	6	7	33	9	0	0	0	0	0	0	0	0	0	0	0	0
4812 Askola Rahkoissuo	13303:85	2	4	3	5	4	0	1	0	3	4	8	5	6	0	0	0	0	0	0	0	0	3	0	5	7	33	9	0	0	0	0	0	0	0	0	0	0	0	0
4825 Askola Rahkoissuo	18928:15	2	3	3	4	2	0	0	0	2	3	8	3	4	0	0	0	0	0	0	0	0	3	0	7	8	28	9	0	0	0	0	0	0	0	0	0	0	0	0
4828 Askola Rahkoissuo	18928:36	2	5	4	4	2	0	0	0	2	4	9	2	4	6	3	0	0	0	0	0	0	3	0	7	5	26	9	0	0	0	0	0	0	0	0	0	0	0	0
4830 Askola Rahkoissuo	18928:39	2	5	4	4	3	0	0	0	2	3	5	3	6	0	0	0	0	0	0	0	0	3	0	8	8	32	9	0	0	0	0	0	0	0	0	0	0	0	0
7319 Dragsfjärd Jordbro	11720:11	7	4	4	2	3	0	0	0	5	4	9	1	1	0	0	12	0	0	3	0	0	3	1	7	7	13	9	0	0	0	0	1	0	0	0	0	0	0	0
7320 Dragsfjärd Jordbro	11720:14	7	3	4	2	3	0	0	0	5	3	5	1	1	0	0	12	0	0	3	0	0	3	1	6	6	13	9	0	0	0	0	1	0	0	0	0	0	0	0
7321 Dragsfjärd Jordbro	11720:20	7	4	4	2	3	0	0	0	5	3	5	1	1	2	3	3	0	0	2	0	0	3	4	7	7	13	9	0	0	0	0	1	0	0	0	0	0	0	0
7323 Dragsfjärd Jordbro	11720:23	2	4	4	4	4	0	0	0	5	4	5	1	1	6	2	12	29	0	3	7	0	3	2	10	11	13	9	0	0	0	0	1	1	0	0	0	0	0	0
7325 Dragsfjärd Jordbro	11720:29	7	4	4	2	3	0	1	0	5	3	6	1	1	0	0	0	0	0	0	0	0	3	0	6	9	17	9	0	0	0	0	0	0	0	0	0	0	0	0
7326 Dragsfjärd Jordbro	11720:36	7	4	3	2	2	0	0	0	5	3	5	2	3	0	0	4	15	12	2	3	3	3	3	7	11	13	9	0	0	0	0	0	1	1	0	0	0	0	0
7329 Dragsfjärd Jordbro	11720:55,59	7	5	4	2	3	0	0	0	3	4	9	1	1	0	0	12	0	0	3	0	0	4	1	8	10	17	9	0	0	0	0	0	1	0	0	0	0	0	0
7330 Dragsfjärd Jordbro	11720:56	7	4	4	2	2	0	4	0	4	3	9	1	1	0	0	21	17	0	8	4	0	3	3	10	7	13	9	0	0	0	0	0	1	1	0	0	0	0	0
7331 Dragsfjärd Jordbro	11720:58	7	4	5	2	2	0	0	0	3	3	8	2	4	4	4	29	0	0	2	0	0	4	1	10	9	22	9	0	0	0	0	0	0	1	0	0	0	0	0
7341 Dragsfjärd Jordbro	11721:6	7	4	4	2	2	0	1	0	4	3	5	2	4	0	0	15	0	0	3	0	0	3	3	10	10	13	9	0	0	0	0	0	1	0	0	0	0	0	0
7346 Dragsfjärd Langång	12563:23	2	5	5	4	4	0	0	0	2	4	3	2	3	0	0	9	0	0	7	0	0	3	2	8	10	13	9	0	0	0	1	0	0	0	0	0	0	0	0
7351 Dragsfjärd Langång	12686:151	2	4	4	4	3	0	0	0	3	3	5	1	1	0	0	19	12	0	4	3	0	3	2	7	6	13	9	0	0	0	0	0	1	0	0	0	0	0	0
7352 Dragsfjärd Langång	12686:178	7	5	5	2	2	0	1	1	4	3	5	1	1	6	1	12	0	0	3	0	0	3	2	7	10	13	9	0	0	0	0	0	1	0	0	0	0	0	0
7353 Dragsfjärd Langång	12686:182	7	4	4	2	2	0	1	0	3	3	5	1	1	2	2	4	0	0	2	0	0	4	3	9	9	13	9	0	1	0	0	0	0	0	0	0	0	0	0
7356 Dragsfjärd Langång	12686:189	7	4	4	2	3	0	0	0	2	3	5	2	3	2	2	15	0	0	3	0	0	3	2	11	8	13	9	0	0	0	0	1	0	0	0	0	0	0	0
7358 Dragsfjärd Langång	12686:216	7	4	4	3	3	0	1	0	3	3	5	2	3	0	0	15	0	0	3	0	0	3	1	7	7	13	9	0	0	0	0	1	0	0	0	0	0	0	0
7362 Dragsfjärd Langång	12686:290	2	3	4	4	3	0	0	0	2	3	5	1	1	1	2	2	0	0	1	0	0	4	2	10	10	13	9	0	0	0	0	0	0	1	0	0	0	0	0
7363 Dragsfjärd Langång	12686:311	7	5	5	2	3	0	0	0	3	3	3	2	3	6	2	15	29	0	3	7	0	2	4	9	11	13	9	0	1	0	0	1	1	0	0	0	0	0	0
7365 Dragsfjärd Langång	12686:320	7	4	4	3	3	0	0	0	3	4	5	1	1	6	1	29	12	0	7	3	0	3	2	7	5	13	9	0	1	0	0	1	0	0	0	0	0	0	0
7366 Dragsfjärd Langång	12686:319	2	4	4	3	3	0	0	0	5	3	7	1	1	2	2	4	15	0	2	3	0	2	3	8	8	13	9	0	1	0	0	1	0	0	0	0	0	0	45
7369 Dragsfjärd Langång	12686:356	2	4	5	4	4	0	1	0	5	3	5	2	3	0	0	12	0	0	3	0	0	3	2	7	10	13	9	0	0	0	0	1	0	0	0	0	0	0	0
7370 Dragsfjärd Langång	12686:347	7	4	4	2	3	0	2	0	3	4	2	1	1	0	0	12	0	0	3	0	0	3	1	13	8	13	9	0	0	0	0	1	0	0	0	0	0	0	0
7376 Dragsfjärd Langång	12686:371	7	5	5	2	2	0	0	0	2	3	5	1	1	0	0	12	0	0	3	0	0	3	1	9	9	13	9	0	0	0	0	1	0	0	0	0	0	0	0
7377 Dragsfjärd Langång	12686:395	7	4	4	2	2	0	2	0	4	3	5	2	3	2	1	4	15	0	2	3	0	3	3	9	11	13	9	0	1	0	0	1	0	0	0	0	0	0	0
7378 Dragsfjärd Langång	12686:390	2	3	5	4	4	0	0	0	3	4	5	1	1	0	0	4	12	0	2	3	0	3	2	5	7	13	9	0	1	0	0	1	0	0	0	0	0	0	0
7379 Dragsfjärd Langång	12686:393	2	3	3	3	3	0	0	0	3	3	5	1	1	2	2	14	0	0	3	0	0	3	1	9	12	13	9	0	0	0	0	1	0	0	0	0	0	0	0
7250 Espoo Finns	8345:53	2	3	3	4	4	0	2	0	5	4	8	3	4	2	1	4	0	0	2	0	0	3	2	5	7	19	9	0	1	0	0	0	0	0	0	0	0	0	0
7592 Espoo Mickelsåkern	8745:13	2	4	3	4	4	2	0	0	5	4	8	1	1	0	0	29	17	0	7	4	0	3	3	8	8	13	9	0	1	0	0	0	1	0	0	0	0	0	0
7593 Espoo Morby	7311:19	t	2	4	5	4	4	0	4	2	5	4	9	2	4	3	4	11	3	0	3	2	0	2	3	8	7	24	9	0	1	0	0	1	0	0	0	0	0	0
5005 Helsinki Malminkartano	23940:179	8	4	3	5	5	0	0	0	5	4	8	2	4	0	0	29	0	0	6	0	0	3	4	6	7	12	9	0	0	1	0	0	0	0	0	0	0	0	0
5008 Helsinki Malminkartano	23940:186	2	4	4	4	4	0	0	0	2	4	5	1	1	0	0	12	3	0	3	1	0	3	4	8	9	27	9	0	1	0	0	1	0	0	0	0	0	0	0
4882 Karjaa Hagnäs IIb	20872:17,40,50	7	5	4	4	5	0	0	0	6	4	5	3	5	6	3	27	17	0	5	4	0	3	5	7	5	12	9	0	0	0	0	0	1	0	0	0	0	1	0
4883 Karjaa Hagnäs IIb	20872:38	7	4	5	3	4	0	0	0	3	4	8	3	4	0	0	0	0	0	0	0	0	2	0	6	10	16	9	0	0	0	0	0	0	0	0	0	0	0	0
4884 Karjaa Hagnäs IIb	20872:39	7	5	5	2	3	0	0	0	2	3	8	4	4	0	0	0	0	0	0	0	0	3	0	12	8	27	9	0	0	0	0	0	0	0	0	0	0	0	0
4886 Karjaa Hagnäs IIb	20872:51,52	7	5	5	2	4	0	0	0	3	4	8	5	6	5	3	34	17	0	10	4	0	2	0	12	7	12	9	0	0	0	0	1	1	0	0	0	0	0	0
4887 Karjaa Hagnäs IIb	20872:49	7	4	5	5	4	0	0	0	3	4	8	4	6	5	3	27	0	0	5	0	0	2	5	5	5	12	9	0	0	0	0	0	1	0	0	0	0	0	0
4888 Karjaa Hagnäs IIb	20872:55	7	5	3	2	2	0	0	0	3	3	3	2	3	0	0	0	0	0	0	0	0	3	0	7	7	24	9	0	0	0	0	0	0	0	0	0	0	0	0
4893 Karjaa Hagnäs IIb	20872:99	9	3	3	4	3	0	0	0	3	4	6	1	1	0	0	1	17	0	1	4	0	3	2	6	6	19	9	0	0	0	0	0	1	1	0	0	0	0	0

Number Site	NM-number	M1	Q1	K1	SH	SK	PM	PN	PT	PS	PO	RM	RF	RP	RE	RA	KE1	KE2	KE3	KY1	KY2	KY3	Kt	V	X	Y	TY	VE	Km0	Kma	Kmb	Kmc	Kmd	Kme	Kmf	Kmg	Kmh	Kmi	Kmj	SIZE
4894 Karjaa Hagnäs IIb	20872:94	9	4	3	4	3	0	0	0	3	4	6	2	3	0	0	1	0	0	1	0	0	4	3	8	8	19	9	0	0	1	0	0	1	0	0	0	0	0	0
4899 Karjaa Hagnäs IIb	20872:152	2	6	5	3	3	0	0	0	1	4	9	5	5	0	0	16	0	0	3	0	0	3	1	14	10	24	9	0	0	0	0	1	0	0	0	0	0	0	0
4902 Karjaa Hagnäs IIb	20872:261,270	2	5	4	4	3	0	4	0	4	4	5	1	1	2	1	4	0	0	3	0	0	0	3	6	6	19	9	0	0	1	0	0	0	0	0	0	0	0	0
4996 Karjaa Östergård	21238:28	2	6	4	4	4	0	1	0	2	4	5	3	5	0	0	31	0	0	8	0	0	2	1	6	12	24	9	0	0	0	0	0	1	0	0	0	0	0	0
4999 Karjaa Östergård	21238:70	2	6	4	4	4	0	0	0	5	4	9	3	5	0	0	0	0	0	0	0	0	2	0	7	10	24	9	0	0	0	0	0	0	0	0	0	0	0	0
4834 Kirkkonummi Koivistosveden	7734:11	7	4	3	3	3	0	3	0	4	4	8	3	4	0	0	0	0	0	0	0	0	3	0	7	7	12	9	0	0	0	0	0	0	0	0	0	0	0	0
4837 Kirkkonummi Koivistosveden	7734:15	7	4	3	3	3	0	1	0	4	4	8	3	4	0	0	0	0	0	0	0	0	3	0	12	12	12	9	0	0	0	0	0	0	0	0	0	0	0	0
7620 Lohja Korsbäck	12562:2	2	4	4	4	4	0	4	0	4	4	8	4	6	2	2	25	22	0	4	4	0	2	3	7	9	24	9	0	0	0	0	0	0	0	0	0	0	1	0
7570 Lohja Pinolahti	12111:13	2	3	3	4	4	0	0	0	5	4	5	2	4	0	0	0	0	0	0	0	0	5	0	5	5	26	9	0	0	0	0	0	0	0	0	0	0	0	0
7582 Lohja Pinolahti	11530:2	2	4	5	4	4	2	0	0	5	3	8	3	6	0	0	2	36	0	1	4	0	2	4	5	6	19	9	0	0	1	0	0	0	0	0	0	0	0	0
7623 Lohja Pinolahti	12341:1	7	1	1	3	4	0	1	1	4	5	8	3	4	0	0	2	0	0	1	0	0	4	1	11	10	24	9	0	1	0	0	0	0	0	0	0	0	0	0
7274 Ähtävä Kvarnnabba	10173:11	2	5	4	4	4	0	0	0	5	4	9	1	1	0	0	29	2	0	7	1	0	3	5	10	8	12	9	1	1	0	0	1	1	0	0	0	0	0	0
7275 Ähtävä Kvarnnabba	10173:31	2	2	2	3	3	0	0	0	3	4	8	2	4	0	0	29	17	0	7	4	0	3	3	8	8	15	9	0	0	0	0	1	1	0	0	0	0	0	0
7684 Perniö Preitti4	30647:1	2	4	5	3	3	0	1	0	3	4	8	4	4	0	0	0	0	0	0	0	0	3	0	8	8	24	9	0	0	0	0	0	0	0	0	0	0	0	0
7605 Pohja Järnvik	11936:16	2	4	5	3	3	0	4	0	4	4	5	3	4	0	0	0	0	0	0	0	0	4	0	5	5	24	9	0	0	0	0	0	0	0	0	0	0	0	0
7610 Pohja Järnvik	11936:34	2	4	4	4	4	0	2	0	4	4	8	2	4	0	0	0	0	0	0	0	0	2	0	7	6	24	9	0	0	0	0	0	0	0	0	0	0	0	0
7611 Pohja Järnvik	11936:34	2	4	5	4	4	0	2	0	4	3	8	3	4	0	0	0	0	0	0	0	0	2	0	7	6	24	9	0	0	0	0	0	0	0	0	0	0	0	0
7616 Pohja Järnvik	11936:39,40	2	4	4	3	3	0	4	0	4	4	5	4	5	2	2	22	0	0	4	0	0	2	1	7	9	24	9	0	0	0	0	0	0	0	1	0	0	0	0
4841 Porvoo Böle	19789:319	2	4	5	5	4	0	0	4	2	4	5	4	4	0	0	0	0	0	0	0	0	3	0	8	5	19	9	0	0	0	0	0	0	0	0	0	0	0	0
4910 Porvoo Böle	12135:1	2	6	5	4	3	0	0	6	2	4	8	3	4	0	0	0	0	0	0	0	0	3	0	7	7	19	9	0	0	0	0	0	0	0	0	0	0	0	0
5009 Ust-PonzaI	14/46	3	4	4	3	4	0	3	0	4	3	5	1	1	0	0	17	0	0	6	0	0	2	1	7	6	34	10	0	0	0	0	0	0	1	0	0	0	0	0
5039 KentoIV	1416/21	7	3	2	3	3	0	2	0	2	3	5	1	1	0	0	1	0	0	1	0	0	4	3	7	7	26	10	0	1	1	0	0	0	0	0	0	0	0	0
5049 KentoIV	1499/21	7	3	2	3	3	0	2	0	2	3	5	1	1	0	0	1	0	0	1	0	0	3	3	7	7	19	10	0	1	1	0	0	1	0	0	1	0	0	0
5052 KeretIII	1758/3	3	5	2	3	3	0	0	0	5	4	9	2	4	0	0	29	0	0	7	0	0	3	1	9	5	20	10	0	0	0	0	0	1	0	0	0	0	0	0
5011 Sofjanga	14/108	7	2	3	3	3	0	0	0	3	4	5	1	1	1	1	4	0	0	2	0	0	3	4	7	7	16	10	0	0	1	0	0	0	0	0	0	0	0	0
5017 Sofjanga I	14/96	3	3	3	4	3	0	2	0	4	3	5	1	1	0	0	17	1	1	6	0	0	3	4	7	7	34	10	0	0	0	0	0	0	1	0	0	0	0	0
5016 Sofjanga I	14/96	3	4	4	3	3	0	3	0	4	3	5	1	1	0	0	17	0	0	6	0	0	2	3	7	7	34	10	0	0	0	0	0	0	1	0	0	0	0	0
5019 Ust-Ponza I	14/110	2	2	3	3	3	0	0	0	3	3	5	1	1	0	0	4	17	0	2	4	0	3	3	7	7	34	10	0	0	0	0	0	0	0	0	0	0	1	0
5022 Ust-Ponza I	28/7	2	6	4	4	4	2	0	0	2	4	5	1	1	4	4	15	0	0	3	0	0	3	1	12	10	16	10	0	0	0	0	1	0	0	0	0	0	0	0
5034 Ust-Ponza II	14/216	1	3	3	3	4	3	1	0	4	4	5	1	1	0	0	2	0	0	3	0	0	3	1	7	6	19	10	0	0	0	0	1	0	0	0	0	0	0	0
5035 Elmenkoski	1684/44,45,64	3	4	4	4	4	0	0	0	5	4	9	2	2	0	0	29	22	0	7	3	0	3	1	11	5	21	11	0	0	0	0	1	1	0	0	0	0	0	0
6250 Elmenkoski	1684/110,111,112,120,121	6	4	5	3	4	0	2	6	4	3	5	5	6	2	1	12	17	4	3	4	2	1	2	6	11	19	11	0	0	0	0	1	1	0	0	0	0	0	0
6106 Bohta II	2976/79	5	6	3	4	2	0	1	0	2	4	5	1	1	0	0	29	30	0	8	9	0	3	4	5	7	20	12	0	0	0	0	0	1	0	0	0	0	0	0
6107 Bohta II	2976/87	5	6	3	4	2	0	1	0	2	4	5	1	1	0	0	17	29	12	4	7	3	3	2	7	7	20	12	0	0	0	0	0	1	1	0	0	1	0	0
6108 Bohta II	2976/89	5	6	4	4	2	0	1	0	5	3	5	3	4	0	0	17	29	30	4	7	9	3	3	6	5	20	12	0	0	0	0	0	0	0	0	0	1	0	0
6109 Bohta II	2976/304	5	6	3	4	2	0	0	0	5	3	5	1	1	0	0	17	0	0	4	0	0	3	1	7	7	20	12	0	0	0	0	0	0	0	0	0	1	0	0
6110 Bohta II	2976/80	5	5	4	3	2	0	1	0	5	4	5	3	4	0	0	17	12	30	4	3	9	3	2	6	5	20	12	0	0	0	0	0	0	0	0	0	1	0	0
6111 Bohta II	2976/42	7	5	1	2	3	0	1	0	4	4	13	2	3	2	2	4	18	0	2	4	0	3	3	10	7	19	12	0	1	0	0	0	1	0	1	0	0	0	0
6112 Bohta II	2976/39	2	4	4	4	4	0	2	0	4	3	2	1	1	2	7	4	16	17	2	3	4	3	5	10	7	19	12	0	1	0	0	1	1	1	0	1	0	0	0
6113 Bohta II	2976/41	2	5	5	4	4	0	0	0	5	4	9	2	4	0	0	4	13	17	2	3	4	3	4	11	8	19	12	0	1	0	0	1	1	1	1	0	0	0	0
6114 Bohta II	2976/73	2	4	4	4	4	0	0	0	3	4	5	2	4	2	1	4	21	2	2	4	1	3	4	8	7	19	12	0	0	0	0	1	1	0	0	0	0	0	0
6115 Bohta II	2976/44	2	5	4	4	4	0	0	0	3	3	2	2	3	0	0	4	12	0	2	3	0	3	3	11	8	19	12	0	0	0	0	1	0	0	1	0	1	0	0
6116 Bohta II	2976/48	2	4	4	4	3	0	0	0	2	4	5	1	1	2	1	4	12	0	2	3	0	3	3	7	6	19	12	0	0	1	0	1	0	0	0	0	0	0	0
6118 Bohta II	2976/47	2	4	3	4	4	0	0	0	3	3	9	2	4	2	1	4	17	0	2	4	0	3	4	10	7	34	12	0	0	0	0	1	1	0	0	0	0	0	0
6119 Bohta II	2976/490	2	5	4	4	4	0	4	0	4	4	5	3	4	2	1	12	0	0	3	0	0	3	2	9	7	19	12	0	0	0	0	0	1	0	0	0	0	0	0
6121 Bohta II	2976/66	2	5	4	4	3	0	0	0	2	3	12	1	1	2	1	4	17	0	2	4	0	3	3	10	8	19	12	0	1	0	0	0	1	0	0	0	0	0	0
6122 Bohta II	2976/64	2	4	3	3	3	0	0	0	2	3	5	2	4	0	0	12	4	2	3	2	1	3	2	7	6	19	12	0	1	0	0	1	1	0	0	0	0	0	0
6124 Bohta II	2976/82	3	6	2	4	3	0	0	0	5	4	8	1	1	0	0	11	0	0	3	0	0	3	2	5	7	19	12	0	0	0	0	1	0	0	0	0	0	0	0
6125 Bohta II	2976/58	2	4	4	4	4	0	0	0	5	4	5	1	1	2	2	4	17	0	2	4	0	3	4	6	4	19	12	0	0	0	0	1	1	0	0	0	0	0	0

Number Site	NM-number	M1	Q1	K1	SH	SK	PM	PN	PT	PS	PO	RM	RF	RP	RE	RA	KE1	KE2	KE3	KY1	KY2	KY3	Kt	V	X	Y	TY	VE	Km0	Kma	Kmb	Kmc	Kmd	Kme	Kmf	Kmg	Kmh	Kmi	Kmj	SIZE
6127 Bohta II	2976/47	2	2	3	2	3	0	0	0	4	3	9	3	5	0	0	29	17	0	7	4	0	3	5	5	7	32	12	0	0	0	0	1	1	0	0	0	0	0	0
6129 Bohta II	2976/210	3	5	5	4	3	0	0	0	3	4	9	2	4	2	2	4	0	0	2	0	0	3	4	10	6	19	12	0	0	1	0	0	1	0	0	0	0	0	0
6133 Bohta II	2433/158,322	6	2	3	4	4	0	5	5	4	3	8	4	6	2	1	15	17	2	3	4	12	1	3	10	8	19	12	0	1	0	0	1	0	0	1	0	0	0	0
6134 Bohta II	2433/–	2	3	3	4	4	0	2	0	4	3	8	3	4	0	0	15	30	0	3	9	0	3	1	7	11	19	12	0	0	0	0	1	1	0	0	0	0	0	30
6135 Bohta II	2433/248,374,521,494,380	2	5	4	4	4	0	2	0	3	3	5	1	1	0	0	4	13	0	2	3	0	1	3	10	11	19	12	0	0	0	0	1	1	0	0	0	0	0	35
6136 Bohta II	2484/483	2	3	4	3	3	0	1	0	3	3	9	3	5	0	0	4	2	0	2	1	0	2	4	10	8	19	12	0	1	0	0	1	1	0	0	0	1	0	0
6139 Bohta II	2484/408	2	5	5	3	3	0	0	0	5	3	5	1	1	2	1	4	13	0	2	3	0	3	4	7	10	19	12	0	1	0	0	1	1	0	0	0	0	0	0
6142 Bohta II	2484/437	2	4	3	4	4	0	1	0	3	4	2	1	1	2	2	4	17	0	2	4	0	3	3	10	8	19	12	0	1	0	0	1	0	0	0	0	0	0	0
6143 Bohta II	2484/314	2	3	2	3	3	0	1	0	5	4	12	1	1	2	1	4	3	0	2	2	2	3	3	10	8	19	12	0	0	0	0	0	1	1	0	1	0	0	0
6144 Bohta II	2484/204,205	5	6	5	4	2	0	2	0	4	3	5	2	4	0	0	17	29	0	4	7	0	1	3	5	5	20	12	0	0	0	0	0	0	0	0	1	0	0	0
6145 Bohta II	2484/580,588	3	6	3	4	2	0	0	0	5	4	9	2	4	0	0	30	0	0	7	0	0	3	2	10	5	22	12	0	0	0	0	0	1	0	0	0	0	0	0
6146 Bohta II	2484/4600	7	4	1	2	3	0	2	0	4	3	9	1	1	0	0	33	0	0	7	0	0	3	1	11	9	22	12	0	1	0	0	0	0	0	0	0	0	0	0
6147 Bohta II	2484/245	7	4	5	2	3	0	1	0	5	4	8	2	4	0	0	34	4	0	10	2	0	3	1	5	10	22	12	0	0	0	0	0	0	0	0	0	0	1	0
6148 Bohta II	2484/582	7	4	4	3	3	0	0	0	3	4	8	3	4	0	0	29	2	0	7	1	0	3	1	6	6	22	12	0	0	0	0	0	1	0	0	0	0	0	0
6150 Bohta II	2484/254	7	4	4	2	3	0	4	0	4	4	5	1	1	0	0	0	0	0	0	0	0	3	0	8	6	20	12	0	0	0	0	0	0	0	0	0	0	0	0
6151 Bohta II	2484/573,566	3	1	2	4	3	0	0	0	5	4	8	2	3	0	0	33	29	0	8	6	0	2	3	11	8	20	12	0	0	0	0	1	0	1	0	0	0	0	0
6152 Bohta II	2484/572	3	4	2	4	3	0	0	0	5	5	8	4	4	0	0	31	0	0	9	0	0	3	1	5	5	20	12	0	0	0	0	1	0	0	0	0	0	0	0
6153 Bohta II	2484/415,481	7	4	5	2	4	0	0	0	5	4	8	2	4	0	0	31	12	0	9	3	0	3	1	7	8	20	12	0	0	0	0	0	1	0	0	0	0	0	0
6154 Bohta II	2484/568,582,418	3	6	6	4	4	0	0	0	5	4	8	2	6	0	0	30	0	0	9	0	0	3	1	10	4	20	12	0	0	0	0	0	1	0	0	0	0	0	0
6155 Bohta II	2484/570	5	6	5	4	2	0	2	0	5	4	5	2	1	0	0	17	29	30	4	7	9	2	2	5	5	20	12	0	0	0	0	0	1	0	0	1	0	0	0
6157 Bohta II	2484/448	2	5	6	3	3	0	1	0	6	3	8	2	4	2	1	4	13	2	2	3	1	2	4	8	7	19	12	0	1	0	0	1	1	0	0	0	0	0	0
6159 Bohta II	2484/–	2	3	3	4	4	0	2	0	4	3	8	3	4	2	1	17	16	4	4	3	2	2	4	10	11	20	12	0	0	0	0	1	1	0	0	0	0	0	0
6160 Bohta II	2484/240	2	4	4	4	3	0	1	0	4	3	8	2	4	0	0	4	13	0	2	3	0	2	4	6	5	19	12	0	1	0	0	1	1	0	0	1	0	0	0
6161 Bohta II	2484/513	2	3	5	4	4	0	2	0	3	3	8	4	5	0	0	4	17	12	2	4	3	2	4	8	6	19	12	0	1	0	0	1	1	0	1	1	0	0	0
6162 Bohta II	2484/485	2	3	4	3	3	0	1	0	3	4	9	2	4	2	2	4	17	2	2	4	1	2	4	8	7	19	12	0	0	0	0	1	1	0	0	1	1	0	0
6163 Bohta II	2484/279	2	3	4	4	4	0	4	0	5	4	9	4	6	2	5	4	13	2	2	3	1	3	4	8	5	19	12	0	0	0	0	1	1	0	0	0	0	0	0
6164 Bohta II	2484/503	2	4	3	2	3	0	0	0	5	3	8	2	4	8	6	4	12	0	2	3	0	2	4	12	10	19	12	0	0	0	0	1	1	0	0	1	1	0	0
6165 Bohta II	2484/493	2	4	3	4	4	0	2	0	3	3	9	2	3	2	1	4	12	0	2	3	0	3	3	9	6	19	12	0	0	0	1	0	1	0	0	0	1	0	0
6166 Bohta II	2484/272	7	2	3	3	3	0	2	0	4	3	9	1	1	0	0	0	0	0	0	0	0	2	0	7	6	19	12	0	0	0	0	0	0	0	0	0	0	0	0
6167 Bohta II	2484/340	6	6	6	4	4	0	0	4	5	4	6	1	1	2	1	17	3	12	4	2	3	3	3	13	12	19	12	0	1	0	0	0	0	0	1	0	0	0	0
6168 Bohta II	2484/496	6	5	4	4	4	0	0	0	5	4	8	3	4	2	1	4	12	0	2	3	0	3	5	7	6	19	12	0	1	0	0	0	1	1	0	0	0	0	0
6169 Bohta II	2484/394	2	3	4	3	3	0	1	0	5	4	9	2	4	2	1	4	17	12	2	4	3	3	4	12	8	19	12	0	1	0	0	1	1	0	1	0	0	0	0
6170 Bohta II	2484/510	2	4	3	3	3	0	1	0	3	3	8	1	1	0	0	12	0	0	3	0	0	3	1	8	7	19	12	0	0	0	0	1	0	0	0	0	0	0	0
6171 Bohta II	2484/–	7	5	5	2	2	0	0	0	3	3	2	1	1	2	1	18	0	0	4	0	0	3	1	8	7	11	12	0	0	1	0	0	0	0	0	0	0	0	0
6173 Bohta II	2453/93	2	5	3	4	4	0	1	0	4	4	5	1	5	0	0	4	12	34	2	3	10	2	4	5	5	34	12	0	0	0	0	1	1	0	0	0	0	0	0
6174 Bohta II	2453/128	7	6	6	2	2	0	0	0	4	3	11	1	1	0	0	26	3	2	5	2	1	3	4	6	8	32	12	0	1	0	0	1	1	0	0	0	0	0	0
6175 Bohta II	2085/508	2	5	3	4	4	0	0	0	2	3	11	1	5	0	0	12	2	0	3	2	0	3	3	6	6	34	12	0	0	0	0	1	0	0	0	0	0	0	0
6178 Bohta II	2433/94,83	2	3	4	4	4	0	2	0	4	4	8	3	4	2	2	4	3	0	2	2	0	2	3	8	12	19	12	0	0	1	0	1	1	0	0	0	0	0	0
6179 Bohta II	2433/–	2	5	3	4	4	0	0	0	2	4	9	1	1	2	1	4	12	0	2	3	0	3	4	10	6	19	12	0	0	0	1	0	0	0	0	0	0	0	0
6180 Bohta II	2433/138	2	4	3	4	4	0	2	0	3	3	9	3	4	2	1	4	3	0	2	2	0	1	4	10	6	19	12	0	0	0	0	1	1	0	1	0	1	0	0
6181 Bohta II	2433/60	2	5	3	4	4	0	0	0	3	3	9	2	4	2	2	4	12	0	2	3	0	2	4	10	7	19	12	0	0	1	0	1	1	0	0	0	1	0	0
6182 Bohta II	2433/85	2	3	3	4	4	0	2	0	4	4	8	2	4	2	1	4	12	2	2	3	1	2	3	8	5	19	12	0	1	0	0	1	1	0	0	0	0	0	0
6183 Bohta II	2433/92	2	3	4	2	4	0	4	0	5	3	5	1	1	2	2	4	12	0	2	3	0	3	3	9	8	19	12	0	1	0	0	1	1	0	0	1	0	0	0
6184 Bohta II	2433/101	2	5	4	4	4	0	1	0	3	4	8	2	4	2	1	4	3	2	2	2	1	3	5	10	7	19	12	0	0	0	0	1	1	0	0	0	0	0	0
6185 Bohta II	2433/167	2	5	3	4	4	0	0	0	5	3	5	2	4	2	1	4	2	0	2	1	0	3	5	8	5	19	12	0	0	0	0	1	1	0	0	0	0	0	0
6186 Bohta II	2433/194	2	4	4	4	4	0	0	0	5	4	8	4	4	0	0	4	0	0	2	0	0	3	2	12	8	19	12	0	0	0	0	0	0	0	0	0	1	0	0
6187 Bohta II	2433/168,129	2	3	3	4	3	0	0	0	3	3	8	3	6	2	1	4	12	17	12	3	4	3	4	7	5	19	12	0	0	0	0	1	1	0	0	0	0	0	0
6188 Bohta II	2433/250	2	4	2	4	3	0	0	0	3	3	5	2	3	2	2	4	12	0	2	3	0	3	3	8	7	19	12	0	0	0	0	1	1	0	0	0	0	0	0
6190 Bohta II	2433/152	2	4	3	3	4	0	1	0	3	3	9	1	1	0	0	4	12	0	2	3	0	3	4	9	5	19	12	0	1	0	0	1	1	0	0	0	0	0	0

Number Site	NM-number	M1	Q1	K1	SH	SK	PM	PN	PT	PS	PO	RM	RF	RP	RE	RA	KE1	KE2	KE3	KY1	KY2	KY3	Kt	V	X	Y	TY	VE	Km0	Kma	Kmb	Kmc	Kmd	Kme	Kmf	Kmg	Kmh	Kmi	Kmj	SIZE
6191 Bohta II	2433/159	2	4	4	3	4	0	2	4	4	3	5	2	4	2	2	2	15	3	1	3	2	3	3	9	9	19	12	0	1	0	0	1	0	0	0	0	0	0	0
6192 Bohta II	2433/197	6	5	4	3	3	0	1	0	3	3	9	2	3	2	2	4	3	2	2	2	1	3	3	9	5	19	12	0	1	0	0	1	1	0	0	0	0	1	0
6193 Bohta II	2433/251	7	4	2	3	3	0	0	0	3	4	5	1	1	2	2	4	12	3	2	3	2	3	3	10	5	19	12	0	1	0	0	1	0	0	1	0	0	0	0
6194 Bohta II	2433/89	2	5	5	4	4	0	2	0	4	3	13	1	1	2	2	4	11	0	2	3	0	3	3	10	6	19	12	0	1	0	0	1	0	0	0	0	0	0	0
6195 Bohta II	2433/186	2	3	4	4	4	0	0	0	3	3	5	2	4	2	1	4	0	0	2	0	0	3	3	8	5	19	12	0	0	0	0	0	1	0	0	1	0	0	0
6196 Bohta II	2433/81	2	5	5	3	4	0	2	0	3	3	5	2	4	2	1	4	17	0	2	4	0	3	4	9	8	19	12	0	1	0	0	0	1	0	1	1	0	0	0
6197 Bohta II	2433/184	2	5	6	3	4	0	0	0	2	3	8	5	4	2	2	4	12	17	2	3	4	3	5	10	7	19	12	0	0	1	0	1	0	0	1	0	1	0	0
6198 Bohta II	2433/249	7	4	4	2	3	0	2	0	3	4	2	3	4	2	1	4	12	0	2	3	12	3	3	12	8	19	12	0	0	1	0	1	0	0	0	0	0	0	0
6199 Bohta II	2433/155	2	5	3	3	3	0	4	0	4	3	9	2	1	2	2	15	12	0	3	3	12	0	2	10	10	19	12	0	0	0	0	1	0	0	0	0	0	0	0
6201 Bohta II	2433/139	2	4	4	4	4	0	4	0	3	3	5	1	1	2	1	4	12	0	2	3	12	3	3	10	8	19	12	0	0	0	0	1	0	0	0	0	1	0	0
6202 Bohta II	2433/104	2	5	4	3	3	0	1	0	2	3	9	2	3	0	0	12	0	0	3	0	0	3	1	14	13	19	12	0	0	0	0	1	0	0	0	0	0	0	0
6204 Bohta II	2433/321	2	3	3	3	3	0	4	0	4	3	8	3	6	0	0	15	29	0	3	8	0	1	1	9	10	19	12	0	0	0	0	1	1	0	0	0	0	0	0
6205 Bohta II	2484/509	2	4	4	3	4	0	1	0	3	3	8	2	4	0	0	4	12	17	2	3	4	2	4	13	10	19	12	0	0	0	0	1	1	0	1	0	1	0	0
6206 Bohta II	2484/38	2	2	3	4	3	0	0	0	3	3	5	2	4	2	1	4	12	8	2	3	10	3	4	8	8	32	12	0	0	0	0	0	1	1	0	0	0	1	0	0
6207 Bohta II	2484/238	2	4	4	4	4	0	2	0	4	3	8	3	4	2	2	4	12	3	2	3	2	2	3	11	6	19	12	0	0	0	0	0	1	1	0	1	0	0	0	0
6208 Bohta II	2484/402	2	4	2	3	3	0	1	0	3	3	5	1	1	2	2	4	3	12	2	2	3	2	4	10	8	19	12	0	1	0	0	1	1	0	1	0	0	0	0
6209 Bohta II	2484/448	2	4	4	3	3	0	2	0	4	3	9	2	4	2	2	4	3	2	2	2	1	3	3	10	8	19	12	0	0	0	0	1	1	1	0	0	0	0	0
6210 Bohta II	2484/456	2	5	3	3	3	0	0	0	2	3	5	1	1	2	1	4	12	17	2	3	4	3	4	11	7	19	12	0	1	0	0	1	1	0	1	0	0	0	0
6211 Bohta II	2484/418	2	2	3	3	3	0	1	0	4	4	8	2	4	5	5	4	12	2	2	3	1	3	2	6	5	19	12	0	0	0	0	1	0	0	1	0	0	0	0
6212 Bohta II	2484/306	2	3	3	3	3	0	2	0	4	3	8	2	4	2	2	4	12	3	2	3	2	3	4	7	5	19	12	0	1	0	0	1	1	1	0	0	0	0	0
6213 Bohta II	2484/444	2	3	4	3	3	0	2	0	3	3	8	2	4	2	1	4	12	0	2	3	0	3	4	10	7	19	12	0	0	0	0	1	1	1	0	0	0	0	0
6214 Bohta II	2484/449	2	5	5	3	4	0	2	0	4	3	5	3	5	2	2	4	8	3	2	10	2	3	5	8	5	32	12	0	0	0	0	1	1	0	0	0	0	0	0
6215 Bohta II	2484/487	2	2	2	4	3	0	2	0	5	3	2	2	5	1	1	4	12	3	2	3	2	3	4	8	8	19	12	0	1	0	0	1	1	0	0	0	0	0	0
6216 Bohta II	2484/242	2	4	2	3	3	0	2	0	4	3	8	2	4	2	2	4	12	0	2	3	12	3	3	11	7	19	12	0	1	0	0	1	0	0	0	0	0	0	0
6217 Bohta II	2484/470	2	4	6	3	3	0	2	0	5	3	8	2	4	0	0	4	17	0	2	4	0	3	4	12	6	19	12	0	0	0	0	1	1	0	0	0	1	0	0
6218 Bohta II	2484/419,422	2	4	6	2	3	0	0	3	4	3	5	1	1	2	2	4	15	0	2	3	0	3	3	8	12	19	12	0	0	0	0	1	0	0	0	0	1	0	0
6219 Bohta II	2484/496	2	2	3	3	3	0	0	0	2	3	8	4	6	0	0	12	0	0	3	0	0	3	1	7	8	19	12	0	0	0	0	1	0	0	0	0	0	0	0
6220 Bohta II	2484/269	2	3	4	4	3	0	0	0	3	3	5	2	4	0	0	2	0	0	1	0	0	3	1	8	8	19	12	0	0	0	0	0	0	0	0	0	0	1	0
6221 Bohta II	2484/481	2	3	3	4	3	0	2	0	4	3	8	2	4	2	2	26	4	0	5	0	0	3	5	7	5	34	12	0	1	0	0	0	1	0	0	0	0	0	0
6222 Bohta II	2484/499	2	2	3	3	3	0	1	0	5	3	9	2	4	2	2	4	3	12	2	2	3	3	5	10	5	19	12	0	0	0	0	1	1	0	1	0	1	0	0
6223 Bohta II	2484/459	2	4	3	4	3	0	2	0	2	3	5	1	1	2	2	4	3	12	2	2	3	3	4	10	8	19	12	0	1	0	0	1	1	0	1	1	0	0	0
6224 Bohta II	2484/480	2	4	4	3	4	0	1	0	4	3	5	1	1	2	2	4	12	0	2	3	0	3	3	10	8	19	12	0	1	0	0	1	1	0	0	0	1	0	0
6226 Bohta II	2484/483	2	4	3	4	4	0	1	0	2	3	5	2	4	2	2	4	12	3	2	3	2	3	4	8	5	19	12	0	1	0	0	1	1	0	0	0	0	0	0
6227 Bohta II	2484/469	2	2	3	4	3	0	4	0	4	3	5	1	1	2	1	25	12	0	4	3	0	3	3	10	10	19	12	0	0	0	0	1	1	0	0	0	0	0	0
6228 Bohta II	2484/394	2	4	3	3	4	0	2	0	5	4	9	2	4	2	1	4	17	0	2	4	12	3	4	10	10	19	12	0	1	0	0	1	1	0	0	0	0	0	0
6230 Bohta II	2484/495	2	3	3	3	3	0	2	0	4	4	9	2	5	2	2	4	17	8	2	4	10	3	5	10	6	34	12	0	1	0	0	1	1	0	0	0	0	0	0
6231 Bohta II	2484/404	2	4	5	4	4	0	1	0	2	3	9	1	1	2	5	4	0	0	2	0	0	3	3	10	5	19	12	0	0	0	0	0	1	0	0	0	0	0	0
6232 Bohta II	2484/204	2	3	3	4	4	0	0	0	3	3	5	1	1	2	2	4	12	17	2	3	4	3	3	10	9	19	12	0	0	1	0	1	1	0	0	0	0	0	0
6233 Bohta II	2484/473	2	4	4	4	4	0	2	0	5	3	5	1	1	2	1	4	0	0	2	0	0	3	3	10	7	19	12	0	1	0	0	0	1	0	0	0	0	0	0
6234 Bohta II	2484/385	2	3	4	4	4	0	0	4	4	4	5	2	4	2	2	4	12	0	2	3	0	3	3	10	9	19	12	0	0	0	0	1	0	0	0	0	1	0	0
6235 Bohta II	2484/287	2	4	4	4	4	0	1	0	5	4	8	2	4	2	5	4	12	0	2	3	0	3	3	8	6	19	12	0	1	0	0	1	1	0	0	0	0	0	0
6237 Bohta II	2484/414	2	4	4	3	3	0	2	0	4	3	8	2	4	0	0	4	12	0	2	3	0	3	3	11	8	19	12	0	0	0	0	0	1	1	0	0	0	1	0	0
6239 Bohta II	2484/511	2	3	3	4	3	0	0	0	3	4	13	1	1	2	1	4	17	0	2	4	0	3	4	10	5	19	12	0	0	0	0	0	1	1	0	0	1	1	0	0
6240 Bohta II	2484/517	2	3	3	4	3	0	2	0	4	4	9	2	4	2	2	12	0	0	3	0	0	3	1	11	6	19	12	0	0	0	0	0	1	0	0	0	0	0	0	0
6242 Bohta II	2484/514	2	2	2	4	3	0	1	0	4	3	5	1	1	0	0	4	12	0	2	3	0	3	2	8	6	19	12	0	0	0	1	0	0	0	0	0	0	0	0	0
6243 Bohta II	2484/259	2	4	4	3	3	0	1	0	4	3	5	1	1	2	2	4	12	0	2	3	0	3	3	7	5	19	12	0	0	0	0	0	1	1	0	0	0	0	0	0
6244 Bohta II	2484/532	2	2	3	3	3	0	2	0	4	3	8	2	4	2	1	4	12	0	2	3	0	3	3	7	6	19	12	0	0	0	0	0	1	0	0	0	0	1	0	0
6246 Bohta II	2484/289	2	4	5	3	3	0	2	0	3	3	5	1	1	2	1	4	17	12	2	4	3	3	3	10	8	19	12	0	0	0	0	0	1	1	0	1	0	0	1	0
6247 Bohta II	2484/525	2	3	3	4	3	0	0	0	3	3	8	2	4	0	0	4	0	0	2	0	0	0	3	6	5	19	12	0	0	0	0	0	0	1	0	0	0	0	0	0

Number Site	NM-number	M1	Q1	K1	SH	SK	PM	PN	PT	PS	PO	RM	RF	RP	RE	RA	KE1	KE2	KE3	KY1	KY2	KY3	Kt	V	X	Y	TY	VE	Km0	Kma	Kmb	Kmc	Kmd	Kme	Kmf	Kmg	Kmh	Kmi	Kmj	SIZE
6248 Bohta II	2484/347	3	2	3	3	3	0	0	0	5	4	5	2	4	2	1	4	3	0	2	2	0	3	3	7	5	19	12	0	0	0	0	0	0	0	1	0	0	1	0
6249 Bohta II	2484/505,358	2	2	3	3	3	0	4	0	5	3	5	2	4	2	1	4	17	12	2	4	3	1	4	9	9	19	12	0	1	0	0	1	1	0	0	1	0	0	0
6251 Kudama XI	1324/1067	2	6	5	3	4	0	0	0	2	3	5	4	3	3	4	12	2	0	3	1	0	3	2	6	10	19	12	0	0	0	0	1	0	0	0	0	0	0	0
6252 Chernaya Rechka V	838/105	2	4	4	2	2	0	0	0	5	4	5	1	1	2	2	4	12	17	2	3	4	2	5	10	5	19	12	0	0	0	1	1	1	1	0	1	0	0	0
6254 Chernaya Rechka V	838/291	2	4	6	3	3	0	4	1	4	3	8	2	4	2	2	12	2	0	3	1	0	3	2	8	6	19	12	0	0	0	0	1	0	0	0	0	0	0	0
6256 Chernaya Rechka V	838/172	2	4	4	3	3	0	0	0	2	3	5	2	4	2	2	4	12	0	2	3	0	3	5	7	5	19	12	0	0	0	0	1	1	1	0	0	0	0	0
6257 Chernaya Rechka V	838/104	6	5	5	3	3	0	1	1	4	3	8	4	4	2	2	12	2	30	3	1	9	3	3	8	4	19	12	0	1	0	0	1	1	0	0	0	0	0	0
6258 Chernaya Rechka V	838/131	2	4	4	3	3	0	2	4	4	4	5	3	4	2	2	12	2	0	3	1	12	3	2	8	8	19	12	0	0	0	0	1	0	0	0	0	0	0	0
6259 Chernaya Rechka V	838/120	2	4	5	3	3	0	2	0	4	3	5	2	3	0	0	15	0	0	3	0	0	3	1	9	7	19	12	0	0	0	0	1	0	0	0	0	0	0	0
6260 Chernaya Rechka V	838/140	7	5	6	1	2	0	2	0	2	3	9	2	6	2	2	12	0	0	3	0	12	3	2	7	5	19	12	0	0	0	0	1	0	0	0	0	0	0	0
6261 Chernaya Rechka V	838/57	7	4	5	2	2	0	2	0	4	3	9	1	1	6	2	3	12	0	2	3	12	3	2	7	6	19	12	0	0	0	0	0	1	0	0	1	0	0	0
6262 Chernaya Rechka V	838/117	2	3	3	4	3	0	1	0	3	4	5	2	4	2	2	17	2	0	4	1	0	3	3	6	5	19	12	0	0	0	0	1	0	0	1	0	0	0	0
6263 Chernaya Rechka V	838/178	2	4	4	3	3	0	0	0	3	4	8	2	4	4	4	11	2	0	3	1	0	3	2	7	6	19	12	0	0	0	0	1	0	0	0	0	0	0	0
6266 Chernaya Rechka V	838/176	2	3	3	4	3	0	0	1	4	4	5	2	4	2	2	3	13	0	2	3	0	3	4	5	5	19	12	0	1	0	0	1	0	0	0	0	0	0	0
6267 Chernaya Rechka V	838/56	2	3	4	3	3	0	0	0	3	3	13	1	1	2	2	12	2	0	3	1	0	3	3	8	7	19	12	0	0	0	0	1	0	0	0	0	0	0	0
6269 Chernaya Rechka V	838/143	2	5	5	3	3	0	2	0	4	3	8	2	4	3	4	2	0	0	1	0	0	3	1	5	7	19	12	0	0	0	0	1	0	0	0	0	0	0	0
6270 Chernaya Rechka V	838/142	7	4	5	2	2	0	0	0	5	3	8	4	6	2	5	4	0	0	2	0	12	2	3	8	7	19	12	0	0	1	0	0	0	0	0	0	0	0	0
6024 Gorelyj-most III	144/721	2	5	2	4	3	0	1	0	2	4	8	3	4	0	0	4	12	0	2	3	0	3	2	10	7	19	12	0	1	0	0	1	0	0	0	0	0	0	0
6025 Gorelyj-most III	144/148	7	4	3	2	3	0	3	0	4	3	13	2	4	2	2	12	0	0	3	0	12	3	1	8	5	19	12	0	0	0	0	1	0	0	0	0	0	0	0
6027 Gorelyj-most III	144/76	2	3	4	3	3	0	1	0	4	4	9	2	4	2	1	4	12	0	2	3	12	3	2	10	5	19	12	0	0	0	0	1	0	0	0	0	0	0	0
6028 Gorelyj-most III	144/543	7	3	3	2	3	0	2	0	4	4	9	2	4	2	1	4	12	0	2	3	12	3	2	9	5	19	12	0	0	1	1	1	0	0	0	0	0	0	0
6029 Gorelyj-most III	144/587	2	3	3	4	4	0	1	0	4	4	9	2	4	2	2	3	12	0	2	3	0	3	2	10	6	19	12	0	1	0	0	1	0	0	0	0	0	0	0
6030 Gorelyj-most III	144/473	2	2	2	4	3	0	0	0	3	4	9	4	6	2	3	12	0	0	3	0	12	3	1	10	5	19	12	0	0	0	0	1	0	0	0	0	0	0	0
6031 Gorelyj-most III	144/478	7	2	3	4	4	0	0	0	3	4	9	2	4	2	2	3	12	0	2	3	12	3	2	9	7	19	12	0	0	0	1	0	0	0	0	0	0	0	0
6033 Gorelyj-most III	144/476	7	4	3	2	3	0	2	0	4	3	13	2	3	2	1	4	0	0	2	0	0	3	3	10	5	19	12	0	1	0	0	0	0	0	0	0	0	0	0
6034 Gorelyj-most III	144/564	2	2	3	4	4	0	0	0	3	4	9	4	6	5	2	4	12	0	2	3	0	3	3	10	6	19	12	0	0	0	1	0	0	0	0	0	0	0	0
6035 Gorelyj-most III	144/319	2	2	3	4	4	0	0	0	3	4	5	2	4	2	2	4	12	0	2	3	0	3	2	7	6	19	12	0	0	0	1	0	0	0	0	0	0	0	0
6036 Gorelyj-most III	144/497	2	1	2	4	4	0	2	0	4	4	9	2	4	2	1	4	12	0	2	3	12	3	3	12	6	19	12	0	1	0	0	1	1	0	0	0	0	0	0
6038 Gorelyj-most III	144/589	2	3	4	4	4	0	0	0	3	4	8	4	4	0	0	4	12	0	2	3	12	3	2	7	4	19	12	0	0	0	1	0	0	0	0	0	0	0	0
6039 Gorelyj-most III	144/475,480	7	4	3	2	3	0	3	0	2	4	9	2	3	2	1	4	12	0	2	3	0	3	4	7	5	19	12	0	1	0	0	1	0	0	0	0	0	0	0
6040 Gorelyj-most III	144/289	7	4	2	2	3	0	3	0	4	4	13	1	1	2	2	12	4	0	3	2	0	3	1	10	5	19	12	0	0	0	0	1	0	1	0	0	0	0	0
6042 Gorelyj-most III	144/271	2	4	4	4	3	0	0	0	4	4	8	3	4	2	2	4	12	0	2	3	0	3	3	7	5	19	12	0	0	0	0	0	1	1	1	0	0	0	0
6044 Gorelyj-most III	144/720	2	4	3	4	4	0	1	0	4	4	9	4	4	2	1	12	0	12	3	0	0	3	1	9	7	19	12	0	0	0	0	0	1	0	0	0	0	0	0
6045 Gorelyj-most III	144/273	7	2	2	3	4	0	0	0	3	4	9	2	3	2	1	12	0	0	3	0	12	3	1	10	6	19	12	0	0	0	0	0	1	0	0	0	0	0	0
6046 Gorelyj-most III	144/490	2	2	2	4	4	0	1	0	4	4	8	4	4	2	1	4	12	0	2	3	12	3	2	10	8	19	12	0	0	0	0	1	0	0	0	0	0	0	0
6047 Gorelyj-most III	144/45	7	5	4	2	3	0	0	0	3	4	8	2	4	2	2	7	0	0	4	0	0	3	2	6	5	19	12	0	0	0	0	0	1	0	0	0	0	0	0
6048 Gorelyj-most III	144/477	7	3	5	3	4	0	0	0	2	4	5	2	4	2	2	4	12	0	2	3	12	3	2	10	5	19	12	0	0	0	0	1	0	0	0	0	0	0	0
6049 Gorelyj-most III	144/653	7	3	3	2	3	0	0	0	4	4	13	1	1	2	1	4	2	12	2	1	3	3	3	10	5	19	12	0	0	1	0	1	0	1	0	0	0	0	0
6050 Gorelyj-most III	144/538	7	3	1	3	3	0	0	0	4	4	9	2	4	2	2	4	12	0	2	3	0	3	3	9	5	19	12	0	1	0	0	1	1	0	0	0	0	0	0
6051 Gorelyj-most III	144/333	7	4	4	2	4	0	0	0	4	4	5	3	6	0	0	3	0	0	2	0	0	3	1	9	4	19	12	0	1	0	0	0	0	0	0	0	0	0	0
6052 Gorelyj-most III	144/472	7	2	1	3	2	0	0	0	5	4	9	2	3	2	1	2	0	0	1	0	0	3	1	12	7	19	12	0	0	0	0	1	0	0	0	0	0	0	0
6055 Zolotets VIII	96/29	2	2	3	3	4	0	0	0	2	3	5	2	4	0	0	4	2	0	2	1	0	3	2	10	9	19	12	0	0	0	0	0	0	0	0	0	0	1	0
6056 Zolotets VIII	96/100	2	4	2	4	3	0	0	0	2	3	5	1	1	2	2	4	14	0	2	3	0	3	3	6	6	19	12	0	1	0	0	1	1	0	0	0	0	0	0
6057 Zolotets VIII	96/82	2	3	3	4	4	0	2	0	4	3	5	3	4	0	0	0	0	0	0	0	0	3	0	8	6	19	12	0	0	0	0	0	0	0	0	0	0	0	0
6058 Zolotets VIII	96/98	7	3	3	4	4	0	2	0	2	4	8	4	4	0	0	14	0	0	3	0	12	3	0	7	7	19	12	0	0	0	0	0	1	0	0	0	0	0	0
6059 Zolotets VIII	96/16	2	3	3	4	4	0	0	0	4	4	9	4	5	0	0	6	0	0	2	0	0	3	5	6	12	19	12	0	1	0	0	0	1	0	0	0	0	0	0
6060 Zolotets VIII	96/63	2	3	2	4	4	0	0	0	3	4	5	1	1	2	2	4	2	0	2	1	0	3	4	5	5	19	12	0	0	0	0	1	1	0	0	0	0	0	0
6062 Zolotets VIII	96/101	7	3	3	2	3	0	0	0	3	4	5	2	3	0	0	2	0	0	1	0	0	3	1	4	5	19	12	0	0	0	0	1	0	0	0	0	0	0	0
6063 Zolotets VIII	96/67	2	3	3	4	4	0	3	0	4	4	8	3	4	2	2	12	0	0	3	0	12	3	1	4	5	19	12	0	0	0	0	1	0	0	0	0	0	0	0

Number Site	NM-number	M1	Q1	K1	SH	SK	PM	PN	PT	PS	PO	RM	RF	RP	RE	RA	KE1	KE2	KE3	KY1	KY2	KY3	Kt	V	X	Y	TY	VE	Km0	Kma	Kmb	Kmc	Kmd	Kme	Kmf	Kmg	Kmh	Kmi	Kmj	SIZE
6066 Ust-Vodla II	2105/229	2	6	5	3	3	0	0	0	3	3	5	2	4	2	1	4	2	0	2	1	0	3	2	10	7	19	12	0	1	0	0	1	0	0	0	0	0	0	0
6067 Ust-Vodla II	2105/293	2	5	5	4	3	0	0	0	2	3	2	1	1	2	1	4	0	0	2	0	0	3	2	10	6	19	12	0	1	0	0	0	0	0	0	0	0	0	0
6068 Ust-Vodla II	2105/204	7	4	3	2	3	0	4	4	4	4	2	1	1	5	5	0	0	0	0	0	12	3	0	8	5	19	12	0	0	0	0	0	0	0	0	0	0	0	0
6071 Ust-Vodla II	2105/306	2	3	4	3	3	0	0	0	2	3	8	2	4	0	0	4	17	0	2	3	0	3	3	5	6	19	12	0	0	0	1	0	0	0	0	0	0	0	0
6073 Ust-Vodla II	2105/207	2	3	3	4	3	0	0	0	2	4	5	1	1	2	2	3	17	0	2	4	12	3	3	5	4	19	12	0	0	0	1	0	0	0	0	0	0	0	0
6076 Ust-Vodla II	2105/217	7	4	4	2	3	0	4	0	4	3	8	3	6	2	1	0	0	0	0	0	12	3	0	7	5	19	12	0	0	0	0	0	0	0	0	0	0	0	0
6079 Ust-Vodla II	2105/84	2	3	4	3	3	0	5	6	4	4	8	1	1	2	1	12	0	0	3	0	0	2	1	8	6	19	12	0	0	0	0	1	0	0	0	0	0	0	0
6080 Ust-Vodla II	2105/80	2	5	4	4	4	0	2	0	5	4	12	1	1	2	1	4	12	2	2	3	1	3	3	11	5	19	12	0	1	0	0	1	0	0	0	0	0	0	0
6081 Ust-Vodla II	2105/199	2	3	4	4	4	0	0	6	4	4	13	1	1	2	2	12	0	0	3	0	0	3	1	8	5	19	12	0	0	0	0	1	0	0	0	0	0	0	0
6083 Ust-Vodla II	2105/15	2	5	3	3	3	0	0	0	2	3	7	3	5	2	1	4	17	0	2	4	0	3	3	8	8	19	12	0	1	0	0	1	0	0	0	1	0	0	0
6084 Ust-Vodla II	2105/218	2	3	3	4	3	0	0	0	4	3	8	3	4	2	2	4	3	2	2	2	1	3	5	7	5	19	12	0	1	0	0	1	0	0	0	0	1	0	0
6086 Ust-Vodla II	2105/116	2	6	3	4	3	0	2	0	4	3	5	2	4	2	3	2	3	0	1	2	0	3	3	5	5	19	12	0	0	0	0	1	0	0	0	0	0	0	0
6087 Ust-Vodla II	2105/214	2	4	3	3	3	0	0	0	3	3	5	2	4	2	2	17	16	0	4	3	0	3	3	6	5	19	12	0	0	0	0	1	0	0	0	0	0	0	0
6089 Ust-Vodla II	2105/273	2	3	3	4	3	0	2	4	4	4	8	4	6	2	1	2	0	0	1	0	0	3	2	6	7	19	12	0	0	0	0	1	0	0	0	0	0	0	0
6628 Chujnavolok I	1951/–	5	4	4	4	3	0	0	0	2	3	5	2	4	2	2	4	12	0	2	3	0	3	4	9	8	19	13	0	1	0	0	1	1	0	0	0	1	0	0
6629 Chujnavolok I	1951/–	5	3	3	4	3	0	1	0	4	3	5	1	1	2	1	4	0	0	2	0	0	3	4	5	9	19	13	0	1	0	0	0	1	0	0	0	0	0	0
6630 Chujnavolok I	1951/1983	7	4	4	4	3	0	2	0	4	3	5	1	1	2	1	17	12	0	4	3	0	3	4	10	5	19	13	0	0	0	0	1	0	0	1	0	0	0	0
6631 Chujnavolok I	1951//451	2	4	5	4	3	0	0	0	3	3	5	1	1	2	1	22	15	0	4	3	0	3	3	8	7	19	13	0	0	0	0	1	0	0	0	0	0	0	0
6632 Chujnavolok I	1951/680	2	4	4	4	3	0	1	2	4	3	5	1	1	0	0	12	0	0	3	0	0	3	1	7	7	19	13	0	0	0	0	1	0	0	0	0	0	0	0
5899 Lahta I	49/387	2	5	4	4	4	0	1	0	5	3	5	2	4	0	0	1	0	0	1	0	0	3	5	7	6	19	13	0	0	1	0	0	1	0	0	0	0	0	0
5900 Lahta I	49/222	2	3	3	2	3	0	1	0	3	3	9	3	4	1	1	1	0	0	1	0	0	3	4	10	6	19	13	0	1	0	0	0	1	0	0	0	0	0	0
5901 Lahta I	49/378	2	5	5	4	4	0	0	0	3	4	9	3	4	1	1	1	0	0	1	0	0	3	4	10	9	19	13	0	1	0	0	0	1	0	0	0	0	0	0
5902 Lahta I	49/116	2	4	4	3	3	0	1	4	4	3	8	3	4	1	1	16	1	0	3	1	0	3	1	9	6	19	13	0	0	0	0	1	0	0	0	0	0	0	0
5903 Lahta I	49/256	2	5	4	3	3	0	1	1	4	3	9	2	4	1	1	1	0	0	1	0	0	3	3	10	5	19	13	0	1	0	0	0	0	0	0	0	0	0	0
5904 Lahta I	49/302	2	4	5	4	4	0	0	0	5	4	5	2	4	0	0	0	0	0	0	0	0	3	0	7	8	18	13	0	0	0	0	0	0	0	0	0	0	0	0
5905 Lahta I	49/324	2	5	5	3	3	0	4	0	4	4	8	3	4	1	1	1	0	0	1	0	0	4	4	11	8	19	13	0	1	0	0	0	0	0	0	0	0	0	0
5906 Lahta I	49/299	7	5	4	2	2	0	2	0	4	3	8	4	4	0	0	0	0	0	0	0	0	3	0	6	6	19	13	0	0	0	0	0	0	0	0	0	0	0	0
5907 Lahta I	49/289	7	5	4	2	2	0	2	0	4	3	8	4	4	0	0	0	0	0	0	0	0	3	0	6	6	19	13	0	0	0	0	0	0	0	0	0	0	0	0
5908 Lahta I	49/87	2	5	4	4	4	0	2	0	4	4	8	4	4	0	0	4	14	7	2	3	4	3	3	7	8	19	13	1	0	0	0	1	0	0	0	0	0	0	0
5909 Lahta I	49/115	2	4	4	4	4	0	0	4	4	3	8	4	4	1	2	2	13	0	1	3	0	3	3	8	6	19	13	1	0	0	0	1	0	0	0	0	0	0	0
5910 Lahta I	49/26	6	4	4	4	4	0	2	0	4	4	5	2	4	1	1	1	0	0	1	0	0	3	3	9	7	19	13	0	1	0	0	0	0	0	0	0	0	0	0
5911 LahtaI	49/162	2	4	5	4	3	0	1	0	2	3	7	2	4	0	0	2	11	0	1	3	0	3	1	7	9	19	13	0	0	0	0	1	1	0	0	0	0	0	0
5912 Lahta I	49/409	2	4	3	4	4	0	4	0	4	3	8	3	4	1	1	4	0	0	2	7	0	3	3	8	5	19	13	0	1	0	0	0	1	0	0	0	0	0	0
5913 Lahta I	49/325	2	5	2	4	4	1	0	0	4	3	8	2	3	1	1	4	0	0	2	0	0	3	3	11	7	19	13	0	1	0	0	1	1	0	0	0	0	0	0
5915 Lahta I	49/392	2	4	4	4	4	0	0	0	3	4	5	1	1	0	0	4	12	0	2	3	0	2	3	6	10	19	13	0	0	0	0	1	1	0	0	1	0	0	0
5916 Lahta II	18/210	2	4	5	3	2	0	4	4	4	3	5	2	3	1	1	17	4	0	4	2	0	2	3	10	5	19	13	0	1	0	0	1	0	0	0	0	0	0	0
5917 Lahta II	155/66	2	5	5	3	4	0	0	0	5	3	5	3	4	0	0	4	14	0	2	3	0	3	4	7	8	19	13	0	1	0	0	1	1	0	0	0	0	0	0
5918 Lahta II	155/546	3	5	4	3	3	0	0	0	3	3	8	3	4	0	0	4	0	0	3	0	0	3	0	6	8	19	13	0	1	0	0	0	0	0	0	0	0	0	0
5919 Lahta II	50/409	7	5	3	2	3	0	3	0	4	3	9	2	4	0	0	1	12	0	2	3	0	3	3	8	7	19	13	0	1	0	0	1	1	0	0	0	0	0	0
5920 Lahta II	50/411	2	3	4	4	4	0	0	0	5	3	5	2	4	1	1	2	14	0	1	3	0	3	3	8	7	19	13	0	1	0	0	1	1	0	0	0	0	0	0
5921 Lahta II	24/139	7	4	5	2	2	0	0	0	5	3	5	2	4	0	0	1	0	0	1	0	0	3	1	10	6	19	13	0	1	0	0	1	1	0	0	0	0	0	0
5922 Lahta II	24/–	7	4	5	2	3	0	0	0	5	4	5	2	3	1	1	1	17	0	1	4	0	3	5	9	11	19	13	0	1	0	0	1	1	0	0	0	0	0	0
5923 Lahta II	50/408	7	5	3	2	2	0	2	0	4	3	12	2	4	0	0	12	0	0	3	0	0	3	1	10	7	19	13	0	0	0	0	1	0	0	0	0	0	0	0
5924 Lahta II	50/207	2	2	3	3	3	0	1	0	4	3	9	3	4	5	4	12	0	0	3	0	0	3	1	6	6	19	13	0	0	0	0	1	0	0	0	0	0	0	0
5925 Lahta II	50/218	2	2	3	3	3	0	0	0	2	3	8	3	4	0	0	1	0	0	1	0	0	3	2	6	6	19	13	0	0	0	0	1	0	0	0	0	0	0	0
5926 Lahta II	50/197	2	3	3	3	3	0	0	0	2	3	9	2	4	0	0	11	0	0	3	0	0	3	1	8	7	19	13	0	0	0	0	1	0	0	0	0	0	0	0
5927 Lahta II	50/174	7	3	2	2	2	0	0	0	3	3	5	3	3	1	1	17	0	0	5	0	0	3	2	7	7	19	13	0	0	0	0	1	0	0	0	0	0	0	0
5928 Lahta II	50/339	6	5	5	3	3	0	0	0	2	3	8	5	6	0	0	4	16	0	2	3	0	3	4	10	10	19	13	0	1	0	0	1	0	0	0	0	0	0	0
5929 Lahta II	50/97	2	4	3	3	2	0	0	0	4	3	5	2	4	1	3	3	13	0	2	3	0	3	4	7	7	19	13	0	0	1	0	1	0	0	0	0	0	0	0

Number Site	NM-number	M1	Q1	K1	SH	SK	PM	PN	PT	PS	PO	RM	RF	RP	RE	RA	KE1	KE2	KE3	KY1	KY2	KY3	Kt	V	X	Y	TY	VE	Km0	Kma	Kmb	Kmc	Kmd	Kme	Kmf	Kmg	Kmh	Kmi	Kmj	SIZE
5930 Lahta II	50/381	2	3	4	2	2	0	1	0	5	3	8	3	4	0	0	31	28	0	7	6	0	3	4	5	4	20	13	0	0	1	0	0	1	0	0	0	0	0	0
5931 Lahta II	50/414	2	4	5	2	3	0	0	0	2	3	5	2	4	0	0	2	15	0	2	3	0	4	2	7	9	19	13	0	1	0	0	1	0	0	0	0	0	0	0
5932 Lahta II	50/375	7	4	5	2	3	0	0	0	2	3	5	1	1	1	1	4	7	0	2	5	0	3	4	9	11	19	13	0	1	0	0	0	1	0	0	0	0	0	0
5934 Lahta II	50/264	2	5	4	2	3	0	1	0	4	3	5	3	5	0	0	4	13	0	2	3	0	3	3	7	8	19	13	0	0	1	0	1	0	0	0	0	0	0	0
5935 Lahta II	215/740	2	4	4	3	3	0	1	0	6	4	8	4	4	3	4	30	12	0	7	3	0	3	2	7	7	19	13	0	0	0	0	1	1	0	0	0	1	0	0
5936 Lahta II	215/553	2	3	4	3	3	0	2	0	5	3	8	2	4	1	2	1	2	0	1	3	0	3	4	6	5	19	13	0	0	0	0	1	0	0	0	0	1	0	0
5937 Lahta II	24/122	7	4	3	2	2	0	4	6	4	3	8	3	6	0	0	1	18	0	3	4	0	3	3	7	7	19	13	0	1	0	0	1	0	0	0	0	1	0	0
5938 Lahta II	215/426	2	4	5	3	3	0	1	0	3	3	5	2	4	0	0	12	0	0	3	0	0	3	1	9	8	19	13	0	0	0	0	1	0	0	0	0	0	0	0
5939 Lahta II	215/389	2	4	5	3	3	0	0	0	3	3	6	2	4	0	0	2	0	0	1	0	0	3	3	9	9	19	13	0	0	0	0	1	0	0	0	0	0	1	0
5940 Lahta II	215/376	2	3	3	2	2	3	0	0	0	3	5	1	1	0	0	1	2	15	1	1	3	4	3	8	8	19	13	0	1	0	0	1	1	0	0	0	0	0	0
5941 Lahta II	215/687	2	4	3	3	2	0	0	0	3	3	5	2	4	5	5	12	0	0	3	0	0	3	2	9	8	19	13	0	0	0	0	0	1	0	0	0	0	0	0
5945 Lahta II	508/339,1333	2	3	4	4	3	0	2	0	5	4	5	4	6	0	0	22	17	0	4	4	0	1	3	5	5	19	13	0	0	0	0	0	1	0	0	0	0	0	0
5946 Lahta II	508/1301	2	3	3	3	3	0	1	0	4	4	8	3	6	0	0	4	0	0	2	0	0	3	3	6	5	19	13	0	0	0	0	0	1	0	0	1	0	0	0
5947 Lahta II	18/862	6	5	4	4	3	0	4	6	3	4	5	3	6	2	1	4	17	2	2	4	4	3	3	8	5	19	13	0	0	0	0	1	0	0	0	0	1	0	0
5948 Lahta II	608/899	2	4	4	3	3	0	1	0	5	3	5	2	4	0	0	4	12	2	2	3	1	3	4	8	6	19	13	0	0	0	0	1	1	0	0	0	1	0	0
5949 Lahta II	608/618	2	4	4	3	3	0	0	0	5	3	5	2	4	0	0	4	11	2	3	4	1	3	4	9	8	19	13	0	0	0	0	1	1	0	0	0	1	0	0
5950 Lahta II	608/903	2	5	5	3	3	0	2	6	5	3	8	3	4	0	0	4	12	2	2	3	1	2	4	7	12	19	13	0	0	0	0	1	0	0	0	0	1	0	0
5951 Lahta II	126/600	2	5	3	3	3	0	1	0	5	3	5	2	3	0	0	4	15	2	2	3	1	3	4	10	5	19	13	0	0	0	0	1	1	0	0	0	1	0	0
5952 Lahta II	215/344	2	4	4	3	3	0	1	6	5	3	8	3	2	0	0	4	17	0	2	4	0	3	4	10	8	19	13	0	0	0	1	1	0	0	0	1	0	0	0
5953 Lahta II	608/455	2	4	4	3	4	0	1	0	5	3	5	2	4	1	1	17	12	2	4	4	1	3	3	7	7	19	13	0	0	1	0	1	1	0	0	0	0	0	0
5954 Lahta II	608/696	2	3	3	2	3	0	1	0	3	3	8	3	4	0	0	31	12	0	9	3	0	3	2	9	10	19	13	0	0	0	0	0	1	0	0	0	0	0	0
5955 Lahta II	608/1315	2	3	4	4	4	0	1	0	4	4	8	4	6	0	0	4	12	0	2	1	0	3	3	5	6	19	13	0	0	0	0	1	1	0	0	1	0	0	0
5956 Lahta II	608/1098	2	3	4	4	4	0	1	0	4	4	5	2	4	0	0	4	17	0	2	4	0	3	4	9	7	19	13	0	0	0	0	1	0	0	0	0	1	0	0
5957 Lahta II	608/353	6	4	4	4	4	0	0	0	3	3	8	2	4	2	2	4	12	0	2	3	0	3	5	10	8	19	13	0	0	0	0	1	1	0	0	0	0	0	0
5958 Lahta II	608/132	7	4	3	2	3	0	0	0	4	3	8	2	4	0	0	4	0	0	2	0	0	3	3	8	5	19	13	0	0	0	0	0	1	0	0	1	0	0	0
5959 Lahta II	608/943	7	4	3	2	3	0	2	0	4	3	5	3	6	5	0	1	0	0	1	0	0	3	2	6	5	19	13	0	1	0	0	0	0	0	0	1	0	0	0
5960 Lahta II	24/218	2	3	4	3	3	0	0	0	5	4	5	2	4	2	1	4	17	0	2	4	0	3	4	8	11	19	13	0	1	0	0	1	1	0	0	0	0	0	0
5961 Lahta II	608/707	5	5	2	3	2	0	0	0	3	3	5	1	1	0	0	29	17	0	7	4	0	3	1	6	6	19	13	0	0	0	0	1	1	0	0	0	0	0	0
5963 Lahta II	215/137	2	3	3	2	3	0	1	0	5	3	5	3	4	0	0	3	0	0	2	0	12	3	3	7	7	19	13	0	1	0	0	0	0	0	0	0	0	0	0
5964 Lahta II	608/132	2	4	4	3	3	0	1	0	4	3	8	4	4	0	0	12	2	0	3	1	0	3	2	6	10	19	13	0	0	0	0	1	0	0	0	0	0	0	0
5965 Lahta II	608/211	2	5	4	3	3	0	1	0	4	3	5	2	4	0	0	30	15	0	9	3	0	3	3	8	8	19	13	0	0	0	0	1	1	0	0	0	0	0	0
5966 Lahta II	608/913	2	5	4	4	3	0	1	0	4	3	8	1	1	0	0	4	2	0	2	1	0	3	4	7	7	19	13	0	0	0	0	0	1	0	0	1	0	0	0
5967 Lahta II	608/497	2	3	4	3	3	0	2	0	4	3	5	2	4	0	0	4	17	2	2	4	1	3	4	8	7	19	13	0	1	0	0	0	1	1	0	0	0	0	0
5968 Lahta II	608/1256	2	4	4	3	3	0	1	0	4	3	5	3	6	0	0	17	2	0	4	1	0	3	2	10	6	19	13	0	0	0	0	1	0	0	0	0	0	0	0
5969 Lahta II	608/1433	2	4	5	4	4	0	0	0	3	3	5	1	1	0	0	4	12	0	2	3	0	3	3	8	9	19	13	0	0	0	0	1	1	0	0	0	1	0	0
5970 Lahta II	608/1097	7	5	5	2	2	0	0	0	3	3	13	1	1	2	2	4	0	0	2	0	0	3	4	12	8	19	13	0	1	0	0	0	0	0	0	0	0	0	0
5971 Lahta II	608/1016	7	5	4	2	2	0	2	0	4	3	13	1	1	0	0	12	0	0	3	0	0	3	2	7	4	19	13	0	0	0	0	1	0	0	0	0	0	0	0
5972 Lahta II	608/434	2	4	4	3	3	0	0	0	3	3	5	2	4	0	0	4	12	2	2	3	1	3	3	10	9	19	13	0	1	0	0	1	0	0	0	0	1	0	0
5974 Lahta II	608/357	5	3	5	3	3	0	1	0	5	3	5	2	4	0	0	4	15	17	2	4	1	3	3	8	9	19	13	0	0	0	0	1	0	0	0	0	1	0	0
5975 Lahta II	608/77	2	4	4	3	3	0	2	0	4	3	8	3	3	0	0	29	12	0	7	3	0	3	2	11	11	19	13	0	0	0	0	1	1	0	0	0	0	0	0
5977 Lahta II	608/1391	2	4	4	3	2	0	0	0	4	3	5	1	1	0	0	4	12	2	2	3	1	3	4	10	7	19	13	0	0	0	0	1	1	0	0	0	1	0	0
5978 Lahta III	466/892,913,897	2	5	4	4	2	0	4	3	4	3	5	2	4	2	2	3	4	12	2	2	3	3	3	8	5	19	13	0	1	0	0	1	1	0	0	0	0	0	0
5979 Lahta III	24/217	2	4	4	3	3	0	0	0	5	3	8	2	4	0	0	4	12	0	2	3	0	3	4	9	7	19	13	0	1	0	0	1	1	0	0	1	0	0	0
5980 Lahta III	466/1525	2	5	4	3	3	0	1	6	4	3	5	2	4	0	0	0	0	0	0	0	0	3	0	6	5	19	13	0	0	0	0	0	0	0	0	0	0	0	0
5982 Lahta III	466/–	2	4	3	4	3	0	1	0	4	4	5	2	4	0	0	3	12	0	2	3	0	3	2	8	7	19	13	0	0	1	0	1	0	0	0	0	0	0	0
5983 Lahta III	466/–	2	2	2	2	3	0	2	6	2	4	8	2	4	0	0	4	18	17	2	4	4	3	3	8	5	19	13	0	0	0	0	1	0	0	0	0	1	0	0
5984 Lahta III	155/602,344	2	4	5	3	3	0	0	0	3	4	5	2	4	2	1	4	17	0	2	4	0	3	4	11	11	19	13	0	0	0	0	1	1	0	0	0	1	0	0
5985 Lahta III	309/89	2	3	3	4	3	0	1	0	5	3	8	3	4	6	4	30	12	0	7	3	0	3	2	7	6	19	13	0	0	0	0	1	1	0	0	0	0	0	0
5988 Lahta III	608/461	2	4	3	3	2	0	0	0	3	3	5	1	1	0	0	4	0	0	2	0	0	3	2	7	5	19	13	0	0	1	0	0	1	0	0	0	0	0	0

Number Site	NM-number	M1	Q1	K1	SH	SK	PM	PN	PT	PS	PO	RM	RF	RP	RE	RA	KE1	KE2	KE3	KY1	KY2	KY3	Kt	V	X	Y	TY	VE	Km0	Kma	Kmb	Kmc	Kmd	Kme	Kmf	Kmg	Kmh	Kmi	Kmj	SIZE
5990 Lahta III	608/1072	2	3	4	4	3	0	0	0	5	3	9	1	1	0	0	1	2	0	1	1	0	3	3	7	6	19	13	0	0	0	0	1	1	0	0	0	0	0	0
5991 Lahta III	608/1338	2	3	3	3	3	0	1	1	3	3	5	1	1	0	0	30	4	12	9	2	3	3	3	6	5	19	13	0	1	0	0	1	0	1	0	0	0	0	0
5992 Lahta III	608/966	2	5	3	3	3	0	0	1	3	4	9	2	4	0	0	4	12	0	2	3	0	3	2	8	7	19	13	0	0	0	0	1	1	0	0	0	0	0	0
5995 Lahta III	608/587	2	5	4	4	4	0	0	0	5	4	8	2	4	6	4	12	7	0	3	4	0	3	2	6	6	19	13	0	0	0	0	1	0	0	0	0	0	0	0
5996 Lahta III	608/1032	2	4	3	3	4	0	0	0	3	4	8	2	4	0	0	4	12	0	2	3	0	3	2	6	5	19	13	0	0	0	0	1	0	0	0	1	0	0	0
5998 Lahta III	608/725	2	4	3	4	3	0	0	0	5	3	8	4	6	0	0	21	31	0	4	9	0	3	2	6	8	19	13	0	0	0	0	1	0	0	0	0	0	0	0
5999 Lahta III	608/482	5	6	2	4	2	0	0	0	5	3	12	1	1	0	0	17	30	0	4	9	0	3	2	9	5	20	13	0	0	0	0	0	0	0	0	1	0	0	0
6000 Lahta III	608/406	2	3	3	4	3	0	0	0	2	3	8	2	4	0	0	27	12	4	5	3	3	3	5	7	6	19	13	0	0	0	0	1	1	0	0	0	0	0	0
6003 Lahta III	608/7	6	4	4	4	3	0	0	0	3	3	9	2	4	2	2	6	12	15	2	3	3	3	4	10	7	19	13	0	1	0	0	1	1	0	0	0	0	0	0
6004 Lahta III	608/902	2	3	3	4	3	0	1	0	5	4	5	2	3	1	2	1	0	0	1	0	0	3	2	4	5	19	13	0	1	0	0	0	0	0	0	0	0	0	0
6005 Lahta III	608/1244	2	4	4	4	3	0	1	0	3	4	5	1	1	0	0	4	2	0	2	3	0	3	3	7	10	19	13	0	1	0	0	1	1	0	0	0	0	0	0
6006 Lahta III	608/962	2	3	4	2	3	0	1	0	5	4	5	2	4	0	0	16	17	0	3	4	0	3	3	2	7	19	13	0	0	0	0	1	1	0	0	0	0	0	0
6007 Lahta III	155/67	2	4	3	2	3	0	0	0	3	3	5	3	4	0	0	4	15	0	2	3	0	3	4	8	7	19	13	0	1	0	0	1	0	0	0	1	0	0	0
6011 Lahta III	155/361	2	3	5	3	3	0	0	0	3	3	5	1	1	0	0	4	17	0	2	4	0	3	3	10	10	19	13	0	1	0	0	1	1	0	0	0	0	0	0
6012 Lahta III	608/1438	2	3	4	3	3	0	2	0	4	3	8	2	4	0	0	4	29	12	2	7	3	3	3	6	6	19	13	0	0	0	0	0	0	0	0	1	0	0	0
6013 Lahta III	155/26	3	3	3	3	3	0	1	0	4	3	8	4	2	0	0	17	30	0	4	9	0	3	3	11	6	22	13	0	1	0	0	0	1	0	1	0	0	0	0
6014 Lahta III	608/465	2	3	3	4	3	0	0	0	4	3	5	1	1	0	0	12	0	0	3	0	0	3	1	7	7	19	13	0	0	0	0	1	0	0	0	0	0	0	0
6016 Lahta III	155/101	7	3	3	2	3	0	1	0	3	3	9	2	4	0	0	4	0	0	2	0	0	3	1	11	7	19	13	0	0	1	0	0	1	0	0	0	0	0	0
6019 Lahta III	155/494,493,495	2	2	3	4	4	0	2	0	5	4	8	2	4	0	0	1	17	0	1	4	0	3	4	7	4	19	13	0	0	0	0	0	1	0	0	1	0	0	0
6020 Lahta III	155/607	2	3	3	2	3	0	1	0	4	3	5	2	3	0	0	21	29	0	4	7	0	3	2	8	5	19	13	0	0	0	0	1	1	0	0	0	0	0	0
6022 Lahta III	608/480	6	3	3	3	3	0	1	0	4	3	5	1	1	2	4	4	17	0	2	4	0	3	2	7	6	19	13	0	1	0	0	0	1	0	0	0	0	0	0
6023 Lahta III	608/681	7	4	3	2	3	0	1	0	4	3	5	2	4	0	0	2	0	0	1	0	0	3	2	7	5	19	13	0	0	0	0	1	0	0	0	0	0	0	0
5841 Malaya-Suna IX	1496/1111	6	3	4	3	3	0	0	0	2	2	11	1	1	0	0	12	0	0	3	0	0	3	1	8	12	26	13	0	0	0	0	1	0	0	0	0	0	0	0
5842 Malaya-Suna IX	1496/924	6	3	4	3	3	0	0	0	1	2	8	2	6	0	0	12	0	0	3	0	0	3	2	6	6	19	13	0	0	0	0	1	0	0	0	0	0	0	0
5845 Malaya-Suna IX	1496/345	2	5	4	4	4	0	0	0	2	4	5	1	1	0	0	17	0	0	4	1	1	3	1	8	8	19	13	0	0	0	0	0	0	0	1	0	0	0	0
5846 Malaya-Suna IX	1496/542	2	5	4	4	4	0	5	0	4	4	8	1	1	0	0	33	12	0	9	3	0	3	1	9	7	22	13	0	0	0	0	1	1	0	1	0	0	0	0
5847 Malaya-Suna IX	1496/425	2	5	3	4	4	0	0	0	3	3	8	2	4	0	0	12	0	0	3	0	0	3	1	7	7	19	13	0	0	0	0	1	0	0	0	0	0	0	0
5851 Malaya-Suna IX	1496/618	2	4	4	4	4	0	0	0	3	3	5	2	4	2	2	17	4	15	4	2	3	3	3	10	7	19	13	0	0	0	0	1	0	0	0	0	0	1	0
5852 Malaya-Suna IX	1496/981	2	3	3	2	3	0	1	0	2	4	8	3	6	0	0	15	0	0	3	0	0	3	1	9	9	19	13	0	0	0	0	0	1	0	0	0	0	0	0
5854 Malaya-Suna IX	1496/288	2	4	4	4	4	0	0	2	4	4	8	2	4	0	0	4	0	0	2	0	0	3	0	11	9	19	13	0	0	0	0	0	1	0	0	0	0	0	0
5855 Malaya-Suna IX	1496/486	2	5	5	4	4	0	1	0	3	4	5	1	1	0	0	4	0	0	2	0	0	3	5	7	6	19	13	1	0	0	0	0	1	0	0	0	0	0	0
5856 Malaya-Suna IX	1496/1583	3	5	4	2	3	0	0	0	5	4	8	2	4	0	0	12	2	0	3	1	0	3	2	8	8	19	13	0	0	0	0	1	0	0	0	0	0	0	0
5857 Malaya-Suna IX	1496/706	2	3	3	3	4	0	2	0	2	4	3	2	3	0	0	4	0	0	2	0	0	3	1	9	8	19	13	0	1	0	0	0	0	0	0	0	0	0	0
5859 Malaya-Suna IX	1496/257	2	3	3	4	4	0	0	0	3	4	5	2	6	0	0	2	0	0	1	0	0	3	1	7	6	18	13	0	0	0	0	1	0	0	0	0	0	0	0
5860 Malaya-Suna IX	1496/790	6	4	3	4	4	0	0	0	5	4	5	4	6	0	0	4	17	0	2	4	0	3	4	9	8	19	13	0	0	0	0	0	0	0	1	0	1	0	0
5861 Malaya-Suna IX	1496/660	2	3	3	4	4	0	1	0	4	3	12	3	6	0	0	4	15	0	2	3	0	3	1	11	9	19	13	0	0	1	0	1	1	0	0	0	0	0	0
5862 Malaya-Suna IX	1496/450	6	4	3	4	4	0	2	0	2	4	8	4	4	0	0	12	0	0	3	0	0	4	1	6	8	19	13	0	0	0	0	1	0	0	0	0	0	0	0
5866 Malaya-Suna IX	1496/679	2	4	5	4	4	0	0	0	3	4	5	2	4	2	2	4	12	0	2	3	0	3	4	9	8	19	13	0	0	0	1	1	0	0	1	0	0	0	0
5867 Malaya-Suna IX	1496/713	2	3	4	4	4	0	5	2	4	4	5	4	6	0	0	12	0	0	2	0	0	3	1	7	7	19	13	0	0	0	1	0	0	0	0	0	0	0	0
5872 Malaya-Suna IX	1496/1104	6	5	5	3	3	0	0	0	5	4	8	2	4	0	0	28	12	2	7	3	1	3	3	7	6	19	13	0	0	0	0	0	1	1	0	0	0	0	0
5873 Malaya-Suna IX	1496/298,386	6	4	4	3	3	0	4	2	4	3	12	2	4	0	0	22	0	0	4	0	0	3	2	10	8	19	13	0	0	0	0	1	0	0	0	0	0	0	0
5874 Malaya-Suna IX	1496/633	2	4	4	3	3	0	1	1	4	3	8	4	6	0	0	15	0	0	3	0	0	3	2	8	8	19	13	0	0	0	0	1	0	0	0	0	0	0	0
5876 Malaya-Suna IX	1496/353	2	5	4	4	4	0	1	1	4	3	5	2	3	0	0	12	0	0	3	0	0	3	1	6	6	19	13	0	0	0	0	1	0	0	0	0	0	0	0
5877 Malaya-Suna IX	1496/903,908	2	4	4	4	4	0	4	0	4	4	5	3	5	0	0	0	0	0	0	0	0	2	0	10	10	19	13	0	0	0	0	0	0	0	0	0	0	0	0
5878 Malaya-Suna IX	1496/1095	2	3	3	4	4	0	0	0	3	4	8	1	1	0	0	12	0	0	3	0	0	2	1	7	7	19	13	0	0	0	0	1	0	0	0	0	0	0	0
5879 Malaya-Suna IX	1496/596	2	3	3	3	3	0	0	5	4	3	5	1	3	0	0	11	4	0	3	2	0	3	3	7	6	19	13	0	1	0	1	0	0	0	0	0	0	0	0
5880 Malaya-Suna IX	161/9	7	4	5	2	2	0	1	0	5	2	9	3	6	0	0	29	14	0	6	0	0	2	3	8	8	22	13	0	0	1	0	0	0	0	0	0	0	0	0
5881 Malaya-Suna IX	161/79	7	4	3	2	3	0	4	1	2	3	12	2	4	6	1	19	12	0	4	3	0	3	1	11	9	18	13	0	1	0	0	1	0	0	0	0	0	0	0
5882 Malaya-Suna IX	161/43	2	5	5	3	4	0	1	0	5	3	8	4	4	2	3	33	4	0	9	2	0	3	2	11	9	20	13	0	1	0	0	0	1	0	0	0	0	0	0

Number Site	NM-number	M1	Q1	K1	SH	SK	PM	PN	PT	PS	PO	RM	RF	RP	RE	RA	KE1	KE2	KE3	KY1	KY2	KY3	Kt	V	X	Y	TY	VE	Km0	Kma	Kmb	Kmc	Kmd	Kme	Kmf	Kmg	Kmh	Kmi	Kmj	SIZE
5883 Malaya-Suna IX	1496/761	6	3	3	2	3	0	2	4	2	3	8	2	4	0	0	12	0	0	3	0	0	3	1	9	8	18	13	0	0	0	0	1	0	0	0	0	0	0	0
5884 Malaya-Suna IX	1496/426	7	3	3	3	3	0	2	5	2	3	9	3	4	0	0	0	0	0	0	0	0	3	0	8	7	19	13	0	0	0	0	0	0	0	0	0	0	0	0
5885 Malaya-Suna IX	1496/177	2	4	4	4	4	0	5	0	4	4	9	2	4	0	0	33	12	0	7	3	0	3	2	10	8	22	13	0	0	0	0	1	1	0	0	0	0	0	0
5886 Malaya-Suna IX	1496/362	7	5	2	3	3	0	0	0	4	3	5	2	4	9	6	31	14	0	9	3	0	3	1	9	8	26	13	0	0	0	0	1	1	0	0	0	0	0	0
5887 Malaya-Suna IX	1496/310	2	4	4	3	3	0	0	3	3	4	5	1	1	0	0	14	0	0	3	0	0	3	1	9	9	19	13	0	0	0	0	1	0	0	0	0	0	0	0
5888 Malaya-Suna IX	1496/1009	2	5	4	4	4	0	0	0	5	4	8	4	4	0	0	0	0	0	0	0	0	3	0	7	9	28	13	0	0	0	0	0	0	0	0	0	0	0	0
5889 Malaya-Suna IX	1496/577	7	4	2	3	3	0	0	0	2	3	8	4	4	0	0	0	0	0	0	0	0	3	0	5	9	28	13	0	0	0	0	0	0	0	0	0	0	0	0
5890 Malaya-Suna IX	1496/1045	6	3	3	3	4	0	0	3	3	4	12	1	1	0	0	14	0	0	3	0	0	3	1	8	6	19	13	0	0	0	0	1	0	0	0	0	0	0	0
5891 Malaya-Suna IX	1496/153	2	5	3	4	4	0	0	0	2	4	5	1	1	0	0	0	0	0	0	0	0	3	0	9	8	19	13	0	0	0	0	0	0	0	0	0	0	0	0
5893 Malaya-Suna IX	1496/121	6	4	3	4	4	0	0	1	2	4	12	1	1	0	0	0	0	0	0	0	0	3	0	4	7	19	13	0	0	0	0	0	0	0	0	0	0	0	0
5894 Malaya-Suna IX	1496/652	2	4	4	3	4	0	0	2	2	3	8	5	6	0	0	14	17	28	3	4	7	3	2	9	10	19	13	0	0	0	0	1	1	0	1	0	0	0	0
5895 Malaya-Suna IX	1496/68	2	3	4	3	4	0	0	0	3	3	5	2	4	2	2	4	14	2	2	3	1	3	4	8	8	18	13	0	0	1	0	1	0	1	0	0	0	0	0
5896 Malaya-Suna IX	1496/982	2	4	5	5	4	0	2	4	4	3	8	5	6	0	0	16	0	0	3	0	0	3	1	7	7	19	13	0	0	0	0	1	0	0	0	0	0	0	0
5897 Malaya-Suna IX	1496/930,934,931,749	2	5	5	3	3	0	5	6	2	3	8	4	6	0	0	12	0	0	3	0	0	1	2	8	10	19	13	0	0	0	0	1	0	0	0	0	0	0	0
5898 Pichevo IIII	1632/–	5	3	5	4	4	0	4	6	4	4	5	1	1	2	2	16	0	0	3	0	0	2	1	9	8	19	13	0	0	0	0	1	0	0	0	0	0	0	40
5787 Pichevo III	1632/35	2	4	4	3	4	0	4	5	3	3	5	2	3	0	0	12	3	0	1	2	0	3	2	6	6	19	13	0	0	1	0	1	0	0	0	0	0	0	0
5788 Pichevo III	1632/184	6	4	3	4	4	0	3	0	4	4	8	3	4	0	0	0	0	0	0	0	0	3	0	8	7	26	13	0	0	0	0	0	0	0	0	0	0	0	0
5789 Pichevo III	1632/485	2	5	4	4	3	0	0	0	2	4	2	2	4	0	0	0	0	0	0	0	0	3	0	7	5	26	13	0	0	0	0	0	0	0	0	0	0	0	0
5790 Pichevo III	1632/395	2	5	4	4	4	0	2	0	3	4	8	4	2	0	0	2	17	0	1	4	0	3	2	6	6	19	13	0	0	0	0	1	0	0	1	0	0	0	0
5791 Pichevo III	1632/395	2	4	5	4	4	0	2	1	3	4	5	3	4	0	0	12	0	0	3	0	0	3	1	6	6	19	13	0	0	0	0	1	0	0	0	0	0	0	0
5792 Pichevo III	1632/379	2	4	5	3	3	0	0	0	3	3	8	3	4	0	0	33	17	0	9	4	0	3	1	6	6	19	13	0	1	0	0	0	1	0	0	0	0	0	0
5794 Pichevo III	1632/393	6	3	4	3	3	0	0	2	4	3	8	3	4	0	0	15	4	3	3	2	2	3	4	10	9	19	13	0	0	0	0	1	1	0	1	0	0	1	0
5795 Pichevo III	1632/523	2	4	5	4	4	0	0	0	5	4	5	3	3	0	0	4	3	17	2	2	4	3	4	19	9	19	13	0	1	0	1	0	1	0	1	0	0	0	0
5796 Pichevo III	1632/250	2	3	4	3	3	0	1	0	4	4	5	1	1	0	0	18	29	0	4	8	0	3	3	7	7	19	13	0	0	0	0	0	0	0	1	0	0	1	0
5797 Pichevo III	1632/397	2	4	4	3	3	0	4	1	3	4	5	2	4	0	0	1	0	0	1	0	0	3	3	10	8	19	13	0	1	0	0	0	1	0	0	0	0	0	0
5798 Pichevo III	1632/494	2	5	4	4	4	0	1	6	3	3	5	2	4	1	4	12	0	0	3	0	0	3	1	11	10	19	13	0	0	0	0	1	0	0	0	0	0	0	0
5799 Pichevo III	1632/402,403	6	3	5	4	4	0	1	2	3	4	5	2	3	1	2	15	0	0	3	0	0	2	1	11	11	19	13	0	0	0	0	1	0	0	0	0	0	0	0
5801 Pichevo III	1632/259,266	2	4	4	4	4	0	1	0	5	3	8	2	4	0	0	2	11	3	1	3	2	2	5	10	9	19	13	0	1	0	0	1	0	0	0	0	0	0	0
5802 Pichevo III	1632/437	6	3	3	4	4	0	2	6	4	4	5	1	1	0	0	0	0	0	0	0	0	3	0	11	9	19	13	0	0	0	0	0	0	0	0	0	0	0	0
5803 Pichevo III	1632/525	2	3	3	4	4	0	1	0	4	4	8	2	4	0	0	12	0	0	3	0	0	3	1	9	8	19	13	0	0	0	0	1	0	0	0	0	0	0	0
5805 Pichevo III	1632/442	6	4	4	3	3	0	1	0	3	3	8	3	4	1	2	1	11	0	1	3	0	3	2	9	7	19	13	0	1	0	0	1	0	0	0	0	0	0	0
5806 Pichevo III	1632/442	2	4	4	3	3	0	1	0	3	3	8	2	4	1	1	1	12	0	1	3	0	3	3	7	6	19	13	0	0	1	0	1	0	0	0	0	0	0	0
5807 Pichevo III	1632/355	2	5	5	4	4	0	0	0	3	4	8	3	4	5	4	10	14	0	4	3	0	3	2	7	7	19	13	0	0	0	0	1	0	0	0	0	0	0	0
5809 Pichevo III	1632/463	2	3	3	4	4	0	1	0	3	3	5	1	1	5	4	7	14	0	4	3	0	3	2	8	7	19	13	0	0	0	0	1	0	0	0	0	0	1	0
5810 Pichevo III	1632/84	6	3	3	4	4	0	0	0	3	3	2	2	4	2	4	4	0	0	2	0	0	3	4	7	6	19	13	0	0	0	0	0	1	0	0	0	0	0	0
5811 Pichevo III	1632/216	2	3	3	4	4	0	2	0	4	4	8	2	4	2	2	1	18	12	1	4	12	3	3	7	6	19	13	0	0	0	0	0	1	0	1	1	0	0	0
5812 Pichevo III	1632/253	2	4	3	4	4	0	0	0	3	3	5	2	4	1	1	2	17	12	2	4	12	3	3	7	7	19	13	0	1	0	0	1	0	1	1	0	0	0	0
5813 Pichevo III	1632/222	2	4	4	4	4	0	0	1	4	4	9	4	6	1	2	1	0	0	1	0	0	3	5	9	6	19	13	0	0	0	0	0	0	0	0	0	0	0	0
5815 Suna VI	1113/212	6	5	4	4	4	0	0	0	3	4	8	3	6	0	0	2	0	0	1	0	0	3	2	7	6	19	13	0	0	0	0	1	0	0	0	0	0	0	0
5816 Suna VI	1113/193,200	2	3	5	3	2	0	0	6	4	3	0	0	8	5	6	15	0	0	3	0	0	2	1	8	8	19	13	0	0	0	0	1	0	0	0	0	0	0	0
5818 Suna VI	1113/157	6	3	3	3	3	0	0	0	5	4	5	2	3	2	1	17	0	0	4	0	0	3	1	8	8	19	13	0	1	0	0	0	0	0	0	0	0	0	0
5819 Suna VI	1113/157	2	3	3	3	3	0	0	0	3	3	8	4	2	0	0	17	3	0	4	2	0	3	2	8	6	19	13	0	1	0	0	1	0	0	0	0	0	0	0
5820 Suna VI	1113/848,850	2	4	4	3	3	0	0	0	3	4	5	1	1	0	0	0	0	0	0	0	0	3	0	8	8	19	13	0	0	0	0	0	0	0	0	0	0	0	0
5821 Suna VI	1113/786	6	4	4	3	3	0	1	0	2	3	5	2	4	6	1	15	0	0	3	0	0	3	1	8	8	19	13	0	0	0	0	1	0	0	0	0	0	0	0
5823 Suna VI	1113/491,493	6	3	5	3	3	0	1	0	2	4	2	4	2	0	0	29	15	4	8	3	2	3	3	7	7	19	13	0	0	0	0	1	1	0	1	0	0	1	0
5824 Suna VI	1113/473	6	5	5	4	4	0	0	0	2	3	8	4	2	2	2	2	0	0	1	0	0	3	2	10	5	19	13	0	0	0	0	0	0	0	1	0	0	0	0
5828 Suna VI	1113/133	6	4	4	3	3	0	0	0	2	3	6	1	1	2	2	2	1	0	1	1	0	4	1	6	6	19	13	0	1	0	0	1	0	0	0	0	0	0	0
5829 Suna VI	1113/281	2	4	3	4	4	0	0	0	3	4	5	2	4	2	5	32	17	0	6	4	0	3	3	5	5	22	13	0	0	2	0	0	0	1	0	0	0	0	0
5830 Suna VI	1113/295	6	4	3	3	3	0	1	1	4	4	5	2	4	1	1	2	0	0	1	0	0	5	1	5	5	19	13	0	0	0	0	1	0	0	0	0	0	0	0

Number Site	NM-number	M1	Q1	K1	SH	SK	PM	PN	PT	PS	PO	RM	RF	RP	RE	RA	KE1	KE2	KE3	KY1	KY2	KY3	Kt	V	X	Y	TY	VE	Km0	Kma	Kmb	Kmc	Kmd	Kme	Kmf	Kmg	Kmh	Kmi	Kmj	SIZE
5831 Suna VI	1113/182	6	4	4	3	4	2	0	0	3	4	5	2	4	1	1	4	0	0	2	0	0	3	2	6	6	19	13	0	0	0	0	0	1	0	0	0	0	0	0
5833 Suna VI	1113/411	2	4	4	3	3	0	0	0	2	4	5	1	1	5	5	2	0	0	1	0	0	5	2	6	6	19	13	0	0	0	0	0	0	0	0	0	0	1	0
5168 Tsudozero I	33/7	3	5	5	4	2	0	0	0	3	3	9	3	3	2	2	4	2	0	2	0	0	2	4	8	5	11	13	0	1	0	0	0	0	0	0	0	0	0	0
6588 Ust-Tomitsa	11072/84	2	4	5	3	2	0	5	0	4	3	8	2	4	0	0	0	0	0	0	0	12	2	0	5	5	19	13	0	0	0	0	0	0	0	0	0	0	0	0
6589 Ust-Tomitsa	11072/951	2	3	6	4	4	0	1	0	4	4	5	3	3	0	0	0	0	0	0	0	0	3	0	4	5	19	13	0	0	0	0	0	0	0	0	0	0	0	0
6591 Ust-Tomitsa	11072/83	2	5	4	3	3	0	0	0	2	3	9	2	4	0	0	0	0	0	0	0	0	3	0	7	5	26	13	0	0	0	0	0	0	0	0	0	0	0	0
6592 Ust-Tomitsa	11072/215	2	4	5	4	4	0	0	1	4	4	8	3	4	2	2	3	12	0	2	3	0	3	3	6	5	19	13	0	0	1	0	1	0	0	0	0	0	0	0
6593 Ust-Tomitsa	11072/410	2	3	4	2	3	0	2	0	4	3	8	2	4	2	2	4	3	12	2	2	3	3	4	7	5	19	13	0	0	1	0	1	0	1	0	0	0	0	0
6594 Ust-Tomitsa	11072/386	2	2	3	3	3	0	1	1	4	3	8	2	4	2	2	3	12	0	2	3	0	3	3	7	5	19	13	0	1	0	0	1	0	0	0	0	0	0	0
6595 Ust-Tomitsa	11072/294	2	2	4	3	3	0	1	1	4	4	5	1	1	2	0	4	13	3	2	3	2	3	4	6	6	19	13	0	1	0	0	1	1	0	0	0	0	0	0
6596 Ust-Tomitsa	11072/449	2	2	4	3	3	0	0	0	2	3	5	2	4	2	3	4	15	3	2	3	2	3	3	8	7	19	13	0	1	0	0	1	1	0	0	0	0	0	0
6597 Ust-Tomitsa	11072/389	7	2	3	2	3	0	1	0	5	3	5	2	3	2	2	4	15	3	2	3	2	3	4	10	6	19	13	0	1	0	0	1	1	0	0	0	0	0	0
6598 Ust-Tomitsa	11072/363	2	5	5	4	4	0	0	0	2	3	2	2	8	2	4	4	3	0	2	2	12	2	4	7	7	19	13	0	1	0	0	0	1	0	1	0	0	1	0
6599 Ust-Tomitsa	11072/388	2	4	4	4	4	0	0	0	2	3	3	4	6	2	5	4	15	0	2	3	0	3	3	6	7	19	13	0	0	0	0	1	1	0	0	0	0	0	0
6600 Ust-Tomitsa	11072/419	2	2	2	3	3	0	0	0	5	3	5	1	1	2	3	4	15	3	2	3	12	3	3	10	6	19	13	0	1	0	0	1	1	0	0	0	0	0	0
6601 Ust-Tomitsa	11072/391	2	3	4	3	3	0	0	4	4	3	5	3	3	0	0	12	0	0	3	0	0	3	2	5	5	19	13	0	0	0	0	1	0	0	0	0	0	0	0
6602 Ust-Tomitsa	11072/395	2	4	5	3	3	0	0	6	4	3	5	1	1	3	4	15	3	0	3	2	0	3	2	8	7	19	13	0	0	0	0	1	0	0	0	0	0	0	0
6603 Ust-Tomitsa	11072/396	2	3	4	3	3	0	1	1	4	3	9	2	4	2	2	4	12	0	2	3	12	3	5	10	8	19	13	0	1	0	0	1	0	0	0	0	0	1	0
6605 Ust-Tomitsa	11072/390	2	2	4	3	3	0	0	0	2	3	5	1	1	2	2	4	12	3	2	3	2	3	4	11	11	19	13	0	0	0	0	1	1	0	1	0	1	1	0
6606 Ust-Tomitsa	11072/415	7	3	4	3	3	0	1	0	4	3	5	1	1	2	2	3	15	0	2	3	0	3	2	10	7	19	13	0	1	0	0	1	0	0	0	0	0	0	0
6607 Ust-Tomitsa	11072/411	2	3	5	3	3	0	4	1	4	3	8	1	1	2	1	12	0	0	3	0	12	3	1	7	8	19	13	0	0	0	0	1	0	0	0	0	0	0	0
6608 Ust-Tomitsa	11072/396	2	3	4	3	3	0	2	1	2	3	8	3	4	2	1	15	12	0	3	3	12	2	3	7	5	19	13	0	0	0	0	1	0	0	0	0	0	0	0
6609 Ust-Tomitsa	11072/41	2	4	5	4	3	0	1	0	2	3	5	1	1	2	2	4	12	15	2	3	3	3	3	12	11	19	13	0	0	0	0	1	0	0	0	0	1	0	0
6610 Ust-Tomitsa	11072/391	2	4	5	3	3	0	1	0	4	3	8	2	4	2	1	4	0	0	2	0	12	3	2	7	5	19	13	0	1	0	0	0	0	0	1	0	0	0	0
6611 Ust-Tomitsa	11072/449	2	5	5	3	3	0	1	1	4	4	5	1	1	2	1	22	0	0	4	0	12	3	2	7	5	19	13	0	0	0	0	1	0	0	1	0	0	0	0
6612 Ust-Tomitsa	11072/34	2	2	4	3	3	0	0	0	4	3	9	4	5	6	1	4	0	0	2	0	12	3	5	7	5	19	13	0	1	0	0	0	0	0	1	0	0	0	0
6613 Ust-Tomitsa	11072/399	2	3	5	3	3	0	4	0	5	4	5	1	1	4	4	2	0	0	1	0	12	3	3	6	7	19	13	0	0	0	0	1	0	0	1	0	0	0	0
6614 Ust-Tomitsa	11072/3	2	2	4	2	3	0	0	3	4	3	5	2	4	0	0	12	0	0	3	0	0	3	2	10	8	19	13	0	0	0	0	1	0	0	0	0	0	0	0
6615 Ust-Tomitsa	11072/400	2	3	4	3	3	0	0	0	5	4	5	1	1	2	2	4	15	0	2	3	12	3	3	8	7	19	13	0	1	0	1	1	1	0	0	0	0	0	0
6616 Ust-Tomitsa	11072/477	2	4	5	3	3	0	0	1	4	3	5	1	1	2	2	4	0	0	2	0	0	3	3	5	4	19	13	0	1	0	0	0	1	0	0	0	0	0	0
6617 Ust-Tomitsa	11072/401	2	3	4	4	4	0	0	0	2	3	8	4	6	4	4	12	15	0	3	3	12	3	4	8	5	19	13	0	0	0	0	1	0	0	0	0	0	1	0
6619 Ust-Tomitsa	11072/404	2	2	3	3	3	0	0	0	2	3	9	2	4	2	2	4	0	0	2	0	12	3	2	6	5	19	13	0	1	0	0	1	0	0	0	0	0	0	0
6620 Ust-Tomitsa	11072/423	7	3	3	2	3	0	0	0	5	3	5	1	1	2	2	4	0	0	2	0	12	3	3	10	5	19	13	0	1	0	0	0	1	0	0	0	0	0	0
6621 Ust-Tomitsa	11072/446	2	3	3	3	3	0	0	4	4	3	5	1	1	0	0	4	12	2	2	3	3	3	3	5	4	19	13	0	1	0	0	1	1	0	0	0	0	0	0
6622 Ust-Tomitsa	11072/457	2	2	3	3	3	0	0	6	4	3	5	2	3	0	0	2	0	0	1	0	0	3	2	5	4	19	13	0	0	0	0	1	0	0	0	0	0	1	0
6623 Ust-Tomitsa	11072/458	2	2	3	3	3	0	1	0	4	3	5	1	1	2	2	4	15	0	2	3	0	3	3	9	6	19	13	0	1	0	0	1	0	0	1	0	0	0	0
6624 Ust-Tomitsa	11072/427	2	3	4	3	4	0	0	0	2	3	6	4	6	2	2	4	0	0	2	0	12	3	3	7	8	19	13	0	1	0	0	1	0	0	0	0	0	0	0
6625 Ust-Tomitsa	11072/387	2	2	4	3	4	0	1	0	2	4	5	1	1	2	2	4	12	0	2	3	12	3	4	10	6	19	13	0	1	0	0	1	0	0	0	0	0	0	0
6626 Ust-Tomitsa	11072/393	2	3	4	4	4	0	2	0	4	4	3	2	3	2	1	4	0	0	2	0	12	3	3	8	8	19	13	0	1	0	0	0	0	0	1	0	0	0	0
6627 Ust-Tomitsa	11072/436	2	2	3	3	3	0	0	1	4	3	8	2	4	2	1	12	0	0	3	0	12	3	1	4	6	19	13	0	0	0	0	1	0	0	0	0	0	0	0
5102 Ust-Vytegra	2164/33	2	5	4	5	4	0	0	0	3	4	5	3	4	1	2	4	16	0	2	3	0	2	4	8	7	19	14	0	0	1	0	1	1	0	0	0	0	0	0
5591 Besovy-sledki I	286/510	7	5	1	2	3	0	1	4	4	4	8	4	6	0	0	2	29	0	1	7	0	3	1	7	7	19	15	0	0	0	0	1	1	0	0	0	0	0	0
5593 Besovy-sledki I	286/–	2	5	3	2	3	3	5	6	4	3	5	4	5	0	0	26	28	11	5	7	3	3	5	4	8	34	15	0	0	0	0	1	0	0	0	0	0	1	0
5595 Besovy-sledki I	286/522	2	6	3	2	4	0	5	6	4	4	5	4	5	0	0	26	12	25	5	3	2	3	5	6	8	34	15	0	1	0	0	1	1	0	0	0	0	0	0
5596 Besovy-sledki I	286/7	2	5	3	2	4	0	5	6	4	4	5	4	5	0	0	26	7	29	5	2	7	3	5	6	8	34	15	0	0	0	0	0	1	0	0	0	0	1	0
5597 Besovy-sledki I	286/460	3	5	4	3	3	0	0	0	2	4	2	1	1	2	1	6	0	0	2	0	0	3	4	14	7	11	15	0	1	0	0	0	0	0	0	0	0	0	0
5598 Besovy-sledki I	286/451	3	5	4	3	3	0	0	0	2	4	13	1	1	2	1	6	0	0	2	0	0	3	4	14	10	11	15	0	1	0	0	0	0	0	0	0	0	0	0
5609 Besovy-sledki III	94/1300	3	5	3	3	3	0	0	0	2	4	8	4	4	1	4	1	15	15	1	3	0	3	3	5	5	19	15	0	0	0	0	1	0	1	0	0	0	0	0
5610 Besovy-sledki III	94/1203	5	3	4	3	3	2	0	0	5	4	9	2	4	0	0	7	0	25	2	0	2	3	4	9	7	10	15	0	0	0	0	1	0	0	0	0	0	0	0

Number Site	NM-number	M1	Q1	K1	SH	SK	PM	PN	PT	PS	PO	RM	RF	RP	RE	RA	KE1	KE2	KE3	KY1	KY2	KY3	Kt	V	X	Y	TY	VE	Km0	Kma	Kmb	Kmc	Kmd	Kme	Kmf	Kmg	Kmh	Kmi	Kmj	SIZE
5611 Besovy-sledki III	288/71	3	6	6	2	3	0	0	0	1	3	3	4	3	0	0	3	0	0	2	0	0	4	2	8	8	11	15	0	0	0	0	1	0	0	0	0	0	0	0
5612 Besovy-sledki III	94/591	3	5	3	4	4	0	0	0	5	4	9	4	4	0	0	0	0	0	0	0	0	3	0	8	5	17	15	0	0	0	0	0	0	0	0	0	0	0	0
5614 Besovy-sledki III	150/607	3	5	2	4	4	0	0	0	5	4	5	3	4	0	0	25	0	0	1	0	0	3	3	4	3	17	15	0	0	0	0	1	0	0	0	0	0	0	0
5616 Besovy-sledki III	150/420	3	5	2	3	3	0	0	0	2	3	9	4	4	2	2	25	0	0	1	0	0	3	4	7	5	17	15	0	0	0	0	1	0	0	0	0	0	0	0
5622 Besovy-sledki III	94/1194	3	5	3	4	4	0	0	0	3	4	5	4	4	0	0	4	0	0	2	0	0	3	4	7	6	17	15	0	1	0	0	0	0	0	0	0	0	0	0
5635 Besovy-sledki III	150/768	3	5	4	3	3	0	0	0	2	3	5	3	4	0	0	4	0	0	2	0	0	4	2	10	8	11	15	0	1	0	0	0	0	0	0	0	0	0	0
5636 Besovy-sledki III	150/1230	3	6	4	2	4	0	0	0	3	4	2	3	3	0	0	6	0	0	2	0	0	3	2	8	6	11	15	0	0	1	0	0	0	0	0	0	0	0	0
5637 Besovy-sledki III	150/187	3	5	3	3	3	0	0	0	5	4	2	3	3	0	0	6	0	0	2	0	0	3	1	10	6	11	15	0	0	1	0	0	0	0	0	0	0	0	0
5638 Besovy-sledki III	150/1709	0	0	0	5	5	0	0	0	6	5	8	5	6	0	0	0	0	0	0	0	0	3	0	10	8	29	15	0	0	0	0	0	0	0	0	0	0	0	0
5639 Besovy-sledki III	150/–	2	4	3	4	4	0	0	0	5	4	9	4	6	0	0	1	0	0	1	0	0	3	1	10	10	26	15	0	0	1	0	0	0	0	0	0	0	0	0
5643 Besovy-sledki III	150/919	2	6	3	4	3	0	0	0	2	4	2	1	1	0	1	11	0	0	3	0	0	4	2	10	8	16	15	0	0	0	0	1	0	0	0	0	0	0	0
5645 Besovy-sledki III	94/605	3	5	4	2	3	0	0	0	2	3	9	3	3	0	0	25	3	0	4	2	0	3	3	8	6	17	15	0	1	0	0	0	1	0	0	0	0	0	0
5646 Besovy-sledki III	150/1316	3	5	3	3	3	0	0	0	3	4	9	3	6	4	4	29	0	0	6	0	0	3	1	8	4	17	15	0	0	0	0	0	0	1	0	0	0	0	0
5648 Besovy-sledki III	94/700	3	6	3	3	3	0	0	0	3	3	5	2	4	0	0	25	11	0	7	3	0	4	4	8	6	11	15	0	0	0	0	1	1	0	0	0	0	0	0
5650 Besovy-sledki III	94/203	3	5	3	3	3	0	0	0	3	3	9	3	4	1	2	5	0	0	2	0	0	4	2	7	6	11	15	0	0	1	0	0	0	0	0	0	0	0	0
5651 Besovy-sledki III	94/562	2	3	4	3	3	0	2	0	2	3	8	3	6	0	0	25	14	0	4	3	0	1	3	8	8	34	15	0	0	1	0	1	1	0	0	0	0	0	0
5657 Besovy-sledki III	94/590	3	4	5	4	4	0	0	0	5	4	9	3	4	0	0	4	0	0	2	0	0	3	2	10	4	17	15	0	0	0	0	0	0	0	0	0	0	1	0
5658 Besovy-sledki III	94/1193	3	5	4	4	4	0	0	0	3	4	8	4	4	0	0	4	0	0	2	0	0	3	2	6	5	17	15	0	0	1	0	0	0	0	0	0	0	0	0
5659 Besovy-sledki III	94/701	3	6	4	4	4	0	0	0	3	4	8	3	4	0	0	4	17	0	2	4	0	3	3	4	3	17	15	0	0	1	0	0	0	1	0	0	0	0	0
5660 Besovy-sledki III	150/1443	3	4	4	3	4	0	0	0	3	3	8	3	6	0	0	5	0	0	2	0	0	3	1	6	4	17	15	0	0	1	0	0	0	0	0	0	0	0	0
5661 Besovy-sledki III	150/228	3	4	3	3	4	0	0	0	3	4	5	4	4	0	0	2	0	0	1	0	0	3	4	2	2	17	15	0	0	0	0	1	0	0	0	0	0	0	0
5663 Besovy-sledki III	94/358	3	6	4	4	4	0	0	0	5	4	8	4	6	0	0	7	0	0	4	0	0	2	4	6	3	17	15	0	0	0	0	1	0	0	0	0	0	0	0
5664 Besovy-sledki III	150/42	3	4	4	4	4	0	0	0	6	4	8	4	4	0	0	4	0	0	2	0	0	3	2	5	4	17	15	0	0	1	0	0	0	1	0	0	0	0	0
5665 Besovy-sledki III	93/563	3	5	3	4	4	0	0	0	3	4	8	3	4	0	0	25	0	0	2	0	0	3	3	5	5	17	15	0	0	0	0	0	1	0	0	0	0	0	0
5666 Besovy-sledki III	93/114	3	4	3	4	4	0	0	0	5	5	9	3	4	2	2	4	0	0	2	0	0	3	3	8	3	17	15	0	0	1	0	0	0	0	0	0	0	1	0
5667 Besovy-sledki III	93/160	3	5	3	3	3	0	0	0	2	3	8	5	6	2	1	4	0	0	2	0	0	3	4	3	3	17	15	0	0	1	0	0	0	0	0	0	0	0	0
5668 Besovy-sledki III	93/343	3	6	4	4	4	0	0	0	3	4	5	4	4	0	0	4	0	0	2	0	0	3	4	4	4	17	15	0	0	0	0	0	1	0	0	0	0	0	0
5671 Besovy-sledki III	93/117	3	5	3	4	4	0	4	0	5	4	13	4	3	2	1	6	16	0	2	3	0	2	5	10	5	15	15	0	1	0	0	0	0	0	0	0	0	0	0
5672 Besovy-sledki III	94/1679	3	5	4	4	4	0	0	0	5	4	9	3	4	0	0	5	0	0	2	0	0	3	3	9	8	17	15	0	0	1	0	0	0	0	0	0	0	0	0
5674 Besovy-sledki III	93/616	3	5	4	4	3	0	0	0	3	3	8	5	6	0	0	4	0	0	2	0	0	3	3	5	5	17	15	0	0	1	0	0	0	0	0	0	0	0	0
5675 Besovy-sledki III	93/306	3	5	4	2	3	0	0	0	2	3	5	3	6	0	0	25	3	0	4	2	0	3	3	8	4	17	15	0	1	0	0	0	1	0	0	0	0	0	0
5677 Besovy-sledki III	93/169	9	3	3	2	3	0	0	0	3	3	5	1	1	2	1	3	0	0	2	0	0	3	3	7	5	16	15	0	0	1	0	0	0	0	0	0	0	1	0
5679 Besovy-sledki III	93/118	7	4	4	2	2	0	0	0	3	3	2	1	1	2	4	6	0	0	2	0	0	3	3	14	7	11	15	0	0	0	0	0	0	0	1	0	0	0	0
5262 Kudam-gyba IV	25/351	3	6	5	2	3	0	0	0	5	4	9	3	4	2	2	4	0	0	2	0	0	2	4	11	5	11	15	0	0	1	0	0	0	0	0	0	0	0	0
5263 Kudam-gyba IV	25/–	3	6	5	3	3	0	0	0	3	3	9	4	4	2	5	4	0	0	2	0	12	4	3	11	6	11	15	0	0	1	0	0	0	0	0	0	0	0	0
5264 Kudam-gyba IV	25/563	3	3	3	3	2	0	0	0	3	3	8	3	6	2	2	4	0	0	2	0	0	4	2	9	8	16	15	0	0	0	0	0	0	0	0	0	0	1	0
5266 Kudam-gyba IV	25/371	3	5	4	3	2	0	0	0	3	3	5	1	1	0	0	36	0	0	4	0	0	3	3	4	4	16	15	0	0	0	0	0	0	0	1	0	0	0	0
5202 Kudam-gyba IX	2227/62	3	5	5	3	3	0	0	0	2	4	2	2	3	5	5	18	0	0	6	0	0	2	4	21	5	11	15	0	0	1	0	0	0	0	0	0	0	0	0
5203 Kudam-gyba IX	2227/429	3	5	5	3	3	0	0	0	2	4	13	1	1	2	7	6	2	0	2	1	0	1	3	18	7	11	15	0	1	0	0	0	0	0	0	0	0	0	0
5185 Kudam-gyba VII	2041/752	3	5	5	3	3	0	0	0	3	3	9	3	4	2	2	4	0	0	2	0	0	3	1	0	7	11	15	0	0	0	0	0	0	1	0	0	0	0	0
5189 Kudam-gyba VII	2041/828	3	6	5	3	3	0	0	0	3	3	1	2	4	6	1	4	0	0	2	0	0	3	2	10	8	11	15	0	0	0	0	0	0	1	0	0	0	0	0
5190 Kudam-gyba VII	2041/91	3	4	5	3	3	0	0	0	3	4	5	2	3	2	1	6	0	0	2	0	0	3	4	8	5	11	15	0	0	1	0	0	0	0	0	0	0	0	0
5278 Kudam-gyba VII	25/1102	3	5	4	4	3	0	0	0	3	3	9	1	1	2	2	5	0	0	2	0	0	3	4	9	4	17	15	0	0	1	0	0	0	1	0	0	0	0	0
5739 Kudama X	518/–	3	5	2	4	4	0	1	0	3	4	8	2	3	0	0	3	28	0	2	7	0	2	4	22	8	22	15	0	0	0	0	0	1	0	1	0	0	0	0
5740 Kudama X	518/923	9	3	3	2	3	0	1	0	4	3	8	2	3	0	0	0	0	0	0	0	0	3	0	17	7	16	15	0	0	0	0	0	0	0	0	0	0	0	0
5741 Kudama X	518/18	9	3	3	2	3	0	2	0	4	3	9	2	3	0	0	17	0	0	4	0	0	3	1	26	10	26	15	0	0	0	0	0	0	0	1	0	0	0	0
5743 Kudama X	518/926	9	4	4	2	2	0	0	0	5	3	8	3	4	0	0	0	0	0	0	0	0	4	0	17	7	9	15	0	0	0	0	0	0	0	0	0	0	0	0
5746 Kudama X	518/–	3	3	3	2	2	0	0	0	2	3	13	1	1	2	2	5	0	0	2	0	0	4	2	12	6	15	15	0	0	0	0	0	0	0	1	0	0	0	0
5749 Kudama X	1647/154,1036	2	5	3	3	3	0	1	0	3	4	8	3	4	0	0	2	15	0	1	3	0	2	2	10	6	17	15	0	1	0	0	1	0	0	0	0	0	0	0

Number Site	NM-number	M1	Q1	K1	SH	SK	PM	PN	PT	PS	PO	RM	RF	RP	RE	RA	KE1	KE2	KE3	KY1	KY2	KY3	Kt	V	X	Y	TY	VE	Km0	Kma	Kmb	Kmc	Kmd	Kme	Kmf	Kmg	Kmh	Kmi	Kmj	SIZE
5751 Kudama X	1647/1033	2	5	3	4	4	0	2	0	4	4	8	3	6	2	2	27	4	11	5	2	3	3	5	7	8	34	15	0	1	0	0	1	1	0	0	0	0	0	0
5752 Kudama X	1647/1060	4	6	3	2	2	0	1	0	2	3	9	2	3	0	0	25	0	0	4	0	0	4	1	8	6	26	15	0	0	0	0	0	1	0	0	0	0	0	0
5753 Kudama X	1647/290	3	5	2	4	3	0	0	0	3	3	9	2	4	0	0	2	0	0	1	0	0	3	1	7	7	17	15	0	1	0	0	0	0	0	0	0	0	0	0
5755 Kudama X	1647/238	2	4	3	4	4	0	1	0	5	4	8	4	6	0	0	12	0	0	3	0	0	3	2	7	3	19	15	0	0	0	0	1	0	0	0	0	0	0	0
5756 Kudama X	1647/511	1	3	3	4	4	0	1	0	5	4	8	3	4	0	0	12	0	0	3	0	0	3	2	8	5	19	15	0	0	0	0	0	1	0	0	0	0	0	0
5758 Kudama X	1647/310	5	3	3	4	4	0	1	0	3	4	5	2	4	1	7	25	2	0	4	1	0	3	3	7	7	26	15	0	0	0	0	0	1	0	0	1	0	0	0
5759 Kudama X	1647/1241	3	5	3	2	2	0	0	5	2	3	8	4	6	0	0	1	0	0	1	0	0	4	1	8	6	19	15	0	0	1	0	0	0	0	0	0	0	0	0
5760 Kudama X	1647/483	2	5	3	4	4	0	1	0	4	3	9	3	6	2	2	27	4	0	5	2	0	3	5	8	7	34	15	0	0	1	0	1	1	0	0	0	0	0	0
5761 Kudama X	1647/618	2	4	3	2	3	0	0	1	3	3	2	1	1	0	0	0	0	0	0	0	0	3	0	9	6	26	15	0	0	0	0	0	0	0	0	0	0	0	0
5770 Kudama X	1647/7	2	5	2	4	4	0	0	0	5	4	5	2	4	0	0	1	17	0	1	4	0	3	3	5	5	17	15	0	0	1	0	1	1	0	0	0	0	0	0
5780 Kudama X	2100/44,64	2	4	3	3	3	0	3	0	3	3	8	3	4	0	0	4	2	0	2	1	0	2	4	7	7	19	15	0	1	0	0	1	1	1	0	0	0	0	0
5781 Ust-Vodla I	2100/49,51	2	4	3	3	3	0	0	1	2	4	5	3	4	2	3	4	12	0	2	3	12	3	3	7	5	19	15	0	1	0	0	1	0	0	0	0	0	0	0
5782 Ust-Vodla I	2100/46	2	4	3	3	3	0	1	0	3	3	5	1	1	0	0	25	14	0	4	2	0	3	2	7	6	19	15	0	1	0	1	1	0	0	0	0	0	0	0
5280 Kudama XI	1301/730	6	4	5	3	4	0	0	4	2	4	5	3	5	0	0	14	0	0	3	0	0	3	1	11	10	19	15	0	0	0	0	1	0	0	0	0	0	0	0
5281 Kudama XI	1301/934	2	5	5	4	4	0	0	4	2	3	9	2	4	0	0	12	0	0	3	0	0	3	1	11	9	19	15	0	0	0	0	1	0	0	0	0	0	0	0
5282 Kudama XI	1301/2049	2	5	4	3	3	0	0	0	3	4	9	2	1	0	0	12	0	0	3	0	0	3	3	10	10	19	15	0	0	0	0	1	0	0	0	0	0	0	0
5283 Kudama XI	1301/148	2	5	4	3	3	0	0	0	3	4	5	1	1	0	0	11	0	0	3	0	0	3	1	8	4	19	15	0	0	0	0	1	0	0	0	0	0	0	0
5285 Kudama XI	1630/296	3	6	2	2	4	0	1	0	2	3	7	2	4	0	0	33	22	0	8	4	0	3	3	7	7	17	15	0	0	0	0	0	1	0	1	0	0	0	0
5287 Kudama XI	1630/425	2	6	3	3	4	0	1	0	3	3	7	1	1	0	0	2	0	0	4	0	0	3	2	8	8	17	15	0	0	0	0	0	1	0	0	0	0	0	0
5288 Kudama XI	1630/673	3	4	4	3	4	0	1	0	4	4	5	2	4	0	0	32	34	0	9	10	0	4	3	10	10	20	15	0	0	0	0	0	1	0	0	0	0	0	0
5289 Kudama XI	1630/515	3	5	3	4	4	0	3	0	4	4	8	4	2	0	0	32	0	0	7	0	0	3	5	6	8	22	15	0	0	1	0	0	1	0	1	0	0	0	0
5290 Kudama XI	1630/446	2	5	4	3	4	0	1	0	4	3	5	2	5	0	0	28	0	0	7	0	0	4	1	5	8	25	15	0	0	0	0	0	1	0	0	0	0	0	0
5291 Kudama XI	1630/751	2	3	3	3	3	0	0	0	3	3	8	4	4	0	0	19	0	0	4	0	0	4	2	7	7	25	15	0	0	1	0	0	0	0	0	0	0	0	0
5292 Kudama XI	1630/263	2	4	4	4	4	0	5	0	4	3	8	4	5	0	0	1	32	34	1	7	10	0	4	7	10	22	15	1	0	0	0	1	1	1	0	0	0	0	0
5294 Kudama XI	1630/6	7	4	2	2	2	0	1	0	2	3	5	3	5	0	0	1	14	0	1	3	0	3	3	7	7	19	15	0	0	0	0	1	1	0	0	0	0	0	0
5295 Kudama XI	1630/694	6	3	4	2	4	0	0	0	2	4	8	4	4	0	0	1	2	0	1	1	0	3	3	11	5	19	15	0	0	0	0	1	1	0	0	0	0	0	0
5296 Kudama XI	1630/837	9	6	4	1	2	0	0	0	1	3	5	3	3	0	0	20	0	0	4	0	0	3	1	10	10	9	15	0	0	0	0	0	0	0	1	0	0	0	0
5297 Kudama XI	1630/574	2	6	5	4	4	0	4	0	3	4	9	3	4	0	0	2	29	0	1	7	0	4	3	11	8	22	15	0	0	0	0	1	1	1	0	0	0	0	0
5298 Kudama XI	1630/645	2	6	5	4	4	0	4	0	3	4	9	2	4	0	0	29	11	0	7	3	0	3	3	10	5	22	15	0	0	0	0	1	1	0	1	0	0	0	0
5299 Kudama XI	1630/794	2	6	3	4	4	0	0	0	3	3	5	2	3	0	0	27	0	0	5	0	0	3	3	5	5	19	15	0	1	0	0	0	1	0	0	0	0	0	0
5300 Kudama XI	1630/473	2	3	3	4	4	0	0	0	3	4	8	4	4	1	1	0	0	0	0	0	0	3	0	11	6	20	15	0	0	0	0	0	0	0	0	0	0	0	0
5301 Kudama XI	1630/803	7	3	2	3	3	0	0	0	5	5	5	2	3	0	0	0	0	0	0	0	0	3	0	6	6	17	15	0	0	0	0	0	0	0	0	0	0	0	0
5302 Kudama XI	1630/559	7	3	3	2	3	0	0	0	2	4	5	2	4	0	0	0	0	0	0	0	0	3	0	6	5	17	15	0	0	0	0	0	0	0	0	0	0	0	0
5303 Kudama XI	1630/478	7	4	4	2	3	0	0	0	2	4	5	1	1	0	0	0	0	0	0	0	0	3	0	8	8	9	15	0	0	0	0	0	0	0	0	0	0	0	0
5304 Kudama XI	1630/850	7	4	4	2	3	0	0	0	2	4	7	1	1	0	0	0	0	0	0	0	0	3	0	8	6	9	15	0	0	0	0	0	0	0	0	0	0	0	0
5305 Kudama XI	1630/540	2	3	3	3	3	0	0	0	2	3	5	3	4	0	0	11	0	0	3	0	0	3	0	6	6	9	15	0	0	0	0	1	0	0	0	0	0	0	0
5306 Kudama XI	1630/416	7	3	2	3	3	0	0	0	3	4	5	2	3	0	0	15	0	0	3	0	0	3	2	7	5	17	15	0	0	0	0	1	0	0	0	0	0	0	0
5307 Kudama XI	1630/143	2	3	3	4	4	0	0	0	3	3	5	3	5	0	0	30	11	0	6	3	0	3	2	5	9	34	15	0	0	1	0	1	0	0	0	0	0	0	0
5308 Kudama XI	1630/783	3	5	3	4	4	0	2	0	3	4	7	2	5	0	0	2	29	0	1	7	0	3	3	3	4	26	15	0	0	0	0	1	1	0	0	0	0	0	0
5309 Kudama XI	1630/924	6	6	3	4	4	0	0	0	3	4	4	1	1	0	0	29	0	0	8	0	0	3	1	9	5	26	15	0	0	0	0	0	1	0	0	0	0	0	0
5310 Kudama XI	1630/1809	7	3	2	3	3	0	0	0	3	4	5	1	1	0	0	0	0	0	0	0	0	3	0	6	6	26	15	0	0	0	0	0	0	0	0	0	0	0	0
5311 Kudama XI	1630/495	7	4	4	3	3	0	0	0	3	4	1	1	1	0	0	7	0	0	4	0	0	3	2	9	7	26	15	0	0	0	0	1	0	0	0	0	0	0	0
5312 Kudama XI	1630/–	2	4	4	3	3	0	0	0	3	3	9	1	1	0	0	0	0	0	0	0	0	4	0	9	7	26	15	0	0	0	0	0	0	0	0	0	0	0	0
5313 Kudama XI	1630/64	2	4	4	3	3	0	0	1	0	3	5	1	1	0	0	0	0	0	0	0	0	3	0	9	9	26	15	0	0	0	0	0	0	0	0	0	0	0	0
5314 Kudama XI	1630/642	2	4	4	2	3	0	0	0	3	3	6	2	1	0	0	29	0	0	8	0	0	4	1	6	6	26	15	0	0	0	0	0	1	0	0	0	0	0	0
5315 Kudama XI	1630/564	2	5	4	4	4	0	0	0	2	3	4	3	4	0	0	9	11	0	4	3	0	3	3	13	5	26	15	0	0	0	0	1	0	0	0	0	0	0	0
5316 Kudama XI	1630/216	2	6	4	4	4	0	4	0	2	4	5	3	5	0	0	31	0	0	11	0	0	4	1	7	8	20	15	0	0	0	0	0	1	0	0	0	0	0	0
5317 Kudama XI	1630/143	5	4	4	3	3	0	2	0	4	3	5	1	1	2	3	4	0	0	2	0	0	4	3	8	8	19	15	0	0	1	0	0	0	0	0	0	0	0	0
5318 Kudama XI	1630/64	2	6	4	2	2	0	0	0	2	3	5	2	3	0	0	14	0	0	3	0	0	4	1	6	6	9	15	0	0	0	0	1	0	0	0	0	0	0	0

Number Site	NM-number	M1	Q1	K1	SH	SK	PM	PN	PT	PS	PO	RM	RF	RP	RE	RA	KE1	KE2	KE3	KY1	KY2	KY3	Kt	V	X	Y	TY	VE	Km0	Kma	Kmb	Kmc	Kmd	Kme	Kmf	Kmg	Kmh	Kmi	Kmj	SIZE
5319 Kudama XI	1630/661	7	3	2	3	3	0	1	0	2	4	5	1	1	0	0	0	0	0	0	0	0	4	0	6	6	26	15	0	0	0	0	0	0	0	0	0	0	0	0
5320 Kudama XI	1630/867	7	3	2	3	4	0	0	0	3	4	5	1	1	0	0	1	0	0	1	0	0	4	1	9	9	26	15	0	0	0	1	0	0	0	0	0	0	0	0
5321 Kudama XI	1630/402	3	5	3	4	3	0	0	0	3	4	5	1	1	0	0	0	0	0	0	0	0	4	0	5	5	17	15	0	0	0	0	0	0	0	0	0	0	0	0
5322 Kudama XI	1630/546	2	3	3	4	4	0	1	0	4	3	5	2	1	0	0	0	0	0	0	0	0	4	0	7	5	17	15	0	0	0	0	0	0	0	0	0	0	0	0
5335 Kudama XI	1630/7	2	4	3	2	4	0	0	0	2	3	5	1	1	0	0	20	0	0	4	0	0	3	2	10	10	17	15	0	1	0	0	0	0	0	0	0	0	0	0
5339 Kudama XI	1630/122	3	5	4	3	4	0	0	0	2	4	5	1	1	0	0	29	0	0	7	0	0	4	1	5	5	17	15	0	0	0	0	0	1	0	0	0	0	0	0
5342 Kudama XI	1630/666	2	4	3	4	4	0	0	0	3	4	8	3	4	0	0	0	0	0	0	0	0	3	0	8	6	17	15	0	0	0	0	0	0	0	0	0	0	0	0
5350 Kudama XI	1630/449	2	4	3	3	4	0	0	0	2	4	5	1	1	0	0	0	0	0	0	0	0	4	0	7	7	17	15	0	0	0	0	0	0	0	0	0	0	0	0
5351 Kudama XI	1630/50	5	5	3	3	3	0	1	0	3	4	5	3	4	0	0	4	2	0	2	1	0	3	3	8	6	20	15	0	1	0	0	1	0	0	0	0	0	0	0
5388 Kudama XI	1301/988,366,322	3	5	5	4	4	0	3	5	4	4	8	4	6	0	0	33	5	2	7	2	3	1	4	10	8	22	15	0	0	0	0	1	1	1	0	0	0	0	0
5389 Kudama XI	1301/1095,1105	7	3	2	4	4	0	1	0	3	3	8	3	5	0	0	17	30	0	4	9	0	1	1	8	5	20	15	0	0	0	0	0	1	0	0	0	0	0	0
5390 Kudama XI	1630/743	3	6	2	3	4	4	5	0	2	4	7	3	4	0	0	31	0	0	9	0	0	2	3	6	6	20	15	0	0	0	0	0	1	0	0	0	0	0	0
5391 Kudama XI	1301/1781	7	5	2	2	3	0	5	0	3	4	5	2	4	0	0	33	2	0	7	1	0	3	3	7	7	20	15	0	0	0	0	0	1	0	0	0	0	0	0
5392 Kudama XI	1630/73	3	6	2	4	4	0	0	0	2	3	2	3	4	0	0	20	2	0	4	1	0	3	2	9	9	26	15	0	1	0	0	1	0	0	0	0	0	0	0
5393 Kudama XI	1325/602	7	4	3	2	3	0	0	0	2	4	7	1	1	0	0	0	0	0	0	0	0	5	0	12	10	9	15	0	0	0	0	0	0	0	0	0	0	0	0
5394 Kudama XI	1325/–	2	5	4	4	4	0	2	0	4	4	9	4	4	0	0	32	11	0	7	3	0	3	4	10	7	22	15	0	0	0	0	1	1	0	0	0	0	0	0
5395 Kudama XI	1325/1334,1376,721	4	3	3	4	5	0	0	0	6	4	5	1	1	0	0	28	0	0	7	0	0	2	2	6	6	20	15	0	0	0	0	0	1	0	0	1	0	0	0
5400 Kudama XI	1301/437	2	5	4	4	4	0	0	0	3	4	6	4	6	0	0	1	29	2	1	8	3	3	3	8	8	19	15	0	1	0	0	0	1	0	0	1	0	0	0
5401 Kudama XI	1630/1106	2	5	3	3	3	0	0	0	2	4	5	2	4	6	1	19	0	0	4	0	0	3	2	7	7	26	15	0	0	0	0	0	0	0	1	0	0	0	0
5402 Kudama XI	1690/826	7	4	4	2	3	0	0	0	3	4	5	1	1	0	0	0	0	0	0	0	0	3	0	8	8	26	15	0	0	0	0	0	0	0	0	0	0	0	0
5403 Kudama XI	1301/765	2	5	3	4	4	0	0	0	3	4	8	4	4	0	0	3	31	0	2	9	0	3	2	6	8	20	15	0	0	0	0	0	1	1	0	0	0	0	0
5404 Kudama XI	1630/217	2	5	4	4	4	0	2	0	4	3	5	3	5	0	0	33	0	0	7	0	0	4	1	8	5	22	15	0	0	0	0	0	1	0	0	0	0	0	0
5405 Kudama XI	1301/–	3	6	3	3	4	0	0	0	2	4	6	1	1	0	0	20	0	0	4	0	0	3	3	7	7	26	15	0	0	0	0	0	0	0	0	0	0	1	0
5451 Kudama XI	1325/2175,1321,1221	3	3	2	5	4	0	2	1	4	5	5	2	2	0	0	33	3	0	7	2	0	3	3	10	6	22	15	0	0	0	0	0	1	1	0	0	0	0	0
5452 Kudama XI	1301/884	3	5	3	5	4	0	2	0	4	4	5	3	4	0	0	34	0	0	10	0	0	3	1	6	4	20	15	0	0	0	0	0	1	0	0	0	0	0	0
5454 Kudama XI	1301/1836	2	5	6	2	2	0	0	0	2	2	5	1	1	0	0	16	0	0	3	0	0	4	1	11	11	26	15	0	0	0	0	0	1	0	0	0	0	0	0
5455 Kudama XI	1301/639	7	2	3	2	2	0	0	0	3	2	8	0	0	0	0	0	0	0	0	0	0	4	0	6	6	26	15	0	0	0	0	0	0	0	0	0	0	0	0
5458 Kudama XI	1301/1654	4	6	1	2	3	0	0	0	5	3	5	2	4	0	0	15	0	0	3	0	0	3	1	7	6	26	15	0	0	0	0	0	1	0	0	0	0	0	0
5459 Kudama XI	1301/468	7	5	3	3	4	0	0	0	5	2	5	3	4	0	0	15	19	0	3	4	0	3	2	6	6	26	15	0	0	0	0	0	1	0	0	0	0	0	0
5460 Kudama XI	1301/1398	2	4	3	4	4	0	0	0	6	4	8	3	4	0	0	19	0	0	4	0	0	3	2	8	5	26	15	0	0	0	0	0	1	0	0	0	0	0	0
5461 Kudama XI	1301/749	2	3	4	4	4	0	0	0	3	4	8	3	3	0	0	12	0	0	3	0	0	3	1	6	5	26	15	0	0	0	0	0	1	0	0	0	0	0	0
5463 Kudama XI	1301/32	2	3	3	3	3	0	0	0	5	3	5	2	4	0	0	5	19	0	2	4	0	3	3	7	7	26	15	0	0	0	0	0	1	0	0	0	0	0	0
5464 Kudama XI	1301/1098,597	7	2	2	4	4	0	2	0	3	4	8	3	4	0	0	17	19	0	4	5	0	2	3	10	7	22	15	0	0	0	0	0	0	0	0	0	0	1	0
5465 Kudama XI	1301/1433	7	4	2	3	3	0	1	1	4	3	5	2	6	0	0	19	12	0	4	3	0	3	3	12	10	19	15	0	0	0	0	0	1	0	0	1	0	0	0
5467 Kudama XI	1301/2121	2	4	4	4	4	0	5	0	4	4	5	1	1	0	0	33	0	0	7	0	0	3	3	7	6	22	15	0	0	0	0	0	0	0	1	0	0	0	0
5468 Kudama XI	1301/1170	2	4	3	4	4	0	0	0	2	4	6	1	1	0	0	29	0	0	8	0	0	3	1	9	9	26	15	0	0	0	0	0	1	0	1	0	0	0	0
5469 Kudama XI	1301/1451	7	6	3	2	2	0	0	0	5	3	5	1	1	0	0	14	4	0	3	8	0	4	2	11	9	26	15	0	1	0	0	1	1	0	0	0	0	0	0
5471 Kudama XI	1301/513	2	4	3	3	4	0	0	0	5	4	6	2	4	0	0	17	30	0	4	9	0	4	2	10	8	26	15	0	0	0	0	1	0	0	1	0	0	0	0
5472 Kudama XI	1325/2079	2	5	4	4	4	0	0	0	5	4	5	1	1	0	0	33	0	0	7	0	0	3	2	6	6	22	15	0	0	0	0	0	0	1	1	1	0	0	0
5478 Kudama XI	1325/1151	2	3	5	3	2	0	0	0	2	3	5	2	4	0	0	31	0	0	9	0	0	3	1	8	8	20	15	0	0	0	0	0	0	1	0	0	0	0	0
5479 Kudama XI	1325/–	7	4	3	3	2	0	0	0	3	3	5	1	1	0	0	14	0	0	3	0	0	3	1	7	7	26	15	0	0	0	0	0	1	0	0	0	0	0	0
5482 Kudama XI	1325/–	3	6	2	4	3	0	0	0	2	3	9	4	4	0	0	28	0	0	7	0	0	4	1	13	4	26	15	0	0	0	0	0	1	0	0	0	0	0	0
5485 Kudama XI	1301/1484	2	4	3	4	3	0	0	0	2	3	5	1	1	0	0	17	11	0	4	3	0	3	2	7	7	26	15	0	0	0	0	1	0	0	0	0	0	0	0
5486 Kudama XI	1325/1388	3	3	3	4	4	0	0	0	5	3	5	3	4	0	0	12	0	0	3	0	0	3	1	7	6	26	15	0	0	0	0	1	0	0	0	0	0	0	0
5491 Kudama XI	1301/1780,1763,1769	7	3	2	3	3	0	2	6	3	3	9	4	4	1	4	11	14	0	3	3	0	2	4	10	8	19	15	0	0	0	0	1	0	0	1	0	0	0	0
5492 Kudama XI	1325/2430	2	5	5	4	4	0	0	0	3	4	5	4	6	2	2	4	12	17	2	3	4	2	5	9	7	19	15	0	0	1	0	1	1	1	1	0	0	0	0
5493 Kudama XI	1630/75	2	4	4	4	4	0	0	0	5	4	9	1	1	1	4	1	12	0	1	3	0	3	2	6	6	19	15	0	1	0	0	1	1	0	0	0	0	0	0
5494 Kudama XI	1301/358	3	6	2	4	4	0	1	0	4	4	8	3	6	0	0	32	3	0	7	2	0	3	3	13	9	22	15	0	0	0	0	0	1	1	1	0	0	0	0
5495 Kudama XI	1630/779	3	6	2	4	4	0	1	0	4	4	8	3	6	0	0	33	0	0	7	0	0	3	2	5	4	22	15	0	0	0	0	0	0	0	0	0	0	1	0

Number Site	NM-number	M1	Q1	K1	SH	SK	PM	PN	PT	PS	PO	RM	RF	RP	RE	RA	KE1	KE2	KE3	KY1	KY2	KY3	Kt	V	X	Y	TY	VE	Km0	Kma	Kmb	Kmc	Kmd	Kme	Kmf	Kmg	Kmh	Kmi	Kmj	SIZE
5497 Kudama XI	1630/70,68	3	6	2	4	4	0	1	0	4	4	8	3	6	0	0	32	4	0	7	2	0	4	4	13	8	22	15	0	0	0	0	0	1	0	0	0	0	1	0
5498 Kudama XI	1301/294	2	4	5	3	3	0	1	0	4	3	8	4	6	0	0	6	14	11	2	3	3	2	3	10	8	19	15	0	0	1	0	0	1	0	0	1	0	0	0
5499 Kudama XI	1325/1224,985	2	6	4	2	3	0	1	0	1	4	11	2	6	0	0	11	2	0	3	3	0	3	4	4	6	19	15	0	0	0	0	1	1	0	0	0	0	0	0
5500 Kudama XI	1325/748	2	4	4	3	3	0	3	6	2	4	5	2	3	0	0	14	11	0	3	3	0	3	4	8	10	19	15	0	0	0	0	1	0	0	0	0	0	0	0
5501 Kudama XI	1301/26	2	3	4	4	4	0	2	1	2	4	9	4	6	0	0	14	0	0	3	0	0	3	1	11	6	19	15	0	0	0	0	1	0	0	0	0	0	0	0
5502 Kudama XI	1301/2112	6	4	3	3	3	0	0	0	5	4	7	1	1	1	4	1	0	0	1	0	0	4	3	8	8	19	15	0	0	0	0	1	0	0	0	0	0	0	0
5503 Kudama XI	1325/1767	6	6	5	3	4	0	1	5	3	4	5	4	6	0	0	4	11	0	2	3	0	2	4	7	6	19	15	0	1	0	0	1	1	0	0	0	0	0	0
5504 Kudama XI	1301/2167	6	6	3	3	3	0	0	3	2	3	5	2	4	0	0	4	12	0	2	3	0	3	1	11	9	19	15	0	1	0	0	1	0	0	0	0	0	0	0
5506 Kudama XI	1325/1313	2	4	3	3	3	0	0	0	3	3	9	3	4	0	0	6	15	3	2	3	2	3	5	10	6	19	15	0	0	0	0	1	1	0	0	0	0	0	0
5507 Kudama XI	1325/1466	6	4	5	3	4	0	0	0	3	4	5	4	4	0	0	6	0	0	2	0	0	3	3	7	8	19	15	0	1	0	0	0	1	0	0	0	0	0	0
5508 Kudama XI	1325/1322	2	5	3	2	2	0	0	1	2	3	11	3	4	0	0	15	2	0	3	1	0	3	2	6	11	19	15	0	0	0	0	1	0	0	0	0	0	0	0
5509 Kudama XI	1301/4056	2	5	3	2	2	0	0	2	2	3	5	3	4	1	4	17	11	0	4	3	0	3	2	6	8	19	15	0	0	0	0	1	1	0	0	0	0	0	0
5514 Kudama XI	1325/216	2	4	4	3	4	0	0	4	2	3	5	2	4	0	0	13	2	0	3	1	0	3	3	7	8	19	15	0	0	0	0	1	0	0	0	0	0	0	0
5515 Kudama XI	1630/894	2	4	3	2	3	0	4	0	4	3	8	4	4	0	0	4	11	0	2	3	0	3	2	5	6	19	15	0	1	0	0	1	0	0	0	0	0	0	0
5516 Kudama XI	1325/2487	2	2	3	3	3	0	1	4	2	3	5	3	4	0	0	14	0	0	3	0	0	3	2	8	8	19	15	0	0	0	0	1	0	0	0	0	0	0	0
5517 Kudama XI	1301/185	0	2	3	3	3	0	0	0	3	6	1	1	0	0	0	2	0	0	1	0	0	3	4	8	8	19	15	0	0	0	0	1	0	0	0	0	0	0	0
5518 Kudama XI	1630/532	2	3	3	3	3	0	0	0	3	3	5	3	4	0	0	4	11	0	2	3	0	3	3	6	6	19	15	0	0	0	0	1	1	0	0	0	0	0	0
5520 Kudama XI	1630/927	2	4	4	3	3	0	0	4	2	4	2	3	4	0	0	0	0	0	0	0	0	4	0	7	3	19	15	0	0	0	0	0	0	0	0	0	0	0	0
5521 Kudama XI	1325/1906,1553	2	5	4	3	3	0	6	4	2	3	8	4	4	2	1	16	0	0	3	0	0	3	2	11	9	19	15	0	0	0	0	1	0	0	0	0	0	0	0
5522 Kudama XI	1325/876	2	5	4	3	3	0	2	1	2	3	13	4	4	0	0	16	13	0	3	3	0	3	3	15	7	19	15	0	0	0	0	1	0	0	0	0	0	0	0
5524 Kudama XI	1301/1343	2	4	4	3	3	0	1	4	2	3	6	4	6	0	0	14	0	0	3	0	0	3	1	9	7	19	15	0	0	0	0	1	0	0	0	0	0	0	0
5525 Kudama XI	1630/279	2	5	4	4	4	0	1	0	5	4	9	4	4	0	0	16	0	0	3	0	0	3	1	6	8	19	15	0	0	0	0	1	0	0	0	0	0	0	0
5526 Kudama XI	1301/1588	2	5	4	2	3	0	2	1	2	4	9	4	4	0	0	14	11	0	3	3	0	3	2	12	8	19	15	0	0	0	0	1	0	0	0	0	0	0	0
5527 Kudama XI	1301/951	6	6	5	3	3	0	1	4	2	3	2	2	3	0	0	13	0	0	3	0	0	5	1	11	11	19	15	0	0	0	0	1	0	0	0	0	0	0	0
5528 Kudama XI	1630/166	2	2	3	3	3	0	0	5	2	3	5	2	6	0	0	15	0	0	3	0	0	3	1	8	8	19	15	0	0	0	0	1	0	0	0	0	0	0	0
5529 Kudama XI	1301/1036	6	5	5	3	3	0	0	1	1	3	8	3	4	0	0	14	0	0	3	0	0	3	1	8	7	19	15	0	0	0	0	1	0	0	0	0	0	0	0
5530 Kudama XI	1301/1416	2	3	3	3	4	0	1	4	2	3	13	3	6	0	0	14	4	0	3	2	0	3	1	14	8	19	15	0	0	0	0	1	0	0	0	0	0	0	0
5531 Kudama XI	1301/–	2	4	4	3	4	0	0	1	2	3	2	2	3	0	0	0	0	0	0	0	0	5	0	8	7	19	15	0	0	0	0	0	0	0	0	0	0	0	0
5532 Kudama XI	1301/–	2	3	3	3	3	0	0	4	2	3	5	2	4	0	0	14	0	0	3	0	0	4	1	8	8	19	15	0	0	0	0	1	0	0	0	0	0	0	0
5534 Kudama XI	1301/2060	2	5	3	3	3	0	0	0	2	3	9	3	4	0	0	12	0	0	3	0	0	3	1	10	8	19	15	0	0	0	0	1	0	0	0	0	0	0	0
5535 Kudama XI	1325/1031	2	5	3	3	3	0	0	1	5	3	8	3	4	0	0	29	0	0	7	0	0	3	3	12	12	20	15	0	0	0	0	0	1	0	0	0	0	0	0
5536 Kudama XI	1325/1363	2	5	4	4	4	0	1	0	4	4	8	3	4	0	0	4	12	0	2	3	0	3	4	10	10	9	15	0	0	0	0	1	1	0	0	0	0	0	0
5537 Kudama XI	1325/2414	1	3	3	4	4	0	0	0	3	4	8	5	6	0	0	6	0	0	2	0	0	3	5	7	5	19	15	0	1	0	0	0	1	0	0	0	0	0	0
5538 Kudama XI	1325/368	2	4	4	3	3	0	0	0	3	3	6	4	4	0	0	17	11	0	4	3	0	3	3	12	12	19	15	0	0	0	0	1	0	0	1	0	0	0	0
5539 Kudama XI	1325/369	2	5	3	3	3	0	0	0	3	4	8	3	4	0	0	4	0	0	2	0	0	3	4	10	8	19	15	0	0	0	0	0	1	0	0	0	0	0	0
5540 Kudama XI	1325/2	2	4	3	4	4	0	0	0	3	4	9	3	4	0	0	6	14	0	2	3	0	4	4	9	7	19	15	0	0	0	0	1	1	0	0	0	0	0	0
5541 Kudama XI	1325/638	2	5	4	4	4	0	1	0	3	4	5	2	4	0	0	9	0	0	7	0	0	4	3	7	8	26	15	0	0	0	0	0	0	0	0	1	0	0	0
5542 Kudama XI	1325/4,843	3	5	3	4	4	0	0	0	4	4	5	3	6	0	0	31	1	0	9	1	0	4	4	4	4	20	15	0	0	0	0	0	1	0	1	0	0	0	0
5543 Kudama XI	1325//457	6	4	4	3	3	0	5	0	4	4	4	3	4	0	0	29	15	0	7	3	0	3	3	9	8	20	15	0	0	0	0	0	1	1	0	0	0	0	0
5544 Kudama XI	1325/1178	2	4	3	2	3	0	1	0	3	3	5	3	3	0	0	4	11	0	2	3	0	3	3	7	7	19	15	0	1	0	0	1	0	0	0	0	1	0	0
5545 Kudama XI	1325/67	2	5	4	2	2	0	0	0	3	3	8	3	6	0	0	17	0	0	4	0	0	3	3	7	7	19	15	0	0	0	0	0	1	0	0	0	0	0	0
5546 Kudama XI	1325/2261	7	2	2	3	3	0	0	0	2	3	6	3	6	0	0	6	0	0	6	0	0	4	1	8	11	19	15	0	0	0	0	0	1	1	0	0	0	0	0
5547 Kudama XI	1325/681	2	3	3	3	3	0	0	0	5	4	5	2	4	0	0	4	2	0	2	1	0	5	3	5	5	26	15	0	0	0	0	1	1	1	0	0	0	0	0
5552 Kudama XI	1325/1139	2	5	4	4	3	0	0	0	3	4	13	3	4	5	2	17	0	0	4	0	0	3	4	7	5	19	15	0	0	0	0	0	0	0	0	0	0	1	0
5555 Kudama XI	1325/519	2	4	3	3	3	0	0	0	3	4	13	3	4	4	4	4	11	0	2	3	0	3	3	9	7	19	15	0	0	1	0	1	0	1	0	0	0	0	0
5556 Kudama XI	1325/170	2	5	5	3	3	0	0	0	2	3	9	3	4	0	0	0	0	0	0	0	0	5	0	10	9	26	15	0	0	0	0	0	0	0	0	0	0	0	0
5557 Kudama XI	1325/1104	2	4	3	3	3	0	1	0	2	3	9	3	6	0	0	11	29	0	3	7	0	4	1	6	7	19	15	0	0	0	0	1	1	0	0	0	0	0	0
5560 Kudama XI	1325/852	2	2	3	3	3	0	0	0	2	4	5	3	6	0	0	11	0	0	3	0	0	0	1	5	6	26	15	0	0	0	0	1	0	0	0	0	0	0	0
5561 Kudama XI	1325/–	2	5	4	3	3	0	0	0	3	3	5	3	4	0	0	2	0	0	1	0	0	3	2	9	8	26	15	0	1	0	0	1	0	0	0	0	0	0	–

Number Site	NM-number	M1	Q1	K1	SH	SK	PM	PN	PT	PS	PO	RM	RF	RP	RE	RA	KE1	KE2	KE3	KY1	KY2	KY3	Kt	V	X	Y	TY	VE	Km0	Kma	Kmb	Kmc	Kmd	Kme	Kmf	Kmg	Kmh	Kmi	Kmj	SIZE
5563 Kudama XI	1325/445	2	4	4	2	4	0	1	0	2	3	5	2	4	0	0	2	0	0	1	0	0	3	1	6	7	26	15	0	1	0	0	0	0	0	0	0	0	0	0
5564 Kudama XI	1325/2254	2	5	5	3	3	0	1	0	4	3	9	4	4	0	0	12	0	0	3	0	0	3	1	8	6	26	15	0	0	0	0	0	1	0	0	0	0	0	0
5565 Kudama XI	1325/424	2	4	4	3	2	0	0	3	2	3	8	3	4	0	0	29	0	0	8	0	0	3	1	9	7	26	15	0	0	0	0	0	1	0	0	0	0	0	0
5566 Kudama XI	1325/1548	2	5	3	3	4	0	4	0	3	3	3	4	6	0	0	29	0	0	6	0	0	3	2	6	5	26	15	0	1	1	0	0	0	0	0	0	0	0	0
5570 Kudama XI	1325/2409	2	4	5	3	3	0	0	0	3	3	9	4	4	0	0	13	0	0	3	0	0	3	1	7	6	26	15	0	0	0	0	1	0	0	0	0	0	0	0
5571 Kudama XI	1325/2301	2	4	4	3	3	0	0	0	3	4	5	2	6	1	4	2	3	0	1	2	0	3	4	5	5	19	15	0	1	0	0	1	0	0	0	0	0	0	0
5572 Kudama XI	1325/1309	2	5	2	4	4	0	4	0	4	4	10	4	6	0	0	0	0	0	0	0	0	3	0	8	5	29	15	0	0	0	0	0	0	0	0	0	0	0	0
5573 Kudama XI	1325/–	2	5	3	3	3	0	1	0	3	3	5	2	3	0	0	13	0	0	3	0	0	3	3	7	5	26	15	0	0	0	0	1	0	0	0	0	0	0	0
5580 Kudama XI	1325/768	0	0	0	2	2	0	0	0	3	3	5	2	3	0	0	0	0	0	0	0	0	3	0	6	6	16	15	0	0	0	0	0	0	0	0	0	0	0	0
5681 Kudama XI	1325/145	3	6	2	3	4	0	1	0	2	3	6	3	3	0	0	3	9	0	2	6	0	3	3	9	5	26	15	0	0	1	0	0	0	0	1	0	0	0	0
5682 Kudama XI	1325/1108	7	4	3	2	4	0	6	0	4	3	5	1	1	0	0	29	17	0	7	4	0	3	4	9	10	20	15	0	0	0	0	0	1	0	0	0	0	0	0
5684 Kudama XI	1325/1140,2162	2	3	4	4	4	0	4	0	4	4	9	3	4	0	0	2	1	0	1	1	0	3	3	9	7	19	15	0	0	0	0	0	1	0	0	0	0	0	0
5685 Kudama XI	1325/652,1654,1625	2	5	4	2	3	0	0	1	3	3	9	4	6	0	0	27	3	0	5	2	0	3	3	9	9	17	15	0	0	0	0	0	1	0	0	0	0	0	0
5687 Kudama XI	1630/119	3	5	4	2	4	0	0	0	3	3	5	3	4	0	0	31	3	0	8	2	0	3	3	7	7	17	15	0	0	0	0	0	1	0	0	0	0	1	0
5688 Kudama XI	1325/388	6	5	3	3	4	0	0	0	3	3	5	2	4	2	1	25	15	0	4	3	0	3	5	10	8	19	15	0	0	0	0	0	1	1	0	0	0	0	0
5689 Kudama XI	1301/1483	2	5	3	3	3	0	0	0	2	3	5	3	4	0	0	14	17	0	3	4	0	3	3	8	7	17	15	0	0	0	0	0	1	0	0	0	0	0	0
5690 Kudama XI	1325/1380	4	4	3	3	3	0	1	1	4	3	8	4	6	2	3	1	0	0	1	0	0	3	1	5	5	19	15	0	0	0	0	0	1	0	0	0	0	0	0
5691 Kudama XI	1325/–	3	5	3	3	3	0	0	0	5	3	8	3	4	0	0	18	1	0	4	1	0	3	3	5	5	19	15	0	0	1	0	0	0	0	0	0	0	0	0
5693 Kudama XI	1325/851	3	5	2	3	3	0	0	0	3	3	8	2	4	0	0	17	0	0	4	0	0	3	3	7	4	19	15	0	0	0	0	0	1	0	0	0	0	0	0
5696 Kudama XI	1325/2935	3	5	3	3	3	0	0	0	3	3	2	2	4	0	0	1	0	0	1	0	0	3	3	12	5	17	15	0	0	0	1	0	0	0	0	0	0	0	0
5698 Kudama XI	1630/65	3	6	3	3	3	0	0	0	2	3	2	2	3	0	0	1	0	0	1	0	0	3	3	11	6	17	15	0	0	0	1	0	0	0	0	0	0	0	0
5700 Kudama XI	1325/867	3	5	3	4	4	0	0	0	5	3	2	1	3	0	0	3	0	0	2	0	0	3	3	6	4	16	15	0	0	0	0	0	0	0	0	0	0	1	0
5706 Kudama XI	1301/–	2	5	4	4	4	0	0	0	5	4	8	3	4	0	0	25	15	0	4	3	0	3	4	10	10	19	15	0	0	0	0	0	1	0	0	0	1	0	0
5708 Kudama XI	1301/1185	7	3	4	2	3	0	0	0	5	3	8	5	5	0	0	8	0	0	4	0	0	3	3	12	8	34	15	0	0	0	0	0	1	0	0	0	0	0	0
5709 Kudama XI	1301/512	2	5	3	4	3	0	0	0	3	3	9	3	4	0	0	17	15	0	4	3	0	3	3	9	5	16	15	0	0	0	0	0	1	0	0	0	0	0	0
5711 Kudama XI	1301/1717	3	3	3	4	4	0	0	0	3	3	9	3	6	0	0	3	0	0	2	0	0	3	5	5	5	17	15	0	0	1	0	0	0	0	0	0	0	0	0
5712 Kudama XI	1301/1549	2	5	3	3	3	0	2	0	4	3	5	3	4	0	0	31	0	0	9	0	0	3	1	8	5	20	15	0	0	0	0	0	1	0	0	0	0	0	0
5713 Kudama XI	1301/29	2	5	4	3	3	0	0	0	5	3	5	4	5	0	0	4	0	0	2	0	0	3	3	8	10	34	15	0	1	0	0	0	0	0	0	0	0	0	0
5714 Kudama XI	1301/1210	7	2	3	5	4	3	0	0	5	3	5	1	4	0	0	29	19	0	7	4	0	3	4	6	6	19	15	0	0	0	0	0	1	0	0	0	0	1	0
5717 Kudama XI	1301/2098	4	6	3	2	3	0	2	0	4	4	6	1	3	5	0	33	3	0	7	2	0	2	3	10	5	22	15	0	0	0	0	0	1	0	1	0	0	0	0
5719 Kudama XI	1301/1655	2	4	3	5	5	0	3	0	4	4	3	3	6	0	0	0	0	0	0	0	0	3	0	7	5	29	15	0	0	0	0	0	0	0	0	0	0	0	0
5722 Kudama XI	1325/1172	4	4	3	2	2	0	1	0	3	3	8	2	4	0	0	29	0	0	7	0	0	3	2	9	8	20	15	0	0	0	0	0	1	0	0	0	0	0	0
5723 Kudama XI	1325/703	2	5	3	3	4	0	0	0	3	3	5	3	3	0	0	3	17	1	2	4	1	2	3	10	10	19	15	0	1	0	0	1	1	0	0	0	0	0	0
5725 Kudama XI	1325/2559	2	3	4	2	2	0	0	0	5	3	9	2	3	0	0	3	0	0	2	0	0	3	2	8	6	26	15	0	0	0	0	0	0	0	1	0	0	0	0
5726 Kudama XI	1325/2431	2	4	4	4	4	0	0	0	3	4	2	2	3	0	0	6	14	1	2	3	1	3	5	8	6	26	15	0	1	0	0	1	1	0	0	0	0	0	0
5727 Kudama XI	1325/1428	4	6	2	3	3	0	5	0	4	3	5	2	3	0	0	29	0	0	7	0	0	3	3	7	6	26	15	0	1	0	0	0	1	0	0	0	0	0	0
5411 Lahta II	215/467	2	4	2	5	5	0	1	0	5	5	8	5	6	0	0	0	0	0	0	0	0	3	0	4	4	29	15	0	0	0	0	0	0	0	0	0	0	0	0
5413 Lahta II	215/297	2	5	3	5	5	0	4	0	5	5	5	4	6	0	0	32	0	0	9	0	0	3	1	5	8	20	15	0	0	0	0	0	1	0	0	0	0	0	0
5414 Lahta II	215/621	2	5	3	5	5	0	1	0	5	5	10	4	6	0	0	0	0	0	0	0	0	3	0	6	5	29	15	0	0	0	0	0	0	0	0	0	0	0	0
5415 Lahta II	251/361	2	5	3	5	5	0	1	0	5	5	9	4	6	0	0	0	0	0	0	0	0	3	0	10	6	29	15	0	0	0	0	0	0	0	0	0	0	0	0
5416 Lahta II	215/377	2	5	3	5	5	0	1	0	5	5	8	5	6	0	0	17	0	0	4	0	0	3	1	3	3	29	15	0	0	0	0	1	0	0	0	0	0	0	0
5417 Lahta II	215/737	2	6	5	3	4	0	1	1	3	3	6	2	1	0	0	4	11	0	2	3	0	3	2	5	10	19	15	0	0	0	1	1	1	0	0	1	0	0	0
5419 Lahta II	215/553	7	4	2	4	4	0	4	0	5	4	8	3	4	3	1	4	13	0	2	3	0	2	4	6	5	19	15	0	0	0	0	1	0	0	0	0	1	0	0
5421 Lahta II	50/264	2	5	3	4	4	0	4	0	4	4	8	3	4	5	3	15	30	0	1	9	0	3	2	6	6	19	15	0	0	0	0	1	1	0	0	0	0	0	0
5422 Lahta II	215/730	5	6	4	4	4	0	0	0	3	4	5	2	3	0	0	1	16	0	1	3	0	3	3	7	7	19	15	0	1	0	0	1	0	0	0	0	0	0	0
5423 Lahta II	215/649	2	5	3	4	4	0	2	0	4	4	12	1	1	0	0	4	17	13	2	4	3	3	3	8	7	19	15	0	0	0	0	1	0	0	0	0	0	0	0
5424 Lahta II	50/187	2	4	4	4	4	0	0	0	3	4	5	1	1	0	0	16	0	0	3	0	0	3	1	8	7	26	15	0	0	0	0	1	0	0	0	0	0	0	0
5426 Lahta II	50/172	7	3	3	3	4	4	0	5	2	4	5	2	3	0	0	0	0	0	0	0	0	4	0	8	8	19	15	0	0	0	0	0	0	0	0	0	0	0	0
5427 Lahta II	50/92	2	3	2	3	3	0	6	0	2	3	8	3	2	0	0	29	0	0	8	0	0	3	4	10	8	26	15	0	0	0	0	0	1	0	0	0	0	0	0

Number Site	NM-number	M1	Q1	K1	SH	SK	PM	PN	PT	PS	PO	RM	RF	RP	RE	RA	KE1	KE2	KE3	KY1	KY2	KY3	Kt	V	X	Y	TY	VE	Km0	Kma	Kmb	Kmc	Kmd	Kme	Kmf	Kmg	Kmh	Kmi	Kmj	SIZE
5430 Lahta II	215/740	2	6	4	4	3	0	3	5	2	3	5	3	4	0	0	6	16	0	2	3	0	3	3	9	8	19	15	0	1	0	0	1	0	0	0	0	0	0	0
5431 Lahta II	215/265	2	6	4	4	3	0	3	0	2	3	5	1	1	4	4	16	0	0	3	0	0	3	1	10	8	26	15	0	0	0	0	1	0	0	0	0	0	0	0
5432 Lahta II	215/687	2	5	3	3	3	0	1	0	2	3	5	1	1	6	2	16	0	0	3	0	0	3	2	9	8	26	15	0	0	0	0	1	0	0	0	0	0	0	0
5433 Lahta II	215/426	2	5	6	3	4	0	1	4	4	3	5	2	4	0	0	16	2	0	3	1	0	3	2	9	9	16	15	0	0	0	0	1	0	0	0	0	0	0	0
5434 Lahta II	215/736	2	6	4	3	3	0	2	0	4	3	11	3	4	0	0	4	36	0	2	4	0	3	3	8	12	19	15	0	0	0	0	1	0	1	0	0	0	0	0
5435 Lahta II	215/348	2	5	4	3	3	0	2	0	4	3	11	3	4	0	0	4	36	16	2	4	3	3	3	7	10	19	15	0	0	0	0	1	0	1	0	0	0	0	0
5436 Lahta II	215/389	2	5	5	3	4	0	0	0	3	4	7	1	1	2	1	2	0	0	1	0	0	3	4	9	9	19	15	0	0	0	0	0	0	0	0	0	0	1	0
5437 Lahta II	215/268	2	5	4	3	5	0	0	1	2	2	5	3	4	0	0	13	0	0	3	0	0	3	3	8	8	19	15	0	0	0	0	1	0	0	0	0	0	0	0
5438 Lahta II	215/275	2	5	3	5	5	0	0	0	5	4	5	3	5	8	8	33	0	0	7	0	0	3	2	8	8	20	15	0	0	0	0	0	1	0	0	0	0	0	0
5439 Lahta II	215/449	2	4	3	3	3	0	4	0	4	4	5	4	3	0	0	4	2	0	2	1	0	3	3	7	6	19	15	0	1	0	0	1	0	0	0	0	0	0	0
5440 Lahta II	215/757	2	3	4	2	2	0	0	0	2	3	7	4	6	0	0	4	0	0	2	0	0	5	2	5	5	19	15	0	0	0	0	0	0	1	0	0	0	0	0
5441 Lahta II	215/271	2	5	5	5	5	0	4	0	4	4	3	3	6	0	0	34	0	0	10	0	0	3	1	6	9	29	15	0	0	0	0	0	1	0	0	0	0	0	0
5442 Lahta II	215/383	2	5	5	5	5	0	4	0	4	4	3	3	6	0	0	34	0	0	10	0	0	3	1	5	5	29	15	0	0	0	0	0	1	0	0	0	0	0	0
5443 Lahta II	215/–	2	5	4	3	3	0	0	0	2	3	8	4	4	0	0	4	14	0	2	3	0	3	1	10	9	19	15	0	0	0	0	1	0	0	0	0	0	0	0
5444 Lahta II	215/161	7	4	4	3	3	0	2	0	4	4	5	1	1	0	0	2	0	0	1	0	0	4	0	8	8	19	15	0	0	0	0	0	0	0	0	0	0	0	0
5446 Lahta II	215/253	2	3	4	4	4	0	0	0	2	4	5	1	1	0	0	4	0	0	2	0	0	3	0	8	8	19	15	0	0	0	0	1	0	0	0	0	0	0	0
5214 Tsudozero IV	26/1178	3	6	5	3	4	0	2	0	2	4	2	3	4	2	2	27	11	0	5	3	0	2	4	10	7	16	15	0	0	0	0	1	1	0	0	0	0	0	0
5215 Tsudozero IV	30/299	3	4	4	4	4	0	0	0	3	4	9	3	4	2	1	6	0	0	2	0	0	3	4	7	5	11	15	0	0	0	0	0	0	0	1	0	0	0	0
5226 Tsudozero IV	30/732	3	4	5	3	3	2	0	0	2	3	5	1	1	2	1	4	0	0	2	0	0	2	4	12	9	11	15	0	0	1	0	0	0	0	0	0	0	0	0
5227 Tsudozero IV	30/355	3	6	4	3	3	0	0	0	3	3	5	1	1	0	0	2	0	0	1	0	0	3	2	9	7	16	15	0	0	1	0	0	0	0	0	0	0	0	0
5229 Tsudozero IV	30/338	3	3	4	2	3	0	0	0	3	3	2	3	3	0	0	4	0	0	2	0	0	3	1	11	7	16	15	0	0	0	0	0	0	1	0	0	0	0	0
6384 Bostilovo II	2198/124	2	3	3	3	3	0	0	0	2	3	5	1	1	0	0	4	12	0	2	3	0	2	4	6	7	19	16	0	1	0	0	1	1	0	0	0	0	0	0
6377 Bostilovo II	2198/146,150	2	3	4	2	2	0	0	0	2	3	6	3	6	0	0	4	12	0	2	3	12	2	5	11	9	19	16	0	0	0	0	1	0	0	0	0	1	0	0
6378 Bostilovo II	2198/180,208	2	3	4	2	2	0	1	0	3	3	8	2	4	2	2	4	17	21	2	4	4	3	3	7	8	19	16	0	1	0	0	1	1	0	0	1	0	0	0
6380 Bostilovo II	2198/148	2	4	4	2	3	0	0	0	5	3	5	1	1	2	2	4	2	23	2	3	4	3	3	12	8	19	16	0	1	0	0	0	1	0	0	0	0	0	0
6381 Bostilovo II	2198/306,212	2	2	4	2	3	0	2	0	3	3	8	2	4	2	1	4	35	0	2	10	0	2	5	12	8	19	16	0	0	0	0	1	1	0	0	0	1	0	0
6382 Bostilovo II	2198/301,317	2	3	4	3	3	0	0	0	3	3	5	1	1	2	1	4	35	0	2	10	0	3	3	11	7	19	16	0	0	0	0	1	1	0	0	0	1	0	0
6383 Bostilovo II	2198/180	2	4	5	3	3	0	1	0	4	3	5	1	1	2	2	4	0	0	2	0	0	3	4	12	10	19	16	0	1	0	0	0	1	0	0	0	0	0	0
6385 Bostilovo II	2198/308	2	4	4	3	3	0	1	0	4	3	5	1	1	2	1	4	8	0	2	10	0	3	4	11	6	19	16	0	0	0	0	1	0	0	0	0	1	0	0
6386 Bostilovo II	2198/136	2	2	3	3	3	0	1	0	3	3	8	1	1	2	1	4	12	0	2	3	0	3	4	6	5	19	16	0	0	0	0	1	1	0	0	0	1	0	0
6387 Bostilovo II	2198/1299	2	3	4	3	3	0	2	0	4	3	8	1	1	2	1	4	0	0	2	0	0	3	4	12	8	19	16	0	0	0	0	0	1	0	0	0	1	0	0
6388 Bostilovo II	2198/147	2	4	4	2	3	0	1	0	4	3	5	1	1	2	2	4	12	0	2	3	0	3	3	12	8	19	16	0	0	0	0	0	0	0	0	0	1	0	0
6389 Bostilovo II	2198/123	2	3	3	3	3	0	0	0	2	3	5	1	1	2	2	4	17	0	2	4	0	3	3	11	8	19	16	0	1	0	0	1	0	0	0	0	0	0	0
6459 Kelka I	2342/242	2	3	3	3	3	0	0	0	3	3	5	2	4	2	2	12	0	0	3	0	12	3	1	9	8	19	16	0	0	0	0	1	0	0	0	0	0	0	0
6460 Kelka I	2342/364	2	3	4	3	3	0	0	0	5	3	5	1	1	0	0	4	0	0	2	0	0	3	4	6	6	19	16	0	1	0	0	0	1	0	0	0	0	0	0
6461 Kelka I	2342/342	2	3	3	3	3	0	1	0	4	3	8	2	4	0	0	3	0	0	2	0	0	3	1	6	7	19	16	0	0	0	0	1	0	0	0	0	0	0	0
6462 Kelka I	2342/328	2	3	4	3	3	0	0	0	4	3	8	2	4	0	0	31	3	12	9	2	3	3	3	9	9	19	16	0	1	0	0	1	1	0	0	0	0	0	0
6463 Kelka I	2342/401	2	4	4	3	3	0	0	0	5	3	9	5	5	0	0	4	31	12	2	9	3	3	4	5	13	19	16	0	1	0	0	1	1	0	0	0	0	0	0
6464 Kelka I	2342/16	2	4	5	3	4	0	0	0	5	3	9	5	5	0	0	4	34	12	2	10	3	3	4	5	12	19	16	0	1	0	0	0	1	0	0	0	0	0	0
6465 Kelka I	2342/899	2	4	3	3	3	0	4	0	4	3	8	5	6	0	0	7	0	0	4	0	0	2	4	14	6	19	16	0	0	0	0	1	0	0	0	0	0	0	0
6466 Kelka I	2342/283,854	2	5	5	4	4	0	2	0	5	3	8	1	1	0	0	16	31	12	3	9	3	3	1	9	9	19	16	0	0	0	0	1	0	0	0	0	0	0	0
6467 Kelka I	2342/272	2	6	5	4	3	0	1	0	5	3	5	1	1	0	0	4	11	0	2	3	0	3	4	8	10	19	16	0	0	0	0	1	1	0	0	0	1	0	0
6468 Kelka I	2342/122	6	4	4	3	3	0	2	0	4	3	8	1	1	2	1	12	0	0	3	0	0	3	2	11	6	19	16	0	0	0	0	1	0	0	0	0	0	0	0
6469 Kelka I	2342/262	2	5	5	4	4	0	1	0	2	3	5	1	1	0	0	4	0	0	2	0	0	3	1	10	9	19	16	0	0	0	0	1	0	0	0	0	0	0	0
6470 Kelka I	2342/350	2	5	6	4	4	0	4	0	4	3	8	3	6	2	1	4	12	0	2	3	0	2	4	10	15	19	16	0	0	0	0	1	1	0	0	0	0	0	0
6472 Kelka I	2342/314	2	4	6	3	4	0	1	0	5	3	8	1	1	2	2	4	0	0	2	0	0	3	1	13	12	19	16	0	0	0	0	0	1	0	0	0	0	0	0
6473 Kelka I	2342/772	2	4	4	4	4	0	2	0	4	3	5	1	1	0	0	4	12	0	2	3	0	3	3	10	8	19	16	0	0	0	0	1	1	0	0	0	1	0	0
6474 Kelka I	2342/4404	2	4	5	4	4	0	1	0	4	3	5	1	1	0	0	4	12	0	2	3	0	3	4	8	9	19	16	0	0	0	0	0	1	1	0	0	0	0	0
6475 Kelka I	2342/294	2	5	6	4	4	0	1	0	4	3	5	1	1	0	0	4	0	0	2	0	0	3	4	10	12	19	16	0	0	0	0	0	1	0	0	0	0	0	0

Number Site	NM-number	M1	Q1	K1	SH	SK	PM	PN	PT	PS	PO	RM	RF	RP	RE	RA	KE1	KE2	KE3	KY1	KY2	KY3	Kt	V	X	Y	TY	VE	Km0	Kma	Kmb	Kmc	Kmd	Kme	Kmf	Kmg	Kmh	Kmi	Kmj	SIZE
6476 Kelka I	2342/298	2	5	6	4	4	0	0	0	5	4	8	1	1	0	0	4	0	0	2	0	0	3	4	10	10	19	16	0	1	0	0	0	1	1	0	0	0	0	0
6477 Kelka I	2342/436	2	3	5	4	4	0	2	0	4	3	5	2	4	0	0	12	0	0	3	0	0	3	1	10	7	19	16	0	0	0	0	1	0	0	0	0	0	0	0
6478 Kelka I	2342/405	2	5	5	4	3	0	0	0	2	3	5	2	4	0	0	4	0	0	2	0	0	3	2	8	8	19	16	0	0	0	0	0	1	0	0	0	0	0	0
6479 Kelka I	2463/152	2	5	5	4	4	0	2	0	2	3	5	1	1	2	1	17	0	0	4	0	12	3	3	10	6	19	16	0	1	0	0	0	1	0	0	0	0	0	0
6480 Kelka I	2463/517	2	4	4	3	3	0	0	0	2	3	6	1	1	2	1	4	2	0	2	1	0	3	3	8	7	19	16	0	1	0	0	0	1	0	0	0	0	0	0
6483 Kelka I	2463/532	2	4	5	4	4	0	0	0	5	3	5	1	1	2	1	4	12	0	2	3	0	3	3	10	8	19	16	0	0	0	0	1	1	0	0	0	0	0	0
6485 Kelka I	2342/3	2	5	5	4	4	0	2	1	4	4	5	1	1	3	4	4	12	0	2	3	0	3	3	7	5	19	16	0	0	0	0	1	1	0	0	0	0	0	0
6486 Kelka I	2342/1420	2	4	5	4	4	0	0	0	5	3	6	1	1	0	0	4	12	0	2	3	0	3	3	12	10	19	16	0	0	0	0	1	1	0	0	0	0	0	0
6487 Kelka I	2342/276	2	4	4	4	3	0	2	1	4	3	9	1	1	2	1	4	3	15	2	2	3	3	3	12	9	19	16	0	1	0	0	1	1	1	0	0	0	0	0
6516 Kelka III	2553/358,364,476,392	2	4	5	4	4	0	4	0	2	4	8	3	6	2	1	4	3	14	2	2	3	1	4	10	10	19	16	0	0	0	0	1	1	0	1	0	0	0	0
6517 Kelka III	2553/1028	2	4	5	4	4	0	2	6	4	4	8	3	6	0	0	15	0	0	3	0	0	2	1	10	7	19	16	0	0	0	0	0	1	0	0	0	0	0	0
6518 Kelka III	2553/1094	2	4	5	4	4	0	0	1	4	4	8	2	4	0	0	7	0	0	4	0	0	3	3	10	12	19	16	0	0	0	0	0	1	0	0	0	0	0	0
6519 Kelka III	2553/630,674,670	2	4	5	4	4	0	2	1	4	4	8	3	6	0	0	14	4	0	2	3	0	3	2	7	8	19	16	0	0	0	0	0	1	1	0	0	0	0	0
6520 Kelka III	2553/233	2	4	4	4	4	0	0	1	2	4	5	1	1	2	1	4	20	12	2	4	3	3	5	9	9	19	16	0	1	0	0	1	1	0	1	0	0	0	0
6521 Kelka III	2553/1881,1802	2	4	4	4	4	0	2	4	4	4	8	4	6	0	0	12	0	0	3	0	0	3	1	9	9	19	16	0	0	0	0	1	1	0	0	0	0	0	0
6522 Kelka III	2553/1804,1460,1992	2	4	4	4	4	0	0	0	5	4	8	4	5	0	0	4	14	3	2	3	3	3	4	10	5	19	16	0	1	0	0	1	1	0	0	0	0	0	0
6523 Kelka III	2553/1487	7	4	5	2	3	0	5	0	4	3	5	2	6	0	0	0	0	0	0	0	0	3	0	6	5	19	16	0	0	0	0	0	0	0	0	0	0	0	0
6524 Kelka III	2553/1731	7	3	3	2	3	0	2	0	4	4	5	2	6	2	3	3	12	0	2	3	12	3	2	6	6	19	16	0	1	0	0	1	0	0	0	0	0	0	0
6525 Kelka III	2553/1753,1745	2	3	4	4	4	0	5	0	4	4	8	2	6	2	2	3	12	7	2	3	12	3	1	7	5	19	16	0	1	0	0	1	0	0	0	0	0	0	0
6526 Kelka III	2553/2077	2	5	3	4	4	0	1	1	4	4	8	4	6	0	0	12	3	0	3	2	12	3	2	10	16	19	16	0	1	0	0	1	0	0	0	0	0	0	0
6527 Kelka III	2553/1424	2	4	3	3	4	0	1	0	5	4	8	3	6	2	2	4	12	0	2	3	0	3	4	7	5	19	16	0	0	0	0	1	1	1	0	0	0	0	0
6528 Kelka III	2553/1091,1092	2	4	3	4	4	0	2	0	2	4	8	4	6	2	2	4	12	0	2	3	0	3	3	8	10	19	16	0	0	0	0	1	1	0	0	0	0	0	0
6529 Kelka III	2553/1593	2	4	3	4	4	0	2	2	4	4	6	1	1	0	0	0	0	0	0	0	12	3	0	7	8	19	16	0	0	0	0	0	0	0	0	0	0	0	0
6530 Kelka III	2553/1089	2	5	4	4	4	0	2	1	2	4	5	2	6	0	0	4	14	0	2	3	0	3	1	7	10	19	16	0	1	0	0	1	0	0	0	0	0	0	0
6531 Kelka III	2553/669	2	5	5	4	3	0	0	6	4	3	5	2	6	0	0	12	0	0	3	0	0	3	2	9	10	19	16	0	0	0	0	1	0	0	0	0	0	0	0
6532 Kelka III	2553/1538	2	4	3	4	4	0	0	0	5	4	5	1	1	2	2	4	3	12	2	2	3	3	5	9	5	19	16	0	1	0	0	1	1	0	0	0	0	1	0
6533 Kelka III	2553/1501	7	4	4	2	3	0	2	0	4	3	8	3	4	2	2	4	3	12	2	2	12	3	8	8	5	19	16	0	1	0	0	1	1	0	0	0	0	0	0
6534 Kelka III	2553/1490	7	4	4	2	3	0	0	0	5	3	8	3	4	2	2	4	3	12	2	2	3	3	5	7	6	19	16	0	1	0	0	1	1	0	0	0	0	0	0
6535 Kelka III	2553/1190	2	4	3	4	4	0	0	0	5	4	5	2	6	0	0	4	3	12	2	2	3	3	5	8	5	19	16	0	1	0	0	1	1	0	0	0	0	0	0
6536 Kelka III	2553/1658	2	4	3	4	4	0	0	0	2	4	5	1	1	6	2	4	3	12	2	2	12	3	5	10	7	19	16	0	1	0	0	1	1	0	0	0	0	0	0
6537 Kelka III	2553/6	2	5	5	4	4	0	5	0	4	4	8	2	4	2	1	14	0	0	3	0	12	3	1	9	8	19	16	0	0	0	0	0	1	0	0	0	0	0	0
6538 Kelka III	2553/716	7	4	4	2	3	0	0	1	2	3	5	2	4	2	2	4	3	12	2	2	12	3	3	6	4	19	16	0	1	0	0	1	1	1	0	0	0	0	0
6539 Kelka III	2553/2073	2	4	4	4	4	0	1	0	4	4	8	2	4	2	1	3	12	0	2	3	12	3	2	8	4	19	16	0	1	0	0	1	0	0	0	0	0	0	0
6540 Kelka III	2553/1881	2	3	3	3	3	0	0	1	2	4	8	2	4	2	1	4	15	0	2	3	12	3	3	11	6	19	16	0	1	0	0	1	1	0	0	0	0	0	0
6541 Kelka III	2553/1825	2	3	3	3	3	0	0	1	2	3	8	2	4	2	2	3	12	0	2	3	12	3	4	11	6	19	16	0	1	0	0	1	0	0	0	0	0	0	0
6545 Kelka III	2553/1489	7	4	4	2	3	0	1	0	4	3	6	4	4	2	2	4	3	12	2	3	12	3	4	10	6	19	16	0	0	1	0	1	1	0	1	0	0	0	0
6546 Kelka III	2553/2197	2	4	4	2	3	0	2	0	4	4	5	1	1	6	2	4	0	0	2	0	12	3	4	10	7	19	16	0	1	0	0	0	1	1	0	0	0	0	0
6547 Kelka III	2553/1757	7	4	5	2	3	0	2	0	4	3	6	3	4	2	2	4	12	0	2	3	12	3	4	8	6	19	16	0	0	0	0	1	1	0	1	0	0	1	0
6548 Kelka III	2553/972,1137	2	3	4	3	3	0	4	0	2	3	5	2	6	2	1	4	0	0	2	0	0	3	2	8	7	19	16	0	0	0	0	0	0	0	0	0	1	0	0
6549 Kelka III	2553/1800	2	4	3	4	4	0	1	0	4	4	6	3	4	2	1	4	12	0	2	3	12	3	4	8	6	19	16	0	1	0	0	1	1	0	0	0	0	0	0
6551 Kelka III	2553/2060	2	4	4	4	4	0	0	0	5	4	5	2	4	2	1	4	3	12	2	3	12	3	5	8	6	19	16	0	1	0	0	1	1	1	0	0	0	0	0
6552 Kelka III	2553/1971	2	3	3	4	4	0	5	0	4	3	6	3	4	2	2	4	3	12	2	3	12	3	4	9	7	19	16	0	1	0	0	1	0	1	0	0	0	0	0
6554 Kelka III	2553/2199	2	3	3	4	4	0	0	0	5	4	5	2	6	2	2	4	3	0	2	2	12	3	4	7	5	19	16	0	1	0	0	0	1	0	1	0	0	0	0
6556 Kelka III	2553/2009	2	4	5	4	4	0	0	0	4	4	5	2	6	2	1	4	3	12	2	3	12	3	3	7	4	19	16	0	1	0	0	1	0	1	0	0	0	0	0
6557 Kelka III	2553/799	7	4	5	2	3	0	1	0	2	3	5	2	4	2	1	0	0	12	0	0	12	3	0	8	6	19	16	0	0	0	0	0	0	0	0	0	0	0	0
6558 Kelka III	2533/1754	7	4	4	2	3	0	1	1	4	4	5	2	4	0	0	3	12	0	2	3	12	3	3	8	5	19	16	0	0	0	1	0	0	0	0	0	0	0	0
6559 Kelka III	2553/186	7	4	4	2	3	0	0	6	4	3	5	4	4	2	2	4	12	0	2	3	0	3	4	8	7	19	16	0	1	0	0	1	0	0	0	0	0	0	0
6560 Kelka III	2553/1814	7	4	4	2	3	0	0	0	2	3	5	2	4	2	1	4	3	12	2	3	12	3	4	10	4	19	16	0	1	0	0	1	1	0	0	0	0	0	0
6561 Kelka III	2553/17	2	4	4	4	4	0	2	0	4	3	5	2	6	0	0	15	0	0	3	0	0	3	1	9	9	19	16	0	0	0	0	1	0	0	0	0	0	0	0

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6562 Kelka III	2553/937	2	3	4	4	4	0	2	0	2	3	9	2	4	2	2	4	3	12	2	3	12	3	3	8	5	19	16	0	1	0	1	0	1	0	1	0	0	0	0
6563 Kelka III	2553/3030	2	4	3	4	4	0	0	2	4	3	6	2	4	0	0	15	0	0	3	0	12	3	2	8	5	19	16	0	0	0	1	1	0	0	0	0	0	0	0
6565 Kelka III	2553/623	7	4	4	2	3	0	5	0	4	3	5	1	1	0	0	17	0	4	0	0	0	3	0	8	8	19	16	0	0	0	0	1	0	0	0	0	0	0	0
6566 Kelka III	2553/1930	2	4	4	4	4	0	1	0	2	3	11	1	1	0	0	15	0	0	3	0	0	3	1	10	13	19	16	0	0	0	0	1	0	0	0	0	0	0	0
6567 Kelka III	2553/1844	2	4	4	4	4	0	1	0	5	4	5	1	1	0	0	12	15	0	3	3	0	3	2	7	6	19	16	0	0	0	0	1	0	0	0	0	0	0	0
6568 Kelka III	2553/1905	2	3	3	4	4	0	2	0	5	4	5	1	1	4	4	4	2	0	3	1	0	3	2	7	6	19	16	0	0	0	0	1	0	0	0	0	0	0	0
6569 Kelka III	2553/1473	7	4	4	2	3	0	2	0	4	4	5	1	1	0	0	15	0	0	3	0	0	3	1	8	6	19	16	0	0	0	0	1	0	0	0	0	0	0	0
6570 Kelka III	2553/1840	2	4	4	4	4	0	4	0	4	4	5	2	4	0	0	15	0	0	3	0	12	3	1	5	6	19	16	0	0	0	0	1	0	0	0	0	0	0	0
6571 Kelka III	2553/369	2	4	5	3	3	0	2	0	4	3	5	3	4	2	2	3	12	0	2	3	0	3	3	8	6	19	16	0	1	0	0	1	0	0	0	0	0	0	0
6573 Kelka III	2553/649	2	2	4	2	3	0	2	0	4	3	5	1	1	0	0	3	15	0	2	3	0	3	1	9	8	19	16	0	1	0	0	1	0	0	0	0	0	0	0
6574 Kelka III	2553/711	7	4	4	2	3	0	0	0	5	3	5	1	1	2	1	4	15	0	2	3	12	3	4	10	10	19	16	0	1	0	0	1	1	0	0	0	0	0	0
6575 Kelka III	2553/1111	2	4	3	4	4	0	1	5	4	4	9	1	1	1	1	12	4	0	3	2	0	3	2	9	8	19	16	0	0	0	0	1	1	0	0	0	0	0	0
6576 Kelka III	2553/328	7	4	3	2	3	0	2	1	4	3	5	3	4	2	1	12	3	0	3	2	0	3	4	6	6	19	16	0	0	0	0	1	0	0	1	0	0	0	0
6578 Kelka III	2553/1780	7	4	4	2	3	0	0	0	2	4	5	1	1	0	0	3	15	0	2	3	0	3	2	9	7	19	16	0	1	0	1	1	0	0	0	0	0	0	0
6579 Kelka III	2553/1095	2	4	4	4	4	0	2	2	4	4	5	2	4	0	0	12	0	0	3	0	0	0	1	8	5	19	16	0	0	0	0	1	0	0	0	0	0	0	0
6581 Kelka III	2553/1148	2	4	3	4	4	0	0	0	5	4	5	2	4	0	0	4	12	0	2	3	0	3	1	7	5	19	16	0	1	0	0	1	0	0	0	0	0	0	0
6582 Kelka III	2553/1808	2	4	3	4	4	0	4	0	4	4	5	1	1	2	1	4	0	0	2	0	0	3	1	7	6	19	16	0	0	1	0	0	1	1	0	0	0	0	0
6583 Kelka III	2553/1452	2	4	3	4	4	0	0	0	5	4	5	1	1	0	0	4	14	0	2	3	0	3	2	7	5	19	16	0	0	1	0	1	0	0	0	0	0	0	0
6584 Kelka III	2553/994	2	4	5	3	3	0	2	0	4	3	8	2	4	2	3	12	0	0	3	0	0	3	1	7	7	19	16	0	0	0	0	1	0	0	0	0	0	0	0
6585 Kelka III	2553/1	2	4	3	4	4	0	1	0	4	4	8	2	4	0	0	12	0	0	3	0	0	3	1	6	7	19	16	0	0	0	0	1	0	0	0	0	0	0	0
6587 Kelka III	2553/1093	2	4	4	4	4	0	0	5	4	4	8	3	6	2	1	3	12	0	2	3	0	3	2	5	5	19	16	0	1	0	0	1	0	0	0	0	0	0	0
6337 Kelka IV	2266/97,1000,126	2	3	3	2	3	0	4	0	4	3	8	3	4	0	0	12	0	0	3	0	0	2	2	9	10	19	16	0	0	0	0	1	0	0	0	0	0	0	0
6338 Kelka IV	2266/90,93	2	3	1	4	4	0	2	0	3	3	8	4	4	0	0	12	0	0	3	0	0	3	1	10	7	19	16	0	0	0	0	1	0	0	0	0	0	0	0
6339 Kelka IV	2266/88	2	4	4	3	4	0	2	0	3	4	8	3	6	0	0	4	3	2	2	2	1	3	4	6	5	19	16	0	1	0	0	1	1	1	0	0	0	0	0
6340 Kelka IV	2255/123	2	4	2	4	4	0	0	0	4	4	5	2	4	0	0	29	17	0	7	4	0	3	2	5	6	19	16	0	0	0	0	1	1	0	0	0	0	0	0
5786 Mog.N.Kolonsha	1729/5,6,7	5	5	2	3	4	0	0	0	3	3	5	4	5	0	0	27	11	29	4	3	7	3	5	5	11	32	16	0	0	0	0	1	1	0	0	0	0	0	0
6394 Ohtoma I	1862/559	2	4	3	4	3	0	1	0	2	3	5	2	4	0	0	1	12	0	1	3	12	3	2	6	8	19	16	0	0	0	0	1	0	1	0	0	0	0	0
6395 Ohtoma I	1862/175	2	4	5	3	3	0	0	0	3	3	5	1	1	0	0	4	12	0	2	3	0	3	3	8	9	19	16	0	1	0	0	1	0	0	0	0	0	0	0
6399 Ohtoma I	1861/240	2	3	3	2	3	0	1	0	5	3	5	1	1	2	1	4	0	0	2	0	0	3	3	7	7	21	16	0	0	0	0	0	1	0	0	1	0	0	0
6400 Ohtoma I	1861/234	2	3	3	4	4	0	0	0	5	3	8	2	4	2	1	4	12	0	2	3	0	3	3	7	5	20	16	0	0	1	0	1	1	0	0	1	0	0	0
6403 Ohtoma I	1861/178	2	3	4	3	3	0	0	0	3	3	8	2	4	2	1	2	0	0	1	0	0	3	1	8	7	19	16	0	0	0	0	0	1	0	0	0	0	0	0
6406 Ohtoma I	1861/50	2	5	2	4	3	0	0	0	4	3	5	2	4	0	0	12	0	0	3	0	0	3	1	6	5	19	16	0	0	0	0	0	1	0	0	0	0	0	0
6407 Ohtoma I	1861/245	2	4	4	4	4	0	1	0	4	4	5	2	4	2	2	25	0	0	4	0	0	3	3	8	10	19	16	0	0	0	0	0	0	1	0	0	0	0	0
6409 Ohtoma I	1861/145	2	4	5	4	4	0	0	0	4	3	5	1	1	4	4	2	0	0	1	0	0	3	1	6	5	19	16	0	0	0	0	1	0	0	0	0	0	0	0
6410 Ohtoma I	1861/340	2	4	5	4	4	0	0	0	4	3	5	1	1	2	5	31	3	12	9	2	3	3	4	9	10	19	16	0	1	0	0	1	1	0	0	0	0	0	0
6411 Ohtoma I	1861/181	2	2	2	2	3	0	1	0	4	3	5	1	1	9	4	2	0	0	1	0	0	3	2	5	5	19	16	0	0	0	0	1	0	0	0	0	0	1	0
6412 Ohtoma I	1862/306	2	4	3	3	3	0	2	0	4	3	5	3	6	0	0	4	12	0	2	3	0	3	2	7	7	19	16	0	0	1	0	1	0	0	0	0	0	1	0
6413 Ohtoma I	1861/339	2	3	4	4	4	0	2	0	5	3	8	2	4	0	0	4	0	0	2	0	0	3	2	5	5	19	16	0	1	0	0	0	0	0	0	0	0	0	0
6421 Ohtoma I	2055/612,613	7	3	3	2	3	0	1	6	4	3	5	4	6	0	0	2	0	0	1	0	0	3	1	6	7	19	16	0	0	0	0	1	0	0	1	0	0	0	0
6422 Ohtoma I	2055/788,787	2	4	3	3	3	0	5	1	4	4	8	1	1	4	4	12	0	0	3	0	0	3	1	6	7	19	16	0	0	0	0	1	0	0	0	0	0	0	0
6423 Ohtoma I	2055/498	2	4	4	3	3	0	2	0	4	3	5	1	1	4	4	12	0	0	3	0	0	3	1	7	8	19	16	0	0	0	0	1	0	0	0	0	0	0	0
6424 Ohtoma I	2055/286	2	4	3	3	4	0	0	0	5	3	9	3	4	2	2	4	2	0	3	1	0	3	5	8	8	19	16	0	1	0	0	1	1	0	0	0	0	0	0
6426 Ohtoma I	2055/56	2	5	4	3	3	0	0	0	5	3	9	3	4	2	2	4	17	12	2	4	12	3	5	7	6	19	16	0	1	0	0	1	1	0	1	0	0	0	0
6428 Ohtoma I	2055/241	2	6	3	4	3	0	2	0	4	3	5	1	1	2	2	12	0	0	3	0	0	3	1	7	4	19	16	0	0	0	0	1	0	0	0	0	0	0	0
6429 Ohtoma I	2055/815	2	3	4	4	4	0	1	0	4	4	9	1	1	2	2	12	0	0	3	0	0	3	1	6	5	19	16	0	0	0	0	1	0	0	0	0	0	0	0
6430 Ohtoma I	2055/21	2	3	3	3	3	0	0	0	3	4	5	1	1	2	2	7	0	0	4	0	12	3	3	6	5	19	16	0	0	0	0	1	0	0	0	0	0	1	0
6431 Ohtoma I	2055/178	2	4	4	2	3	0	0	0	2	3	8	4	6	0	0	12	0	0	3	0	0	3	1	9	12	19	16	0	0	0	0	1	0	0	0	0	0	0	0
6432 Ohtoma I	2055/655	2	6	5	3	4	0	0	0	5	3	8	2	4	0	0	4	0	0	2	0	0	3	4	7	7	19	16	0	1	0	0	0	1	0	0	0	0	0	0
6434 Ohtoma I	2055/264	2	5	4	3	4	0	0	0	4	3	5	2	4	2	2	4	12	0	2	3	0	3	4	8	5	19	16	0	1	0	0	1	0	0	0	0	0	0	0

Number Site	NM-number	M1	Q1	K1	SH	SK	PM	PN	PT	PS	PO	RM	RF	RP	RE	RA	KE1	KE2	KE3	KY1	KY2	KY3	Kt	V	X	Y	TY	VE	Km0	Kma	Kmb	Kmc	Kmd	Kme	Kmf	Kmg	Kmh	Kmi	Kmj	SIZE
6435 Ohtoma I	2055/724	2	5	5	3	3	0	2	0	4	3	5	1	1	2	1	4	0	0	2	0	0	3	4	9	8	19	16	0	0	0	0	0	1	1	0	0	0	0	0
6436 Ohtoma I	3055/605	2	4	4	4	3	0	1	0	4	3	5	1	1	2	2	4	12	0	2	3	12	3	3	10	6	19	16	0	1	0	0	1	1	0	0	0	0	0	0
6437 Ohtoma I	2055/614,592	2	3	4	3	3	0	0	0	2	4	8	2	6	2	1	2	0	0	1	0	12	3	4	8	7	19	16	0	0	0	0	1	0	0	0	0	0	1	0
6438 Ohtoma I	2055/789	2	3	4	4	3	0	0	1	2	3	8	2	4	2	2	4	2	12	2	1	3	3	4	8	6	19	16	0	1	0	0	1	0	0	0	0	1	1	0
6439 Ohtoma I	2055/578	2	4	4	3	3	0	2	0	4	3	8	2	4	5	5	4	3	12	2	2	3	3	3	8	4	19	16	0	1	0	0	1	1	0	0	0	0	0	0
6440 Ohtoma I	2055/576	2	4	4	4	4	0	2	0	4	4	5	1	1	2	1	4	3	15	2	2	3	3	4	8	4	19	16	0	1	0	0	1	1	0	0	0	0	0	0
6441 Ohtoma I	2055/727	0	0	0	3	3	0	1	1	4	3	5	1	1	2	1	4	12	0	2	3	0	3	4	8	7	19	16	0	1	0	0	1	1	0	0	0	0	0	0
6442 Ohtoma I	2055/189	2	2	4	4	4	0	1	0	4	3	5	1	1	2	2	4	3	12	2	2	3	3	4	8	7	19	16	0	1	0	0	1	1	0	1	0	0	0	0
6443 Ohtoma I	2055/715	2	3	3	3	3	0	2	2	4	3	9	1	1	0	0	25	12	0	4	3	0	3	4	8	6	19	16	0	0	0	0	1	1	0	0	0	0	0	0
6444 Ohtoma I	2055/909	7	3	3	3	3	0	2	0	2	3	5	2	4	6	2	4	14	0	2	3	0	3	3	8	5	19	16	0	0	0	0	1	1	0	0	0	0	0	0
6445 Ohtoma I	2055/698	2	4	4	3	3	0	0	4	4	3	9	2	4	2	2	4	14	0	2	3	0	3	3	7	5	19	16	0	1	0	1	1	0	0	0	0	0	0	0
6446 Ohtoma I	2055/494	2	4	4	4	4	0	0	0	2	3	9	1	1	2	2	4	2	0	2	1	0	3	5	10	6	19	16	0	0	0	0	0	1	0	0	0	0	0	0
6447 Ohtoma I	2055/258	2	4	4	4	3	0	4	1	4	3	9	2	4	2	2	4	12	0	2	3	0	3	3	10	5	19	16	0	1	0	0	1	0	0	0	0	0	0	0
6450 Ohtoma I	2055/968	2	4	4	4	4	0	2	0	4	3	5	2	4	2	1	4	2	0	2	1	0	3	4	8	4	19	16	0	1	0	0	1	1	0	0	0	0	0	0
6451 Ohtoma I	2055/357	2	3	3	4	4	0	1	1	5	4	5	4	4	2	1	4	2	12	2	1	12	3	3	8	6	19	16	0	1	0	0	1	0	0	0	0	0	0	0
6452 Ohtoma I	2055/205	2	4	5	4	4	0	2	0	4	4	8	1	1	2	2	4	12	0	2	3	12	3	4	7	5	19	16	0	0	0	0	1	1	0	0	0	0	0	0
6453 Ohtoma I	2055/940,831	2	3	4	4	4	0	1	0	5	4	8	4	6	2	2	4	12	3	2	3	2	3	4	7	10	19	16	0	0	0	0	1	1	1	0	0	0	0	0
6454 Ohtoma I	2055/383	2	5	3	4	4	0	2	0	4	4	9	2	4	2	5	4	14	0	2	3	0	3	5	8	6	19	16	0	0	0	0	1	0	1	0	0	0	0	0
6455 Ohtoma I	2055/91	2	4	4	4	4	0	2	0	5	4	8	2	4	4	5	4	14	0	2	3	0	3	5	8	6	19	16	0	0	0	0	1	1	1	0	0	0	0	0
6489 Ohtoma III	2056/413,411	2	4	5	4	3	0	0	1	4	3	3	5	6	2	2	12	2	3	1	0	12	3	3	10	9	19	16	0	0	0	0	1	0	0	0	0	0	0	0
6490 Ohtoma III	2056/1087	2	2	3	4	4	0	0	1	5	4	5	1	1	0	0	4	3	17	2	2	4	3	2	7	5	19	16	0	1	0	0	0	1	1	0	1	0	0	0
6494 Ohtoma III	2056/1971	2	4	5	3	4	0	0	0	2	3	5	1	1	2	2	3	0	0	2	0	0	3	3	8	6	19	16	0	1	0	0	0	0	0	0	0	0	0	0
6495 Ohtoma III	2056/1588,414	2	4	4	4	4	0	0	0	5	3	8	4	6	2	2	4	17	0	2	4	0	3	5	10	5	19	16	0	1	0	0	0	1	1	1	1	0	0	0
6496 Ohtoma III	2056/1645	7	3	3	2	3	0	0	0	4	3	5	1	1	0	0	3	2	0	2	1	0	3	5	5	5	19	16	0	0	0	0	1	1	0	0	0	0	0	0
6498 Ohtoma III	2056/239	2	4	5	4	4	0	0	0	5	3	5	1	1	2	1	4	0	0	2	0	0	3	4	10	11	19	16	0	0	1	0	0	0	0	0	0	0	0	0
6499 Ohtoma III	2056/1887	2	4	4	4	3	0	1	0	2	3	5	2	3	6	4	4	0	0	2	0	0	3	4	10	5	19	16	0	0	0	0	0	0	1	0	0	0	0	0
6500 Ohtoma III	2056/2418	2	4	4	3	3	0	0	4	4	3	5	1	1	2	2	7	27	0	4	5	12	3	2	10	6	19	16	0	1	0	0	1	0	0	0	0	0	0	0
6501 Ohtoma III	2056/828	2	3	5	3	4	0	0	0	2	3	5	1	1	4	4	12	2	0	3	1	12	3	3	12	10	19	16	0	1	0	0	0	0	0	0	0	0	0	0
6502 Ohtoma III	1863/716	2	2	3	3	3	0	0	0	2	3	5	1	1	2	1	2	0	0	1	0	12	3	2	8	7	19	16	0	1	0	0	0	0	0	0	0	0	0	0
6503 Ohtoma III	2056/1869	2	4	5	4	4	0	0	0	2	3	5	3	3	2	2	12	0	0	3	0	12	3	3	8	9	19	16	0	0	0	0	1	0	0	0	0	0	1	0
6504 Ohtoma III	2056/243	2	3	4	4	4	0	4	6	4	3	5	1	1	0	0	12	0	0	3	0	0	3	3	4	4	19	16	0	0	0	0	1	0	0	0	0	0	1	0
6505 Ohtoma III	2056/1518,1862	2	3	5	3	3	0	0	0	2	3	3	1	1	2	2	12	0	0	3	0	12	3	2	11	9	19	16	0	0	0	0	1	0	0	0	0	0	1	0
6506 Ohtoma III	2056/1107,389	2	4	5	3	3	0	0	0	2	3	5	2	4	2	2	5	12	0	2	3	12	3	4	10	8	19	16	0	1	0	0	1	0	0	1	0	0	0	0
6508 Ohtoma III	2056/1181	2	3	3	4	4	0	2	0	4	4	5	2	4	6	5	17	12	0	4	3	0	2	4	10	8	19	16	0	0	0	0	1	1	1	0	0	0	0	0
6509 Ohtoma III	1863/824	2	4	4	4	4	0	4	6	4	3	8	5	6	2	1	12	0	0	3	0	12	2	2	12	7	19	16	0	0	0	0	1	0	0	0	0	0	0	0
6510 Ohtoma III	2056/2640	1	1	1	2	3	0	2	0	2	3	8	4	5	2	2	4	17	12	2	4	12	3	4	10	7	19	16	0	1	0	0	1	0	0	1	0	0	0	0
6511 Ohtoma III	1863/933,950	2	4	4	3	3	0	0	0	2	3	9	2	3	2	2	4	17	12	2	3	12	3	4	11	7	19	16	0	0	0	0	1	1	0	0	0	0	0	0
6512 Ohtoma III	1863/229,1768,434	2	4	5	3	3	0	2	1	2	3	8	4	6	2	4	4	3	12	2	2	12	3	1	10	7	19	16	0	1	0	0	1	1	0	0	1	0	0	0
6513 Ohtoma III	1863/1176	2	5	4	4	4	0	0	1	2	4	5	4	6	0	0	19	12	0	4	3	0	3	4	5	7	19	16	0	1	0	0	1	0	0	0	0	0	0	0
6514 Ohtoma III	2056/1340	2	2	2	3	3	0	4	0	4	3	8	4	6	2	2	4	3	12	2	2	3	3	4	8	5	19	16	0	1	0	0	1	1	0	0	0	0	0	0
6515 Ohtoma III	1863/1870	2	4	4	4	3	0	0	4	4	3	5	2	3	2	1	13	0	0	3	0	0	3	3	9	7	19	16	0	0	0	0	1	0	0	0	0	0	0	0
6366 Poga I	1843/84,86,82,98,83	2	3	3	3	3	0	5	0	4	3	8	4	6	9	4	12	0	0	3	0	0	2	1	9	8	19	16	0	0	0	0	1	0	0	0	0	0	0	0
6367 Poga I	1843/899,150	7	5	3	2	3	0	4	1	4	3	5	2	3	9	4	12	0	0	3	0	0	3	1	8	10	19	16	0	0	0	0	1	0	0	0	0	0	0	0
6368 Poga I	1843/650	7	5	3	2	3	0	4	1	4	3	5	2	4	6	1	12	0	0	3	0	0	3	2	6	9	19	16	0	0	0	0	1	0	0	0	0	0	0	0
6369 Poga I	1843/154	7	2	2	3	2	0	2	1	4	3	8	1	1	0	0	12	0	0	3	0	0	3	2	10	5	19	16	0	0	0	0	1	0	0	0	0	0	0	0
6370 Poga I	1843/89,90,648	2	3	3	2	2	0	0	0	4	3	8	2	4	0	0	0	0	0	0	0	0	3	0	10	6	19	16	0	0	0	0	0	0	0	0	0	0	0	0
6371 Poga I	1843/155	2	3	4	3	3	0	5	4	4	3	5	1	1	2	2	4	16	0	2	3	0	3	3	10	9	19	16	0	1	0	0	1	0	1	0	0	0	0	0
6372 Poga I	1843/170	2	3	6	3	3	0	4	0	3	3	5	2	4	2	2	6	12	0	2	3	0	3	5	8	9	19	16	0	1	0	0	0	1	0	0	0	0	0	0
6272 Somboma	1844/229,856	2	2	2	3	3	0	2	4	4	3	5	3	6	0	0	4	17	12	2	4	3	3	4	10	6	19	16	0	0	1	0	1	0	0	0	0	0	0	0

Number Site	NM-number	M1	Q1	K1	SH	SK	PM	PN	PT	PS	PO	RM	RF	RP	RE	RA	KE1	KE2	KE3	KY1	KY2	KY3	Kt	V	X	Y	TY	VE	Km0	Kma	Kmb	Kmc	Kmd	Kme	Kmf	Kmg	Kmh	Kmi	Kmj	SIZE
6274 Somboma	1888/359	2	4	3	3	4	0	4	6	4	4	5	2	6	4	4	15	0	0	3	0	0	3	1	12	12	19	16	0	0	0	0	1	0	0	0	0	0	0	0
6275 Somboma	1888/1013	2	3	4	3	4	0	2	0	4	4	3	4	6	4	4	11	0	0	3	0	0	3	1	10	5	19	16	0	0	0	0	1	0	0	0	0	0	0	0
6276 Somboma	1888/1292	7	4	3	2	3	0	1	0	2	3	5	2	6	4	4	12	2	0	3	1	0	3	4	8	8	19	16	0	0	0	0	1	0	0	0	0	0	0	0
6277 Somboma	1888/1623	2	4	3	3	4	0	2	2	4	4	8	4	6	0	0	12	0	0	3	0	0	3	1	7	7	19	16	0	0	0	0	1	0	0	0	0	0	0	0
6278 Somboma	1888/1233	2	3	3	4	4	0	5	4	4	4	5	1	1	8	4	16	0	0	3	0	0	3	1	8	7	19	16	0	0	0	0	1	0	0	0	0	0	0	0
6279 Somboma	1888/1132	2	2	3	3	3	0	2	0	4	3	9	2	4	2	2	4	17	11	2	4	3	3	2	10	7	19	16	0	0	0	0	1	1	0	1	0	0	0	0
6280 Somboma	1888/1914	2	3	3	3	3	0	0	0	2	3	5	1	1	2	2	2	0	0	1	0	0	3	3	10	9	19	16	0	0	0	0	1	0	0	0	0	0	1	0
6282 Somboma	1888/22	7	2	3	2	3	0	5	0	4	4	5	2	4	2	1	4	12	17	2	3	4	2	3	6	6	19	16	0	1	0	0	1	1	0	1	0	0	0	0
6283 Somboma	1888/1534	2	4	4	4	4	0	2	6	4	4	5	1	1	2	2	4	12	0	2	3	12	3	2	7	5	19	16	0	1	0	0	1	0	0	0	0	0	0	0
6285 Somboma	1888/1925	6	3	5	3	3	0	0	4	4	4	5	3	6	2	2	4	2	0	2	1	0	3	3	8	5	19	16	0	0	0	0	1	0	1	0	0	0	0	0
6286 Somboma	1888/1297	2	4	4	3	3	0	0	4	4	3	9	1	1	0	0	15	0	0	3	0	0	3	1	10	8	19	16	0	0	0	0	1	0	0	0	0	0	0	0
6287 Somboma	1888/1817	2	4	3	3	3	0	2	0	4	3	5	1	1	2	1	15	0	0	3	0	0	3	1	7	6	19	16	0	0	0	0	1	0	0	0	0	0	0	0
6288 Somboma	1888/1029	2	3	3	3	4	0	2	0	4	3	5	2	3	0	0	4	0	0	2	0	0	3	5	8	7	19	16	0	1	0	0	0	1	0	0	0	0	0	0
6289 Somboma	1888/1579	2	2	3	3	3	0	4	0	4	4	9	1	1	2	2	4	3	12	2	2	3	3	4	9	6	19	16	0	1	0	0	1	1	0	1	0	0	0	0
6293 Somboma	1888/2045	7	2	2	3	3	0	2	1	4	4	5	1	1	0	0	4	12	0	2	3	0	3	3	7	7	19	16	0	1	0	0	1	0	0	0	0	0	0	0
6294 Somboma	1888/1298	2	3	4	3	3	0	2	0	4	4	5	2	4	2	2	4	12	0	2	3	0	3	3	8	7	19	16	0	1	0	0	1	1	0	0	0	0	0	0
6295 Somboma	1844/3801	2	3	4	3	3	0	1	0	5	4	5	2	1	2	1	4	12	0	2	3	12	2	4	10	7	19	16	0	0	1	0	1	0	0	0	0	1	0	0
6296 Somboma	1844/2563	7	3	3	2	3	0	0	1	2	3	5	3	4	6	2	12	17	0	3	4	0	3	1	12	8	19	16	0	0	0	0	1	0	0	0	0	0	0	0
6297 Somboma	1844/3362	2	3	4	2	3	0	0	0	3	3	8	2	4	2	2	4	17	2	2	4	12	3	4	10	10	19	16	0	0	1	0	0	0	0	0	0	0	0	0
6298 Somboma	1844/2383	6	3	3	2	3	0	1	5	4	4	8	2	4	2	2	4	17	0	2	4	0	3	4	10	9	19	16	0	0	1	0	0	0	0	0	1	0	0	0
6299 Somboma	1844/100	7	5	5	2	2	0	2	1	2	3	8	3	4	0	0	33	12	0	7	3	12	3	3	5	7	22	16	0	0	0	0	1	1	0	1	0	0	0	0
6300 Somboma	1844/4052	2	2	2	2	3	0	0	0	3	4	8	2	4	2	2	12	4	0	3	2	0	3	3	10	8	19	16	0	0	0	0	1	0	0	0	0	0	1	0
6301 Somboma	1844/3794	2	3	4	2	2	0	2	0	5	3	8	2	4	2	1	4	15	17	2	3	12	3	4	10	9	19	16	0	0	1	0	1	1	0	0	1	1	0	0
6302 Somboma	1844/1672	2	6	5	4	4	0	2	3	4	4	9	1	1	8	4	15	0	0	3	0	0	3	1	10	5	19	16	0	0	0	0	1	0	0	0	0	0	0	0
6305 Somboma	1888/2008,1995	7	3	3	2	3	0	2	0	4	3	5	2	5	0	0	2	12	0	1	3	0	2	3	6	5	19	16	0	0	0	0	1	0	0	0	0	0	1	0
6306 Somboma	3000/1401	7	3	3	3	3	0	1	5	4	4	5	2	4	0	0	15	0	0	3	0	0	3	2	7	7	19	16	0	0	0	0	1	0	0	0	0	0	0	0
6308 Somboma	3000/2018	2	3	4	3	3	0	2	0	4	3	5	2	3	4	4	14	0	0	3	0	0	1	2	9	12	19	16	0	0	0	0	1	0	0	0	0	0	0	0
6309 Somboma	3000/26	2	3	4	3	3	0	2	0	4	3	5	1	1	0	0	14	0	0	3	0	0	2	1	7	7	19	16	0	0	0	0	1	0	0	0	0	0	0	0
6311 Somboma	3000/478	2	2	2	2	4	0	2	4	4	4	5	2	4	2	2	12	15	0	3	3	12	2	3	10	10	19	16	0	0	0	0	1	0	0	0	0	0	1	0
6312 Somboma	3000/–	2	2	3	3	3	0	4	2	4	4	5	1	1	2	2	12	30	0	3	9	0	3	1	6	8	19	16	0	0	0	0	1	0	0	0	0	0	0	0
6313 Somboma	3000/1176	2	2	2	3	4	0	1	4	4	4	5	1	1	0	0	12	30	0	3	9	0	3	1	7	10	19	16	0	0	0	0	1	0	0	0	0	0	0	0
6314 Somboma	3000/1055	7	2	2	3	4	0	2	4	4	4	5	1	1	0	0	12	30	0	3	9	0	3	1	8	5	19	16	0	0	0	0	1	0	0	0	0	0	0	0
6315 Somboma	3000/1670,1214	2	2	2	4	4	0	2	4	4	4	5	5	6	2	2	12	3	0	3	2	0	1	3	7	5	19	16	0	0	0	0	1	0	0	0	0	0	1	0
6316 Somboma	3000/711	7	3	4	2	3	0	1	0	3	3	5	3	6	4	4	12	2	0	3	1	0	2	3	9	10	19	16	0	0	0	0	1	0	0	0	0	0	1	0
6317 Somboma	3000/901	2	3	4	3	3	0	4	4	4	3	5	1	1	0	0	4	12	0	2	3	0	3	3	9	10	19	16	0	1	0	0	1	1	0	0	0	0	0	0
6318 Somboma	3000/1471	2	3	3	4	3	0	0	0	3	3	5	3	4	0	0	12	0	0	3	0	0	3	3	6	8	19	16	0	0	0	0	1	0	0	0	0	0	1	0
6319 Somboma	3000/273	2	4	4	4	4	0	0	4	4	4	5	1	1	0	0	15	0	0	3	0	0	3	1	12	9	19	16	0	0	0	0	1	0	0	0	0	0	0	0
6320 Somboma	3000/1568	7	3	3	2	3	0	0	2	4	4	5	1	1	2	1	12	2	0	3	1	0	3	2	10	10	19	16	0	0	0	0	1	0	0	0	0	0	0	0
6321 Somboma	3000/1680	2	4	2	3	3	0	1	2	4	4	5	1	1	0	0	12	0	0	3	0	0	3	1	9	12	19	16	0	0	0	0	1	0	0	0	0	0	0	0
6322 Somboma	3000/1201	7	3	3	3	3	0	1	0	2	3	5	2	4	0	0	12	0	0	3	0	0	3	1	8	11	19	16	0	0	0	0	1	0	0	0	0	0	0	0
6323 Somboma	3000/1757	2	3	3	4	3	0	0	0	2	4	2	2	3	2	2	4	12	0	2	3	12	3	3	10	5	19	16	0	1	0	0	1	0	0	0	0	0	0	0
6324 Somboma	3000/1287	7	3	3	3	3	0	2	0	4	4	2	2	3	0	0	17	12	0	4	3	0	3	3	10	7	19	16	0	0	0	0	1	0	0	0	1	0	0	0
6326 Somboma	1888/1328	2	3	3	4	3	0	1	0	5	3	5	1	1	0	0	4	15	11	2	3	3	4	3	8	6	19	16	0	1	0	0	1	1	0	0	0	0	0	0
6327 Somboma	1888/89	2	3	3	3	3	0	1	0	5	4	5	1	1	0	0	29	12	0	7	6	3	3	3	7	8	19	16	0	0	0	0	1	1	1	0	0	0	0	0
6328 Somboma	1888/1625	2	3	3	3	3	0	0	0	5	3	5	3	6	0	0	29	2	0	7	1	0	3	3	10	7	19	16	0	0	0	0	1	1	1	0	0	0	0	0
6329 Somboma	1888/1961	2	3	4	3	3	0	0	0	3	3	5	2	4	0	0	4	12	2	2	3	1	3	3	10	9	19	16	0	1	0	0	1	1	0	0	1	0	0	0
6330 Somboma	1888/2044,1202	7	3	3	3	3	0	1	0	5	4	5	2	6	2	5	4	12	0	2	3	0	1	3	9	10	19	16	0	0	0	0	1	1	1	0	0	0	0	0
6331 Somboma	1888/1140,1141	2	4	4	4	4	0	0	0	3	4	5	3	6	0	0	2	0	0	1	0	0	3	2	11	9	19	16	0	0	0	0	1	0	0	0	0	0	0	0
6332 Somboma	3000/3031,2962	2	3	3	4	4	0	0	2	4	4	5	2	4	2	2	3	0	0	2	0	12	3	3	10	10	19	16	0	0	0	0	0	0	0	1	0	0	0	0

Number Site	NM-number	M1	Q1	K1	SH	SK	PM	PN	PT	PS	PO	RM	RF	RP	RE	RA	KE1	KE2	KE3	KY1	KY2	KY3	Kt	V	X	Y	TY	VE	Km0	Kma	Kmb	Kmc	Kmd	Kme	Kmf	Kmg	Kmh	Kmi	Kmj	SIZE
6334 Somboma	3000/1903,2707	2	3	5	3	3	0	2	4	4	4	5	5	6	0	0	4	17	0	2	4	0	2	4	10	9	19	16	0	0	0	0	1	1	0	1	0	0	0	0
6335 Somboma	3000/2699,2709,2726	2	4	5	4	3	0	1	5	4	4	8	4	6	2	1	4	3	0	2	2	12	3	4	10	8	19	16	0	0	1	0	0	1	0	0	0	0	0	0
6336 Somboma	3000/284,270,305,274	2	2	3	3	3	0	1	2	4	4	5	2	4	2	2	4	14	0	2	3	0	2	4	8	7	19	16	0	0	1	0	1	0	0	0	0	0	0	0
6341 Tonda IV	2267/64	2	3	3	3	3	0	1	0	5	4	5	1	1	0	0	4	12	0	2	3	0	3	3	9	5	19	16	0	0	1	0	1	1	0	0	0	0	0	0
6345 Tonda IV	2266/124,129,147,123	2	3	4	4	4	0	5	0	4	3	5	3	6	0	0	7	0	0	4	0	0	1	1	5	6	19	16	0	0	0	0	1	0	0	0	0	0	0	0
6346 Tonda IV	2752/398,399	2	3	4	4	3	0	2	0	4	3	5	2	4	2	1	4	12	17	2	3	2	2	5	9	9	19	16	0	1	0	0	1	1	0	0	0	0	0	0
6347 Tonda IV	2752/298,255,253	2	3	4	2	3	0	1	0	3	3	5	2	4	2	1	4	14	0	2	3	0	3	4	9	7	19	16	0	0	0	0	1	1	1	0	0	0	0	0
6348 Tonda IV	2752/52	2	3	4	3	3	0	2	0	5	3	5	1	1	2	1	4	12	0	2	3	0	3	4	8	8	19	16	0	0	1	0	1	1	0	0	0	0	1	0
6349 Tonda IV	2752/258,250	2	4	4	3	3	0	0	0	2	3	5	1	1	2	1	4	13	0	2	3	0	3	3	10	6	19	16	0	1	0	0	1	1	0	0	0	0	0	0
6350 Tonda IV	2752/360	2	3	3	3	4	0	0	0	3	4	6	1	1	0	0	4	0	0	2	0	0	3	3	10	12	19	16	0	0	0	0	0	0	0	0	0	1	0	0
6352 Tonda IV	2752/217	2	3	4	3	3	0	1	0	2	3	6	1	1	0	0	12	0	0	3	0	0	3	2	10	10	19	16	0	0	0	0	0	1	0	0	0	0	0	0
6353 Tonda IV	2752/218	2	4	4	3	4	0	1	0	4	3	9	1	1	4	4	4	2	0	2	1	0	3	3	8	7	19	16	0	1	0	0	1	1	0	0	0	0	0	0
6354 Tonda IV	2752/400	2	4	5	3	3	0	1	0	5	3	5	1	1	2	1	4	17	12	2	4	3	3	4	9	9	19	16	0	1	0	0	1	1	0	0	0	0	0	0
6355 Tonda IV	2752/119	2	4	5	3	4	0	0	0	3	3	5	1	1	2	1	4	0	0	2	0	0	3	3	9	8	20	16	0	0	0	0	0	1	0	0	1	0	0	0
6357 Tonda IV	2752/122	2	4	5	3	3	0	0	0	3	4	5	1	1	0	0	4	0	0	2	0	0	3	3	9	9	20	16	0	0	0	0	0	0	0	0	1	0	0	0
6358 Tonda IV	2752/16	2	4	4	3	4	0	0	0	5	4	5	1	1	0	0	4	12	3	2	3	2	3	4	10	9	19	16	0	1	0	0	1	1	0	0	0	0	0	0
6359 Tonda IV	2752/229	2	3	4	3	3	0	0	0	5	4	5	2	4	2	1	4	0	0	2	0	0	3	3	8	7	19	16	0	0	0	0	0	1	0	0	0	0	0	0
5784 Ust-Vodla	2364/16	2	3	3	3	3	0	2	0	4	3	8	4	6	4	2	14	11	0	3	3	0	3	4	8	6	19	16	0	0	0	0	1	0	0	0	0	0	0	0
5783 Ust-Vodla	2364/29	2	2	3	4	4	0	2	0	4	4	5	3	4	0	0	12	0	0	3	0	0	3	3	7	7	19	16	0	0	0	0	1	0	0	0	0	0	0	0
6090 Ust-Vodla V	3073/78	2	5	5	4	3	0	0	0	3	3	8	3	4	2	5	4	12	0	2	3	0	1	5	10	7	19	16	0	1	0	0	1	1	0	1	1	1	1	0
6091 Ust-Vodla V	3073/807	2	3	4	3	3	0	2	0	2	3	8	2	4	2	1	4	12	0	2	3	0	1	4	11	8	19	16	0	1	1	0	1	1	1	0	0	1	1	0
6092 Ust-Vodla V	3073/784	2	3	4	4	4	0	2	0	3	4	8	2	4	0	0	30	3	0	2	9	0	2	4	5	8	19	16	0	1	0	0	0	1	0	0	0	0	0	0
6093 Ust-Vodla V	3073/783	2	2	4	3	3	0	0	4	2	4	2	2	3	2	1	12	4	0	3	2	0	4	1	6	5	19	16	0	1	0	0	1	1	0	0	0	0	0	0
6094 Ust-Vodla V	3073/779	2	5	3	4	3	0	0	0	5	1	5	1	1	2	1	4	13	0	2	3	0	3	4	7	8	19	16	0	1	0	0	1	1	0	0	0	0	0	0
6095 Ust-Vodla V	3073/808	2	3	5	4	3	0	2	0	5	3	5	1	1	2	1	4	2	0	2	1	0	3	4	9	7	19	16	0	0	0	0	1	0	0	0	0	1	0	0
6096 Ust-Vodla V	3073/675	7	3	2	3	3	0	2	0	5	3	9	2	6	2	1	6	13	0	2	3	0	2	3	11	7	19	16	0	1	0	0	1	1	1	0	0	0	0	0
6097 Ust-Vodla V	3073/737	2	5	4	4	4	0	0	0	5	3	5	2	6	2	2	4	12	3	2	3	2	3	3	10	5	19	16	0	1	0	0	1	1	0	1	0	0	1	0
6098 Ust-Vodla V	3073/84,85	2	5	5	4	4	0	2	0	4	4	5	2	4	2	1	4	12	0	2	3	0	2	3	10	6	19	16	0	1	0	1	1	0	0	0	0	0	0	0
6099 Ust-Vodla V	3073/3	2	2	2	4	4	0	1	0	5	4	6	1	1	0	0	4	0	0	2	0	0	3	3	5	7	19	16	0	0	0	0	0	0	0	0	0	1	0	0
6101 Ust-Vodla V	3073/205	2	4	5	3	4	0	1	0	3	3	5	1	1	2	1	4	13	0	2	3	0	3	3	7	8	19	16	0	1	0	0	0	1	0	0	0	0	0	0
6102 Ust-Vodla V	3073/280	7	3	1	3	4	0	3	0	5	4	8	1	1	0	0	4	17	0	2	4	0	3	3	6	6	19	16	0	1	0	0	0	1	0	0	0	1	0	0
6104 Ust-Vodla V	53073/54	2	4	4	4	4	0	2	0	4	4	5	1	1	2	1	4	12	0	2	3	0	3	3	8	7	19	16	0	1	0	0	1	1	0	0	0	1	0	0
6105 Ust-Vodla V	3073/550	6	4	4	4	4	0	2	0	4	3	2	1	1	2	1	3	0	0	2	0	0	3	2	11	8	19	16	0	0	0	0	0	0	1	0	0	0	0	0
5731 Meijeri III	1808/83	3	6	2	3	4	0	0	0	2	3	2	3	3	0	0	25	0	0	4	0	0	3	3	15	8	11	17	0	0	0	0	0	0	0	1	0	0	0	0
5732 Meijeri III	1808/145	3	3	3	2	3	0	0	0	3	3	5	1	1	0	0	11	0	0	3	0	0	3	1	8	8	16	17	0	0	0	0	0	1	0	0	0	0	0	0
6634 Olonka I–IV	–/1214,1215	2	4	5	3	3	0	0	0	5	3	5	1	1	2	2	4	12	0	2	3	0	2	5	9	9	19	17	0	1	0	0	1	0	0	0	0	0	0	45
6635 Olonka I–IV	–/1378	2	4	5	4	4	0	0	1	4	4	5	1	1	2	2	4	12	0	2	3	0	3	3	6	5	19	17	0	0	1	0	1	0	1	0	0	0	0	0
6636 Olonka I–IV	–/1248	2	4	4	4	3	0	1	0	5	4	2	1	1	2	2	4	0	0	2	0	0	3	2	7	6	19	17	0	1	0	0	0	1	0	0	0	0	0	0
6637 Olonka I–IV	–/1365	2	3	4	4	3	0	2	0	2	3	8	2	4	2	2	4	12	17	2	3	4	2	5	8	10	19	17	0	0	0	0	1	1	0	0	0	1	0	0
6638 Olonka I–IV	–/1431	2	4	5	3	3	0	0	0	5	3	5	1	1	2	1	4	12	0	2	3	0	3	3	6	8	19	17	0	1	0	0	1	1	0	0	0	0	0	0
6639 Olonka I–IV	–/1380,1388	2	3	4	4	4	0	2	0	4	4	13	3	6	2	7	4	12	0	2	3	0	3	3	10	6	19	17	0	0	0	0	1	1	0	0	0	1	0	0
6640 Olonka I–IV	–/1385	6	5	5	4	3	0	5	0	4	3	8	2	4	2	2	4	12	0	2	3	0	3	3	9	6	19	17	0	0	0	0	1	1	0	0	0	1	0	0
7136 Habolovskaya	9	2	3	4	4	4	0	0	0	3	3	8	4	6	2	3	4	3	12	2	2	3	3	3	5	6	19	18	0	0	0	0	0	1	1	0	1	0	1	0
7137 Habolovskaya	6	6	4	3	4	3	0	5	0	4	3	8	3	4	0	0	29	0	0	7	0	0	3	2	8	5	19	18	0	1	0	0	0	0	0	0	0	0	0	0
7139 Habolovskaya	1	7	4	3	2	3	0	2	1	3	3	6	2	3	0	0	30	0	0	8	0	0	3	2	9	8	22	18	0	0	0	0	0	1	0	0	0	0	0	0
7140 Habolovskaya	8	2	4	4	3	3	0	0	0	2	3	5	2	4	8	2	12	4	0	3	2	0	3	1	5	4	19	18	0	0	1	0	1	0	0	0	0	0	0	0
6958 Issady I	58	6	5	5	4	3	0	2	5	4	3	5	3	5	2	1	4	12	0	2	3	0	1	4	8	9	19	18	0	0	1	0	1	1	0	0	0	0	0	25
6972 Issady I	289	2	5	4	3	4	0	2	0	4	3	5	1	1	2	1	4	0	0	2	0	12	3	3	7	7	19	18	0	1	0	0	0	1	1	0	0	0	0	0
6973 Issady I	435	2	5	5	4	4	0	2	0	5	3	6	1	1	2	1	4	0	0	2	0	0	3	3	8	8	19	18	0	1	0	0	0	1	1	0	0	0	0	0

Number Site	NM-number	M1	Q1	K1	SH	SK	PM	PN	PT	PS	PO	RM	RF	RP	RE	RA	KE1	KE2	KE3	KY1	KY2	KY3	Kt	V	X	Y	TY	VE	Km0	Kma	Kmb	Kmc	Kmd	Kme	Kmf	Kmg	Kmh	Kmi	Kmj	SIZE
6974 Issady I	495	6	5	4	4	4	0	0	0	3	3	5	2	4	2	1	4	0	0	2	0	0	3	3	9	7	19	18	0	0	0	0	0	0	1	0	0	0	0	0
6975 Issady I	397	6	4	5	4	4	0	0	0	3	3	6	1	1	2	2	4	0	0	2	0	0	3	3	7	8	19	18	0	0	0	0	0	1	0	0	0	1	0	0
6976 Issady I	262	6	5	5	4	4	0	1	0	3	3	5	2	4	2	1	4	0	0	2	0	0	3	3	8	8	19	18	0	0	0	0	0	1	0	0	0	1	0	0
6977 Issady I	336	2	5	5	4	4	0	0	4	4	3	6	1	1	2	1	4	0	0	2	0	0	3	4	6	6	19	18	0	1	1	0	0	0	0	0	0	0	0	0
6978 Issady I	180	2	5	5	4	4	0	1	0	3	3	5	1	1	2	4	4	30	0	2	9	0	3	4	6	10	19	18	0	0	1	0	0	1	1	0	0	0	0	0
6979 Issady I	144	2	3	3	4	4	0	0	0	4	4	2	1	4	2	1	4	2	0	2	1	0	3	3	10	5	19	18	0	1	0	0	1	1	0	0	0	0	0	0
6981 Issady I	195	6	5	5	4	4	0	1	0	3	3	5	1	1	2	1	4	0	0	2	0	0	3	4	8	7	19	18	0	0	0	0	0	0	1	0	0	0	0	0
6983 Issady I	219	2	5	6	4	4	0	1	0	3	3	7	1	1	2	4	4	0	0	2	0	0	3	4	5	9	19	18	0	1	0	0	0	1	0	0	0	0	0	0
6984 Issady I	144	2	5	6	4	4	0	0	0	5	5	4	5	1	2	1	4	0	0	2	0	0	3	3	6	9	19	18	0	1	0	0	0	1	0	0	0	0	0	0
6985 Issady I	385	2	4	5	4	4	0	0	0	5	3	6	1	1	2	1	4	0	0	2	0	0	3	3	9	6	19	18	0	0	0	0	0	1	0	0	0	1	0	0
6986 Issady I	217	2	3	5	4	4	0	1	0	5	4	6	1	1	2	2	4	12	0	2	3	0	3	2	8	6	19	18	0	0	0	0	0	1	0	0	0	1	0	0
6987 Issady I	285	8	4	5	4	4	0	0	0	3	3	8	2	4	2	1	4	0	0	2	0	0	3	4	6	5	19	18	0	1	0	0	0	1	0	0	0	0	0	0
6988 Issady I	113	2	5	5	4	4	0	0	0	3	4	6	1	1	2	1	4	0	0	2	0	0	3	3	8	6	19	18	0	0	0	0	0	0	0	0	0	1	0	0
6989 Issady I	385	2	5	5	4	4	0	0	0	3	3	9	1	1	2	2	4	0	0	2	0	0	4	3	10	8	19	18	0	0	0	0	0	0	0	0	0	1	0	0
6990 Issady I	1169	2	4	4	4	3	0	0	0	2	3	5	1	1	2	1	4	0	0	2	0	0	3	4	6	6	19	18	0	1	0	0	0	0	1	0	0	0	0	0
6991 Issady I	1121	2	3	4	4	3	0	0	0	2	3	8	1	1	0	0	4	0	0	2	0	0	3	2	7	6	19	18	0	0	0	0	0	0	0	0	0	1	0	0
6992 Issady I	1221	2	4	5	4	3	0	0	0	2	3	5	1	1	0	0	4	0	0	2	0	0	3	4	9	6	19	18	0	1	1	0	1	0	0	0	0	0	0	0
6993 Issady I	1046	2	4	5	4	3	0	0	0	3	3	6	1	1	2	1	4	23	0	2	4	0	3	3	6	6	19	18	0	1	0	0	0	1	1	0	0	0	0	0
6994 Issady I	1086	6	5	5	4	4	0	2	0	4	3	6	1	1	0	0	4	0	0	2	0	0	3	3	7	7	19	18	0	1	0	0	0	0	0	0	0	0	0	0
6995 Issady I	652	6	4	5	4	4	0	2	0	3	3	6	1	1	2	2	4	0	0	2	0	0	3	3	8	7	19	18	0	0	1	0	0	0	1	0	0	0	0	0
6996 Issady I	1248	2	4	4	4	4	0	0	0	2	3	8	5	6	2	1	4	3	0	2	2	12	3	4	12	11	19	18	0	1	0	0	0	1	0	0	0	0	0	0
6997 Issady I	887	2	3	4	4	3	0	1	0	4	3	5	2	4	5	1	29	0	0	7	0	0	3	3	8	6	19	18	0	1	0	0	0	0	0	0	0	0	0	0
6998 Issady I	945	2	4	4	4	4	0	1	0	4	3	5	1	1	2	1	4	12	0	2	3	0	3	3	6	5	19	18	0	0	1	0	1	1	0	0	0	0	0	0
6999 Issady I	385	0	0	0	3	3	0	0	5	4	3	3	4	6	2	1	4	12	0	2	3	0	1	5	8	5	19	18	0	0	1	0	1	1	0	0	0	0	0	0
7000 Issady I	335	2	5	4	4	4	0	0	0	3	3	6	1	1	2	1	4	17	0	2	4	0	2	4	6	7	19	18	0	0	0	0	1	1	1	0	0	0	0	0
7001 Issady I	1128	2	3	4	3	4	0	0	0	2	3	5	4	5	2	1	4	12	0	2	3	0	3	4	5	5	19	18	0	1	0	0	1	1	0	0	0	0	0	0
7002 Issady I	72	2	5	5	4	4	0	2	0	4	3	6	1	1	5	1	12	18	0	3	4	0	3	3	8	6	19	18	0	1	0	0	1	0	0	0	0	0	0	0
7003 Issady I	191	2	5	5	4	4	0	1	0	2	3	8	2	4	2	1	17	0	0	4	0	0	3	1	5	8	19	18	0	0	0	0	0	0	0	1	0	0	0	0
7004 Issady I	51	2	5	5	4	4	0	1	1	4	3	3	3	6	4	4	12	4	0	3	2	0	3	2	6	6	19	18	0	0	0	0	1	1	0	0	0	0	0	0
7005 Issady I	401	2	3	4	4	3	0	1	0	4	3	5	2	4	2	1	4	12	0	2	3	0	3	4	7	5	19	18	0	1	0	0	1	1	0	0	0	0	0	0
7006 Issady I	73	2	4	4	4	4	0	0	0	2	3	6	1	1	2	1	4	12	0	2	3	0	3	5	8	7	19	18	0	1	0	0	1	0	0	0	0	0	0	0
7007 Issady I	77	0	0	0	4	3	0	2	0	4	3	8	2	4	0	0	3	12	0	2	3	0	3	3	5	5	19	18	0	1	0	0	1	0	0	0	0	0	0	0
7009 Issady I	396	2	4	4	4	3	0	0	0	3	3	8	4	5	0	0	4	12	0	2	3	0	2	4	5	6	19	18	0	1	0	0	1	0	0	0	0	0	0	0
7010 Issady I	48	2	4	5	3	3	0	0	0	3	3	5	1	1	2	2	4	12	0	2	3	0	3	3	6	6	19	18	0	0	0	0	1	1	0	0	0	0	0	0
7011 Issady I	345	2	4	5	4	4	0	2	1	4	3	6	2	4	2	2	4	12	0	2	3	0	3	3	8	6	19	18	0	0	0	0	1	0	0	0	0	1	0	0
7012 Issady I	123	2	5	5	4	4	0	0	0	2	3	5	1	1	2	2	4	2	0	2	1	0	4	3	9	8	19	18	0	1	0	0	1	0	0	0	0	0	0	0
7013 Issady I	190	2	5	5	4	4	0	1	1	4	4	8	3	6	2	1	4	12	0	2	3	0	3	4	9	8	19	18	0	0	1	0	1	0	1	0	0	0	0	0
7014 Issady I	24	5	3	4	4	4	0	1	0	3	3	9	2	4	2	5	4	12	0	2	3	0	3	4	5	7	19	18	0	0	1	0	1	0	0	0	0	0	0	0
7015 Issady I	436	2	3	4	4	4	0	1	0	3	3	9	2	4	5	1	3	12	0	2	3	0	0	2	11	8	19	18	0	1	0	0	1	0	0	0	0	0	0	0
7016 Issady I	262	2	4	5	4	4	0	0	0	3	3	5	2	4	2	1	4	12	0	2	3	0	3	4	7	8	19	18	0	0	0	0	1	1	0	0	0	1	0	0
7017 Issady I	–	2	3	3	4	3	0	0	0	3	3	5	2	4	2	1	4	12	0	2	3	0	3	4	6	7	19	18	0	1	0	0	1	1	0	0	0	0	0	0
7018 Issady I	1243	2	5	6	4	4	0	0	0	3	3	5	2	4	2	2	4	12	0	2	3	0	3	3	9	6	19	18	0	1	0	0	1	1	0	0	0	0	0	0
7019 Issady I	401	2	4	4	3	3	0	0	0	5	3	6	2	4	2	1	4	12	0	2	3	0	3	3	7	7	19	18	0	0	1	0	1	1	0	0	0	0	0	0
7020 Issady I	1070	8	5	4	4	4	0	1	0	4	3	8	3	4	0	0	15	12	0	3	3	0	3	2	7	8	19	18	0	0	0	0	1	0	0	0	0	0	0	0
7021 Issady I	1141	2	4	4	3	3	0	1	0	3	4	5	2	3	6	1	22	0	0	4	0	0	3	1	8	7	19	18	0	0	0	0	1	0	0	0	0	0	0	0
7023 Issady I	1095	8	3	4	3	3	0	0	0	3	3	5	1	1	0	0	4	12	0	2	3	0	3	4	5	6	19	18	0	0	1	0	1	0	0	0	0	0	0	0
7024 Issady I	1197	2	5	4	4	3	0	0	1	4	3	2	1	1	2	1	12	4	0	3	2	0	3	2	8	7	19	18	0	1	0	0	1	0	0	0	0	1	0	0
7025 Issady I	1243	2	5	5	4	4	0	0	0	2	3	5	2	4	2	2	4	12	0	2	3	0	3	3	8	5	19	18	0	0	1	0	1	0	0	0	0	1	0	0
7026 Issady I	1133	2	3	3	4	3	0	1	0	2	3	5	1	1	2	1	4	12	0	2	3	0	3	3	4	4	19	18	0	1	0	0	1	1	0	0	0	0	0	0

Number Site	NM-number	M1	Q1	K1	SH	SK	PM	PN	PT	PS	PO	RM	RF	RP	RE	RA	KE1	KE2	KE3	KY1	KY2	KY3	Kt	V	X	Y	TY	VE	Km0	Kma	Kmb	Kmc	Kmd	Kme	Kmf	Kmg	Kmh	Kmi	Kmj	SIZE
7027 Issady I	1126	2	3	4	3	3	0	2	4	4	3	5	2	6	2	1	4	12	0	2	3	0	3	4	8	7	19	18	0	0	0	0	1	0	0	0	0	1	0	0
7028 Issady I	933	2	4	5	4	4	0	0	0	3	3	8	4	6	6	2	22	0	0	4	0	0	3	3	5	7	19	18	0	0	0	0	1	0	0	0	0	0	0	0
7029 Issady I	369	2	4	4	4	4	0	2	0	3	4	8	3	6	2	1	4	12	0	2	3	0	3	5	8	7	19	18	0	0	0	0	1	1	1	0	0	0	0	0
7030 Issady I	562	2	4	5	4	4	0	0	0	2	3	5	2	4	0	0	4	12	0	2	3	0	3	5	8	10	19	18	0	0	1	0	1	0	0	0	0	0	0	0
7031 Issady I	929	2	4	5	4	4	0	2	0	4	3	6	1	1	2	1	4	0	0	2	0	0	3	2	6	7	19	18	0	0	0	0	0	0	1	0	0	0	0	0
7032 Issady I	1009	2	4	3	4	3	0	4	0	2	3	6	2	6	2	2	4	12	0	2	3	0	3	4	4	6	19	18	0	0	1	0	1	0	1	0	0	1	0	0
7033 Issady I	931	2	3	5	4	3	0	1	0	2	3	6	1	1	0	0	22	4	0	4	3	0	3	2	6	7	19	18	0	0	0	0	1	0	0	0	0	0	0	0
7035 Issady I	689	2	4	4	4	4	0	0	5	4	4	5	1	1	0	0	18	0	0	4	0	0	3	2	5	8	19	18	0	0	0	0	0	0	1	0	0	0	0	0
7037 Issady I	159	2	3	3	3	4	0	0	5	4	3	9	2	4	0	0	12	0	0	3	0	0	0	1	9	7	19	18	0	0	0	0	1	0	0	0	0	0	0	0
7038 Issady I	385	2	5	5	4	4	0	0	2	4	3	5	2	4	0	0	12	0	0	3	0	0	3	1	9	8	19	18	0	0	0	0	1	0	0	0	0	0	0	0
7042 Issady I	1248	6	5	5	4	4	0	0	0	2	3	5	1	1	6	1	12	0	0	3	0	0	3	3	9	4	19	18	0	0	0	0	1	0	0	0	0	0	1	0
7043 Issady I	–	2	4	4	4	3	0	0	0	2	3	5	1	1	0	0	4	12	0	2	3	0	3	2	10	8	19	18	0	1	0	0	1	0	0	0	0	0	0	0
7044 Issady I	26	2	4	4	4	4	0	0	0	2	3	5	2	4	0	0	4	12	0	2	3	0	3	4	5	7	19	18	0	1	0	0	1	0	0	0	0	0	0	0
7045 Issady I	24	2	3	4	3	3	0	2	0	3	3	5	2	4	2	2	4	12	0	2	3	12	3	4	7	7	19	18	0	0	0	0	1	1	0	0	0	1	0	0
7046 Issady I	400	2	3	3	3	3	0	1	0	3	3	5	1	1	2	1	4	12	0	2	3	0	3	4	8	5	19	18	0	0	1	0	1	1	1	0	0	0	0	0
7047 Issady I	223	2	4	4	4	3	0	0	0	4	3	9	1	1	2	7	4	12	0	2	3	0	3	4	8	7	19	18	0	0	1	0	1	0	0	0	0	1	0	0
7048 Issady I	31	2	3	4	4	3	0	0	0	4	3	8	1	1	2	1	4	12	0	2	3	0	3	5	5	4	19	18	0	0	1	0	1	0	0	0	0	0	0	0
7049 Issady I	185	2	4	4	3	3	0	1	0	3	3	8	2	4	2	1	4	22	0	2	4	0	3	3	7	6	19	18	0	1	0	0	1	0	0	0	0	0	0	0
7050 Issady I	560	6	5	5	4	4	0	0	0	3	3	5	1	1	2	1	4	12	0	2	3	0	3	4	5	5	19	18	0	1	0	0	1	1	0	0	0	0	0	0
7051 Issady I	517	2	4	5	4	4	0	0	1	3	3	5	1	1	2	1	4	12	0	2	3	0	3	4	10	10	19	18	0	0	0	0	0	1	1	0	0	0	1	0
7052 Issady I	569	2	5	3	4	4	0	0	0	3	4	5	2	4	6	1	4	12	0	2	3	0	2	4	7	9	19	18	0	0	0	0	0	1	0	1	0	0	0	0
7053 Issady I	329	6	5	5	4	4	0	2	0	4	4	5	1	1	0	0	4	15	12	2	3	3	3	4	7	7	19	18	0	1	0	0	1	0	0	0	0	1	0	0
7054 Issady I	853	2	5	3	4	4	0	1	0	3	4	8	2	4	2	4	4	12	0	2	3	0	3	4	6	6	19	18	0	0	0	0	1	0	1	0	0	0	0	0
7055 Issady I	556	2	3	3	4	3	0	0	2	4	3	5	2	5	0	0	12	0	0	3	0	0	3	2	5	5	19	18	0	0	0	0	1	0	0	0	0	0	0	0
7056 Issady I	618	2	5	5	4	4	0	4	0	3	3	5	2	4	2	1	4	2	0	2	1	0	3	2	8	7	19	18	0	1	0	0	1	1	0	1	0	1	0	0
7057 Issady I	523	6	5	5	4	3	0	2	5	4	3	5	4	5	2	2	12	4	0	3	2	0	3	4	8	8	19	18	0	0	1	0	1	1	0	0	0	0	0	0
7085 Issady I (1950)	–	2	3	4	3	3	0	2	0	4	3	8	2	4	2	8	4	12	15	2	3	3	2	5	8	10	19	18	0	0	0	0	1	0	0	0	0	1	0	0
7086 Issady I	79	7	4	4	2	3	0	0	0	3	3	8	3	4	0	0	35	3	0	11	2	0	2	2	12	8	22	18	0	0	0	0	0	1	1	1	0	0	0	0
7087 Issady I	182	2	4	4	3	3	0	0	0	2	3	8	5	6	0	0	12	4	0	3	2	0	3	3	6	6	19	18	0	1	0	0	1	0	0	0	0	0	0	0
7088 Issady I	51	2	5	5	4	3	0	0	1	4	3	5	3	5	2	1	4	12	0	2	3	0	3	4	9	9	19	18	0	0	1	0	1	1	0	0	0	1	0	0
7089 Issady I	250	2	4	4	3	3	0	0	1	4	3	8	2	4	8	2	12	17	0	3	4	0	3	2	5	6	19	18	0	0	0	0	0	1	0	0	0	0	0	0
7090 Issady I	138	2	3	4	3	3	0	1	0	4	3	9	3	4	2	1	17	4	0	4	2	0	3	3	13	7	19	18	0	0	0	0	1	1	0	1	0	0	0	0
7091 Issady I	742	2	4	4	3	4	0	1	0	4	3	5	1	1	2	2	4	0	0	2	0	0	3	3	8	9	19	18	0	1	0	0	0	1	0	0	0	0	0	0
7092 Issady I	305	2	4	4	3	4	0	0	0	4	3	8	3	4	2	1	4	12	0	2	3	0	3	4	6	7	19	18	0	0	0	0	1	1	0	0	0	1	0	0
7093 Issady I	673	2	5	5	4	4	0	0	0	3	3	7	2	4	0	0	4	12	0	2	3	0	3	3	5	7	19	18	0	0	1	0	0	0	0	0	0	0	0	0
7094 Issady I	125	2	4	5	4	4	0	1	0	3	3	5	2	4	2	1	4	12	0	2	3	0	3	5	5	5	19	18	0	0	1	0	1	0	1	0	0	0	0	0
7095 Issady I	752	2	4	5	4	4	0	0	0	4	3	5	1	1	2	1	4	1	0	2	1	0	3	3	10	8	19	18	0	0	0	0	0	1	1	0	0	0	0	0
7096 Issady I	797	2	5	5	4	3	0	1	0	3	3	5	1	1	2	2	4	0	0	2	0	0	3	4	10	8	19	18	0	0	0	0	0	0	0	0	0	1	0	0
7099 Issady I	124	2	3	4	4	4	0	0	0	3	3	5	1	1	2	2	4	0	0	2	0	0	3	3	5	5	19	18	0	0	1	0	0	1	1	0	0	0	0	0
7100 Issady I	861	2	4	4	4	4	0	0	0	3	3	6	1	1	2	1	4	12	0	2	3	0	3	3	5	5	19	18	0	0	0	0	1	1	0	0	0	0	0	0
7102 Issady I	79	2	4	4	3	3	0	1	1	4	3	2	1	1	2	1	4	0	0	2	0	0	3	3	9	5	19	18	0	0	0	0	0	0	0	0	0	1	0	0
7103 Issady I	423	2	3	4	3	3	0	0	0	2	3	5	1	1	8	2	29	0	0	6	0	0	3	2	8	8	19	18	0	0	0	0	0	0	0	0	0	1	0	0
7104 Issady I	456	2	3	3	3	3	0	0	0	3	3	8	2	4	0	0	4	0	0	2	0	0	3	2	5	5	19	18	0	1	0	0	0	0	0	0	0	0	0	0
7105 Issady I	263	2	4	4	4	3	0	0	0	3	3	6	1	1	2	1	4	12	0	2	3	0	3	4	6	6	19	18	0	1	0	0	1	1	0	0	0	0	0	0
7106 Issady I	307	2	5	5	4	3	0	0	0	3	3	5	1	1	2	8	4	0	0	2	0	0	3	4	7	7	19	18	0	1	0	0	0	0	0	0	0	0	0	0
7107 Issady I	678	2	4	5	4	3	0	0	0	3	3	6	1	1	0	0	4	0	0	2	0	0	3	3	7	7	19	18	0	1	0	0	0	1	0	0	0	0	0	0
7108 Issady I	77	2	4	4	4	4	0	0	0	3	3	8	3	4	0	0	4	0	0	2	0	0	3	5	3	5	19	18	0	1	0	0	0	1	0	0	0	1	0	0
7109 Issady I	180	2	5	4	3	3	0	0	0	2	3	5	1	1	2	2	4	12	0	2	3	0	3	3	8	9	19	18	0	0	0	1	0	0	0	0	0	0	0	0
7110 Issady I	330	2	5	4	4	3	0	0	0	2	3	6	1	1	2	8	4	0	0	2	0	0	4	3	7	7	19	18	0	0	1	0	0	0	1	0	0	0	0	0

Number Site	NM-number	M1	Q1	K1	SH	SK	PM	PN	PT	PS	PO	RM	RF	RP	RE	RA	KE1	KE2	KE3	KY1	KY2	KY3	Kt	V	X	Y	TY	VE	Km0	Kma	Kmb	Kmc	Kmd	Kme	Kmf	Kmg	Kmh	Kmi	Kmj	SIZE
7111 Issady I	209	2	4	5	4	4	0	1	0	4	3	5	1	1	2	2	4	0	0	2	0	0	3	4	6	6	19	18	0	0	0	0	0	0	0	0	1	0	0
6980 Issasy I	1133	2	5	4	4	4	0	0	0	3	3	6	1	1	2	1	17	2	0	4	1	0	4	3	7	7	19	18	0	0	0	0	1	0	0	0	0	0	0	0
7148 Merevo II	21	2	5	5	4	4	0	0	0	3	3	5	1	1	2	3	22	0	0	4	0	0	3	4	6	6	19	18	0	0	0	0	1	0	0	0	0	0	1	0
6970 Syabernaya III (1988)	824	7	5	4	2	3	0	0	2	3	3	5	3	4	0	0	4	17	12	2	4	12	2	4	12	8	19	18	0	0	0	0	1	1	0	1	0	0	0	0
7059 Syabernaya III (1988)	2555	7	3	3	2	3	0	0	6	4	4	5	2	3	0	0	0	0	0	0	0	0	4	0	5	5	19	18	0	0	0	0	0	0	0	0	0	0	0	0
7060 Syabernaya III	1359	7	4	4	2	3	0	0	0	5	3	9	3	4	2	5	4	0	0	2	0	0	3	2	15	5	19	18	0	0	0	0	0	1	0	0	0	0	0	0
7062 Syabernaya III	2284	7	4	4	2	2	0	1	0	3	3	5	1	1	0	0	4	3	0	2	2	0	3	4	6	6	19	18	0	0	0	0	0	1	0	1	0	0	0	0
7065 Syabernaya III	2436	7	3	2	3	3	0	0	5	4	4	5	2	4	0	0	0	0	0	0	0	0	3	0	10	7	19	18	0	0	0	0	0	0	0	0	0	0	0	0
7066 Syabernaya III	2296	2	5	5	4	4	0	4	0	4	4	5	2	4	0	0	3	0	0	2	0	0	3	1	8	9	19	18	0	0	0	0	0	1	0	0	1	0	0	0
7067 Syabernaya III	2283	7	4	3	2	4	0	0	0	3	4	7	4	4	0	0	4	0	0	2	0	0	3	4	8	10	19	18	0	0	0	0	0	1	0	0	0	0	0	0
7073 Syabernaya III	607	7	5	4	2	2	0	0	0	3	4	7	4	4	2	2	4	0	0	2	0	0	3	3	9	8	19	18	0	0	0	0	0	1	1	0	0	0	0	0
7076 Syabernaya III	2280,2279,2278	7	4	4	2	3	0	0	0	3	3	7	4	4	2	2	4	0	0	2	0	0	2	4	8	6	19	18	0	0	0	0	0	1	0	0	0	0	0	0
7077 Syabernaya III	2281,2282	7	4	4	2	3	0	0	0	3	3	7	4	4	2	2	4	0	0	2	0	0	3	4	8	6	19	18	0	0	1	0	0	1	1	0	0	0	0	0
7078 Syabernaya III	1315	7	5	4	2	2	0	0	0	3	4	7	4	4	2	2	4	0	0	2	0	0	3	3	9	7	19	18	0	0	0	0	0	1	0	0	0	1	0	0
7153 Syabernaya III	1320	7	4	4	2	3	0	0	0	2	3	5	2	4	0	0	0	0	0	0	0	0	3	0	9	11	17	18	0	0	0	0	0	0	0	0	0	0	0	0
7112 Podsope (1950)	24	2	4	5	4	4	0	0	5	4	3	8	2	4	2	2	12	0	0	3	0	0	3	1	9	6	19	18	0	0	0	0	1	0	0	0	0	0	0	0
7113 Podsope	25	2	4	5	4	3	0	0	3	3	3	5	2	4	2	1	12	0	0	3	0	0	3	1	12	5	19	18	0	0	0	0	1	0	0	0	0	0	0	0
7114 Podsope	116	2	3	3	4	3	0	0	1	4	4	5	2	4	2	2	4	12	0	2	3	0	3	3	9	7	19	18	0	0	0	0	1	1	0	0	0	0	0	0
7115 Podsope	599	2	3	1	4	3	0	0	5	4	4	5	3	4	0	0	4	12	0	2	3	0	3	3	7	7	19	18	0	1	0	1	1	0	0	0	0	0	0	0
7116 Podsope	600	2	3	3	4	3	0	0	1	4	4	5	1	1	4	4	12	0	0	3	0	0	3	2	6	5	19	18	0	0	0	0	1	0	0	0	0	0	0	0
7117 Podsope	577	2	4	4	4	4	0	0	2	4	3	2	3	4	2	2	12	0	0	3	0	0	3	2	9	5	19	18	0	0	0	0	1	0	0	0	0	0	0	0
7118 Podsope	283	7	3	4	2	3	0	0	4	4	3	5	1	1	4	4	4	12	0	2	3	0	3	5	8	7	19	18	0	1	0	0	1	0	0	0	0	0	0	0
7121 Podsope	140	2	3	4	2	3	0	0	0	3	3	5	1	1	8	3	17	0	0	4	0	0	3	2	10	6	19	18	0	0	0	0	1	0	0	1	0	0	0	0
7122 Podsope	547,549	2	3	4	4	3	0	1	5	4	3	11	3	4	2	2	12	0	0	3	0	0	3	1	10	5	19	18	0	0	0	0	1	0	0	0	0	0	0	0
7123 Podsope	150	2	4	3	4	4	0	0	1	4	3	8	3	6	0	0	12	0	0	3	0	0	4	1	5	6	19	18	0	0	0	0	1	0	0	0	0	0	0	0
7124 Podsope	927	2	4	4	4	4	0	0	1	4	4	5	3	4	0	0	12	0	0	3	0	0	3	2	5	5	19	18	0	0	0	0	1	0	0	0	0	0	0	0
7125 Podsope	1005	2	5	4	4	4	0	0	0	2	3	5	3	4	4	4	3	12	0	2	3	0	3	2	7	7	19	18	0	1	0	0	1	0	0	0	0	0	0	0
7126 Podsope	1085	7	3	3	2	2	0	1	1	4	3	9	2	4	2	2	12	4	0	3	2	0	3	1	10	5	19	18	0	0	0	0	1	1	0	0	0	0	0	0
7127 Podsope	–	2	4	5	3	4	0	0	0	3	3	5	1	1	2	1	2	0	0	1	0	0	3	1	8	6	19	18	0	0	0	0	1	0	0	0	0	0	0	0
5733 Ust'Uda	146/26	2	6	5	2	3	0	4	1	4	3	2	2	3	0	0	3	12	0	2	3	0	3	3	12	8	34	18	0	1	0	0	1	0	0	0	0	0	0	0
5734 Ust'Uda	146/28	7	3	3	2	3	0	2	0	2	3	5	2	3	1	2	1	17	0	1	4	0	4	1	7	5	34	18	0	1	0	0	0	0	0	0	0	0	0	0
5735 Ust'Uda	146/8	7	2	2	3	2	0	4	0	4	4	9	2	3	0	0	15	17	0	3	4	0	3	1	8	5	34	18	0	0	0	0	1	0	0	0	0	0	0	0
5737 Ust'Uda	146/4	2	5	3	3	3	0	0	0	2	4	2	1	1	0	0	6	0	0	2	0	0	3	3	10	7	16	18	0	1	0	0	0	0	0	0	0	0	0	0
6902 Ust-Rybezhna II	799	2	3	4	3	3	0	0	0	3	4	8	4	6	2	2	4	3	0	2	2	0	2	4	8	6	19	18	0	0	0	0	1	1	0	0	0	0	0	0
6903 Ust-Rybezhna II	–	2	3	4	4	3	0	0	0	3	3	8	2	4	0	0	4	12	0	2	3	0	3	3	6	5	19	18	0	0	0	0	1	1	0	0	0	1	0	0
6904 Ust-Rybezhna II	595	2	2	4	3	3	0	1	0	3	3	8	2	4	2	2	4	3	12	2	2	3	3	4	7	6	19	18	0	0	1	0	1	1	1	0	0	0	0	0
6905 Ust-Rybezhna II	564	7	4	4	2	3	0	4	0	2	3	5	2	4	0	0	4	12	0	2	3	12	3	2	7	7	19	18	0	1	0	0	1	1	0	0	0	0	0	0
6906 Ust-Rybezhna II	206	2	3	4	3	3	0	0	0	3	3	8	3	6	2	2	4	17	12	2	4	3	2	5	8	7	19	18	0	0	0	0	1	1	1	1	0	0	0	0
6907 Ust-Rybezhna II	1024	7	4	4	2	3	0	0	0	3	4	8	3	4	6	2	29	2	0	7	1	0	3	3	9	6	19	18	0	0	0	0	1	1	0	0	0	0	0	0
6908 Ust-Rybezhna II	1099	2	2	4	4	4	0	0	0	5	3	5	1	1	2	2	4	17	12	2	4	3	2	4	9	8	19	18	0	0	1	0	1	0	1	0	0	0	0	0
6909 Ust-Rybezhna II	5	7	4	3	2	3	0	0	0	2	3	8	2	4	2	1	4	15	0	2	3	12	3	2	8	10	19	18	0	1	0	0	1	0	0	0	0	0	0	0
6910 Ust-Rybezhna II	334	2	4	5	3	4	0	0	0	3	3	8	3	4	2	2	4	12	3	2	3	2	3	5	10	7	19	18	0	1	0	0	1	1	0	0	0	0	0	0
6911 Ust-Rybezhna II	358	2	3	4	3	3	0	0	4	4	3	8	2	4	2	2	3	4	0	2	2	0	3	2	9	8	19	18	0	1	0	0	0	1	0	0	0	0	0	0
6912 Ust-Rybezhna II	533	2	3	4	4	3	0	0	6	4	4	8	4	4	2	2	15	12	0	3	3	0	2	3	7	7	19	18	0	0	0	0	1	0	0	0	0	0	0	0
6915 Ust-Rybezhna II	871	7	4	4	3	3	0	0	2	4	3	9	2	4	2	1	4	3	0	2	2	0	3	4	11	6	19	18	0	1	0	0	0	1	0	1	0	0	0	0
6917 Ust-Rybezhna II	659	2	4	4	3	3	0	0	2	4	4	5	2	4	6	2	12	0	0	3	0	0	3	1	12	9	19	18	0	0	0	0	1	0	0	0	0	0	0	0
6918 Ust-Rybezhna II	736	7	4	5	2	3	0	0	0	3	4	8	3	4	0	0	17	0	0	4	0	0	3	2	7	6	19	18	0	0	0	0	1	0	0	0	0	0	0	0
6919 Ust-Rybezhna II	761	7	3	3	2	3	0	0	5	4	3	5	2	4	6	2	4	2	15	2	1	3	3	3	10	5	19	18	0	1	0	0	1	0	0	0	0	0	0	0
6920 Ust-Rybezhna II	923	2	3	3	3	3	0	2	3	4	3	5	2	4	0	0	15	0	0	3	0	12	3	1	8	9	19	18	0	0	0	0	1	0	0	0	0	0	0	0

Number Site	NM-number	M1	Q1	K1	SH	SK	PM	PN	PT	PS	PO	RM	RF	RP	RE	RA	KE1	KE2	KE3	KY1	KY2	KY3	Kt	V	X	Y	TY	VE	Km0	Kma	Kmb	Kmc	Kmd	Kme	Kmf	Kmg	Kmh	Kmi	Kmj	SIZE
6921 Ust-Rybezhna II	5	2	5	4	4	4	0	0	4	4	3	5	2	4	0	0	12	0	0	3	0	0	3	1	6	5	19	18	0	0	0	0	1	0	0	0	0	0	0	0
6924 Ust-Rybezhna II	316	2	3	4	3	4	0	0	3	4	4	8	3	4	0	0	12	0	0	3	0	0	3	2	8	5	19	18	0	0	0	0	1	0	0	0	0	0	0	0
6925 Ust-Rybezhna II	42	2	4	5	3	3	0	4	5	4	4	8	3	6	4	4	12	0	0	3	0	0	3	2	8	7	19	18	0	0	0	0	1	0	0	0	0	0	0	0
6926 Ust-Rybezhna II	4839	2	4	5	3	4	0	4	6	4	4	8	2	4	4	4	12	0	0	3	0	0	2	1	8	9	19	18	0	0	0	0	1	0	0	0	0	0	0	0
6927 Ust-Rybezhna II	424	2	5	5	4	4	0	1	1	4	4	5	2	3	0	0	12	0	0	3	0	0	3	1	8	6	19	18	0	0	0	0	1	0	0	0	0	0	0	0
6928 Ust-Rybezhna II	166	2	2	4	3	3	0	2	2	4	4	5	4	6	0	0	12	0	0	3	0	0	3	1	9	7	19	18	0	0	0	0	1	0	0	0	0	0	0	0
6929 Ust-Rybezhna II	428	2	5	5	3	3	0	4	5	4	3	8	2	4	0	0	12	0	0	3	0	0	3	1	7	7	19	18	0	0	0	0	1	0	0	0	0	0	0	0
6930 Ust-Rybezhna II	300	2	5	5	4	4	0	0	4	4	3	5	2	4	0	0	12	0	0	3	0	0	3	1	8	6	19	18	0	0	0	0	1	0	0	0	0	0	0	0
6931 Ust-Rybezhna II	475	2	5	5	4	4	0	1	4	4	3	5	3	6	0	0	12	0	0	3	0	0	3	1	8	9	19	18	0	0	0	0	1	0	0	0	0	0	0	0
6932 Ust-Rybezhna II	664	2	4	4	3	4	0	0	4	4	3	5	2	3	0	0	0	0	0	0	0	0	3	0	9	7	19	18	0	0	0	0	0	0	0	0	0	0	0	0
6933 Ust-Rybezhna II	284	2	4	4	3	4	0	0	4	4	3	8	2	4	5	3	0	0	0	0	0	0	3	0	8	6	19	18	0	0	0	0	0	0	0	0	0	0	0	0
6934 Ust-Rybezhna II	806	7	3	3	3	3	0	0	3	4	4	8	3	4	0	0	0	0	0	0	0	0	3	0	7	6	19	18	0	0	0	0	0	0	0	0	0	0	0	0
6935 Ust-Rybezhna II	838	2	5	4	3	3	0	0	0	3	3	5	1	1	0	0	12	0	0	3	0	0	3	1	7	5	19	18	0	0	0	0	1	0	0	0	0	0	0	0
6936 Ust-Rybezhna II	–	7	3	3	2	3	0	0	0	2	3	8	3	6	0	0	2	29	0	1	7	0	3	3	5	6	19	18	0	0	0	0	1	1	0	0	0	0	0	0
6937 Ust-Rybezhna II	487	2	4	5	4	4	0	0	0	2	3	5	1	1	0	0	12	0	0	3	0	0	3	1	7	7	19	18	0	0	0	0	1	0	0	0	0	0	0	0
6938 Ust-Rybezhna II	–	2	4	5	4	4	0	0	0	5	3	5	1	1	2	2	12	0	0	3	0	0	3	1	7	7	19	18	0	0	0	0	1	0	0	0	0	0	0	0
6940 Ust-Rybezhna II	342	2	3	2	3	2	0	0	2	4	3	8	2	4	0	0	29	0	0	7	0	0	3	2	9	7	19	18	0	0	0	0	0	1	0	0	0	0	0	0
6941 Ust-Rybezhna II	59	2	5	5	3	4	0	1	0	4	3	5	2	4	2	2	4	12	0	2	3	0	3	2	7	7	19	18	0	0	1	0	1	1	1	0	0	0	1	0
6942 Ust-Rybezhna II	195	7	3	3	3	2	0	0	6	4	3	8	2	4	0	0	29	0	0	7	0	0	3	1	8	8	19	18	0	0	0	0	0	1	0	0	0	0	0	0
6943 Ust-Rybezhna II	423	2	4	5	4	4	0	1	0	3	3	8	3	4	0	0	4	3	12	2	2	3	2	5	7	7	19	18	0	0	0	0	1	1	1	0	0	0	0	0
6944 Ust-Rybezhna II	8	7	4	3	2	3	0	0	5	4	3	8	3	4	0	0	29	0	0	2	0	0	2	2	7	7	19	18	0	0	0	0	0	1	0	0	0	0	0	0
6945 Ust-Rybezhna II	840	2	5	5	4	4	0	0	1	4	3	5	1	1	2	2	4	0	0	2	0	0	3	2	7	6	19	18	0	1	0	0	0	1	0	0	0	0	0	0
6946 Ust-Rybezhna II	1215	2	3	4	4	4	0	0	0	5	3	8	2	4	6	2	4	12	17	2	3	4	2	4	6	5	19	18	0	0	0	0	0	1	1	1	0	0	0	0
6947 Ust-Rybezhna II	–	2	5	5	4	4	0	1	0	3	3	8	2	4	2	2	4	12	2	2	3	1	2	4	8	9	19	18	0	0	0	0	0	1	0	1	0	0	0	0
6948 Ust-Rybezhna II	52	2	4	5	3	3	0	0	5	4	4	8	3	6	2	1	4	12	0	2	3	0	2	4	7	6	19	18	0	0	0	0	0	1	1	1	0	0	0	0
6949 Ust-Rybezhna II	668	7	3	3	3	3	0	0	0	5	3	6	2	4	2	2	4	12	0	2	3	0	3	4	12	8	19	18	0	0	0	0	0	1	1	1	0	0	0	0
6950 Ust-Rybezhna II	773	2	4	3	4	3	0	4	0	5	3	8	3	4	6	4	4	12	0	2	3	0	2	2	5	5	19	18	0	0	0	0	0	1	1	0	0	0	0	0
6951 Ust-Rybezhna II	737	2	4	5	4	4	0	2	0	3	3	5	3	5	0	0	4	12	0	2	3	0	3	3	7	7	19	18	0	0	0	0	0	1	0	0	0	0	1	0	0
6952 Ust-Rybezhna II	369	7	3	3	2	3	0	1	5	4	4	5	2	4	2	2	4	0	0	2	0	12	3	0	7	7	19	18	0	0	0	0	0	0	0	0	0	0	0	0
6954 Ust-Rybezhna II	55	2	4	4	3	3	0	0	0	5	3	5	1	1	4	4	4	12	0	2	3	0	3	4	6	5	19	18	0	0	1	0	1	1	1	0	0	0	0	0
6955 Ust-Rybezhna II	378	2	4	5	4	4	0	0	5	4	4	8	3	4	2	2	4	12	0	2	3	0	3	2	5	6	19	18	0	1	0	0	1	0	0	0	0	0	0	0
6956 Ust-Rybezhna II	762	2	5	6	4	4	0	0	1	3	3	5	2	3	2	2	4	12	0	2	3	0	3	2	8	5	19	18	0	0	1	0	1	1	0	0	0	1	0	0
6957 Ust-Rybezhna II	699,845	2	5	5	4	4	0	0	5	3	3	5	1	1	0	0	4	12	0	2	3	0	2	3	6	5	19	18	0	0	0	0	0	1	1	0	1	0	0	1	0
6958 Ust-Rybezhna II	422	2	5	5	3	3	0	0	1	4	3	9	2	4	0	0	4	2	0	2	1	0	3	4	10	7	19	18	0	0	0	0	0	1	1	0	0	0	0	0
6959 Ust-Rybezhna II	348	7	4	3	2	2	0	0	1	4	3	5	3	4	6	1	4	0	0	2	0	0	3	4	9	8	19	18	0	0	1	0	0	1	0	0	0	0	0	0
6960 Ust-Rybezhna II	52	2	5	5	4	4	0	0	0	3	3	5	2	4	2	5	4	0	0	2	0	0	3	3	8	8	19	18	0	0	0	0	0	1	1	0	0	0	0	0
6962 Ust-Rybezhna II	1047	7	4	4	2	2	0	0	0	3	3	5	2	4	0	0	4	0	0	2	0	0	3	4	8	10	19	18	0	0	0	0	0	0	0	0	0	0	1	0	0
6963 Ust-Rybezhna II	1014	7	3	3	3	3	0	0	0	3	4	6	1	1	2	1	4	0	0	2	0	0	4	4	9	5	19	18	0	0	1	0	0	1	0	0	0	0	0	0
6964 Ust-Rybezhna II	441	2	3	5	4	4	0	0	0	5	3	5	3	4	2	2	4	17	2	2	4	1	3	4	5	5	19	18	0	0	1	0	1	1	1	0	0	0	0	0
6967 Ust-Rybezhna II	–	2	3	4	3	3	0	1	2	4	3	9	3	4	0	0	12	0	0	3	0	12	3	2	12	5	19	18	0	0	0	0	0	1	0	0	0	0	0	0	0
6971 Syabernaya III	2556	7	3	3	2	3	0	1	0	5	3	5	1	1	0	0	4	0	0	2	0	0	3	3	6	9	19	18	0	0	0	0	0	0	1	0	0	0	0	0	0
6722 Akali	4013:3236	2	5	5	4	4	0	0	1	4	3	5	1	1	2	1	3	0	0	2	0	0	4	0	10	8	19	19	0	1	0	0	0	0	0	0	0	0	0	0	0
6728 Akali	4013:368	7	3	3	3	3	0	5	0	4	3	8	2	4	0	0	0	0	0	0	0	0	4	0	5	5	19	19	0	0	0	0	0	0	0	0	0	0	0	0	0
6732 Akali	4013:4751	7	4	4	3	3	0	0	0	2	3	5	1	1	0	0	22	0	0	4	0	0	4	2	4	4	26	19	0	1	0	0	0	0	0	0	0	0	0	0	0
6739 Akali	4013:6406	2	3	4	4	3	0	0	0	2	3	5	1	1	2	2	0	0	0	0	0	12	4	0	8	7	19	19	0	0	0	0	0	0	0	0	0	0	0	0	0
6740 Akali	4013:6575	2	3	4	3	3	0	2	0	4	3	5	2	6	2	1	3	12	0	2	3	0	3	3	9	10	19	19	0	1	0	0	1	0	0	0	0	0	0	0	0
6741 Akali	4013:6241	2	4	4	4	4	0	0	0	2	3	9	2	4	0	0	25	12	0	2	3	0	3	2	6	6	19	19	0	1	0	0	1	1	0	0	0	0	0	0	0
6744 Akali	4013:6754	7	3	3	2	3	0	2	2	4	3	5	2	3	2	2	4	0	0	2	0	0	3	0	9	8	19	19	0	1	0	0	0	0	0	0	0	0	0	0	0
6745 Akali	4013:7170	2	5	2	4	4	0	0	0	4	3	9	1	1	0	0	2	0	0	1	0	0	3	2	8	6	19	19	0	0	0	0	0	1	0	0	1	0	0	0	0

Number Site	NM-number	M1	Q1	K1	SH	SK	PM	PN	PT	PS	PO	RM	RF	RP	RE	RA	KE1	KE2	KE3	KY1	KY2	KY3	Kt	V	X	Y	TY	VE	Km0	Kma	Kmb	Kmc	Kmd	Kme	Kmf	Kmg	Kmh	Kmi	Kmj	SIZE
6747 Akali	4013:7391	7	4	3	3	3	0	4	0	4	3	5	1	1	4	4	12	0	0	3	0	0	3	3	8	5	19	19	0	0	0	0	1	0	0	0	0	0	0	0
6748 Akali	4013:7693	2	4	4	4	3	0	0	0	3	3	5	1	1	0	0	12	0	0	3	0	0	4	1	10	7	19	19	0	0	0	0	1	0	0	0	0	0	0	0
6749 Akali	4013:775	7	4	3	2	2	0	0	0	3	3	9	2	4	1	4	4	12	0	2	3	0	4	3	10	8	19	19	0	0	0	0	1	1	0	0	0	0	0	0
6759 Akali	4013:7954	7	3	3	3	4	0	0	0	3	4	5	1	1	7	1	20	0	0	4	0	0	3	3	9	9	19	19	0	0	1	0	0	0	0	1	0	0	0	0
6760 Akali	4013:8363	7	3	3	3	4	0	1	0	4	3	5	1	1	2	1	12	0	0	3	0	0	4	1	11	10	19	19	0	0	0	0	1	0	0	0	0	0	0	0
6762 Akali	4013:8619	7	5	4	2	2	0	0	0	2	3	5	2	4	0	0	12	0	0	3	0	0	3	2	11	10	19	19	0	0	0	0	1	0	0	0	0	0	0	0
6763 Akali	4013:8606	0	0	0	4	4	0	0	0	5	3	8	2	4	0	0	28	0	0	7	0	0	3	2	4	6	19	19	0	1	0	0	0	0	0	0	0	0	0	0
6767 Akali	4013:8730	2	5	4	3	3	0	0	0	3	3	9	4	3	0	0	31	0	0	8	0	0	3	3	9	4	12	19	0	0	0	0	0	1	0	0	0	0	0	0
6768 Akali	4013:8745	7	3	4	4	4	0	0	0	5	3	8	4	4	7	1	31	0	0	8	0	0	3	3	8	8	12	19	0	0	0	0	0	1	0	0	0	0	0	0
6771 Akali	4013:8889	7	4	3	2	3	0	0	0	2	3	8	2	4	2	1	4	0	0	2	0	12	4	2	8	5	19	19	0	0	1	0	0	0	0	0	0	0	0	0
6773 Akali	4013:8979	7	4	3	3	3	0	0	0	3	3	8	4	4	0	0	31	0	0	7	0	0	3	3	11	8	12	19	0	0	0	0	0	1	0	0	0	0	0	0
6774 Akali	4013:9059	0	0	0	4	4	0	1	0	3	4	8	4	4	0	0	2	0	0	1	0	0	3	4	15	5	19	19	0	0	0	0	1	0	0	0	0	0	1	0
6775 Akali	4013:9113	7	2	3	4	4	0	0	0	3	3	8	4	4	0	0	29	0	0	7	0	0	3	3	11	6	12	19	0	0	0	0	0	1	0	0	0	0	0	0
6777 Akali	4013:9141	2	5	4	4	4	0	1	0	5	3	5	4	6	0	0	0	0	0	0	0	0	3	0	5	7	26	19	0	0	0	0	0	0	0	0	0	0	0	0
6780 Akali	4013:9148	7	2	2	3	3	0	1	0	3	3	9	1	1	8	4	0	0	0	0	0	0	3	0	8	5	17	19	0	0	0	0	0	0	0	0	0	0	0	0
6781 Akali	4013:9152	2	3	4	4	5	0	0	0	5	3	9	4	6	0	0	0	0	0	0	0	0	3	0	4	6	26	19	0	0	0	0	0	0	0	0	0	0	0	0
6786 Akali	4013:9298	7	4	4	3	3	0	0	5	4	3	5	3	6	0	0	12	0	0	3	0	0	3	0	9	5	19	19	0	0	0	0	1	0	0	0	0	0	0	0
6788 Akali	4013:9268	7	3	3	2	3	0	0	2	4	3	5	2	4	0	0	0	0	0	0	0	0	3	0	6	6	19	19	0	0	0	0	0	0	0	0	0	0	0	0
6789 Akali	4013:9263	0	0	0	3	3	0	0	0	3	3	5	2	4	0	0	28	0	0	7	0	0	3	3	3	7	17	19	0	1	0	0	0	0	0	0	0	0	0	0
6790 Akali	4013:9267	2	3	4	3	3	0	0	0	3	3	5	2	4	0	0	0	0	0	0	0	0	5	0	3	7	17	19	0	0	0	0	0	0	0	0	0	0	0	0
6791 Akali	4013:9369	7	3	3	2	3	0	0	0	3	4	8	3	6	0	0	4	0	0	2	0	0	2	4	6	7	19	19	0	0	0	0	0	1	0	0	0	0	0	0
6794 Akali	4013:9391	7	5	4	2	2	0	0	0	2	3	8	2	4	0	0	0	0	0	0	0	0	4	0	8	6	19	19	0	0	0	0	0	0	0	0	0	0	0	0
6795 Akali	4013:9394	7	4	3	2	2	0	4	0	4	3	5	1	1	0	0	4	0	0	2	0	0	3	1	7	7	19	19	0	0	0	0	0	1	0	0	0	0	0	0
6797 Akali	4013:9449	0	0	0	4	4	0	0	0	5	4	8	4	4	0	0	31	0	0	8	0	0	3	3	20	8	12	19	0	0	0	0	0	1	0	0	0	0	0	0
6798 Akali	4013:9542	2	3	4	4	4	0	0	0	2	3	8	3	6	0	0	0	0	0	0	0	0	4	0	7	7	17	19	0	0	0	0	0	0	0	0	0	0	0	0
6799 Akali	4013:–	2	4	4	4	4	0	1	0	4	3	8	5	6	0	0	31	0	0	8	0	0	2	3	8	7	12	19	0	0	0	0	0	1	0	0	0	0	0	0
6800 Akali	4013:–	7	4	3	2	2	0	4	0	4	3	5	1	1	2	1	4	0	0	2	0	0	3	2	5	5	19	19	0	0	0	0	0	0	0	1	0	0	0	0
6801 Akali	4013:–	2	3	4	3	3	0	0	0	2	3	5	1	1	0	0	0	0	0	0	0	0	3	0	7	8	26	19	0	0	0	0	0	0	0	0	0	0	0	0
6806 Akali	4013:9657	2	4	4	4	4	0	0	3	4	4	5	1	1	0	0	0	0	0	0	0	0	4	0	7	7	19	19	0	0	0	0	0	0	0	0	0	0	0	0
6807 Akali	4013:9645	0	0	0	4	4	0	0	0	2	4	5	2	4	0	0	27	0	0	5	0	0	3	2	5	7	19	19	0	0	0	0	0	1	0	0	0	0	0	0
7892 Alakula	–	2	5	6	4	4	0	0	5	4	3	8	2	3	0	0	12	0	0	3	0	0	2	1	11	12	19	19	0	0	0	0	1	0	0	0	0	0	0	0
7745 Akali	3994:311	2	3	3	3	3	0	0	0	5	3	5	2	3	0	0	12	0	0	3	0	0	2	1	6	9	33	19	0	0	0	0	1	0	0	0	0	0	0	0
7750 Akali	3994:562	2	3	4	4	3	0	2	0	4	3	8	2	4	0	0	14	0	0	3	0	0	2	1	7	7	33	19	0	0	0	0	1	0	0	0	0	0	0	0
6812 Asva	3307:–	7	3	3	3	3	0	0	0	3	3	3	5	6	0	0	29	0	0	7	0	0	4	1	7	8	19	19	0	0	0	0	0	1	0	0	0	0	0	0
6815 Asva	3307:164	2	2	3	3	3	0	1	0	2	3	5	2	4	0	0	0	0	0	0	0	0	3	0	8	11	26	19	0	0	0	0	0	0	0	0	0	0	0	0
6816 Asva	3658:319	2	2	4	3	3	0	4	0	4	4	5	1	1	0	0	15	0	0	3	0	0	3	1	6	10	33	19	0	0	0	0	1	0	0	0	0	0	0	0
6817 Asva	3658:465	2	4	4	3	3	0	5	0	4	3	5	1	1	0	0	14	0	0	3	0	0	3	1	7	9	33	19	0	0	0	0	1	0	0	0	0	0	0	0
6818 Asva	3658:464	2	2	5	3	3	0	4	0	4	3	5	2	4	0	0	15	0	0	3	0	0	3	1	6	5	33	19	0	0	0	0	1	0	0	0	0	0	0	0
6819 Asva	3658:294	2	3	3	3	4	0	2	0	4	3	5	2	4	0	0	15	0	0	3	0	0	3	1	5	9	33	19	0	0	0	0	1	0	0	0	0	0	0	0
6820 Asva	3658:291	2	3	3	3	4	0	2	0	4	3	5	1	1	0	0	15	0	0	3	0	0	3	1	5	9	24	19	0	0	0	0	1	0	0	0	0	0	0	0
6821 Asva	3658:492	0	0	0	4	4	0	0	0	5	4	9	1	1	2	4	27	0	0	5	0	0	3	3	11	7	12	19	0	0	0	0	0	1	0	0	0	0	0	0
6822 Asva	3658:222	2	4	4	3	3	0	1	0	2	3	8	3	6	0	0	15	0	0	3	0	0	3	1	7	8	33	19	0	0	0	0	1	0	0	0	0	0	0	0
6823 Asva	3658:691	2	3	5	3	3	0	1	0	4	3	8	3	4	0	0	15	0	0	3	0	0	3	1	7	11	33	19	0	0	0	0	1	0	0	0	0	0	0	0
6824 Asva	3658:84	2	2	5	3	3	0	5	0	4	3	8	3	6	0	0	12	0	0	3	0	0	2	1	7	8	33	19	0	0	0	0	1	0	0	0	0	0	0	0
6825 Asva	3658:492	2	2	5	4	4	0	5	0	4	3	8	2	6	0	0	15	0	0	3	0	0	2	1	6	8	33	19	0	0	0	0	1	0	0	0	0	0	0	0
6826 Asva	3658:568	2	2	5	3	3	0	4	5	4	3	5	2	4	0	0	15	0	0	3	0	0	2	1	9	11	33	19	0	0	0	0	1	0	0	0	0	0	0	0
6827 Asva	3799:334	2	3	4	3	3	0	2	0	2	3	5	2	6	0	0	15	0	0	3	0	0	2	1	6	9	33	19	0	0	0	0	1	0	0	0	0	0	0	0
6828 Asva	3799:148	2	5	5	3	3	0	1	0	2	3	5	5	6	0	0	15	0	0	3	0	0	2	1	6	8	33	19	0	0	0	0	1	0	0	0	0	0	0	0
6829 Asva	3899:677	0	0	0	3	2	0	1	0	2	3	9	1	1	0	0	15	0	0	3	0	0	3	1	6	10	33	19	0	0	0	0	1	0	0	0	0	0	0	0

Number Site	NM-number	M1	Q1	K1	SH	SK	PM	PN	PT	PS	PO	RM	RF	RP	RE	RA	KE1	KE2	KE3	KY1	KY2	KY3	Kt	V	X	Y	TY	VE	Km0	Kma	Kmb	Kmc	Kmd	Kme	Kmf	Kmg	Kmh	Kmi	Kmj	SIZE
6830 Asva	3799:397	2	2	5	3	2	0	4	0	4	3	9	1	1	0	0	29	0	0	7	0	0	4	3	9	10	24	19	0	0	0	0	0	1	0	0	0	0	0	0
6832 Asva	3799:412	2	2	5	3	3	0	5	0	4	4	8	2	4	0	0	29	0	0	7	0	0	3	3	7	7	33	19	0	0	0	0	0	1	0	0	0	0	0	0
6833 Asva	3799:429	2	2	5	4	4	0	2	0	4	3	5	1	1	0	0	2	0	0	1	0	0	3	1	6	7	33	19	0	0	0	0	1	0	0	0	0	0	0	0
6834 Asva	3799:–	0	0	0	4	4	0	0	0	5	3	3	5	6	0	0	17	0	0	4	0	0	3	2	8	10	12	19	0	0	0	0	1	0	0	0	0	0	0	0
6835 Asva	3658:461	2	3	5	4	4	0	0	4	4	3	5	2	6	0	0	15	0	0	3	0	0	2	1	8	8	33	19	0	0	0	0	1	0	0	0	0	0	0	0
6836 Asva	3307:242	0	0	0	4	3	0	0	0	2	3	5	3	6	0	0	2	0	0	1	0	0	3	1	7	8	33	19	0	0	0	0	1	0	0	0	0	0	0	0
6837 Asva	3994:309	2	2	4	4	4	0	4	0	5	3	5	3	6	0	0	15	0	0	3	0	0	2	1	6	9	33	19	0	0	0	0	1	0	0	0	0	0	0	0
6838 Asva	3994:93	2	3	4	4	4	0	1	0	5	4	5	2	3	0	0	15	0	0	3	0	0	3	1	7	8	24	19	0	0	0	0	1	0	0	0	0	0	0	0
6840 Asva	3307:285	2	3	5	4	4	0	4	0	4	3	5	1	1	0	0	12	0	0	3	0	0	3	1	6	6	33	19	0	0	0	0	1	0	0	0	0	0	0	0
6841 Asva	3658:400	2	2	5	4	3	0	4	0	4	3	5	1	1	0	0	15	0	0	3	0	0	2	1	8	8	33	19	0	0	0	0	1	0	0	0	0	0	0	0
6843 Asva	3799:2	2	2	5	4	4	0	4	1	4	4	5	1	1	0	0	0	0	0	0	0	0	3	0	7	10	33	19	0	0	0	0	0	0	0	0	0	0	0	0
6844 Asva	3799:66	2	3	5	4	3	0	4	0	4	3	5	1	1	0	0	15	0	0	3	0	0	3	1	9	9	33	19	0	0	0	0	1	0	0	0	0	0	0	0
6845 Asva	3799:54	2	2	4	4	4	0	2	0	4	3	9	1	1	0	0	15	0	0	3	0	0	3	1	9	9	33	19	0	0	0	0	1	0	0	0	0	0	0	0
6846 Asva	3799:263	2	2	4	4	4	0	2	0	4	3	8	4	6	0	0	15	0	0	3	0	0	2	1	6	5	33	19	0	0	0	0	1	0	0	0	0	0	0	0
6847 Asva	3799:427,262	2	3	5	4	3	0	2	4	4	3	8	2	4	0	0	15	0	0	3	0	0	2	1	6	7	33	19	0	0	0	0	1	0	0	0	0	0	0	0
7729 Asva	3799:380	2	3	4	3	3	0	4	0	4	3	5	1	1	0	0	15	0	0	3	0	0	3	1	5	8	33	19	0	0	0	0	1	0	0	0	0	0	0	0
7730 Asva	3799:385	2	3	4	3	3	0	4	0	2	3	5	1	1	0	0	12	0	0	3	0	0	3	2	4	8	33	19	0	0	0	0	1	0	0	0	0	0	0	0
7735 Asva	3799:395	2	3	3	3	3	0	1	0	3	3	5	2	6	0	0	12	0	0	3	0	0	3	1	7	6	33	19	0	0	0	0	1	0	0	0	0	0	0	0
7736 Asva	3799:421	2	3	3	3	3	0	0	0	3	3	5	1	1	0	0	12	0	0	3	0	0	2	1	6	8	33	19	0	0	0	0	1	0	0	0	0	0	0	0
7737 Asva	3799:421	2	3	3	3	3	0	0	0	3	3	5	1	1	0	0	20	0	0	4	0	0	3	1	6	5	33	19	0	0	0	0	0	0	0	1	0	0	0	0
7738 Asva	3799:421	2	3	3	3	3	0	2	0	4	3	8	3	4	0	0	0	0	0	0	0	0	3	0	5	7	33	19	0	0	0	0	0	0	0	0	0	0	0	0
7739 Asva	3799:421	2	3	3	3	3	0	0	0	2	3	5	1	1	0	0	12	0	0	3	0	0	3	1	5	8	33	19	0	0	0	0	1	0	0	0	0	0	0	0
7740 Asva	3799:422	2	3	3	3	3	0	2	0	4	3	5	1	1	0	0	13	0	0	3	0	0	3	1	7	9	33	19	0	0	0	0	1	0	0	0	0	0	0	0
7741 Asva	3799:424	2	3	3	3	3	0	4	0	4	3	8	3	4	0	0	16	0	0	3	0	0	2	1	6	5	33	19	0	0	0	0	1	0	0	0	0	0	0	0
7743 Asva	3994:501	2	4	3	4	3	0	0	0	3	3	8	3	6	0	0	15	0	0	3	0	0	2	1	5	6	33	19	0	0	0	0	1	0	0	0	0	0	0	0
7744 Asva	3994:511	2	4	3	4	3	0	1	0	5	3	5	3	6	0	0	12	0	0	3	0	0	2	1	8	10	33	19	0	0	0	0	1	0	0	0	0	0	0	0
7753 Asva	3994:573	2	5	5	3	3	0	0	0	5	3	5	2	3	0	0	12	0	0	3	0	0	2	1	5	7	33	19	0	0	0	0	1	0	0	0	0	0	0	0
7755 Asva	3994:787	2	3	3	3	3	0	0	0	2	3	6	2	6	0	0	27	12	0	5	3	0	2	2	6	9	33	19	0	0	1	0	1	0	0	0	0	0	0	0
7756 Asva	3994:714	2	4	4	3	3	0	5	0	5	3	8	4	6	0	0	15	0	0	3	0	0	2	1	7	10	33	19	0	0	0	0	1	0	0	0	0	0	0	0
7759 Asva	3994:824	2	3	3	3	3	0	2	0	4	3	5	2	4	0	0	11	0	0	3	0	0	2	2	5	7	33	19	0	0	0	0	1	0	0	0	0	0	0	0
7761 Asva	3994:319	2	4	4	3	3	0	1	0	3	3	8	3	4	0	0	0	0	0	0	0	0	2	0	5	7	33	19	0	0	0	0	0	0	0	0	0	0	0	0
7762 Asva	3994:915	2	4	4	4	4	0	2	0	5	4	8	2	6	0	0	12	0	0	3	0	0	2	1	7	6	33	19	0	0	0	0	1	0	0	0	0	0	0	0
7763 Asva	3994:888	2	2	2	3	3	0	1	0	5	3	5	2	6	0	0	1	0	0	1	0	0	2	1	5	6	33	19	0	1	0	0	0	0	0	0	0	0	0	0
7768 Asva	3994:1095	2	4	4	4	4	0	0	0	5	3	8	2	6	0	0	21	0	0	4	0	0	2	1	6	8	33	19	0	0	0	0	1	0	0	0	0	0	0	0
7769 Asva	3994:1084	2	4	4	3	3	0	0	0	2	3	8	3	4	0	0	12	0	0	3	0	0	2	1	6	7	33	19	0	0	0	0	1	0	0	0	0	0	0	0
7770 Asva	3994:1111	2	4	4	4	4	0	0	0	3	3	3	3	5	0	0	0	0	0	0	0	0	2	0	5	10	33	19	0	0	0	0	0	0	0	0	0	0	0	0
7770 Asva	3994:1119	2	2	2	4	3	0	0	0	5	3	8	2	4	0	0	28	0	0	6	0	0	3	2	4	4	33	19	0	0	1	0	0	0	0	0	0	0	0	0
7772 Asva	3994:1167	2	3	3	4	4	0	0	0	4	3	5	1	1	0	0	2	0	0	1	0	0	3	1	4	4	33	19	0	0	0	0	1	0	0	0	0	0	0	0
7773 Asva	3994:1167	2	5	5	4	4	0	1	0	3	3	8	2	4	0	0	2	0	0	1	0	0	3	1	5	8	33	19	0	0	0	0	1	0	0	0	0	0	0	0
7774 Asva	3994:1179	2	4	4	4	4	0	2	0	4	3	6	2	4	0	0	15	0	0	3	0	0	2	1	5	6	33	19	0	0	0	0	1	0	0	0	0	0	0	0
7778 Asva	3994:1787	2	4	4	4	4	0	0	0	3	3	8	2	4	0	0	15	0	0	3	0	0	2	1	5	9	33	19	0	0	0	0	1	0	0	0	0	0	0	0
7782 Asva	3994:1353	2	4	4	4	4	0	2	0	4	4	9	3	4	0	0	15	0	0	3	0	0	2	1	8	9	33	19	0	0	0	0	1	0	0	0	0	0	0	0
7783 Asva	3994:1353	2	4	4	3	3	0	1	0	2	3	8	3	6	0	0	15	0	0	3	0	0	2	1	7	10	33	19	0	0	0	0	1	0	0	0	0	0	0	0
7784 Asva	3994:1335	2	4	4	4	4	0	1	0	5	4	8	3	6	0	0	15	0	0	3	0	0	2	1	6	9	33	19	0	0	0	0	1	0	0	0	0	0	0	0
7785 Asva	3994:136	2	4	4	4	4	0	1	1	3	3	8	3	6	0	0	12	0	0	3	0	0	2	1	6	8	33	19	0	0	0	0	1	0	0	0	0	0	0	0
7787 Asva	3994:1417	2	4	4	3	3	0	0	0	3	3	3	2	3	0	0	2	0	0	1	0	0	2	1	6	9	33	19	0	0	0	0	1	0	0	0	0	0	0	0
7788 Asva	3994:1437	2	4	5	3	4	0	2	0	4	3	8	3	6	0	0	14	0	0	3	0	0	2	1	6	11	33	19	0	0	0	0	1	0	0	0	0	0	0	0
7789 Asva	3994:1437	2	5	5	3	3	0	1	0	3	3	6	2	6	0	0	36	0	0	3	0	0	2	1	7	8	33	19	0	0	0	0	1	0	0	0	0	0	0	0
7790 Asva	3994:1437	2	4	4	3	3	0	5	0	4	3	7	1	1	0	0	11	0	0	3	0	0	3	1	7	10	33	19	0	0	0	0	1	0	0	0	0	0	0	0

Number Site	NM-number	M1	Q1	K1	SH	SK	PM	PN	PT	PS	PO	RM	RF	RP	RE	RA	KE1	KE2	KE3	KY1	KY2	KY3	Kt	V	X	Y	TY	VE	Km0	Kma	Kmb	Kmc	Kmd	Kme	Kmf	Kmg	Kmh	Kmi	Kmj	SIZE
7792 Asva	3994:1557	2	4	4	3	3	0	0	0	3	3	8	3	5	0	0	12	35	0	3	10	0	2	1	5	10	33	19	0	0	0	0	1	1	0	0	0	0	0	0
7794 Asva	3994:1700	2	4	4	3	3	0	4	0	4	3	5	3	5	0	0	28	12	0	7	3	0	2	3	7	10	33	19	0	0	0	0	1	0	0	0	0	0	1	0
7796 Asva	4012:3	2	5	4	3	4	0	4	0	4	3	5	1	1	0	0	12	35	0	3	10	0	2	2	7	8	33	19	0	0	0	0	1	1	0	0	0	0	0	0
7801 Asva	4012:262	2	3	4	3	3	0	1	0	2	3	5	3	6	0	0	14	0	0	3	0	0	2	1	7	13	33	19	0	0	0	0	1	0	0	0	0	0	0	0
7802 Asva	4012:423	0	0	0	4	4	0	0	0	5	3	5	3	6	0	0	9	0	0	4	0	0	2	2	6	7	33	19	0	0	1	0	0	0	0	0	0	0	0	0
7805 Asva	4012:356	2	4	4	4	3	0	0	5	4	3	5	3	5	0	0	14	0	0	3	0	0	2	1	6	8	33	19	0	0	0	0	0	1	0	0	0	0	0	0
7810 Asva	4012:369	2	4	4	3	4	0	0	0	2	3	8	3	6	0	0	0	0	0	0	0	0	2	0	7	8	33	19	0	0	0	0	0	0	0	0	0	0	0	0
7814 Asva	4366:103	2	2	3	3	3	0	2	0	4	3	5	3	3	0	0	12	0	0	3	0	0	2	1	7	9	33	19	0	0	0	0	1	0	0	0	0	0	0	0
7815 Asva	4366:131	2	3	4	4	4	0	0	4	4	3	8	3	4	0	0	12	0	0	3	0	0	2	1	5	7	33	19	0	0	0	0	1	0	0	0	0	0	0	0
7816 Asva	4366:154	2	3	4	3	3	0	5	0	4	3	5	2	3	0	0	12	0	0	3	0	0	2	1	6	7	33	19	0	0	0	0	1	0	0	0	0	0	0	0
7821 Asva	4366:171	2	4	4	3	3	0	4	1	4	3	5	3	5	0	0	21	0	0	4	0	0	2	1	7	11	33	19	0	0	0	0	1	0	0	0	0	0	0	0
7824 Asva	4366:275	2	3	3	3	3	0	0	0	3	3	5	3	3	0	0	0	0	0	0	0	0	1	0	5	9	33	19	0	0	0	0	0	0	0	0	0	0	0	0
7825 Asva	4366:294	2	3	3	4	4	0	0	0	3	3	5	2	3	0	0	11	0	0	3	0	0	2	1	8	7	33	19	0	0	0	0	1	0	0	0	0	0	0	0
7827 Asva	4366:406	2	3	4	4	4	0	0	0	3	3	8	3	6	0	0	12	0	0	3	0	0	1	1	5	7	33	19	0	0	0	0	0	0	0	0	0	0	0	0
7830 Asva	4366:470	2	3	3	4	4	0	0	0	3	3	5	2	3	0	0	21	0	0	4	0	0	2	1	6	7	33	19	0	0	0	0	1	0	0	0	0	0	0	0
7831 Asva	4366:428	2	4	4	3	3	0	1	0	3	3	7	1	1	0	0	12	0	0	3	0	0	2	1	8	9	33	19	0	0	0	0	1	0	0	0	0	0	0	0
7832 Asva	4366:451	2	3	4	3	3	0	2	0	4	3	5	1	1	0	0	14	0	0	3	0	0	2	1	6	9	33	19	0	0	0	0	0	1	0	0	0	0	0	0
7834 Asva	4366:464	2	4	5	3	4	0	4	0	4	3	8	3	5	0	0	11	0	0	3	0	0	2	1	6	8	33	19	0	0	0	0	0	1	0	0	0	0	0	0
7836 Asva	4366:468	2	4	3	4	4	0	2	0	4	3	8	5	5	0	0	14	0	0	3	0	0	2	1	7	8	33	19	0	0	0	0	0	1	0	0	0	0	0	0
7839 Asva	4366:492	2	3	4	3	3	0	2	0	5	3	8	5	5	0	0	16	0	0	3	0	0	2	1	7	10	33	19	0	0	0	0	0	1	0	0	0	0	0	0
7841 Asva	4366:518	2	5	5	3	3	0	0	3	4	3	8	3	5	0	0	2	0	0	1	0	0	2	1	6	8	33	19	0	0	0	0	0	1	0	0	0	0	0	0
7844 Asva	4366:567	2	4	4	3	4	0	0	0	5	3	8	3	6	0	0	14	0	0	3	0	0	2	1	6	7	33	19	0	0	0	0	0	1	0	0	0	0	0	0
7845 Asva	4366:567	2	4	4	3	3	0	2	0	4	3	5	2	3	0	0	14	0	0	3	0	0	2	1	6	10	33	19	0	0	0	0	0	1	0	0	0	0	0	0
7847 Asva	4366:604	2	3	3	3	3	0	0	0	5	3	5	2	4	0	0	2	0	0	1	0	0	2	1	6	7	33	19	0	0	0	0	0	1	0	0	0	0	0	0
7852 Asva	4366:592	2	4	5	3	3	0	2	0	4	3	5	2	4	0	0	14	0	0	3	0	0	2	1	7	9	33	19	0	0	0	0	0	1	0	0	0	0	0	0
7853 Asva	4366:609	2	3	4	4	4	0	0	0	3	3	5	2	5	0	0	15	0	0	3	0	0	2	1	7	10	33	19	0	0	0	0	0	1	0	0	0	0	0	0
7855 Asva	4366:619	2	3	3	3	3	0	0	0	3	3	8	4	5	0	0	0	0	0	0	0	0	2	0	7	7	33	19	0	0	0	0	0	0	0	0	0	0	0	0
7856 Asva	4366:619	2	3	4	3	4	0	0	0	5	3	8	4	5	0	0	0	0	0	0	0	0	1	0	6	8	33	19	0	0	0	0	0	0	0	0	0	0	0	0
7857 Asva	4366:638	2	3	4	3	3	0	2	0	4	3	8	4	6	0	0	15	0	0	3	0	0	2	1	6	8	33	19	0	0	0	0	1	0	0	0	0	0	0	0
7859 Asva	4366:639	2	4	3	4	3	0	0	0	3	3	8	4	5	0	0	18	0	0	4	0	0	2	2	5	6	33	19	0	1	0	0	0	0	0	0	0	0	0	0
7860 Asva	4366:673	2	2	2	3	3	0	3	0	4	3	5	3	5	0	0	15	28	0	3	7	0	2	2	6	7	33	19	0	0	0	0	1	0	0	1	0	0	0	0
7862 Asva	4366:717	2	3	4	3	3	0	4	0	4	3	5	4	5	0	0	0	0	0	0	0	0	2	0	5	7	33	19	0	0	0	0	0	0	0	0	0	0	0	0
7863 Asva	4366:713	2	2	3	4	4	0	0	0	5	3	6	4	5	0	0	27	0	0	5	0	0	2	1	4	7	12	19	0	0	0	0	0	1	0	0	0	0	0	0
7864 Asva	4366:707	2	3	3	4	4	0	1	4	4	3	7	1	1	0	0	14	0	0	3	0	0	2	1	6	9	33	19	0	0	0	0	1	0	0	0	0	0	0	0
7866 Asva	4366:724	2	4	5	3	3	0	2	0	4	3	5	2	4	0	0	15	0	0	3	0	0	2	1	5	8	33	19	0	0	0	0	1	0	0	0	0	0	0	0
7868 Asva	4366:737	2	3	4	4	4	0	0	0	5	3	5	2	4	0	0	11	0	0	3	0	0	2	1	5	7	33	19	0	0	0	0	1	0	0	0	0	0	0	0
7869 Asva	4366:505	2	4	5	3	3	0	0	0	1	5	5	3	3	0	0	0	0	0	0	0	0	2	0	7	8	33	19	0	0	0	0	0	0	0	0	0	0	0	0
7870 Asva	4366:826	2	4	5	3	3	0	0	0	2	3	8	3	4	0	0	14	0	0	3	0	0	2	1	10	9	33	19	0	0	0	0	0	1	0	0	0	0	0	0
7871 Asva	4366:608	2	3	2	4	4	0	1	0	4	3	5	2	4	0	0	25	0	0	4	0	0	3	2	4	1	12	19	0	0	0	0	0	0	1	0	0	0	0	0
7872 Asva	4366:839	2	4	4	4	4	0	0	0	3	3	8	2	3	0	0	12	0	0	3	0	0	2	1	7	7	33	19	0	0	0	0	0	1	0	0	0	0	0	0
7873 Asva	4366:882	2	4	4	3	3	0	1	0	5	3	5	2	3	0	0	12	0	0	3	0	0	2	1	5	8	33	19	0	0	0	0	0	1	0	0	0	0	0	0
7875 Asva	4366:875	2	4	5	4	4	0	1	0	3	3	5	1	1	0	0	36	0	0	4	0	0	2	1	7	8	33	19	0	0	0	0	0	1	0	0	0	0	0	0
7877 Asva	4366:867	2	3	3	4	3	0	2	0	4	3	5	3	5	0	0	12	0	0	3	0	0	2	1	7	9	33	19	0	0	0	0	0	1	0	0	0	0	0	0
7879 Asva	4366:882	2	4	5	3	4	0	0	0	1	3	8	3	6	0	0	11	0	0	3	0	0	2	1	6	8	33	19	0	0	0	0	0	1	0	0	0	0	0	0
7881 Asva	4366:875	2	3	4	4	4	0	0	0	3	4	5	2	4	0	0	11	0	0	3	0	0	2	1	6	6	33	19	0	0	0	0	0	1	0	0	0	0	0	0
6808 Kivisaari	2158:19	7	2	2	3	4	0	0	0	5	4	8	4	4	0	0	17	29	0	4	7	0	3	4	15	7	17	19	0	0	0	0	0	1	1	0	0	0	0	0
6810 Kivisaari	2158:75	7	2	3	3	3	0	2	0	4	3	8	2	4	0	0	0	0	0	0	0	0	3	0	8	10	19	19	0	0	0	0	0	0	0	0	0	0	0	0
6645 Kullamägi	4045:73	7	2	3	2	3	0	0	2	4	3	5	1	1	0	0	12	0	0	3	0	0	4	2	6	8	19	19	0	0	0	0	0	1	0	0	0	0	0	0
6647 Kullamägi	4045:119	2	3	3	3	4	0	1	0	2	4	6	2	4	0	0	12	0	0	3	0	0	3	0	7	8	19	19	0	0	0	0	0	1	0	0	0	0	0	0

Number Site	NM-number	M1	Q1	K1	SH	SK	PM	PN	PT	PS	PO	RM	RF	RP	RE	RA	KE1	KE2	KE3	KY1	KY2	KY3	Kt	V	X	Y	TY	VE	Km0	Kma	Kmb	Kmc	Kmd	Kme	Kmf	Kmg	Kmh	Kmi	Kmj	SIZE
6653 Kullamägi	4045:–	7	5	5	2	3	0	1	2	4	3	5	1	1	2	1	0	0	0	0	0	0	5	0	8	6	19	19	0	0	0	0	0	0	0	0	0	0	0	0
6654 Kullamägi	4045:–	2	3	5	3	3	0	0	0	2	3	5	1	1	0	0	12	31	0	3	6	0	4	1	8	10	19	19	0	0	0	0	1	1	0	0	0	0	0	0
6655 Kullamägi	4045:–	2	5	5	3	4	0	2	0	4	3	5	2	4	0	0	17	4	0	4	2	0	3	2	7	8	19	19	0	0	0	0	0	1	0	1	0	0	0	0
6667 Kullamägi	4045:279	2	3	3	4	4	0	0	2	4	4	5	1	1	0	0	0	0	0	0	0	0	4	0	5	6	19	19	0	0	0	0	0	0	0	0	0	0	0	0
6669 Kullamägi	4045:319	2	3	5	4	3	0	0	0	2	3	8	2	4	0	0	12	0	0	0	0	0	4	0	7	7	19	19	0	0	0	0	1	0	0	0	0	0	0	0
6677 Kullamägi	4045:412	7	4	4	2	3	0	0	0	3	3	5	1	1	5	2	4	3	0	2	2	0	3	5	6	6	19	19	0	0	0	0	1	1	0	0	0	0	0	0
6681 Kullamägi	4045:477	7	3	3	3	3	0	0	0	3	3	5	2	3	4	4	4	0	0	2	0	0	3	3	5	10	19	19	0	1	0	0	0	0	0	0	0	0	0	0
6682 Kullamägi	4045:462	7	5	4	3	3	0	0	2	4	3	5	3	4	0	0	12	0	0	3	0	0	3	1	9	11	19	19	0	0	0	0	1	0	0	0	0	0	0	0
6683 Kullamägi	4045:453	2	3	3	4	4	0	0	0	3	3	5	2	4	0	0	30	0	0	9	0	0	3	0	7	6	19	19	0	0	0	0	0	1	0	0	0	0	0	0
6685 Kullamägi	4045:537	7	3	2	3	3	0	0	2	4	3	3	2	3	0	0	0	0	0	0	0	0	3	0	5	7	19	19	0	0	0	0	0	0	0	0	0	0	0	0
6686 Kullamägi	4045:548	2	5	5	3	3	0	0	0	5	3	10	3	6	2	2	4	2	0	2	1	0	2	3	5	15	19	19	0	0	0	0	1	1	1	0	0	0	0	0
6687 Kullamägi	4045:503	2	4	3	4	4	0	0	2	4	3	1	1	1	2	1	0	0	0	0	0	0	3	0	5	11	19	19	0	0	0	0	0	0	0	0	0	0	0	0
6690 Kullamägi	4045:615	2	5	5	4	4	0	0	0	3	4	2	1	1	2	1	4	15	0	2	3	0	3	5	15	10	19	19	0	1	0	0	1	0	0	0	0	0	0	0
6691 Kullamägi	4045:–	0	0	0	3	3	0	0	0	2	3	5	1	1	0	0	4	2	0	2	1	0	3	3	6	6	19	19	0	1	0	0	0	0	0	0	0	0	0	0
6693 Kullamägi	4045:561	2	3	3	3	3	0	0	0	2	3	5	2	4	0	0	0	0	0	0	0	0	3	0	9	10	19	19	0	0	0	0	0	0	0	0	0	0	0	0
6694 Kullamägi	4045:669	2	5	5	4	4	0	0	0	2	3	8	2	4	0	0	17	0	0	4	0	0	3	1	5	7	19	19	0	0	0	0	1	0	0	0	0	0	0	0
6696 Kullamägi	4045:633	2	4	4	4	4	0	0	0	5	4	5	1	1	2	2	3	0	0	2	0	0	3	3	9	7	19	19	0	1	0	0	0	0	0	0	0	0	0	0
6698 Kullamägi	4045:639	2	5	5	4	4	0	0	0	2	4	5	1	1	0	0	14	0	0	3	0	0	3	1	6	6	19	19	0	0	0	0	1	0	0	0	0	0	0	0
6699 Kullamägi	4045:673	2	3	5	4	4	0	0	0	2	3	5	1	1	0	0	14	0	0	3	0	0	3	1	8	9	19	19	0	0	0	0	1	0	0	0	0	0	0	0
6700 Kullamägi	4045:715	2	5	5	4	3	0	0	0	2	3	5	2	4	0	0	11	0	0	3	0	0	3	1	7	7	19	19	0	0	0	0	1	0	0	0	0	0	0	0
6701 Kullamägi	4045:704	7	4	3	2	3	0	0	2	4	3	8	2	4	0	0	0	0	0	0	0	0	3	0	8	7	19	19	0	0	0	0	0	0	0	0	0	0	0	0
6704 Kullamägi	4045:756	2	5	5	4	4	0	5	0	4	3	5	1	1	0	0	29	0	0	7	0	0	3	4	6	7	19	19	0	0	0	0	0	1	0	0	0	0	0	0
6708 Kullamägi	4045:107	7	5	3	2	3	0	0	2	4	3	8	3	4	0	0	4	0	0	2	0	0	3	2	10	6	19	19	0	0	0	0	0	1	1	0	0	0	0	0
6709 Kullamägi	4045:1092	7	4	3	2	2	0	0	0	2	3	5	2	4	0	0	0	0	0	0	0	0	4	0	3	4	19	19	0	0	0	0	0	0	0	0	0	0	0	0
6712 Kullamägi	4045:1117	7	2	3	3	2	0	1	0	3	3	8	2	4	0	0	21	0	0	4	0	12	3	3	9	5	19	19	0	0	0	0	1	0	0	0	0	0	1	0
6714 Kullamägi	4045:1152	7	2	3	3	3	0	0	0	3	3	5	1	1	0	0	4	0	0	2	0	0	2	4	9	5	19	19	0	0	1	0	0	0	0	0	0	0	0	0
6719 Kullamägi	4045:134	2	5	5	4	4	0	1	0	2	4	8	3	4	0	0	14	0	0	3	0	0	3	1	6	9	19	19	0	0	0	0	1	0	0	0	0	0	0	0
6720 Kullamägi	4045:1351	2	5	4	4	4	0	0	0	3	4	8	2	4	0	0	0	0	0	0	0	0	3	0	5	6	26	19	0	0	0	0	0	0	0	0	0	0	0	0
6721 Kullamägi	4045:1353	2	5	5	4	4	0	0	0	2	4	5	2	4	0	0	18	0	0	4	0	0	3	0	8	7	19	19	0	0	0	0	0	0	0	1	0	0	0	0
6755 Kullamägi	4045:16	7	3	3	2	2	0	0	0	2	3	5	1	1	0	0	17	0	0	4	0	0	4	5	4	4	19	19	0	0	0	0	1	0	0	1	0	0	0	0
7888 Riigikula XIV	2181:243	7	4	4	2	3	0	0	0	5	4	9	2	4	0	0	27	0	0	5	0	0	2	5	18	8	12	19	0	0	0	0	0	1	0	0	0	0	0	0
7890 Riigikula XIV	2181:199	7	4	4	2	3	0	4	0	4	4	9	1	1	0	0	0	0	0	0	0	0	2	0	14	8	24	19	0	0	0	0	0	0	0	0	0	0	0	0
7891 Riigikula XIV	4218:600	7	2	2	3	4	0	0	0	5	4	9	1	1	0	0	27	0	0	5	0	0	2	4	15	8	12	19	0	0	0	0	0	1	0	0	0	0	0	0

Appendix 6a. Chronology of the ceramic types related to Textile ceramics in Russia. The chronology is based on calibrated carbon-14 datings. Most calibrations are made by Christian Carpelan (2000). The original data has been published by Russian archaeologists in several articles (see below).

Type/Dating	Volosovo[1]	Fatyanovo[2]	Sejma-Turbino	Pozdnyakovo[3]	Prikazan[4]	Textile[5]
1 BC						
250						
500						Late Textile
750					IV Maklaseev	
1000 BC				III		
1250					III Atabaevsk	
1500			Late Sejma	II	II (see***)	
1750		IV (see *)	Early Sejma	I	I Zaimisensk	Early Textile
2000 BC		III (see **)				
2250		II Nikulchinsk				
	III Late					
2500		I Ivangorod				
2750						
3000 BC	II Early					
3250						
3500						
	I Proto					

* Bolosovo-Danilovskij, ** Ckomorohovsko-Bunkovskij, *** Balymsko-Kartanihinskij

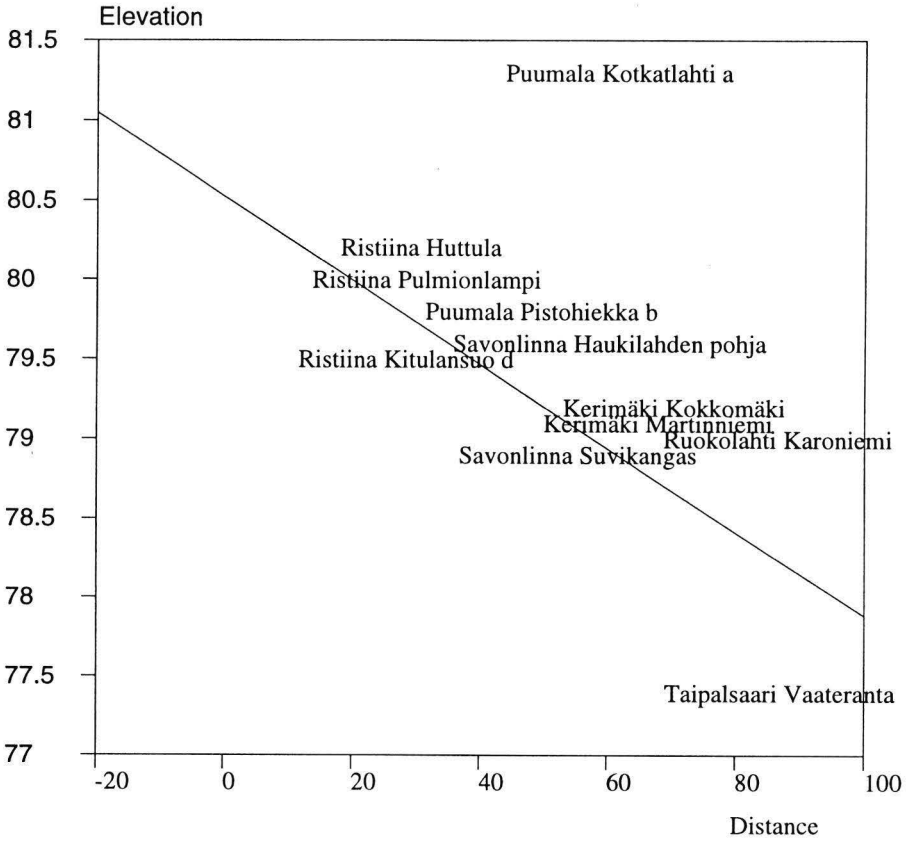
[1] Krajnov 1987a:14–15; Carpelan 2000:18
[2] Krajnov 1987b:74; Carpelan 2000:24
[3] Halikov 1987:134–135; Carpelan 2000:24–25.
[4] Halikov 1987:140; Carpelan 2000:24–25..
[5] Patrushev 1989:30, 71–72; Voronin 1998:322.

Appendix 6b. Chronology of the ceramic types related to Textile ceramics in Russia. The chronology is based on calibrated carbon-14 datings. Most calibrations are made by Christian Carpelan (2000). The original data has been published by Russian archaeologists in several articles (see below).

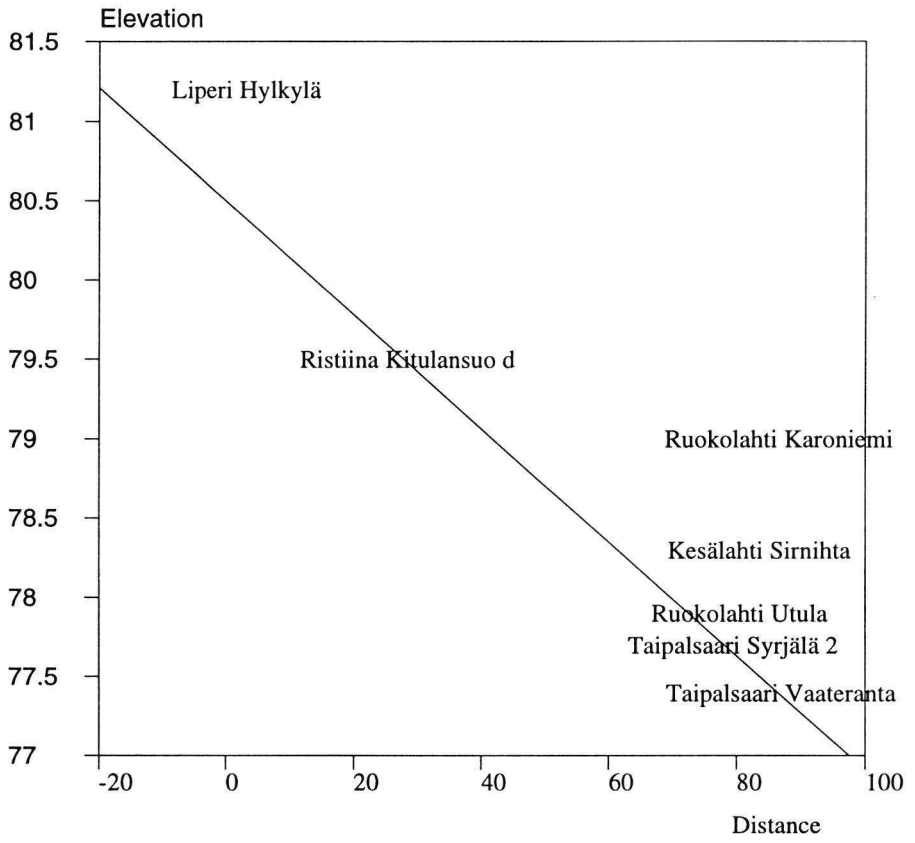
Type/Dating	Rhomb-pit Ware[1]	Asbestos ceramics[2]	Corded Ware[3]	Late Kargopol[4]
250				Late Kargopol ceramics
500				
750				
1000 BC				
1225		Palayguba II		Late-Kargopol ceramics
1500	Rhomb-Pitted Ware			
1725		Orovnavolok XVI		
2000 BC				
2250		Vojnavolok XXVII	Late Corded Ware	
2500				
2750				
3000 BC			Early	
3250	Early Rhomb-Pitted Ware		Corded Ware	
3500				
3750				
4000 BC				

[1] Vitenkova 1988:68–69 ; 1991:124-125; Carpelan 2000:16–17.
[2] Zhulnikov 1991:145; 1999:76–77; Carpelan 2000:17–18.
[3] Carpelan 2000:17–18.
[4] Manyuhin 1996:236-237; Carpelan 2000:17–18.

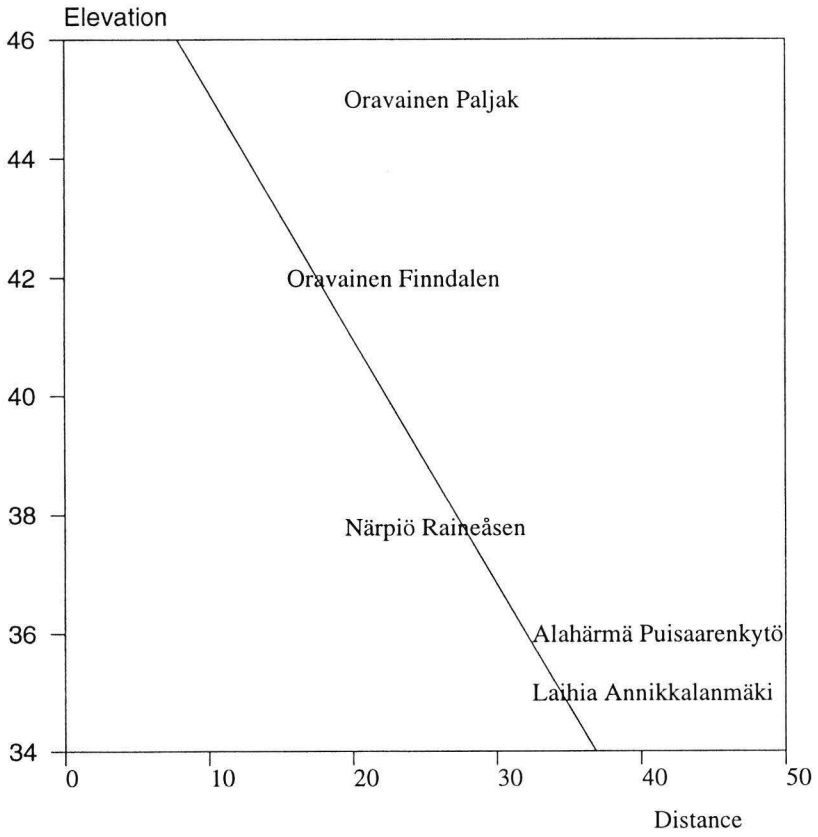
Appendix 7. Distance diagrams and regression lines for the dwelling sites involving Textile ceramics in Finland.



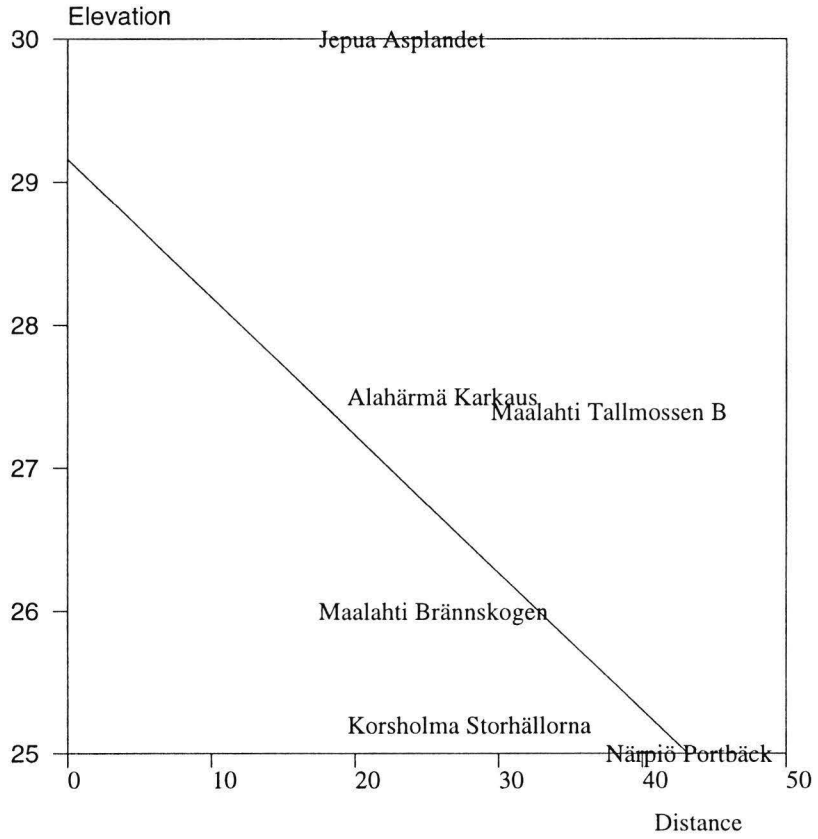
App. 7a:1. Distance diagram and a regression line for the Textile ceramics in the southern part of the Lake Saimaa area.



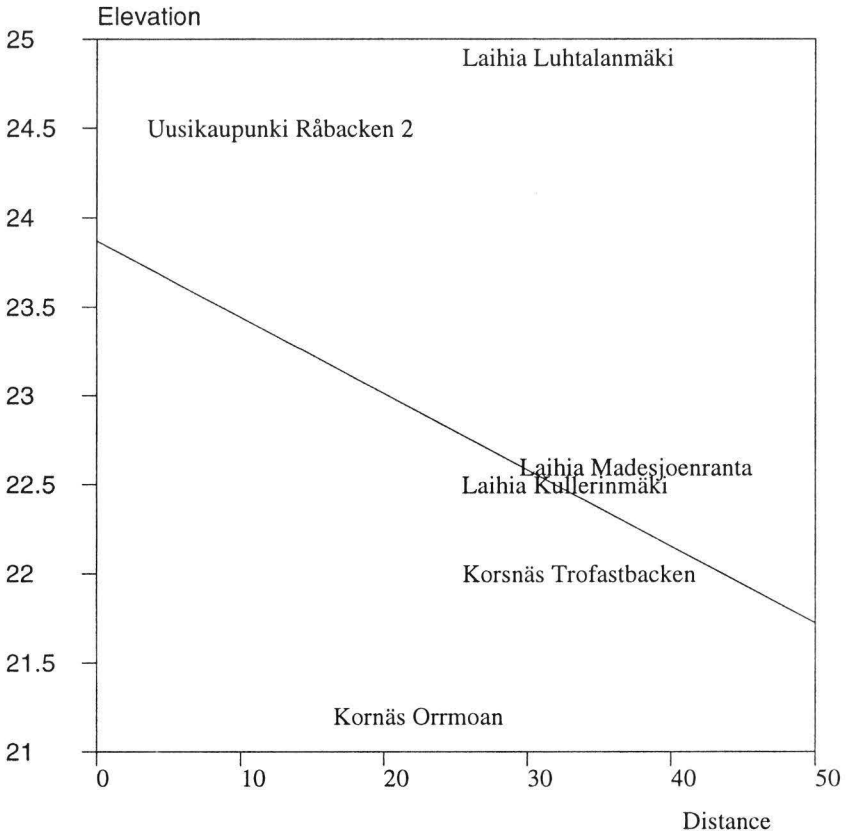
App. 7a:2. Distance diagram and a regression line for the Luukonsaari ceramics in the southern part of the Lake Saimaa area.



App. 7b:1. Distance diagram and a regression line for the Kiukainen ceramics in the Southern Ostrobothnia.



App. 7b:2. Distance diagram and a regression line for the Late Bronze Age in the Southern Ostrobothnia.



App. 7b:3. Distance diagram and a regression line for the Pre-Roman Iron Age (Morby ceramics) in the Southern Ostrobothnia.

Appendix 8a. Accelerating datings of Textile ceramics and some Early Metal Period ceramics in Finland and northern Scandinavia.

Accelerating datings of Textile ceramics in Finland (1 σ probability, 68.2 %). Calibration has been made by the Oxcal 2000 –calibration program.

Lab. code	Site	NM-number	Date	calBC-calAD
Hela-154	Muhos Halosentörmä	17646:163	3420±105	calBC1880(68.2%)1600
Hela-142	Suomussalmi Kalmosärkkä	14504:286	3135±70	calBC 1500(68.2%)1310
Ua-10317	Suomussalmi Kalmosärkkä	14829:288	3140±75	calBC1520(56.4%)1370 calBC1360(11.8%)1310
Hela-144	Suomussalmi Mikonsärkkä	19879:23	2600±80	calBC 900(2.2%)870 calBC 840(32.1%)750 calBC 690(33.9%)540
Ua-10316	Suomussalmi Tormuan särkkä	18322:996-997	3040±70	calBC1400(64.4%)1210 calBC1200(1.8%)1190 calBC1140(2.0%)1130
Ua-10319	Joensuu Varaslampi	19471:375	2875±55	calBC 1190(1.0%)1180 calBC 1130(62.6%)970 calBC 960(4.6%)940
Ua-10320	Joensuu Varaslampi	19471:499	2930±60	calBC 1260(5.4%)1230 calBC 1220(62.8%)1020
Hela-104	Ristiina Kitulansuo	28960:586	3220±65	calBC1600(7.3%)1560 calBC1530(60.9%)1410
Hela-221	Porvoo Böle	30321:1614	3326±65	calBC 1690(1.0%)1520
Hela-466	Kurkijoki Kuuppala	6675:42	2640±70	calBC 900(68.2%)760
Hela-467	Kaukola Juho Paavilaisen rantapelto	7117:24	3085±70	calBC 1430(58.2%)1260
Hela-469	Kurkijoki Kuuppala	6675:50	2540±75	calBC 800(15.4%)750 calBC 720(52.8%)520

Accelerating datings of Säräisniemi 2 ceramics in Finland (1 σ probability, 68.2 %). Calibration has been made by the Oxcal 2000 –calibration program.[1]

Lab.code	Site	NM-number	Date	calBC-calAD
Hela 14	Rovaniemi Kotijänkä	26780:81	2410±75	calBC 760(19.8)680 calBC 670(3.2)640 calBC 560(45.3)390
Hela 15	Rovaniemi Kotijänkä	26780:88	2465±75	calBC 760(21.2%)680 calBC 670(14.4%)610 calBC 600(23.1%)480 calBC 470(3.6%)450 calBC 440(6.0%)410
Hela 16	Rovaniemi Kotijänkä	26780:255	2540±80	calBC 810(14.8%)750 calBC 720(53.4%)520
Hela 17	Kemijärvi Neitilä	416553:180	1910±95	calAD 1(68.2%)230
Hela 18	Kemijärvi Neitilä 4	16553:125	2075±55	calBC 170(63.6%)40 calBC 30(1.4%)20 calBC 10(3.3%)1
Hela 19	Kemijärvi Neitilä 4	16553:198,603	2080±60	calBC180(68.2%)1calAD
Hela 20	Kemijärvi Neitilä 4	16553:1332	3035±80	calBC 1400(60.5%)1210 calBC 1200(2.5%)1190 calBC 1180(2.7%)1160 calBC 1140(2.6%)1130
Hela 21	Kemijärvi Neitilä 4	16553:1248	3320±75	calBC 1690(68.2%)1510
Hela 22	Kemijärvi Neitilä 4	16553:1287	2540±100	calBC 810(68.2%)510
Hela 35	Utsjoki Guatniljärvi	13289:2	2020±70	calBC110(68.2%)70calAD
Hela 36	Kemijärvi Neitilä 4	16553:292	1990±65	calBC 90(2.0%)80 calBC 60(64.7%)90 calBC 100(1.4%)120
Hela 37	Kemijärvi Jatulinsaari	15492:16	3210±70	calBC 1600(7.6%)1560 calBC 1530(60.6%)1400
Hela 39	Sodankylä Juikenttä	SU 5577:151	2560±75	calBC 810(19.7%)750 calBC 710(48.5%)520
Hela 41	Kemijärvi Anttila 1	14344:83	2630±65	calBC 900(66.7%)760 calBC 680(1.5%)670
Hela 43	Kemijärvi Neitilä 4	16145:573	2885±100	calBC1260(2.1%)1240 calBC 1220(66.1%)920
Hela 44	Kemijärvi Neitilä 4	16145:81	2400±115	calBC 760(17.2%)680 calBC 670(8.5%)610 calBC 600(42.5%)390
Hela 50	Kemi Kiimamaa	27700:4	2695±115	calBC 1020(67.3%)760 calBC 680(0.9%)670

[1] These AMS-datings will be soon published together with Charred Crust Series in the report of the Dating Laboratory, University of Helsinki (Radiocarbon dates VI by Högne Jungner and Eloni Sonninen).

NORWAY

Datings of Norwegian Textile ceramics (according to Jørgensen & Olsen 1987).

Lab. code	Site	Date	calBC-calAD
T-6473	Gasadaknes, Karasjok	3080±170	calBC 1520(65.6%)1110 calBC 1100(1.7%)1080 calBC 1070(0.9%)1050
T-6471	Gasadaknes, Karasjok	3360±150	calBC 1880(5.7%)1840 calBC 1830(3.5%)1790 calBC 1780(57.1%)1490 calBC 1480(1.9%)1460

Datings of Kjelmøy ceramics, Imited textile ceramics and shell and mica-tempered ceramics (according to Jørgensen & Olsen 1987).

Lab. code	Site	Date	calBC-calAD
T-6149	Habatgouikka, Kautokeino	2210±90	calBC 390(68.2%)170
T-6472	Mestersanden, Kjelmøy	2170±90	calBC 360(68.2%)110
T-6475	Kirkhellaren, Træna	2840±120	calBC 1190(1.9%)1170 calBC 1160(1.9%)1140 calBC 1130(57.5%)890 calBC 880(6.9%)830
T-6150	Kolvika, Vestvågøy	3030±150	calBC 1430(68.2%)1040
T-6147	Mestersanden, Kjelmøy	2550±100	calBC 810(68.2%)520
T-6474	Mestersanden, Kjelmøy	2450±120	calBC 760(18.3%)680 calBC 670(10.5%)610 calBC 600(39.4%)400

SWEDEN

Datings of Swedish Textile ceramics (Linder 1966). In this connection the Lilla Laisan vessel has been interpreted not as Kjelmøy ceramics, but together with Swedish Textile ceramics.

Lab. code	Site	Date	calBC-calAD
St-1352	Lappvallen	2685±110	calBC 1010(67.1%)760 calBC 680(1.1%)660
St-1808	Lilla Laisan	3025±80	calBC 1400(68.2%)1120
St-1356	Lilla Laisan	3170±160	calBC 1680(1.1%)1670 calBC 1640(64.7%)1250 calBC 1240(2.4%)1210

Datings of Swedish Kjelmøy ceramics (Linder 1966)

Lab. code	Site	Date	calBC-calAD
St-1140	Valviksudden	2110±105	calBC360(11.8%)290 calBC 240(56.4%)10
St-1141	Valviksudden	2090±110	calBC 350(6.3%)310 calBC 230(1.5%)220 calBC 210(60.4%)30
St-1142	Lappvallen	2060±120	calBC 350(3.5%)320 calBC 210(64.7%)70
St-1143	Lappvallen	1895±105	calBC 20(0.8%)10 calAD 0(67.4%)250
St-1350	Valviksudden	1995±100	calBC 150(2.5%)130 calBC 120(65.7%) 130calAD
St-1351	Valviksudden	2100±90	calBC 350(6.3%)320 calBC 230(1.2%)220 calBC 210(60.7%) 10 calAD
St-1353	Lappvallen	1875±70	calAD 70(68.2%)240
St-1354	"Kultsjö-krukan"	2300±110	calBC 520(68.2%)170
St-1355	Kultsjön	2375±115	calBC 760(15.7%)680 calBC 670(6.2%)630 calBC 600(2.5%)570 calBC 560(42.6%)360 calBC 270(1.1%)260
St-1357	Ånnsjön	2020±110	calBC 180(65.4%) calAD90 calAD 100(2.8%)120

Appendix 8b. Carbon-14 datings from the find contexts including Textile ceramics in Finnish dwelling sites. In principle, only such datings have been taken into a consideration which have been made from the dwelling sites involving Textile ceramics. Calibration has been made by the Oxcal 2000 -calibration program.

The River Kemijoki Water System

Lab.code	Site	NM-number	Date	calBC-calAD
Hel-250	Kemijärvi Neitilä 4	16145:1917	7310±180	calBC 6380(14.9%)6280 calBC 6270(53.3%)6010
Hel-251	Kemijärvi Neitilä 4	16553:1803	1320±100	calAD 620(64.3%)830 calAD 840(3.9%)860
Hel-191	Kemijärvi Neitilä 4	16145:2164	6750±170	calBC5790(65.8%)5510 calBC5500(2.4%)5480

The River Oulujoki Water System

Lab.code	Site	NM-number	Date	calBC-calAD
Hel-2735	Kuhmo Pajasaari	24491:992	440±100	calAD 1400(48.3%)1530 calAD 1560(19.9%)1630
Hel-2736	Kuhmo Pajasaari	24491:992	280±100	calAD 1470(58.5%)1680 calAD 1760(7.9%)1810 calAD 1930(1.9%)1950
Hel-2435	Kuhmo Pajasaari	–	4270±90	calBC 3020(42.0%)2850 calBC 2820(26.2%)2690
Hel-1601	Kuhmo Sylväjänniemi	20903:219	660±110	calAD 1260(68.2%)1410
Hel-2096	Sotkamo Kiikarusniemi	22198:570	4640±110	calBC 3650(58.9%)3300 calBC 3250(9.3%)3100
Hel-1750	Sotkamo Kiikarusniemi	21482:116	6150±110	calBC5260(68.2%)4940
Hel-3232	Suomussalmi Salmenniemi	26392:15	2130±100	calBC 360(15.7%)290 calBC 260(52.5%)40
Hel-3231	Suomussalmi Mikonsärkkä	26341:130	5270±100	calBC 4230(12.0%)4180 calBC 4170(56.2%)3970
Hel-3233	Suomussalmi Mikonsärkkä	26341:125	1490±120	calAD 430(68.2%)660
Hel-2570	Suomussalmi Joenniemi	23701:567	1480±100	calAD 430(68.2%)660
Hel-1532	Suomussalmi Joenniemi	–	modern	–

Southern Ostrobothnia

Lab.code	Site	NM-number	Date	calBC-calAD
Hel-2738	Ikaalinen Ämmänsaaren ranta	–	1310±120	calAD 630(68.2%) 890
Hel-2539	Ikaalinen Ämmänsaaren ranta	–	3100±120	calBC 1520(66.0%)1210 calBC 1200(1.1%)1190 calBC 1140(1.1%)1130
Su-2430	Laihia Annikkalanmäki	26571:14	2630±60	calBC 900(7.5%)870 calBC 860(59.7%)760 calBC 680(1.0%)670
Su-2421	Laihia Annikkalanmäki	–	2500±40	calBC 790(5.7%)750 calBC 710(62.5%)520
Hel-2438	Laihia Kullerinmäki	-	840±100	calAD 1040(13.9%)1090 calAD 1120(5.8%)1140 calAD 1150(48.5%)1280
Hel-2683	Laihia Viirikallio	24366 (E-F/10)	2350±110	calBC 800(58.0%)350 calBC 300(10.2%)200
Hel-2684	Laihia Viirikallio	23694 (asp 1 C)	2360±120	calBC 800(61.8%)350 calBC 300(6.4%)200
Hel-2446	Laihia Peltomaa	–	2710±90	calBC 980(5.0%)950 calBC 940(63.2%)790
Hel-2447	Laihia Peltomaa	-	2530±130	calBC 810(63.4%)510 calBC 470(2.0%)450 calBC 440(2.8%)410
Hel-1370	Nykarleby Råbacken	–	1370±110	calAD 560(68.2%)780
Hel-2555	Nykarleby Råbacken	–	290±100	modern
Hel-2556	Nykarleby Råbacken 2	–	420±100	modern
Hel-2557	Nykarleby Råbacken 2	–	2430±110	calBC 760(18.4%)680 calBC 670(8.6%)610 calBC 600(3.3%)570 calBC 560(37.9%)400
Hel-2558	Nykarleby Råbacken 2	–	2290±110	calBC520(68.2%)170
Su-1596	Nykarleby Råbacken 2	–	2310±90	calBC 520(37.9%)340 calBC 330(30.3%)200

Lab.code	Site	NM-number	Date	calBC-calAD
Hel-303	Iisalmi Haapaniemi	-	2140±140	calBC 370(66.0%)40 calBC 30(0.9%)20 calBC 10(1.3%)1 calAD
Hel-3057	Iisalmi Haapakangas		2760±100	calBC 1010(68.2%)800
Hel-305	Kesälahti Sirnihta	–	750±120	calAD 1160(56.2%)1330 calAD 1340(12.0%)1400
Hel-306	Kesälahti Sirnihta	–	820±100	calAD 1040(9.5%)1090 calAD 1120(5.1%)1140 calAD 1150(53.6%)1290
Hel-307	Kesälahti Sirnihta	–	1560±110	calAD 400(68.2%)620
Hel-308	Kesälahti Sirnihta	–	540±100	calAD 1300(68.2%)1450
Hel-309	Kesälahti Sirnihta	–	2030±120	calBC 200(68.2%)90calAD
Su-2476	Joensuu Varaslampi	19471:1317	2360±30	calBC 485(13.5%)460 calBC 455(6.7%)435 calBC 430(0.8%)420 calBC 415(47.1%)385
Su-2477	Joensuu Varaslampi	19471:1318	2430±30	calBC 760(9.9%)720 calBC 540(58.3%)400
Hel-2185	Pieksämäen mlk Vemmellahti	–	6650±110	calBC 5740(95.4%)5360
Hel-2184	Pieksämäen mlk Vemmellahti	–	5160±100	calBC 4220(2.8%)4200 calBC 4050(65.4%)3790
Hel-2183	Pieksämäen mlk Vemmellahti	–	2310±110	calBC 800 (1.5%)700 calBC 550(66.7%)200
Hel-3187	Pielavesi Meijerinkangas	–	1910±110	calBC 40(68.2%)240 calAD
Hel-3186	Pielavesi Meijerinkangas	–	modern	–
Hel-3058	Pielavesi Meijerinkangas	–	4880±100	calBC 3790(52.7%)3620 calBC 3590(15.5%)3520
Hel-3671	Ristiina Kitulansuo d	–	550±90	calAD 1300(35.9%)1370 calAD 1380(32.3%)1440
Hel-3672	Ristiina Kitulansuo d	–	530±80	calAD 1300(28.8%)1370 calAD 1380(39.4%)1450
Le-5093	Ristiina Kitulansuo d	–	2460±60	calBC 760(22.4%)680 calBC 670(8.8%)630 calBC 600(3.5%)570 calBC 560(21.0%)480 calBC 470(12.5%)410
Hel-3836	Ristiina Kitulansuo d	–	2170±90	calBC 360(68.2%)110
Hel-3837	Ristiina Kitulansuo d	–	1530±80	calAD 430(68.2%)610
Hel-4149	Ristiina Kitulansuo d	–	320±70	calAD 1480(68.2%)1650

The River Kymijoki Water System

Lab.code	Site	NM-number	Date	calBC-calAD
Hel-3056	Kinnula Häähkäniemi	–	5000±120	calBC 3950(64.6%)3690 calBC 3680(3.6%)3660
Hel-3055	Korpilahti Raidanlahti	–	110±90	calAD 780(2.6%)800 calAD 810(65.6%)1020
Hel-127	Korpilahti Raidanlahti	14130:51	5240±190	calBC 4350(68.2%)3800
Hel-425	Pihtipudas Kumpulainen	16345:23	2420±100	calBC 760(18.9%)680 calBC 670(6.7%)630 calBC 600(2.6%)570 calBC 560(40.0%)390

Varsinais-Suomi

Lab.code	Site	NM-number	Date	calBC-calAD
Hel-3306	Paimio Toispuolojanummi	–	2970±120	calBC 1380(5.3%)1330 calBC 1320(62.9%)1010
Hel-3572	Kaarina Hulkkio, alue B	–	1820±100	calAD 80(68.2%)340
Hel-3214	Kaarina Hulkkio, alue A	–	2580±110	calBC 840(68.2%)510
Hel-3215	Kaarina Hulkkio, alue A	–	1620±100	calAD 260(3.5%)280 calAD 330(64.7%)560
Hel-1577	Salo Ketohaka 1 [1]	–	2670±100	calBC 100(66.9%)760 calBC 680(1.3 %)660

Uusimaa

Lab.code	Site	NM-number	Date	calBC-calAD
Hel-4094	Porvoo Böle	–	2870±100	calBC 1220(68.2%)900
Hel-4095	Porvoo Böle	–	2200±90	calBC 390(68.2%)160
Hel-4096	Porvoo Böle	–	2290±90	calBC 490(2.0%)460 calBC 450(0.9%)440 calBC 420(65.4%)170
Hel-4097	Porvoo Böle	–	2230±80	calBC 390(68.2%)200

[1] Together 21 carbon-14 dates have been published in Ketohaka 1 (Uino 1986:Table 3:5) dating from calBC 1000 to calAD 640. The great majority of dates fall to the first half of I millennium calAD.

Appendix 9a. Bronze axes in Finland and on the Karelian Isthmus. Date refers to the Scandinavian Bronze Age chronology presented by Montelius.

Area	Parish	Find place	NM-number	NM-subnumber	Type	Date	Context	Notes
North Lapland	Inari	Lusmasaari	8724	0	Seima	II	cache	Tallgren 1926:78
S Ostrobothnia	Mietoinen	Rauvola	19990	0	Flanged axe	I	stray find	Edgren 1981:24–28
S Ostrobothnia	Jepua	Jungar	20650	0	Mälar	IV	stray find	Miettinen, M. 1984
S Ostrobothnia	Laihia	Kyläpää	0	0	Mälar	IV	lost	Hackman 1897:389
S Ostrobothnia	Jepua	Asplandet	26618	0	Seima	II	stray find	Miettinen 1994b: 7
Saimaa WS	Lapinlahti	Jokiniemi	18351	0	Maaninka	III	stray find	Edgren 1981:22–24
Saimaa WS	Lieksa	Viekijärvi	11313	0	Maaninka	III	offering find?	Kivikoski 1942:22
Saimaa WS	Maaninka	Halola	5311	0	Maaninka	III	stray find	Hackman 1910b:6
Saimaa WS	Pielavesi	Taipale	10815	0	Seima	II	stray find	Hackman 1900:55; Tallgren 1911:72
Karelian isthmus	Kaukola	Rokosina	2535	0	Mälar	IV	unknown	Hackman 1897:390
Karelian isthmus	Valkjärvi	Uusikylä	2298	193	Mälar/Skandau	IV	stray find	Hackman 1897:390
Kokemäenjoki WS	Harjavalta	Taalperi	0	0	Socketed axe	I	lost	Tallgren & Lindelöf 1916:156
Kokemäenjoki WS	Kiukainen	Panelia	3361	0	Flanged axe	I	stray find	Hackman 1897:405
Kokemäenjoki WS	Rauma	Vermuntila	5235	0	Flanged axe	I	unknown	Tallgren & Lindelöf 1916:157
Kokemäenjoki WS	Lappi TL	Alakieri	10750	0	Flanged axe	I	stray find	Kivikoski 1942:25
Kokemäenjoki WS	Kiukainen	Panelia	19438	0	Socketed axe	I	stay find	Edgren 1975:26-29
Kokemäenjoki WS	Tottijärvi	Laukko	10811	0	Maaninka	III	stray find	Kivikoski 1942:22
Kokemäenjoki WS	Harjavalta	Taalperi	4123	0	Mälar	IV	cairn	Tallgren 1906b:43
Kokemäenjoki WS	Kiukainen	Toriseva	6690	0	Mälar	IV	stray find	Tallgren & Lindelöf ; 1916:156 Hackman 1916:tafel 9f
Kokemäenjoki WS	Nakkila	Järviranta	2151	572	Mälar/Skandau	IV	stray find from dried lake	Hackman 1897:384
Kokemäenjoki WS	Laukaa	Simuna	10551	0	Seima	II	stray find	Hackman 1897:394
Kokemäenjoki WS	Noormarkku	Teinpaka	3033	0	Seima	II	stray find	Hackman 1897:385
Varsinais-Suomi	Maaria	Haihu	9685	0	Ananino	V	stray find	Tallgren 1933:18
Varsinais-Suomi	Kimito	Tjuda	10816	0	Flanged axe	I	refuse heap; fragment	Tallgren 1906:47
Varsinais-Suomi	Lieto/Kaarina	Littoinen	10876	0	Flanged axe	III	stray find	Hackman 1897:382
Varsinais-Suomi	Masku	–	3699	2	Flanged axe	I	secondary find place	Hackman 1899:81

Area	Parish	Find place	NM-number	NM-subnumber	Type	Date	Context	Notes
Varsinais-Suomi	Laitila	Suontaka	4014	0	Flanged axe	I	stray find	Hackman 1900:58
Varsinais-Suomi	Paimio	Helsberg	4014	2	Socketed axe	I	copy; stray find	Hackman 1900:60
Varsinais-Suomi	Perniö	Paarskylä	2025	10	Flanged axe	I	stray find	Hackman 1897:379
Varsinais-Suomi	Perniö	Asteljoki	12069	0	Flanged axe	I	stray find from the garden	Meinander 1954b:213
Varsinais-Suomi	Sauvo	–	8052	0	Flanged axe	I	stray find from new cemetery	Hackman 1925:24
Varsinais-Suomi	Turku	Pahaniemi	11678	0	Flanged axe	I	stray find	Meinander 1954b:61
Åland	Finström	Törnebolstad	Mariehamn 29	0	Flanged axe	I	stray find	Meinander 1954b:210
Varsinais-Suomi	Halikko	–	5512	21	Socketed axe	I	unknown	Hackman 1897:377
Varsinais-Suomi	Laitila	Suontaka	Pori 3351	0	Socketed axe	I	cairn?	Hackman 1900
Varsinais-Suomi	Paimio	Maljamäki	9830	0	Socketed axe	I	stray find	Kivikoski 1936:56
Varsinais-Suomi	Laitila	Soukainen	30867	0	Flanged axe	I	stray find	–
Varsinais-Suomi	Perniö	Ketunpyöli	10920	0	Socketed axe	I	field	Kivikoski 1942:24
Varsinais-Suomi	Perniö	Kantola	12022	0	Socketed axe	I	natural stoneheap?	Meinander 1954b:212
Varsinais-Suomi	Turku	Pahaniemi	14705	0	Socketed axe	I	cairn	Meinander 1954b:216
Varsinais-Suomi	Uskela	Kivihaka	9305	0	Socketed axe	I	stray find	Meinander 1954b:214
Varsinais-Suomi	Paimio	Oinila	10454	0	Maaninka	III	stray find	Kivikoski 1936:53
Varsinais-Suomi	Kimito	–	800	0	Mälar	IV	unknown	Hackman 1897:382
Varsinais-Suomi	Västanfjärd	Norkulla Östanå	11588	0	Mälar	IV	stray find from the fields	Meinander 1954b:212
Uusimaa	Karjaa	Heimo	11644	0	Flanged axe	–	stray find when ploughing	Meinander 1954b:224
Uusimaa	Porvoo mlk	Finnby (a)	3502	0	Flanged axe	–	offering find	Hackman 1900:53
Uusimaa	Porvoo mlk	Finnby (b)	3502	0	Flanged axe	–	offering find	Hackman 1900:50
Uusimaa	Snappertuna	Björnböle	10783	0	Flanged axe	–	stray find from the fields	Kivikoski 1942:21
Varsinais-Suomi	Dragsfjärd	Hammarboda	1910	0	Socketed axe	I	cairn	Hackman 1897:375f
Uusimaa	Inkoo	Gårdsböle	4806	2	Socketed axe	I	stray find	Sturms 1932:253
Uusimaa	Inkoo	Kalkulla	4806	0	Socketed axe	I	unknown	Hackman 1897:380
Uusimaa	Sipoo	Nickby	10046	0	Socketed axe	I	stray find	Kivikoski 1936:57
Uusimaa	Lohja	Jalassaari	8330	0	Mälar	IV	stray find	Meinander 1954b:224
Åland	Sund	Brännbolstad	8334	0	Flanged axe	I	stay find	Hansson 1927:tafel 43
Åland	Saltvik	Bertby	Mariehamn 106	0	Mälar	IV	stray find from the fields	Drejer 1939/3:18
Åland	Sund	–	8940	0	Mälar	IV	stray find	Meinander 1954b:210

Appendix 9b. Casting moulds and crucibles in Finland and on the Karelian Isthmus.

Area	Parish	Find Place	NM-number	NM-sub-numbers	Type	Material	Notes
Kemijoki WS	Kemi	Ala-Paakkola	PPM 336		a mould for a Mälar axe	soapstone	Hackman 1903:1; Tallgren 1910:20
Kemijoki WS	Kemijärvi	Neitilä 4	15671	1299	4 mould fragments for an Ananino axe	soapstone	Meinander 1969:53 Huurre 1983:268
Kemijoki WS	Rovaniemi	Suopajärvi	14087	1,2,28	mould fragments for a Mälar axe	soapstone	Huurre 1983:266–267
Kemijoki WS	Salla	Naruska	7162	3	partly worked mould fragment	clay	Huurre 1983:269
Kemijoki WS	Ylitornio	Krunniniva	2160		mould for an Ananino axe	soapstone	Hackman 1897:398; Tallgren 1911:49
Oulujoki WS	Hyrynsalmi	Vonkka II	15393	611	fragments of a mould for an Ananino axe	soapstone	Meinander 1969:52
Oulujoki WS	Kuhmo	Sylväjänniemi	20903	102	crucible	clay	main catalogue
Oulujoki WS	Muhos	Halonen	17646	147	small fragments of crucible	clay	main catalogue
Oulujoki WS	Muhos	Tahvola	3045	37	an half of a mould for an Ananino axe	soapstone	Hackman 1897:397
Oulujoki WS	Sotkamo	Kiikarusniemi	22198	422	crucible	clay	Huurre 1986:102–103
Oulujoki WS	Suomussalmi	Jalonniemi	20809	1	an unfinished mould fragment	soapstone	Huurre, main catalogue
Oulujoki WS	Suomussalmi	Jalonniemi	21034	1	an unfinished mould fragment	soapstone	Huurre 1982:24
Oulujoki WS	Suomussalmi	Jalonniemi	21034	2	an unfinished mould fragment	soapstone	Huurre 1982:24
Oulujoki WS	Suomussalmi	Jalonniemi	21034	3	a fragment of a casting hearth	soapstone	Huurre 1982:24; 1983:484
Oulujoki WS	Suomussalmi	Joenniemi	20375	1	Ananino mould	soapstone	Huurre 1982:24
Oulujoki WS	Suomussalmi	Joenniemi	22003	1	mould fragment	soapstone	Huurre 1986:105
Oulujoki WS	Suomussalmi	Joutenniemi	21737	1	crucible	volcanic rock with feldspar inclusions	main catalogue
Oulujoki WS	Suomussalmi	Kallio	28993	1	unfinished	soapstone	main catalogue
Oulujoki WS	Suomussalmi	Kalmosärkkä	14830	1696	mould fragment for an unknown artefact	soapstone	Huurre 1982:25
Oulujoki WS	Suomussalmi	Kalmosärkkä	14830	990	crucible	clay	Huurre 1986:102–103
Oulujoki WS	Suomussalmi	Kellolaisten tuli	14831	725	a mould fragment for a brooch	soapstone	Huurre 1986:105
Oulujoki WS	Suomussalmi	Kellolaisten tuli	20792	3	fragments of a crucible?	clay	main catalogue
Oulujoki WS	Suomussalmi	Kellolaisten tuli	21017	6	fragments of a crucible?	clay	main catalogue
Oulujoki WS	Suomussalmi	Kellolaisten tuli	22066	17	fragments of a crucible?	clay	main catalogue

Area	Parish	Find Place	NM-number	NM-sub-numbers	Type	Material	Notes
Oulujoki WS	Suomussalmi	Kukkosaari	20400	24	a mould for an axe	soapstone	Huurre 1982:24 1982:24
Oulujoki WS	Suomussalmi	Kukkosaari	20593	230	an unfinished mould fragment	soapstone	Huurre 1982:24
Oulujoki WS	Suomussalmi	Kukkosaari	24236	2	an unfinished fragment (unclear)	soapstone	main catalogue
Oulujoki WS	Suomussalmi	Maikonsärkkä	20442	1	a mould for an Ananino axe	soapstone	Huurre 1982:24
Oulujoki WS	Suomussalmi	Maikonsärkkä	20414	11	fragments of crucibles?	clay	main catalogue
Oulujoki WS	Suomussalmi	Mikonsärkkä	21018	3	fragment of a crucible?	clay	main catalogue
Oulujoki WS	Suomussalmi	Mikonsärkkä	22065	10	a fragment of a crucible (unclear)	clay	main catalogue
Oulujoki WS	Suomussalmi	Mikonsärkkä	22065	9	an unfinished mould fragment	soapstone	Huurre 1986:105
Oulujoki WS	Suomussalmi	Peuronhieta	25064	1	mould fragment	soapstone	Huurre 1986:105
Oulujoki WS	Suomussalmi	Peuronhieta	25064	2	mould fragment	soapstone	Huurre 1986:105 1986:105
Oulujoki WS	Suomussalmi	Peuronkorpi	24237	1	mould fragment	soapstone	Huurre 1986:105
Oulujoki WS	Suomussalmi	Putikka	20374	2	a mould for a knife	soapstone	Huurre 1986:105
Oulujoki WS	Suomussalmi	Putikka	20804	1	mould fragment	schist	Huurre 1986:105
Oulujoki WS	Suomussalmi	Salmenniemi (Alajärvi)	12671	1,2	a mould for a Mälar axe	soapstone	Meinander 1954b:228; Huurre 1982:23
Oulujoki WS	Suomussalmi	TB:n ranta	20417	1	a mould for an Ananino axe	soapstone	Huurre 1986:105
Oulujoki WS	Suomussalmi	TB:n ranta	20417	2	a fragment of a mould for an adze	sopastone	Huurre 1986:105
Oulujoki WS	Suomussalmi	TB:n ranta	20417	3	a fragment of a mould for an adze	soapstone	Huurre 1986:105
Oulujoki WS	Suomussalmi	Vanha Kirkkosaari	21031	4	an unfinished fragment of axe mould (unclear)	soapstone	Huurre 1986:105
Oulujoki WS	Utajärvi	Pikkarainen	18562	106,119	fragments of crucibles	clay (talc & asbestos)	Huurre 1991a:42
Oulujoki WS	Vaala	Järventaka	7619	32	a mould for an unknown artefact	clay	Huurre 1986:105
Oulujoki WS	Vaala	Sillankorva	2378	36	a mould fragment for a necklace	clay (feldspar temper)	Huurre 1986:105
Oulujoki WS	Vaala	Sillankorva	3147	19–21	moulds for an Ananino axe	clay (asbestos temper)	Hackman 1897:395; Ailio 1909:185
Oulujoki WS	Vaala	Sillankorva	4080	12	a mould fragment for a necklace	clay (feldspar temper)	Huurre 1986:105
Oulujoki WS	Vaala	Sillankorva	4080	12	moulds for an Ananino axe	clay	Ailio 1913:12; Tallgren 1911:13

Area	Parish	Find Place	NM-number	NM-sub-numbers	Type	Material	Notes
S Ostrobothnia	Laihia	Nikonkallio	10857	6	a fragment for a stick or a crucible?	clay	Meinander 1943:41; 1950:56
S Ostrobothnia	Laihia	Viirikallio	24366	97	a fragment of crucible	clay	Miettinen, M. 1994a
S Ostrobothnia	Laihia	Viirikallio	24366	33,100	an unsure mould fragment	clay	Miettinen, M. 1994a
Saimaa WS	Iisalmi	Jysmä	17296	1	a fragment of a mould for an Ananino axe	soapstone	Meinander 1969:52
Saimaa WS	Ilomantsi	Kiukoila	11140	3	a mould for an adze	soapstone	Vikkula 1991:58
Saimaa WS	Ilomantsi	Mekrijärvi	11140	3	an half of a mould for a spearhead of Ananino type	soapstone	Äyräpää 1941:11
Saimaa WS	Joensuu	Varaslampi	19471	303	mould fragment	clay	Lavento 1997a
Saimaa WS	Joensuu	Varaslampi	19471	636	mould fragment	clay	Lavento 1997a
Saimaa WS	Joensuu	Varaslampi	19471	932	mould fragment	clay	Lavento 1997a
Saimaa WS	Liperi	Juvonen	14554	8	a fragment of a crucible	schist, heavily burnt	Meinander 1969:59
Saimaa WS	Parikkala	Kaunissaari	5176	14	a fragment for a tube-like ferrule	soapstone	Äyräpää 1934:49; Tallgren 1934:47
Karelian Isthmus	Kurkijoki	Kuuppala	10872	104	crucible	clay	
Karelian Isthmus	Räisälä	Kalmistonmäki	2845	8	a mould fragments for an Ananino axe	clay	Tallgren 1914:11; 1934:41; 1937:23
Karelian isthmus	Räisälä	Kalmistonmäki	6675	1,5,7,20, 22,38,64	fragments of pipe-formed moulds	clay	Tallgren 1935:42–47
Kymijoki WS	Asikala	Kotasaari	18141	260,276, 304,311	small mould fragments	clay	main catalogue
Kymijoki WS	Asikkala	Kotasaari	18141	15,108, 123,141	mould fragments for small implements	clay	main catalogue
Kymijoki WS	Asikkala	Kotasaari	18141	321	small fragments	clay	main catalogue
Kymijoki WS	Kivijärvi	Kujanpää	3625	14	mould fragment	soapstone?	main catalogue
Kokemäenjoki WS	Eura	Luistari	18000	3052	a mould for a necklace?	clay	Salo 1981:98–99
Kokemäenjoki WS	Harjavalta	Kaunismäki	11594	83,79,264	clay	clay	Meinander 1954b:220
Kokemäenjoki WS	Loppi	Makasiininmäki	23549	461,462	–	clay	
Kokemäenjoki WS	Nakkila	Rieskaronmäki		SatM 16454:58	crucible	clay	Salo 1970:30–34, 112–113; 1981:281
Kokemäenjoki WS	Nakkila	Rieskaronmäki	16454	8,50,52, 55,57,59	a mould for a necklace?	clay	Salo 1970:30–34, 112–113; 1981:281
Kokemäenjoki WS	Pälkäne	Hylli	14545	213,214,215, 269,306	moulds for brooches and other small implements	clay	main catalogue
Kokemäenjoki WS	Pälkäne	Hylli	14545	93,189	moulds for small implements	sandstone and clay	main catalogue

Area	Parish	Find Place	NM-number	NM-sub-numbers	Type	Material	Notes
Varsinais-Suomi	Lieto	Vanhalinna	14644	2085	mould fragments	clay	Luoto 1984:126
Varsinais-Suomi	Lieto	Vanhalinna	17471	237	mould fragments	clay	Luoto 1984:126
Varsinais-Suomi	Lieto	Vanhalinna	77	166,357	mould fragments	clay	Luoto 1984:126
Varsinais-Suomi	Lieto	Vanhalinna	84	237	mould fragments	clay	Luoto 1984:126

Appendix 9c. Straight-based arrowheads in Finland and on the Karelian Isthmus. Some implements mentioned in the list are so large that they have more probably been used as spearheads (see footnotes).

Area	Parish	Find place	NM-number	Subnumber	Material
Kemijoki WS	Enontekiö	Jiettajoen suu	26773	1	quartzite
Kemijoki WS	Enontekiö	Muotkajavri	25041	1	quartzite
Kemijoki WS	Enontekiö	Ounistieva	26755	20	quartz
Kemijoki WS	Enontekiö	Pöyrisjärvi	20131	1	quartzite
Kemijoki WS	Enontekiö	Saamenmuseo	25690	148	quartz
Kemijoki WS	Enontekiö	Saamenmuseo	25690	183	quartzite
Kemijoki WS	Enontekiö	Saamenmuseo	25690	186	quartz
Kemijoki WS	Enontekiö	Tsahkaljohka	25174	1	quartzite
Kemijoki WS	Inari	–	28833	1	quartzite
Kemijoki WS	Inari	–	2012	5	quartzite
Kemijoki WS	Inari	Edlihjärvi	23252	1[1]	quartzite
Kemijoki WS	Inari	Harrisuvanto	10907		quartzite
Kemijoki WS	Inari	Kaamanen	20864	1	quartzite
Kemijoki WS	Inari	Kirakkapuro	23710	1	quartzite
Kemijoki WS	Inari	Kolessaari (Paatsjoki)	4438		quartzite
Kemijoki WS	Inari	Lahdenmäki	14878	1	quartzite
Kemijoki WS	Inari	Nellim	14878	3	schist
Kemijoki WS	Inari	Nellim	14897	1	quartzite
Kemijoki WS	Inari	Nellim	14897	10	quartzite
Kemijoki WS	Inari	Nellim	14897	11	quartzite
Kemijoki WS	Inari	Nellim	14897	12	quartzite
Kemijoki WS	Inari	Nellim	14897	13	quartzite
Kemijoki WS	Inari	Nellim	14897	14	quartzite
Kemijoki WS	Inari	Nellim	14897	15	flint
Kemijoki WS	Inari	Nellim	14897	16	flint
Kemijoki WS	Inari	Nellim	14897	2	quartzite
Kemijoki WS	Inari	Nellim	14897	22	schist
Kemijoki WS	Inari	Nellim	14897	3	quartzite
Kemijoki WS	Inari	Nellim	14897	4	quartzite
Kemijoki WS	Inari	Nellim	14897	5	quartzite
Kemijoki WS	Inari	Nellim	14897	6	quartzite
Kemijoki WS	Inari	Nellim	14897	7	quartzite
Kemijoki WS	Inari	Nellim	14897	8	quartzite
Kemijoki WS	Inari	Nellim	14897	9	quartzite
Kemijoki WS	Inari	Nellim	14999	1	quartzite
Kemijoki WS	Inari	Nellim	14999	2	quartzite
Kemijoki WS	Inari	Paatsjoen luusua	19428	165	quartzite
Kemijoki WS	Inari	Palttoniemi	7259		flint
Kemijoki WS	Inari	Selkäjärvi	26733	1[2]	quartzite
Kemijoki WS	Inari	Toivoniemi	9125	12	quartzite
Kemijoki WS	Inari	Tshurnavuono	4067[3]		flint
Kemijoki WS	Inari	Uulahden suu	26820	20	chert
Kemijoki WS	Inari	Uulahden suu	26820	21	quartzite
Kemijoki WS	Inari	Uulahden suu	26820	22	quartzite
Kemijoki WS	Inari	Vaskojoen suu	24359	2	quartzite
Kemijoki WS	Kemijärvi	Haveri	15043	224	quartz
Kemijoki WS	Kemijärvi	Haveri	15191	118	quartz

Area	Parish	Find place	NM-number	Subnumber	Material
Kemijoki WS	Kemijärvi	Haveri	15191	207	quartz
Kemijoki WS	Kemijärvi	Haveri	15191	620	flint
Kemijoki WS	Kemijärvi	Hietalahti	15667	349	flint
Kemijoki WS	Kemijärvi	Koivusaari	16107	189	quartz
Kemijoki WS	Kemijärvi	Koivusaari	16107	190	quartz
Kemijoki WS	Kemijärvi	Neitilä 1a	16489	5	flint
Kemijoki WS	Kemijärvi	Neitilä 1a	16489	63	quartzite
Kemijoki WS	Kemijärvi	Neitilä 4	16145	1204	quartz
Kemijoki WS	Kemijärvi	Neitilä 4	16145	2133	quartz
Kemijoki WS	Kemijärvi	Neitilä 4	16145	312	quartz
Kemijoki WS	Kemijärvi	Neitilä 4	16553	1349	quartz
Kemijoki WS	Kemijärvi	Neitilä 4	16553	1825	flint
Kemijoki WS	Kemijärvi	Neitilä 1a/b	15669	334	flint
Kemijoki WS	Kemijärvi	Revässaari	25545	1	quartz
Kemijoki WS	Kittilä	Rauhala	24848	133	quartz
Kemijoki WS	Posio	Kynsiperä Valkeinen	15447	1	quartzite
Kemijoki WS	Posio	Mauno		PPM 2973	flint
Kemijoki WS	Rovaniemi	Hakaluoma	13545	3	quartz
Kemijoki WS	Rovaniemi	Niskanperä 1	14699	3175	flint
Kemijoki WS	Rovaniemi	Niskanperä 1	14699	3181	flint
Kemijoki WS	Rovaniemi	Nuorajärvi	16092	1	quartzite
Kemijoki WS	Rovaniemi	Oikarainen	15307	1	quartzite
Kemijoki WS	Rovaniemi	Suopajärvi	14087	3	quartz
Kemijoki WS	Rovaniemi	Vätynginniemi	1126	1	flint
Kemijoki WS	Rovaniemi	Kenttälahti	24626	1	quartz
Kemijoki WS	Sodankylä	Poikamella	27674	1328	quartzite
Kemijoki WS	Sodankylä	Poikamella	27674	1692	quartz
Kemijoki WS	Sodankylä	Poikamella	27674	551	quartz
Kemijoki WS	Tornio	Aapajärvi	11709	1	flint
Kemijoki WS	Utsjoki	Ala-Jalve	18899	13	quartzite
Kemijoki WS	Utsjoki	Ala-Jalve	21749	6	quartzite
Kemijoki WS	Utsjoki	Ala-Jalve	21835	1	quartzite
Kemijoki WS	Utsjoki	Kenesjärvi	18974	27	quartzite
Kemijoki WS	Utsjoki	Kenesjärvi	24401	3	quartzite
Kemijoki WS	Utsjoki	Kenesjärvi	25388	15	quartzite
Kemijoki WS	Utsjoki	Kenesjärvi	25388	58	quartzite
Kemijoki WS	Utsjoki	Kenesjärvi	25388	93	quartzite
Kemijoki WS	Utsjoki	Tenon silta	26603	308	quartzite
Kemijoki WS	Utsjoki	Tsuoggalompola	24407	1[4]	quartzite
Oulujoki WS	Hyrynsalmi	Nahkaniva	15084	3	quartz
Oulujoki WS	Hyrynsalmi	Niskanpuro	23480	1	quartzite
Oulujoki WS	Kajaani	Jormuanlahti	20478	1	flint
Päijänne WS	Kivijärvi	Muhola	3625	11	quartz
Oulujoki WS	Kuhmo	Kieliö	20844	1	quartz
Oulujoki WS	Kuhmo	Papinlahti	21518	1	flint
Oulujoki WS	Kuhmo	Ukonniemi	29050	1	flint
Oulujoki WS	Muhos	Halonen	17646	165	quartz
Oulujoki WS	Muhos	Halonen	17646	166	quartz
Oulujoki WS	Muhos	Halonen	17646	182	quartz
Oulujoki WS	Muhos	Halonen	17646	95	quartzite

Area	Parish	Find place	NM-number	Subnumber	Material
Oulujoki WS	Muhos	Honkala	3871	18	flint
Päijänne WS	Ruovesi	Kärkelänniemi	3500		quartz
Oulujoki WS	Sotkamo	Lahdenlouhi	17985	1	quartz
Oulujoki WS	Suomussalmi	Jalonniemi	23057	13	flint
Oulujoki WS	Suomussalmi	Jalonniemi	24418	97	quartz
Oulujoki WS	Suomussalmi	Joenniemi	20801	1	flint
Oulujoki WS	Suomussalmi	Joenniemi	23701	59	quartzite
Oulujoki WS	Suomussalmi	Joutenniemi	26324	1	flint
Oulujoki WS	Suomussalmi	Kalmosärkkä	14830	1270[5]	flint
Oulujoki WS	Suomussalmi	Kalmosärkkä N	14504	327	flint
Oulujoki WS	Suomussalmi	Kalmosärkkä N	14504	350	flint
Oulujoki WS	Suomussalmi	Kalmosärkkä N	14504	526	flint
Oulujoki WS	Suomussalmi	Kalmosärkkä N	14830	1332	quartz
Oulujoki WS	Suomussalmi	Kalmosärkkä N	14830	1385	quartz
Oulujoki WS	Suomussalmi	Kalmosärkkä N	14830	1458	quartz
Oulujoki WS	Suomussalmi	Kalmosärkkä N	14830	1502	quartz
Oulujoki WS	Suomussalmi	Kalmosärkkä N	14830	1577	quartz
Oulujoki WS	Suomussalmi	Kalmosärkkä N	14830	456	flint
Oulujoki WS	Suomussalmi	Kalmosärkkä N	14830	517	flint
Oulujoki WS	Suomussalmi	Kalmosärkkä S	14829	274	flint
Oulujoki WS	Suomussalmi	Kellolaisten tuli I	14831	1491[6]	flint
Oulujoki WS	Suomussalmi	Kellolaisten tuli I	14505	27	flint
Oulujoki WS	Suomussalmi	Kellolaisten tuli I	14831	1516	flint
Oulujoki WS	Suomussalmi	Kellolaisten tuli I	14831	696	flint
Oulujoki WS	Suomussalmi	Kellolaisten tuli I	14831	819	flint
Oulujoki WS	Suomussalmi	Kukkosaari	20806	1	flint
Oulujoki WS	Suomussalmi	Kukkosaari	20806	18	quartzite
Oulujoki WS	Suomussalmi	Mikonsärkkä	18322	840	quartz
Oulujoki WS	Suomussalmi	Mikonsärkkä	21018	18	flint
Oulujoki WS	Suomussalmi	Mäkelän ranta	14836	2	quartz
Oulujoki WS	Suomussalmi	Salmenniemi	15053	1[7]	schicht
Oulujoki WS	Suomussalmi	Salonsaari	20376	2	flint
Oulujoki WS	Suomussalmi	TB:n ranta	20417	1	quartz
Oulujoki WS	Suomussalmi	TB:n ranta	23329	4	flint
Oulujoki WS	Suomussalmi	TB:n ranta	23831	1	quartzite
Oulujoki WS	Suomussalmi	Tormua	18322	14	quartz
Oulujoki WS	Suomussalmi	Tormua	18322	656	quartz
Oulujoki WS	Suomussalmi	Tormua	18322	762	quartz
Oulujoki WS	Suomussalmi	Vanha kirkkosaari	25708	720	quartzite
Oulujoki WS	Suomussalmi	Vanha kirkkosaari	20394	3	flint
Päijänne WS	Viitasaari	Rajaniemi	13010		flint
S Ostrobothnia	Alahärmä		7817		quartz
S Ostrobothnia	Alajärvi	Koppelonmäki	13085		flint
S Ostrobothnia	Alavieska	Lamminniemi	9730	PHM 956	quartz
S Ostrobothnia	Jepua	Asplandet	26618	2	flint
S Ostrobothnia	Kalajoki	Alakääntä	10859		quartzite
S Ostrobothnia	Kruunupyy	Kvänjälan	9922	1	quartz
S Ostrobothnia	Kuortane			HäM 1191:51	flint
S Ostrobothnia	Kurikka	Keski-Jyrä	14713	1	quartz
S Ostrobothnia	Lestijärvi	Ranta	21539	2	flint

Area	Parish	Find place	NM-number	Subnumber	Material
S Ostrobothnia	Peräseinäjoki		23938	1[8]	quartzite
S Ostrobothnia	Pyhäjärvi			10002:4	quartz
S Ostrobothnia	Reisjärvi	Lokkiperä	20065	1	quartz
S Ostrobothnia	Veteli	Wilskman	2675	3	quartz
S Ostrobothnia	Ylistaro		0	Priv. coll.	quartz
Saimaa WS	Ilomantsi	Vaara	12852		flint
Saimaa WS	Kesälahti	Mustapohja	28937	7	flint
Saimaa WS	Kiuruvesi	Rapakkojoki	12059		flint
Saimaa WS	Lapinlahti	Leppälahti		KuM 5844	quartz
Saimaa WS	Leppävirta	Palosaari	24195	1	flint?
Saimaa WS	Liperi	Koivukumpu	22035	1	flint?
Saimaa WS	Maaninka	Leppälahti		KuM 5844	
Saimaa WS	Maaninka	Vianto	2023	104	quartz
Saimaa WS	Ristiina	Astuvansalmi	17636	2	quartz
Saimaa WS	Ristiina	Kitulansuo d	28112	7	quartzite
Saimaa WS	Siilinjärvi	Saunalahti		KuM 6251:1	flint
Saimaa WS	Tohmajärvi	Onkamo	10025	735	quartz
Karelian Isthmus	Kaukola	Olli Paavilaisen nököpelto	5164	12	flint
Karelian Isthmus	Kaukola	Lavamäki	5963	638	flint
Kymijoki WS	Sysmä	Vahittula	9802	1	quartz
Kokemäenjoki WS	Hämeenkyrö	Paukon pelto	2192	616	quartz
Kokemäenjoki WS	Hauho	Rukkoila	19387	1	quartz
Kokemäenjoki WS	Ikaalinen			SatM 10315	quartz
Kokemäenjoki WS	Kihniö	Ruohiosa	8847		flint
Kokemäenjoki WS	Kiukainen			SatM 16411	flint
Kokemäenjoki WS	Kiukainen			SatM 6334	quartz
Kokemäenjoki WS	Kiukainen	Panelia	10737	1	flint
Kokemäenjoki WS	Lapväärtti	Långängsbacken	7959	3	quartz
Kokemäenjoki WS	Ulvila	Tuohimaa	16411		flint
Varsinais-Suomi	Kisko	Karistonniitty	3684	28	flint
Varsinais-Suomi	Muurla		6548	1	flint
Varsinais-Suomi	Uskela			Priv. coll.	flint
Varsinais-Suomi	Uskela	Pukkila	11316	8	flint
Varsinais-Suomi	Vammala			HäM 1192:20	quartz
Varsinais-Suomi	Vammala	Haapakallio	10657	10	quartz
Varsinais-Suomi	Vammala	Haapakallio	10657	88	quartz
Varsinais-Suomi	Vammala	Kalliala	10401	1	flint
Uusimaa	Askola	Onkimaa	18947	9	quartz

[1] Spearhead.
[2] Spearhead.
[3] Perhaps a secondary product of a Stone Age arrowhead.
[4] Spearhead.
[5] Spearhead.
[6] Spearhead.
[7] Spearhead.
[8] Spearhead.

Appendix 10. Plates (1–25). Textile ceramics in Finland and on the Karelian Isthmus. Also some material from the Karelian Republic, St. Petersburg region, and Estonia are presented. The identification number given in parenthesis together with each sherd refers the numbering used in the SURVO database (App. 5). Also NM-numbers and subnumbers or local museum numbers are given. (Scale 1:1)

PLATE 1

a	Kemijärvi Hietalahti	15667:232 (2987)
b	Kemijärvi Hietalahti	15667:232 (2987)
c	Kemijärvi Juuniemi	14345:40 (3010)
d	Kuhmo Pajasaari	23700:199 (774)
e	Kuhmo Pajasaari	23700:218 (774)
f	Kuhmo Pajasaari	23700:218 (774)
g	Kuhmo Sylväjänniemi	20903:67 (823)
h	Kuhmo Sylväjänniemi	20903:39 (823)

PLATE 2

a	Kuhmo Sylväjänniemi	20903:39 (823)
b	Kuhmo Vasikkaniemi	25302:175 (792)
c	Sotkamo Kiikarusniemi	21482:91 (933)
d	Suomussalmi Joenniemi (1) and (2)	23701:452, 456, 457, 458, 460, 462, 463, (375)
e	Suomussalmi Kalmosärkkä	14504:147 (21)
f	Suomussalmi Kalmosärkkä	14504:182 (21)

PLATE 3

a	Suomussalmi Kalmosärkkä	The Kainuun museum
b	Suomussalmi Kalmosärkkä	14829:288 (59)
c	Suomussalmi Kalmosärkkä	14830:1115 (116)
d	Suomussalmi Kalmosärkkä	20413:3 (133)
e	Suomussalmi Kalmosärkkä	14830:1450 (114)
f	Suomussalmi Kalmosärkkä	20413:4 (134)

PLATE 4

a	Suomussalmi Kalmosärkkä	14830:1421 (93)
b	Suomussalmi Kalmosärkkä	14830:1634 (93)
c	Suomussalmi Kalmosärkkä	14830:1274 (180)
d	Suomussalmi Kalmosärkkä	14831:514 (185)
e	Suomussalmi Kalmosärkkä	14831:921 (179)
f	Suomussalmi Kalmosärkkä	14831:1274 (180)
g	Suomussalmi Kalmosärkkä	14831:1274 (180)

PLATE 5

a	Tormuan Särkkä	18322:996, 997 (321)
b	Tormuan Särkkä	18322:825 (339)

PLATE 6

a	Vaala	3147:15 (633)
b	Vaala	7620:141 (705)
c	Vaala	4080:57 (588)
d	Ilomantsi Syväys I	18200:36 (1110)
e	Ilomantsi Syväys I	18200:17 (1110)
f	Laihia Viirikallio	24366:88 (4527)
g	Laihia Viirikallio	24366:79 (4526)
h	Ilomantsi Suiponniemi	23382:83 (1169)
i	Joensuu Varaslampi	19471:171 (1189)
j	Joensuu Varaslampi	19471:155 (1189)

PLATE 7

a	Joensuu Varaslampi	19471:338 (1202)
b	Joensuu Varaslampi	19471:277 (1202)
c	Joensuu Varaslampi	19471:279 (1219)
d	Joensuu Varaslampi	19471:339 (1232)
e	Joensuu Varaslampi	19471:384 (1237)
f	Joensuu Varaslampi	19471:319 (1237)
g	Joensuu Varaslampi	19471:499 (1259)

PLATE 8

a	Joensuu Varaslampi	19471:530 (1275)
b	Joensuu Varaslampi	19471:714 (1367)
c	Joensuu Varaslampi	19471:782 (1260)
d	Joensuu Varaslampi	19471:838 (1307)
e	Joensuu Varaslampi	19471:836 (1309)
f	Joensuu Varaslampi	19471:985 (1277)
g	Joensuu Varaslampi	19471:1298 (1364)
h	Joensuu Varaslampi	19471:696 (1296)
i	Joensuu Varaslampi	19471:727 (1296)

PLATE 9

a	Kitee Turusenniemi	19254:9 (1534)
b	Kitee Turusenniemi	19254:9 (1534)
c	Parikkala Kaunissaari	5427:272 (1813)
d	Lieksa Vienansuunniemi	14690:1 (1584)
e	Pielavesi Meijerinkangas	26088:43 (4578)
f	Pielavesi Meijerinkangas	26088:43 (4578)
g	Puumala Pistohiekka b	25050:1 (1818)
h	Punkaharju Kulennoinen	17606:174 (1717)
i	Punkaharju Kulennoinen	17870:174 (1717)

PLATE 10

a	Polvijärvi Multavieru	18266:5 (1649)
b	Polvijärvi Multavieru	18266:6 (1649)
c	Polvijärvi Multavieru	23819:14 (1686)
d	Polvijärvi Multavieru	23819:15 (1686)
e	Ristiina Akanlahti	28542:4 (4942)
f	Ristiina Pulmionlampi	27382:8 (4617)
g	Ristiina Kitulansuo d	28641:298 (1855)
h	Ristiina Kitulansuo d	28541:601 (1859)

PLATE 11

a	Ristiina Kitulansuo d	28541:76 (1847)
b	Ristiina Kitulansuo d	28541:654 (1858)
c	Ristiina Kitulansuo d	28541:909 (1858)
d	Ristiina Kitulansuo d	28541:605 (1857)
e	Ristiina Kitulansuo d	28541:654 (1858)
f	Ristiina Kitulansuo d	28960:489 (4633)
g	Ristiina Kitulansuo d	28960:543 (4635)
h	Ristiina Kitulansuo d	28960:825 (4645)
i	Ristiina Kitulansuo d	28960:1027 (4640)
j	Ristiina Kitulansuo d	28960:1065 (4641)
k	Ristiina Kitulansuo d	28541:727 (1858)
l	Ristiina Kitulansuo d	28541:736 (1858)

PLATE 12

a	Rääkkylä Pörrinmökki	27195:891(1875)
b	Rääkkylä Pörrinmökki	27195:1217 (1874)
c	Rääkkylä Huotinniemi	27578:1 (1893)
d	Savonlinna Haukilahden pohja	27582:1 (1896)
e	Savonlinna Suvikangas	28324:1 (4659)
f	Taipalsaari Valkeasaari	17040:1 (1898)

PLATE 13

a	Kaukola H. Teräväisen rantapelto	5511:37 (4686)
b	Kaukola H. Teräväisen rantapelto	5563:19 (4687)
c	Kaukola H. Teräväisen rantapelto	7815:7 (4698)

d Kaukola
H. Teräväisen rantapelto 7815:7 (4698)
e Kaukola
H. Teräväisen rantapelto 7117:4 (4723)
f Kaukola Simo Iivosen nummi 6910:6 (4700)
g Kaukola Simo Iivosen nummi 6910:8 (4701)
h Kaukola
O. Paavilaisen nököpelto 5096:147 (4667)
i Kaukola
H. Teräväisen rantapelto 6191:17 (2621)
j Kaukola
Tiitunmäen kallionvieri 6191:15 (2620)
k Kaukola
Tiitunmäen kallionvieri 7815:7 (4732)
l Kaukola
Tiitunmäen kallionvieri 6191:15 (2618)

PLATE 14

a Kurkijoki Kuuppala 10872:71 (2927)
b Räisälä Kalmistonmäki 6675:35 (2068)
c Räisälä Kalmistonmäki 6675:34 (2061)
d Räisälä Kalmistonmäki 6675:34 (2061)
e Räisälä Kalmistonmäki 6675:72 (2068)
f Räisälä Kalmistonmäki 6675:45 (2960)
g Räisälä Kalmistonmäki 6675:9 (2964)
h Räisälä Kalmistonmäki 6675:9 (2964)
i Räisälä Kalmistonmäki 6675:54 (2959)

PLATE 15

a Iiitti Keidas 18043:2 (1913)
b Iiitti Keidas 18043:2 (1913)
c Asikkala Kotasaari 15466:34 (3134)
d Asikkala Kotasaari 15789:32 (3167)
e Asikkala Kotasaari 15466:35 (3135)
f Asikkala Kotasaari 15466:33 (3135)
g Asikkala Kotasaari 15466:149 (3141)
h Asikkala Kotasaari 15466:149 (3141)
i Asikkala Kotasaari 15466:149 (3141)
j Asikkala Kotasaari 15789:5 (3162)
k Asikkala Kotasaari 15789:33 (3168)
l Asikkala Kotasaari 18141:252 (4204)
m Asikkala Kotasaari 15466:127 (3181)
n Asikkala Kotasaari 18141:252 (3204)

PLATE 16

a Pihtipudas Madeneva 13887:98 (3328)
b Kinnula Häähkäniemi 25804:409 (3297)
c Kinnula Häähkäniemi 25804:406 (3297)
d Kinnula Häähkäniemi 25804:409 (3297)
e Korpilahti Raudanlahti 25198:2 (3303)
f Korpilahti Raudanlahti 25198:3 (3304)
g Nastola Kovalahti 26605:85 (3315)
h Nastola Kovalahti 26605:85 (3315)
i Nastola Kovalahti 26605:20 (3313)
j Nastola Kovalahti 26605:52 (3315)
k Saarijärvi Summassaari 23702:120 (3416)

PLATE 17

a Kangasala Pohtio 13433:166 (3553)
b Kangasala Pohtio 13433:166 (3553)
c Kangasala Pohtio 7757:59 (3511)
d Kangasala Pohtio 17104:426 (3798)
e Kangasala Pohtio 17104:426 (3798)
f Kangasala Pohtio 7757:13 (3511)
g Kangasala Pohtio 7757:11 (3511)

PLATE 18

a Kangasala Pohtio 7757:45 (3520)
b Kangasala Pohtio 7757:45 (3520)
c Kangasala Pohtio 7757:45 (3520)
d Kangasala Pohtio 7757:38 (3516)
e Kangasala Pohtio 17340:115 (3570)
f Kangasala Sepänjärvi 9604:7 (3487)
g Kangasala Sepänjärvi 9604:7 (3487)
h Kangasala Sepänjärvi 9604:7 (3487)
i Kangasala Sepänjärvi 17131:683 (4173)
j Kangasala Sepänjärvi 9604:77 (3505)
k Kangasala Sepänjärvi 9604:74 (3503)
l Kangasala Sepänjärvi 9604:36 (3486)

PLATE 19

a Laitila Lalla 19265:40 (4354)
b Laitila Lalla 19404:10 (4370)
c Laitila Lalla 19265:78 (4357)
d Laitila Lalla 19265:98 (4368)
e Laitila Lalla 19265:78 (4357)
f Muurla Haansyrjänpelto 15916:1 (4381)
g Muurla Haansyrjänpelto 15916:1 (4381)
h Kirkkonummi Koivistosveden 7734:11 (4836)
i Kirkkonummi Koivistosveden 7734:11 (4836)
j Porvoo Böle 12359:14 (4915)
k Porvoo Böle 12359:10 (4013)
l Porvoo Böle 12359:13 (4014)

PLATE 20 (The Karelian Republic)

a Ust' Vytegra III 2144/33 (5102)
b Kudama XI 1301/1730 (5280)
c Kudama XI 1701/1762 (5491)
d Kudama XI 1325/2430 (5492)
e Kudama XI 1301/284 (5498)
f Kudama XI 1301/1743 (5524)
g Besovy Sledki III 94/1300 (5609)
h Kudama XI 1325/67 (5688)
i Ust' Vodla I 2100/44 (5780)
j Ust' Vodla I 2364/16 (5784)

PLATE 21 (The Karelian Republic)

a Pichevo III 1632/353, 256 (5794)
b Pichevo III 1632/402, 403 (5799)
c Pichevo III 1632/499 (5806)
d Pichevo III 1632/235 (5812)
e Suna VI 1113/242 (5815)
f Pichevo III 1496/652 (5892)
g Lahta II 608/1301 (5946)
h Lahta II 608/403 (5947)
i Lahta II 608/1315 (5955)

PLATE 22 (The Karelian Republic)

a Gorelyj most III 144/721 (6024)
b Gorelyj most III 144/213 (6053)
c Ust-Vodla II 2105/279 (6066)
d Ust-Vodla II 2105/84 (6079)
e Ust-Vodla II 2363/223 (6089)
f Ust-Vodla V 807/3073 (6090)
g Bohta II 2484/322 (6133)
h Bohta II 2976/41 (6113)
i Bohta II 2976/39 (6112)

PLATE 23 (The Karelian Republic)

a Somboma 1888/1292 (6276)
b Somboma 1888/3794 (6301)
c Somboma 3000/1301 (6310)
d Bostilovo II 2198/124 (6384)
e Ohtoma I 2055/56 (6426)
f Ohtoma I 2055/178 (6431)
g Ohtoma III 1863/938, 950 (6511)
h Ust-Tomitsa 11072/294 (6595)
i Ust-Tomitsa 11072/442 (6596)
j Ust-Tomitsa 11072/396 (6603)
k Ust-Tomitsa 11072/391 (6610)
l Ust-Tomitsa 11072/399 (6613)

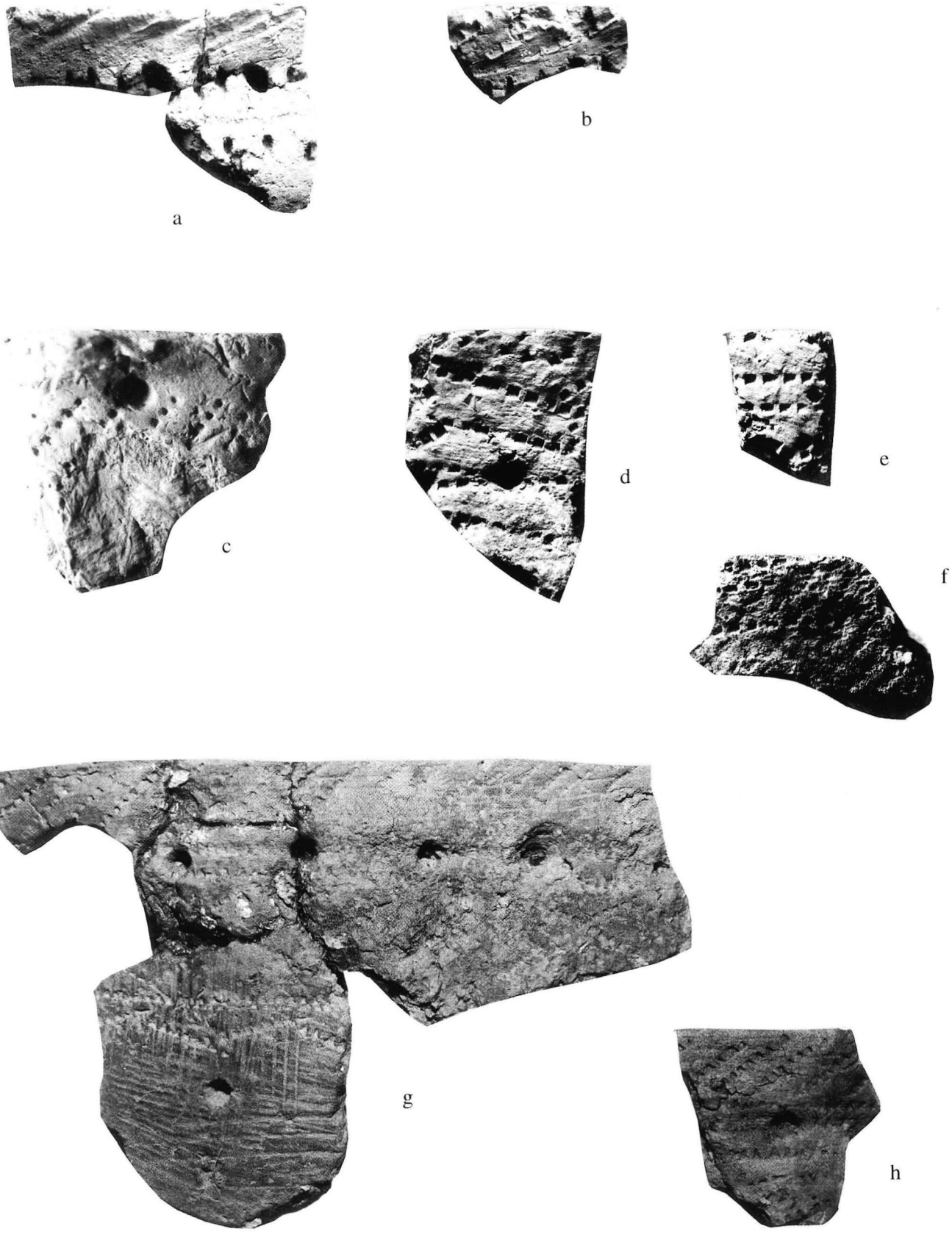
PLATE 24 (St. Petersburg region)

a	Ust-Rybezhna	6481/210 (6904)
b	Ust-Rybezhna	6481/209 (6905)
c	Ust-Rybezhna	6481/273-3 (6912)
d	Ust-Rybezhna	6481/195-5 (6924)
e	Ust-Rybezhna	6481/200-7 (6930)
f	Ust-Rybezhna	6481/222-6 (6957)
g	Ust-Rybezhna	6481/220-5 (6961)
h	Issady	2281, 2282 (7077)
i	Issady	51 (7088)

PLATE 25 (Estonia)

a	Kullamägi	4045/367 (6674)
b	Kullamägi	4045/538 (6686)
c	Kullamägi	4045/511 (6688)
d	Akali	4013/7170 (6745)
e	Akali	4013/8504 (6764)
f	Akali	4013/8812 (6770)
g	Akali	4013/9320 (6786)
h	Akali	4013/7170 (6747)
i	Asva	3799/265 (6846)
j	Asva	3799/427 (6847)
k	Asva	4012/356 (7761)

PLATE 1 (Scale 1:1)





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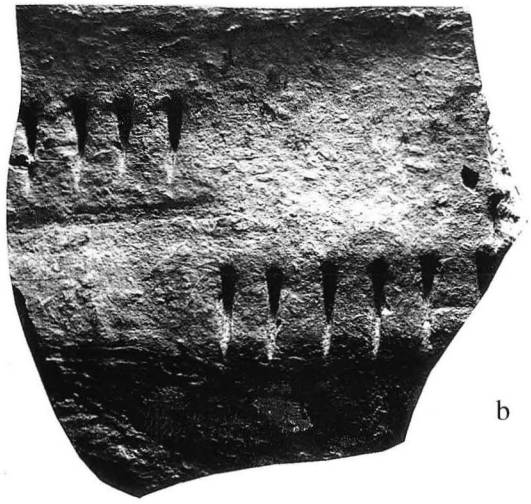

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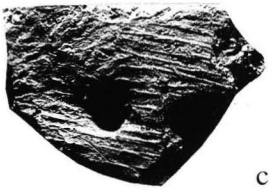

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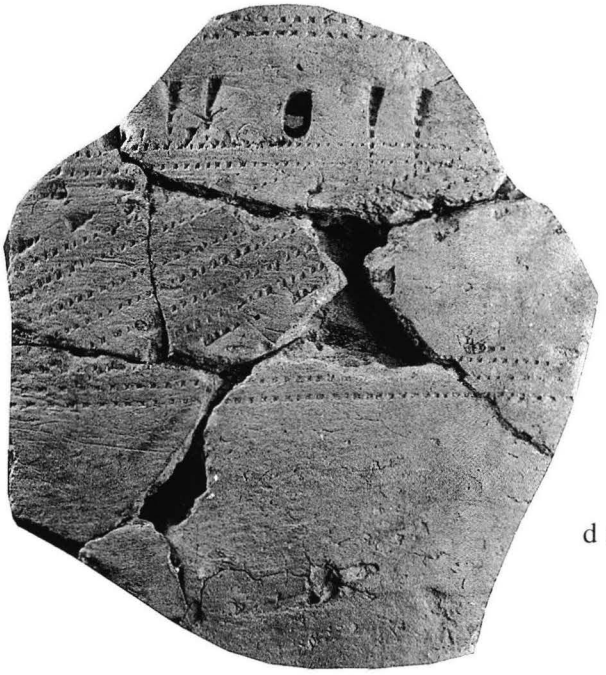
d (1)



d (2)

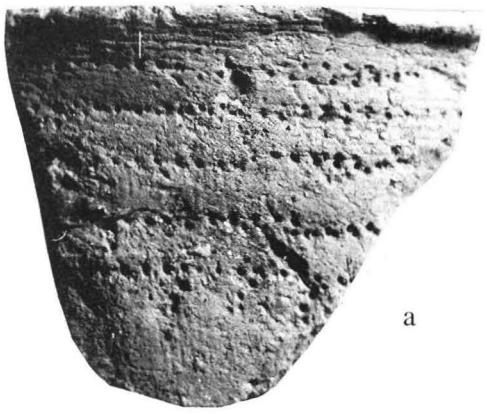


e



f

PLATE 3 (Scale 1:1)



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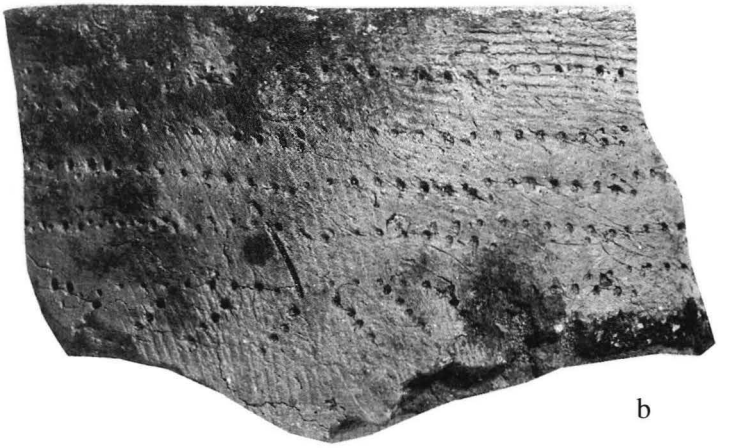
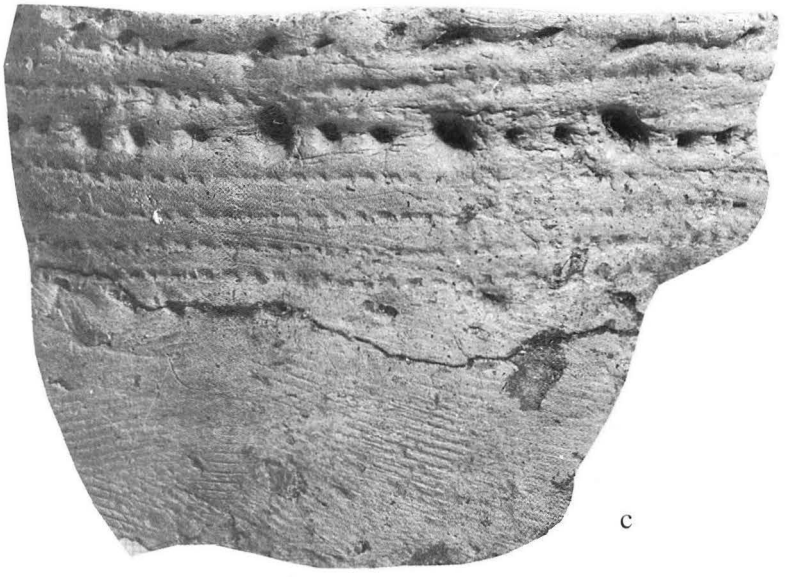


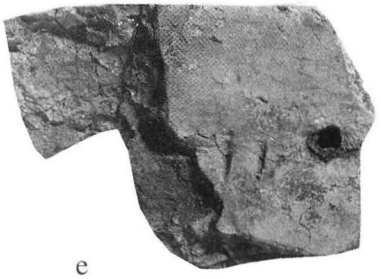
b



c



d



e



f



a



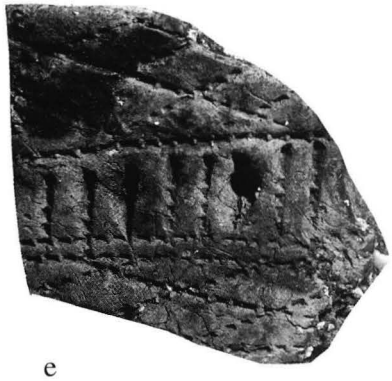
b



c



d



e



f



g

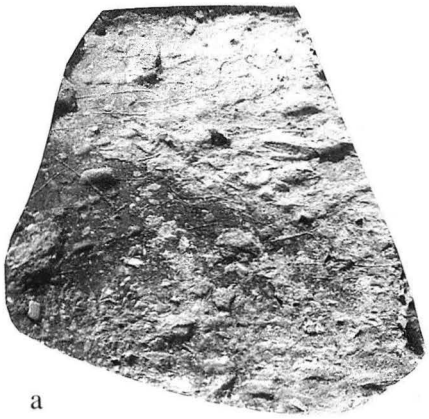
PLATE 5 (Scale 1:1)



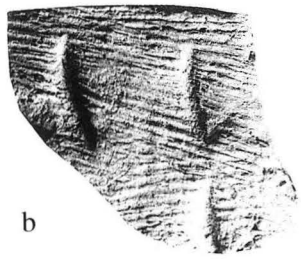
a



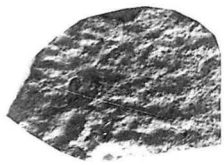
b



a



b



c



d



e



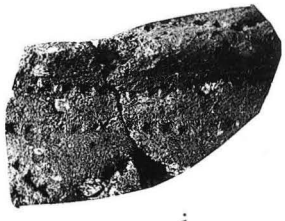
f



g



h



i



j

PLATE 7 (Scale 1:1)



a



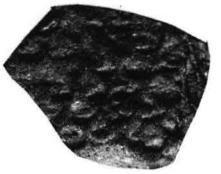
b



c



d



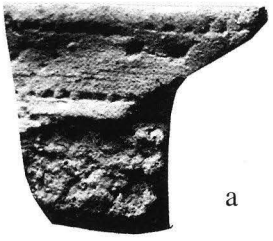
e



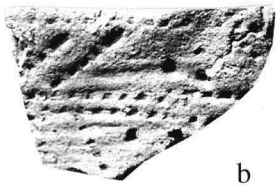
f



g



a



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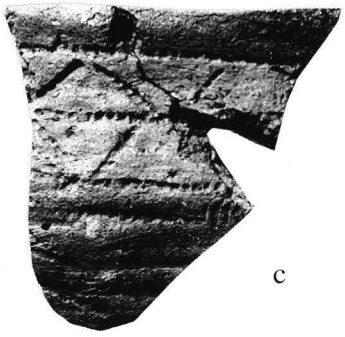


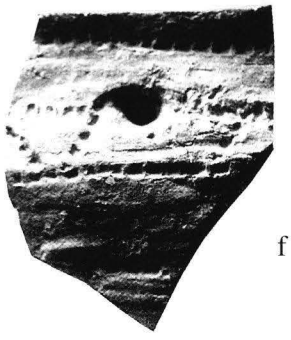
c



d



e



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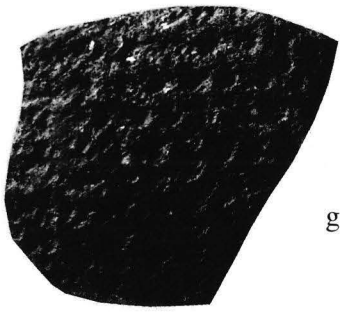


g



h



i

PLATE 9 (Scale 1:1)



a



b



c



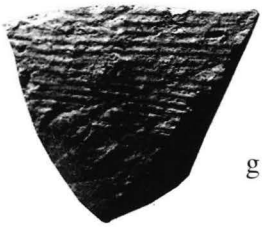
d



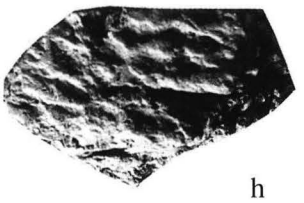
e



f



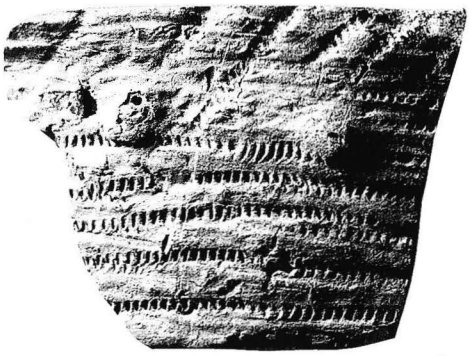
g



h



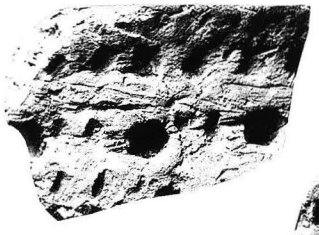
i



a



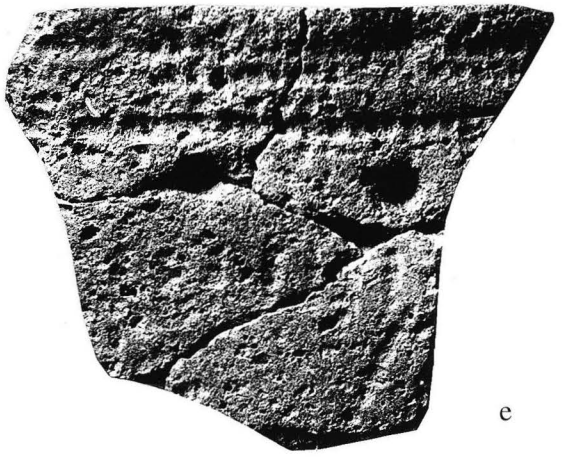
b



c



d



e



f



g

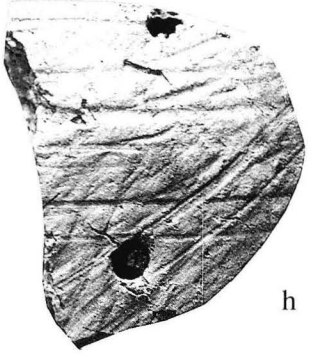


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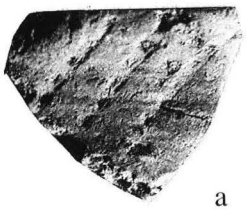
PLATE 11 (Scale 1:1)



a



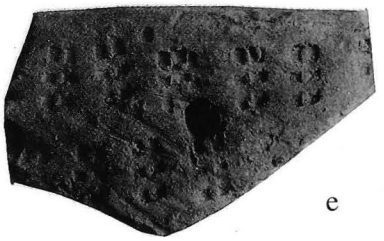
b



c



d



e



f



g



h



i



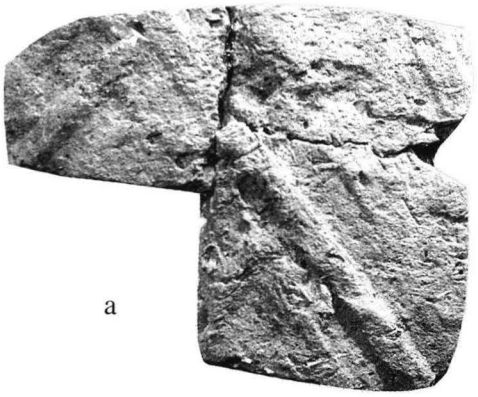
k



l



j



a



b



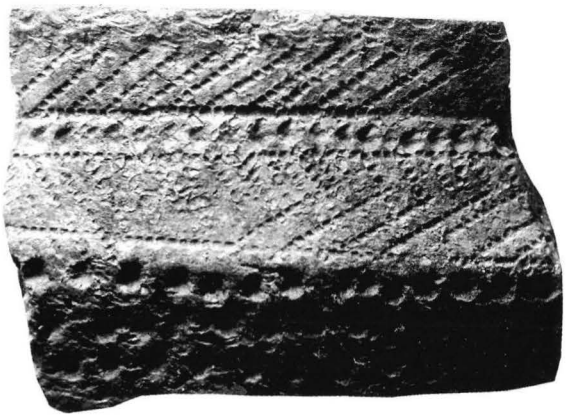
c



d

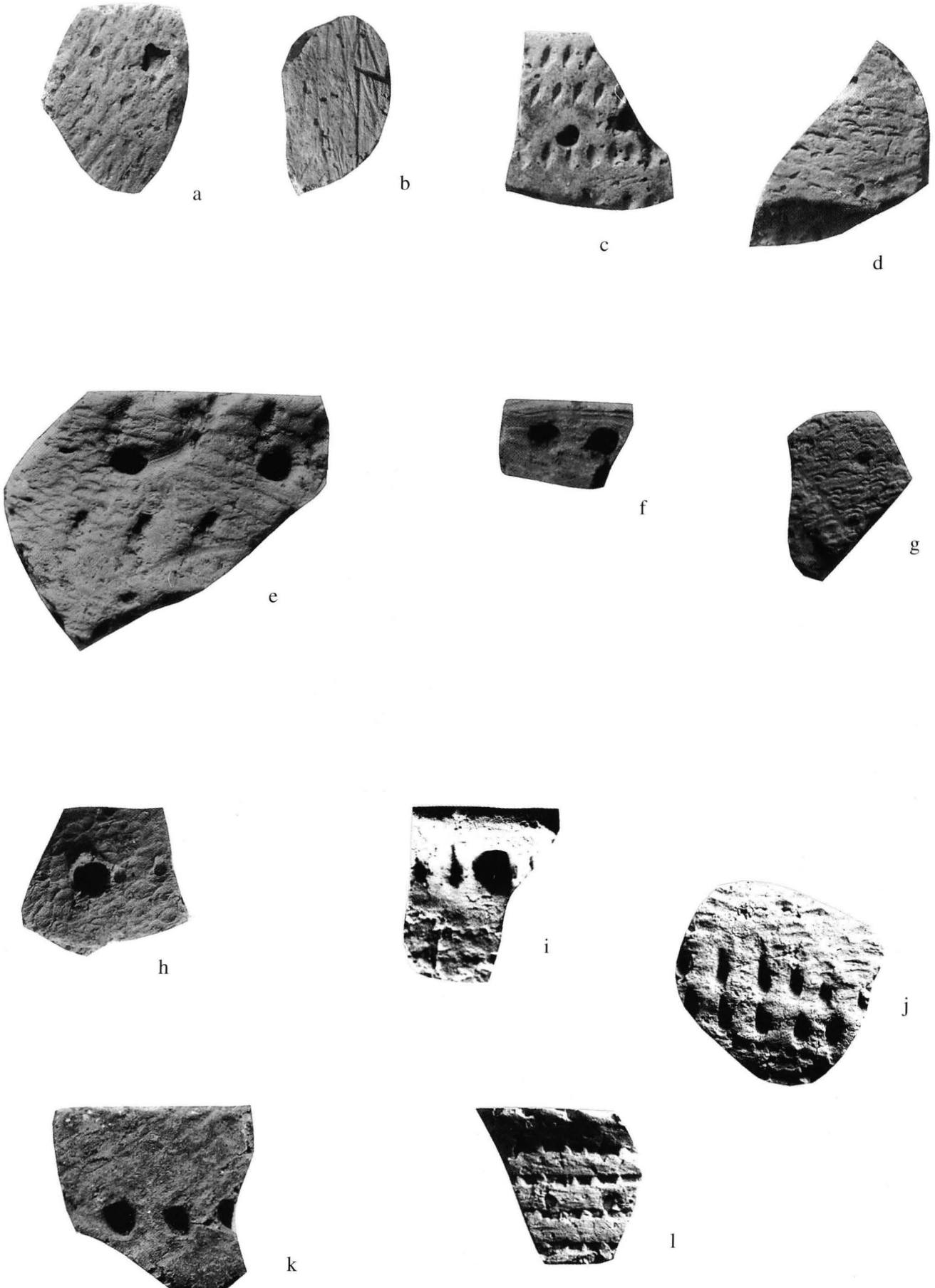


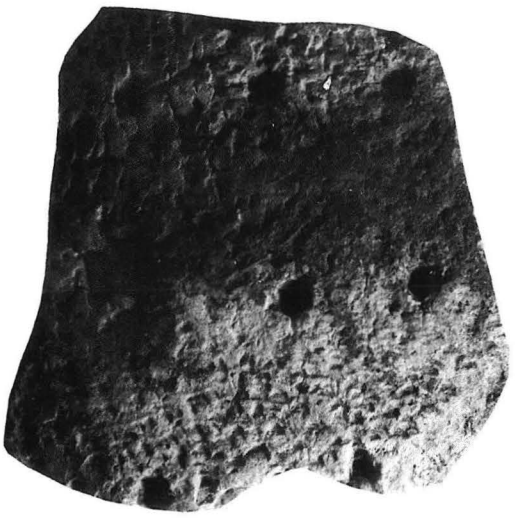
e



f

PLATE 13 (Scale 1:1)





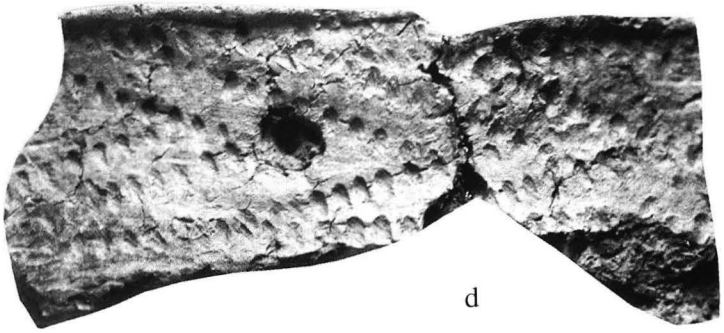
a



b



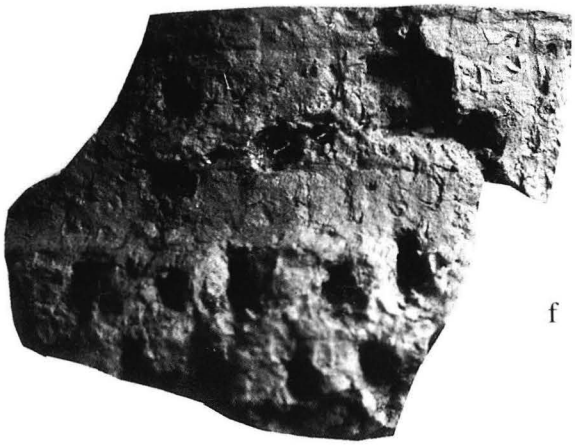
c



d



e



f



g

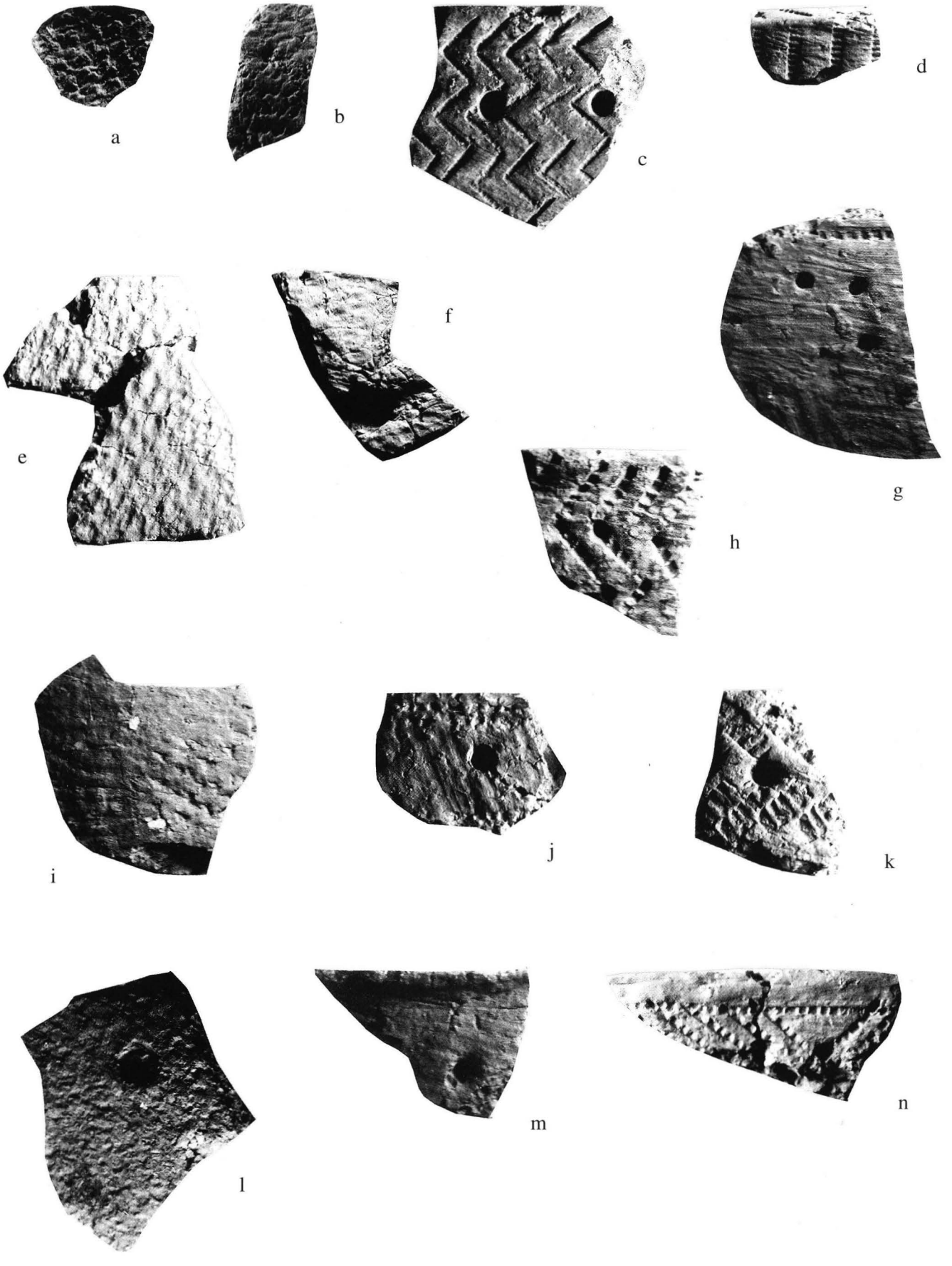


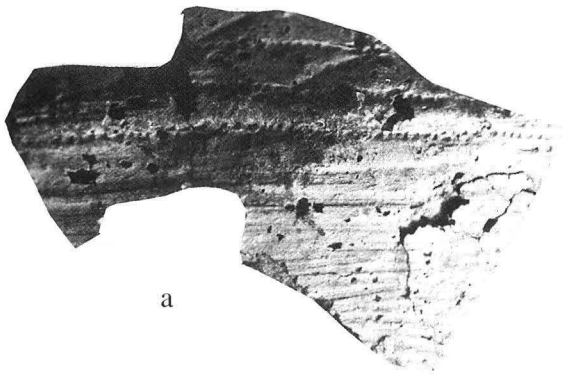
h



i

PLATE 15 (Scale 1:1)

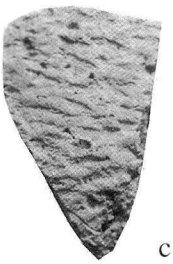




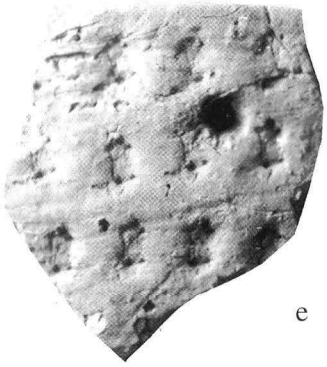
a



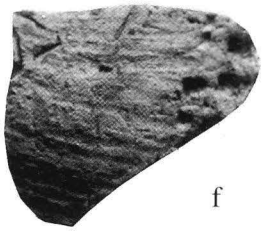
b



c



e



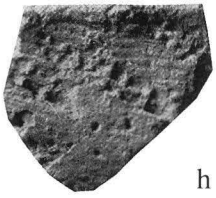
f



d



g



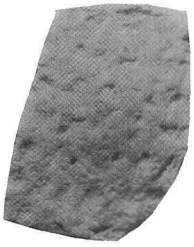
h



i



j



k

PLATE 17 (Scale 1:1)



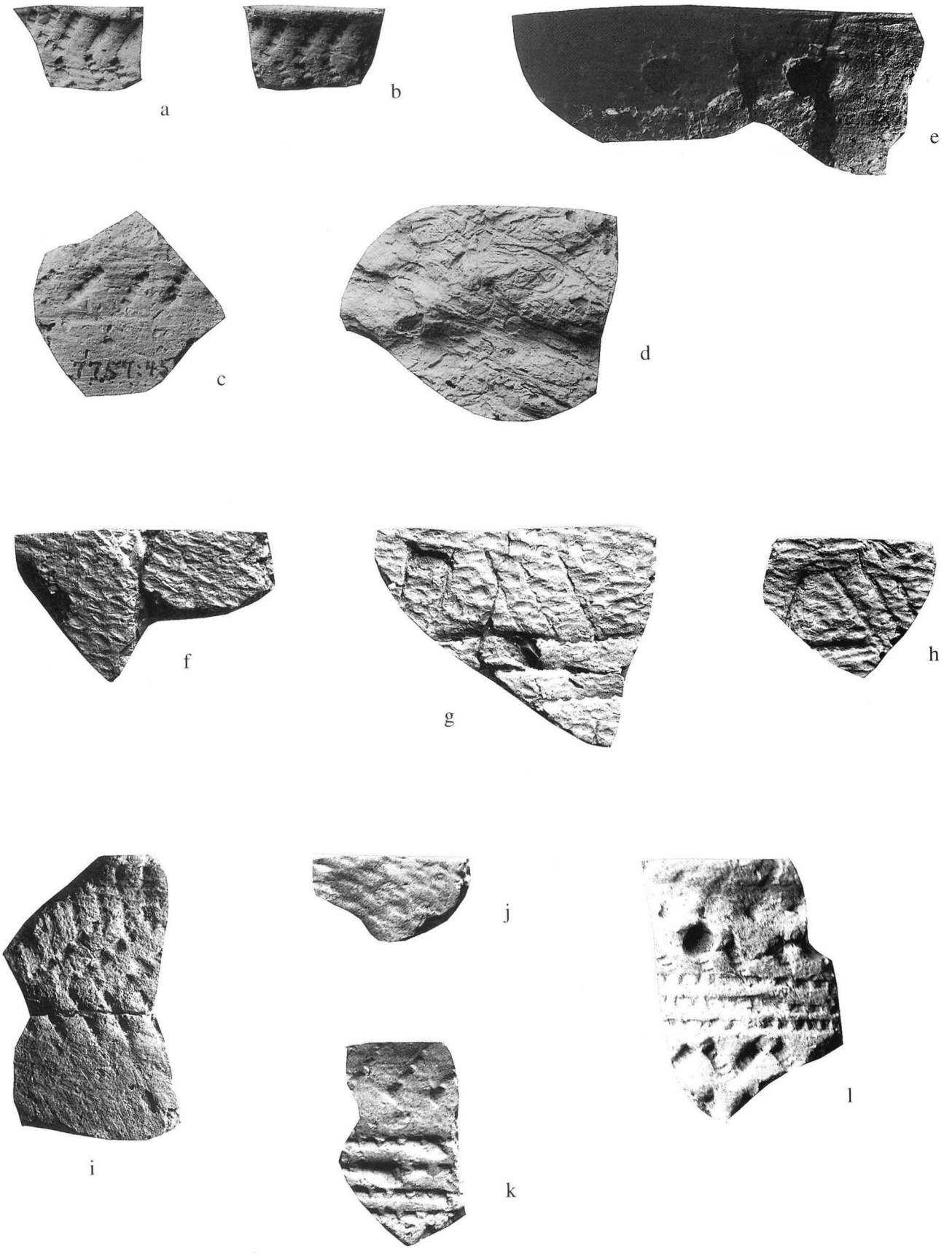
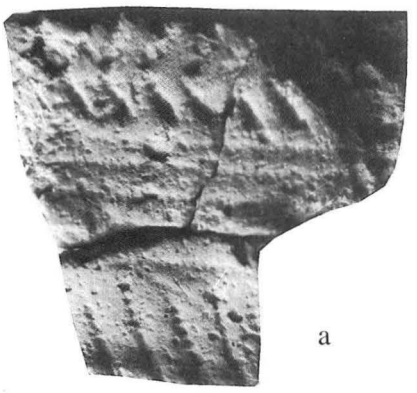

a
b
e
c
d
f
g
h
i
j
k
l

PLATE 19 (Scale 1:1)



a



b



c



d



e



f



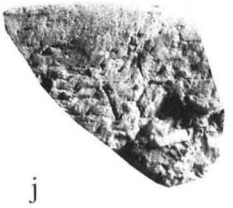
g



h



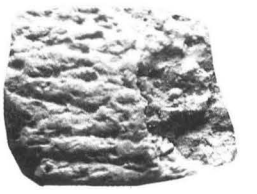
i



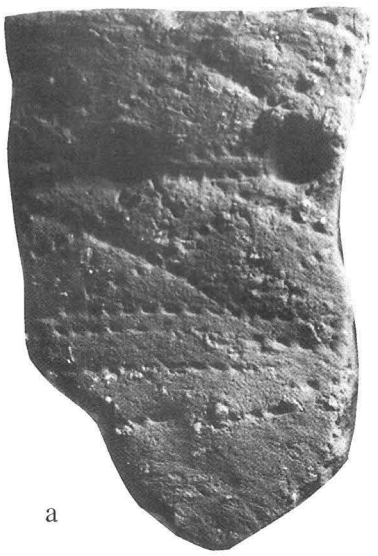
j



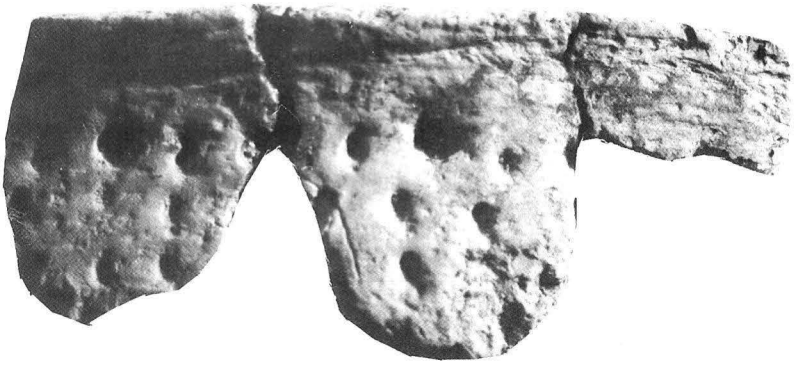
k



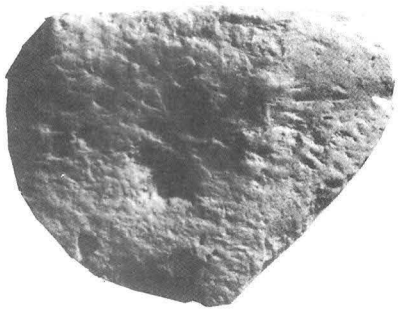
l



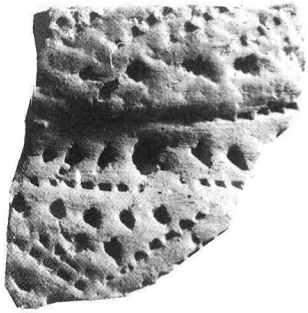
a



b



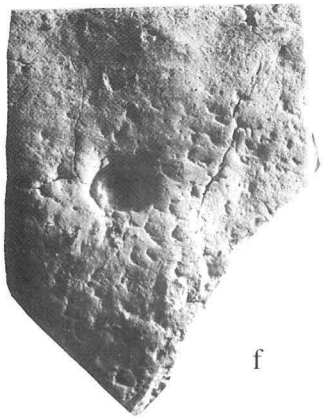
c



d



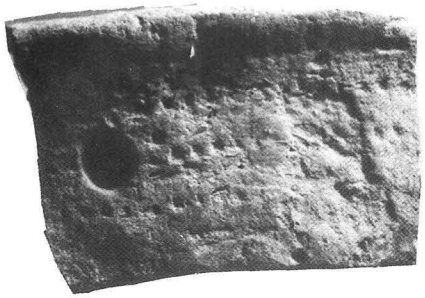
e



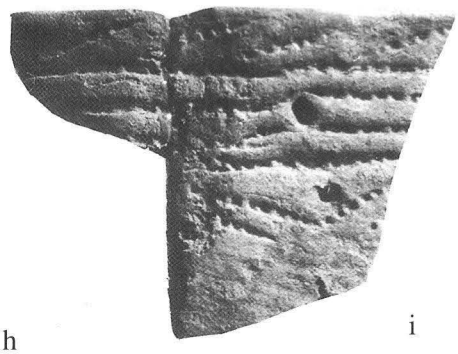
f



g



h

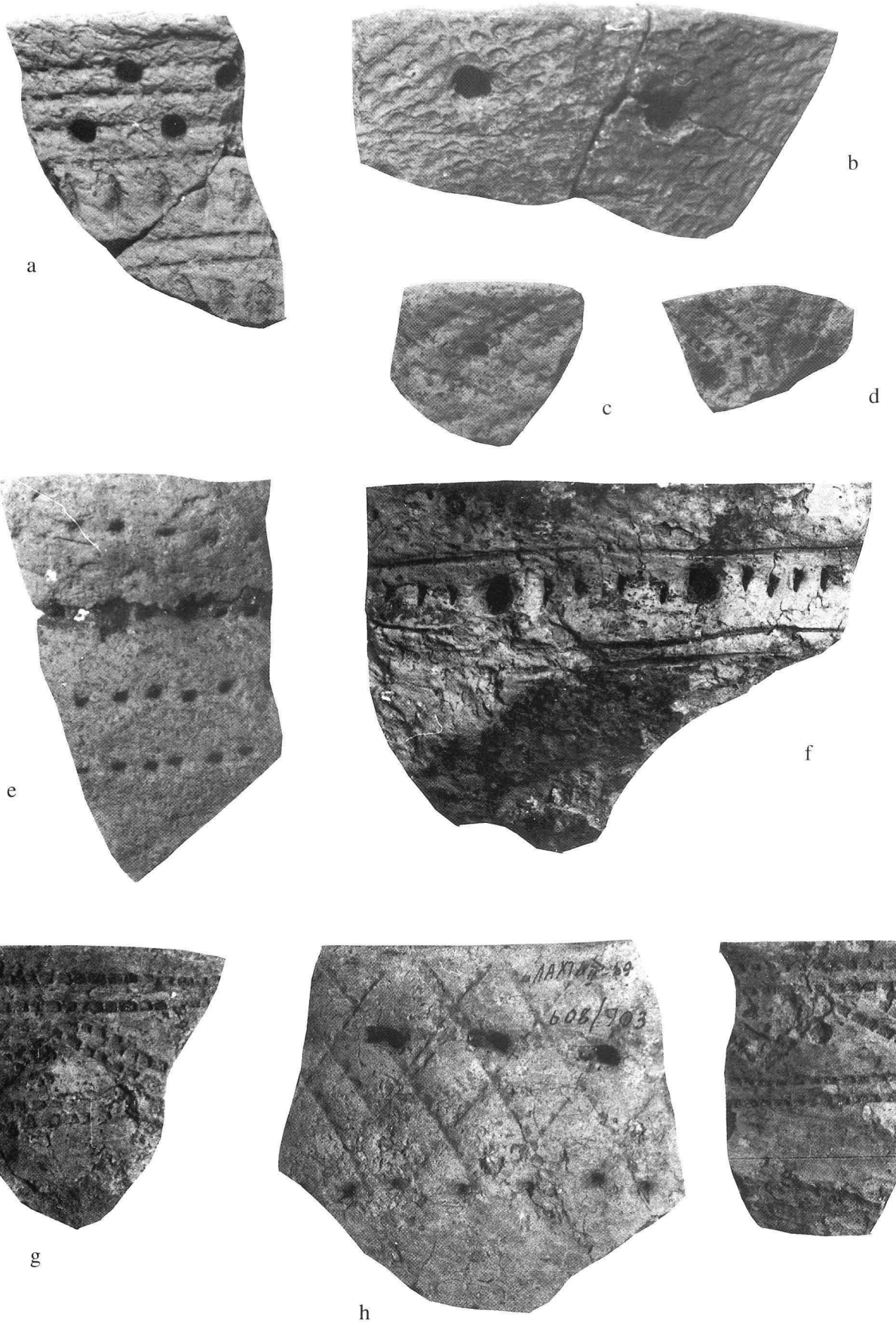


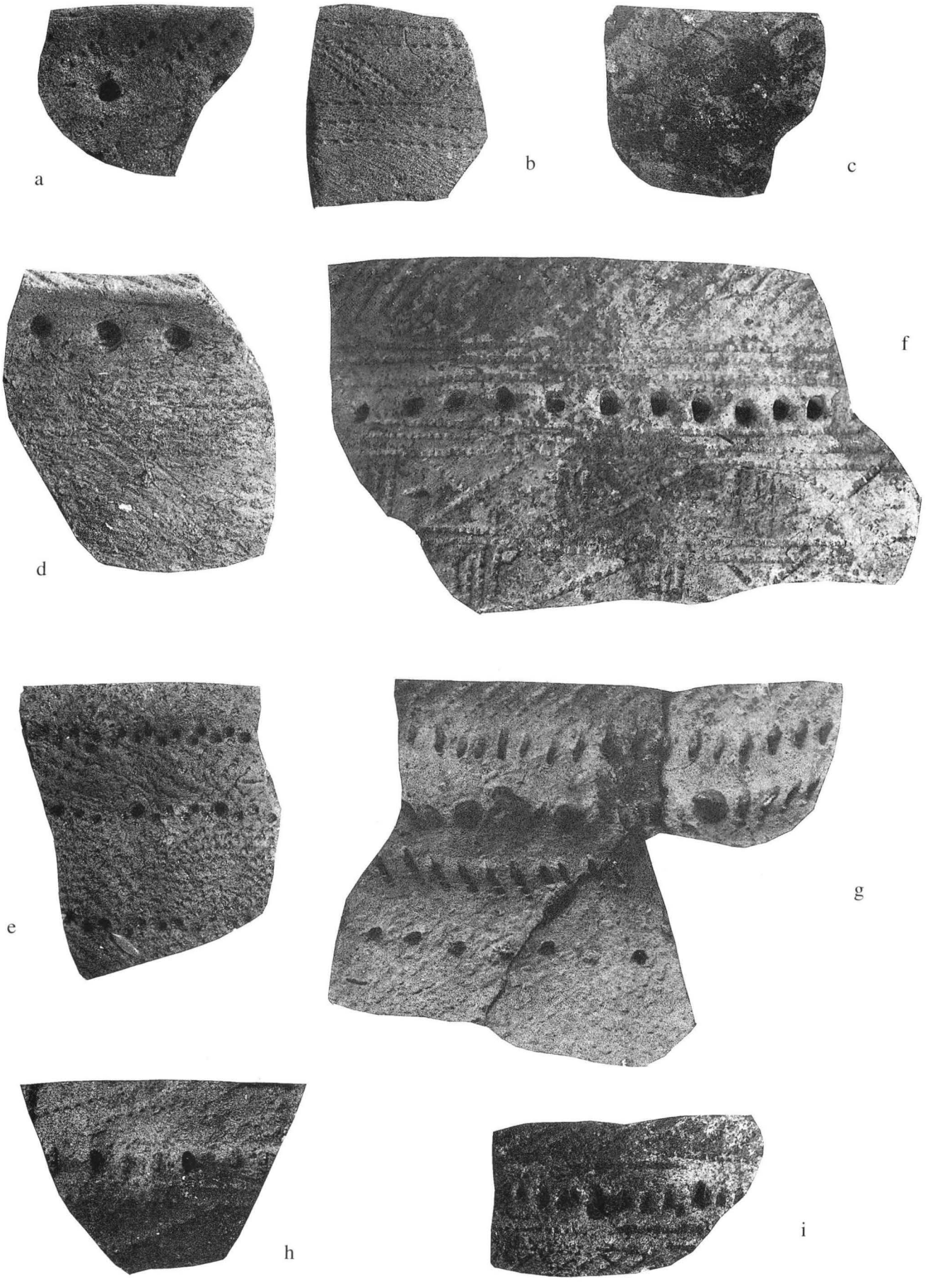
i



j

PLATE 21 (Scale 1:1)




a
b
c
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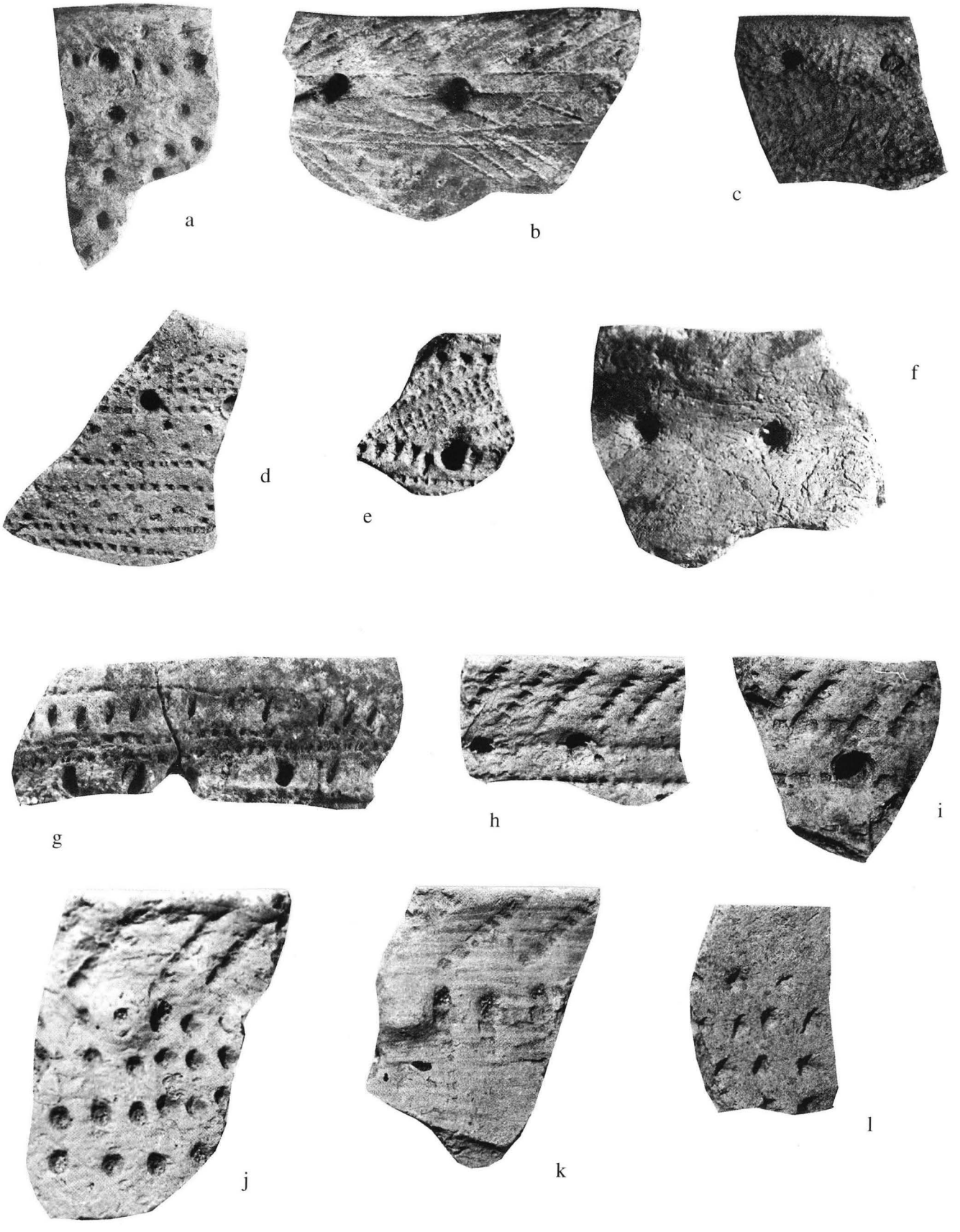
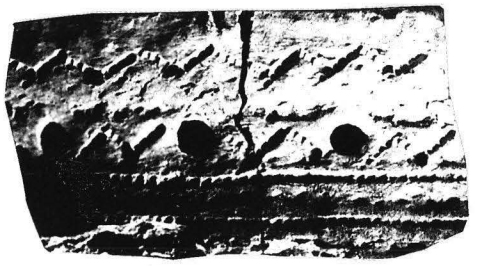
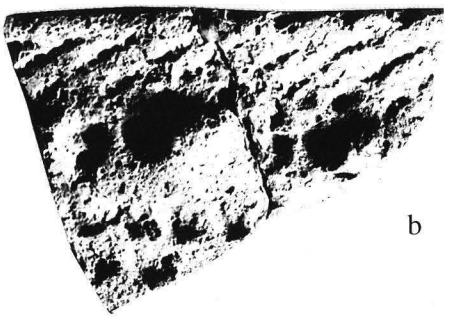
i

PLATE 23 (Scale 1:1)

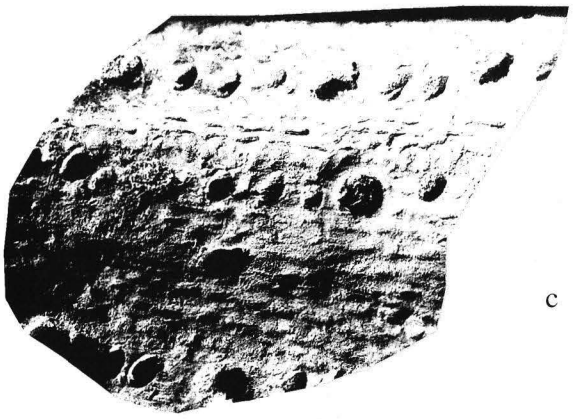




a



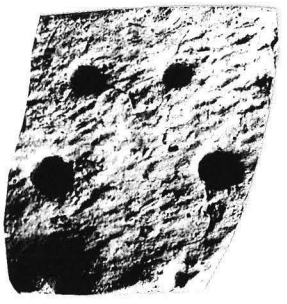
b



c



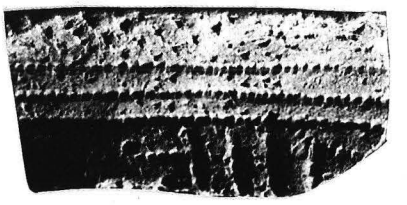
d



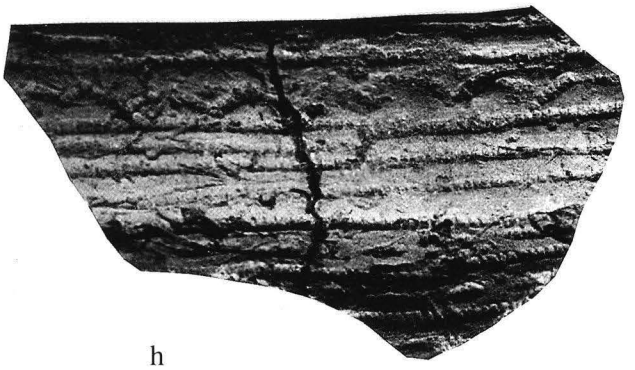
e



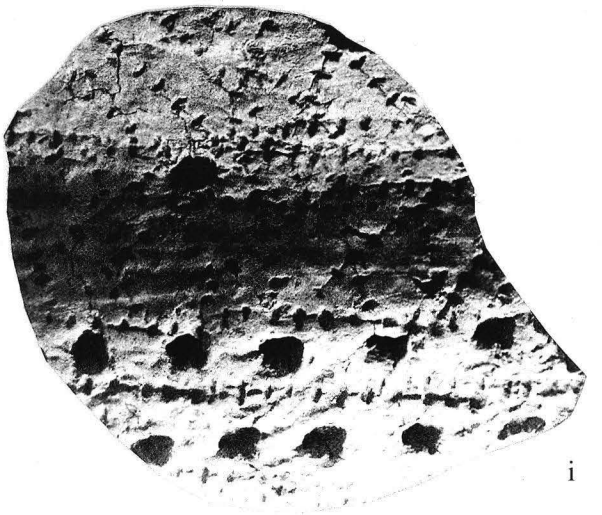
f



g



h



i

PLATE 25 (Scale 1:1)

