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Early Farmers. The view from archaeology and science, edited by Alasdair Whittle & Penny Bickle, 2014. Oxford: Oxford University Press (Proceedings of the British Academy 198); ISBN 978-0-19-726575-8 hardback £90 & $135; xx + 450 pp., 12 col. pls, 86 figs, 25 tables, index

Peter Bogucki

At the turn of the twenty-first century, the study of the early farming societies in Europe, particularly in central Europe, was a frozen conflict. On one side were archaeologists who subscribed to the traditional, some might say orthodox, position that the establishment of farming communities was the result of the movement of populations within a landscape that was largely empty except for certain avoided areas that contained concentrations of foragers. The other camp housed archaeologists who saw the establishment of farming communities as the widespread adoption of pottery, livestock and crops by indigenous foraging populations, perhaps relocating regionally from their ancestral habitats to arable soils and retaining a high level of mobility. Each side seemed persuaded of the exclusiveness, virtue and certainty of its position.

Superimposed upon this debate was the tension between 1970s processual archaeology and 1980s post-processual archaeology, which, in retrospect, were actually two competing heresies from earlier forms of archaeological practice. By the 1990s, these had turned into a rivalry between what might be called science-based archaeology that stressed dating, settlement patterns and environmental data and the social and cognitive approaches to explore identity, values and sociality. The study of the transition to agriculture and its consequences was caught in this multivalent frozen conflict and was not really making a lot of progress *c.* AD 2000.

Now, in the second decade of the twenty-first century, the study of the earliest farmers in Europe and nearby parts of southwest Asia has been revived and energized. The last two decades have seen an explosion in analytical techniques from chemistry and genetics, as well as the realization that bone and other short-lived materials are far better for AMS radiocarbon dating than charcoal bits. *Early Farmers. The view from archaeology and science*, edited by Alasdair Whittle and Penny Bickle, documents these advances to provide an overview of how the application of laboratory science has reshaped our understanding of these societies. The first thing to understand is that this book is *not* the second coming of Brothwell and Higgs' 1963 *Science in Archaeology* that many archaeologists of a certain age still have on their shelves. *Early Farmers* is a review of current archaeological thought as motivated by emerging analytical techniques in the physical and life sciences to seek new insights into the lives of Neolithic people.

Early Farmers has 21 chapters by 75 authors, or an average of 3.6 authors per paper, reflecting the multiple-author publishing model of the sciences. Actually, it is a bit more complex than such a simple average. Seven of the chapters have one author and another six have two authors. The remaining eight chapters, then, have an average of seven authors each. The fewer the authors, the more synthetic and generalizing the presentation. Chapters with more authors have the character of research reports on specific applications of scientific methods and techniques. Seven of the chapters deal with the *Linearbandkeramik* (LBK) communities of central Europe, while the others are distributed from the Zagros to Ireland.

After an introductory chapter by Bickle and Whittle to establish the scope and themes of the book, chapters by Robb and by Barrett provide programmatic statements for the study of the transition from foraging to farming in the decades to come. Both declare the frozen conflict between acculturation and migration to be resolved, or at least retrograde, and propose nuanced ways to move forward in understanding how 'Neolithic things and practices' (an expression used by Whittle in several other publications) came to be. Both point to the importance of building interpretive frameworks that cross-cut the boundaries of intellectual terrain staked out in previous decades. *Early Farmers* contains additional programmatic statements in subsequent chapters that should not be overlooked. Larsen makes the case for the importance of bioarchaeology as a way of studying life conditions and health of early farmers. Further on, a chapter by Harris provides important insights into how to harmonize the impact of scientific analyses with theoretical approaches to materiality by expanding the concept of assemblage to include its physical, expressive, territorial and 'de-territorial' dimensions.

Three chapters apply a variety of analytical techniques to *Linearbandkeramik* (LBK) data. Bocquet-Appel and his collaborators use multi-agent modelling to examine the interplay between archaeological and environmental data to reconstruct and simulate LBK society. LBK social behaviour has long been fertile ground for computer modelling, but advances in computing power and the resolution of environmental data now enable many more variables to be taken into account. Szécsényi-Nagy *et al.* analyse ancient DNA of the LBK in Transdanubia and the Szakálhát group in the southern Alföld. They document the close genetic affinity of these Neolithic populations with other LBK populations in the Carpathian Basin and beyond, while pointing toward a negligible impact of indigenous hunter-gatherer haplogroups. Brandt *et al.* integrate palaeogenetics and strontium isotope analysis in the study of burials from the LBK settlement at Karsdorf in central Germany to show that membership in the community was dynamic and fluid, with individuals joining and leaving across generations.

Chapters by Balasse *et al.* and Tafuri *et al.* discuss herding practices using stable isotope studies of faunal remains. These techniques have tremendous potential, since animal

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bones are usually much more abundant than human remains. The Romanian site studied by Balasse *et al.* dates to *c.* 5000 cal BC, while the work of Tafuri *et al*. focuses on the celebrated ditched villages in the Tavoliere region of Italy in the late sixth millennium BC. In both cases, stable isotope results argue for diversity in herding strategies rather than a one-size-fits-all model.

The Neolithic was not a peaceful time. Schulting and Fibiger document that 8–15 per cent of the Neolithic population in Scandinavia and the British Isles suffered a blow to the head at some point in their lives, and in about half of these cases, the blow was lethal. Neolithic life was also dangerous in the LBK area. Meyer *et al.* analyse what they call 'deviant treatment of the deceased' in the form of mass graves with multiple articulated skeletons and of enclosures with body parts strewn about. 'Mass fatality events' were more common than once thought, while ritual activities involving the manipulation of disarticulated human remains add yet more diversity to LBK mortuary ritual.

Animal bones and carbonized seeds provide a macroscopic picture of the prehistoric economy, but relatively little insight as to how plants and animals actually made their way into peoples' stomachs. Over the last 15 years, biomolecular techniques have permitted 'economy' to be complemented by 'diet' and even 'cuisine'. Saul, Glykou and Craig provide an overview of the potential for such analyses and present a case study of lipid residues from two sites at the transition from foraging to farming in the western Baltic zone *c.* 4000 cal BC that illuminates use of both terrestrial and marine resources. Analysis of lipid residues by Smyth and Evershed in sherds from 15 Neolithic sites in Ireland shows high levels of bovine milk fats at enclosures and house sites, expanding further the proposition that milk was central rather than peripheral to Neolithic life.

Several chapters synthesize multiple strands of evidence to construct models of Neolithic lifeways at various scales. Using data from figurines, plastered skulls, burials and stable isotopes, Pearson and Meskell reconstruct identities and life choices of indivduals at Çatalhöyük in their social and physical realms. Matthews *et al.* summarize a complex research project in the Zagros range that studies the micromorphology of occupation surfaces and phytoliths, dung, coprolites and charred plant remains found in thin-sections to understand plant use, household activities, fuel use and animal management. Hachem and Hamon weave together data on house forms, faunal samples and ground stone tools from sites in the Aisne valley of France, particularly Cuiry-lès-Chaudardes, to develop a model of LBK household organization. Bogaard situates stable isotope data on crops from multiple sites across Europe within a larger discussion of weed ecology and palaeodiet to document the intensive and sustained cultivation of arable plots in the Neolithic taskscape.

Lest we get carried away by the celebration of innovative scientific techniques in transforming the archaeology of early farming societies, several final chapters remind us of archaeology's particular strengths in the identification and interpretation of patterns of evidence. Chapman applies comparative methods to examine the prehistoric practice of 'science', specifically the understanding of scientific causation, in the Balkan Mesolithic, Neolithic and Copper Age. One of the great challenges posed by recent scientific advances is that their results are often orthogonal to archaeological interpretations. While one might try to make the square science fit a round archaeological hole, or *vice versa*, a better approach, in the view of Sheridan and Pétrequin, is to ask the right questions at the start and then integrate archaeology and what they call 'hard science' to address the problem. They illustrate such an approach with the study of the distribution of jadeite axes in western Europe during the fifth millennium BC. Finally, Halstead sums up the volume with an appreciation of the contributions of science, but points out that, in many cases, they start from unsubstantiated archaeological assumptions, or provide such indirect evidence of human behaviour that they are open to multiple interpretations.

Although a keen advocate of the liberation of information from archaeological materials through novel and innovative analytical techniques, I share a concern that archaeology as a comparative, systematic, theorizing discipline will become dominated by headlines of spectacular scientific breakthroughs published in high-impact journals like *Nature* and *PNAS*, which have publicity machines that complement institutional press offices to sensationalize new discoveries. At the same time, however, new approaches as highlighted in *Early Farmers* have melted the frozen conflicts to which I alluded earlier and introduced a fresh spirit of shared purpose and collegiality into Neolithic archaeology. It is a wonderful time to be studying the problems of the transition to agriculture and its consequences!

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What do we do with an encyclopaedia in an information age? The idea of an encyclopaedia, the systematic,

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