2 Nuances in the Archaeological Record Regarding the Mesolithic-Neolithic Transition

David Mennear

The aim of this article is two-fold; to help show the effects of an integrated multidisciplinary approach in studying and understanding the Mesolithic-Neolithic transition, and a discussion on the several issues that the transition had on selected archaeological sites and cultures. Thus the article will limit itself in scope, with the discussion of two European cultures and a Japanese culture which will help to highlight the different techniques and approaches used in understanding the nuances in the archaeological record.

The transition from a hunter-gatherer lifestyle to farming as a means for a stable food return varies enormously depending on which cultures are under discussion and investigation. Additionally, this fundamental transitional period was not an immediate or permanent change in lifestyle; the boundaries between the Mesolithic and Neolithic are becoming ever more blurred as new evidence comes to light (Price 2000: 4). Zvelebil notes, 'The adoption of farming must have had a number of causes which were variable from region to region and were contingent on the region environmental and socio-economic conditions' (Zvelebil 1986: 13).

The LBK Across the Central European Plain

The first culture to be discussed is the Linearbandkeramik culture (LBK) of the Central European Plain (CEP). The predominant impulsive spread of the LBK has been pinpointed and dated from 5700 BC to 4500 BC, and has its origins ascertained to the Middle Danube, and tributaries in Hungary (Scarre 2005: 407). Throughout the LBK culture it has been noted that the sites are often found on fertile loess soils of the CEP as they provided the optimal growing conditions for agricultural use. Price notes this is in contrast to the 'Mesolithic foragers [who] were [more] concentrated in marine, riverine and rich lacustrine environments' and that 'recent surveys in the interior European basins have failed to reveal substantial Mesolithic remains' (Price 2000: 5). The numerous LBK settlements, often located in fertile forest clearings, are very similar in both structurual and material remains which suggests a relatively strong cultural coherence which 'colonised' its way across central Europe (although this has recently been debated). There is also suggestion of an LBK movement from a communal to a later household level of organisation, as the long houses excavated are unique familiar units in the typical village layout (Keeley 1992: 86). It must be noted, however, that there were regional differences in lithic, ceramic and dietary choices within the composition of the LBK culture.

There is also evidence of violence and cultural in-fighting within neighbouring LBK groups from osteological analysis of human remains at the both Talhiem site in Southern Germany, Herxheim in Southeast Germany and the LBK site of Schletz in Eastern Austria. The evidence points towards injuries inflicted with LBK-style weaponry, specifically targeting the male population, rather than by foraging or other farming groups (Scarre 2005: 411). Violence, it seems, is endemic to human populations throughout the course of human history. The geographical predisposition for farming and intensive adaptation of fertile land for farming settlements presents a key development in the nature of land use

by human societies in the spread of European agriculture. Interestingly the spread laterally across the CEP contrasts with the later uptake of agriculture around the eastern Baltic and western Russia in 3500 BC, where biologically wild resources were still heavily used up until the 3rd millennium BC (Price 2000: 16; Zvelebil and Lillie 2000).

The Jomon and Yayoi of Japan

Not all societies were exposed to agriculture so quickly, as is evident throughout the Jomon period in Japan. Lasting from approximately 14,000 BC to 300 BC, the Jomon culture contains evidence for the earliest use of pottery in the world and made extensive use of the large variety of environments in the Japanese archipelago (Akazawa 1986; Kaner and Ishikawa 2007; Mithen 2003). The Jomon have been classed as predominantly a hunter-gather-forager culture until the Yayoi period around 300 BC, when the adoption to agriculture was fully implemented with intensive rice agriculture, weaving and the introduction of metallurgy (Mays 1998: 90). There has long been discussion as to whether the Yayoi culture were settlers from mainland Asia who explicitly brought agriculture to the Jomon of Japan, as an integration model, or if the Yayoi superseded the Jomon as propagators of agriculture (Akazawa 1986; Kaner and Ishikawa 2007; Mays 1998). Studies have been carried out on the measurements of skull morphology, in particular the study of the modern day aboriginal Ainu people located in Hokkaido, a large island north of mainland Japan, who maintain they are the Jomon's descendents. Craniometric and multivariate analysis of human skeletal measurements have led to results that indicate that the Jomon are distinctive in head shape from the Yayoi, but they still share distinct similarities with the modern day Ainu population (Akazawa 1986: 151; Mays: 90). This has led to theories that population pressures pushed the Jomon northwards up through Japan to the modern day island of Hokkaido, whilst the Yayoi immigration wave helped to spread agriculture across Japan.

The importance of this work highlights the movement of the adaptation of agriculture in a relatively late time frame, in comparison to mainland Asia and Europe. Palaeoenvironmental evidence suggests this is due to the richness and diversity of the Japanese archipelago, with heavy densities of the Jomon population in 3500 BC located in central and eastern Japan (Kaner and Ishikawa 2007: 2). Stable village sites with pit dwellings, storage areas and burial facilities have been excavated and studied, yet there is only a hint of cultivating nuts and plants. It must also to be noted that Akazawa (1986: 163) points out:

> Rice cultivation would seem redundant to those Jomon societies whose procurement was regulated by year round demands of different major food gathering activities whereas it would seem attractive to those Jomon societies characterised by a simple food procurement system, supported by a single major food gathering activity.

Ongoing data conflicts with the accelerated mass spectrometry (AMS) results from human and animal bone have resulted in suggestions that the impact of the Yayoi culture should be pushed back to 1000 BC or 900 BC. However, the results from sites located on coastal areas could be contaminated with the 'marine radiocarbon reservoir effect', a natural distortion of radiocarbon dates by the dissolving of calcium carbonate which could thus require a possible need

to recalibrate existing dates (Kaner and Ishikawa 2007: 4). The outcome of the timing of adoption of agriculture in the Late Jomon/Yayoi period is still hotly debated, as outlined by a few issues discussed above. Yet the archaeological evidence presents a hunter-gather society managing to thrive without agriculture in a range of diverse environments, until later cultural re-adjustment and migrations of people came into contact with the existing Jomon culture and fostered a change towards widespread rice agriculture (Akazawa 1986; Mays 1998).

Portuguese Mesolithic to Neolithic Changes on the Atlantic Coast

Moving on to the Portuguese Atlantic coast, the evidence points to a different motivation in the timing for the implementation of agriculture. Stable isotopic analysis and the dental attrition rates of a number of skeletons have revealed a great variety of information regarding diet changes during the Mesolithic to Neolithic transition. Work carried out by Lubell et al. (at the Moita do Sebastiao, Melides and Fontainhas Roche Forte II sites in Southeast Portugal) demonstrates a gradual dietary change from a mixture of terrestrial and marine resources in the Mesolithic to a diet more dependent on terrestrial food in the Neolithic (Lubell et al. 1994). The date for this transition has been dated to around 5000 BC in central Portugal, with changes beginning around 6000 BC or maybe even 7000 BC (Lubell et al. 1994: 201). This indication of change in food origin is a feature of the 'Neolithic package'. But as we have seen with the Jomon culture, key indicators of the Neolithic (such as pottery and long term village sites) do not always show a movement or adoption towards full blown agriculture. This key concept of the 'Neolithic' package is constantly being reassessed as new evidence blurs this important transitional period in the development of humanity (Zvelebil 1986).

So what other evidence is present in Portugal? Zvelebil and Rowley-Conwy (1986: 68) note a continuing Mesolithic economy, with large shell middens present on the River Muge located at Cabeco da Amoreira and Cabeco da Arruda. Palaeoenvironmental evidence indicates that they were located near shallow lagoon and estuary type environments, with the shell middens themselves dating back to mid 4000 BC with long periods of use. Evidence from the middens has also revealed the presence of faunal remains, such as auroch, roe deer, red deer, badger and lynx, suggesting a rich environment of resources. Evidence of cemeteries include those found at the above sites alongside Moita do Sebastiao, with evidence pointing towards a 'probable increased group size and (increase in) social complexity' (Zvelebil and Rowley-Conwy 1986: 68). This suggests socially and economically complex hunter-gatherer communities near the Atlantic coast with a dependence on seasonal marine resources. The use of cemeteries and long lived sites suggests greater sedentism, which could have opened the hunter-gatherers up to pre-adaption of agriculture.

The early conservatism of the Mesolithic population is noted by the choices of marine and some terrestrial food illustrated by the narrow nitrogen isotopic range from stable light isotope studies, along with a homogenous diet recorded in the earlier middens. This later contrasts to the wider range of carbon and nitrogen isotope averages and the broader range of molar attrition recorded in the Neolithic skeletons, suggesting a greater inclusion of terrestrial foodstuffs into the diet (Lubell et al. 1994: 213). The timing of the adaption to agriculture

was culturally defined in this locality, and Lubell et al. conclude that the Neolithic was 'an intensification of a trend which started as an adjustment of food supply during an earlier period of sea level, climatic and vegetational change' (Lubell et al. 1994: 214). This, with the above evidence, drove the long term changes and adoption to farming as it was culturally embraced and practised as the trend continued.

Conclusion

Throughout this discussion it has become clear that the mechanics of the transitional period are various and too diverse to fully discuss here. Inevitably different timings of the adoption occur throughout the world; not one single cause can be suggested for the emergence of agriculture (Lubell et al. 1994; Price 2000; Scarre 2005; Zvelebil and Lillie 2000). It is the amalgamation of a multidisciplinary investigation that helps to clearly define and produce a record of this key prehistoric period and its outcomes for the human population, and it is hoped that this article shows but a small part of that effort.

Bibliography

- Akazawa, T. (1986). 'Hunter-gatherer Adaptations and the Transition to Food Production in Japan'. In M. Zvelebil, (ed.) Hunters in Transition: Mesolithic societies of temperate Eurasia and their transition to farming. 151-165. Cambridge: Cambridge University Press.
- Kaner, S. and Ishikawa, T. (2007). 'Reassessing the concept of 'Neolithic' in the Jomon of Western Japan'. Documenta Preahistorica. 2007. 1-7.
- Keeley, L. H. (1992). 'The Introduction of Agriculture to the Western North European Plain'. In A. B. Gebauer & T. D. Price (eds.) Transitions to Agriculture in Prehistory. 81-96. Madison: Prehistory Press.
- Larsen, C. (1997). Bioarchaeology: Interpreting Behaviour From The Human Skeleton. Cambridge: Cambridge University Press.
- Lubell, D. and Jackes, M. Schwarcz, H. Knyf, M. Meicklejohn, C. (1994). 'The Mesolithic-Neolithic Transition in Portugal: Isotopic
- Mays, S. (1999). The Archaeology of Human Bones. Glasgow: Bell and Bain Ltd.
- Mithen, S. (2003). After The Ice: A Global Human History, 20,000-5000 BC. London: Weidenfeld and Nicolson.
- Price, T. D. (2000). 'Europe's First Farmers: An introduction'. In T.D. Price (ed.) Europe's First Farmers. 1-19. Cambridge: Cambridge University Press.
- Roberts, C. and Manchester, K. (2010). The Archaeology of Disease Third Edition. Stroud: The History Press.
- Scarre, C. (2005). 'Holocene Europe'. In C. Scarre (ed.) The Human past: World Prehistory and the Development of Human Societies. 392-431. London: Thames and Hudson.

- Waldron, T. (2009). Palaeopathology: Cambridge Manuals in Archaeology. Cambridge: Cambridge University Press.
- Zvelebil, M. (1986). 'Mesolithic prelude and Neolithic revolution'. In M. Zvelebil (ed.) Hunters in Transition: Mesolithic societies of temperate Eurasia and their transition to farming. 5-16. Cambridge: Cambridge University Press.
- Zvelebil, M. and Rowley-Conwy, P. (1986). 'Foragers and farmers in Atlantic Europe'. In M. Zvelebil (ed.) Hunters in Transition: Mesolithic societies of temperate Eurasia and their transition to farming. 67-93. Cambridge: Cambridge University Press.
- Zvelebil, M. and Lillie, M. C. (2000). 'Transition to agriculture in eastern Europe'. In T. D. Price (ed.) Europe's First Farmers. 57-92. Cambridge: Cambridge University Press.