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WHO ARE THE EUROPEANS?

Abstract

In order to understand better the formation and the structure of modern European paternal and maternal genetic landscape we discuss the ancestral hunter-gatherers' and farmer's populational dynamics in late Pleistocene and early Holocene. Particular attention is paid to the origins and diffusions of 'Palaeolithic' and 'Neolithic' Y-chromosome and mitochondrial DNA haplogroups in relation to 'demic diffusion' and to process of transition to farming in Eurasia. Our basic interpretative premises are:

- That the genesis of European neolithic civilisation was not linked to 'demic diffusion' of Levantine and Anatolian farmers;
- That the phylogeography of Y chromosome haplogroups I1b*, J and E do not support the model of neolithic colonisation and replacement of indigenous populations in Europe;
- That the southeast European populational trajectories and the rewriting of genetic palimpsest were set by networks of social relationships and associated small-scale mobility and local and/or regional migration;
- That people, through contact provided the agency of transmission of information and incorporation of innovations such as cultigens, domesticates and ceramic technology. And these have lead to structural changes of the pre-existing social, economic and cultural phenomena with rather insignificant gene flow.

Introduction

It is doubtless convenient to begin with the simplifying assumption that the dawn of European civilization relates directly to a Neolithic way of living and thinking that have spread *en bloc* from Asia Minor into Europe. The 'demic diffusion' of Levantine farmers and the replacement of indigenous pre-Neolithic European population was conceptualized in the context of the orthodox 'centre and periphery' perception of the genesis of Eurasian civilizations. This perception perpetuates the politicisation of the debate between 'diffusionists' and 'indigenists' about the process of colonization and civilization of Europe. While the diffusionist idea of an allochthonous farmers invasion of Europe has been self promoted continuously in a way that "the idea of 'demic diffusion', which is now widely accepted and used in literature ... helped to fill a major gap in terms of how we think about the movement of people in prehistory", the indigenists' idea of autochthonous population participation in the transition to farming was labelled anachronistic and nationalistic (see *Ammerman 2003: 14-16*).

The population geneticists, however, suggest that the replacement of population at the dawn of European civilization was not a realistic scenario, and that the

participation of autochthonous European hunter-gatherers' populations in the creation of the European maternal and paternal genetic landscape of modern population was much greater than the allochthonous near-eastern farmers' population.

Jacques Cauvin (1978: 134; 2000: 22–29, 204–205, 207–208) suggested that the use of clay as a building material and fired-clay figurines were markers of the new religion and ideology - a powerful force which made possible the transition to the Neolithic and to farming way of life, which 'very quickly revealed itself to be expansionist'. He thought he had found the reason villagers outside the Levant did not develop subsistence production for themselves. They supposedly did not adopt the 'humanisation' of art and related new divinities that could have stimulated the necessary energy to develop a new type of palaeo-economy. The Europe in this interpretative scenario thus could not become Neolithicised and civilized until the farmers and the ceramic figurines and vessels had reached the Balkans. It is broadly accepted, indeed, that ceramic female figurines appeared along with the beginning of cereal cultivation in Pre-Pottery Neolithic A in the Levant, and that all the gender and the symbolic attributes were visualised at that time, and as such incorporated a millennia later in the 'new materiality' that defines the European Neolithic. The hypothesis is based on the assumption that Neolithic colonisers, when crossing the border between the Levant and Europe, brought in their most valuable objects, techniques, symbols and language(s).

We pointed out recently that diverse forms of ceramic technology had been 'inhabited' into the agency of Eurasian hunter-gatherers long before the emergence of farming economy and sedentary social structures appeared (see *Budja 2005; 2006*).

The archaeogenesis of modern European populational palimpsest

Fortytwo years ago, two paradigmatic works coincidentally appeared in the same year. Robert Rodden (1965: 86) formulated a list of farmers' settlements and artefact sets in southeastern Europe and the Near East, emphasising that, because of similar economic, technological and symbolic features the former was 'not peripheral to the region within which the Neolithic revolution began, but was an integral part of it'. Grahame Clark (1965*a*; 1965*b*) presented the results of 'a pure scientific approach in chronological determination of the expansion of farming culture', which was based on the radiocarbon dating 'of materials from the actual settlements of the prehistoric cultivators themselves'. The decreasing values of uncalibrated radiocarbon dates that appeared to be arranged in a southeast-northwest cline he described, on contrary, as 'the gradual spread of farming culture and the Neolithic way of life from the Near East over Europe'.

The same cline of radiocarbon dates and related, supposedly initial Neolithic settlements dispersal, six years later Ammerman and Cavalli-Sforza (1971; 1984)

saw as the marker of 'demic diffusion'. In the time-space-transgressive settlement pattern they recognized the continuous displacements of farmers at an average of 1 km per year. The rate of displacement was calculated by the ratio between the time of departure from the Levant (Jericho was used as the starting point of diffusion), time of arrival in Europe, and the geographical distance between the two. There was not very much attention devoted to the discrepancy between the rates of advance of farmers on the continental and regional levels. Along with a continental average of 1.08 km/per year for 'all of Europe', the most extreme regional rates of 0.70 for 'Balkans' and 5.59 for 'Bandkeramik' were suggested. The authors believed, however, that such an 'average constant rate of diffusion' must have been driven by permanent population growth, and that the continuous waves of population expansion must have been distinct from 'cultural diffusion'. While in 'demic diffusion', a movement in a radial expansion of populations, farmers themselves caused the spread of agriculture; in 'cultural diffusion' it was spread by the transmission of farming techniques. The population growth was explained as the result of surpluses and storage in farming societies, which allowed the carrying capacity of the land to rise.

Marina Gkiasta and her colleagues recalculated the mean rate of spread in Europe by linear regression analyses of calibrated radiocarbon dates, and produced results similar (1.3 km per year) to those of Ammerman and Cavalli-Sforza. But when all calibrated date distributions are used to show the spread, the pattern is far less obvious, and a clear co-occurrence of hunter-gatherers' and farmers' sites was shown within the southeast European regions (*Gkiasta et al. 2003*).

Menozzi, Piazza and Cavalli-Sforza (1978; *Cavalli-Sforza, Menozzi and Piazza, 1994*; see also *Ammerman and Cavalli-Sforza 1984*) seven years later, for the first time postulated that 'demic diffusion' and the replacement of indigenous European population are genetically and archaeologically grounded in the resemblance of a southeast-northwest gradient of the first principal component of 95 gene frequencies of 'classic' non-DNA marker dispersal (allele frequencies for blood groups, the tissue antigen HLA system, and some enzymes) and the gradual farming settlement distribution as measured by radiocarbon dates.

From this point onwards, interpretations of the processes of Neolithisation and transition to farming in Europe were dominated by concepts of permanent population growth and subsequent 'demic diffusion' taking over new lands. While at interregional level the macro model of 'wave of advance' has been applied, the micro models of 'availability', 'leapfrog' and 'saltatory' jumps from one suitable environment to another, 'pioneer' and 'insular' colonization were suggested for regional and local levels (*Zvelebil and Rowley-Conwy 1984*; *Zvelebil and Lillie 2000: 62*; see also *Zvelebil 2005*; *Zilhão 1993: 37*; *2001*; *van Andel and Runnels 1995*; *Perlès 2001: 62*; *2003*).

It is noteworthy that over the same period Colin Renfrew (1987: 169-170, *Fig. 7.9*), working on the arrival of a Proto-Indo-European language in Europe with

the arrival of farmers, objectified ‘demic diffusion’ archaeologically through the catalogue of artefacts and symbols attached to Rodden’s map twelve years earlier. He has reinterpreted the Eurasian artefact distribution in a very simplistic manner. The map has become soon an icon perpetuating the legitimacy of both ‘demic diffusion’, and ‘great exodus’, in which Levantine and Anatolian farmers carried with them all the features of their cultures but, paradoxically, not the central authority and symbolic representations that maintained this power (Özdoğan 1997: 16-17; Perlès 2005: 276-278, Table 1).

The mtDNA and Y-chromosome haplogroups and the ‘demic diffusion’

The map of the first ‘principal components’ in classical marker frequency dispersal across Europe and the Near East (Menozzi, Piazza and Cavalli-Sforza 1978) has perpetuated the legitimacy of Neolithic ancestry for modern Europeans, and the question ‘who are the Europeans?’ that Alberto Piazza (1993) addressed in this context was not at all rhetorical. The Near East was recognized as an ancestral homeland for the people who now live in Europe. The elimination of the European Mesolithic population was supposed, despite only a 27% total variation in ‘classical marker’ frequencies attributed to Neolithic populations across the Europe. The assumption driven by population geneticists that there was no genetic interaction between hunter-gatherers and farmers was broadly accepted (Cavalli-Sforza, Menozzi and Piazza 1993: 639-646; see also Sokal et al. 1991; Cavalli-Sforza et al. 1994; Cavalli-Sforza and Cavalli-Sforza 1995; Cavalli-Sforza 1996; Renfrew 1996; Belwood and Renfrew 2002; Dupanloup et al. 2004; Barbujani and Bertorelle 2001).

This interpretative discourse was mainly the outcome of a low-resolution map of allele frequency distribution, showing that Europe as a whole is quite homogeneous, as the genetic distances between different populations are relatively short, and the genetic landscape is rather uniform. Only some clear outliers, such as Basques and Saami have been shown to emerge from this homogeneous entity as hunter-gather Mesolithic relics.

Simulations of the colonisation process of Europe by Neolithic farmers have been performed recently in parallel to test the effect of the Neolithic expansion on European molecular diversity, as well as their potential admixture and competition with local pre-Neolithic hunter-gatherers. The results strongly suggest that the scenario of ‘demic diffusion’ is unrealistic, as it would only have occurred if Neolithic migrants had contributed more than 66% of the genes at the time of the admixture (cf. Goldstein and Chikhi 2002: 143), and, as mathematical simulations suggest that there should have been a massive Palaeolithic contribution to the current gene pool of Europeans (Currat and Excoffier 2005).

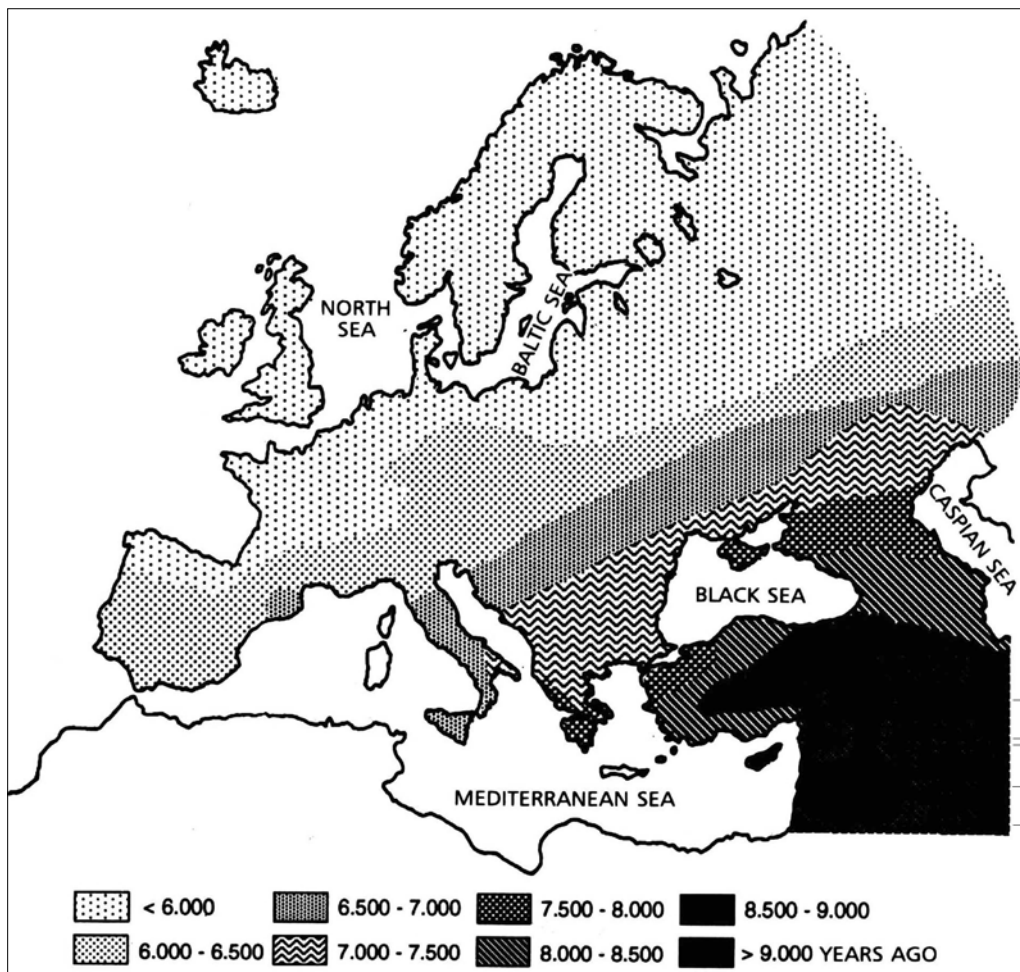


Figure 1. The hypothesised spread of farmers and agriculture across the Europe. The model of neolithization of Europe was based on 'classic' non-DNA genetic marker dispersal and 'demic diffusion' taking Jericho as the starting point of the process (from Cavalli-Sforza L. L. 1996. Fig. 6.5).

After the revolution in the study of the human genome the debate has moved from 'classical' markers of certain genes to loci in humans, the mitochondrial DNA that is present in both sexes, but inherited only in the maternal line, and the Y chromosome that is present only in males and inherited through males exclusively. Because they are non-recombining and highly polymorphic, the mitochondrial genome and the Y chromosome are ideal for reconstructing human evolution, population history and ancestral migration patterns.

The analysis of uniparentally inherited marker systems allows population geneticists to study the genetic diversity of maternal and paternal lineages in

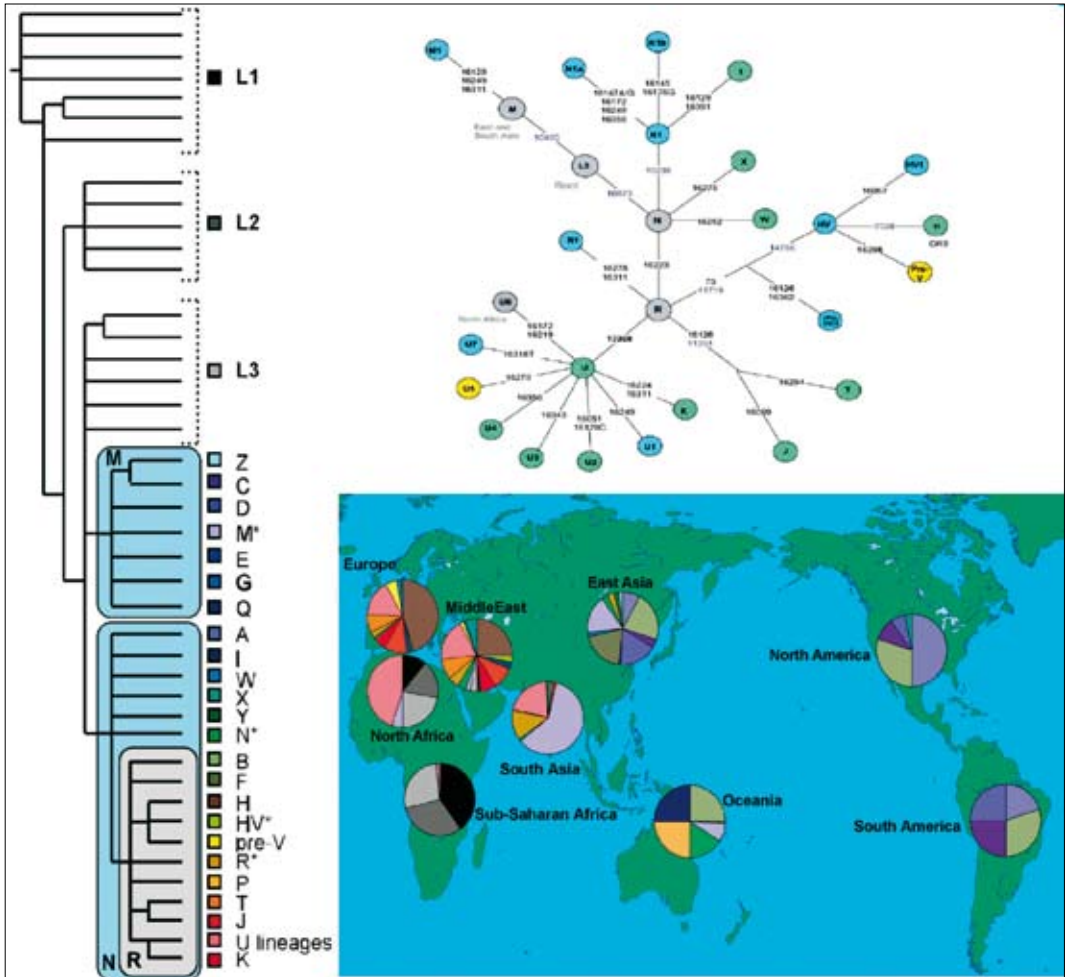


Figure 2. MtDNA haplogroups and their worldwide distribution (from Richards M. 2003: Figure 3, and after http://www.mcdonald.cam.ac.uk/genetics/images/MtDNA_DistributionMap.gif).

different Eurasian populations, as well as the environmental and cultural processes that might have been involved in the shaping of this variety. Thus different human nuclear DNA polymorphic markers (polymorphisms) of modern populations have been used to study genomic diversity and to define maternal and paternal lineage clusters, haplogroups, and to trace their (pre)historic genealogical trees and chronological and spatial trajectories. Particular attention has been drawn in recent years to the power of Y Chromosome biallelic markers as it allows the construction of intact haplotypes, and thus male-mediated migration can be readily recognised (for a review of the literature see Richards 2003; Goldstein and Chikhi 2003; O'Rourke 2003; Jobling and Tyler-Smith 2003: 598-610).

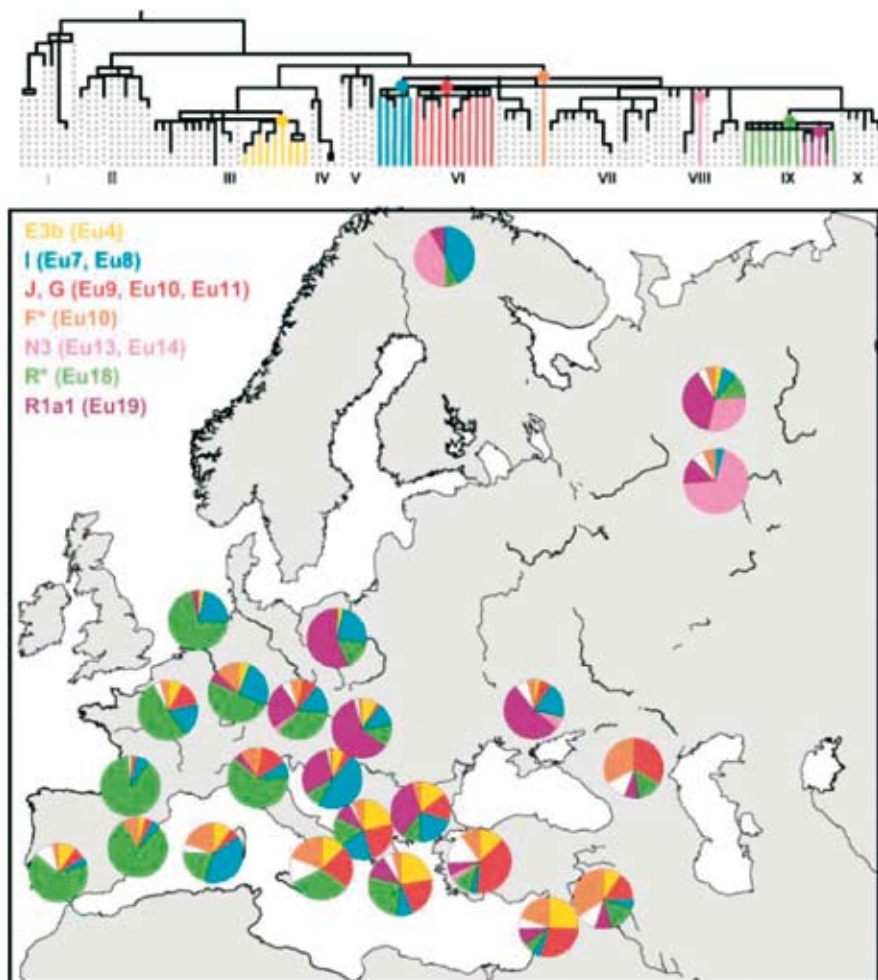


Figure 3. *Y chromosome haplogroups and their distribution in Western Eurasia (from Richards M. 2003: Figure 6).*

Over 90% of maternal lineages present in European populations can be classified into 8 major (macro)haplogroups, designated H, V, T, J, N1, U, X and W, characteristic of western Eurasians in general. Haplogroup H is the most frequent cluster but it occurs at frequencies of only around 25%-30% in the Near East, whereas its frequency is about 45%-60% in European populations. The cline of its spatial frequency is quite the opposite of what one would expect had it been distributed by 'demic diffusion' during the Neolithic. Indeed, haplogroup H and its sister clade V arrived in Europe during the Middle Upper Palaeolithic and re-expanded after the Last Glacial Maximum. The haplogroups J and T1 that are linked to Neolithic gene flow from the Near East and Anatolia present only a small minority of lineages

at frequencies between 12% and 23%. It is noteworthy that these haplogroups did not play an equivalent role in the diffusion of farming towards the East (*Richards et al. 1996; Richards 2000; 2003; Richards and Macaulay 2000; Torroni et al. 2000; Quintana-Murci 2004: 838; Pereira et al. 2005; Gamble et al 2006*).

After the study of female lineages that provided “uniquely authoritative glimpse of the African origin and subsequent dispersal of our species, the Y Chromosome has finally come into its own”, Colin Renfrew and his colleagues euphorically hailed the recognition of new Y chromosome markers (*Renfrew, Forster and Hurles 2000*; for phylogeography of major Y chromosomal haplogroups sequence see *Hammer and Zegura 2002*).

Three paradigmatic papers were published at the same time, sorting the paternal genetic legacy of our species that has persisted to the present in the Y chromosome dispersal. Peter Underhill *et al.* (2000; see also 2001; 2002) suggested ten globally distributed distinct haplogroups, I-X. The first extensive studies of European Y chromosomes dispersal was resulted in the identification of clinal patterns and in grouping of ten distinct haplogroups (1-3, 8-9, 12, 16, 21-22, 26) (*Rosser et al. 2000*) and/or twenty-two distinct haplotypes, Eu 1 - Eu 22 (*Semino et al. 2000*), with corresponding binary Y Chromosome markers that relate to the demographic history of Europe and Near East. We must note that more than 95% of European Y chromosomes was grouped out of which 70-80% of Y chromosome gene pool was determined as Palaeolithic and remaining 20% as Neolithic.

Two main migratory scenarios have been proposed. At the global level the expansion of *Homo sapiens sapiens* out of Africa via the Levantine corridor to Europe at approximately 45,000-30,000 years BP was said to have been recognized in markers M89/213 and haplogroup VI. Its appearance in Europe is very low (0.2%), indicating that few of these lineages have survived to the present (*Underhill et al. 2001: 53*). An alternative chronology for these events has been suggested: that the separation of the out-of-Africa branch of modern humans from Africans was embedded within 135,000 bp for the earliest and 57,000 bp for the latest chronological limits, and that the Asian and European populations diverged some 20,000 years later (*Zhivotovsky 2001*). At the inter-regional level, two Palaeolithic migratory episodes, and one Neolithic, were recognized as having contributed the modern European gene pool. The first is linked to the expansion of haplotypes Eu18 and Eu19 (M173 and M17) from isolated population nuclei in the Iberian peninsula and the Ukraine around 30,000 bp. The second relates to haplogroup Eu7 (M170), which originated in Europe in descendants of men who arrived from the Middle East 25,000 to 20,000 years bp, who could have been associated with the archaeologically traceable Gravettian culture. The southeast-northwest cline of frequencies for haplotypes Eu4, Eu9, Eu10 and Eu11 (M35, M172, M89 and M201) is believed to mark the male contribution of a Neolithic ‘demic diffusion’ of farmers from the Near East to Europe (cfr. *Semino et al. 2000* and *Rosser et al. 2000*).

In interpreting the mtDNA (for European mitochondrial DNA lineages see *Richards 2000* and *Gamble et al. 2006*; for ancient mtDNA see *Haak et al. 2005* and *Burger et al. 2006*) and Y Chromosome spatial frequency patterns in Europe Ornella Semino and colleagues calculated that European gene pool 'has ~80% Palaeolithic and ~20% Neolithic ancestry' and that the diffusion seems to be more pronounced along the Mediterranean coast than in Central Europe (*Semino et al. 2000: 1157-1158*). By coalescence dating for a generation time of 27 years, they calculated the origins of these haplogroups at about 20,000-15,000 years bp (see also *Rosser et al. 2000*). The calculation was based on the concepts of a statistical estimate of earlier and later limits for divergence times, since a population in a corresponding haplogroup region had bifurcated (*Hammer 2000: 6771; Zhivotovsky 2001; Zhivotovsky et al. 2003; 2004; Rosenberg and Nordborg 2002*). Since the molecular age of mutations (Y-Chromosomal marker sequence) and its corresponding haplotypes must predate the demographic migratory event which it marks, the hypothesised 'demic diffusion' could have happened at any *terminus post quem* and need not have been associated with farmers.

A year later Nebel and his group calculated by use of the mean variance of microsatellite repeats for a generation time of 25 years the start of the rapid expansion haplogroup 9, which includes both Eu9 and Eu10 haplotypes to 7,492 years bp (*Nebel et al. 2001: 1103,1105*). The molecular age of haplogroup dispersals that are supposed to support the model of 'demic diffusion' thus post-dates the transition to farming in the Near East and in most of Europe.

In most recent studies of the origin, differentiation and diffusion of Y chromosome haplogroups J (sub-clades J1 and J2) and E3b [The Neolithic Eu4 and Eu9, Eu10, and Eu11 lineages have been renamed to haplogroups E3b, J, and G after the introduction of Y chromosomal binary haplogroups nomenclature system, *Hammer (2002)*] it becomes evident that expansions from the Middle East toward Europe, whether calculated for a generation time of 25 or 30 years 'most likely occurred during and after the Neolithic' (*Semino et al. 2004: 1032; Peričić et al. 2005*). The median expansion time of haplogroup J (J1-M267* and J2-M172*) was calculated at 8,700-4,300 years bp, respectively, for the earliest and the latest limits. The network of haplogroup E (E3b1-M78 and E3b3-M123) with dispersals in the Near East, North Africa and the Southern Balkans exclusively, has been dated by the divergence time between the Near East and European lineages to a range of 14,000-7,000 year bp. Haplogroup E3b1 (M78), which typifies European lineages, however, was calculated to have a median estimation of expansion date at 4,800 years bp (*Cinnioglu et al. 2004: 131, 134*).

It was suggested that a major difference in population structure between Southern Europe and the Central Mediterranean from the Near East had already been formed at the time of the spread of haplogroup J, which was considered to represent the signature of the Neolithic 'demic diffusion' associated with the spread of agriculture (*Di Giacomo et al. 2004*). The recent findings of many

biallelic markers which subdivide the haplogroups J and E suggest that the large-scale clinal patterns cannot be read as a marker of a single, time limited wave of advance from the Levant, but a multi-period process of numerous small-scale, more regional population movements, replacements, and subsequent expansions overlying previous ranges (*Semino et al. 2004: 1032; Di Giacomo et al. 2004: 367; Cinnioğlu et al. 2004: 133-135*)

The contribution of Europe's indigenous inhabitants to European society has been underestimated ever since. The conclusion often drawn is that large regions were uninhabited during the early Postglacial, and because of a lack of evidence of Mesolithic sites in both Central and Southeast Europe the Mesolithic population must have been very sparse and, in consequence, this would have allowed farmers to expand and colonise the regions rapidly (*Pinhasi, Foley, Mirazón Lahr 2000: 50, 54; Gkiasta et al. 2003; Pinhasi and Pluciennik 2004: 69-72; Pinhasi, Fort and Ammerman 2005; Pinhasi 2006*). Hunter-gatherer sites are unequally distributed throughout the South-eastern Europe, but there are well-defined clusters dispersed along the Aegean coast and among the islands, in Thessaly, on the Adriatic and Ionian coasts, and Dinarides, and in the Danube in the Northern Balkans.

The European paternal genetic landscape was reinterpreted recently by the identification of subclades of I haplogroup of Y chromosome. The haplogroup I is the only autochthonous haplogroup that is almost entirely restricted to the European continent where it shows frequency peaks in two areas, Scandinavia and Southeastern Europe (*Semino et al. 2000; Rootsi et al. 2004: 129-134; Barač et al. 2003; see also Peričić et al. 2006; Rootsi 2006*). Semino et al. (2000: 1156) suggested that it appeared in Europe, probably before the Last Glacial Maximum, accounting, on average, for 18% of the total paternal lineages, with frequency peaks of ~ 0%-50% in two distinct regions, in Nordic populations of Scandinavia, and in the Balkan population of Southern Europe.

The phylogeographic analyses of I haplogroup resulted in a phylogeographical structure of four distinct subhaplogroup regions and subclades I1a, I1b*, I1b2, and I1c. Geographical distribution of I1a (the highest frequencies in Northern Europe among Norwegians, Swedes and Saami) is considered to be a result of recolonization of Europe after the LGM from the Francocantabrian refugial area (*Rootsi et al. 2004*). The origin of less frequent I1c, that covers a wide range of Europe and peaks in northwest coastal Europe, is in concordance with I1a. The I1b2 most likely arose in the most southern France/Iberia and west Mediterranean islands. A completely different distribution pattern is observed in I1b* Y chromosomes, the most frequent haplogroup I subclade in Eastern Europe and on the Balkan Peninsula.

Recently performed detailed survey of frequency distribution demonstrates that I1b* lineages reach maximum frequency in central and western Balkans and Adriatic (52 %-64%). Over a large geographic region it demonstrates substantial

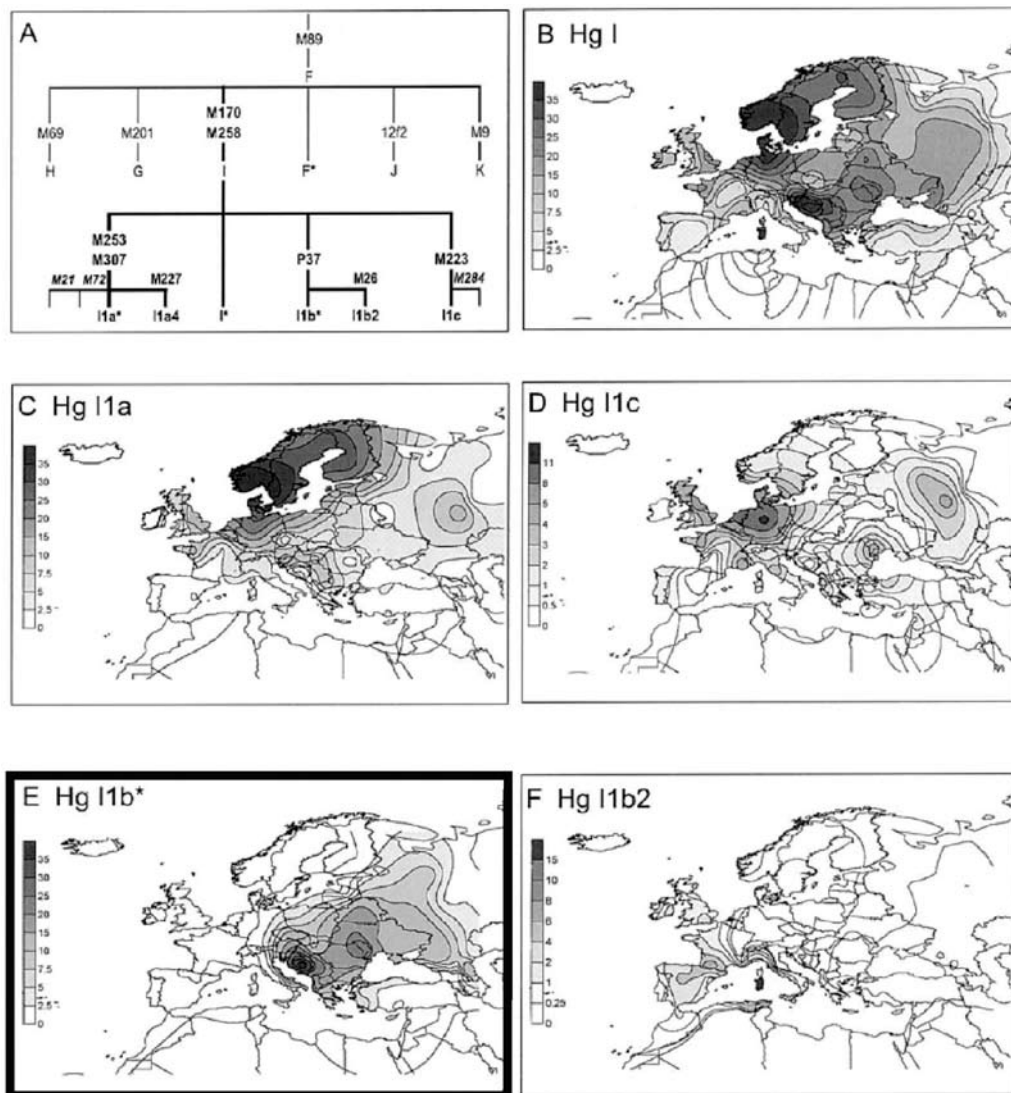


Figure 4. Haplogroup I and sub-haplogroups I 1a, 1b*, 1b2 and 1c frequency distributions in Western Eurasia (from Rootsi S, et al. 2004: Figure 1).

(30%) frequencies in all populations in Central and South-eastern Europe, with the exception of two reproductively isolated populations, Kosovar Albanians and Macedonian Romani (Barač et al. 2003; Peričić et al. 2005; 2006). We must note that I1b* lineages expanded from the refuge in South-eastern Europe before the Neolithic at ca 11,100±4,800 BP (Peričić et al. 2006: 12), and, interestingly, a gene flow from the Balkans to Anatolia at about 9,100 years bp was suggested (Cinnioglu et al. 2004: 131, 134; Rootsi et al. 2004: 134).

It is, of course, rather speculative to read a detailed demographic picture of Palaeolithic and Mesolithic hunter-gatherers and Neolithic farmers from the distribution of present-day genetic lineages. It should perhaps be stressed that any Y chromosome or mtDNA marker sequence intrinsically associates the 'demic diffusion' of Levantine and Anatolian farmers and the Neolithic way of life. It was more the continuous movements of men and women along the social networks, which seemed to be more dynamic in the Eastern Balkans.

Neolithic demic diffusion and the ceramic figurine paradox

It was suggested recently that the distribution of Neolithic ceramic female figurines appears to have links with human genetic evidence. As Roy King and Peter A. Underhill (2002) have hypothesised, these figures are perhaps 'the best genetic predictor' of Neolithic farmers' haplogroups and of the (re)population dynamics in Europe and Western Asia. It is due to the postulates that their geographic distribution correlates closely with the southeast-northwest cline of frequencies of Y chromosome markers and associated haplogroup Eu9 (J-M67* and J-M92 according to *Semino et al. 2004: 1030*) in modern populations in Asia Minor and Europe, and, that all appear to originate in the same area of south-central Anatolia. The ceramic female figurines were hypothesised to appear at the same time as the emergence of cereal cultivation in the PPNA of the Levant. Moreover, they were believed to symbolise a series of gender and symbolic attributes that were carried forward with the spread of farming and went on to constitute part of the 'new materiality' that defined the key economic and ideological features of the Southeast European Neolithic (see *Budja 2006*).

However, the introduction of ceramic female statuettes, animal figurines and constructional ceramics were certainly not within the cultural domain of earlier Levantine hunter-gatherer societies, and nor they did not appear only on the 'eve of the appearance of an agricultural economy' as *Cauvin (2000: 25)* suggested. The tradition of making figurines can be traced back to Central Europe, across the Russian Plain, into southern Siberia, and ultimately back to the Levant and Northern Africa. It is now clear that the clay figurine tradition was deeply embedded in pre-existing Eurasian hunter-gatherer social and symbolic contexts and that the dates of these figures begins as earlier as 26,000 years BP (*Budja 2004; 2005*). For example, more than 16,000 fragments of anthropomorphic figurines, zoomorphic statuettes, pellets, 'earplugs', flat fragments and constructional ceramic were recovered from the Central European Palaeolithic sites of Dolní Věstonice, Pavlov, Petřkovice, and Předmostí in Moravia. In the same region poorly preserved fragments of fired clay have also been recorded at Krems-Wachtberg, Moravany-Lopata, Jarošov, and hypothetically at Kašov and Cejkov (*Soffer and Vandiver 1997; Verpoorte 2001*), and while some may have been statuettes, their exact form remains unclear. Further to the East, on the Russian Plain, low-tem-

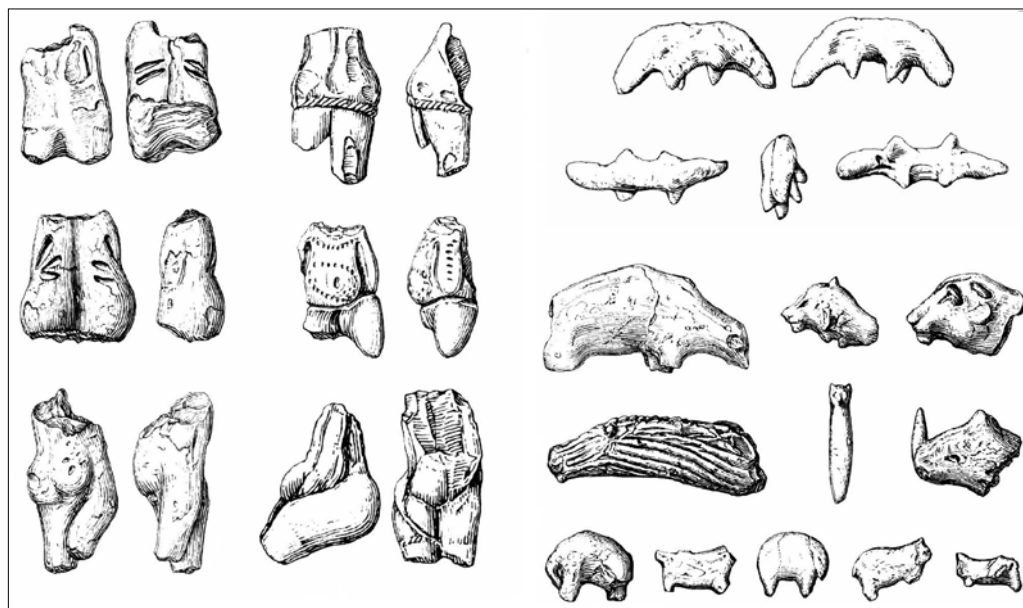


Figure 5. Palaeolithic anthropomorphic and zoomorphic ceramic figurines from Dolní Věstonice Pavlov and Předmostí (from Verpoorte 2001: Figs. 3, 6, 7, 8, 9, 46, 3.73, 8.1 and 54)

perature-fired clay fragments were reported at Zaraisk and Kostenki Gravettian sites. At the latter, located on the banks of the River Don, more than four hundred fragments were found, contextually associated with marl and ivory Venus figures, and animal statuettes (Iakovleva 1999; Soffer, Adovasio and Hyland 2000; Soffer et al. 2000: 814). Finally, the most easterly anthropomorphic ceramic figurine was found at an open-air site at Maininskaya (Maina), on the left bank of the Yenisei River in Siberia (Vasil'ev 1985; Maina on-line).

The early pottery actually occurred first in hunter-gatherer contexts in Eastern Eurasia, where it was associated with small-scale sedentary or semi-sedentary communities. Currently, the earliest known dates for ceramic vessels are from Southern China, where the direct dating of pottery at Miaoyan and Yuchanyan sites, based on insoluble residues, yield ^{14}C values of 17,030-15,807 calBC at 2σ (15,220 \pm 260 BP [BA94137b]) and 16,088-14,538 calBC at 2σ (14,390 \pm 230 BP [BA95057b]) (Zhao and Wu 2000: 236-237; Pearson 2005: 823). In the Russian Far East very early pottery found was also produced by hunter gatherer societies at the sites of Gromatukha and Gasya and has been dated to between 14,167-13,351 calBC at 2σ (13,240 BP \pm 85 [AA-20939] and 13,801-13,011 calBC at 2σ (12,960 \pm 120 BP [LE-1781]) (Kuzmin 2002: 41, Tab 1; Zhushchikhovskaya 2005: 13, 17) [The calibration was calculated with OxCal Program v3.10, Bronk Ramsey 2005]. Kuzmin, on contrary suggests there was an almost simultaneous appearance of pottery in Southern China at c. 13,700-13,300 BP, in Japan at c. 13,500 BP, and in the Russian Far East at c. 13,300 BP (Kuzmin 2006; see also Keally et al. 2004: 349).

The earliest vessels are described as deep bowls, with flat or pointed bases, with walls up to two centimetres thick. The estimated volume of the pots is approximately 5.5 to 6 litres. The secondary burning, carbonized adhesion, soot and water lines seen on many fragments, show that the basic functions of the pottery were for boiling water and food or other organic materials ($\delta^{13}\text{C}$ values are closest to C3 plants and herbivore meat) and extracting fish oils from salmonids (Keally, Taniguchi and Kuzmin 2003: 5; Kuzmin 2002: 42; Zhushchikhovskaya 2005: 15, 29). These data correspond well with the concept of 'hearth-centred female activities' that stem from increased levels of group sedentism, and are linked to an increasingly gendered focus of food processing and cooking, centred at or around the hearth (Haaland 1997: 381).

It worth remembering that the invention of ceramics and vessel technology has become archaeologically conceptualized with pottery making since Morgan (1878) hypothesised that in context of human social evolution 'lower barbarism' could be distinguished from 'upper savagery' by the presence of vessels, and, since Childe (1951) put forward the idea that pottery making represented '... *the earliest conscious utilization by man of a chemical change ...*', and went on to suggest that the ceramic vessels were the universal characteristic of Neolithic farming communities and their cultural identities as much as the marker of the colonization and civilization of Europe.

The beginning of pottery production in Near East postdates for the millennia and a half the adoption of agriculture in contexts of transition to farming in the region. Ceramic vessel had not occurred prior to the end of the Pre-Pottery Neolithic (ca 6900-6800 calBC), and even after this point the manufacture and use of ceramic technology followed different trajectories in different areas. Some communities remained 'aceramic' throughout; others adopted pottery at much later dates and only then in its more advanced rather than incipient form. Despite these regional variations we can note that the earliest appearance of ceramic vessels in Levant correlates with the collapse of a 'ritual economy' and aggregation centres, the cessation of previous mortuary and ritual practices and the dispersal of peoples after the 'package' of crops and livestock had been adopted (Kuijt 2000; Kuijt and Goring-Morris 2002). The beginning of pottery production may thus have been linked to the processes of settlement de-centralization, social fragmentation and, to the appearance of smaller communities or even autonomous households. The transition to small Pottery Neolithic households seems to follow scenario which anticipates the tensions between ritual and emerging economic elites, and between new forms of community cooperation, individual lineages (households) and traditional kinship organisation over rights and greater access to and control of resources and privileges, and in shaping social arrangements within communities in combination with regional environmental changes and local environmental degradation.

It can be suggested, therefore, that ceramic technology had become 'inhabited' in the agency of Eurasian hunter-gatherers long before food production and

agricultural social structures appeared. It is not only that the making of ceramic figurines predates pottery in Eurasia, but also that pottery was not necessarily associated with farming, as ceramic vessels appear before farming in Eastern Asia, and afterwards in the Levant and Anatolia in southwestern Asia.

Conclusions

The ‘dawn of European civilization’ and the creation of the genetic landscapes of modern European populations depended more on the social hierarchy of hunting and gathering communities, the intensity of social networks and the dynamics of structural transformation in the regions than on the transfer of population. Geneticists suggest that large-scale clinal patterns cannot be read as a marker of a single, time limited wave of advance from the Levant, but a multi period process of numerous small-scale, more regional population movements, replacements, and subsequent expansions overlaying previous ranges that happened during and after the Neolithic.

The dynamics of these processes were interrelated and overlapped with historical constraints, cultural inheritances and the social hierarchies of hunting and gathering communities in the regions. Early Neolithic ‘agricultural frontiers’ which were broadly accepted as the front lines of transferred exogenous farming populations may never have existed in the Balkans. The regional patterns of new dispersal of material culture and related spatial counters of the ‘Neolithic package’ distributions could have been simply archaeologically visible markers of social hierarchy and structure, the intensity of social networks and dynamics of the structural transformation of hunting and gathering communities in South-eastern Europe and Western Anatolia.

We should not forget the suggestions driven by population geneticists of a continuous paternal Y Chromosome gene flow, objectified in Palaeolithic and Mesolithic sub-haplogroup I1b* and Neolithic haplogroups J and E in both directions. They are markers of neither ‘demic diffusion’, a slow and regular east-west spread of population from one contiguous area to the next, nor punctuated and isolated events of a long-distance pioneering migration, but of the continuous process of population dynamics in South-eastern Europe and Western Anatolia.

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Povzetek

Kdo smo Evropejci?

V predavanju analiziramo pojasnitve oblikovanja in strukturiranja evropske genetske krajine tako po ženski kot moški liniji. V okviru prehoda na kmetovanje Evropi in Aziji v času med 10.000 in 6.000 pr. Kr. pojasnimo pomen populacijskih dinamik in študija populacijske genetike lovcev in nabiralcev ter poljedelcev in živinorejcev. Posebno pozornost namenimo izvoru in difuziji paleolitskih in neolitskih Y-kromosomskih in mitohondrijskih haploskupin. Naši ključni interpretativni poudarki so vezani na ugotovitve in ocene:

- da geneza evropske neolitske civilizacije ni rezultat 'demske difuzije' levantskih in anatolskih kmetovalcev;
- da filogeografija Y-kromosomskih haploskupin I1b*, J in E ne podpirajo modela neolitske kolonizacije Evrope in menjave avtohtonih populacij;
- da so populacijske trajektorije in preoblikovanje genetske krajine v Jugovzhodni Evropi vezane na predneolitske mreže socialnih interakcij in mobilnosti ter lokalnih ali regionalnih migracij;
- da so ljudje preko stikov in mobilnosti vzpostavljali pretok informacij in prevzem inovacij (kultivati in domestikati, keramične tehnologije), ki so povzročile spremembe v obstoječih socialnih, ekonomskih in kulturnih strukturah in sistemih.