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Excerpt

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# 1 *Origins*

... but the real reason why we study it [evolutionary biology] is that we are interested in origins. We want to know where we came from

*John Maynard Smith and Eörs Szathmáry*

## **A diversity of sources**

To understand the present biology of Latin American populations it is important at the outset to emphasize the large diversity of their founding stocks. The earliest migrants to the continent were those now called Amerindians. The end of the fifteenth century witnessed the so-called European discoveries, which set in motion a mass movement of people not only from that continent, but also from Africa and Asia. In this chapter we will present some background material for the characterization of these migrants, needed for the evaluation of what occurred in the past 500 years.

## **Amerindians**

### *Confusion at the first encounter*

The denomination of ‘Indian’ to the people Christopher Columbus found when he landed in America was due to a mistake, since he and his companions imagined that they had arrived in India. This did not preclude the quick dissemination of this generic designation, although some restrictions have been raised in relation to it (Maestri-Filho, 1994; Field, 1994). America was named to honour Americus Vesputius, the Florentine navigator, who, differently from Columbus, conceived the new lands as a New World (Vesputio, 1951).

## **Controversies**

There is much discussion about almost all aspects related to the arrival of the earliest Americans. (Table 1.1 summarizes some of the questions, and the evidence used to answer them.) In relation to their previous homeland

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several options could be considered, but there is an almost unanimous consensus that they probably entered the American continent from Asia through the Bering Strait. A recent proposal to resurrect traces of Polynesian ancestry among these early Americans was shown to be unwarranted by Bonatto *et al.* (1996).

However, establishing an Asian origin is not enough. From where in Asia did they come from? A previous idea that they derived from groups inhabiting eastern Siberia was contradicted by evidence from mitochondrial DNA (mtDNA), since these groups lack a mtDNA haplogroup (B) that is well represented in Amerindians. The T cell lymphotropic virus type II, present in a large number of Amerindian groups, is absent in eastern Siberia. Both the virus and the mtDNA haplogroup B, however, do occur in the indigenous population of Mongolia, suggesting common ancestry between the present Amerindians and Mongolians (Neel *et al.*, 1994).

There is also much controversy about the date of arrival of these migrants, and the number of main waves of migration. The options are indicated in Table 1.1. There is increasing evidence that this date of entry is much earlier than has been supposed, but there are no undisputed indications about this from the archaeological and paleoanthropological material. Based on mtDNA data Bonatto and Salzano (1997*a,b*) suggested a model for the peopling of the Americas in which Beringia played a central role. This region would have been colonized by the Amerindian ancestors, and sometime after this colonization, they would have crossed the Alberta ice-free corridor and peopled the rest of the American continent. The collapse of this ice-free corridor during a few thousand years (about 14 000 to 20 000 years ago) isolated the people south of the ice sheets, giving rise to the bulk of North, Middle and South American Indians. The Na-Dene, Eskimo, and probably the Siberian Chukchi, would have originated from those who had stayed in Beringia, through a process of independent diversification.

This view, however, is not accepted by many scholars, who use other sources of evidence to question it. Here is not the place to examine all arguments in detail, and the reader is directed to the references given at the bottom of Table 1.1 for an appraisal of the most important aspects of these controversies. In relation to the number of migration waves, it would be wise to remember Brandon's (1961) assertion: 'There is no reason whatever to suppose that men of such times were consciously migrating, they were only living'.

***Prehistoric development***

Independently of what happened before, the fact is that a substantial number of people were present in what is now Latin America at the time of European arrival, by the end of the fifteenth century. But again there is much discussion about their precise numbers. The estimates generally relied on are: (a) prehistoric remains, (b) historical accounts, and (c) depopulation rates that occurred due to war, epidemics or other causes; and inferences from these factors are then made about the size of the putative original groups. All of these estimates are subject to errors, due to incomplete conservation of the prehistoric material, exaggerated or wrong testimonies, and local variation of the factors responsible for population decreases and eventual recoveries.

Selected estimates for the number of persons present in several areas, and in the total of Latin America, at the time of the European arrival are given in Table 1.2. For the whole region the number of people varies between 28 and 88 million, with a reasonable value, in our view, being 43 million. Their distribution through the continent, however, was uneven and related to the degree of socioeconomic development the different groups reached through time.

What are the main characteristics of these socioeconomic developments? The groups that first colonized the area were small, assembled as bands which relied mainly on hunting and gathering for their subsistence. They are generally classified under the generic name of Paleoindians, and archeological evidence of them is found all over the area, from Middle America to Tierra del Fuego. Some of the most important sites and cultures related to them are given at the bottom of Table 1.3.

Environmental changes and the extinction of the Pleistocene megafauna conditioned the development, initially in Middle America and the Andes, of agriculture. This occurred around 5000 BP, and led to a real revolution. By this time, the bands started to merge into larger groups or tribes. They could assemble in villages or stay dispersed in neighborhoods, but rarely exceeding, a few thousands of members. Fishing and the collection of mollusks was still an important means of subsistence in the coastal areas, and this strategy would continue together with the incipient agriculture.

The next stage in structural development was reached through the chiefdoms, with the integration of communities and the beginnings of stratification and hierarchies. This began around 2300 BP in different regions, including Middle America, the Intermediary Area (part of Central America, Ecuador and Colombia), as well as Caribbean, Andean and Amazonian territories. Two of the most sophisticated cultures of this

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period were the Middle American Olmec tradition, present in the La Venta site, and the Andean Chavín de Huántar (Table 1.3.).

Finally, in Middle America and the Andes, this type of social organization led to the development of states with incipient (Maya) or more developed urban centers (Toltec, Aztec, Inca). At the arrival of the Spaniards in Peru in 1532, the Inca Empire extended from Colombia to central Chile, from the Pacific Ocean to the eastern jungles – the largest political system created in the New World up to that time. Its capital, Cuzco, was as the Inca proclaimed ‘the world’s navel’, and the Empire’s total population is estimated to have been 12–14 million (Bethell, 1984).

This linear scheme of development is just an abstraction. Actually, the process was different in diverse regions, involved reversals, adaptation to local conditions, and in many places (as in the Amazon) the persistence of many groups with essentially the same way of life as they had at the time of colonization of the continent.

We can only guess about the conditions of life that these groups enjoyed under these varied circumstances. There is a long way from the basic egalitarian relationships prevailing in the hunter-gatherer bands to the Inca’s complex hierarchy. The relationships between the center of the Empire and its periphery are also important. Neves and Costa (1998) considered this question with regard to the prehistoric people who inhabited the Atacama Desert of northern Chile and their association with the Tiwanaku empire. They used femur length as an indication of stature, and the latter as an assessment of standard of living. Femur length *per se*, and sexual dimorphism were evaluated (it is known that nutritional stresses affect males and females differentially, reducing sexual differences). Comparisons were made for three periods: before the Tiwanaku influence, during the period of the Empire’s control, and post-Tiwanaku. Both indicators suggested a positive impact (better life conditions) during the associated Tiwanaku/Atacama period. Since the measures do not show any increase in variation in the people of this period, the authors concluded that the data do not support the hypothesis of a concentration of health in a few individuals during Tiwanaku times, but rather a generalized improvement of living conditions.

**Europeans***Small but important*

The small size of the European continent (it could be visualized as just a peninsula of the larger Asian continent) contrasts with its historical,

cultural, political, and economic importance. Its history, in many respects, constitutes the essence of humankind's achievements. It was the birthplace of all occidental civilization, both in its material and spiritual aspects. The diversity of its peoples is only matched by their cultural variability. It was from there that, in the sixteenth century, the great adventure of the maritime expansion took place, considerably enlarging our view of ourselves.

### *Prehistory*

Members of the genus *Homo* (*Homo erectus* and archaic *Homo sapiens*) were present in the region as early as 700 000 years ago. By the late Middle and early Upper Pleistocene (between 200 and 35 thousand years ago) the area was inhabited by a peculiar type of creature, the neanderthals. The appearance of modern humans (*Homo sapiens sapiens*) is documented only much more recently, that is, about 45 000 years ago. A heated debate has been going on for a long time now whether *Homo sapiens neanderthalensis* would have been completely substituted by *sapiens sapiens* without admixture, or whether such admixture did actually occur. Morphologic and genetic data were assembled and variously assessed (reviews in Stringer and Gamble, 1993; Trinkaus and Shipman, 1993). The direct examination of mitochondrial DNA sequences of the neanderthal-type specimen (Krings *et al.*, 1997), determined that they fall outside the variation of modern humans, suggesting that at least in relation to this organelle there was no overlap. These results, however, do not rule out the possibility that neanderthals contributed other genes to modern humans.

### *Cultural development*

The cultural developments that took place in Europe from the time of *H. sapiens sapiens*' arrival up to around AD 900 are summarized in Table 1.4. It is a long history of achievements, from the simple stone artifacts of the Paleolithic to the Iron Age, reflected in its demographic structure which varied from single bands of hunter-gatherers to sophisticated empires. The interpretation of these facts is also subject to much discussion, which can be exemplified by the models advanced for the spread of agriculture.

Three models have been advanced for the spread of farming, a cultural development which started in the Near East. They are: (a) *demic diffusion*: a slow expansion of people from the Neolithic source population into

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Europe who, due to their better suitability, either displaced or absorbed the less numerous Mesolithic hunter-gatherer populations (Ammerman and Cavalli-Sforza, 1984); (b) *cultural diffusion*: which did not involve intrusion of peoples, only of ideas, as well as the trade of crops (Dennell, 1983); and (c) *pioneer colonization*: migration of persons did occur, but was on a small scale, with much less influence in the genetic make-up of the populations involved (Zvelebil, 1986).

These models can be tested, considering the present genetic variability of European groups and that expected under the different alternatives proposed. Three selected examples will be presented here. Barbujani *et al.* (1995) developed five models of microevolution in European populations, considering also their relationships with Indo-European speakers. These were then compared with data from 26 nuclear protein genetic systems. The best correlations between observed and simulated data were obtained for two models in which dispersal depended basically on population growth, thus favoring the demic diffusion hypothesis. But diametrically different conclusions were reached by Richards *et al.* (1996), after an analysis of the mtDNA of 821 individuals from Europe and the Middle East. These authors found that the major extant European mtDNA lineages should have predated the Neolithic expansion, the conclusion being that the spread of agriculture was a substantially indigenous development. Fix (1996), on the other hand, using the HLA system as a model, made a computer simulation that indicated that clinal patterns similar to those observed in European populations could be due to temporal gradients in natural selection. These clines could have been influenced by domestication (specifically to animal husbandry) but not necessarily to the mechanism of demic diffusion. More recently Barbujani *et al.* (1998) and Chikhi *et al.* (1998) reexamined the problem both conceptually and using nuclear DNA markers, clearly favoring the demic diffusion model.

*Factors responsible for the Maritime Epopee*

More specific information about the events which shaped the lives of people living in the six European countries mainly involved with the Great Navigations of the sixteenth century is given in Table 1.5. They are characterized, in the period considered (AD 1000–1600) by an intense flux of peoples of different ethnic affiliations, wars, and the formation and dissolution of political units. The question that can be asked is: What factors were influential for the development of this great enterprise?

Undoubtedly, significant improvement in the art of navigation is the

first point to be considered. In this connection, Portugal's Prince Dom Henrique (1394–1460) should be mentioned. He founded the School of Sagres, responsible for the training of a series of important Portuguese navigators, who successively, during one century, explored almost all regions of the world.

The structure of the European societies of that time should also be considered (reviews in Wehling and Wehling, 1994; Wasserman, 1996a; Wasserman and Guazzelli, 1996). With a density of 40–60 inhabitants per square kilometer, there was more physical contact among individuals, wider circulation of goods and ideas, and a more intensive exchange of experiences. The societies were structured in a rigid way, which generally involved the monarchy, the Church, the nobility, and the common people – bourgeois, artisans, and peasants. But this does not mean that regional differences did not exist. An important aspect in Portugal's and Spain's initial development must have been the Arab influence, with its characteristic absence of private property and of a pluralistic society in which there were opportunities irrespective of ethnic or religious affiliations. In Europe as a whole, however, the transition between feudalism and capitalism was actively under way. Within this context, the strengthening of the monarchies, the development of trade, the need for a stable monetary system, the crusading ideal that 'the others' should receive the word of Christ, and the Renaissance during the fourteenth to sixteenth centuries, were all important for the developments that took place at that time.

## Africans

### *The cradle of mankind*

There is consensus that the first species of our genus, *Homo habilis*, originated in Africa from an earlier genus *Australopithecus*, now extinct. It is thought that *H. habilis* first appeared some 2.5 million years ago (mya), and was replaced by *H. erectus* at about 1.5 mya. The latter spread to Asia and Europe. The next taxon in this phyletic line was *H. sapiens*, who appeared around 500 thousand years ago (kya) in Africa, and later dispersed to Europe and west Asia. Modern humans (*H. sapiens sapiens*) are first found in East and South Africa around 100 kya (Table 1.6).

8 *Origins**Cultural development*

Later developments in Africa are summarized in Table 1.6. People from three basic stocks are recognized as the ancestors of all African populations: Khoisanids, Negroids and Caucasoids. Descendants from the first today inhabit almost exclusively southern Africa, but were once found over a wider area. Present-day representatives are the Khoi and San, notable for characteristics such as steatopygia and languages with characteristic clicks.

Negroids would have given rise to the groups who live today in the tropical forest and in much of eastern and southern Africa, the pygmies probably representing a long-term adaptation to tropical forest. These would include Nilo-Saharan speakers, West Africans and Bantus.

Groups related to modern Caucasoid populations lived in North Africa. In the Maghreb a specific Paleolithic culture developed from 22 000 to 7500 BC, named Iberomarusian, typically of the Cro-Magnon type. At the end of the Pleistocene – early Holocene they coexisted with a pre-Neolithic culture, the Capsian. People from this culture were hunter-gatherers and fishermen who consumed large amounts of mollusks. Later they acquired pottery and sheep, but always retained Paleolithic characteristics.

Neolithic developments involved the appearance of agriculture, cattle domestication, and more efficient fishing economies. Written documents appear in Egypt about 3000 BC. The advent of the Metal Age furnished conditions for the organization of early states and empires (more details in Table 1.6).

*State formation*

Starting with the Egyptian and Ethiopian empires, a series of states originated in many parts of the African continent. Some of these are listed in Table 1.7, with the approximate epoch of their existence and location. However, no consensus has been formed for why they originated in so many parts of the African continent. Partial explanations could be: (a) the superiority of iron weaponry which, monopolized by a few, would lead to this development; (b) the increment of long-distance trade, determining the formation of centralized urban groups; (c) the production of economic surplus, bringing about specialization of labor and a restricted group of ‘power’ goods that could be kept in the hands of a few; (d) the need for social management of larger and larger groups, determined by demographic growth; and (e) conquest, or imitation of neighboring states

(Curtin *et al.*, 1978). It is probable that a combination of these factors may have been important, and that they differed in diverse circumstances.

### *The tragic commerce*

Enslavement is part of the history of all ancient populations, but it never before or after reached the levels of the sixteenth to nineteenth centuries, with its tragic impact on African societies. As was emphasized by Curtin *et al.* (1978), it is ironic that maritime contact, which ended Africa's long isolation, should have led to a situation in which its own peoples became Africa's main export product. To understand clearly all aspects of the phenomenon it should be understood that: (a) the trade was uneven along the continent; areas such as the present Republic of South Africa and East Africa, from Tanzania to Ethiopia, were not involved in it; and (b) the Africans themselves were active agents in the process. For instance, there was a convention in West Africa (though not in Central Africa or Mozambique) that the European slave traders should stop at the waterside. Africans themselves would act as middlemen in the trade to the interior.

Details about the main regions where the slave trade was active, ports of exportation, African dealers, and the relative importance of these regions are presented in Table 1.8. The traffic occurred mainly along the West Coast and Mozambique, through several ports, and distinct states acted as dealers. The flow varied among regions during the four centuries of the trade. For instance, in Senegal and Gambia the peak of the traffic in absolute numbers occurred in the eighteenth century, while for Mozambique this happened a century later. The net result, however (e.g. the intercontinental transportation of about 80 000 people per year in the 1780s) was only matched by the intentional overseas European migration that took place in the nineteenth and twentieth centuries. Reader (1998) estimated as 9 million the number of slaves who were shipped across the Atlantic between 1451 and 1870.

What was the impact of the slave trade on the African populations? Some small ethnic groups were completely wiped out. Others suffered heavily for a time (Yoruba, Wolof), some were lightly involved (Benin), while still others (such as the Dahomey) may have profited at the expense of their neighbors. The sheer physical destructiveness of the trade was not high enough to produce differences in social health and progress between aggressors and victims. Its most serious damage to African society was the negative social imprinting that was established upon all the unfortunate victims, and their descendants, who suffered this unethical process (Curtin *et al.*, 1978).

10 *Origins***Other contributors***The Asian connection*

Migrants to Latin America came from almost everywhere. But in historical times and numerically, besides the groups already mentioned, some of the most important contributors (especially for Middle America, the northern part of South America, and southern Brazil) were people from East Asia (mainly Chinese and Japanese), as well as East Indians and Pakistani.

Asia is presently the most populous continent on earth, 1997 estimates indicating a population of 3.5 billion. More than half are concentrated in China (1.2 billion) and India (0.9 billion). The continent also has a rich prehistoric and historic past. Aspects related to the Mongolian and Siberian contributions to the formation of Latin American Amerindians were discussed earlier in this chapter. Here we shall concentrate on the main events that in the past shaped East Asian (Table 1.9) and East Indian (Table 1.10) populations.

*A millenarian civilization*

Pre-sapiens fossils and artifacts have been found in several places in the present Chinese territory, as well as early *Homo sapiens*, but no neanderthals. In what is now Japan evidence for human occupation near Tokyo 30 kya (the Sanrizuka site), and the oldest pottery in the world (12.7 kya) has been found.

Some of the main events and cultures identifiable in the prehistory or history of East Asia are listed in Table 1.9. The first written documents and urban life can be dated to the epoch of the Shang dynasty, 3.7 kya. The ensuing history is complicated because we are considering a very large territory, high population numbers, and tremendous fragmentation of these populations, with frequent migration from one region to another. However, few points deserve mention. Technical improvements in agriculture were mainly responsible for the population growth. With the end of the feudal system, farmers owned their land, while merchants and artisans became independent of the lords. A new elite also emerged, composed of administrators, teachers and philosophers. During the following years, a complex civilization was developed, which succeeded in developing a closely knit social and political structure that benefited from trade with its neighbors. Assimilation of other people (Turkic, Mongol, Tungusic) was also active, resulting in a closer approximation of northern Chinese to