

**ON A LANDBRIDGE IN THE GIBRALTAR AREA
IN PROTOHISTORICAL TIMES:
A ZOOGEOGRAPHICAL STUDY AND ITS
IMPLICATIONS FOR HUMAN SETTLEMENT**

by

François de Sarre

Summary

During the last millennia, the sea level all around the world was subjected to many fluctuations, causing some disorder in the course of the human civilizations. Floods occurred and land connections were broken. In the Gibraltar area, the link between Iberia and today Morocco is thought to have been definitively lost for 15,000 years, as the end of the Ice Age caused great quantities of snow and ice to melt and run into the Atlantic ocean.

Yet, the zoogeographical datae support the idea of a *more recent* up-and-down transit of animals in this area, reflecting the situation when the European and African continents were joined, until an obstacle like the Strait of Gibraltar limited the dispersal capacities of the organisms.

In the context of human settlements, the presence of a protohistoric landbridge allows us to emphasize that many events have occurred in a way that is not consonant with the usually recognized theses.

The author of the present paper thinks of the possibility that prehistoric civilizations were in possession of boats capable to reach distant places. In fact, Pleistocene mariners could have crossed the Atlantic and got into trade on both sides of the ocean. Cro Magnon originated from Central America, and transoceanic contacts between Europe, Africa and the Americas, were rather regular during the Upper Palaeolithic. This will be discussed.

In recent periods (Neolithic, Chalcolithic), transoceanic voyages continued to be undertaken, from each side of the Atlantic. At some regards, a great circum-atlantic civilization (*Megalithics*) can be postulated. Later, as the Strait of Gibraltar became definitively open, the Phoenicians, as the heritors of the Megalithics, went on to cross the Atlantic for commercial purposes; they were the guardians of the "Pillars of Hercules", and let other people think there was nothing to find in a westerly direction...

SCIENCE IS INTENDED to retrace the variations of the sea level around the world during the prehistoric and protohistoric times. Connected with inundations, *tsunamis* and tectonal upheavals, the importance of such events shows us how quickly Earth's history can be changed, and Mankind's destiny, too [1].

LOCAL OR WORLDWIDE CATAclysms really point out how vulnerable our civilizations are. Legends of many people tell us indeed of deluges, devastated lands, sunken islands, and destructions by volcanic inferno.

Scientists become now aware that Earth's history is not only one of gradual and stately changes in the lithosphere. But let us first deal with general considerations.

DUE TO ICE MELTING, the level of the ocean has steadily increased since the end of the Pleistocene. About 5500 years ago, it is estimated 4 metres *higher than today*. There are some oscillations in the meanwhile, and another increase at 3 metres above the present level: this event is dated from 3300 years BP [2].

In the Mediterranean Sea, therefore, the situation seems to have been quite different. Geologists claim that there was only one continuous (so called *Versilian*) gradual transgression until the level "zero", that was reached around 1500 years ago [3].

AS A MATTER OF FACT, there are in the whole Mediterranean area no indications for a *durable* stand of the sea level *above* the today level, in prehistoric times. The recent discovery of parietal figurations in the (now) submerged grotto Cosquer (near Marseilles) confirms this point of view. If water had stood higher in the Mediterranean, the grotto paintings would have been damaged, and certainly lost.

Consequently, it seems that the Atlantic ocean and the Mediterranean sea have followed separate ways, in recent times, *because they were not steadily connected*.

It would mean that the Strait of Gibraltar was not opened, in the way we now intend. The following zoogeographical study may help us to discern what once succeeded at the junction between Europe and North Africa.

Geological review

DURING THE TRIASSIC PERIOD, when the unique continent (*Pangaea*) of the Earth began to dislocate, the *Tethys* was the ocean which lay at the equator between Eurasia and a southern big continent including: Africa, Antarctica, Australia and the Americas.

As the Atlantic ocean opened, Africa drifted away and pushed northernmost against Europe and Asia, making the local *Tethys* to become a *confined sea*. The closing of the sea occurred first in the east (Near-Orient), then on the west side (Gibraltar area). In this way we can imagine the formation of the Mediterranean sea [4], around 20 millions of years ago. At the same time, the structuration of the Alpine chains of mountains took place. On the western margin of the Mediterranean basin, the **Betic-Rifean** orogenic belt made the junction between Iberia and North Africa. Another landbridge existed for a while between Tunisia (*Cap Bon*) and Sicily.

Figure 1 depicts this mountainous belt that overhanged on one side the Atlantic ocean, and on the other side the Alboran backarc depression, as a part of the Mediterranean basin. The Betic-Rifean belt formed a landbridge and was the natural passage for terrestrial animals, even big ones, between the African mainland and the North Atlantic

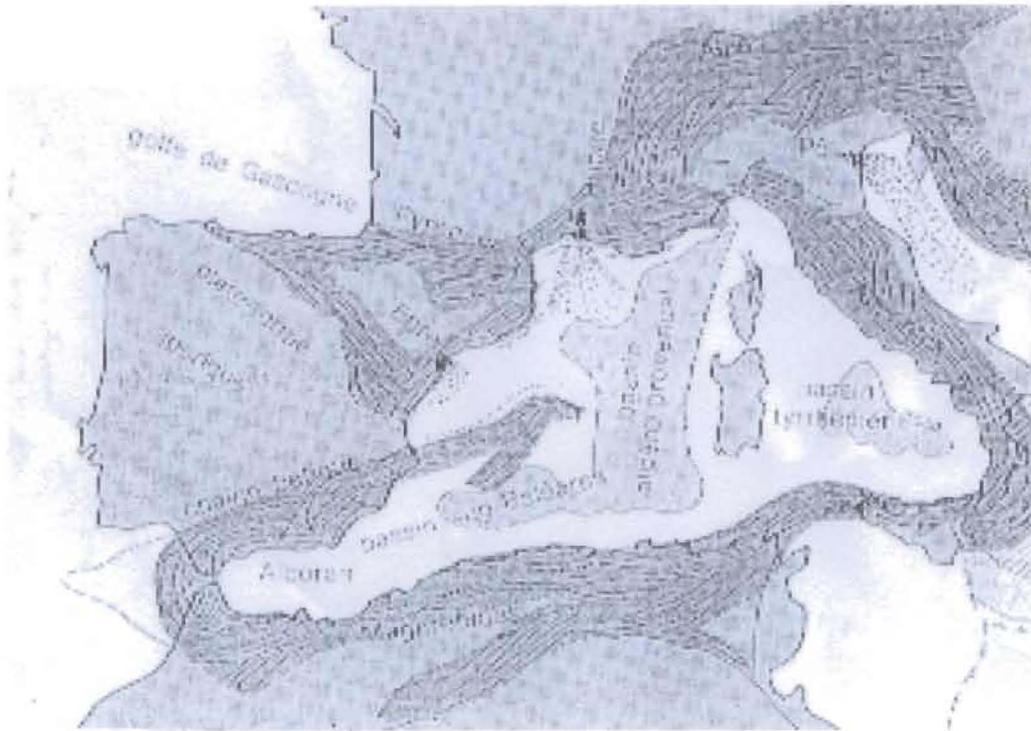


Figure 1: The Mediterranean Sea during the Pliocene (after Biju-Duval *et al.*,1976)

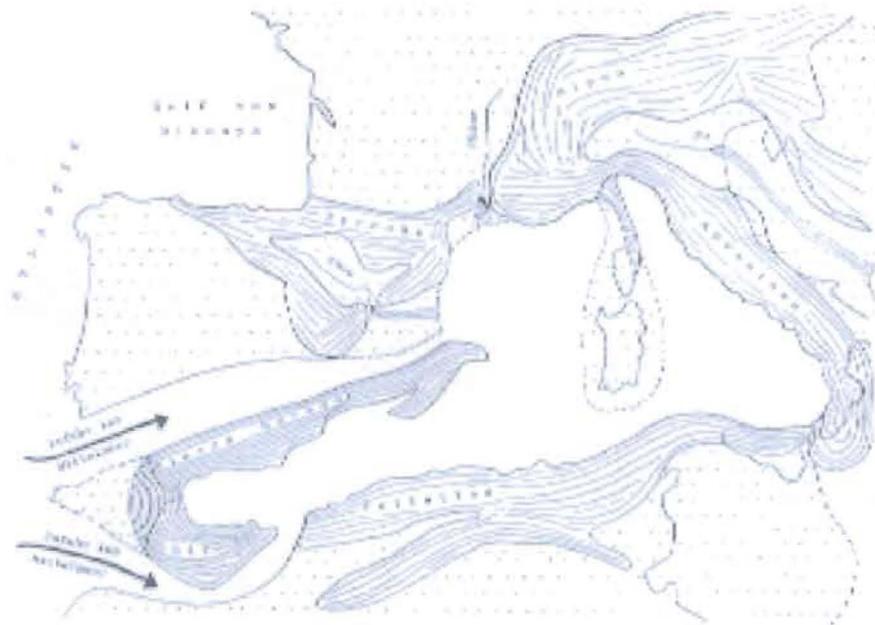


Figure 2: Geographical situation in the western part of the Mediterranean, as channels connected with the Atlantic were alternatively opened, north and south of the betic-rifean cordillera (de Sarre, 1999; after Biju-Duvac 1993, Comas 1992)

foreland of what is today Europe, from Spain to Scandinavia.

THE LINK between the Ocean and the inland Mediterranean was not necessarily cut, as channels could alternatively be opened or shut, for instance at the north of the Betic cordillera, or at the south of the Rif mountains [see figure 2].

At the Messinian time, dated by geologists at less than 6 mya ago, it happened that the Mediterranean sea was entirely *dry* [5]. The landscape was one of deep valleys and plains, about 2 kilometres *under* the level of the continental plateau.

Then, the basin was filled anew, but not *perforce* through a break in the cordillera, at the emplacement of the today Strait of Gibraltar [6]. Yet, nothing on the Earth surface is immutable, even not a mountain range, like the Betic-Rifean chain!

NOWADAYS, in the middle of the cordillera, there is a sea-arm through which the Atlantic ocean daily discharges its outflow. Local volcanism, tectonic events, as well as the action of marine transgressions and regressions, have fashioned the topography and the dimensions of the sea-arm, until the present day.

What can Zoogeography be used for?

IN COMMON TERMS, Zoogeography is the study of geographical distribution of animals throughout the globe. The different parts of the world support different *faunae*: today disparities are indeed not haphazard, but they retrace the history of the animal lineages under changing geologic conditions. The *Palaeartic* region includes North America and Eurasia, which have together

much in common, but also North Africa (whereas the remaining part of Africa is belonging to the *Ethiopian* region).

During Jurassic times, the dinosaur *Brachiosaurus* lived on both the Iberian foreland and North Africa. A very ancient group of reptiles, the *Amphisbaenidae*, or ringed lizards (they look like big worms), still inhabits Spain and Morocco. *Blanus cinereus* is found today on both continents, whereas relative species live in South and Central America. This may indicate that the *Amphisbaenidae* once occupied all this part of the *Pangaea*, before the continents drifted away.

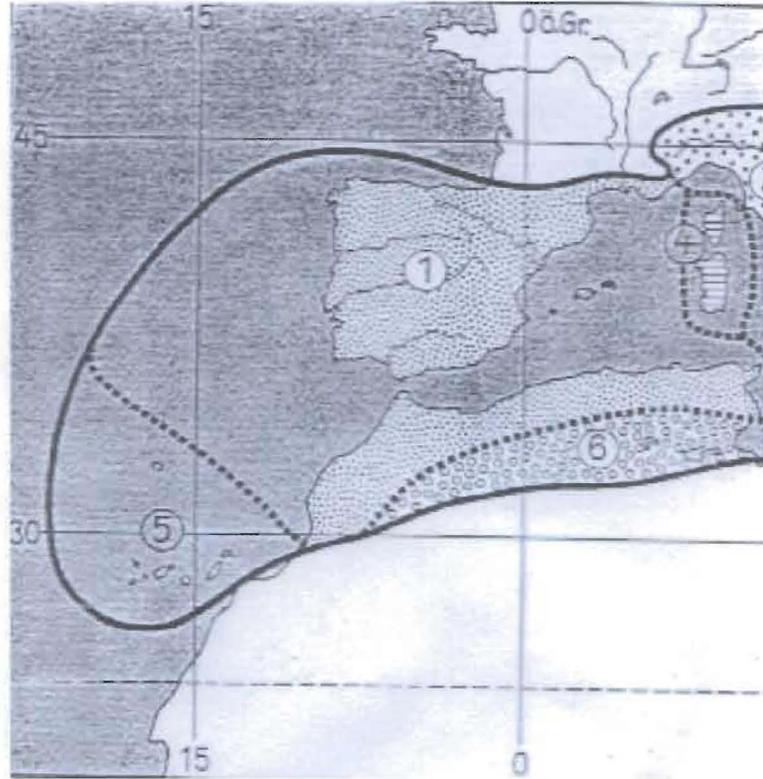
There are other groups of animals, like the *Characoidea* (or characins: they are small fishes, often kept in aquariums), which are now separated by the Atlantic ocean!

In the Ibero-Moroccan area, that is concerned by the present study, many organisms live today *on both sides* of the Strait of Gibraltar. Some of them are restricted to this area. It can be concluded that the populations are closely related: they were recently divided by the sea-arm between Atlantic and Mediterranean!

IN THAT SENSE, Professor Gustaf de Lattin (who was my former director at the Zoological Institute in Saarbrücken, Germany) gave specific names for all the Mediterranean subregions, in his book "*Grundriss der Zoogeographie*" [7]. We notice that both the Iberian peninsula and North Africa (Morocco, Algeria, Tunisia) are included in the same subdivision, that professor Gustaf de Lattin called: *Atlanto-Mediterranean* Subregion [figure 3].

This map reflects the situation when the European and African continents were connected, until an obstacle like the Strait of Gibraltar limited the dispersal capacities of terrestrial organisms.

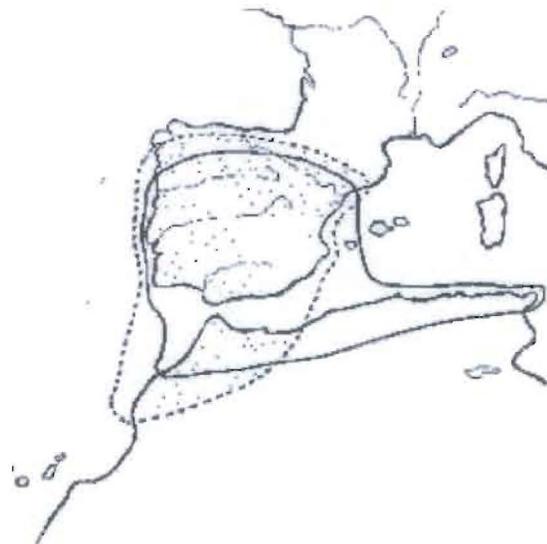
Figure 3: The Atlanto-Mediterranean subregion (1), as defined by the zoogeographer Gustaf de Lattin (1967), coupling the Iberian peninsula and the Maghreb



The Atlanto-Mediterranean Subregion

As professor Gustaf de Lattin began to study the biotas in Spain and Morocco, he first put his attention to the butterflies, for he was a lepidopterologist. This may appear strange, because the butterflies are able to fly, sometimes across wide distances... But they are also bound to peculiar plants for their larval development. Furthermore, they keep habits reflecting a former behaviour. So many of them continue to fly across the strait of Gibraltar, also when the other coast is out of sight, or if the wind is contrary, as would they think to fly over only land...

Figure 4 shows the example of *Zegris eupheme*, which is a parent of our cabbage-white; similar distributions have other butterflies, like the meadow-brown *Melanargia ines*, and the small brimstone-butterfly *Gonepteryx cleopatra*.



The former landbridge near Gibraltar

IN THE FRAMEWORK of our study, the *freshwater fishes* are quite instructive. As a matter of fact, their distribution on both sides of the strait of Gibraltar would indicate that their ancestors have passed through this area; and they have needed not only a simple

Figure 4: Distribution of the 2 species of butterflies:
 - *Zegris eupheme* (Iberia and Maghreb)
 - *Melanargia ines* (Iberia and Morocco)
 (after de Lattin, 1967)

connection, but a broad land mass *with a hydrographic network* inside it!

SURELY, we cannot take in consideration a fish species like the trout (*Salmo trutta*) which lives as well in fresh as in salt water. Thus, one interesting point is that of the salmon (*Salmo salar*) which apparently not yet found the "entrance" into the Mediterranean sea, although salmons inhabit rivers in northern Portugal! Contrary to the eel (*Anguilla*), that is perhaps more ancient in the region, and also more capable to swim across inundated shallow areas, like there were in Spain and Morocco before the Strait of Gibraltar was open.

About the ichthyofauna of North Africa, professor de Lattin wrote (*Grundriss*, p. 195) that there are *no true African* representatives among the freshwater fishes of Morocco, Algeria or Tunisia (excepted some *Cichlidae*, I must add). Most of the fishes are indeed of *Palearctic* origins, i.e. they came from northern countries.

If we look at the *Cobitinae* (loaches), we shall consider the interesting case of *Acantophthalmus* that inhabits Morocco, but not elsewhere in Africa. Surely, it is also found in Spain (Europe until Siberia). The *Cobitinae* are furthermore *primary* freshwater fishes: they don't hazard in salt water! Consequently, *Acantophthalmus* must have crossed the Gibraltar area by mean of river and lake connections. This was certainly done as the Betic-Rifean cordillera joined the Iberian subcontinent to the African mainland.

ZOOGEOGRAPHICALLY, there is the same situation with the *Barbus* species (barbels) which live today in Spain, Morocco and Algeria. Other small fishes (*Aphanius*) are usually restricted in estuaries and in some rivers; they could also have crossed the Mediterranean, especially at a time when the sea was less salt than today. *Aphanius*

fasciatus is now to be found in Algeria, and also at the Spanish and French coasts till the Italian border. The 5-7 cm sized fish doesn't present subspecific variations across its whole area: one can suppose that the isolation of the populations in the estuaries is dating back from a rather recent past.

As the Amphibians (frogs and newts) are unknown from brackish or salt waters, they are *excellent indicators* for land connections. They need ponds or rivulets for their reproduction, and wet places for the adults. So the presence of the same species on both sides of the strait of Gibraltar indicates here was a well-wooded landbridge!

Among the *Anura* (frogs and toads), *Discoglossus pictus*, *Bufo bufo* and *Hyla arborea*, possess a circum-mediterranean distribution: they may have come from the Near East, or they have crossed above an ephemeral landbridge between Sicily and Tunisia, before having joined Morocco. Nevertheless, a good indication is given by the frog *Rana ridibunda*, because the same subspecies *perezi* inhabits Spain and Morocco. Zoologists would mean that the African and Iberian populations formed *a single natural group*, not long ago! Otherwise *Rana ridibunda* would certainly have developed a new subspecies on the African continent...

THE CASE OF the newt *Pleurodeles waltlii* is perhaps more striking, because this small amphibian is known only from Portugal, southern Spain and Morocco [figure 5]! There is actually the same species on both sides of the Strait of Gibraltar. East of the Rif, a distinct species, *Pleurodeles poireti*, occurs in Algeria and Tunisia. The zoogeographical datae retrace the following evolutionary history of the genus *Pleurodeles* = A former homogeneous population inhabited a vast territory from Iberia to Libya; then the eastern representatives became

separated through a channel (it led to speciation), whereas the northern and western



Figure 5: Distribution of the genus *Pleurodeles* (newt) on each side of the Strait of Gibraltar:
 - ***Pleurodeles waltlii* (left)**
 - ***Pleurodeles poireti* (right)**
 (after Grzimek, 1974)

representatives remained still *together*, until the Strait of Gibraltar was open... Chronologically, it seems that a *first* separation occurred *between Morocco and Algeria*, reflecting a large-scale flooding of the Atlantic into the Mediterranean sea, at this one place. The today seaway, indeed, appears to be a lot *younger* than previous channels between the Rif and the Atlas!

Other examples of animal distribution

THE BIGGEST LIZARD in Europe is *Lacerta lepida* (until 80 cm), its territory stretches from France to Spain and North Africa. A close related species, *Lacerta galloti*, lives on the Canaries. They own a common ancestor that apparently reached the islands as they were connected with the

African mainland. But we must also think to a diffusion *by the sailors*. Lizards are curious and fearless enough to find their way in boots at wharf! Then, this would certainly offer an evidence that the Canaries were visited by Prehistoric man.

In the framework of our study, it is worth noting the distribution of 2 small lizards, *Psammodromus algirus* and *Acanthodactylus erythrurus*, that live in sand and arid areas, far from human settlements, in North Africa and in the Iberian peninsula. We suppose that they came from West African beaches, spreading across the landbridge, as circumstances permitted. Other reptiles have tried it, in the same direction. This was done by the chameleon (*Chamaeleo chamaeleon*) that is found at some places in Andalusia: this would indicate that the isthmus was *still* a well-wooded area, as it went through, allowing an *arboreal* species to migrate toward north!

ON THE OTHER HAND, typical desert reptiles, like the common agama (*Agama bibroni*) or the spiny-tailed lizard (*Uromastyx*), which are today abundant in North Africa, apparently never have reached Spain. Maybe these species came up in Morocco *after* the last climatic changes, as the Strait of Gibraltar was already open. Both events seem indeed to be closely linked: the *desertification* of the Sahara and the opening of a *durable seaway* between Atlantic ocean and Mediterranean sea!

Before being broken up, the landbridge was surely taken by some big mammals, like lions, panthers and cheetahs, that appear on Palaeolithic paintings. All big cats lived in North Africa very recently. The last Moroccan lion (*Panthera leo*) was shot in 1920. In Libya (Djebel el Akhdar) a small population of cheetahs (*Actinonyx jubatus*) may still survive. Elephants are known to

have been used for war purposes by the Carthaginians; during historic times, they also inhabited the Iberian peninsula [8]. Small elephants lived on Mediterranean islands (Cyprus, Creta, Malta, Sicily) and were without doubt related to the African dwarf species *Loxodonta pumilio*.

The well-known magot of Gibraltar (*Macaca sylvana*) is the only monkey still existent in Europe [figure 6], even if individuals must steadily be brought from the neighbourly mountains of Morocco... Thus, fossil remains demonstrate that *Macaca* had once a wide distribution in Europe, in prehistoric times. The last magots have been stopped by the channel, as they tried to wander southwards.



Figure 6: The today distribution of the magot (*Macaca sylvana*) in Morocco and in Algeria. The arrow indicates the relictual area of these apes on the Rock of Gibraltar. (after Grzimek, 1971)

OTHER INTERESTING CLUES can be given by the distribution of the brown bear (*Ursus arctos*), which is a typical representative of the Palaearctic region. There are today no bears in Africa, but it is admitted that bears existed in the Atlas mountains until the XIXth century. They may have come from the Pyrenees, then walked along the

cordilleras until the isthmus was reached, and, from this point, they have joined the African continent... The same route was apparently followed by neanderthals (*Homo neanderthalensis*), as we'll see it below. Both groups have a similar history.

Zoogeographical conclusions

WE CAN CONSIDER that many animal species were or are still confined to similar biotas in the Iberian peninsula and in North Africa because a landbridge has allowed a free passage between the two continents. We can also emphasize that this landbridge was, at least in its primary configuration, broad and massiv enough to permit the natural migration of freshwater organisms, like fish or amphibians [figure 7]. In more recent times, the damaged Betic-Rifean belt formed an isthmus, constituted by debris, muddy shores, sand deposits, and periodically overflowed areas. Then, the strong eastward current of Atlantic waters of overpowering force entered the Mediterranean basin, causing disaster and inundations in many inhabited regions.

Interesting points for our subject concern also the Mediterranean sea *and its fauna*, during the above evoked periods. We know that in the case of a failing connection with the Atlantic (and with the Indian ocean), the sea surface evaporation inevitably conducts to a hydrologic deficit. In spite of the water amount received from rainfall and river inputs, the Mediterranean sea turns to dry up. A very shallow area between Sicily and Afric divides it into two main basins, western and eastern.

We have today deep Mediterranean areas corresponding to each division of this sea; the eastern Mediterranean as a whole is deeper: 4000 m are reached and surpassed south-east of Sicily and south of Greece. The

homothermy (about 13°C) is also found at a greater depth (400 m) in the eastern Mediterranean than in the western (200 m). It is stated that about 120 species of fishes (about 1/5 of the total) live below the thermocline and deserve to be called “deep-sea fishes” in a broad sense [9].

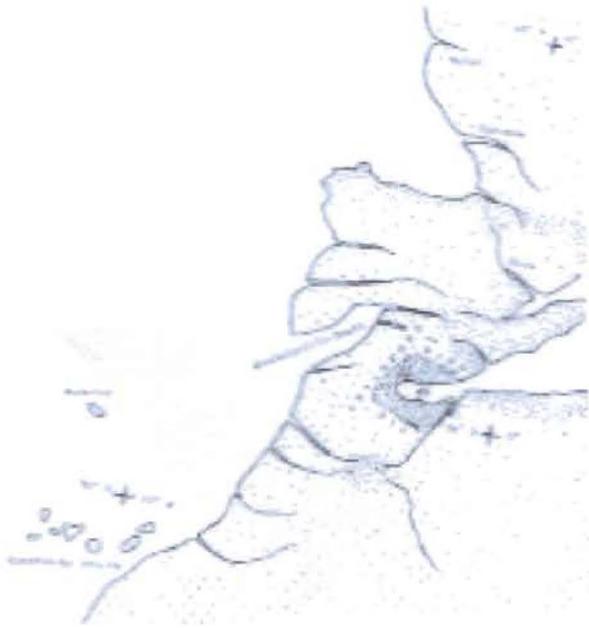


figure 7: Hypothetical reconstitution of the Ibero-Moroccan region during late Palaeolithic times, showing the landbridge and the Betic-Rifean cordillera. The great bay is the estuary of the Guadalquivir River.

WHEN THE MEDITERRANEAN SEA was dry in former times, it is obvious that the abyssal forms (not only the fish) completely disappeared. A continuous restocking is supposed to have occurred from the sill of Gibraltar into the Mediterranean, as eggs and juvenile stages have been occasionally carried through by the Atlantic currents.

This possibility may exist, but would only concern a few species. Indeed, another major

event has followed the dry phase in the Mediterranean sea, as attested by the fossil records [10]: *cold polar water* rushed from the north into the Mediterranean basin! Arctic organisms, like the mollusc *Cyprina islandica* or the fish *Malotus villosus* (capelin), got suddenly out of place and reached the eastern Mediterranean!

IT IS ORDINARILY THOUGHT that these organisms migrated through the Gibraltar area, but what about the extreme climatic conditions that allowed it? It is not to be forgotten that *Malotus villosus* lives in water around 2-3°C!

This brought me to the hypothesis of a violent happening in Earth's history that has caused the refilling of the Mediterranean after a last dessication [11]. The impact of an asteroid in the North Atlantic, east of Greenland, may have provoked a giant *tsunami* that forwarded water and organisms into the Mediterranean basin, after submerging and devastating Europe...

SUCH A SCENARIO would also explain the today existence of deep-sea organisms in the Mediterranean, especially of those which do not possess *larvae* able to be shifted across a narrow shallow channel, like the Strait of Gibraltar indeed represents. We are aware of the Mediterranean sea-lilies (*Crinoidea*): the French marine biologist Pascal Barrier claimed [12] that their distribution did not fit with our current views about the geological history of the Mediterranean. He is considering that a big quantity of cold water was extracted from the northern Atlantic, then discharged into the Mediterranean...

The Italian ichthyology professor Enrico Tortonese noticed [9] that some abyssal fish groups, like the *Saccopharyngiformes* or the *Ceratioidei*, which are common in the oceanic depths near Portugal, do not occur in the adjacent Mediterranean. On the other hand,

we know abyssal sea-worms (*Polychaeta*) that they are quite similar in the depths near Monaco, and in the northern Atlantic [13].

After the “*big wave*”, the Mediterranean got warm again, and the connections with the Atlantic reopened, alternatively north and south of the present channel. The emplacement of the future Strait of Gibraltar, indeed, already suffered under unfavourable tectonic conditions. Later on, the structure broke up in its middle, and the Atlantic ocean ineluctably began to rush into the downward Mediterranean!

After the last terrestrial animals had crossed over what has remained of the landbridge between western Europe and Africa, the big marine organisms could lastly reach the Mediterranean Sea. There were most of the fishes, especially *open sea* species like thunnid and swordfish, also whales and dolphins. That the Strait of Gibraltar recently opened, is confirmed by the distribution of small shore fishes, like the *Blenniidae* (blennies), which are today entering very progressively the area *within the Mediterranean sea*, on both Spanish and Moroccan sides [14], i.e. after having crossed the legendary “Pillars of Hercules” (so the entrance of the Atlantic was called in the Antiquity).

Ancient seafaring and Paleolithic people

AS WE SAW ABOVE, the zoogeographical *datae* give us reliable informations about a land connection that was efficient between Europe and Africa, very recently. Thus, we cannot exactly measure how many years have spent since the formation of a navigable channel in the area near Gibraltar. However, we will now try to check some pre-, proto- and historical events, in accordance with the statements we already made.

Let us first deal with the situation in Europe at the beginning of the Upper Palaeolithic.

Mainstream scientists think that for over 35,000 years southwestern Europe has been inhabited only by neanderthals (*Homo neanderthalensis*) and that they were replaced by modern man (*Homo sapiens*) coming from East, as the climate got warm again.

There is of course a widely accepted evidence that Cro Magnon and Neanderthal have lived at the same time. Admixture did occur in Portugal, Morocco, Crete, Palestine, and could very well have occurred elsewhere. But it is not a proven fact that modern human populations arose *as a new species* from Africa, then wandered across the Near East to replace *all other indigenous peoples* in Eurasia, such as the neanderthals...!

The author of the present paper has a simple explanation for the question of Cro Magnon's presence in Europe, that still causes controversy. In fact, when ice covered much of north Europe, the vast southern French-Cantabrian region *seemed* to have been ever *unoccupied* by modern humans. The lack of fossil records from this period (Middle Palaeolithic), however, does not mean that *Homo sapiens* was always absent from this place, in the times before the Upper Palaeolithic! Either possible remains have not yet been found out, - or all vestiges have disappeared, perhaps wiped away through the giant *tsunami* we mentioned above?

IN ANY CASE, the presence of Cro Magnon in Europe at the beginning of the Upper Palaeolithic may have resulted from a far *colonization*. As I already emphasized [15], seafarers could have crossed the Atlantic ocean, coming up from Central America, in order to establish colonies around the Gulf of Gasconne. Because an icesheet covered the northern Atlantic, the Gulf Stream passed south-east of its present location, and would have pushed seagoing boats, *even rafts* directly into the Gulf of Gasconne area [figure 8].

Therefore, it can be admitted that humans did own a *great experience in seafaring*, during the Final Pleistocene, by using ships with real manoeuvring capability. The mental dispositions of prehistoric peoples have long been underestimated... As a matter of fact,

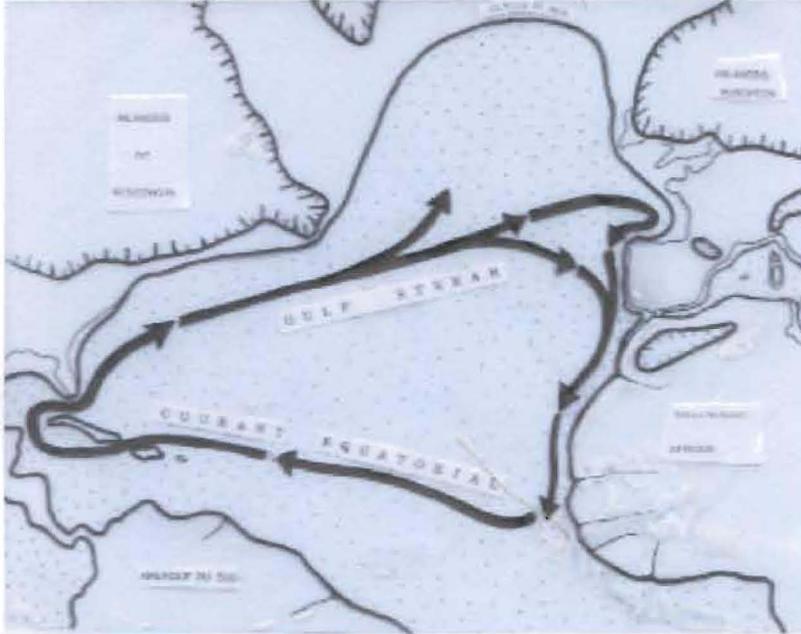


Figure 8: The Gulf Stream during the Upper Palaeolithic, with the polar icesheet in the north and the glaciers in Europe and America. Sailors would be drifted by the current until the French-Cantabrian area, and come back to the Antillas thanks to the North Equatorial Current. (de Sarre 1995, after Capart 1986)

they were doing a whole lot more than we give them credit for! They were *Homo sapiens*, like we, and not the “evolved apes”, imagined by the palaeontologists of the XIXth Century. If they once took refuge in caves or grottos, this happened only *transitorily* to get secured from the dangers of a hostile environment. We would do the same in the case of any major catastrophic event, if we get no place, for instance, under a reinforced shelter!

Like the Italian professor Emilio Spedicato claimed [16], a glaciation may be started by

an asteroid impact *over the continent* and can be terminated by a collision *over an ocean*. During the Würm glaciation in Europe and North America, good climatic conditions elsewhere made possible for mankind to survive and to develop a high level of civilization. On present indications, seafaring may have contributed to a new settlement of south-western Europe, and furthermore of the Mediterranean area, after the North Atlantic impact has initiated the now prevailing climatic conditions. Yet, there are no vestiges of settlements from an ancient period, because the tsunami has devastated all what we call today Europe!

THE CRO MAGNON remains (bones, stone or horn artifacts, paintings) dating from the Upper Palaeolithic, are those of

survivors of the cataclysm who lived in protected areas (high mountains!), of seafarers from the Americas, and essentially of all their descendants who took refuge in grottos, or under rock shelters. They went *perforce* through a process of *acculturation*. We call them “cave-men”...

There were certainly cultural exchanges and seafaring between *both sides* of the Atlantic, during all the course of the Palaeolithic, with some interruptions due to climatic degradations. The Upper Palaeolithic in Europe, indeed, corresponds to a “package” of different cultural features, appearing more or less simultaneously in the archaeological record. This would indicate several arrivals of settlers from the Americas, and/or diffusion from Africa over the terrestrial way (landbridge).

PROJECTILE POINTS and blades found along the east coast of North America are virtually indistinguishable from those manufactured by the *Solutrean* culture in southwestern Europe. In *Clovis* (New Mexico) and in other sites (like *Gypsum cave*, Nevada), the same patterns of arrowheads demonstrate that ocean-going civilizations have been in contact for some 15,000-10,000 years BP. They are found in association with bones of Pleistocene animals now extinct in North America, including mastodon and ground sloth. Maybe these layer are, like the correspondent items in Europe, *de facto* younger [17] than commonly believed?

THIS STRONGLY SUPPORTS the idea of a global trade on the Atlantic, *with ships crossing the ocean in both directions*. The northern route, with help of the Gulf Stream, led to the Gascogne region, where Cro Magnon and his descendants lived, and the southern route was quite the same that Columbus followed in 1492, as he "discovered" Central America.

Another possibility to retrace the wandering of people during the Upper Palaeolithic is argued by Dr. Christine Pellech, on the basis of DNA-analysis [18]. The haplogroup X, one of the mtDNA-lineages, is present in both modern Native American and European populations. Haplogroup X is remarkable in that it has not been found in Asians. This would strongly suggest seafaring, cultural exchanges and intermingling of people between western Europe and the Americas.

Pleistocene maritime colonizations are already known from eastern Asia (*Flores*) with two main differences [19]: short distances between islands are concerned, and the use of simple rafts by hominians (*Homo erectus*) is proposed, because allegedly the *Homo sapiens* had no existence, yet, in a form similar to us.

THEREFORE, the only evidence suggests that Lower and Middle Palaeolithic mariners have crossed the oceans frequently, traversing long distances on their sailing-vessels. They were certainly humans, like we!

This leads us to speak about the neanderthals (*Homo neanderthalensis*), and to evoke the simplifying way in which they are presented, in relation with the (re)colonization of Europe by the *Homo sapiens*, during the Upper Palaeolithic.

In the XIXth Century, the neanderthals were designed as our ancestors. In the popular literature, Neanderthal was described, as walking with bent knees, his head slinging forward, his big toe splaying out "chimpanzee-like" to the side... Surely, with XXth Century advances, a new view of Neanderthal has been provided, but the old *cliché* remained in the mind of many people. Furthermore, the creed that Neanderthal "developed into modern man", was just replaced by the belief of his anteriority in Europe -and of his supplanting and extinction, around 25,000 years ago-

WE ZOOLOGISTS, indeed, think that *Homo neanderthalensis* was a species of wildman, with several particular features: prominent eyebrow ridges, low forehead, long narrow brain case, protruding upper jaw, and a strong lower jaw *without a chin*. Neanderthals lived in Europe, with some of them in North Africa and in Asia, especially in mountain forests, because they were very good adapted to a cold environment. It is easy to understand *why* neanderthals have been so capable to colonize the vast plains of Europe, during the Glaciation, when the *Homo sapiens* was hampered by circumstances, and constrained to take refuge in the caverns! As the bad times were over, the neanderthals retired to their previous habitats in the mountains, where they perhaps still survive, for exemple in the Caucasus or in North Pakistan [20]

Their “extinction” by modern humans in Europe is rather due to a displacement of the neanderthalian populations. For security they turned into the Alps or the Pyrenees, where they may still have lived for thousand of years. We can suppose that some of them went to Africa, across the Betic-Rifean cordillera, in the same way the brown bears (*Ursus arctos*) did. They may both have survived until the historic times [21].

THIS EXAMPLE SHOWS US why we must dissent from the current *cliché* of man’s evolution, suggesting a “linear” evolution from some ape-men to modern humans. In a recent article [22], the French palaeontologist Yvette Deloison wrote that “*the primitive hand of the man induces that his ancestor was neither arboreal nor quadrupedal, consequently he was bipedal*”. We do suggest that this assumption would resolve many aspects of the evolutionary puzzle.

Implications for protohistoric civilizations and their habitat

PROTOHISTORIC EVENTS have been transmitted to us by stone buildings (*megaliths*) or by the retranscriptions of ancient writings, often put into a novel form: Plato’s *Timaeus* and *Critias*, or the references to great catastrophes (*deluges*).

The configuration presented by the Atlantic seabord in Europe and in Northwest Africa [figure 7] was surely a reason of attraction for visitors from the Americas. North Africa, including the area of the today desert of Sahara, had the benefite of a mild and rainy climate. It was covered by pasturages, forests and lakes. Important groups of people lived once in this vast and fertile region.

The landbridge between Iberia and Africa was a favoured route. The whole area formed a once united country: maybe there was the centre of the Empire of the *Megalithics*. In accordance with the resarchs of the German professor Theo Vennemann and of the French linguist Jacques Touchet (22) , I developed the idea of a great Atlantic civilization using a *Semitic* language, that spread over the coasts of Europe and Africa, before entering the inland by sailing up the rivers, and furthermore all the Mediterranean area. The ancient inhabitants were the descendants of the Cro Magnon people, and spoke an old *Baskish*. Both populations coexisted.

THE MEGALITHIC CIVILIZATION was destroyed by violent happenings, such as earthquakes, tsunamis and inundations. Since that time, the configuration of the coasts in Spain and Morocco turned into what we know today. Hercules was first a Phoenician hero (called *Melgart*), who allegedly broke up the isthmus between the two “Pillars of Hercules” (associated with both the Rock of Gibraltar and the Djebel Mussa, near Ceuta). Maybe there were sandy shallow areas that were periodically recovered by Atlantic tide [figure 9]. Jacques Touchet thinks that the Hebrews have also traversed these inlets, before the last Atlantic transgressions made impossible to wade across. In that sense, Jews (called *Ibers*) settled in Spain at this epoch.

The *Phoenicians* are without doubt the direct descendants of the *Megalithic* people. They were sophisticated seafarers, and kept close watch on the “Pillars of Hercules”! They probably owned sea-maps like the one redrawn by the Turkish admiral Piri Re’is in 1513. As Dr. Christine Pellech interpreted in Homer’s “*Odyssey*”, the Phoenicians remembered well the sea-route to America, and the possibility to navigate all around the globe.

IN HISTORIC TIMES, the Phoenicians create an eastern Mediterranean state (Byblos, Tyre, Sidon), and Carthago. Through the "Pillars of Hercules", the Sea Peoples migrated into the open Mediterranean sea. They supposedly came from submerged areas

in North Europe. The Egyptians and the Greeks told about them. Later the Romans, whose heritors we are, made themselves at home in the Mediterranean basin, speaking of their "*mare nostrum*". The modern historic times were begun.

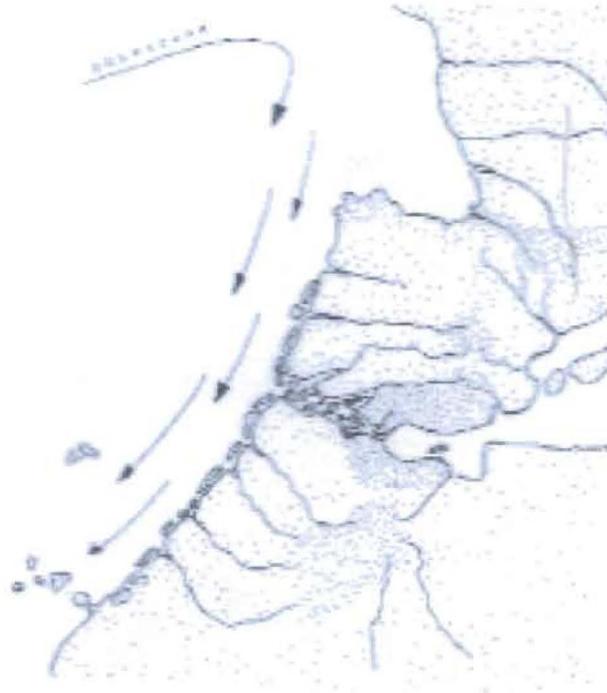


Figure 9: Hypothetical representation of the Ibero-Moroccan area before the definitive formation of the Strait of Gibraltar. This would correspond to the epoch after the last cataclysms and floods in the Mediterranean basin. The Phoenicians, guardians of the "Pillars of Hercules", once inherited their knowledge of seafaring -and maps- from a former circum-atlantic civilization (*Megalithics*).

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Résumé

Se basant sur des considérations géologiques, puis zoogéographiques, l'auteur du présent article postule la présence d'un *pont de terre* jusqu'à une période récente, dans la zone de l'actuel détroit de Gibraltar.

Une analyse de la répartition des faunes, et le cas de plusieurs espèces dont des poissons et des amphibiens, suggèrent qu'une formation massive, incluant réseau hydrographique et partie arborée, s'est maintenue en tant que telle jusqu'au Paléolithique supérieur, alors que la Méditerranée en contre-bas était presque asséchée. Un cataclysme majeur, comme l'impact d'un astéroïde dans l'Atlantique Nord (alors recouvert par la banquise), mit fin d'une part à la glaciation de Würm, et permit d'autre part le remplissage de la Méditerranée par une énorme quantité d'eau polaire, ce que les données fauniques confirment.

Le déferlement du tsunami à travers l'Europe occidentale détruisit tout vestige d'implantation humaine, épargné par l'avancée des glaciers. L'Afrique du Nord fut également dévastée, et l'isthme constitué dans l'essentiel par la cordillère rifain-bétique, sérieusement endommagé. Des chenaux purent se constituer pour acheminer l'eau de l'Atlantique vers la Méditerranée.

Dans l'hypothèse formulée par l'auteur, la colonisation humaine de l'Europe occidentale (Cro Magnon) put se faire grâce à des navigateurs venus d'Amérique Centrale, suivant le Gulf Stream qui débouchait alors dans le Golfe de Gascogne.

Ces *Homo sapiens* se heurtèrent à des néanderthaliens, dont ils partageaient le mode de vie durant les épisodes froids.

Les échanges transocéaniques ont dû être réguliers, dans les deux sens, comme le montrent les similitudes entre l'industrie solutréenne et celle de Clovis, en Amérique.

Un véritable Empire atlantique vit vraisemblablement le jour, avant d'être détruit par une série de nouvelles catastrophes, à l'issue desquelles l'isthme entre l'Atlantique et la Méditerranée ceda définitivement.

Le détroit de Gibraltar était né. Sous la poussée du courant océanique, il allait vite atteindre les dimensions qui sont les siennes aujourd'hui (environ 15 km de large).

Dans le présent article, l'auteur s'interroge sur la chronologie communément admise par les géologues. Les diverses constatations zoogéographiques l'incitent à rajeunir des événements, comme la glaciation de Würm, la venue de Cro Magnon, l'Empire des Mégalithiques, les grandes inondations diluviennes, et bien sûr l'ouverture du détroit de Gibraltar.

Certains épisodes légendaires pourraient se référer à ces événements, qui remonteraient donc à la Protohistoire. *La pratique ancienne de la navigation transocéanique* apparaît comme corollaire évident de la présente étude.

Correspondence address:

Francois de Sarre
C.E.R.B.I.
(Centre d'Etudes et de Recherches sur la Bipedie Initiale)
32 av. de Buenos-Ayres
06000 Nice
France
Fax : 0033-4-93-97-16-38
E-mail : francois.de.sarre.cerbi@wanadoo.fr