

THE FIRST FARMERS OF EUROPE

Knowledge of the origin and spread of farming has been revolutionised in recent years by the application of new scientific techniques, especially the analysis of ancient DNA from human genomes. In this book, Stephen Shennan presents the latest research on the spread of farming by archaeologists, geneticists and other archaeological scientists. He shows that it resulted from a population expansion from present-day Turkey. Using ideas from the disciplines of human behavioural ecology and cultural evolution, he explains how this process took place. The expansion was not the result of 'population pressure' but of the opportunities for increased fertility by colonising new regions that farming offered. The knowledge and resources for the farming 'niche' were passed on from parents to their children. However, Shennan demonstrates that the demographic patterns associated with the spread of farming resulted in population booms and busts, not continuous expansion.

Stephen Shennan is Professor of Theoretical Archaeology at the UCL Institute of Archaeology, where he was Director from 2005–2014. His main interest is explaining stability and change in prehistory in the light of evolutionary ideas. He has published over 120 papers and books, including *Quantifying Archaeology* (2nd edition, 1997), *Genes, Memes and Human History* (2002) and *Pattern and Process in Cultural Evolution* (edited, 2009). He is a Fellow of the British Academy and a member of the Academia Europaea. He received the Rivers Medal of the Royal Anthropological Institute in 2010 and a Shanghai Archaeological Forum Research Award for his EUROEVOL project in 2015.

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EUROPE

An Evolutionary Perspective

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Para Lúcia, a luz da minha vida

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PREFACE AND ACKNOWLEDGEMENTS

The origins of this book go back to the late 1990s and it represents the tip of the iceberg of a vast amount of earlier work with numerous colleagues that has depended on generous support from grant-giving bodies. Prior to that time my main research interests had focussed on the beginnings of the European Bronze Age, but by 1995 I had published the report on my excavation of a Bronze Age site in the prehistoric copper-mining region of Austria and was free to devote more attention to my growing interest in cultural evolution and, linked to that, in prehistoric population patterns and their implications. My inaugural lecture at the UCL Institute of Archaeology in 1998, published in *Current Anthropology* two years later, was entitled, 'Population, culture history and the dynamics of culture change' and began to develop this topic, which I took forward again with my book, *Genes, Memes and Human History*, in 2002. I had also become much more interested in the idea of looking for broad regional and inter-regional patterns in prehistory than in the archaeology of individual sites and micro-regions and I felt that the potential for this was being neglected in the archaeological intellectual climate of the time, which had turned against 'grand narratives'. There seemed to be great scope for combining my evolutionary and 'big picture' interests by turning to the origins of the European Neolithic and the spread of farming into Europe. Fortunately this view was shared by funders, and later by journal editors, despite the claim by many grant and paper reviewers that 'noise' from factors affecting data recovery and survival would overwhelm any historical signal.

In 1999 James Steele and I were successful in obtaining a research grant from the UK Arts and Humanities Research Board (as it then was) for a project entitled 'Spatial and Chronological Patterns in the Neolithisation of Europe' that involved collating available sources of radiocarbon dates. This was the first in a series of grants from the Arts and Humanities Research Council (as it later became) that made it possible to develop this agenda. 'The origin and spread of Neolithic Plant Economies in the Near East and Europe' followed in 2001, with James Steele and James Conolly, and 'The origin and spread of stock-keeping

in the Near East and Europe', with Keith Dobney and James Conolly, in 2007. In 2000 a group of colleagues, including Mark Collard, Mark Lake and James Steele, and I had been successful in obtaining a five-year Arts and Humanities Research Board Research Centre award for a 'Centre for the Evolutionary Analysis of Cultural Behaviour', which enabled a variety of theoretical and methodological research projects in cultural evolution to be carried out, and this continued with the award of a continuation of the Centre in 2006 as the 'Centre for the Evolution of Cultural Diversity', under the direction of James Steele. At the same time, grants from the Leverhulme Trust to Mark Lake and to me for the projects 'Strontium isotope analysis and multi-agent modelling' and 'Ceramic analysis and cultural process', the latter with Paolo Biagi, also focussed on Early Neolithic themes. All these developments culminated in 2010 when I obtained a European Research Council Advanced Grant for the project 'Cultural Evolution of Neolithic Europe' (EUROEVOL), 2010–2015. This made it possible to bring together and update previous data-gathering work as well as develop new analyses, in order to produce the basis for a new 'big picture' account of the arrival of farming in Europe and its impact, with a particular focus on the demographic dimension. It was Todd Whitelaw who, after reading the draft grant application, suggested that I should commit to producing a synthesis at the end of the project and not just a series of papers. My knowledge of a key region for understanding the spread of farming, western Anatolia, was then enormously enhanced when in 2012 I was kindly invited by Joachim Burger of Johannes Gutenberg University in Mainz to be a co-investigator on his Marie Curie Initial Training Network project 'Bridging the European and Anatolian Neolithic'. This enabled me to have a PhD student in this field, Beatrijs de Groot, as well as visit the area, get to know a new set of colleagues, and to contribute as a co-author to Joachim's important ancient DNA papers on the spread of farming. Since the end of the EUROEVOL project in 2015 I have been able to continue with very similar population and economy agendas by collaborating with Andy Bevan, Mike Parker Pearson, Tim Kerig, Neil Roberts and Ralph Fyfe, on two projects again funded by the Leverhulme Trust. Andy Bevan's data-mining work is now taking the potential for 'big picture' studies of prehistoric patterns to new levels.

It will be obvious that without the support of the funding bodies named above none of this would have happened. I am also extremely grateful to all those who have generously shared data with us over the years. Without data sharing large-scale projects would be impossible, and the growing expectation from journals that authors of papers make available the data on which they are based is one of the most important developments of the last few years, both in archaeology and more widely.

Of course, I have also incurred an enormous number of personal debts to the people I have worked with on these various projects and it is a pleasure to record them. My fellow investigators on the grant applications, who made

them possible, have already been mentioned. Key to the success of these projects though has been a wonderful group of very talented post-docs with whom it has been a privilege to work. They include Alex Bentley (with whom I've continued to collaborate) and Michela Spataro, from the early days, as well as Barbara Stopp and Fiona Coward. Sue Colledge has been there virtually from the beginning, in 2001 with the Neolithic plant economies project, and has played an essential role in project organisation and data management through to the end of the EUROEVOL research, as well as in her specialist field of archaeobotany. The same role has also been played by Katie Manning, the archaeozoologist, who came to the stock-keeping project at a difficult moment and stayed for EUROEVOL. Here they were joined by Sean Downey, Kevin Edinborough and Tim Kerig, and then Enrico Crema and Adrian Timpson when Sean and Tim moved on to other positions. Enrico and Adrian's outstanding computing and statistical skills were fundamental to producing the project's later papers and final database. The new Leverhulme projects too are very fortunate in their post-docs, Alessio Palmisano, Kevan Edinborough, Peter Schauer and the pollen analyst Jessie Woodbridge of the University of Plymouth. I should also add that EUROEVOL benefitted greatly from the input of our invited 'critical friend' reviewers Sander van der Leeuw, James Conolly and Mike O'Brien during the course of the project.

Needless to say, there are many other debts. It has been an inspiration in the last few years to work with Mark Thomas and to learn from the creativity of his rigorous model-building and testing methods, so much more demanding than the usual archaeological story-telling. He was crucial to the development of some of the EUROEVOL methods and our joint supervision of the recently completed PhD project of Elizabeth Gallagher on modelling farming origins has been a very stimulating experience. I have also been fortunate to learn from him something of the complexity of making inferences from ancient DNA data, as this has completely changed our picture of the origin and spread of farming in the last couple of years and forms one of the foundations of this book. I hasten to add though that any misunderstandings and misinterpretations of the genetics presented here are entirely my own. In this respect I must also absolve Joachim Burger, who has provided patient answers to many genetics questions but is not responsible for what I've done with them. Joachim also tried out drafts of several chapters on his students to my considerable benefit. In addition, I'm grateful to Jamie Jones, Barbara Horejs, Andreas Zimmermann, Tim Kerig, Jutta Lechterbeck, Oreto García Puchol and Mike Parker Pearson for reading and commenting on specific chapters. None are responsible for what I've done with their suggestions. Oreto and her co-editor Domingo Salazar-García were also kind enough to invite me to contribute a concluding chapter to their book *Times of Neolithic Transition along the Western Mediterranean*, from which I learned a great deal.

Over the long period in which the material and ideas for this book have been accumulating I have also been inspired and influenced in various ways by others whom I've talked to and/or worked with. They include Jean-Pierre Bocquet-Appel, Sam Bowles, Rob Boyd, Cyprian Broodbank, Clive Gamble, Ian Hodder, Anne Kandler, Tim Kohler, Kristian Kristiansen, Kevin Laland, Ruth Mace, Ian Morris, Johannes Müller, Eduardo Neves, Mike O'Brien, Colin Renfrew, Pete Richerson, Eric Smith, Alasdair Whittle and my outstanding colleagues at the Institute of Archaeology, UCL, especially, in relation to the topic of this book, Dorian Fuller. The Institute provides the best possible open-minded, stimulating and congenial community for archaeological teaching and research, not to mention the wonderful library with its knowledgeable and helpful librarians. It has been a privilege to work there for the last 21 years.

Producing the book has incurred its own debts. I'd like to thank Norman Yoffee for his encouragement and support for its publication, as well as Beatrice Rehl at Cambridge University Press. Two readers for the press, including Mary Stiner who waived her anonymity, were very encouraging and made many helpful comments. I'm most grateful to Denitsa Nenova for producing the excellent illustrations, in particular for being so tolerant and understanding when I changed my mind about things. Sue Colledge systematically tracked down and obtained the necessary permissions for them. Rachel Tyson was the most meticulous copy-editor that anybody could wish for, and Clare Owen at Out of House Publishing was a pleasure to work with in the final stages of production.

Finally, since these projects began my wife, Lúcia Nagib, has been an endless source of love and support as well as an inspiration for the dynamism, perceptiveness and creativity of her own research and publications in the field of film studies. Without her nothing in life would seem interesting or worthwhile and it is to her that this book is dedicated.