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LINGUISTIC EQUILIBRIUM IN THE PALAEO-LITHIC: THE CASE OF INDO-EUROPEAN

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Résumé : Pendant le paléolithique on peut trouver presque toutes les conditions favorables à une lente évolution linguistique, notamment si on compare avec le rythme d'évolution des périodes postérieures.

Abstract: During the Palaeolithic age we have almost all the conditions favouring a much rather slow linguistic evolution when compared with the rate of change in subsequent periods.

In recent years a group of scholars from different countries, myself included, at first working independently and often with independent arguments and multifarious methodologies, has been proposing that the age of the Indo-European linguistic community was quite a lot older than the age that had been proposed for nearly two centuries¹. In doing so we have been openly challenging not only the current opinion about the Indo-European chronological frame, but also most of its central principles, since obviously such a major change in chronological record for the Indo-European world must have significant consequences in Linguistics and History.

In this new approach we would like to recognize that we were also greatly stimulated by the previous and brilliant criticism of Sir COLIN RENFREW² against traditional (or kurgan) theory about the origin of the Indo-European languages. This criticism offered us stimulating grounds for further research. I assume that, as in my case, the majority of us were convinced by his arguments against *doctrina recepta* or traditional theory³, but obviously the majority of us are not so convinced by the alternative model proposed by RENFREW, by his *Neolithic theory*. Thus, in an almost natural way, the rejection of both models, the traditional and the Neolithic, led us to one of the few remaining possibilities of proposing a further date for the Indo-European linguistic community, an older date in Palaeolithic times, a date before 8,000 BC.

THE MYTH OF THE STABLE CHANGE RATE

It is not difficult to presume that many scholars would argue that it is quite unlikely for us to recognize a linguistic group after such a long period of time, since languages change⁴.

This will probably be their main objection against a *pro-Neolithic* age for Indo-European community. Therefore, I will try to show now that specifically the Palaeolithic world is the only one providing those specific conditions that favor the slowest rate of linguistic change. Here are my arguments:

First of all, I would like to present an **epistemological** objection: the change rate argument implies the idea that languages change, more or less, at a stable or constant speed. I would like to reject this idea categorically, because "The rate at which a language changes is not constant and is not predictable" (DIXON 1997: 9; *similiter ibidem* 11, 54), because "languages do change at different rates" (DIXON 1997: 95; *similiter ibidem* 69–70)⁵.

But even if we accept the fiction that languages change at a constant rate, no one can assure us that the average change rate statistically recorded for historic languages must be similar or the same for proto-historic languages (or indeed anthropologic or *a-historic* languages). Theoretically proto-historic languages could change faster or slower, but if we want to know how languages change, we should perhaps first address the question of why they change. In my opinion, language is basically a kind of social and cultural instrument, which helps, like many other human organs or capabilities in adapting to the environment; "language is an adaptation for sharing information" (PINKER 1998: 117). I intentionally use the word *environment* here in a very wide sense, including ecological, cultural, social and economic aspects. As DIXON (1997: 1) has stated: "A language does not exist in a vacuum but is the means for communication within a group of people [...] An integrated

limited to a relatively short time depth—usually put at 5,000–10,000 years—beyond which all trace of genetic affinity has been erased by unrelenting waves of semantic and phonological change".

¹ The most extensive presentation is carried out by ALINEI (1996, 2000a, 2000b, 2001).

² The classical reference is RENFREW 1987, but see RENFREW 1999a for a more recent and some renewed view.

³ ZVELEBIL–ZVELEBIL (1990: 239): "a clear advance on previous models"; ALINEI (2000b: 25): "Renfrew's book can be considered the first successful criticism of the traditional theory, from an archaeological point of view [...] it is a milestone in the history of our field".

⁴ RUHLEN (1994: 242): "Probably the central myth of twentieth-century historical linguistics has been the belief that the comparative method is

⁵ Also ROSS (1998: 142): "The words on a standard word list evidently vary in their rate of replacement from language to language according to the conventions which govern language use [...] and according to the social history of a language's speakers, especially the amount and kind of contact which they have had"; RAMER ET AL. (1998: 65): "we must be wary of blanket generalizations about how much linguistic change we can assume over a given amount of time. The fact is that different languages undergo change at differing rates"; McMAHON–LOHR–McMAHON (1999: 273): "we may therefore reject the assumption of a constant rate of change"; SINOR (1999: 396): "linguistic changes do not occur at a steady pace", *et caetera*.

theory of language development must pay attention to the way of life of the group”⁶. Therefore, if the environment does not change, we have no reason to expect drastic linguistic changes, but, if the language environment changes drastically, then we must expect drastic linguistic changes as well. This subject was convincingly treated by DIXON (1997) some few years ago. I agree with DIXON that a language can survive without major changes for very long periods of time provided that these are periods of **equilibrium**⁷. Therefore, as KRANTZ (1988: 184) points out, “it is quite possible that language change was a much slower phenomenon in early times than it has been more recently. Most known cultural changes follow this pattern”. Indeed, the description by DIXON (1997: 147) of prototypical situations for linguistic equilibrium, *id est* “small egalitarian groups, living in a stable situation, in relative harmony with each other, without any particular prestige being attached to any group or language or dialect”, suits perfectly well the conditions that we normally find in groups of hunters, as we shall see immediately.

According also to DIXON (1997: 3), “over most of human history there has been an equilibrium situation”. I think that this assertion is very important here, in that it embodies the idea that languages would have changed very **slowly** over the greater part of human history. Nonetheless, the last 2,000 years in the history of mankind would be characterized by a spectacular interruption of equilibrium (DIXON 1997: 4), with languages changing very quickly.

LINGUISTIC EQUILIBRIUM IN PALAEOOLITHIC TIMES

Now I shall try to show that the best conditions for linguistic equilibrium are fairly easily found in Palaeolithic times. I shall concentrate in particular on Europe. Now let’s have a closer look at these almost optimal conditions for linguistic equilibrium.

First of all, the Palaeolithic age was an age of extreme **cultural stability** in Europe in comparison with Mesolithic and Neolithic ages⁸. Over millennia, the referential and

technological world changed very little in Palaeolithic times. Let me now just mention one significant aspect: while, for example, a large amount of new activities and professions appeared in the history of mankind almost all of a sudden with the so-called Neolithic revolution, throughout all Palaeolithic period men were basically hunters and women were basically gatherers.

It is beyond doubt that another factor favoring linguistic equilibrium is **demographic stability**, a sort of population equilibrium. According to DIXON (1997: 69), in a situation of linguistic equilibrium the overall population of the complete area must remain approximately constant during the whole period. Well, certainly demographic equilibrium is typical of hunter-gatherer communities. No doubt a language is more stable when spoken by a limited number of people, let’s say, by some thousands rather than by millions of speakers. A language spoken by millions of speakers is very apt to change rapidly and diversify⁹. As KRANTZ (1988: 184) says, “small speech communities appear to drift more slowly than large ones, all else being equal [...] The general rule is that among sister languages, these with the **larger** populations change the fastest” and “increased communication tends to provide innovations for further changes” (1988: 184). It is a well-known fact that the demographic density was very low in the Palaeolithic, especially in comparison with the Neolithic¹⁰. A demographical boom is a main feature of the Neolithic age¹¹. To give just a few illustrative numbers from KRANTZ (1988: 19), the most probable population densities are 0,1 per square kilometre in hunting economies¹², 0,25 per square kilometre in pastoral economies and 1,0 per square kilometre in farming economies. According to some scholars (CAVALLI-CAVALLI 1999: 175), 100,000 years ago the number of modern humans was between 20,000 and 100,000 and between 5 and 10 million some 10,000 years ago when the Palaeolithic was ending, and humans had occupied almost all the planet (CAVALLI-CAVALLI 1998: 142; 1999: 30, 175), then the demographic density would be of one inhabitant per square

humans, around 45,000 years ago [...] Everything after this event corresponds [...] to the slow evolution of these modern populations within the European continent”. But see also RENFREW (1990: 17): “It is, for instance, well established that most of the areas of Europe and Asia were inhabited already in Upper Palaeolithic times. A coherent explanation in terms of convergence might seek to reflect the underlying cultural unities in the Upper Palaeolithic occupation over much of this area in linguistic terms also. Successive phases of interaction over thousands of years would account for many of the linguistic features observed”.

⁶ *Similiter* TOVAR (1997: 29) “la lengua no se diferencia en su ‘vivir’ de los otros aspectos de la cultura”.

⁷ DIXON (1997: 70): “changes during a period of equilibrium would be relatively minor”.

⁸ Of course, this is likewise a main argument for Indo-European linguistic **unity** in such a period. As KÜHN stated (1932: 239): “[Die Einheit des Volkes] In der Bronzezeit hat es sicher nicht mehr bestanden, im Neolithikum [...] aber auch nicht. Es kann nur in der Zeit vorher, im Paläolithikum, existiert haben, und in der Tat, nur in dieser Zeit hatte Europa noch ein einheitliches Gesicht, eine einheitliche Struktur; im Neolithikum ist das Volk schon geteilt”. OTTE (1998: 402): “The paleoanthropological record shows that the only time when a total break (anatomical and/or cultural) occurred in European prehistory was with the appearance of Cro-Magnon; all the rest of prehistory has amounted only to development of this basic phenomenon, *within* Europe [...] not a single trace of a pan-continental Indo-European invasion exists, either during the Neolithic [...] or during the Bronze Age [...] local continuity can be traced back to the local Palaeolithic” and (2000: 42); “[In Europe] The major event in this general development is the appearance of modern

⁹ Unless there are means as writing, television or some other communication media hindering sudden linguistic changes (at least for a time), but, of course, this was not the case in prehistoric times.

¹⁰ ZVELEBIL-ZVELEBIL (1990: 247): “it is undeniable true that the potential for population growth is far greater among farmers than hunter-gatherers”.

¹¹ It is been estimated that the human population needed two millions of years in order to increase one hundred times more, while with the Neolithic revolution the population increased ten thousand times over a period of 10,000 years (CAVALLI-CAVALLI 1998: 144). There are several further indications that in Middle East from 10,000 to 6,000 BC the population increased thirty times more *jumping* from 100,000 to more than 3 millions of persons (HARRIS 1998: 252, with references).

¹² “Population densities between 0.50 and 0.005 people/kilometres square are probable and are relatively high for hunter-gatherers” (MITHEN 1994: 119).

kilometre, only in the best zones (CAVALLI–CAVALLI 1998: 142–3)¹³.

The contact with a very different language is also one of the main factors favoring sudden or drastic language drift¹⁴. The higher the number of languages in contact and the more different these languages are, the more a language is likely to change. Since **linguistic contacts** certainly increase with the development of civilization, this supplies another argument supporting the idea of a slower linguistic evolution in Palaeolithic times, because linguistic contacts in that age were obviously not so abrupt and they did not occur so frequently as in Neolithic times.

Another factor favoring, in my opinion, linguistic equilibrium has to do with writing. In a relatively short term, writing is a conservative factor since it offers a standard of language that is imitated or followed by literate people. In this way people of different centuries can understand each other through written tokens. Nonetheless, this situation usually ends up in a divorce between oral and written language. Speaking now over the long term, languages without writing are more conservative, since they can better keep lexicon as a living and active element, without fixing lexicon into complex morphology or into developed syntax as much written language does. The existence of writing promoted the existence of grammar (from Greek *grammatikhv* ‘art of writing’) favoring morphological rules instead of living lexicon. I do not need to say that the condition of pure **orality** (non-literacy) is typical of the Palaeolithic and of hunting bands. Hunters do not need writing¹⁵. Furthermore, while the function of preserving language is regularly assigned to writing in communities with literacy, the same function is ascribed to orality in communities that ignore writing. In that sense, writing deprives speech of a very important factor in order to preserve old traditions, stories, folktales and so on. In brief, to preserve old wisdom with its old language. Usually to know by heart means to speak in a more ancient way. We have many good examples of the preserving power of orality¹⁶.

¹³ 35,000 years ago there would have been about 3 millions of persons on the planet (MALHERBE 1983: 24).

¹⁴ TOVAR (1997: 229): “uno de los factores de desequilibrio es el contacto de lenguas, la intrusión en una de elementos de otra”. DIXON (1997: 9): “The rate at which a language changes [...] depends on many factors, especially upon what other language(s) speakers of the given language are in contact with. Generally, a language with no immediate neighbours is likely to change relatively slowly”.

¹⁵ DIXON (1997: 81): “These groups did not have writing. Writing was not developed during periods of equilibrium simply because it was not needed”.

¹⁶ Many enchantments and prayers were recited strictly *litteratim* in order to be efficient (a mistake in only one word or even one sound could sometimes be very dangerous), for example, among Navaho people (HARRIS 1998: 604). This kind of practice is well documented for Indo-European people (Romans, old Persians, Indians...). The bands of hunters usually have their own *hunting songs*, for example, among the Inuit (HARRIS 1998: 606). When a Cheyenne wanted to recite a traditional story, two other members of the tribe were required in order to memorize it (TAYLOR 1996: 27). Thus, it is not such a striking fact that hunters and gatherers used to have a very developed musical sense, as Pygmies or Guaranies. This is true for other *primitive* people such as Chippewa Indians (TAYLOR 1996: 42) or mountain Papuans.

WIDER (EXTERNAL AND INTERNAL) COMMUNICATION

If language use is constant, fluent and homogeneous, it is not likely to change drastically. I would like to refer to this condition of wider communication exchange as the principle of **omnicommunication**. Let’s see now how this condition could be manifested in Palaeolithic Europe favoring a general communication between all members of the group and consequently a larger linguistic stability.

It is obvious that a language is more stable if it is used in a compact community with no major social differences among its members, since major social differences sooner or later will produce major linguistic differences. It is fairly well known that hunter groups are essentially **egalitarian** with regards to both gender¹⁷ and age¹⁸. Within bands of hunters communication is fluent among all their members regardless of sex or age, in clear contrast to farming societies, where we do find social-based linguistic differences.

Another typical practice that we usually find in hunter societies is **exogamy** and we may also have excellent testimonies of exogamy for Palaeolithic Europe¹⁹. Again the communication among different tribes by means of exogamy is a factor that deeply favors language convergence and linguistic stability all over large zones²⁰. This convergence, of course, (and not *genetics* or *genealogies*) is the real ground and genuine source for producing dialect clusters and finally linguistic groups²¹ (and not *families* or *phyla*).

The communication between different tribes by different means, such as communal hunting²², cultural or technical exchange²³, or especially by some kind of **commerce** or other

¹⁷ An almost universal feature of hunter-gatherer communities is the gender division with regards to work: hunting is a matter for men, and gathering basically a matter for women (GÓMEZ 1980: 272–3). In quantitative terms, the gathering of the women is usually more important than the hunting of the men in providing food. Though not the only one, this is a good reason to explain why hunter-gatherer communities used to be gender egalitarian. In contrast, farming societies are essentially non-egalitarian and women have lower reputation than men.

¹⁸ According to RAMOS (1999: 328), in Palaeolithic Europe “no hay indicios de desigualdad ni de sexos, ni de edades en las sociedades de cazadores-recolectores [...] es la reciprocidad la que regula todos los valores sociales”.

¹⁹ According to RAMOS (1999: 355), some artistic products —especially mobile products— would be typical exogamic presents.

²⁰ For example, in some Australian tribes from Victoria it is not allowed to marry a woman if she speaks the same dialect (FRAZER 1987: 102).

²¹ ZVELEBIL (1999: 359): “contiguous, neighbouring, or intertrading languages become fused into *Sprachbunde*; maybe, after all, Trubetzkoy was right”. In an essential sense, of course, he was completely right.

²² This practice would also have helped a great deal to the diffusion of technical terms as linguistic *borrowings* (RAMOS 1999: 319, 342, 344–5). But *borrowing* is a very unlucky word because it suggests that *taking* (not *borrowing*) linguistic elements from other languages is a rather odd activity and not a completely natural and simple process. This old bias is typical of *family-tree* mentality.

²³ HERNANDO (1999: 236): “los grupos cazadores-recolectores no viven —no pueden vivir— en células autónomas y aisladas [...] El contacto cultural es una de las condiciones de su supervivencia”.

trade activities would likely contribute to a major linguistic convergence as well. In the Upper Palaeolithic, extensive trading networks can already be documented in many areas of Europe with, for instance, the “transportation of sea shells and other materials over remarkable distances of up to 400–600 km” (MELLARS 1998: 92). We have to emphasize that these kinds of contacts were more common and occurred over longer distances when subsistence was more precarious or more problematic, because it was precisely then that more solidarity was required²⁴, and certainly a frozen Europe was a very precarious environment for life.

Coming back to some demographic elements, just let me state that in modern times hunters are usually organized into groups with normally a *minimum* of 20 and a *maximum* of 50 people²⁵. These are likewise the numbers that we can posit, on the basis of several data, for Palaeolithic hunters of Europe (RAMOS 1999: 225, 330). These numbers are, of course, much lower than those we find in farming societies with usually hundreds or even thousands of persons. Obviously communication within a band is **complete** and constant: everybody speaks with everybody. The only exception is that during part of the day women talk to women and men talk to men. The limited number of members facilitates fluent communication. In contrast, the communication in farming settlements (or in pastoral tribes) usually concerns only a very selective group of people and not for long periods, but only *hin und da*, from time to time.

Generally speaking, hunters have **more time** for communication exchange than farmers. The working day is considerably shorter for hunters than for farmers (M. SAHLINS *apud* MOURE–GONZÁLEZ 1995: 152; CAVALLI–CAVALLI 1999: 28). Hunters have more free time²⁶. Usually it is sufficient for the group subsistence if about ten people devote themselves to supplying meat for the whole group in a band consisting of some fifty persons (SANTACANA–GARCÍA 1991: 27). Moreover, the hunter’s life in the campsite offers plenty of opportunities for general communication among all the members. Speech plays an essential role in many activities (folktales, jokes, myths, performing, proverbs, singing...).

Although far removed from the *noble savage* myth²⁷, longevity figures are more proportionate among hunters than among farmers²⁸. The average life–expectancy that has sometimes been estimated in the Upper Palaeolithic —28,7 years for women and 33,3 for men— was perfectly comparable with similar figures in European societies from the nineteenth century and, thanks to nutrition, physical exercise or some other factors, average mortality was very often lower in bands of hunters (GÓMEZ 1980: 291)²⁹. In contrast to a farmer’s family, a hunter’s family shows larger age gaps among siblings. Present day gatherers have around five children with an interval of four years between each child³⁰, but usually only two of them live long enough to reach adult age. Population does not increase or it does so very slowly (CAVALLI–CAVALLI 1999: 149). Age gaps between brothers — technically between members of the same generation— can easily exceed fifteen or more years. Elderly (or disabled) people used to look after children when they were unable to hunt or gather any longer³¹. Due to the useful role they had in the band, elderly people used to be highly regarded among hunters³². As a result, communication among different generations is similarly more fluent for hunters than for farmers, the range of potential **audience** being very **large** in bands of hunters: men, women, children, old people, relatives, people from other tribes.... In contrast to modern farming–based societies, among hunters there is neither a *generational gap* (HARRIS 1998: 168–9) nor cultural gap between generations, and consequently **no linguistic gap** between generations.

Finally, in the bands of hunters there are no social differences, mainly because there are no major activity differences and **no** high degree of **specialization** is required. No hunter needs to learn a more specific lexicon than any other hunter from the same tribe; no gatherer needs a more specific lexicon than any other gatherer. In contrast, members of farming societies usually need to learn the specific vocabulary of their professions. This fact contributes to linguistic diversification.

We can conclude this section by outlining that hunter communities display excellent conditions for language

²⁴ MELLARS (1994: 67): “it would almost certainly have been essential in these contexts for the human groups to maintain some form of wide–ranging contacts with other social groups as a hedge against these periods of local food–resource failures. One possible reflection of this kind of wide–ranging alliance system is perhaps seen in some of the extensive trading or exchange networks which can now be documented in many areas of Upper Palaeolithic Europe. In both western and central Europe, for example, there is evidence that several species of sea shells were traded or exchanged over vast areas —as, for example, between the Mediterranean coast and the Périgord regions (a distance of c.250 kilometres) or between the Black Sea coast and the Don valley (c.500 kilometres)”.

²⁵ For example, Bushmen bands usually have 30–60 members (BURENHULT 1995: 83).

²⁶ For example, the Australian Mardu employ less time per day in finding and preparing their food than western people in earning their salaries (SACKETT 1995: 80). Among the !Kung (Bushmen) the adults spend less than two and half days per week in hunting and gathering: men hunt every two or three days (HARRIS 1998: 321) and no longer than three hours per day, which means less than twenty hours per week (BURENHULT 1995: 83).

²⁷ But maybe we have to keep far away from the myth of the *rich farmer* too, especially in ancient times. In clear contrast to what was supposed, the transition to farming economies did not represent such a general improvement of life conditions in the Neolithic Europe. Instead of gathering during a few hours per day, farmers had to face *circa* ten hours of hard labouring (BURENHULT 1995: 84).

²⁸ For instance, more than 10% of the !Kung were older than 60 years (in contrast to 5% in farming countries as Brazil or India) and generally they were healthy (HARRIS 1998: 322).

²⁹ Thus, it is understandable that hunters and gatherers are usually satisfied with their way of living and do not show any will of modifying it (CAVALLI–CAVALLI 1998: 145).

³⁰ For example, among the G/wi (Bushmen) raising children can take up 25 years of their parents’ life (SILBERBAUER 1983: 194, 199).

³¹ This is the case, for example, among the G/wi (SILBERBAUER 1983: 195).

³² In fact, the *senate* (from lat. *senatus* related to *senes* ‘old, senior’) or assembly of a number of elders seems a typical institution of a hunting origin, since among hunters there are no chiefs and senior members of the group used to guide discussion (*see* DIXON 1997: 78). For instance, we find this practice among Australian natives (SERRA 1962: 437). Similar examples could be cited by the dozens.

stability. I have only found two linguistic elements in hunter bands that are fairly innovative. Firstly, a very common linguistic feature in hunting communities is taboo. By means of taboo, specific elements of vocabulary are continuously renewed in order to avoid certain words. Secondly, the existence of initiation languages, a common feature in hunting communities, is also another factor of innovation.

THE GENERAL FRAME AND SOME OTHER ARGUMENTS

Besides the general argument that hunting communities display almost *maximum* linguistic stability, we have still more arguments supporting the idea of a very old date for Indo-European, since before the Neolithic we find other conditions that could bring to light another major mystery of Indo-European studies, the puzzle of the vast extension reached by the old Indo-European languages. Certainly, we need realistic and compelling reasons³³ to explain such a wide extension³⁴ and, in my opinion, we can find them perfectly well in Palaeolithic Eurasia. So far I have focused on why it is possible to find almost all the best conditions for slow linguistic change during the Palaeolithic era, henceforth I would like to add still more new arguments that are of fundamental importance to explain the vast extension of old Indo-European languages. Of course, these new arguments are sometimes narrowly linked to some of the arguments already noted above.

First of all, aiming for a better exploitation of food resources, the bands of hunters have a very wide-ranging habitat and consequently they are very **mobile**. They seemingly prefer vast spaces, either because they are looking for stationary resources and new resources, or because they have to chase large migratory animals, as was, for example, conspicuously the case with deer in Eurasia³⁵. These journeys —sometimes very long— were even more frequent than ever in Palaeolithic times due to climatic and ecological instability and due also to the existence of lots of virgin land. In Palaeolithic times as in the present day, hunters usually did not *camp* more than a few weeks in the same place³⁶. According to KRANTZ (1988:

19), the most probable tribal areas covered 5,000 square kilometres for hunting economies, 2,000 square kilometres for pastoral economies and 500 square kilometres for farming economies, with 80 kilometres as an average tribal diameter for hunters³⁷, 40 kilometre for pastoral economies and 25 kilometres for farmers. Hunter mobility is very well documented in Palaeolithic Europe and, as noted before, in many instances we can likewise document the use of materials from remote origins³⁸. Of course, mobility is another factor favoring language convergence and linguistic equilibrium. According to MALLORY (1994: 146), “Mobile subsistence economies such as hunter-gatherers, or more certainly pastoral nomads, frequently retain linguistic uniformity over a wider area than is typically found among agriculturists”.

Secondly, we have to pay attention to **ecological** factors. The natural mobility of hunters was highly stimulated during the Upper Palaeolithic by new geographic and climatic conditions, a cluster of circumstances that offers easy explanations for very long journeys —and linguistic expansions— so that, in the words of DARWIN (1983: 232), we can say that the glacial period offers a simple explanation of facts. During the glacial period most of northern Europe and the Alps were covered by ice. The coldest phase was around 18,000 BC. When the Ice Age was almost over, many territories changed their ecosystem in a very abrupt way, and when the ice started melting, lots of meadows and prairies started growing, providing food for bison, horses, deer, mammoths, reindeer³⁹ and other animals, all of them being very important for the human diet or other needs. Those prairies spread northward and were later replaced by forests in many places⁴⁰. Animals followed vegetation and men followed animals and vegetation (ALINEI 2000a: 50). Those advantages —a sort of *golden opportunity*⁴¹— represented good reasons for inviting men to make such long journeys, during an age when the weather, at least during long periods,

instance, in Mesolithic we have evidence of small campsites which represent a single occupation for just a few hours by a small group of hunters or large site complexes which have settlement remains indicating occupation throughout the year by large human groups (MITHEN 1994: 111). Only bands, whose main diet was fish, have a bit less mobility (GÓMEZ 1980: 274).

³³ KRANTZ (1988: 2–3): “The first of the two principles of human movement to establish here is that people and their languages generally do not move. All peoples will tend to occupy their own territory until some compelling force is brought to bear to make them change their location (or their ethnic identity) [...] It is normally in the best short-term survival interest of all ethnic groups to maintain their locations and languages as tenaciously as possible. Any suggestion of an instance of contrary behavior should be accompanied by a sufficient explanation for it” and (*ibidem* 15): “It is argued here that human groups do not change their locations, or their languages, as a common practice. Such changes require compelling reasons. Any well-thought-out reconstruction of such events in the past must indicate these reasons”. Already for SAPIR (1921: 220) the language was “probably the most self-contained, the most massively resistant of all social phenomena”.

³⁴ Though not exceptional: many other linguistic supergroups present similar or even bigger extension.

³⁵ For example, in Rhin zone we have evidence of season migrations of reindeers and concomitant displacements of hunters from plane to mountain (RAMOS 1999: 248).

³⁶ GÓMEZ (1980: 274): “Existe numerosa documentación arqueológica que hace evidente la práctica del nomadismo en la Era Paleolítica”. For

³⁷ For example, the Palaeolithic occupation of La Cueva de Ambrosio (Almería, Spain), at 1,000 meters of altitude, involves stationary movements of its inhabitants to the coast —today 60 kilometres far away— for fishing and hunting other species (RAMOS 1999: 316–7 with other similar examples).

³⁸ For instance, in central Europe during the Upper Palaeolithic we have evidence of materials coming from a distance of more than 200 kilometres and even of products, as shells, coming from a distance of more than 800 kilometres (RAMOS 1999: 242–3, 249, 326–7).

³⁹ The reindeer —animal of capital importance in Palaeolithic Europe for many tribes because of its almost complete exploitation— could reach the last corners of northern Europe already around 10,000 BC (GÓMEZ 1980: 32).

⁴⁰ “From the human standpoint, there can be little doubt that the most significant factor was the replacement of the open tundra and steppe-like landscapes of the central and northern latitudes of Europe by densely forested conditions” (MELLARS 1994: 75).

⁴¹ (ALINEI 2000a: 52–3): “la possibilità di estendere verso nord il loro territorio di caccia e pesca [...] dovette apparire come un’occasione d’oro”.

was more temperate than today⁴². As MELLARS (1994: 44–5) has remarked: “One further consequence of glacial conditions was a substantial lowering of sea levels [...] it can be calculated that world-wide sea levels must have dropped by at least 100 metres at the time of the maximum of the last glaciation, around 18,000 BP [...] All of this, of course, would have had a significant effect on the coastal geography of Europe. In most regions of Europe this led simply to an expansion in the extent of the coastal plains—usually by not more than perhaps 20–50 kilometres beyond their presents limits”. Human displacements were highly favored by a decrease of the sea level, that could drop as much as 140 meters some 90,000 BC (GÓMEZ 1980: 30) and that, with natural fluctuations, could stay some 100 meters (or more) below its present level during all the Palaeolithic. Yet around 18,000 BC, the sea level could drop to some 120 meters below present sea level (COSGROVE 1994: 60). During the periods of lowest sea level, continental shelves were exposed⁴³, allowing larger contacts in Europe.

Finally, it has now been established beyond any reasonable doubt that modern humans populated Europe and most other parts of the world during the Upper Palaeolithic, while “Certainly recent molecular genetic evidence for Europe does show indications of human dispersals accompanying the Neolithic, but on a relatively small scale” (RENFREW 1999b: 11). Indeed, these dispersals were limited to southern and eastern Europe. If the Neolithic represented a quantitative revolution human population, the Palaeolithic—not the Neolithic—represented a qualitative revolution⁴⁴. It is a well-established fact that the elder migrations are the most important in the **genetic** components of a population because they come when the population density is still very low (CAVALLI–CAVALLI 1999: 170; BERTRANPETIT–JUNYENT 1998: 68, 70). This situation is sometimes described as the *foundational effect*, in order to outline the significance of a few persons in small populations before they expanded (see BERTRANPETIT–JUNYENT 1998: 66–70)⁴⁵.

⁴² At any rate, note that snow presents likewise positive aspects for hunters: on the snow it is easier to follow the trace and to hunt some animals (a hunter with rackets can walk longer or even faster than some of his preys), aliments are more easily maintained ready for the use thanks to snow, snow can furnish drinkable water in a simple way...

⁴³ Integrating, for instance, Britain with the main land mass of Europe and producing a large plain in the northern Adriatic (GAMBLE 1994: 16; MELLARS 1994: 44–45); actually the Adriatic Sea was almost half-size and the distances between Europe and Africa were considerably shorter in many places of the world just around 6,000 BC. Many islands—as Corsica and Sardinia—were linked on earth (McCALL–FLEMING 1999: 234). I could be the same with Italy and Sicily, northern Greece and Minor Asia. Only around 6,000 BC the sea reached its actual level and then, for example, the British islands were definitively separated from continent (GÓMEZ 1980: 34). ADAMS and OTTE (1999) have assessed the intercourse between climate instability and the spread of Indo-European languages.

⁴⁴ And, in a certain sense, a bigger cultural revolution in the history of mankind. MELLARS (1998: 91–2): “The archaeological records spanning the period of the replacement of Neanderthal by anatomically modern populations reflect what I and many other archaeologists [...] would regard as the most radical episode of cultural, technological and general behavioral change in the entire history of the European continent”.

⁴⁵ ADAMS–OTTE (1999: 73): “Following a climate phase marked by low human population densities across the region, any one group that acquired

A combination of all these factors could easily put back the Indo-European date more than 10,000 years. From the arguments put forward (especially the climatic, ecological and geographic, those referring to mobility...) we can conclude that in Europe the expansion of the Indo-European supergroup was based essentially on a northward and westward hunter-gatherer exploration and on an exploitation of land through climate sensitive adjustment before 8,000 BC, more or less as it happened to Uralic and *mutatis mutandis* with most or many other linguistic supergroups.

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both the general cultural traits that caused it to spread rapidly out of a refugium and the technology to enable it to do so would have experienced rapid exponential population growth in an environment relatively free of competition from other hunter-gatherer groups. Such a group [...] would have made a disproportionate contribution to the genetic and linguistic legacy of Europe and parts of Near East”.

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