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Europe's first farmers: an introduction

The transition from hunting and gathering to agriculture is arguably the most important event in human prehistory, representing a shift from foraging to farming, from food collection to food production, from wild to domestic, that sets the stage for most of the significant subsequent developments in human society. For this reason, the beginnings of agriculture have been the subject of scholarly interest since at least the middle of the last century, as evidenced by Charles Darwin's 1868 treatise on *The Variation of Plants and Animals under Domestication*, and subsequent works by various other authors (e.g., de Candolle 1882, Roth 1887).

The search for causality began early as well. Raphael Pumpelly in 1908 first suggested the oasis as the context of domestication in the ancient Near East during the time of desiccation thought to have characterized the end of the Pleistocene, invoking climatic change as a primary cause. The 1920s brought two important concepts to the study of the first farmers (Harris 1996b, Watson 1995). In 1926, the botanist N. I. Vavilov defined "centers of origin" for the domestication of plants and two years later the archaeologist V. Gordon Childe described the origins of agriculture in terms of a "Neolithic Revolution." Employing this new concept of centers, Childe argued that agriculture, along with a number of other innovations, had moved to Europe from its place of origin in the Near East.

Large multidisciplinary projects of archaeological investigation characterized research on agricultural origins after the Second World War (e.g., Braidwood 1960, Byers 1967, Hole *et al.* 1969, Kenyon 1981, MacNeish 1992). The 1960s and early 1970s saw an intensified search for causality (e.g., Binford 1968, Cohen 1977, Flannery 1973). Humans were viewed as forced into agriculture by the uncontrollable circumstances of nature, such as climatic change, environmental degradation, or inherent growth in their own numbers. Consensus views today of the origins and spread of agriculture are generally an outgrowth of these perspectives.

Since the 1970s, many details have been added to the picture and

innovative theories have been suggested. The origins and spread of farming have been considered in a variety of new publications (e.g., Anderson 1992, Aurenche and Cauvin 1989, Clark and Brandt 1984, Clutton-Brock 1989, Cowan and Watson 1992, Edmonds and Richards 1998, Gebauer and Price 1992, Harris 1996c, Harris and Hillman 1989, Helmer 1992, Price and Gebauer 1995b, Rindos 1984, Smith 1994, Zohary and Hopf 1993, Zvelebil *et al.* 1998). A synthesis is emerging from the accumulation of information, ideas, and methods that truly provides new insight on the complex process that is the transition to agriculture. More recent perspectives suggest that humans were active players in this process and that changes in the social, economic, and ideological aspects of human society were important forces in bringing about the transition.

With this acknowledged bias toward new evidence and non-traditional perspectives, *Europe's First Farmers* is intended to provide an overview of the new synthesis, some of the latest information concerning the introduction of farming in prehistoric Europe and the details of that transition in various portions of the continent, as well as the new ideas that have appeared. There is more archaeological information in Europe with which to try and answer these questions than elsewhere in the world in terms of archaeological sites, radiocarbon dates, detailed studies, and published reports. A great deal has been learned about the where, what, and when of the transition to agriculture. Major questions remain concerning who brought the domesticates and why. Fundamental issues in archaeological research are involved in these questions. Colonization vs. indigenous adoption – migration vs. acculturation – is an essential aspect of the study of culture change. Causality – why the transition to agriculture took place – is a relevant concern in every part of the globe where farming replaced foraging. These issues are the major concerns of this volume.

In this initial chapter, I will outline the generally accepted views of the transition to agriculture in Europe, followed by a brief discussion of more recent data and perspectives that document substantive changes in the traditional picture. In the subsequent chapters specialists elaborate the recent evidence, and its interpretation, in detail region by region. These chapters are organized along the lines of the spread of the Neolithic from southern and eastern Europe to the north and west. The concluding chapter provides a summary of these new data and ideas, returning to the major questions of this volume – colonization vs. indigenous adoption and the possible causes of the transition. Several major theories specifically concerned with the introduction of agriculture into Europe are evaluated in the light of the new synthesis.

Traditional views of the transition in Europe

It is important to remember that most of the major innovations in European prehistory – domesticated plants and animals, pottery, writing, and more – came initially from Asia. It is clear that the staple crops and

herd animals of the European Neolithic – wheats and barley, pulses, and flax, along with cattle, pigs, sheep, and goats – were originally domesticated in the Near East shortly after 10,000 BC. These plants and animals spread to Europe as agricultural practices moved beyond the boundaries of southwest Asia. The expansion of agriculture across Europe took place relatively quickly, within a period of approximately 3000 years – certainly within less time than it had taken farming first to spread across southwest Asia. Incipient farming communities appeared in the Aegean area and Greece some time around 7000 BC, while the earliest agriculture in northwestern Europe (Britain and Scandinavia) did not arrive until after 4000 BC.

The introduction of agriculture into Europe has, since Childe's original conceptualization in the 1920s, been thought to reflect the spread of foreign colonists bearing ceramic containers and domesticated plants and animals, and bringing permanent villages, new architecture, storage facilities, long-distance trade, and elaborate burial rituals. The indigenous hunter-gatherers of Europe are thought to have been only sparsely present, residentially mobile, socially amorphous, and eventually overwhelmed.

This traditional view of the transition was based on rather limited archaeological data and simple, logical expectations. For the last fifty years or more the textbook map of the introduction of agriculture into Europe has shown a continent riddled by large arrows, the first thrusting from Turkey across the Aegean and into Greece. That initial attack split in two as a pincer movement began, one by land and the other by sea. The inland movement brought farming, pottery, and rectangular mud brick houses to southeastern Europe. The second, maritime arm moved along the Mediterranean shore carrying domesticated sheep and goats, cereals, and pottery. The next step was an explosive expansion across central Europe, with farmers pouring out of Hungary and occupying an area from Holland, Belgium, and France to the Ukraine in the east, and from the Alps to northern Germany and Poland.

At the same time, the arrows began to move from the Mediterranean shore inland as farmers entered the fertile valleys of Italy, France, Switzerland, and the Iberian peninsula. In central Europe the initial spread of farming was followed by a period of "regionalization" as Neolithic groups took on a distinctive, local character and in the west began to erect monumental tombs known as megaliths. By 4500 BC, most of Europe, with the exception of the British Isles and Scandinavia, had been occupied by farmers. Finally around 4000 BC the last arrows made their way to these northwest margins, blanketing most of the continent with the Neolithic.

The apparent regularity of this spread, along with the monotonic decline in radiocarbon dates for the earliest Neolithic across the continent, led Ammerman and Cavalli-Sforza in 1973 – drawing on Clark (1965) – to describe this process as a "Wave of Advance," aptly characterizing the presumed inevitability of colonization by farming communities. This wave model has been the explicit, or implicit, foundation for discussions of the

transition to agriculture for twenty-five years. In that same time, however, a proliferation of innovative ideas, new methods, extensive fieldwork, and myriad information has steadily accumulated that does not fit this traditional view.

Toward a new synthesis

The foundation for a new synthesis can be viewed as responses to a series of questions regarding the prehistoric transition to agriculture in Europe that have been revisited and investigated over the last twenty-five years. These questions concern the data used to interpret the onset of the Neolithic, certain methods of analysis, and conceptual frameworks for describing what we know and how we think about it. These questions more specifically involve matters such as the meaning of “Neolithic,” the contents of the Neolithic package, the use of radiocarbon dates and other evidence, the nature of farming, who was responsible, the role of the indigenous Mesolithic inhabitants, and why in fact the transition occurred.

The meaning of the term Neolithic itself is highly variable in its use in European prehistory (e.g., Prescott 1996, Thomas 1991b, Whittle 1996, Zvelebil 1986c, 1998) and has changed substantially since first employed. Neolithic has been used as a time period, a cultural phase, an evolutionary step, an economy or mode of production, a population, a social structure, and other variable cultural phenomena. This ambiguity has complicated an understanding of the transition to agriculture. As Dennell (1992: 92) noted, “the concept of the ‘Neolithic’ as signifying the appearance of agriculture probably has done more to obscure than to illuminate the nature of the processes involved.” It is essential to define the meaning of the term in order to know what is being observed and reported in the literature.

Other information has been employed to identify the Neolithic. Radiocarbon dates of a certain age are often the criteria used for designating the Neolithic in Britain, in spite of the fact that there is a great deal of overlap in the dates for the late Mesolithic and early Neolithic (Williams 1989, Woodman, this volume). In Scandinavia and other areas, the presence of distinctive pottery or polished flint is frequently taken as the hallmark of the first farmers. In this context, it is essential to distinguish between characteristics of the Neolithic, such as pottery, settled villages, polished stone, and the like, and the actual evidence for agriculture, the use of domesticated plants or animals. Plant and animal remains of domesticated species are the most reliable indication of cultivation and herding.

One of the reasons that criteria must be clearly stated and consistently applied has to do with the concept of the “Neolithic package.” As originally defined, the term was intended to distinguish assemblages of Neolithic artifacts from Palaeolithic ones. Neolithic included pottery and ground stone objects, in addition to the flaked stone technology typical of the Old Stone Age. Since that initial definition, more baggage has been

added to the concept, particularly as the notion of colonization as the mechanism for spreading the Neolithic became established. Colonists would have carried a set of knowledge, tools, and concepts with them, in addition to domesticated plants and animals. This package, denoting a Neolithic presence, came to include permanent villages of rectangular houses, religious objects and structures, and domesticated plants and animals, as well as pottery and ground stone tools. These items were expected to appear simultaneously with the arrival of new farming populations. Even though direct evidence of domesticated plants and animals was often missing, they were assumed to have been present as part of the package. In recent years, however, it has become clear that the package did not always arrive intact.

Increasing interest in the indigenous populations of Europe during the transition to agriculture has brought new insights as well. Scholars of the Mesolithic have been particularly active in Europe during the last twenty-five years, elaborating our knowledge and understanding of this period (e.g., Bonsall 1989, Gramsch 1981, Kozłowski and Kozłowski 1973, Vermeersch and Van Peer 1990). Views of the Mesolithic have shifted in that time from a period of quarantine or degradation between the Palaeolithic and Neolithic to a time of dynamic groups of complex foragers. This perspective has emphasized the role of indigenous people in the transition to agriculture.

Several aspects of Mesolithic adaptations are of relevance to the question of the transition to agriculture, including sedentism, population size, and plant foods (Price 1987). These characteristics have traditionally been considered as exclusively Neolithic. The presence of sedentary communities was often used as evidence of the arrival of the Neolithic, but it is now clear that permanent settlements existed in many parts of Europe in the preceding Mesolithic as well, e.g., in the Iron Gates of the Danube (Srejovic 1972), in Scandinavia (Brinch Petersen 1973), and in Ireland (Woodman 1985b).

Discussions regarding Mesolithic population remain fraught with problems in estimating past numbers of people. However, a general pattern is emerging. It now seems clear that Mesolithic foragers were concentrated in marine, riverine, and rich lacustrine environments across Europe. It is less certain how intensive occupation was in less productive river valleys and heavily forested areas of the interior of the continent. A number of authors have suggested that the dense canopy of the mixed oak forest of Atlantic Europe would not have provided substantial biomass for hunters or their prey (Noe-Nygaard 1995, Vencl 1986, Waterbolk 1982). Recent surveys in the interior basins of central Europe have failed to reveal substantial Mesolithic remains (M. Kuna, personal communication). Greece and the southeastern Balkans, with the exception of the Iron Gates, apparently had a very small Mesolithic presence (van Andel and Runnels 1995).

There is mounting evidence for the use of wild plants in the

Mesolithic (Hansen and Renfrew 1978, Price 1989, Zvelebil 1994a). At the Grotto dell'Uzzo in Sicily, the Mesolithic layers, dating before 6000 BC, contained the remains of grass pea, pea, wild strawberry, wild olive, and wild grape (Constantini 1989, Dennell 1992). Holden *et al.* (1995) have identified a number of species in charred plant remains from the Roc del Migdia in Catalonia, including fragments of hazelnut and sloe and several roots and tubers. In northern Europe, there is substantial evidence for the use of nuts (hazelnuts and acorns), water chestnuts, and nettles; fruits such as wild strawberry, apple, and sloe and rowan berries and raspberries have also been found (Price 1989, Regnell *et al.* 1995, Zvelebil 1996). Zvelebil (1994a) has gone so far as to suggest that wild plant food husbandry was practiced in the Mesolithic as a pre-adaptation for the arrival of the Neolithic.

Another issue is the question of domesticated plants and animals in Mesolithic contexts. There have for some years been a number of instances of cereal pollen with early dates from many parts of the continent. In virtually every instance, these have been dismissed on the grounds of weak chronology or questionable identification. Recent evidence, however, suggests that domesticated plants may have been present during the later Mesolithic in some parts of Europe. The best example of this comes from pollen cores from the Zurich region in Switzerland where cereal pollen (*Triticum* sp.) and a seed of flax (*Linum usitatissimum*) have been dated to c. 6400 BC cal., almost 1000 years before the accepted start of the Neolithic in this region. Domesticated animals may also appear before the traditionally recognized arrival of the Neolithic. Examples are known from several areas (e.g., Scandinavia, Jennbert 1984; the Mediterranean, Geddes *et al.* 1989, Schworer *et al.* 1979). Additional examples are needed before these pre-Neolithic contexts are fully accepted, but evidence is certainly accumulating.

Because of an increasing appreciation of the Mesolithic period, significant questions have arisen about the degree and extent of colonization involved in the transition to agriculture. It seems clear that local inhabitants often played an important role in the transition. The simple distinction between demic diffusion (colonization by immigrants) and indigenous adoption obscures a great deal of variability and often is inadequate for explaining observed evidence. This problem has been recognized by a number of authors and various models of diffusion and acculturation have been proposed (van Andel and Runnels 1995, Anthony 1994, Arnaud 1982, Dennell 1985, Gregg 1988, Moore 1985, Renfrew 1987, Whittle 1996, Zilhão 1993). Zvelebil and Lillie in this volume and Zvelebil elsewhere (1995b, 1996) propose several different mechanisms to explain how materials, ideas, and/or people move into new areas. Each of these has implications for the nature and for the kind of evidence that result as new subsistence strategies, technologies, and material culture spread into a given region.

In addition to changing views and methods, there are substantial new data from Europe on the transition to agriculture. Research on this

question has resulted in a great deal of fieldwork, analysis, and publication in the last twenty-five years (e.g., van Andel and Runnells 1995, Barker 1985, Biagi 1990, Bogucki 1988, 1996, Bogucki and Grygiel 1983, Chapman 1994b, Coudart 1991, Demoule and Perlès 1993, Dennell 1992, Gregg 1988, Harris 1996c, Hodder 1990, Milles, Williams, and Gardner 1989, Perlès 1992, Price and Gebauer 1992, Price *et al.* 1995, Price 1996b, Renfrew 1989, Rowley-Conwy 1995, Thorpe 1996, Tilley 1996, Whittle 1996, Zvelebil 1986c, Zvelebil and Dolukhanov 1991).

Some of this information is briefly summarized in the paragraphs below to provide a region by region overview of Greece and the Aegean, southeastern Europe, the Mediterranean shore, central Europe, eastern Europe, and northwestern Europe, following the path of the spread of agriculture. It is not my intent to provide a detailed description of all of the new evidence and ideas that have accumulated in the last twenty-five years, but rather to note some of the major developments. The following chapters will provide more of the details for specific areas.

The eastern Mediterranean

The earliest farmers in Europe appeared in the Aegean and Greece by the beginning of the seventh millennium BC (Demoule and Perlès 1993). This has traditionally been seen as a classic case of colonization. There is very little evidence for a human presence on the islands of the eastern Mediterranean until the Neolithic, suggesting a distinct pattern of colonization by sea (Broodbank and Strasser 1991, Cherry 1990, Jarman 1996, Sondaar 1971). These first colonists often quickly diverged from their original character, as Ronen has described for the first Neolithic inhabitants of Cyprus (Ronen 1995).

The early Neolithic sites on the plains of Thessaly in Greece appear to be substantial, long-term communities, largely dependent on domesticated plants and animals (Halstead 1996). These settlements were located on perennially wet floodplains with very fertile soils (van Andel and Runnells 1995). Little is known of the Mesolithic and earliest Neolithic occupation of this area; the low number of sites from this period suggests that a rather empty landscape may have been available for colonization throughout Greece (Runnells 1995). Perlès (1993, 1995) and others have pointed out that the early Neolithic environment of Greece resembled the Near East more than the remainder of Europe. Because the first Neolithic settlements on mainland Greece were villages housing grain-cultivating, cattle-herding agriculturalists, their inhabitants are thought to have arrived as colonists from the Near East (Demoule and Perlès 1993, Papathanassopoulos 1996).

Traditional assumptions regarding the similarities between the Neolithic in the Near East and the Aegean area, however, have been brought into question. Özdoğan (1993, 1997) and others, for example, have pointed out that the Neolithic of southwest Asia is not a monolithic entity, that

there are substantial regional differences. The Anatolian Neolithic differs significantly from the traditional area of the western Fertile Crescent; in addition to differences in material culture, sedentary communities were dependent on hunting and gathering to a much greater extent than in the Levant (Özdoğan 1997). Anatolia may well have been the source of the first Neolithic inhabitants of the Aegean and perhaps the Greek mainland (Özdoğan 1989). Direct comparison of the European situation to the Neolithic of the Levant is not warranted.

Other lines of evidence suggest indigenous adoption in mainland Greece, rather than colonization. Very little is known about the earliest Neolithic in this area. There are questions about the completeness of the Neolithic package in this area (Halstead 1996, Tringham, this volume). An enigmatic “preceramic” phase is known at a few sites (e.g., Argissa, Gediki, Sesklo) where pottery is absent but domesticated plants and animals are present. The radiocarbon dates for the Greek Preceramic Neolithic sites all cluster around 6800 BC. The lithic assemblages in these preceramic levels are described as Mesolithic (Tringham, this volume).

To the south, in the more rocky and isolated areas of the Peloponnese, local foragers may have gradually adopted cultigens and herd animals as part of the transition to agriculture. The evidence for this comes largely from the site of Franchthi Cave in the Peloponnese (Jacobsen 1981). A mix of local and foreign traditions can be seen at Franchthi in lithic tradition and faunal remains; moreover, the earliest ceramics are distinct from those elsewhere in Greece (Demoule and Perlès 1993). The use of wild barley and wild lentils is documented in the late Pleistocene and early Holocene and suggests that hunter-gatherers in this area were already consuming substantial amounts of plant foods (Dennell 1985, Hansen 1991, 1992, Hansen and Renfrew 1978). The pieces of the Neolithic package appear to have arrived here sequentially as domesticates were gradually added to the diet over time (Halstead 1996). In this area local adoption of farming and the Neolithic appears to have been the case.

Thus, current views on the transition to agriculture in the Aegean and Greece are mixed. Many authors (van Andel and Runnels 1995, Demoule and Perlès 1993, Lewthwaite 1986b, Perlès 1993, and others) argue for colonization on the basis of the similarity to materials in Anatolia, the fact that the islands of the eastern Mediterranean were inhabited for the first time in the early Neolithic, and the general absence of Mesolithic occupation in the primary areas where the first farmers appear. Others (Budja 1993, Chapman 1994b, Dennell 1983, Theocharis 1973, Tringham, this volume, Whittle 1996), supporting indigenous adoption, point to contrasts with the materials in the Near East, the apparent existence of a preceramic Neolithic with Mesolithic affinities, and the gradual transition indicated at Franchthi Cave. In fact, the varied evidence – and more research and information on both the late Mesolithic and the early Neolithic are badly needed

— suggests a situation in which both colonization and indigenous adoption took place in different areas.

Southeastern Europe

During the seventh millennium BC, farming and pottery followed two main pathways from the Aegean area into the rest of Europe: by land into the southeastern quarter of the continent and by sea along the north shore of the Mediterranean. The Neolithic spread quickly to the Balkan Peninsula (i.e., Bulgaria, Romania, and Hungary, and the present countries of the former Yugoslavia). In the other direction, distinctively impressed Cardial pottery, the bones of domesticated sheep, and cereals are found in caves and rockshelters along the Mediterranean and southern Atlantic coasts of Europe.

Less than 1000 years after the appearance of agriculture in the Aegean, the first farming appears in the interior of southeastern Europe. The radiocarbon dates for the Early Neolithic in the southern Balkan peninsula are 6600–5800 BC and for the northern area around 6500–5200 BC (Chapman and Dolukhanov 1993, Todorova and Vajsov 1993, Tringham, this volume). The traditional view of the Neolithic in the Balkan peninsula involved the expansion of farmers out of the plains of Thessaly and northern Greece, moving up the natural corridors of the major river valleys, into southeastern Europe. Indeed, there are areas such as the Vardar-Morava corridor, the Maritsa basin, and the middle and lower Danube basins which witnessed the simultaneous arrival of early Neolithic material culture and a change in settlement pattern. With a few exceptions, the early Neolithic is known primarily from large tells with deep deposits containing rectangular houses, pottery, and domesticated plants and animals. The similarity of these sites to those known from the Near East gave obvious support to a model of colonization by immigrant farming populations. The subsequent sixth millennium BC witnessed the flowering of Neolithic cultures in southeastern Europe — elaborate religious systems, rich graves, gold and copper mining and metallurgy, and extensive trade networks, again supporting the idea of outside influence.

However, substantive questions have been raised about the colonization of southeastern Europe (Bogucki 1996, Budja 1993, Radovanovic 1996, Whittle 1996). Chapman (1994b) and Whittle (1996) take the position that little evidence exists for incoming farmers in southeast Europe. Deep tell deposits do not easily reveal their lowest levels. Greenfield (1993) reports that variation in faunal assemblages at early Neolithic sites in the Balkans indicates local adoption rather than wholesale insertion of farmers. Van Andel and Runnels (1995) suggest that Neolithic settlement in most of southeastern Europe was quite sparse and irregularly distributed on floodplains and other particularly hospitable areas for agriculture. Willis and Bennett (1994) point to the sparsity of pollen and other evidence for substantial

cultivation in southeastern Europe prior to 5000 BC. Such information suggests that initial farming populations in southeastern Europe were relatively small and that networks among foraging populations may have been responsible for the spread of agriculture.

Neither these initial farmers nor the late Mesolithic inhabitants of southeastern Europe are well known or documented, yet one of the most important aspects of the transition to the Neolithic is the relationship between them. The basis for this ambiguity lies in the significance of a series of settlements from the Iron Gates region of the Danube, along the Yugoslavian–Romanian border. Evidence from these settlements, and especially from the site of Lepenski Vir, indicates that Mesolithic hunter-gatherers in southeast Europe already had adopted the complexities of a sedentary way of life (Bonsall *et al.* 1997, Radovanovic 1996, Tringham, this volume).

The stratigraphy and chronology of Lepenski Vir has been debated for some time; the interpretation of the site is critical for understanding the transition to agriculture in the Balkan peninsula. The major question concerns the dating of the Neolithic component at the site. Jovanovic (1975), Tringham (this volume), and others have argued that the radiocarbon determinations from Lepenski Vir place the occupation between 6500 and 5700 BC, making much of the settlement entirely contemporary with early Neolithic sites in the Morava, middle Danube, and Tisza valleys, no more than 100 km distant. Radovanovic (1996) has proposed a detailed chronology for Lepenski Vir with six phases of occupation, dating from approximately 7500–5500 BC. Pottery is present at the site by 6500 BC, indicating connections with Neolithic groups, but domesticated plants and animals are missing in the archaeological remains. Bonsall *et al.* (1997) report a change toward more terrestrial diets at Lepenski Vir also around 6500 BC, correlated, they suggest, with the introduction of domesticated plants and animals, perhaps appearing before the introduction of pottery.

The presence of Neolithic ceramics and other materials at Lepenski Vir is generally seen as evidence for interaction between the Iron Gates foragers and farmers in nearby areas. The archaeological data on subsistence, stability, and use of resources suggest to Tringham that, in a situation of interaction between the two populations, the foragers were the more dynamic partners. Faunal assemblages show pronounced differences between the hunters and farmers: Iron Gates sites were based largely on hunting and fishing; Neolithic sites were dependent on farming and herding. The stone tools of these early Neolithic settlements were made of local pebbles, even though good raw materials were located nearby (Tringham 1988, Voytek and Tringham 1989). The stone artifacts of the late Mesolithic settlements of the Iron Gates (including early Lepenski Vir), however, are made from both local and imported lithic resources. This pattern of limited use of local materials in the early Neolithic is also seen in