ENCOUNTERS AND TRANSFORMATIONS

The Archaeology of Iberia in Transition

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Dedicated to Manuel Fernández-Miranda
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1. The Island Filter Model Revisited

Juan Manuel Vicent García

This paper will discuss certain issues concerning the diffusion and the adoption of domesticated species in the Iberian peninsula. An examination of certain ideas about the historical interpretation of this process will serve as a point of departure for a critical alternative to the theories most widely accepted by Spanish archaeologists.

At present, the dominant theoretical position with respect to the process of neolithic developments in the Iberian peninsula is substantially diffusionist. According to an orthodox formulation of this approach, the Iberian Neolithic developed as the result of the introduction of a ‘cultural current’, which installed itself at the beginning of the fifth millennium BC on the eastern coasts of the peninsula, in particular in the País Valenciano (Valencia). This initial ‘focus’ initiated a process of ‘acculturation’ of the local Epipalaeolithic ‘substrate’, a process which would eventually reproduce itself across the whole peninsula. This interpretation has guided research over recent decades and has attained a high degree of elaboration and empirical support. In fact, the Neolithic archaeological sequence in the Spanish Levant constitutes the reference point for discussions of the periodization and radiocarbon dating of the Neolithic in the rest of the peninsula.

Whether or not it is feasible in archaeological terms, this point of view is, in my opinion, highly unsatisfactory in its implications for the understanding of the historical, social, and cultural processes that derived from the introduction of domesticates to Iberia. The way in which the archaeological evidence is presented, the categories by which that evidence is organized, indeed the very idea of a ‘cultural current’ forces the diffusionists to link the process of neolithic development to a ‘demic’ hypothesis; i.e. one related to a movement of people.

In this article I shall present in some detail the archaeological underpinnings of the most elaborate and coherent expression of the diffusionist point of view, namely the ‘dual’ theory proposed by the most influential group of Levantine neolithic specialists. I do not propose to criticize the archaeological foundation of this theory, but rather to argue against it as an interpretation of historical processes, and to show how other points of view that can account for the same evidence without recurring to ‘demic’ explanations. In particular, I will argue against two of the basic assumptions of the diffusionist interpretation:

1) the substantial unity of the ‘neolithic package’ (cereals + animal domesticates + pottery); and
2) the disjunctive character of the technological and typological relationship between the Epipalaeolithic/Mesolithic and the Neolithic.

I will discuss the first assumption in relation to the concrete mechanisms by which domesticates were introduced to Iberia, and the second in relation to the problem of how a real economy of production was established.

The ideas I will propose are not in themselves original. The central goal of this contribution is, rather to relate the development of the Neolithic more within the sphere of social relations than of techno-economic determinants. In the final analysis, all I seek to do is to apply Ockham’s Razor to some of more dogmatic extremes of diffusionism, such as cultural influences or pre-historic colonizations, and thus to reestablish the social logic of this process within a historical perspective.

The diffusionist paradigm

Recent investigations of the origin of the Neolithic in the Iberian peninsula have been based on a general consensus that accepts the theses of Bernabò Brea (1946–56) concerning the unity of the so-called western Mediterranean Impressed Ware horizon, its chronological position as the earliest neolithic facies in each region, and its external origin, namely the eastern Mediterranean. Within this consensus there is some theoretical variation. Levantine prehistorians defend a ‘dual’ approach that attributes the introduction of the Neolithic to a cultural group (possibly consisting of settlers), while most Catalans subscribe to a more eclectic ‘acculturationism’ that limits the mechanism of neolithic development to the assimilation of external
'cultural influences' by native populations (cf. Bosch and Tarrús 1991: 63). The general agreement about the significance of the 'Cardial horizon' has occasionally been challenged by autochthonist alternatives, usually linked to evidence from areas that are peripheral to the Levantine 'nuclear zone'. As we shall see, the development of research over the past twenty years has been guided by the debate between these positions. At no time, however, has the Cardial horizon' consensus lost its position as the dominant paradigm.

Consensus was initially gained at the expense of the old Africanist tradition of the years before the Civil War (e.g., Bosch Gimpera 1932), which derived the Iberian Neolithic from the Capsian of North Africa. The 'collapse of the African myth' — the phrase is Martínez Santa Olalla's (1946: 22) — was supported by archaeological research in the 1940s and 1950s (San Valero 1946, 1947, 1950; Jordà and Alcàcer 1949; Pericot 1945; Tarradell 1960; etc.). The principal arguments involved the priority of Cardial pottery, its Mediterranean parallels, as well as the lack of viability of the existence of an independent African centre.

The final triumph of these claims was a direct consequence of the impact of the stratigraphy of Arene Candide and its subsequent use as an independent external reference point for Cardial wares in Spain (San Valero 1947), but it was also the product of a general movement among Spanish prehistorians of the post-Civil War period towards Orientalist positions. This change was really directed against the latent evolutionism of the Occidentalism of Bosch and his followers, who at that time were politically suspect (Martínez Santa Olalla 1946: 19–20). This anti-evolutionism was transmitted directly to later research, which postulated the oriental origin of the Spanish Neolithic as undisputed.

At the same time, excavations at important sites such as Cova de l’Or (Fletcher 1962, 1963), Cova de la Sarsa (San Valero 1950), and Cueva de la Carigüela (Pellicer 1964) permitted the definition of the scope and characteristics of the Cardial horizon, which was assimilated, for better and for worse, to the 'Early' section of the Early/Middle/Late tripartition that was adopted at this time as the general organizational framework for the Neolithic of the Iberian peninsula.

The Orientalist approach received its definitive backing with the study and dating of the cereals from the Cardial levels of Cova de l’Or (Hopf 1966; Schubart and Pascual 1966). These results confirmed the oriental origins and the early chronology (beginning of the fifth millennium) of the Cardial complex, as well as its technoeconomic significance, as the cultural context for the introduction of domesticates to the peninsula.

As a result of these developments, from the mid-1960s the groundwork was set for a rare phenomenon in Spanish prehistory; a coherent research program with well-defined archaeological objectives. In terms of the principal, testable implications of the diffusionist thesis, these objectives may be summed up as follows:

1) demonstration of the essential unity of the Cardial horizon in the western Mediterranean and of the place of the Spanish Cardial complex within that whole;
2) demonstration that this horizon was the first to have pottery and a 'production economy', and that it was independent from local cultural traditions; and
3) demonstration of the secondary, derived character of the Neolithic of the rest of the Iberian peninsula.

The ‘dual’ theory

This approach directed the research in the 1970s and 1980s of a group of prehistorians (notably Martí Oliver, Bernabeu, and Fortea) committed to carrying out the program I have just described. As a result of the continued, coherent, and conscientious efforts of these and others, the Spanish Levant has become the general point of reference for the whole process of neolithic development of the peninsula. Likewise, the 'dual' theory has become the underlying assumption in all discussions of the issue and its regional sequences. This gives it a decisive importance, one that goes beyond its original regional context.

The 'dual' hypothesis postulates the existence in the Spanish Levant of two groups, one the 'pure' Neolithic, the other the local Epipalaeolithic 'substrate'. This view was put forward by Jordà and Alcàcer (1949), and received its definitive form after Fortea's (1971, 1973) systematization of the Mediterranean Epipalaeolithic and the renewed excavations at Cova de l'Or by Martí Oliver (1977; Martí Oliver et al. 1980). The pure group, identified at sites like Or, Sarsa, and Verdés, is characterized by what the proponents of the approach consider to be a fully developed neolithic set of traits, both economic (there is evidence of domesticates) and cultural (there is pottery). These features of this group appear fully formed and with-
out possible local predecessors: the domesticates are fully differentiated and so presumably have a foreign origin, and this is confirmed by the parallels which the Cardial pottery has in other groups of the Mediterranean Impressed Ware horizon. In accordance with the underlying diffusionist theses, the ‘pure’ Neolithic demonstrated at the sites described above, would constitute a nucleus, both for the region and for the peninsula as a whole. In contrast, the substrate would be constituted by the indigenous inhabitants, who received the acculturating influence of the pure Neolithic while maintaining their local Epipalaeolithic tradition. These influences are manifested by the independent occurrence of isolated neolithic traits in contexts that otherwise would be classified within the ‘geometric’ Epipalaeolithic of Fortea (1973). In effect, the dual theory simply transfers to historical reality the taxonomic dichotomy between the Cova de l’Or and Cocina III-IV assemblage types (Bernabeu and Martí 1992: 215).

The arguments of the proponents of this theory stress the incompatibility of the characteristic elements of the two groups (Bernabeu 1989: 10; Bernabeu and Martí 1992: 214). The contrasts are seen in economic patterns (presence/absence of domesticated species, ratio of domesticated to wild animals, killing patterns, settlement locations, etc.), the material culture (the lithic and bone industries, ornaments, etc.), and in recent publications (Martí and Fernández 1988) even rock art (linear-geometric vs. macro-schematic representations). Confirmation of discontinuity in all aspects of the archaeological record is a critical feature of the model in that it is evidence of an external Cardial origin.

No less crucial an implication of the underlying diffusionist thesis is the substantial unity of the foreign neolithic ‘package’ that includes Cardial pottery and domesticated plants and animals (Fortea and Martí 1985). Validation of the thesis requires that anomalies like the presence of animals in aceramic contexts or of pottery in Epipalaeolithic contexts without domesticates be explained away. These facts cease to be anomalous, and indeed reinforce the theory as proof of the neolithic influence on the substrate, if one can demonstrate that:

1) no access to domesticates is possible except through their Cardial introducers; and
2) there is no ceramic horizon earlier than the Cardial one.

The first proposition refers to the possibility of either a local process of domestication or of an independent transmission of domesticates prior to Cardial Ware. Both issues have been raised repeatedly.

Early domestication has been discussed in relation to the Epipalaeolithic contexts with domesticated sheep/goat at Cova Posca (Castellón), whose excavators have argued for the existence of a local process of domestication during the seventh millennium BC (Olaria and Gusi et al. 1982; Olaria and Gusi 1983; Olaria 1988a, 1988b; Estévez 1988). Similar problems have arisen in Andalusia: domesticated animals have been identified in epipalaeolithic levels at Cueva de Nerja (Boessneck and Driesch 1980; Pelllicer 1983; Muñoz 1984). In both cases proponents of the dual hypothesis have attacked the anomaly with arguments that allude to problems of the radiocarbon dates with regard to their stratigraphic and techno-typological contexts (as this would be defined by the sequence in the Spanish Levant, of course), to the doubtful integrity of the contexts themselves and to problems with the identification of the faunal remains (extensive discussions along these lines are presented by Fortea and Martí 1985; Bernabeu 1989; Bernabeu and Martí 1992; Zilhão 1993, etc.). The basic arguments, however, are still the absence of domesticable wild species on the Iberian peninsula, on the one hand, and the lack of nearby areas from which domesticates could have been introduced in pre-Cardial times, on the other. This last argument has been raised against parallel claims of local or pre-Cardial domestication in southern France (Geddes 1980).

As far as the question of pre- or non-Cardial ceramic horizons are concerned, the discussion has also centred on the acceptance or rejection of radiocarbon dates, based on whether or not they fit with the Levantine sequence. Frequently, the dates under discussion are the same ones that are rejected in discussions of early domesticates. As the reader will recall, the rejection of early domesticates is generally based on comparative typological considerations, so that the matter of the ceramic sequence is of critical importance. Be that as it may, the interdependence of the two issues frequently leads to circular arguments in which the assumptions about domestication and comparative typology support one another.

The priority of the Levantine Cardial centre was initially discussed in relation to a possible pre-Cardial phase of undecorated pottery radiocarbon dated to 6000±150 bc at Verdelino (Cuenca) (Moure and Fernández-Miranda, 1977; cf. detailed discussions in Fortea and Martí 1985:
174ff, and Bernabeu 1989: 128). The initial proponents of this pre-Cardial horizon did not respond to the numerous criticisms they received, and the Veredelpino evidence has for the moment been shelved. Implicitly, the early date at Veredelpino is argued to be the result of mixing in the deposits. At present, then, the typological-comparative debate centres on the independence of the Levantine centre from the oldest contexts with pottery in Andalusia. Here Cardial pottery does not dominate the ceramic assemblages (as in the earliest phase of the Levantine sequence), but is present in association with other decorative techniques, such as non-Cardial impressions, incisions, relief decoration, and ‘almagra’ (red, burnished) surfaces. Generally, these contexts had been considered representative of an Andalusian Middle Neolithic referred to as the ‘Cultura de las Cuevas’ (Navarrete 1976), an attribution based on the stratigraphy at Cueva de la Cabrigiela (Granada) (Pellicer 1964) and the dates from Cueva de los Murciélagos (Córdoba) (Vicent and Muñoz 1973). The publication in the 1980s of a series of very early radiocarbon dates (in the sixth and seventh millennia BC) for some of these contexts (Nerja, Dehesilla, Cueva Chica de Santiago) brought into question the idea that the Levantine Cardial centre should be considered the nuclear zone for the Iberian Neolithic (e.g., Ollaria 1986; Acosta 1986). Other less extreme dates from other regions (Chaves in Aragón, Barranco de los Grajos in Murcia, Can Ballester and Cova Fosca in Castellón) reinforced the crisis of the model of absolute priority for the Levantine Cardial complex.

The reaction of the proponents of the dual theory has consisted of a refinement of the Levantine ceramic sequence, based on a comparative analysis of the series from Or and Cendres (Bernabeu 1989). This revision substitutes the earlier tripartite periodization with a sequence of two phases (Neolithic I and II), which are interpreted explicitly as successive ‘cultures’ (Bernabeu 1989: 10; Bernabeu and Martí 1992: 213). The first of these cultures encompasses the old Early and Middle Neolithic into a single cultural tradition that is part of the Mediterranean Impressed Ware complex. The ceramics at Or and Cendres would permit the subdivision of this thousand-year long tradition into three horizons (A, B, C), which in turn could be subdivided into phases (A1, A2, B1, B2). The criterion for this ceramic periodization is the continuous decrease in the proportion of Cardial motifs in relation to other forms of decoration over the course of the two stratigraphic sequences. Accordingly, the Neolithic IA would be properly denominated the ‘Cardial ware horizon,’ while the Neolithic IB would be termed the ‘Impressed-Incised ware horizon’ (Bernabeu 1989: 113). Only phase IA1 could be considered to have an absolute predominance of Cardial ware, and thus to represent the first moment of the process of neolithic development.

This existence of this phase, only identified at Or and Cendres, fulfils the need to maintain the chronological priority of the Levantine centre against the pretensions of autonomy (or, more modestly, synchrony) for the contexts that are not strictly Cardial and have absolute dates that are ‘too’ early. In effect, these contexts have their clearest parallels in horizon IB of the Levantine sequence. In accordance with the logic of a cultural interpretation of the ceramic sequence, the parallels are interpreted in terms of ‘genetic’ relations and therefore of contemporaneity (e.g., Bernabeu 1989: 118). Thus, the model postulating the Levantine as a nucleus for the transition to agriculture receives archaeological support.

By taking typological similarities as indicators of strict synchrony this view is in open disagreement with the available absolute chronology. The arguments must, therefore, be directed to establishing the inferiority of absolute chronologies with respect to the coherence of the relative sequence and, what is even more, to the fundamental diffusionist thesis. As Bernabeu (1989: 128) puts it:

The model assumed ... to explain the origins of the Neolithic leads us to a first selection in accepting radiocarbon dates that refer to the initial chronology of this process: if the initial Neolithic horizon corresponds ... to impressed wares, then its chronology must be put into relation with what is proposed for those same wares in the diffusionary centre or centres.

These problems do not completely disappear, however, if one accepts the arguments of the proponents of the dual theory and throws out all the dates from the sixth millennium and earlier (Nerja, Dehesilla, Cueva Chica de Santiago, Fosca, Barranco de los Grajos: see the detailed discussion in Bernabeu 1989), since some ‘acceptable’ dates (e.g., Cueva de los Murciélagos, Chaves) suggest the possibility that the two early horizons of the Levantine sequence are contemporaneous.

As we have just seen, the dual theory depends upon a complex interpretation of the archae-


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ological record, an interpretation whose critical points are, firstly, the discontinuity between a pure Neolithic and an Epipalaeolithic that is becoming Neolithic and, secondly, the unity of the Cardial neolithic package, together with supplementary arguments about the inability of the substrate to obtain independent access to the components of that package. The purely archaeological aspects of this interpretation are not indisputable, as we have seen, but they are sufficiently supported by the evidence to constitute a solid framework for organizing the archaeological record. It must be said, however, that this solidity is relative to the extreme fragility of the arguments put forward by opponents of dualism. Zilhão (1993: 38–46) has analyzed in detail the most important cases brought forward against the dualists (Cueva Dehesilla, Cova Fosca, and Cueva de Nerja) and has shown that they are all affected by serious problems of archaeological credibility. This, of course, does not subtract validity from the dualists’ own evidence, but needs to be taken into account when evaluating that evidence.

I now wish to consider the historical implications of this theory, that is to say, what it argues about the actual way in which the process of neolithic development unfolded, given that the empirical basis on which it stands has been accepted as valid. The defenders of the dual hypothesis are usually ambiguous on this point. One has the impression that, rather than resolve the issue, they try to avoid it, suspending their judgment. Thus, in Martí Oliver’s (1983) comprehensive and popular account of the Levantine Neolithic, its extra-peninsular origin is practically not discussed, beyond a mere affirmation of its oriental provenance.

The most salient feature of the dual theory is, however, its complete dependence on arguments for demic diffusion as the basis for the process of cultural diffusion. In effect, the interpretation of the record is based on the assumption that the pure Neolithic of the Or facies is something more than a taxonomic abstraction. The way in which the proponents of this model write about the pure Neolithic suggests, indeed, demands, that it should have a real ethnic basis, since reference is always made to the ‘bearers’ of that culture. Ultimately, in the words of Bernabeu (1989: 138), ‘the only model capable of explaining the origin of our Neolithic without entering into logical contradictions when it is applied to the facts of the archaeological record is a diffusion that involves the displacement of human groups.’

In the formative phase of the diffusionist para-

We propose that the appearance of the first Neolithic groups, the bearers of the earliest Cardial ceramics, is to be related to a process of population expansion from the eastern Mediterranean just as Ammerman and Cavalli-Sforza have proposed (Bernabeu and Martí 1992: 214).

In short, the demic hypothesis of Ammerman and Cavalli-Sforza serves to redeem the coherence of the dual model, a model compromised by the apparent theoretical insufficiency of its ingenuous normativism. Under these circumstances the dual interpretation of the process of neolithic development would appear to be rendered immune from all possible refutation. On the one hand, it is impossible to explain the early
presence of domesticates in Iberia without resorting to diffusionist arguments. On the other hand, there is no longer any need to explain the absence of data relating to both the exact origin of the bearers of these domesticates, and the means by which they arrived from abroad.

The ‘Island Filter’ model

A general reconsideration of the problem of the westward diffusion of domesticates would seem to be required in order to overcome the theoretical impasse just described. In my opinion, the elements for such a reconsideration were first put forward by Lewthwaite (1986b) in what he termed the ‘island filter model.’ His formulation is empirically weak, but it embodies as many valuable elements as other suggestions he has made. Thus, Lewthwaite (1982) was the first to point out that ‘complex hunter-gatherers’ constituted possible ethnographic analogues for the subsistence strategies that seemed to be revealed by a dispassionate analysis of the oldest neolithic groups of the western Mediterranean. He was also the first to suggest the essentially social role played by the elements of the neolithic package in those contexts (Lewthwaite, 1981, 1986a, 1986b, 1987). The ideas I present in the rest of this work are simply intended to derive general principles from proposals, that have unfortunately, made an insufficient impact on Spanish research.

The island filter model (Lewthwaite, 1986b) seeks to account for the palpable differences that are observed in the transition to food production in the eastern and western basins of the Mediterranean. In the east, mesolithic foraging economies seem to be replaced very early (about 6000 bc) and rather abruptly by village farming economies, after a relatively brief episode of intensification, the most distinctive feature of which is deep water fishing. In the west however, the appearance of village farming economies is delayed at least until the fourth millennium, after a long period (at least two millennia) in which pastoral exploitation of domestic animals is integrated into subsistence strategies and ways of life that continue the patterns of the preceding period with just a few modifications.

From a Western perspective, these contrasts suggest at least two questions concerning (1) the prolonged stability of mixed strategies of hunting-gathering and animal-keeping and (2) the delay in the adoption of the village farming pattern. These really involve two aspects of the same general question: Why does the so-called ‘Early Neolithic’ of the western Mediterranean (which corresponds in culture-historical terms to the ‘Cardial horizon’) seem so un-neolithic when judged by the standard of eastern Mediterranean patterns? Or more generally still, why did access to the techniques of food production not lead the inhabitants of the western Mediterranean to adopt a village way of life?

The island filter model claims that explanation of the palpable difference between the sequences of neolithic development in the eastern and western Mediterranean basins is based on the selective role played by the islands of the western Mediterranean in the process of the transmission of neolithic traits. The specific conditions which the populations of these islands would have faced would explain why they adopted certain features, such as domesticated sheep and goats, and remained indifferent to others, such as village dwellings.

The underlying principle in all of this is that, under normal conditions, the traits that are assimilated are those that would guarantee the preservation of previous ways of life, not those that would bring about their transformation. Raising small mammals would permit the maintenance of a way of life based on the exploitation of local wild equivalents after these had become extinct due to excessive human pressure in another chronological context (this is the case for Myotragus balearicus). Naturally, these wild equivalents would have no reason to be the genetic antecedents of any domesticated species.

Logically, as a consequence of the operation of this principle, the recipients of the ‘Neolithic’ further to the west would only have access to those features which had been of interest to their intermediaries, so that the Early Neolithic of Iberia would resemble its post-Palaeolithic predecessors more than would the societies in which agriculture originated.

This hypothesis has become indefensible for empirical reasons: there is no evidence for the priority of the islands in the process of neolithic development in the western Mediterranean basin. It contains, however, a series of assumptions which make it an important milestone in the development of research on the issue, assumptions whose logic outline their refutation on empirical grounds. I believe two of these assumptions are of particular importance: (1) the importance attributed to the contrasts between the sequences of eastern and western neolithic development, contrasts considered to be at the
root of the problem; and (2) the emphasis on the concrete mechanisms by which the complex of domestication spread.

The island filter model places the difference between the eastern and western Mediterranean at the centre of the problem, underlining the characteristic contrast between discontinuity and continuity in the two areas. Naturally, this involves an interpretation of the evidence to which defenders of the dual theory would not subscribe. For them, sites like Cova de l’Or represent a 'pure Neolithic', for which a fully developed economy of food production is assumed. Now, as they themselves recognize (Marti Oliver 1983), the absence of the village type settlements which would be expected in this case is paradoxical. The dual theory usually resolves this problem with ad hoc hypotheses or by proposing that judgment on the matter be put off; ('village settlements are unknown, but they may be found in the future'). The intensification of research in some regions and the recent introduction of systematic, intensive surveys has permitted the identification of a growing number of such settlements, although few have been excavated as yet. These discoveries have been hailed by dualists as a confirmation of one of their theory's critical predictions, which, until the 1980s, had been seen as an embarrassing paradox.

For its part, the island filter model emphasizes this contradiction, but gives it a diffusionist interpretation: village settlements were an element 'filtered' by the selective self interest of the intermediary transmitters of the neolithic complex.

It is impossible to accept this argument, because the system of village farming cannot be considered a cultural feature that can be transmitted in itself. It is not, for example, an isolated technology. On the contrary, it is a complex phenomenon that affects all aspects (economic, ideological, political) of the social whole, as well as the particular form in which that whole is articulated.

We can accept, however, that the contrast between the process of neolithic development in the eastern and western Mediterranean must be the point of departure for any discussion of the issue. The crucial question is the one that was formulated above: why did access to the techniques of food production not lead the inhabitants of the western Mediterranean to adopt a village way of life?

Naturally, this approach questions, not only the basic model of diffusion, but also the interpretation of the significance and historical role of the introduction of domestication to the western area. We accept as given that domesticated plants and animals came from the east, but we refuse to accept that fully developed neolithic economies were present in the west until well into the fourth millennium at the earliest, in spite of the presence of those same plants and animals. Accordingly, we must accept that important aspects of the neolithic process, (such as the economic, social, and even ideological characteristics of village settlements) are not immediately tied with the diffusion of domesticates, since their appearance seems to be deferred for almost two millennia.

The island filter model is right in attributing this anomaly to the concrete mechanisms by which diffusion took place. Its principal weakness, however, is its emphasis on the route of diffusion as a central factor of explanation. Although it substitutes the demic vehicle of diffusion with the more logical process of relations between neighbours, it still accepts the traditional idea of the diffusionary 'current' as a single, directional vector of cultural transmission.

The capillary diffusion model

I believe the logic of the capillary diffusion model approach can account for the westward diffusion of domesticates and other cultural features without the need to resort to suppositions about the movement of human populations. To develop the model we must consider what is known about social relations among hunter-gatherers as well the evidence about the conditions of human occupation in the western Mediterranean during the early Holocene.

Everything appears to indicate that the social organization of the post-palaeolithic populations of the Mediterranean did not surpass the complexity attributed to the ideal type of 'band' society. At any rate, social relations would have been segmentary, and in known segmentary societies different kinds of relations of reciprocity between groups play an important role. These relations form wide ranging networks through which goods and social gifts flow, as a vehicle of kinship obligations, political alliances, social competition, and even conflict. In a certain sense, the capacity of these social relations to serve as the base for flows of material elements may be considered as a form of 'conductivity'.

It seems reasonable to suppose that domesti-
icated plants and animals — and with them their genetic properties — circulated through these networks of reciprocity, be it as products, as means of production or even as status objects. That is to say, we may speak of a certain conductivity of the post-palaeolithic social world with respect to domesticates. Naturally, the nature of this phenomenon would have to be determined in each particular case. What seems certain, however, is that the segmentary social dynamic favored — or at least did not impede — the expansive pressure of domesticated genotypes. To paraphrase a well-known neo-Darwinian formulation, we might say that certain plant and animal species used post-palaeolithic social networks very efficiently to maximize their adaptive success and dispersal.

Under the segmentary conditions we attribute to the post-palaeolithic populations of the Mediterranean, the conductive properties of the complex of intergroup relations must have been isotropic, equal at all points in the network. As we shall see later, the homogeneity of the conductivity would probably only be distorted by ethnic/cultural boundaries and by specific geographic limitations. The absence of pronounced differences of potential in demography, economy, and socio-political scale between the various parts of the network would exclude the possibility of long-distance, directional movement of goods and information. Thus, it seems appropriate to propose a capillary model for the process of transmission, in lieu of the traditional axial or arterial model.

This model implies a large-scale pattern similar to the 'wave of advance' of Ammerman and Cavalli-Sforza, and it accounts for the same geographical and chronological pattern of westward diffusion of domesticated species, but is based on assumptions other than the principle of demic diffusion. In effect, the capillary model presumes a relatively static situation in the distribution of human populations. This does not exclude the possibility of movement of human populations, but eliminates a dependency on demic explanations for arguments about the process of transmission.

We must also bear in mind the probable existence of exogamic practices among post-palaeolithic societies, and thus for the likely circulation of 'reproducers' along the same networks 'used' by domesticated species. It is even possible that the circulation of both were linked by specific exogamic institutions, such as dowry or bride-price. In any case, it seems possible to explain phenomena of genetic spread through relatively static populations, so that we can reject the wave of advance model, even if we accept the existence of the genetic evidence Ammerman and Cavalli-Sforza adduce in its support. If a static model of transmission is reasonable for human genetic features, it should be reasonable also for technological or cultural elements, which can be transmitted independently of human movement.

The processes of capillary transmission suggest possible explanations of some specific facts that characterize how domesticated species spread within the Iberian peninsula, making discontinuous and uneven progress from the coast toward the interior. To understand this pattern we must now consider the factors of differential spread of relative anisotropy, mentioned above.

We may suppose that the circulation between groups of objects diffused socially would be affected by the particular configuration of relations between societies. Effectively, the web of segmentary social relations would exhibit discontinuities due to differences in ethnic/cultural identity, linguistic communities, transitory political circumstances, and so on. Furthermore, the influence the landscape itself had on social and productive processes would impose severe modifications on the model of isotropy. This, in fact, is the logic of the filter effect.

At the same time, the dynamics of different anisotropic factors are not synchronous, but develop over different Braudelian durées. Thus, the existence of a political conflict between neighbouring communities may interrupt or impede the transmission of goods between them, but such phenomena represent conjectures that would barely affect the distribution of goods over archaeological time scales. Ethnic or cultural discontinuities would exert a much more lasting influence, filtering flows of material goods associated with the interchange of social information (since the possibility of such interchange is affected by cultural diversity) over long periods of time. Finally, discontinuities in the landscape, to the extent that they determine the conditions of infrastructural production permanently, would generate fractures and lines of force in the systems of interregional transfer of information, according to well-known principles of complementarity, incompatibility, and so on.

The combined effect of these factors is what leads to the archaeological impression that the advance of domesticates into the Iberian peninsula was discontinuous, a pattern easily interpreted in terms of demic colonizations and agricultural frontiers. The origins of the Neolithic in
the various natural regions (or in the different cultural facies that represent these regions in the archaeological record) appear to occur all at once. In reality, the domesticates (or Cardial pottery, as the case may be) first occupy the system of intergroup exchange, saturating it to its outer limits relatively rapidly. These limits would themselves be a restriction on further transfers to areas beyond the system, at least as long as the material flows in question remained associated with specific social institutions.

The pattern of diffusion of Cardial pottery is a good example of this kind of phenomenon, one that may perhaps apply to the earliest domesticates as well. There is a certain consensus, based on solid analytical evidence, about the non-functional character of Early Neolithic decorated pottery. It is a highly elaborated ware, made from very fine clays, and is fragile and difficult to fire. This is true both of Levantine and of Andalusian assemblages (Marti et al. 1987; Navarrete et al. 1991). At the same time, the recent discovery that motifs on Cardial pottery are also found in rock art (Marti and Hernández 1988) supports the view that these ceramics somehow propped up the identity of social groups, although at a level which is difficult to specify. I do not mean to suggest that decorated pottery was an authentic ethnic marker, but rather that its patterns of distribution were related to aspects of intergroup relations that were not directly functional.

This hypothesis was first put forward in general terms by Lewthwaite (1981), and interesting case studies have been made for Languedoc (Barnett 1990) and southern Italy (Malone 1985). According to these studies, regional analysis of the distribution of Early Neolithic decorated pottery shows that some decorative types have a local distribution, while others are uniform across broad areas. Malone (1985: 122–24) considers these to be reflections of the formation of local alliances and Barnett (1990: 864) suggests they demonstrate intergroup prestige networks.

Thus, what seems to characterize the earliest ceramic phases of the prehistory of Iberia is not so much the spread of a particular type of pottery as the spread of the social need to possess and exchange decorated pottery. This need would be manifested differently in different regions, thus producing the impression that different cultural areas existed. On this account, the spread of pottery would be related to aspects of the internal social dynamics of Epipalaeolithic groups, possibly as a symptom of the gradual dissolution of the previous social order.

The stylistic fragmentation which follows the Cardial episode seems to coincide with the conversion of pottery production towards directly functional uses, with a partial loss of its sociotechnic character as a vehicle for, and sign of, social relations.

Some of this argument might perhaps also be applied to domesticates, as Lewthwaite (1987) suggests, on condition that the role they played in the internal social dynamic of post-palaeolithic groups be clarified.

**Discussion**

By accepting intergroup reciprocity as the vector for the transmission of neolithic traits, we assume that the transmission was social in nature, rather than specifically economic or generally techno-adaptive. Accordingly, we should attempt to formulate a hypothesis concerning the way in which the first domesticated plants and animals were integrated into the new social and productive contexts in which they were accepted. This is what the dual theory tries to do when it proposes that the first appearance of domesticated cereals and sheep/goats were part of a fully developed economy of food production (Bernabeu and Martí 1992). The general argument against this interpretation has already been mentioned: its central point is the absence of village farming in the western Mediterranean until a very late phase of the Neolithic. The human populations of that area appear to integrate the potential elements of a production economy into their previous way of life, adjusting them to the productive strategies of foragers by using them as complementary resources which reduce the risk of subsistence production (Lewthwaite 1986b). This would relate the process to the practice of social storage, a factor which appears to be as critical to the process of transition to food production as it is to the process of the emergence of social complexity (Testart 1982; Halstead and O'Shea 1982; Ingold, 1983). At the same time it would bring to the fore the social potential of Mediterranean domesticates as accumulators of use value.

Indeed, social storage strategies are easily related to risk reduction, but, as Testart (1982) has demonstrated, its practice requires profound transformations in the social structure of hunter-gatherers, since it requires a severe restriction of
the norms of generalized reciprocity that constitute one of the central principles of band organization. At the same time, the control of risk by such accumulation has clear implications for the development of inequalities and differentiated forms of political power.

This line of analysis should lead us to ask about the nature of the social and political dynamics among the post-paleolithic inhabitants of the western Mediterranean. If indeed the role of the earliest domesticates is to be interpreted in relation to the concept of social storage, we must suppose that they were received into a context in which the decomposition of the social structure characteristic of hunter-gatherers was already under way: the conditions for accumulation which the domesticates would provide must already have been in existence to some extent. Otherwise, the features in question would have been filtered out. This is in fact what occurs with respect to some of them, when we consider the extreme scarcity (and spatial restriction) of cereals in comparison with sheep/goat during the first phases of the process.

Unfortunately, we do not as yet have an adequate empirical basis for the discussion either of social relations during the Early Neolithic of the Iberian peninsula or of the links between the earliest use of domesticates and social storage strategies. Notwithstanding, the same contextual arguments that have been used by proponents of the dual theory as evidence for the productive maturity of Cardial neolithic societies can be interpreted so as to support a hypothesis that postulates a social use for domesticates, such as the argument outlined above. The cereals at Cova de l’Or have been presented as the product of a mature production technology on the basis of their advanced degree of processing and their concentration in a storage deposit (Bernabeu and Martí 1992). At the same time, it has been suggested that the abundance of young individuals among the sheep/goat at the site represent a selective cull pattern characteristic of surplus-oriented livestock keeping (Pérez Ripoll in Martí et al. 1980: 203; see also Martí et al. 1987; Bernabeu and Martí 1992, etc.) There is little doubt that the finds at Or reflect a technically sophisticated use of domesticates, but this in no way implies their predominance within the totality of production. As Barandiarán and Cava (1992: 194) have correctly indicated:

The high percentage of plant and animal domesticates present in the Or deposit guarantees that the people there were intensively engaged in the exploitation of agricultural and pastoral resources, but this does not necessarily mean that those people did not practice the hunting and gathering of wild resources with equal intensity in other places.

This issue is directly related to the possibility that early neolithic groups may have practiced various spatial and temporal diversifications of production like those that are documented among the epipaleolithic populations of southern France and the Spanish Levant (Davidson 1976). Thus, the classic Levantine sites may be showing us only a part of the subsistence system, thanks to their functional specialization in activities related to the exploitation of domesticates.

This leads me to a final reflection on the nature of the facts available for the Early Neolithic. In reality, the entire characterization of the socioeconomic aspects of the pure Cardial phase is based on evidence from very few sites, which may in some way be a product of very special circumstances. Thus, for example, Cova de l’Or has produced remains of a grain storage facility, but not a single trace of grain processing (in fact, the site is located on a steep slope in mountainous terrain, a place highly unsuitable for grain cultivation.) Likewise, with respect to cull patterns, the predominance of young animals could be the result, not of general economic patterns, but of the seasonal use of the site. Clark’s (1985: 257-258) suggestion that differences in age at death may be due to the import or export of animals from a site should also be considered. These interpretations could be consistent with one another and with a third piece of evidence: the outstanding quality of the Cardial ware from the site. These three considerations may lead to the suggestion that the site was not so much the permanent seat of a residential group as a place linked to important activities within economic and social cycles the complete variability of which eludes us. We may suppose, in effect, that the concentration in the cave of grain silos, of the remains of the intensive consumption of young sheep/goats, and of exceptional decorated pottery is a reasonable indication of the existence in that place of an authentic accumulation of use values, in the sense discussed earlier. If this conjecture is accurate, Cova de l’Or would have been a locality functionally specialized not in the exploitation of domesticates, but in social storage. This would require us to give a different interpretation to the differences between the classic Levantine Cardial facies and the presumed substrate. These
would, in reality, be the product of the same people observed at distinct moments in the deployment of their subsistence and social activities.

Of course, all these ideas are yet to be tested archaeologically. For such testing to take place, however, it is essential that researchers set aside certain clichés that have hitherto been beyond discussion. This article seeks to invite this large scale and much-needed revision, without which little progress in our knowledge of the Neolithic in the Iberian peninsula will be possible.

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