

NEOLITHIZATION AND THE HUMAN BODY

Lise Harvig

University of Copenhagen, Copenhagen K, Denmark

Abstract

The spread of the Neolithic economy is not a new discussion within prehistoric archaeology, and has therefore been studied from several differing viewpoints during centuries. The result is several different explanations on the same phenomena. Natural sciences and physical anthropology have often been applied as basis for the explanations, but the results are far from easy to interpret for the archaeologists.

Migration is, for many reasons, no longer a frequently discussed issue within archaeology. This is partly because it is 'old fashioned', but mainly due to the increasing theoretical discussions, which now focuses more on social relations, individuals, gender etc.

Movement or migration of smaller or larger groups of people is however still an often discussed issue within physical anthropology. The study of human evolution does not end with the Upper Palaeolithic periods, but instead continues until this very day. Combined with biological and ecological studies on the prehistoric environment (which the humans lived in), many anthropologists still discuss whether the changes of the Neolithic human body were only due to evolution, or if migration in some form should still be considered. This of course changes from area to area, but morphologically there seems to be some pronounced differences between the late Palaeolithic or Mesolithic skeletons and the Early Neolithic, in several parts of Europe. The changes are not only seen in the cranial form, but also in the limb proportions etc. These changes are explained as either genetic (migration) or ecological (evolution). Several recent results add further to this discussion. For instance, modern studies of DNA give us differing answers to the question. Working across different sciences of course helps us, but even so, researchers in both fields (archaeology and anthropology) often work with very narrow problems within their field, and thus do not see the greater contexts. Where are we heading with the research on this subject today?

Theoretical Archaeology and the Neolithization

Most of the earliest explanations to the spread of the neolithic economy across the continent were concentrated on migration and theories related to this. The migration theories were proposed during the post war period and before the 1960's. Today we often refer to these theories as 'Cultural Archaeology'. They have often been criticised of not relating to the archaeological material in the local areas, but instead only having focused on large scale explanations. Prof. C. J. Becker (1947), a Danish archaeologist of the time, was for instance of the opinion that the whole funnel beaker culture (TRB) had migrated into Denmark and thereafter occupied the land. Gordon Childe (1949) had the same ideas, and explained it as a slow migration due to over-exploitation of the soils in the old areas. Ammerman & Cavalli-Sforza in 1971 and onwards still believed in migration (see below). Around 1968 and onwards new discussions appeared at the scene. They were led on by the American discussions started by Lewis Binford, and have ever since been referred to as "New Archaeology" or "positivistic" or "processual" archaeology. These ideas were soon accepted in many parts of Western Europe. Especially in England and Scandinavia, the new theories were seen as a breakthrough. Climatic and ecological changes (stress) were seen as one of the main reasons for the neolithic transition and there was almost no doubt, that the local hunter-gatherers themselves were the ones who 'took over' the new economy and the new ideas. Migration of any kind was, at this time, totally abandoned in the mentioned parts of Europe. One of the processual alternatives to migration was for instance that people were forced to move onwards due to population growth, which was already proposed by Binford in the early 1970'ies and Ammerman and Cavalli-Sforza. Along with the processual theoretical discussions a great, some would say naive, believe in natural sciences came to exist. All kinds of natural sciences were applied, more or less uncritical, to explain any cultural change. This was especially true in relation to the neolithic transition, where different observations in for instance sea level and changes in the marine resources, could easily explain why people would have been forced to change their economy. The Scandinavian research was thus after the 1970'ies characterised by New archaeology and the explanations were based on population pressure, economy and ecology. Many of these methodological and theoretical discussions did almost only take place in Anglo-American and Scandinavian archaeology, whereas in the rest of Europe there was still a great deal of archaeologists who believed in the traditional migration theories or variants of these.

Up until 1980 the western European explanations to the neolithic transition was exclusively ecological-diffusionistic, but soon after socio-economic interpretations came into the scene. "Social", "post-modern" or "post-processual" archaeology came in these years with a great deal of criticism towards the former processual archaeology. It was pinpointed that the processual theories were so focused on calculations and natural science, that the humans themselves - the individuals - had totally been forgotten. Prestige, competition, peoples own free will and for instance mere coincidences could effect the calculations so much, that they were close to unusable!

After 1990 the post-processual theories settled in Anglo-American and to some extent Scandinavian archaeology. Here the neolithization is now seen as a cognitive or ideological change (Ian Hodder, Christopher Tilley, Julian Thomas and others). In the 1990'ies an onwards more new postprocessual theories came in Sweden, Norway and England but almost not at all in Denmark. The general opinion today is that there was no crisis and that there, to some extent, was economic continuation from the Mesolithic and into the neolithic. This idea is based on many recent results (from the natural sciences) that have shown that there was no serious ecological crisis during this period, that the neolithization was slow and that many continued hunting and fishing.

Social archaeology is also a relevant issue in the new discussions, but unfortunately theory and the actual archaeological material (the facts) seldom correspond. This is mainly in the case of the postprocessual theories of individual minds and gender etc., since they often can't be tested on the material. They're simply way to relativistic.

"The Wave of advance" theory

A. J. Ammerman and L. L. Cavalli-Sforza published their 'Wave of advance'-theory in 1984. The theory is one of the explanations to the Neolithization of Europe that combines archaeology and anthropology. In their theory they argue that the spread of farming made the population number increase, due to a better fertility among the women. Demic diffusion was a natural consequence of this and people were thus forced to move their households further and further out on the new and uncultivated soils. They calculated the spread of the neolithic economy to around 1 km pr. year. In some areas this would have gone faster, in others more slowly (like in the alpine region).

Many scientists actually still do agree with Ammerman and Cavalli-Sforza, that the implications of the neolithization indeed was a better fertility and a population increase, but they also often argue that the possibility of infectious diseases would thus also have increased! The majority however believe that cultural diffusion is much more likely.

No matter how much we discuss this issue, we cannot deny that it is close impossible to calculate if there has ever been a population increase or not, based on the European skeletal material alone. There are simply too few skeletons preserved from the transition period!

The demographic implications of the neolithization

As mentioned before, it was assumed by some scientists that the neolithic populations were more exposed to infectious diseases, because of their sedentary lifestyle and animal husbandry. Today many factors speak against this. The transition to agriculture in the Levant does not result in a demographic crisis and there are no signs of an increased mortality around the transition from the natufian period to the early neolithic (PPN1). The average age at death instead rose slightly and the population probably increased along with an improved fertility and longer life spans for most people. This is also, to some extent, true in Europe. In the period of the linear band pottery (LBK) the highest number of settlements is seen. After this period, the number of settlements decreases again. We thus have archaeological evidence of population growth during this period!

DNA and blood types - What do the genes tell us about migrations?

So far no one has come to an agreement on the origin of the European gene pool, even though it is the one that has been examined most thoroughly. The disagreement is especially on the share of genes from respectively Palaeolithic hunter-gatherers and a later migration of neolithic farmers from the Near East.

The European blood types indicate a demic diffusion model, whereas the studies on mtDNA lately have suggested cultural diffusion. Recent studies on DNA from the Y-chromosomes (male) show that the Y-DNA from the neolithic farmers makes up approx. 20 % of the European gene pool. DNA is no matter how you put it, difficult to interpret, and bottlenecks and the like could have changed the pictures completely!

Never the less, five or six larger migrations are believed to have taken place in Europe, according to the last 20 years of genetic studies:

1. The first anatomic modern humans - around 50-40.000 years ago.
2. A later migration into Europe during the upper Palaeolithic from Eastern Europe and the Near East - around 25-20.000 years ago.
3. A late glacial population expansion and colonization of the de-iced areas from Spain and France (Magdalenian) - around 15-10.000 years ago.
4. A demic diffusion of early farmers from the Near East to Europe - around 8500-5500 years ago.
5. A late prehistoric migration from Eastern Europe into Central Europe and regions in the North, possibly by nomads and peasants speaking Indo-European - around 6000-4500 years ago.
6. Later migrations during the migration period - around 400-500 AD.

Morphology

Cranial measurements show that the Mesolithic cranial forms are a mixture of the Palaeolithic and the Neolithic types. Thus some of the morphological changes around the neolithization must definitely be due to adaptation, and should therefore be seen as answer to both climatic changes and the effects of the changed diet (evolution due to ecological factors). This however still cannot explain why some groups change profoundly while others don't - even though they all undergo the same cultural changes!

Some do argue that the Middle Eastern influence of farmers could have come later on in the neolithic period, perhaps in the middle neolithic.

Studies on cranial morphology in Anatolia and the Levant reveal that the first farmers were a very mixed group. A variation like this is not known from the rest of Europe. This could be due to a genetic bottle neck among the Anatolian groups that only led a small genetic variation through to Europe.

In the rest of Europe the relationship between hunter-gatherers and farmers is more complex. Studies of cranial forms support that there was a biological discontinuity between the Palaeolithic and Mesolithic groups (the pre-neolithic groups) and the neolithic groups. In Catal Hüyük the skull shapes lie closer to other European forms than to the ones from Anatolia and the Levant. This therefore suggests that some of the European genes do actually stem from this area!

As mentioned before, the early farmers in Anatolia and the Near East differed so much from one another, that it can only have been a small part of genes from Anatolia (Catal Hüyük?) that came through a possible bottle neck and into Europe. In many areas there is an evident lack of archaeological evidence of continuity from the Mesolithic and into the Neolithic in specific sites (locations). The biological results mentioned above do in some ways support this. In general we should probably count on different processes in different areas. Further we must be aware of factors such as secondary neolithizations and/or migrations and also the possibility of more processes taking place at the same time - in the same place.

Body proportions

Piontek and Vančata did in 2002 study the skeletal material from many of the areas that were affected by the neolithization. They found a great difference between the pre-neolithic and the neolithic groups in body size, body proportions, bone shape and robustness. They believe that natural selection due to a changed fertility around the neolithization favoured new types of genes. This should thus have been due to a change in maturation. Early maturity has some connection to a longer body and shorter limbs!

The Danish skeletal material

The number of early neolithic skeletons from Denmark is now up at around 50, because of the many new datings of the skeletal material found in bogs. The average stature in the early neolithic in Denmark is almost the same as in the Mesolithic period, but the skeletons, especially the ones from the bogs, now appear to be more gracile and the skulls taller, slimmer and with less bone mineral content (the cranial vault is thinner). Some believe that this change is mainly due to a reduction of the chewing muscles, because of the change in diet which to some extent was abrupt; Both C¹³-analyses, the less tooth wear and a few more carious infections show that a pronounced change of diet took place in this period. The change in skull shape itself towards a taller and more slim skull is however still thought to be due to genetic factors.

Traits among the Danish Mesolithic skeletons indicate that they were a homogenous group, and often genetic related. The neolithic skeletons however are far more heterogeneous. While some remain robust, others don't. The robust Mesolithic body was adapted to the cold northern climate by selection and evolution. Since then, the robustness of the human body has decreased up until today.

The evolution towards a less robust body around the Neolithization is more pronounced among males. Some believe that this is due to a change in the work burdens, especially for males, but most DNA results also show, that more male DNA has been moving northwards at this time. Many anthropologists therefore still suggest that some demic diffusion must have taken place around the neolithization. In relation to this it is interesting that many linear band pottery (LBK) skeletons, from the areas just south of Denmark, have the same morphological traits as the new Danish neolithic type of skeletons.

The health conditions are in general good among the Mesolithic population in Europe, while there among the neolithic populations seems to be a tendency towards more nutritional defects and infectious diseases. Many believe that this is mainly due to the assumed population growth, the sedentariness and more uniform diet at the beginning of the neolithic.

Local areas

The Levant (Israel-Palestine, Syria, Lebanon, Jordan and Iraq)

It probably wasn't climatic changes around the beginning of the younger dryas (a prehistoric climatic period) that caused the neolithization in the Levant. The Natuf culture arose around 10.800 years ago in Israel, Lebanon and Jordan. It was a high developed hunter-gatherer culture, that traditionally is split into an early (9-8.200) and a late (8.200-4000) faze. The Natufian population is believed to have caused some hunting pressure on the wild game such as for instance the Gazelle, which made the number of animals decrease in the Mediterranean during the period. The pressure was seemingly most intense in the late Natuf, as it is obvious that the slaughtered animals were used more intensively then. This has led to an idea of an escalating pressure on the resources (resource pressure) in the late Natufian period. There are no indications that this led to agriculture, but it might have been one of the reasons why the Natufian population began experimenting with the first minor crops.

It seems as though the neolithization evolved in slow moves forward. It began in the areas of the Natuf culture in the Levantine corridor and in the Fertile Crescent (Jordan, Syria, Palestine, the southern Turkey, Iraq and Iran and perhaps also in the northern Egypt). The first crops (in Jordan) were einkorn, emmer, lenses, peas and beans. The first domesticated animals were used in the western part of the Fertile Crescent in the Sagros Mountains at the borders of Iran and Iraq. At first it was mainly goat and sheep, but cattle and pigs came later on in the areas around. It took some thousands of years before there was agriculture in the whole area. Herding or animal husbandry and agriculture were first brought together after 6500 BC. Agriculture is assumed to have spread from here in many different ways from one place to the other. Many believe that sedentariness in general came prior to the neolithization, and we do actually have evidence of sedentariness in the Natuf culture. Whether agriculture was spread from one place or it arose in many different places because of similar conditions, is not certain. It definitely happened in many different places within in a very short period of time. In the Levant small urban communities on mounds (of urban waste) arose in Jericho among other places - a tradition which expanded into Anatolia as it for instance is seen in Catal Hüyük.

The whole world population before the neolithic revolution was probably not any larger than 1 million people. This however changed radically with the agriculture which could now feed many more people per hectare.

Anatolia

Agriculture came via Anatolia (Western Turkey) into Europe. The earliest dates in Anatolia are from Catal Hüyük and are from around 5600 BC and onwards. The sites in Anatolia have deliberately been placed where the soil is fertile and thus in areas that have not earlier been occupied by local Mesolithic groups - just as it is seen in the rest of Europe. If you want to believe in Cavalli-Sforza and Ammerman's theory of the wave of advance, it should thus be modified so that people moved for fertile soils and thus not in a constant distance and speed. Before agriculture reached Greece, it stagnated in Thessaly until the population had grown large enough to proceed. This was first after 1500 years of neolithic economy. Later on it spread to the southern Balkans.

The Neolithization of Europe

Around 7-6000 BC the first neolithic economies arose in Greece (Balkan and Cyprus). From here it spread on in to directions; a *Danubian tradition* which became the linear band pottery group (LBK) and a *Mediterranean tradition* which became known for their cardium pottery and settled at the coasts of Greece, Italy, Southern France, Spain and Portugal.

In for instance the western Mediterranean, in Spain and in France, the neolithic economy arrives in small parts at different times after 4800 BC. This has been interpreted as an indication of cultural diffusion; maybe small Neolithic groups came by boat to the Iberian Peninsula.

In the same period the climate changed towards more rainfall and warmer winters, which might have led to agriculture in Central- and Western Europe around 6-5000 BC. Areas with 'loess' soils along the rivers from Belgium and Northern France and all the way to the borders of Asia were occupied at first, because of the ideal conditions for crops. The settlements now lay close to one another. Agriculture reached Paris, the Rhine delta and Alsace around 5300-5200 BC. It is assumed that the population number rose steadily and that the farmers slowly moved on to new soils. The first Central European farming culture was the linear band pottery group (LBK). The long houses, the long barrows, the cultic enclosures with palisades and the farming with herding of cattle and pigs were very uniform all the way from Hungary in the east to the Rhine area in the west. The Neolithic economy spread in many different ways. In many other areas than Europe, for instance to the east, nomadic cultures arose, who lived with cattle, horses or camels. Nomads could also be found in Europe; The Magyar's who wandered across the Carpathians and into Hungary in the 9th century is an example. Nomads with domestic animals do spread differently than peasants, since they're independent of the landscape and often are smaller groups of people together that can easily move.

Around 5000 BC agriculture had moved closer to the Baltic Sea. Here it stagnated for several centuries.

There were however many contacts across the frontier. The northernmost settlements had gradually developed certain characteristics and separated into smaller groups, but they had all still kept many of the old traditions. In all of Northern Europe the groups of this period can be classified as part of the funnel beaker group (TRB), and the long barrows were remarkably similar across the area.

Contact and migration are the most common explanations to the introduction of agriculture into Europe, from the Levant via Anatolia. It has long been acknowledged that population growth and migration spread the neolithic (Ammerman & Cavalli Sforza's theory). The modern 'migrationists' do however believe more in demic diffusion, than an actual "migration". Others believe that the ideas alone spread from the Levant - not the people themselves. In general *the Danubian tradition* (LBK) is associated to demic diffusion (and migration), while *the Mediterranean tradition* is associated to cultural diffusion. Lately archaeologists have realized that the Mediterranean tradition spread far faster than the Danubian. The fact that the Mediterranean tradition spread along the coasts, could indicate a migration along the shores and the style in the whole area is actually more uniform than the linear band pottery in mainland Europe. On the other hand it does have roots in the Mediterranean tradition, so many find it unlikely, that there have been immigration of farmers from the Near East in the Mediterranean.

Eastern Europe

The first evidence of pottery and animal husbandry north of the Black Sea is from around 6000 BC. These cultural areas, that still has a basic economy of hunting and fishing, are neighbours to the LBK groups to the northwest and Cris to the west. There is a general agreement to the fact that these groups did not receive agriculture by immigration, but by contact alone. The first all neolithic culture in the area is the Dnieper-Donets culture. It arose around 5000 BC and is known from several sites. For instance over 800 burials with ochre, pearls, shells and early copper, which indicates contacts to Caucasus. The humans are morphologically seen tall and robust Cro Magnon people, who differ from the neolithic slim and gracile skeletons from the Balkans.

East of these areas there are nomadic cultures, who never become sedentary.

Central, North and North Western Europe

Many believe that the linear band pottery (LBK) represents an immigrated group of people who brought the original domestic animals and plants with them, along with the pottery and the long houses. In some areas the 'package' (domesticated plants and animals, pottery, polished axes, sedentary villages, megalithic tombs and monuments) appeared at the same time, in others it came separately. In the Baltic area the Mesolithic population is believed to slowly have taken over the neolithic economy by themselves.

Great Britain

The neolithic "package" is implemented in Scotland around 3800 BC. Pollen analyses also indicate early crops at the shores of Scotland. At the same time, or soon after, it is seen in all of Scotland. In Orkney it is seen in new sites that have not been used before in the Mesolithic period.

There is a general agreement on that the neolithization of Scotland on the west coast was slow and gradual with continuity from the former period. In certain sites the neolithization took place very rapidly and diets assumable changed quickly and drastic. Therefore some are still discussing colonization as a part of the neolithization of Scotland and the UK. The datings show that the diet, right up to the neolithic period, was based on the marine resources, and that it changed drastically towards a terrestrial diet in the neolithic.

The neolithization of the Baltic area

Most of the hunter-gatherer groups around the Baltic Sea were highly developed by the end of the Mesolithic, with an intensified hunting strategy and specialisation in many areas. They gradually became more sedentary, and since agriculture moved closer, they eventually took it in. The many different types of neolithic cultures that arose in the Baltic area are a good example on the way the different groups changed their economies in different ways. They emerged as a mixture of the old groups and the new economy. In Poland the hunter-gatherers lived side by side with the farming groups for a very long period of time. Maybe TRB should be considered as a combination of agriculture and hunting/ gathering - a result of the two colliding cultural ideas.

The neolithization of Scandinavia

Some groups become more sedentary during the late Mesolithic in Denmark (the Ertebølle period), but not all. There is a great local variation. We have indications of larger groups living together, and seasonal sedentariness. The grave sites are larger than in the earlier periods, but this is not necessarily an indication of sedentariness. From around 4500 BC we have pottery in Denmark and Scania. This is approximately at the same time as the t-shaped antler axe. From around 4250 BC influences also go south and around 4000 BC we see the funnel beakers in all of southern Scandinavia. Most agree that there was continuity in both the flint technology and the ceramic tradition. There are thus no clear signs of immigration.

Denmark

Just before the agricultural “revolution” reached Denmark the climate had turned a little colder. By many scientists this has been interpreted as one of the main reasons for the change. The climatic change disturbed the possibilities for fishing and made the oyster almost disappear. Also the vegetation changed. In the Pollen diagrams the ‘landnam’ is seen, but it has taken place over some 500 years. Emmer wheat was one of the dominating crops.

The earliest cattle is known from ‘Åmosen’ around 3955 BC. Zoologists have determined that the cattle was imported and domesticated in advance. The funnel beakers appear at the almost same time. The polished axes and the megalith tombs came a little later.

Even so, we know that people were dependent on marine resources way into the neolithic. Gloss on flint sickles indicate that farming had first real established it self around 3000 BC, so there is no doubt that it was a slow process.

Furthermore it is difficult to date the neolithization in Denmark precisely. The conclusion for the dating of domesticated animals in Denmark must be around 3950 BC. Whether crops and domesticated animals came at the same time or separately, is not certain. We have no signs of cultivated crops before 3900-3800 BC, and they are first seen in the pollen diagrams after 3600-3500 BC. These datings are interesting, since they collide with the early Carbon 13 analyses that revealed a rapid change in diet at the transition.

We only have few graves from the early neolithic, but the Dragsholm grave is of the old Mesolithic type and indicates some continuation of the Mesolithic traditions.

Artefacts as the transverse arrowhead, flint axes, pottery, the t-shaped antler axe and the bone artefacts all come at different times. Many new artefacts stem from the north western parts of Europe, where the agriculture already existed for some time. The Ertebølle culture was part of a great net of contacts but was also split into regional groups. These groupings continue into the neolithic in the ceramic styles. This is also one of the reasons why Danish archaeologists believe in cultural diffusion.

The socio-economic models are the most common explanations to the neolithization of Denmark. Sometimes they are combined with social archaeology and prestige - interpretations. But immigration is almost taboo.

Conclusion

Anthropological and genetic studies in local areas give very different results. More and more anthropologists across Europe reject the migration theories, partly because of the many new DNA studies and natural scientific results, partly because of the theoretical discussions within archaeology that now focuses more and more on for instance ethnicity, gender, individual perspectives etc.

Anthropologists and archaeologists have different ways of looking at the neolithization, since their materials and backgrounds are different. We sometimes work together, but it seems as though we still cannot discuss the issues at the same level. Both parties should be more open to new explanations but should also focus more on their own material. Even though the other part doesn't like the interpretations – if for instance migration does not fit with the archaeological material – the anthropologists should still publish their thoughts. Just because a theory isn't modern, it could still be correct! - Are anthropologists afraid to draw conclusions from a material if they (the conclusions) speak totally against the archaeologists modern interpretations?

References

- Andersen, S. H. 2002. The Transition from the Early to the Late Stone Age. In: Fischer, A. & K. Kristiansen 2002 (eds.). *The Neolithisation of Denmark. 150 years of debate*. Sheffield 2002, p. 219-230.
- Ahlström, T. 2003. Caries or Pottery? On the reduction in tooth size in the Neolithic Age. In: Iregren, E. & L. Larsson (eds.). *A tooth for a tooth*. Report series no. 87. Lund 2003, p. 47-63.
- Ammerman, A. J. & L. L. Cavalli-Sforza 1984. Conclusions. *The Neolithic Transition and the Genetics of Populations in Europe*. New Jersey 1984, (chapter 8), p. 133-139.
- Bennike, P. 1999. The Early Neolithic Danish bog finds: a strange group of people! In: Coles, B., J. & M. S. Jørgensen 1999 (eds.) *Bog Bodies, Sacred Sites and Wetland Archaeology*. WARP 12. Exeter, England 1999, p. 27-32.
- Bennike, P. & V. Alexandersen 2002. Population Plasticity in Stone Age Denmark. In: Fischer, A. & K. Kristiansen 2002 (eds.). *The Neolithisation of Denmark. 150 years of debate*. Dorset, England 2002, p. 289-302.
- Bentley, A., L. Chikhi & T. D. Price 2003. The Neolithic transition in Europe: comparing broad scale genetic and local scale isotopic evidence. *Antiquity* 77, p. 63–66.
- Bocquet-Appel, J.-P. 2002. Paleoanthropological Traces of a Neolithic Demographic Transition. *Current Anthropology* 43, no. 4, August-October. Chicago 2002, p. 637-650.
- Cavalli-Sforza, L. L. 1996. The spread of agriculture and nomadic pastoralism: insights from genetics, linguistics and archaeology. In: Harris, D. R. 1996 (ed.). *The Origins and Spread of Agriculture and Pastoralism in Eurasia*. London 1996, p. 51-69.
- Chikhi, L., R. A. Nichols, G. Barbujani & M. A. Beaumont 2002. Y genetic data support the Neolithic diffusion model. *Proceedings of the National Academy of Sciences* 99. Washington 2002, p. 11008-11013.
- Crubézy, E., J. Brůžek & J. Guilaine 2002. The Transition to Agriculture in Europe: an Anthropobiological Perspective. In: Bennike, P., E. B. Bodsár & C. Susanne 2002 (eds.). *Ecological Aspects of Past Human Settlements in Europe*. Biennial Books of EAA, Budapest 2002, vol. 2., p. 93-110.
- Eshed, V., A. Gopher, T. B. Gage & I. Hershkovitz 2004. Has the Transition to Agriculture Reshaped the Demographic Structure of Prehistoric Populations? New Evidence From the Levant. *American Journal of Physical Anthropology* 124. New Jersey 2004, p. 315–329.
- Fischer, A. 2002. Food for Feasting?. In: Fischer, A. & K. Kristiansen 2002 (eds.). *The Neolithisation of Denmark. 150 years of debate*. Sheffield 2002, p. 341-393.
- Froment, A. 2002. Biological Evolution of Populations during the Early Holocene Transitions. In: Bennike, P., E. B. Bodsár & C. Susanne 2002 (eds.). *Ecological Aspects of Past Human Settlements in Europe*. Biennial Books of EAA, vol. 2. Budapest 2002, p. 41-60.
- Haak, W., P. Forster, B. Bramanti, S. Matsumura, G. Brandt, M. Tänzler, R. Willems, C. Renfrew, D. Gronenborn, K. W. Alt & J. Burger 2005. Ancient DNA from the First European Farmers in 7500-Year-Old Neolithic Sites. *Science* 310. November. Cambridge/Washington 2005, p. 1016-1018.
- Harris, D. R. 1996 (ed.). The origins and spread of agriculture and pastoralism in Eurasia: an overview. *The Origins and Spread of Agriculture and Pastoralism in Eurasia*. London 1996, p. 552-574.
- Jackes, M., D. Lubell & C. Meiklejohn 1997. Healthy but mortal: human biology and the first farmers of western Europe. *Antiquity* 71, no. 273. York 1997, p. 639-58.
- Jennbert, K. 1998. 'From the inside': A Contribution to the Debate about the Introduction of Agriculture in Southern Scandinavia. In: Zvelebil, M., L. Domanska & R. Dannel (eds.). *Harvesting the Sea, Farming the Forest: the emergence of Neolithic societies in the Baltic region*. Sheffield 1998, p. 31-36.
- Jones, M., T. Brown & R. Allaby 1996. Tracking early crops and early farmers: the potential of biomolecular archaeology. In: Harris, D. R. 1996 (ed.). *The Origins and Spread of Agriculture and Pastoralism in Eurasia*. London 1996, p. 93-100.
- Munro, N. D. 2004. Zooarchaeological Measures of Hunting Pressure and Occupation Intensity in the Natufian: Implications for Agricultural Origins. *Current Anthropology* 45, Supplement, August-October. Special Issue. Chicago 2004, p. 5-35.
- Noe-Nygaard, N. 1988. $\delta^{13}\text{C}$ -values of dog bones reveal the nature of changes in man's food resources at the Mesolithic-Neolithic transition, Denmark. *Chemical Geology (Isotope Geoscience Section)* 73. Amsterdam 1988, p. 87-96.
- Pinhasi, R. & M. Pluciennik 2004. A Regional Biological Approach to the Spread of Farming in Europe: Anatolia, the Levant, South-Eastern Europe, and the Mediterranean. *Current Anthropology* 45, Supplement, August-October. Special Issue. Chicago 2004, p. 59-83.
- Piontek, J. & V. Vančata 2002. Genetic Transition to Agriculture in Europe: Evolutionary Trends in Body Size and Body Shape. In: Bennike, P., E. B. Bodsár & C. Susanne 2002. *Ecological Aspects of Past Human Settlements in Europe*. Biennial Books of EAA, vol. 2. Budapest 2002, p. 61-92.
- Price, T. D. 2000. Lessons in the transition to agriculture. In: Price, T. D. 2000 (ed.). *Europe's first farmers*. Cambridge 2000, p. 301-318.
- Renfrew, C. 1996. Language families and the spread of farming. In: Harris, D. R. 1996 (ed.). *The Origins and Spread of Agriculture and Pastoralism in Eurasia*. London 1996, p. 70-92.
- Rowly-Conwy, P. 1998. Cemeteries, Seasonality and Complexity in the Ertebølle of Southern Scandinavia. In: Zvelebil, M., L. Domanska & R. Dannel (eds.). *Harvesting the Sea, Farming the Forest: the emergence of Neolithic societies in the Baltic region*. Sheffield 1998, p. 193-202.

INTENSIVE COURSE IN BIOLOGICAL ANTHROPOLOGY
1st Summer School of the European Anthropological Association
16–30 June, 2007, Prague, Czech Republic

- Schulting, R. J. & M. P. Richards 2002. The wet, the wild and the domesticated: The Mesolithic-Neolithic transition on the coast of Scotland. *European Journal of Archaeology* 5, no. 2, august. London 2002, p. 147-189.
- Zvelebil, M. 1998. Agricultural frontiers, neolithic origins and the transition to farming in the Baltic basin. In: Zvelebil, M., L. Domanska & R. Dennel (eds.). *Harvesting the Sea, Farming the Forest: the emergence of Neolithic societies in the Baltic region*. Sheffield 1998, p. 9-29.
- Zvelebil, M. 2000. The Social Context of the Agricultural Transition in Europe. In: Renfrew, C. & K. Boyle 2000 (eds.). *Archaeogenetics: DNA and the population prehistory of Europe*. Cambridge 2000, p. 57-80.

Mailing address:

Lise Harvig
University of Copenhagen, Nørregade 10, P.O. Box 2177
DK-1017 Copenhagen K, Denmark
Lisoharvig@hotmail.com