

# Finnish archaeology: A love story

*Ezra B. Zubrow*

## Abstract

I was so young when I first saw you. I close my eyes and the flashback begins. The decades disappear. I am standing by the Sederholm house and my parents are taking me to Stockmann to buy school clothes. Little did I know that for someone who was not Finnish how important Finland would be in my professional and personal life. This chapter is an individual and somewhat idiosyncratic tribute to the celebration of a century of archaeology at the University of Helsinki and to Finnish archaeology generally. In addition to being a personal homage, it examines the history of Finnish archaeology from an outsider's perspective, pointing out how integrated Finnish archaeology has been with world trends in archaeology. It considers some of the big substantive issues in Finnish archaeology – i.e., cultural heritage, the occupying process of post glacial Finland, and the origin of monumental architecture. Finally, it tries to make a modest contribution using statistics and simulations to understand the early occupiers and the occupation process.

**Keywords:** outsider's perspective, cultural heritage, monumental architecture, occupation, migration, statistics, simulation

*'My only companions will be the forest and the shore and the lake.'*

Edith Södergran

## Introduction

Every person is a map. Events are drawn on the landscape of memory. Some areas remembered others forgotten. There are waypoints and if you know a few of them, you frequently can reconstruct those that are lost, and even their origins.

This is an old voice telling a love story. Love is love and how it comes to be is inexplicable. Nevertheless, I see it now from the passenger's seat of my mind as the road cuts through the Finnish forests and skirts coal black lakes at the edges of tended places. The destinations Helsinki, Turku, Tampere, Oulu, Rovaniemi, Yli-Ii, Kuusamo, are less important than the trips.

It returns us to a time when a young boy first drew his inspiration from the voices and behaviours of his childhood friends, his college colleagues, and various elders whom he did not really understand.

I am neither Finno-Finn nor a Swedo-Finn, nor am I descended in any way from Finns at least as far as I can tell. There is no family history of any ancestor being Finnish nor do I have any of the physical traits that are usually associated with Finland. Rather I used to look Mediterranean with coal black curly hair before it turned white with age. However, I have loved Finland and the Finns most of my life, in fact more than six decades. It began as a child. It was part of a family rotation through the developed world.

My family moved from Colorado to Helsinki from the foothills of the Rockies to Munkkiniemi. I was eleven years old. Moving from the ranch-oriented town of 25000 to the results of Eliel Saarinen's Munksnäs-Haga plan. We lived on the fifth floor of a functionalist apartment house with a cold closet. That cold closet reminded me of going with my parents to Pactolus Lake in Colorado to cut ice for our icebox and to skate with coats held up as sails.

My sisters and I took the tramline 4 (Munkkiniemi–Katajanokka) to school every morning and returned on it every evening. In

the winter, I played bandy on an ice rink that was made from the school playground. In addition, one of my favourite memories was skiing across the ice in the dark. School would end about the same time as the sun would set, and by 5 pm I would have my skis on, and I would be skiing across the ice to Seurasaari where fires had been lit in front of the Pertinotsa house and the Antti farmstead from Säskylä. It was magical. Large flakes falling gently and silently. Out of the complicit darkness other skiers would emerge, warm themselves, and disappear back into the forest. There are so many memories – some not so romantic. For example, standing for what seemed to be hours freezing in Engel’s Senate Square waiting for the state funeral of Juho Kusti Paasikivi.

I would return again and again. I came back as a student when I had a vacation from university, again as a young professor at Stanford, and again when Ari Siiriäinen and I informally changed places for a semester and found, to my surprise, myself making decisions on which new students could come and study. I kept returning – many more times to do field work along the Oulu River. I did field research in the Oulanka valley and later in the actual border land between Finland and Russia as well as the surrounding no man’s land. Even later, I would do surveys along the Siuruanjoki river and the Iijoki river. I gave lectures in many places, universities (Helsinki, Oulu, Lapin Yliopisto – the University of Lapland in Rovaniemi), as well as museums, such as the Yli-Ii museum, I served as the opponent on PhD committees, as well as an evaluator on professor’s appointment committees. I think about all my Finnish friends, Finnish schoolmates, Finnish college students, Finnish archaeologists, Finnish doctors<sup>1</sup>, and even Finnish government bureaucrats who have helped me throughout the years.

My memory returns to those dark pine and spruce forests that are punctuated by groves of

silver birch shining in the midnight sun and shading into the more faded downy birches. There is perfection about the silent shores of the lakes with their red timbered houses with white trim and small outlying saunas.

## Some idiosyncratic thoughts on the archaeology of Finland

### *Theory and institutions*

The history of archaeology in Finland goes back to the early archaeology of the other Nordic countries. Although not always seen from within, it has been progressive internationalist archaeology. There have been forces that have been nationalist, inward-looking and non-inclusive, but if one looks at Finnish archaeology historically or contemporaneously, I believe it is well situated within the major innovations of global archaeology. It has partaken of the complete archaeological meal: theory, methodology, and substance. Yet, being Finnish, their partaking has been quiet, never glitzy, empathic and never taking over the story, never needing the approval or applause of others, but are at ease with their work. This began as far back as its origins. As Thomsen’s Three Age System began to establish itself, the extant historical chronology started to fail. Nilsson merged his successive subsistence types (hunters preceding farmers schema) and Steenstrup his successive forest types (aspen, pine, oak, and alder) (Egerton 2009). The years immediately following showed that human time depth dwarfed the conception of ancient history. After Darwin published the *Origin of Species* in 1859, the ‘great chain of being’ began to be made dynamic in a variety of areas including Maine and Dwight’s *Ancient Law* (1864) and Morgan’s *Ancient Society* (1877).

By the 1880s there was in Europe among a new and progressive intellectual circle, a new

1 My father had been teaching economics at the University of Helsinki and Svenska Handelshögskolan (Hanken School of Economics). When my family left Helsinki to move to Marlowe near Oxford for him to be at the London School of Economics, my mother, my two sisters, and I went with them. But my one-year-old brother was too sick to travel and so he was left in a children’s home connected to the old Aurora hospital. When he was well enough to travel his pediatrician flew to Heathrow to deliver him into the hands of his waiting parents. He only spoke Finnish and Swedish and to their dismay did not recognize his parents. The family believes this affected the course of his life – learning Nordic languages and teaching at Reykjavik, prior to returning to Colorado.

'habit of mind.' J.R. Aspelin, a very early archaeologist in Finland, was associated with this circle. He helped establish the National Museum of Finland as well as being the first professor of archaeology at the Imperial Alexander University in Helsinki. This 'habit of mind' focused on the educational philosophy developed by Wilhelm von Humboldt followed in German and Russian Universities of the time. Priority was on demonstrating the creation of knowledge.

Aspelin was part of a large international network. A student and lifelong friend of the Swedish scholar Oscar Montelius. Similarly, Montelius was a friend of Italian scholars such as Wolfgang Helbig, Giuseppe Bellucci, and Pompeo Castelfranco, as well as many others in a series of overlapping circles that corresponded frequently. Montelius developed a schema that suggested that material culture and biological life develop through the same evolutionary processes (Montelius 1885; 1903; Montelius & Woods 1888). In 1899 he declared:

*'What the species is to the natural scientist, the type is to the prehistoric archaeologist, and the latter ... no longer regards it as his only task to describe and compare the antiquities from different countries in bygone days. He now tries to trace the internal connection, which exists between the types, and to show how one type, like one species, has developed from the other. We call this "typology"'* (Montelius 1899, 237).

What could be more central to archaeology? Aspelin clearly took his professor's idea to heart.

Professor and student wrote competing books on the origin of the Bronze Age in the Nordic countries. Moreover, as Timo Salminen (1997) – who knows far more than I do regarding the intellectual history of Finnish archaeology – points out, Aspelin was even more progressive in his manner of accepting dynamic change.

Tallgren became the first professor of Finnish and Nordic archaeology at the new University of Helsinki in 1923 which is the position this book celebrates. He held the chair until his death in 1945. Tallgren follows in the same broad Humboldtian tradition. Previously, teaching in Estonia, he focused mainly on the Bronze Age, like Aspelin, and added the Early Iron Age in eastern Europe. Also institutionally minded, he founded the journal

Eurasia Septentrionalis Antiqua and was the Chairperson of the Finnish Antiquarian Society. Similarly, interested internationally, his works included many studies in Estonia, the other Baltic countries and Russia (Salminen 2017) He maintained in the same tradition as Aspelin a lively international correspondence with the Australian V. Gordon Childe, the Ukrainian E. Makarenko, the Russian V.A. Gorodtsov, and many others about such topics as diverse as Bronze Age classification and chronology, the Mariupol type cultures, and international scientific relations (Kokkonen 1985).

It would be fair to say that all the major theoretical and methodological changes in the paradigms that have changed archaeology globally have affected the growth of Finnish archaeology. One sees the 'unilineal evolutionists' being replaced by 'diffusionists' and 'time-space systematics and increasing empiricism as well as a fundamental interest in historicism.' These in turn were being replaced by 'geographic determinism.' 'Geographic determinism' being replaced by 'economic explanations' and 'neo-evolutionary' paradigms simultaneously. Then the 'new or processual archaeology' subdivided into 'cultural ecology' and 'systemic explanations.' Next, the rejection of science and the rise of the 'post modernists, narrative, and post-processual archaeology.' And finally, into the 21st century the return to science and methodology 'synthetic' and 'big data' paradigms that have originated back in the Nordic countries.

As archaeology developed in Finland, there were many informal and more formal intellectual groups as both the institutions increased, and the changing paradigms of archaeology more globally impacted the field. The field grew consistently over the decades – from one university to three, from a few museums to many. Different universities took different theoretical positions at various times. From one professor of archaeology, there are now three: Miika Lavento at the University of Helsinki (on whose appointment committee I served), Georg Haggren at the University of Turku, and Vesa-Pekka Herva at the University of Oulu.

I wish to remark on two more recent professors in the long line – remarkably similar intellectually, but in a typical way their stories recapitulate the relationship that existed between Montelius and Aspelin. They illustrate the subtle similarities

and differences when examining Finnish archaeology. Perhaps, one could describe them as the opposite poles of Finnish archaeology. One was Ari Siiriäinen, professor of archaeology at the University of Helsinki, who arrived in Finland in a basket from Vyborg (Seitsonen, this volume). He emphasized experimental archaeology (on quartz artefacts), cultural resource management, combining geomorphology and ethnographic oral traditions with archaeology. Fieldwork was international not only in Finland, but in Kenya, Egypt, Southern Sudan, as well as Inca sites in South America. He harks back to Aspelin in his internationalism and willingness to accept change.

The other is Milton Núñez (see also Núñez, in this volume) who was, until he retired, Professor of Archaeology at the University of Oulu. Originally a Cuban refugee, he came to the US to study engineering at the age of sixteen in Detroit. However, by 1969 having traveled to Paris, England and Helsinki, he decided to study with Joakim Donner, the professor of Geology and Paleontology and the archaeology professor Carl Fredrik Meinander at the University of Helsinki. His research was primarily the application of geology to archaeological sites. And not surprisingly, he wrote a thesis on the anomalies found by Ari Siiriäinen in shoreline chronology. Later doing fieldwork with François Bordes and a postdoc at the University of Calgary in computer science, he received his PhD in archaeology from Calgary. He developed interests in human bioanthropology, the Paleolithic and paleo-environments, in computer applications, in Finnish pioneer settling and Åland prehistory, in giant churches, in mummy paleopathology, and paleo-diets. Like Ari Siiriäinen, he did field work in a variety of international settings in addition to Finland, including Spain, Egypt and Puerto Rico. At the university of Oulu, under his guidance he set up a highly scientific rather than historically oriented department. In the last part of the 20th century, it focused on the new archaeology, later post-processual, and more recently the newest theories and methodologies.

The point being that from an outsider's view whether more historical or scientific, whether academic or cultural resource management, Finnish archaeology has been connected to worldwide trends, Finns have applied trends from outside to

Finnish archaeology, and taken Finnish expertise to international venues.

The same is true for the Finnish Heritage Agency. Today it is responsible for cultural, architectural, and archaeological heritage and museums. However, in my opinion, under the recent directors Finnish archaeology has mostly resisted some of the worst trends in archaeology. Finnish heritage always has been state oriented. Cultural heritage belongs to the people and thus to the state.

In short, it is 'preserving the deserving.' This has been deeply rooted in Finnish culture. After working on the rock paintings with Knut Heskog in Jiepmaluokta about 5 kilometres from Alta, I remember being shown the 1911 registration of the first rock paintings in the National Board of Antiquities. There are few countries that can say 'The first paintings to be recognised as Stone Age were reported in 1911 by Jean Sibelius, whose eye was caught by strange patterns on a lakeside cliff near Hvitträsk, the home of his friend, architect Eliel Saarinen.' Archaeology conjoined with the most famous musician and architect of Finland.

If one considers the ownership of heritage, there is a continuum that varies around the world nation by nation (Figure 1). On the far right, there is the view that heritage follows the ownership of the land on which it occurs and thus, when it is on private property, heritage belongs to the individual. This is primarily the case in the US although it is not absolute. For example, east of the Mississippi River most subsurface finds belong to the owner of the property. However, west of the Mississippi most of the land was settled through the Homestead Act that gave homesteaders forty free acres. However, the subsurface rights were not ceded and thus with more land in state and federal hands, the state and federal government have an important ownership role.

There are some societies where ownership is given to the community. One example is the Golden Temple of Amritsar that is owned by the Sikhs. Then there is ownership by the nation. In general, the Nordic countries adhere to this principle. Finally, there is the position that heritage belongs to the world or humanity. This is UNESCO's position, as seen through the prism of the World Heritage Sites, as well as that of the ICCROM.

The global trend across time – from community to nation to humanity to individual – is shown in Figure 2. I believe that Finland has not succumbed to the Washington Consensus in privatizing herit-

age. Of course, there are conflicts. These conflicts are particularly difficult to resolve when the beliefs about the ownership of heritage differ.

## Ownership of Heritage



Figure 1. Diverse ideologies for the ownership of heritage. Courtesy of the author.

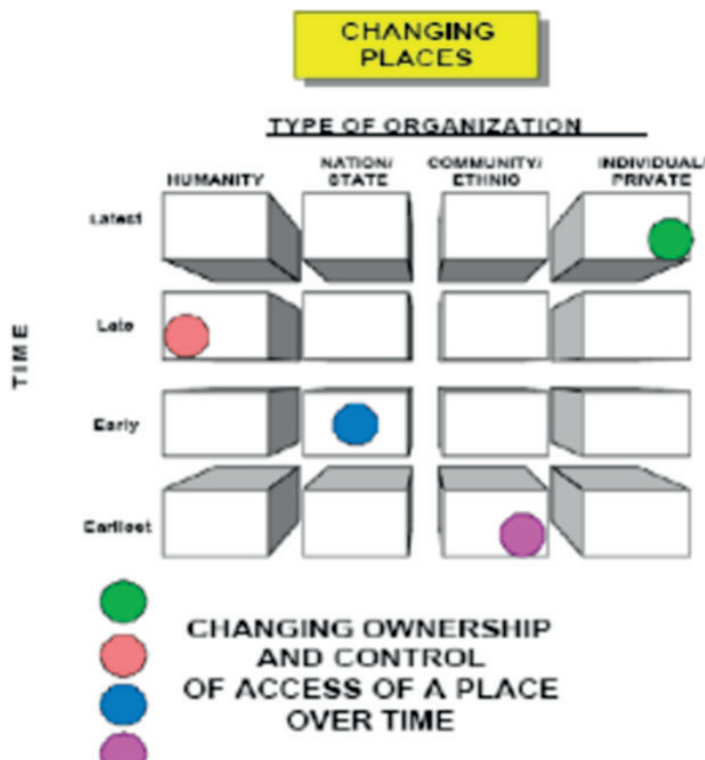


Figure 2. Changing ownership and control of access to heritage places over time. Courtesy of the author.

### *Substantive archaeology*

The fundamental Finnish archaeological sequence is well known and not seriously contested in its broad general strokes. From hunter and gatherers, who followed the retreating ice, to more southern Neolithic agricultural communities complemented by more northern pastoral peoples to the Bronze Age, Iron Age and the Industrial Revolution, one finds general agreement. Yet Finland is the locus of at least two important archaeological topics. These are global concerns. The first is pre-glacial habitation of the north. The second is the origin of monumental architecture.

Of course, there are controversies. Among them is Wolf Cave (Swedish: Varggrottan, Finnish: Susiluola). Located in a crack in the Pyhävuori mountain in Kristinestad near the Karijoki municipality in Ostrobothnia, if confirmed, it would be the only pre-glacial (Neanderthal) site so far found in the Nordic countries and would date about 130 000 years old. After numerous field seasons, some eight layers were excavated with 200+ artifacts made on materials from outside the area using Levalloisian, Mousterian, and even Clactonian techniques. Palynology and zooarchaeology indicated plants and animals not found in Ostrobothnia since the Würm (Schulz 1998; 2002; Schulz *et al.* 2002).

I am of two minds. The situation is in many ways similar to the pre-Clovis Beringia controversy in the New World. Namely, are there interglacial occupations and when were the lands first occupied? On one hand, as in the New World case, one needs to be very cautious because preglacial occupation is such an anomaly. How could cultures exist in an area that would be covered by ice during the Würm. On the other hand, there is increasing evidence that just further south there are sites and, as in the case of the pre-Clovis, every year brings more and more sites that are indicative.

In an excellent article, Christopher M. Nicholson (2017) correlates interglacial climate zones, geographic areas, and existing Neanderthal sites to project the expected number of sites in contrast to the actual number of sites. After noting 'that so few sites from this interglacial period have been recovered likely stems from two causes; the first relates to very low Neanderthal population densities on the landscape, with the second being the impact

of taphonomic processes on the preservation of particularly old sites,' he shows that 19.55 sites are expected in the cold and arid areas, which include Finland, Norway, Sweden, and parts of Russia, and that only three sites have been found (Nicholson 2017, 146, 152). Furthermore, it is well known that early Neanderthal populations living in western Eurasia had already evolved a suite of physiological adaptations to cold.

Even if the Wolf Cave site does not pan out, I would expect a similar site to be discovered soon in the Nordic countries.

Another long-standing argument of controversy is the matter of the 40+ so-called 'Giant's Churches' (Finnish: jätinkirkko). From a global perspective, they are important even if they have not received much archaeological attention. Monumental architecture was considered a characteristic of civilization and the urban revolution (Childe 1950). Later, it became an attribute of the Neolithic. And now there is Finnish evidence that it is Mesolithic and built by hunters and gatherers. These sites are one of the few examples of monumental architecture built by hunters and gatherers. Others are the large shell middens of the American Southeast and Pacific (Southard 2021). Most Giant's Churches are located in Ostrobothnia (Okkonen 2003). However, a few have been found just south of Oulu. Whether these large stone assemblages making up enclosures were religious is controversial. Some interpretations are that they are related to food processing such as seal hunting. This corresponds to one of the functions of the New World shell middens. Giant's Churches date from the sub-Neolithic period (3500–2000 BC). If they were not religious or ritual structures, what other purposes did they serve? What are their earliest and latest dates? Since new religious buildings are frequently built on earlier religious structures, were early Christian churches located on what were previously Giant's Churches or other prehistoric religious sites (Sipilä & Lahelma 2007; Hulse 2008; Andren 2013; UNESCO 2021)? One knows that their construction was a very serious investment of labour that could have been invested elsewhere.

The concept of monumentality embraces many types of built structures ranging from residences to palaces from forts to temples and even tombs. They express power, political authority,

social order and collective will and require a long-term commitment as well as the ability to control resources and coordinate substantial investments of labour. They create a sense of group identity and memory. They are more than materials, shapes and designs; they also serve as expressions of human intent (Given 2004). They are durable and over time have unique histories resulting in changing meanings. Monuments tend to be most prominent during the formative stages of a society (Trigger 1990) and most frequently appear in regional settings (Demarrais *et al.* 1996; Kolb 2005). The fact that Finland has pre-Neolithic monumental architecture is very significant in our understanding of the evolution and diffusion of culture.

Finally, I wish to point to another area of controversy. There has been a long tradition of asking the question from where Finns derive. From a global perspective, it is not surprising that everyone is interested in their origins. This is particularly true if one belongs to a relatively small population and speaks what for many is an unusual language.

### The occupiers and the occupying process

However, from a global perspective it is not as central a problem as it is from a nationalist perspective. What is far more important is that there were people occupying Finland ever since the ice retreated. I would argue that in some sense it is more important to understand what it means to be an occupier of Finland as the ice retreats than where these occupiers came from.

All the evidence points to the fact that the first occupiers of Finland were hunter-gatherer-fishermen.

If we look at the Gulf of Finland, there are two remarkably different geographical areas after the deglaciation. One is the oscillations of the ancient Baltic reservoir and the second is the isostatic land uplift with gradient growing from southeast to northwest (Miettinen 2004). It was deglaciated between 13300–12300 cal BP (Kalm 2006). There are periods when the Baltic was separated from the oceans by isostatic uplift making land movements easier (Saarnisto & Siiriainen 1970; Saarnisto 2008; Saarse *et al.* 2009). The Danish Straits opened and

then decreased by 9200 cal BP (Björck 2008). The Litorina Sea transgression is mainly dated in the Gulf of Finland region within the period of 8400–5100 cal BP, and its maximum was reached between 7500 and 6800 cal BP (Rosentau *et al.* 2013).

The earliest archaeological sites in the eastern part of the Baltic region date to about 11000 cal BP, and on the eastern Gulf of Finland there is a 10700 cal BP date from the Saarenoja 2 site (Jussila *et al.* 2012), while the earliest ceramic traditions date to 6000 cal BP. This represents the spreading of the earliest pottery making traditions in the region. Thus, the upper chronological limit is established about 6000 cal BP. Accordingly, for somewhere between four and five millennia, Finland was only occupied by hunting, fishing, and gathering societies.

Although I have been working with such periods for most of my working life, I still find it difficult to put my mind to such time periods. Thirteen thousand years is somewhat 450 generations. The first four thousand years of early occupation by hunters, gatherers, and fishermen means somewhere between 125 and 150 generations. Looking back from today, four to five thousand years would be time since there were the first big settlements in the Ukraine, the monumental architecture in Malta, the mass graves at Tell Brak in Syria, the first mummification in Egypt, Minoan culture, and the Uruk period in Sumer. It is not surprising that our knowledge is general and tends to be very limited or in the best of cases very broad based.

It is worth reflecting on what does it mean that Finland was beginning to be occupied by these hunter-gatherer-fishermen. It means that not only residence but control of consumption and usually, but not always, control of production was being taken over by small groups of people. If the early occupation of Finland is similar to later occupations, there frequently is a sense of frustration experienced with new occupation. The ambitions of the occupants are not met. First, they are not met because the desires of the occupant to use and later to transform parts of the environment are never fully realized. Second, the new occupiers are by definition deficient in expertise for their new environments for no two environments are the same. Third, they are usually deficient in actual number of individuals.

The above has been part of the radical transformation in hunter-gatherer scholarship since the new millennium. There has been the shift from supposing hunter-gatherer-fishermen being uniformly similar to recognizing their variability. From the uniform viewpoint there were two generalizations – small group size and lots of movement (Lee & DeVore 1968). This, in turn, was extended to assumptions of similarity along such variables as ideology, subsistence, settlement pattern, technology, and social organization. Today, however, one recognizes that hunter-gatherer-fishermen adaptations will differ greatly as environments, demography, and regional organization vary. With this increased variation one recognizes that there are differing concepts of sovereignty for occupation. It would be expected that over the four to five millennia the hunters, gatherers and fishermen who began to occupy Finland surely exercised some authority over the land and resources, but with differing defined concepts of sovereignty.

What can we actually know about these hunters, fishermen and gatherers? One line of evidence is archaeological, another is environmental, and a third is based upon ethnographic analogy. Using the actual database files that Binford created for his classic 2001 study on hunters and gatherers, one gains an insight, or at least heuristics, to understanding part of their lifestyle. In Binford's survey of 339 hunting, fishing, and gathering groups, none are in present day Finland. However, there are more than 40 that are in the same latitudes and environmental conditions as present day Finland.

Their subsistence is heavily weighted to hunting and fishing. The average percentage of the diet based on hunting terrestrial animals is 42%, fishing and other aquatic resources 55% and gathering terrestrial resources the rest. The average of the mean size of the smallest residential unit is 17, the average of the mean size of the largest residential group is 57, and the average of the mean size of periodic regional camps where various groups get together is 168.

The average of the mean area they occupy is 1202 square kilometers. The average mean density is 4 per 100 square kilometers. The average number of moves per year is 10 and the average mean distance for each move is 12 km. Marriage is very young particularly for women. The average mean

age for marriage is 22 for men and 14 for women. The average mean family size is 4 while the average mean household size is much bigger at 10. Most of these are based on ethnographies written more than a hundred years ago. Several being in 1860 and the average mean date about 1887.

These Finnish hunters, fishermen, and gatherers are different than the average hunter, fishermen and gatherer societies globally. Choosing just a few parameters, we immediately see the difference. For the global average the percentage of diets from the three components are 38% hunting, 35% gathering, and 38% fishing. Gathering is far less for those hunters, gatherers and fishermen in Finland. The density is 25 per 100 square kilometers, far greater than the Finnish settlers, and the area occupied by the ethnic group is much smaller, about 39 square kilometers. The demographic size of the regional periodic camps is larger at 209. The average number of moves per year is the same, 10, but the average distance per move is more than double at 25 km per move for the global average. The mean household size is 8 globally compared to 10 for their Finnish compatriots.

Finally, I would like to use some numbers and simulations to provide a group of heuristics for the early occupation of Finland. Finland presently is approximately 338440 square kilometers of which 90% is land, 10% water. The coastline is about 1250 kilometers. There are more than 650 lakes and 647 rivers being broadly inclusive. The largest lake is Saimaa, about 4400 square kilometers. The rivers in descending order are the Kemijoki (550 km), the Tornionjoki (522 km), the Tenojoki (344 km), the Iijoki (330km), and the Ounasjoki (298 km), to mention the top five. My work has been primarily along Iijoki and Oulujoki as well as the Oulankajoki. Let us assume that the above estimates based upon hunter-gatherer-fishermen who are living in areas conforming to Finland's latitude and environments are correct. The density is 4 per 100 square kilometers. The amount of land to fill (not counting water) is about 304088.34 square kilometers. There are approximately 3041 one-hundred-square-kilometer territories in Finland. Let us imagine that the occupation of Finland begins with one of these territories being occupied and that the next territory is occupied when the density threshold is surpassed. These two, after their thresholds are reached, oc-



cupy two more, making a total of four, and then these four become in turn eight, and so on. To fill all the Finnish territories, it would take about 3040 occupations. If we started with one occupation and every occupational generation doubled it, then there would be somewhere between 11 and 12 occupational generations (11.57 generations).

The above chart shows the approximate dates that Finland became deglaciated. It ranges from Helsinki at about 12700 BP to Tornio at about 10100 BP, or about 1600 years. The occupation territory rate could be doubling about once every approximately 140 years, which conveniently is 0.5% a year. This is well within the expected rates. There is considerable debate. For example, in 2000–2005 the world population size increased at a rate of 1.17 per cent per year, which equals the difference between a birth rate of 2.03 per cent and a death rate of 0.86 per cent (Bongaarts 2009). It overestimates the modern analysis of prehistoric growth rates from northern Norway and Finland, as analyzed by M. Tallavaara and E.K. Jørgensen (2020). Given the ethnographic and archaeological population growth rate estimates, they claim that only the Dobe !Kung growth rate is in a similar range as the archaeological estimates that are limited to relatively short time scales. Most of the archaeological rates

are close to stationary. In their brilliant paper they use simulations of both ethnographic and archaeological populations and find simulated annual population growth rates that vary between 0.4% and 3% with important oscillating characteristics following oscillating environmental conditions. These simulations show a pattern of converging growth rates between ethnographic and archaeological results. This corresponds to the oscillating demographic and environmental characteristics that I discussed in my article Prehistoric carrying capacity in the Southwest (Zubrow 1971).

The results that we calculated may be on the high side. One reason is that, in our growth estimates, we do not consider that an occupational area might result in total failure.

This could clearly reduce the growth rate from 0.5% to 0.2% or 0.3%. Turning to the population sizes of this early occupation, about 10100 BP after the first occupation, there might have been as many as 12180 people. Of course, these estimates should not be taken too seriously. Rather, like this estimate (territories, time, population densities), it really is a heuristic.

Robert H. MacArthur and Edward O. Wilson created a mathematically sophisticated model for dispersals along an archipelago. They

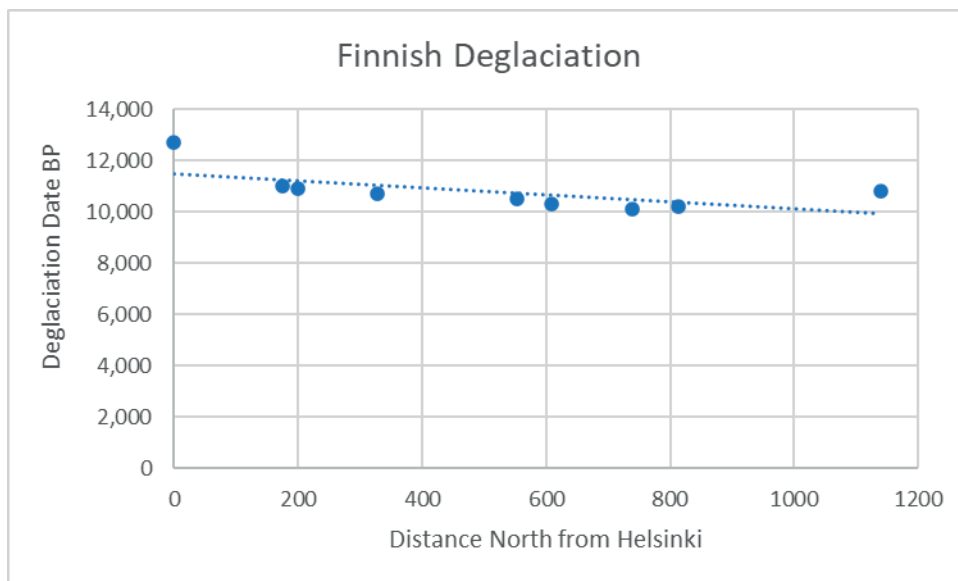


Figure 3. Dates of Finnish deglaciation by distance north from Helsinki. Courtesy of the author.

consider isolation from source and island size in an equilibrium model. Many important questions may be derived from their original statements. For example, there is the Sloss debate. Is it better to keep a single large conservation refuge area or to divide an equal area into many small refuges? Which strategy conserves diversity better? Additionally, what type of migration results in the most successful occupation? They consider three types of migration. First is one migration with a large number of people that occurs once. Second, a migration with a smaller number of people migrating but they are migrating continuously. Third, a smaller non-continuous but pulsed migration. They prove that the third is the most likely to be successful (MacArthur & Wilson 2001). Their original demonstration was for islands and for archipelagos where the water made significant barriers to be crossed. The Finnish landscape is not an archipelago, except for the Åland islands. However, at the time of original occupation, it would have been a difficult landscape to navigate with considerable barriers.

Neither modern Finns nor modern Saami presently live in a hunting and gathering economy. However, there are still a few living members of northern hunter and gathering societies in Canada and native knowledge of hunting and gathering has been collected by the indigenous Cree Trappers Association. They have long linear hunting and trapping territories – some over a 100 km long. They claim the forests are very difficult to travel both in summer and winter and are considered obstacles. The rivers and lakes are far easier to navigate, in the warmer seasons with canoes and in the winter on the ice. It is the indigenous version of the modern ice road.

One may simulate what the patterns of occupation might be under different migratory rates and pulsation into Finland. Here are a few examples. We begin with a slow migration pulsation from outside of Finland that begins occupation in the southernmost areas of what is now Finland.

The simulation, Figure 4a, shows the number of people in each area. The higher the ‘hills’ the more the population. There are several things to note. First, unlike the Cavalli-Sforza-Ammerman model, there is not a continual wave of occupation resulting in a pattern of no people before the wave and a smooth even distribution of

occupation across the landscape behind the wave. Rather, we see a pattern of increased populations in patterned areas of occupation. The numbers of people are distributed in a wave pattern moving from the south to the north. Each concentration of population is approximately 100–110 kilometers apart. In the south-central area (roughly south of Kuopio and north of Lahti) there appears to be fewer people. Perhaps this is because of the increased lakes and decreased average land mass. Perhaps there are other reasons.

If one increases the pulsation rate, one develops a far more complex picture (Figure 4b). The same generalizations apply about the patterns. The original point of access is the same as in the previous graph. There is no homogenous distribution and no gaps before the wave. The same south-central lack of concentrations is apparent, although it has moved further south. However, the distribution of population rises and falls far more rapidly as indicated by more numerous small hills and depressions in the graph. The concentrations are about 20 km apart. Additionally, the range of population is smaller. In other words, not only are the rises and the depressions more frequent, but the difference between height and depression is less.

The migration moves up two main corridors, and as it approaches the middle of the country, one sees waves moving toward the east and then waves moving to the north. I believe it underestimates the southern coastal populations. The Oulu–Kuusamo break line occurs here as well. South of the break line there are two south-to-north ridges that represent larger contingent populations. One stretches from near Turku to near Seinäjoki. The other is from Kotka to Kuopio. North of the Oulu–Kuusamo line, we find one large and two smaller south–north ridges indicating larger contingent populations. However, even along the ridges we see the wave-like action that is the result of the aggregation of the pulsation.

For the sake of argument, let us assume that some of the immigrants into Finland came from the west. Figure 4c represents this possibility. The west-to-east movement is clear, while the rates of migration are about the same as in Figure 4. One notices that the pattern of diminished occupation in the south-central area does not occur

here, and that the migration does not continue north of Hirvassalmi.

Probably the value of these simulations is as a heuristic. Simulations are a mental shortcut that provide insights into the problem as well as help make the analyst make good strategic and tactical judgments and decisions. The truth about the early occupation of Finland is that it requires massive amounts of information from a wide range of scientific and historical disciplines. It is not only difficult to obtain the information, but it is difficult to process. Like most heuristics, these simulations produce 'good enough' answers to problems most of the time. Further research will either confirm or repudiate what is presently known.

## Conclusion

So, we conclude this 'love story.' I owe a great amount to Tallgren. He and his successors provided me with not only an intellectual focus but also what has turned out to be a destination for my life. In the late 1950s, there were traveling one ring circuses that visited Finland. The performers were trained by the 'Moscow Circus' and were wonderfully original, very artistic, and had superb technique. We were sitting in the third row up from the circular ring. On my right was a Finnish family, on my left a Swedish-Finnish family. The father bought all seven children – two of his, two of the Forsells', and three of the Zubrows' – jäätelö. As we watched the clowns and the men juggling, the women standing on the

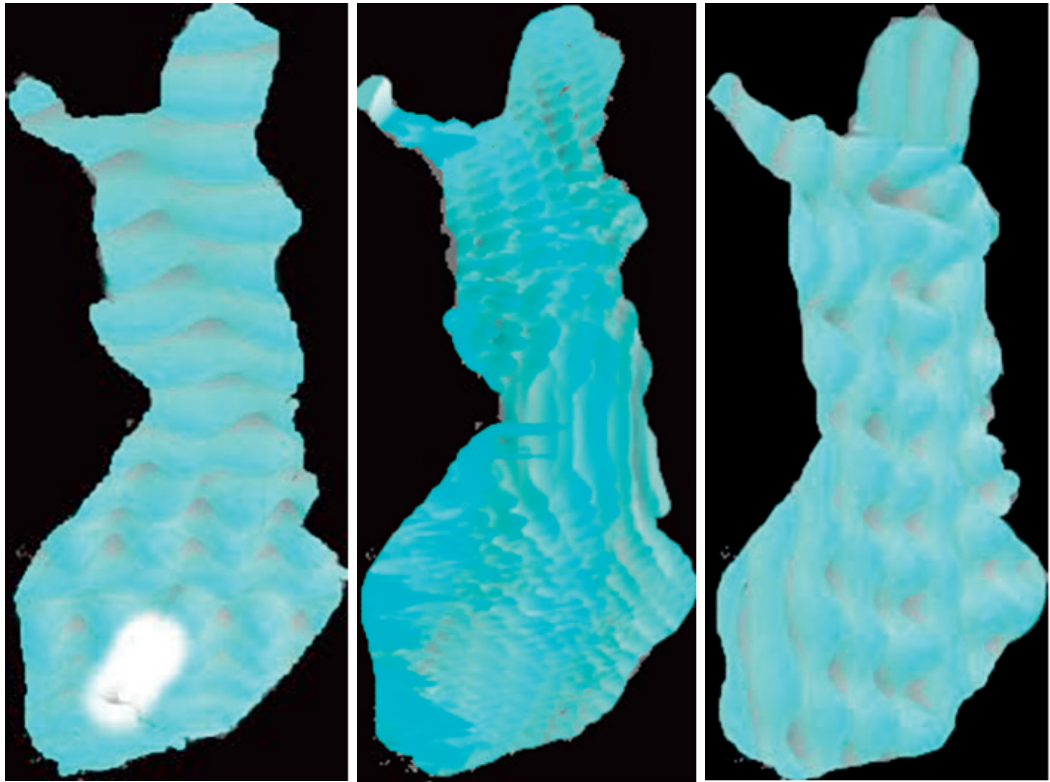


Figure 4a-c. 4a. Simulation from the south. 4b. Simulation from the south with more rapid pulsation. 4c. West to east migration. Courtesy of the author.

horses, and twirling plates on top of the poles, I realized that I belonged to Finland. Finland had captured my soul that evening, and it has never given it back.

*Grow three hillocks clothed in verdure;  
From each hillock, speckled birches,  
Three in number, struggle skyward;  
On the summit of each birch-tree  
Sits a golden cuckoo calling,  
And the three sing, all in concord:  
'Love! O Love!*

From the *Kalevala*.

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