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Prehistoric Iberia: Genetics, Anthropology, and Linguistics¹

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Evidence for an autochthonous development of culture in prehistoric Iberia comes from genetics, anthropology, and linguistics. Pre-Neolithic and Neolithic circum-Mediterranean contacts, mostly by sea, probably produced a community of Mediterraneans who had frequent

trade, genetic, and cultural exchanges; objective findings indicate that the demic-diffusion model of cultural and population replacement does not hold.

To discuss these issues, a meeting was held in Madrid, sponsored by the Fundación de Estudios Genéticos y Lingüísticos, November 16–17, 1998. Participants from the fields of genetics, archaeology, anthropology, and linguistics adopted a multidisciplinary approach.

Antonio Arnaiz-Villena (Immunology, Universidad Complutense, and Fundación de Estudios Genéticos y Lingüísticos, Madrid) presented data suggesting that, according to the HLA genes (A30-B18), paleo-North Africans (Berbers) were related to Iberians, including the Basques. An old genetic substratum in Iberia (marked by A29-B44) parallels the Rh(-) frequencies and is shared by western European populations from Ireland, southern France, and England. Portuguese and Basques show less Mediterranean HLA gene flow than other Iberians. Furthermore, eastern Mediterranean populations (Jewish, Lebanese, Cretan) tend to cluster together, and western ones (Berber, Spaniards, Portuguese, Algerians, Basques) also tend to be more similar among themselves when all of the Mediterranean gene frequencies are compared. However, all Mediterranean populations cluster together when compared with Greeks, who represent an outgroup with a genetic distance similar to that of the Japanese. Arnaiz-Villena concluded that, in the past few thousand years and especially in periods of milder climate, there were circum-Mediterranean contacts and gene flow and that the Greeks are relatively "recent" Mediterraneans (pre-Mycenaean, 2000 B.C.) who conquered the Cretan empire and adopted its writing (Linear A) and culture (Arnaiz-Villena et al. 1999).

Vicente M. Cabrera (Genetics, Universidade de la Laguna, Tenerife) showed that the maternally inherited (mitochondrial) genes of the present-day Canary Islands population came from the North African Berbers and its paternally inherited genes from Europeans. This is concordant with historical facts. Berber-speaking people populated the Canary Islands in prehistoric times; this has been documented by inscriptions found in caves and by archaeological data. In the 14th century, Europeans invaded the Canary Islands, killed (or sold in Iberia) most of male aborigines (*guanches*), and mixed with female aborigines.

Alicia Sánchez-Mazas (Anthropology and Ecology, University of Geneva) presented genetic data on Berbers (Imazighen, the first white North African population), showing that HLA data grouped northern and southern Mediterraneans together and supported a northward migration of prehistoric Berbers to Iberia, Italy, and the Mediterranean islands, where they mixed with the autochthonous populations. The migration may have occurred when the North African climate became hotter and drier after 6,000 B.P. Most of the present North African populations speak Arabic but are Berber in origin. The genetic information supports the view that the 7th-century Arab invasions of Iberia and North Africa included Arab leaders and aristocrats from the Middle East but consisted mainly of recently recruited Berbers. Blood

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2. On behalf of Jorge Alonso García, Vicente M. Cabrera, José Luis Escacena, Mary Jackes, Christopher Meiklejohn, Pedro del Moral, Peter Rowley-Conwy, Merritt Ruhlen, and Alicia Sánchez-Mazas.

groups (ABO and Rh) show that North African (Maghreb) Arabic-speaking and Berber-speaking people did not differ in genetic background. Tuaregs (Berbers living in the southern Sahara) show more differences and are probably more closely related to the people of the Sudan Beja.

Pedro del Moral (Anthropology, Universidad de Barcelona) showed that a mitochondrial DNA analysis yielded a west-east gradient of haplotype frequencies with the highest value of V and H haplogroups around Iberia (more frequent in Basques). This gradient also included North Africans from the Maghreb. This supports a pre-Neolithic migration from Iberia (or North Africa) eastward, probably during the second European interglacial. However, chromosome-Y data provide a completely different picture, one of north-to-south discontinuity, particularly in the Strait of Gibraltar (although only one Moroccan population has been analysed). Differences in gene genealogies between mitochondrial and Y DNA data are found all over the world. To interpret these differences it will probably be necessary to correlate the archaeological, historical, and sexual-behavioural data on the various ethnic groups with the genetic data. In addition, the degree of isolation should be taken into account. Further complexity was introduced by the analysis of less polymorphic genetic systems. In these cases, it will be necessary to consider bootstrap values of relatedness dendrograms and differential analysis for each set of data, including the degree of polymorphism and differences in the degree of isolation of ethnic groups.

Christopher Meiklejohn (Anthropology, University of Winnipeg) argued that according to craniometric data the Mesolithic-Neolithic transition in the Iberian peninsula was not accompanied by detectable population replacement. This does not support the demic-diffusion model, according to which agriculturalists from the Middle East were gradually reaching Western Europe and replacing existing populations. Morphological patterns in Portuguese crania were similar in Mesolithic and Neolithic samples. In addition, Mesolithic and Neolithic samples from Anatolia, Greece, Italy, and Corsica showed a separation between East and West Mediterranean skeletons, and therefore the arrival in the west of new populations from the east should have been noticed if it occurred. The only exception was an indication of similarity between early Neolithic groups in Greece and Anatolia. In summary, east-west demic diffusion in the central and western Mediterranean cannot be demonstrated by craniometric analysis (Jackes, Lubell, and Meiklejohn 1997).

David Lubell (Anthropology, University of Alberta) summarized both his and other studies on Maghreb archaeology and palaeoenvironments during the past 20,000 years, asking whether connections between the Maghreb and Iberia could be demonstrated prior to the widespread appearance of Cardial ceramics in the western Mediterranean around 7,000 B.P. Significant climatic variations occurred between 20,000 B.P. and 7,000 B.P. in western North Africa: the Iberomaurusian culture appeared in coastal areas ca. 20,000 B.P., when sea level was 110 m below modern levels and the interior high plateaus were inhospitable and dry. Two types of ana-

tomically modern *Homo sapiens* have been associated with this culture, a more robust Mechta-Afalou and a more gracile Mechtoid, but the distinction is based on metric traits which are not necessarily reliable. By 11,000 B.P., just before the Younger Dryas, the northern border of the Sahara had shifted south, opening a zone of Mediterranean scrub across the interior of the Maghreb. By 9,000 B.P. there were bands of grassland north and south of the Sahara (then only a semidesert), and the inland regions were populated by groups responsible for the Capsian. By 8,000 B.P. the Sahara was a grassland widely populated by both pastoralists and hunter-gatherers. This period extended until about 5,000 B.P., when modern climatic conditions were established. The anatomically modern populations responsible for the Capsian were the same as those found with the Iberomaurusian. Analyses of craniometry, dentition, and lithic industries show no clear sign of new human immigration. A series of indigenous developments occurred approximately along the Tropic of Cancer, in both the eastern and the western Sahara, between 9,000 and 7,000 B.P. (pottery, cattle domestication, collection of grasses) which could have crossed the Sahara to the Mediterranean littoral and possibly Iberia, although at present there is no evidence to substantiate this. The Capsian way of life became the "Neolithic of Capsian Tradition" (as yet poorly understood with the exception of one site). All these circum-Saharan cultural changes are regarded as autochthonous.

Mary Jackes (Anthropology, University of Alberta) discussed the difficulties of generalizing about past lifeways on the basis of archaeological skeletal samples. She showed that while DNA extraction is of paramount importance, the work of skeletal biologists is critical to establishing a context for the interpretation of the work of geneticists, particularly those who are extrapolating backward through time. Furthermore, in cases in which ancient DNA cannot be amplified because of the microbial destruction of bone, the information provided by skeletal biologists becomes crucial. She argued that it is essential to understand the possibility of sampling bias and the reality of demographic constraints and that dental morphology is probably the best means by which skeletal biologists can discuss the genetic relationships of past populations. Within the limits of the data available at present, she used dental morphology to show that there was no dramatic change of population at the Mesolithic-Neolithic transition in Iberia. This is in accord with the interpretation of the Mesolithic shell middens at Muge (Moita do Sebastião, Cabeço da Arruda) as indicating a fairly sedentary population which was slowly changing through time, with indications from dental pathology of a trend towards the Neolithic, and a slowly changing dietary regime. Work on the human skeletal samples from these sites and several Neolithic Portuguese ossuaries (Casa de Moura, Feteira, Furninha, Melides) indicates a slowly increasing population, one in which there is no dramatic change in terms of health or demography. The available osteological data do not support a scenario of population replacement at Mesolithic-Neolithic transition in Iberia and thus contradict the

demic-diffusion model. While there is no evidence of population change (and it must be recognized that because of the biological limits to human fertility a small number of immigrants will not alter the gene pool dramatically), the question of cultural diffusion and multiple contacts along Mediterranean coasts as the explanation for the appearance and subsequent intensification Neolithic lifeways is of course outside the realm of competence of the osteologist. Archaeological and osteological data need to be reconciled, perhaps by increased study of ancient DNA.

Peter Rowley-Conwy (Archaeology, University of Durham), citing his and others' study of faunal remains from numerous archaeological sites throughout the circum-Mediterranean, showed that sheep and cattle were domesticated early in the Neolithic, goat in the Middle Neolithic, and pig in the late Neolithic. All four types of animals go with cereal agriculture in a single package, each species making its own contribution to the enhancement of this new way of life. Thus, animal domestication probably occurred in Iberia when agriculture reached the Peninsula from Europe; this does not necessarily mean population replacement but only that the Iberian indigenous groups adopted the new technology. Claims for the existence of late Mesolithic and early Neolithic domestic pigs in southern Spain and their North African origin are not substantiated by the available evidence.

José Luis Escacena (Archaeology, Universidad de Sevilla) presented archaeological data from the La Marismilla settlement (at the ancient mouth of the Guadalquivir River) that he considered to demonstrate that ceramics and other cultural items (dating to about 2000 B.C.) were very similar to those of the Egyptian predynastic El-Badari culture. He postulated a common origin for Egyptian and Iberian cultures, suggesting that Saharans emigrated to both Iberia and the Nile Valley because of increasing aridity. Further studies will be necessary to assess this idea.

Jorge Alonso García (Fundación de Estudios Genéticos y Lingüísticos, Madrid) presented a translation of a previously undeciphered Iberian-Tartesian language based on Basque-Spanish equivalences. The theory that present-day Basque represents the language of ancient Iberians has been advanced by many writers, including William von Humboldt in 1821. The "Rosetta Stone" was an inscription in both Latin and Iberian from Tarragona (Spain): *Heic. est. sit* (Latin) = *Aqui yace* (Spanish) = "Here is buried" (English); *Are-tace-ce(u)-sakarlin* (Iberian) = *Aratze-zeu-sakar-ilun* (Basque) = *Aquí yace el difunto desecho para la oscuridad* (Spanish) = "Here is buried the deceased, debris for darkness." Also, the Tartesian language, spoken in southern Spain and Portugal, has been shown to be similar to Iberian with minor phonetic and alphabet variants (Arnaiz-Villena and Alonso-García 1999).

Merritt Ruhlen (Stanford, California) presented evidence, based largely on the work of John Bengtson, that Basque belongs to a recently delineated language family known as Dene-Caucasian. In addition to Basque, this

family has five branches: (1) the Caucasian family, spoken in the Caucasus Mountains of southern Russia, (2) the Burushaski language, spoken in the mountains of northern Pakistan, (3) the Ket language, the sole surviving member of an earlier Yeniseian family, spoken on the Yenisei River in central Siberia, (4) the Sino-Tibetan family (Chinese, Burmese), spoken in East Asia, and (5) the Na-Dene family, spoken in the New World, primarily in Alaska and western Canada (Ruhlen 1998). The discontinuous distribution of the six branches of the family, three of whose members are protected by their location in a mountainous region, suggests that they are all that remains of what must have once been a much larger family. It thus appears that an early Dene-Caucasian migration into Eurasia was later in large measure overrun by a different expansion, that of the Eurasiatic family (including Indo-European, Uralic, and Altaic). In Europe, Basque remains the sole language from the initial expansion, all the others having been replaced by Indo-European languages within the past 6,000 years.

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Complex Societies of Central Eurasia from the 3d to the 1st Millennia B.C.: Regional Specifics in the Light of Global Models¹

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