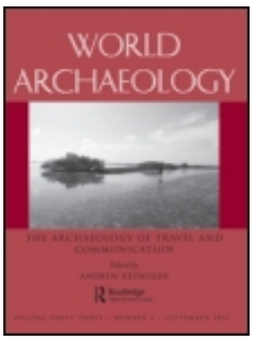

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The significance of variability in Palaeolithic assemblages

François Bordes *and* Denise de Sonneville-Bordes

When, about 1948, one of us began systematically to study the variations of percentages in typology and techniques in Mousterian assemblages, he expected to find a continuous spectrum of variation. One could suppose that each layer would show some originality and that chance, plus, maybe, specialization of the sites, would result in few sites giving the same general distribution of tool types. So he was surprised to find that the Mousterian assemblages could be classified by types, the fluctuations around the types being relatively minor. By the use of cumulative graphs (other kinds could have been used as well) and several discriminating factors (percentage of side scrapers, of denticulate tools etc.) he could define three main types of assemblages, types subdivided by the presence, absence or relative frequency of certain types of tools (e.g. typical backed knives, Quina-type scrapers, handaxes) in four or five main types of Mousterian. Another surprise was the small importance of the flaking technique: we know each type of Mousterian under a Levallois facies as well as under a non-Levallois facies. In the case of the Quina Mousterian, the Levallois facies is represented by the Ferrassie type, and in that case the influence of technique is at a maximum: one does not make thick Quina scrapers on thin Levallois flakes, nor transverse scrapers on elongated Levallois flakes. Accordingly, in the Ferrassie Mousterian the percentages of Quina scrapers as well as of transverse scrapers is lowered. The classical Quina has its special debitage, the so-called 'salami slices', which is always found, but in varying proportions in sites of this facies, and yields the thick flakes on which the Quina scrapers are usually made.

There are three main types of cumulative graph (fig. 14) for Mousterian assemblages. The first one characterizes assemblages rich in scrapers (more than 50%) and low in denticulates (Quina, Ferrassie and some typical Mousterian reaching the lower limit of this definition). The discriminating factors are the flaking technique (separating the Quina from the Ferrassie type, together with the percentage of transverse scrapers), and the percentage (inside the scraper class) of the Quina scrapers, which often separates the Quina from the Ferrassie, and very clearly distinguishes these two types from the Typical Mousterian.

The second is characterized by a moderate percentage of side scrapers and a rather lower percentage of denticulates. It comprises the other part of the Typical Mousterian, and the Mousterian of Acheulian Tradition, sub-type A (with numerous handaxes). The secondary discriminating factors are the presence, in notable percentage, of handaxes, or, conversely, the absence or extreme rarity, in the case of the Typical Mousterian, of handaxes and backed knives.

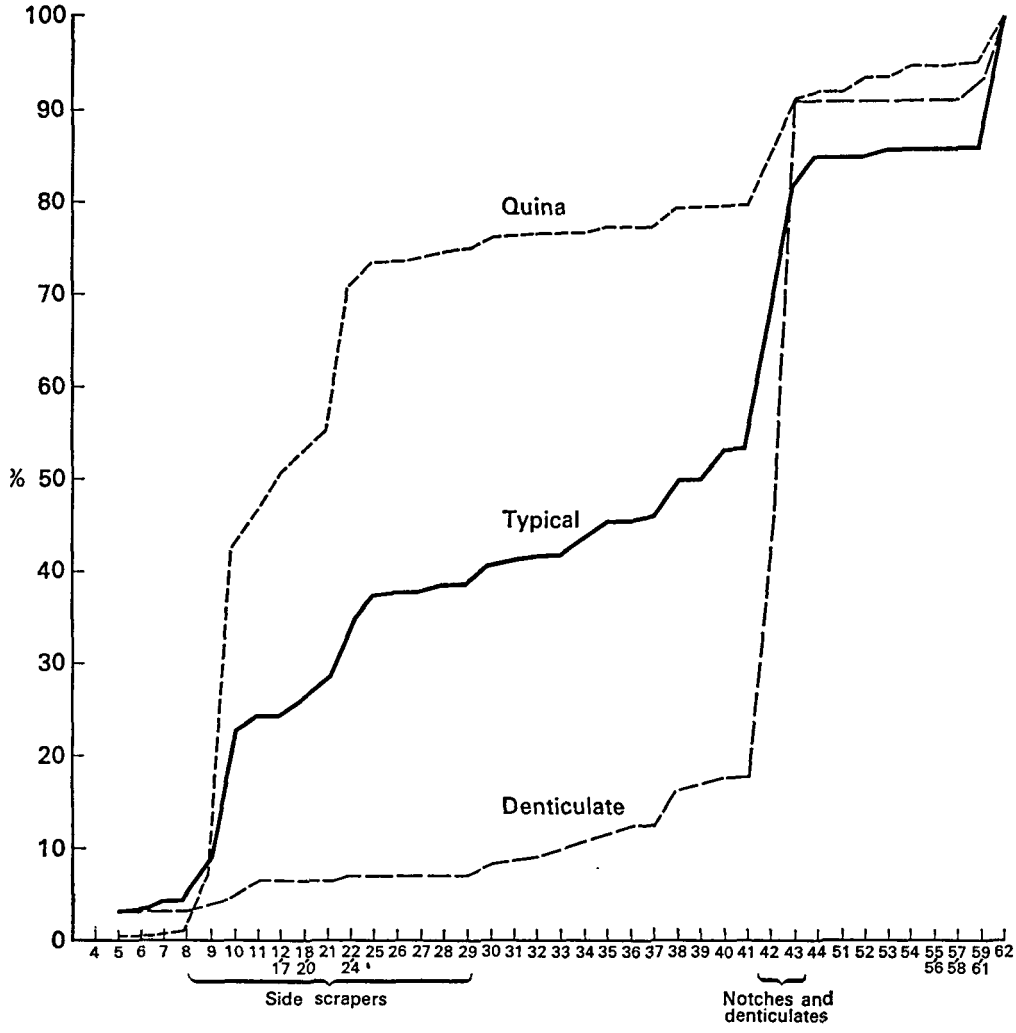

Figure 14 Cumulative graphs of Quina, Typical and Denticulate Mousterian

The third one is characterized by the low percentage of side scrapers (from about 4% to 20%) and a strong to very strong percentage of denticulates (up to 60%), always greater anyway than the percentage of scrapers. It comprises the Denticulate Mousterian and the Mousterian of Acheulian Tradition, sub-type B. The discriminating factor is the presence of handaxes (albeit rare) and true backed knives in the latter and their absence or extreme paucity in the former.

Combining the cumulative graphs with the secondary discriminants, one arrives at the classification we have used which is, broadly, the following one:

1 *Charentian group*

(a) *Quina type* Very high percentage of side scrapers usually, but sometimes falling to 50%. High proportion of transverse scrapers, high proportion of Quina-type scrapers,

absence or rarity of true handaxes, which when found are of special types, or backed knives. Very low percentage of Levallois flaking.

(b) *Ferrassie type* Very high percentage of side scrapers, rather low percentage of transverse scrapers, medium percentage of Quina-type scrapers, absence or rarity of handaxes (when found, of special types) and backed knives. High percentage of Levallois flaking.

Some layers have given assemblages which are in between these two types.

2 *Typical Mousterian*

The percentage of side scrapers is variable and seems to subdivide this type into two sub-types (fig. 15). Rather low percentage of transverse scrapers, absence or very low percentage of Quina-type scrapers, absence or rarity of true handaxes and backed knives. Variable percentage of Levallois flaking.

3 *Mousterian of Acheulian Tradition* (the French abbreviation M.T.A. is used below for convenience)

(a) *Sub-type A* Variable percentage of side scrapers, but never very high or very low, denticulate tools often numerous, absence or low percentage of Quina-type scrapers, variable percentage of handaxes (rarely less than 8%) and of backed knives (rarely numerous). Variable percentage of Levallois flaking.

(b) *Sub-type B* Low percentage of side scrapers, none being Quina type. Low percentage of handaxes, often 'degenerate', high percentage of denticulates and backed knives, and good percentage of 'Upper Palaeolithic' type tools: end scrapers, burins, borers, truncated flakes and blades. This sub-type is chronologically younger than the preceding one, and derives from it. Variable percentage of Levallois flaking.

4 *Denticulate Mousterian*

Low to very low percentage of side scrapers, often 'degenerate', none being Quina-type. High to very high percentage of denticulates and notches. Absence of true handaxes and absence or extreme rarity of backed knives. Variable percentage of Levallois flaking.

These diverse types of Mousterian exist for a very long time, with relatively little variation, except for the M.T.A. The Quina Mousterian, which seems to derive from the Rissian Clactonian-like cultures (la Micoque, layer 3; High Lodge) by way of last interglacial cultures (Ehringsdorf-like) present a semi-circular evolution: the Rissian assemblages are rich both in scrapers (40%) and denticulates (26%), the early Würm assemblages are still rich in denticulates (Combe-Capelle, layer IV: 58·3% of scrapers, 21·7 of denticulates), but the average for six Quina layers in the middle of Würm II at Combe-Grenal is respectively 75·8 (scrapers) and only 5·2 for the denticulates. But, for three layers towards the end of Würm II at the same site, the scraper index is lower (54·2) and the denticulate index higher again (12·9).

The Typical Mousterian has some possible ancestors in Riss times (La Micoque, layer 4; Rigabe in Provence). From the bimodal distribution of its scraper index, it seems to include, maybe, two different sub-types. There are also some differences, perhaps, between Würm I and Würm II Typical Mousterian.

The Denticulate Mousterian, origin still poorly known, seems to show a very slight change through time. On the other hand, change between sub-types A and B of the M.T.A. is very important, but intermediate stages exist. This evolution accelerates during Würm II and leads to the Lower Perigordian of the beginning of Würm III.

The reality of these different types of Mousterian seems well established not only by our researches, but also by the work of J. Combier in the Rhône valley, and H. de Lumley and E. Bonifay in Provence. But what is their significance? And, during the Upper Palaeolithic, what is the significance of the enormous differences that exist between the contemporary Aurignacian and Perigordian? We tend to interpret these differences as reflecting cultural differences of human groups in possession of different traditions. This does not necessarily mean that the men were physically different. However, D. Peyrony thought that the Perigordian was linked to Combe-Capelle man, and the Aurignacian to the Cro-Magnon form, and, for the lower stages of these cultures, he may well have been right. Let us recall also that no human remains are linked with certainty to the Mousterian of Acheulian Tradition.

Others, especially some American scientists (L. and S. Binford, for instance) or some who have worked on modern primitive people (like C. White) prefer to explain these variations as the result of different activities carried on by people of the same culture. It is always risky to apply to the European Palaeolithic what has been observed among the Pitjanjara or the Eskimo or others, without taking into account the enormous cultural and ecological differences. South-west France never was Labrador or the Australian or Kalahari deserts. The only primitives that could *perhaps* be compared with the European Upper Palaeolithic people without too much risk are the North-Western Indians of the Pacific coast.

Let us examine the different hypotheses, and the criticism that could be made of each.

A '*Different cultures*' *hypothesis*

There existed, during the Lower Palaeolithic (Acheulian, Clactonian), the Middle Palaeolithic (diverse Mousterian facies) and the Upper Palaeolithic (Perigordian, Aurignacian) different cultures, with different traditions of tool making, which coexisted on the same territory and influenced each other very little.

Criticism: it is unlikely that 'cultures' could have lasted so long.

Answer: we have examples of long-lasting cultures, at Haua Fteah, Cyrenaica, or in Australia. Anyway, the assemblages *do* exist and so, something lasted for millennia.

Criticism: it is unlikely that different contemporary cultures could have exploited the same ecological niche in the same territory. It is also unlikely that several contemporary cultures did not influence each other by intermarriage or contact.

Answer: we should examine what is meant by the words 'contemporary' and 'same territory'. One should never forget the length of prehistoric times and the imprecision of

our chronology. If at two points A and B, close to each other, two different Mousterian assemblages are 'contemporary' in the limit of our possibilities of dating, it may well be that 100 or 200 years elapsed between the abandonment of point A by Mousterians of type X, and the occupation of point B by Mousterians of type Y. Our present techniques do not allow us to perceive this interval, neither by sedimentology, nor by pollen analysis, nor even by radiocarbon dating.

Sometimes, however, real contemporaneity can be established on almost sure bases by sedimentology and pollen analysis: at Combe-Grenal, all the beginning of Würm I is occupied by Typical Mousterian. At Pech de l'Azé II, at the same time, there are Typical Mousterian, then Denticulate Mousterian, then Typical Mousterian again. We can say that the Denticulate Mousterian of Pech de l'Azé II must have been contemporary with one or the other of the layers of Typical Mousterian at Combe-Grenal. In the same manner, at the beginning of Würm II, the M.T.A. of Pech de l'Azé I seems to have been contemporary first with the Ferrassie, then the Typical Mousterian, then the Quina Mousterian of Combe-Grenal. The two sites are about 10 km. apart, as the crow flies, but separated by the Dordogne River, which may well have been the frontier between these different cultures, each of them having its hunting and migrating territory.

This last point leads us to make reservations about the supposed nomadism of Palaeolithic people. Today, Bushmen as well as Australian Aborigines are nomadic. But, most of the time, their nomadism is restricted to fixed territories, where they have several camping places, seasonal or not. The situation seems to have been rather different in south-west France: the study of reindeer teeth and antlers shows that in many cases these animals were killed all the year round and thus that the shelters were occupied also all the year round, at least by part of the tribe. This does not preclude the possibility of hunting expeditions, or temporary camps, as we shall see.

Intermarriages are difficult to assert or negate, but all the history of Europe shows, as we wrote elsewhere (Bordes, F. 1968) that man exchanges his genes more readily than his customs. Moreover, in primitive societies, conservatism is usually very strong, and if one supposes that a Mousterian of Acheulian Tradition married a Quina woman, she might have well gone on using the thick scrapers to which she was accustomed, but we doubt that her daughters would have done the same. It is, however, possible that the sporadic occurrence of tools which are characteristic of a given type of Mousterian, among the tool kit of another type, may be a trace of such a contact. Maybe also they are pieces picked up on a whim, or convergences. Anyway, the interactions seem to have been rather weak. One would expect strong influences only if intermarriages had been numerous, which is not the case even among modern primitives.

B *Hypothesis of evolution from one type to another*

We shall try here to dispose, quite definitely we hope, of the antiquated hypothesis that the different types of Mousterian represent an evolution, an hypothesis recently brought forward once again in the face of the most flagrant contradiction by stratigraphical data. In one variant of this hypothesis, it is supposed that the M.T.A. is the oldest type of Mousterian, having Acheulian 'hangovers'. Then the handaxes disappeared, and one had the Typical Mousterian. At last the 'evolved Mousterian' of Quina type developed.

This theory was first contradicted when D. Peyrony, in the lower shelter at Le Moustier, found the Mousterian of Acheulian Tradition sandwiched between two Typical Mousterian layers. Today, examples of interstratification are very numerous, and one can find any type of Mousterian in any stratigraphical position.

C *'Different activities' hypothesis*

For the extreme supporters of this point of view, only one Mousterian culture existed in one region at one time, and the different assemblages found in different places or layers represent different specialized activities, some requiring more type A tools, other more type B tools etc. This hypothesis could be divided in two:

(a) *Seasonal activities* Here, it is supposed that each type of Mousterian assemblage corresponds to one season. But the layers are often thick, without any significant change from bottom to top, and must have accumulated during a long time. We should then presuppose a kind of covenant between Mousterian tribes, reserving such and such a cave for summer activities, and some other one for winter activities. But, as there are at least four different types of Mousterian, we should also presuppose spring and fall activities. Moreover, we know that, at least in certain cases, men occupied the cave all the year round.

(b) *Different specialized activities* This is the point of view of L. and S. Binford (1966). Using the results of S. Binford's excavations at Shubbabiq (Israel) and several of our own excavations, these authors have submitted counts of tool types to factor analysis, and obtained several factors which they interpret as representing specialized activities or activity complexes. They deduce the existence in the French Middle Palaeolithic of different types of sites, living sites, hunting sites, workshops etc., and thus explain the different types of Mousterian as representing not different 'cultures' or traditions, but different activities or complexes of activities, more or less predominant following the specialization of the site. They support this interpretation with modern ethnographic observations. But, even *a priori*, it seems to us that several objections can be raised:

1 Killing sites, that is places where one or several large animals have been killed and butchered, are almost unknown in France, while they are numerous in American prehistory. These American sites yield lots of bones, with projectile points and various other tools, sometimes made or sharpened on the spot. This type of site, no doubt, did exist here also, but none, to our knowledge, has been excavated and described as such. Maybe sporadic finds of tools far away from any recognized site represent such killing areas.

2 Specialized workshops are known, but rare. At Barbas (Dordogne) the Aurignacians seem to have exploited big flint nodules. The assemblage comprises big cores, many flakes, few good blades and very rare tools (excavations by J. and G. Guichard, to be published). But not far from there a test trench has shown the presence of a site very rich in large blades, which may be the corresponding living site. In the caves or shelters, as well as on the open-air sites, one usually finds not only the tools, but also the

cores, flakes, chips etc., which indicate that fabrication *and* utilization of the tools took place *in the same area.*

3 Even if we accept the validity of factor analysis as used by L. Binford (some criticisms have been presented from a purely methodological point of view), and accept the existence of these factors, their meaning derives from *interpretation*, always open to criticism, at least until studies following Semenov's method, *combined with experimentation*, give us more solid ground. For instance, the atypical burin is to be found in the Binfords' factor I, and the typical burin in factor V. But we had distinguished one from the other purely on qualitative criteria. Basically, they are the same type of tool. But, in the Binfords' analysis, the first one is found in a 'maintenance group' linked to activities of the base camp, while the second is found in a 'hunting and butchering' tool kit, which is 'more specialized' than the 'hunting and butchering' tool kit of factor II.

4 An analysis of what is meant by 'site' would have to be done. For the Palaeolithic period, it is essentially a place (cave, shelter, open station) where are found numerous tools and animal remains (when bones are preserved) with structures (when it is possible to find them), such as fireplaces, tents, huts etc. By Neolithic times, it has already become more complicated, and the site is often a village or a hamlet. Today, it would be a nation: in 10,000 years, the excavator of Sarlat or even Bordeaux would have no knowledge of the steel mills of the north and east of France, for instance. The unit of culture grows geographically with civilization, and tomorrow it may be the planet itself.

5 Ethnographic comparisons may well be dangerous, if they do not take into account differences of environment. South-west France never was the Kalahari, the Australian desert, or Labrador. Flint is plentiful almost everywhere, either in outcrops or in river gravels; if not flint, then quartzite or other workable rocks: no need to go miles away to extract it, so no need for quarries. The shelters are numerous, game must have been plentiful. Killing sites have not yet been found, but they certainly do exist, and there a specialized tool kit may be found. Perhaps some very poor sites in the loess of the north, in Upper Palaeolothic times, correspond to this type of site. Temporary camps exist in the loess belt: there one finds many blades, flakes and cores, but so few tools that it is sometimes difficult to ascertain to which culture they belong. But in the south-west, the situation was different.

6 Also, we *do* know of specialized tool kits, corresponding probably to different activities, but *within a single site.* We know for example of concentrations of scrapers, denticulates, handaxes or Noailles burins. They probably show that different activities were carried on in different places at the same site, rather than at different specialized sites.

It would be interesting to analyse, following the Binfords' method or any other, the differences between open-air sites and caves or shelters assigned to the same 'culture'. Layer 1 at Roc de Combe (Lot) is an evolved Perigordian, posterior to the Noailles level, corresponding to a cold period and found in a small cave. Layer 1 at Corbiac (Dordogne) is also an evolved Perigordian, in a cold period, in an open-air site. The two assemblages

are at first sight very similar, and nobody would classify either of them any other way than evolved Perigordian or at least Upper Perigordian. However, the two sites are very different: small cave in a small valley for the first; open air site on a ridge near a wide valley (the Dordogne valley) for the other. It seems moreover that Corbiac was a summer site only, where men came back several years, for even now, in winter, it would be difficult to live there in huts or tents, for the place is very windy. At Roc de Combe, reindeer teeth show that man was there all the year round. We do not doubt that a very elaborate analysis (not yet finished) will show some differences between the two tool kits, maybe to be linked to different activities, but these typological differences will not change the attribution of the two sites to evolved Perigordian.

On the other hand, about 15 miles from Corbiac is the site of Rabier, also an open air site located in a small valley (excavations by J. and G. Guichard, to be published). The assemblage, at first glance, resembles very strongly the one from Corbiac, but while at Corbiac gravettes and micrograveltes are numerous (about 16%), at Rabier they are rare. So we have three sites: two where theoretically the activities should have been different (cave, open air) and where the tool kit is very similar, and two where activities should have been similar (both open air) and where one of the most characteristic types of the Upper Perigordian is found in very different percentages. But, even in the case of Rabier, the attribution to Upper or evolved Perigordian is not open to question.

The Mousterian of Acheulian Tradition is another case in point. The assemblage from the cave of Pech de l'Azé I, near Sarlat, and the one from Toutifaut, an open-air site near Bergerac, are very similar, even if the last one is of Levallois debitage. The same happens for the Quina Mousterian of Combe-Grenal, a shelter, and Chinchon, an open-air site near Castillon-sur-Dordogne. Here also it is possible that a more elaborate analysis will show some differences, but the difference of type of site, and therefore, theoretically at least, of activities, does not transform one type of Mousterian into another.

Then, against the hypothesis of different activities, one can raise the same objection as against the hypothesis of seasonal activities: some layers did accumulate for a long time, but do not show much internal typological variation. There again, should one suppose a covenant among Mousterian people to reserve such and such a site for such and such an activity, or complex of activities? This seems difficult to accept. But if it is not so, one would expect a continuous spectrum of variability in the assemblages. On the contrary, even if some overlapping of the different indices does exist, the distribution is clearly polymodal (fig. 15). The scraper index shows four peaks, and the analysis of its distribution within each type of Mousterian is interesting: the Quina and Ferrassie types occupy about the same range (between 50 and 85); the Typical Mousterian (clearly bimodal, which may indicate that there is more than one Typical Mousterian) varies between 20 and 65; the Mousterian of Acheulian Tradition sub-type A ranges from 20 to 45, and sub-type B between 5 and 25; the Denticulate Mousterian of the region under consideration varies between 4 and 15. The variation of the Quina index (fig. 16) shows that if there is an overlap for the scraper index between the Typical Mousterian and the Charentian (Quina + Ferrassie), this is not the case for the Quina index, and, at present, we do not know of any good assemblages with a Quina index between 3 and 6. In the Typical Mousterian, the Quina index is always lower than 3, which could mean

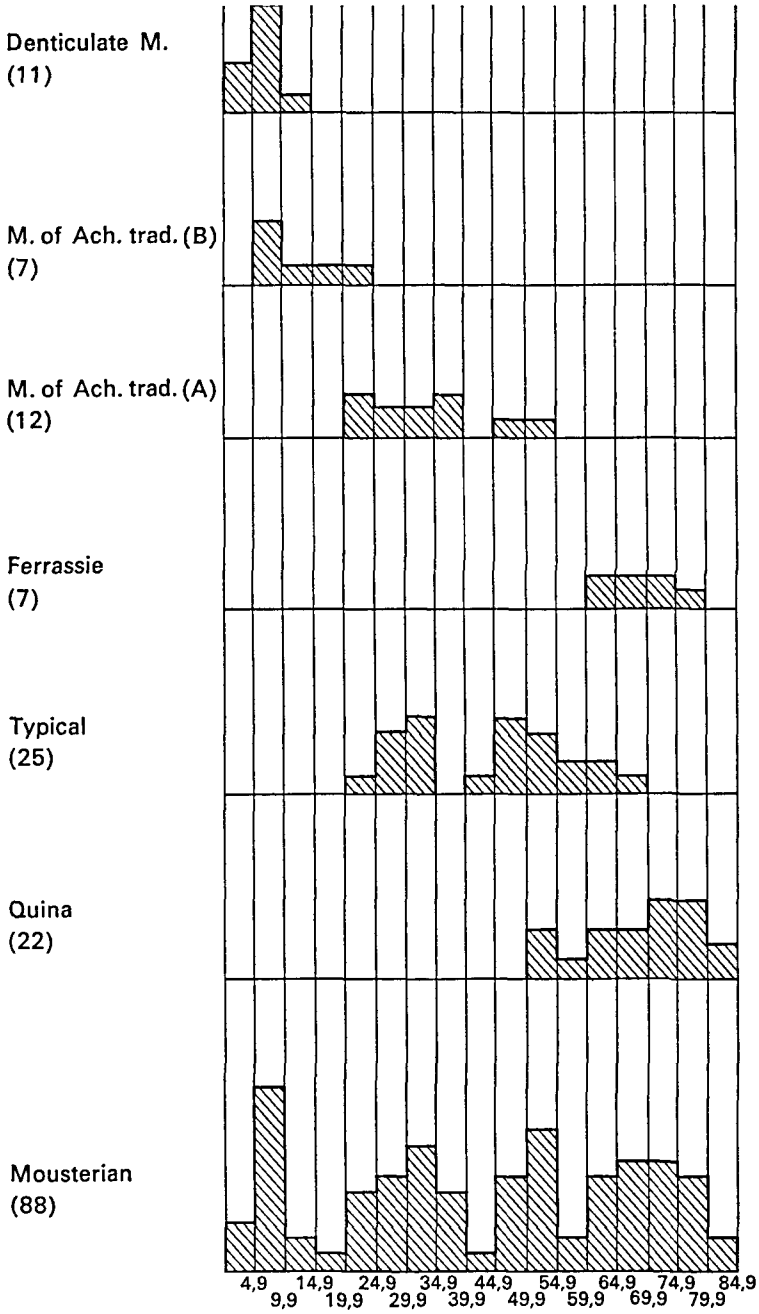

Figure 15 Distribution of the scraper index

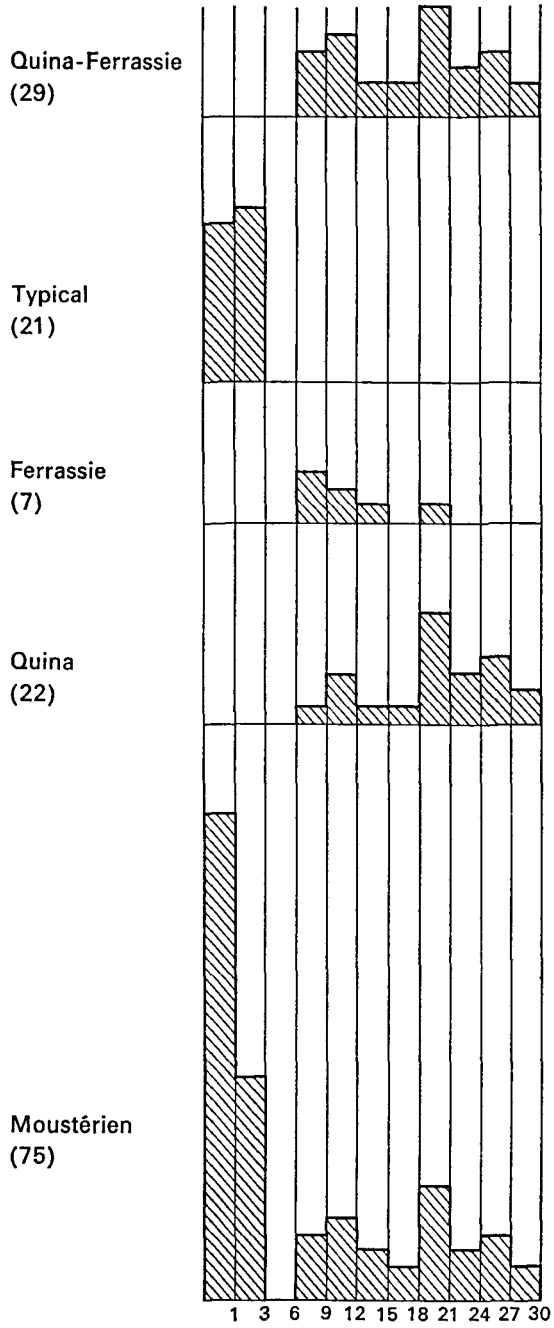

Figure 16 Distribution of the Quina index

that these Quina scrapers may be 'fortuitous Quina': ordinary scrapers made by chance on thick flakes and resharpened till they approach the Quina type. They may well not be a normal feature of this industry, since often the Quina index in Typical Mousterian is zero. It may be the same with the Mousterian of Acheulian Tradition, where they are always rare, and so far we have never found them in the Denticulate Mousterian.

It is interesting to note that some assemblages, Quina by their Quina index, are assigned to Ferrassie because of their debitage (very Levallois) and conversely some assemblages, Quina by their debitage, have a Quina index which puts them in the Ferrassie type. However, it may be said that, roughly, the Ferrassie type has a Quina index between 6 and 15, and the Quina type one between 15 and 30. But this overlapping seems to reinforce the idea that Quina and Ferrassie are only two facies of the same industry, the Charentian.

Another hypothesis would link the different types of Mousterian to different environments. This goes against the fact that certain Mousterian assemblages of North Africa are very much like those from France, where the environment was certainly different. One could object that, in both cases, steppic environment prevailed. But we have recent results which contradict the environmental hypothesis. By pollen and sedimentary analysis, correspondences have been established between Pech de l'Azé II and Combe-Grenal. Layer 4C2, Typical Mousterian at Pech de l'Azé, corresponds to the base of layer 52 at Combe-Grenal, also Typical Mousterian. But layer 4B of Pech de l'Azé II, Denticulate Mousterian, corresponds to the top of layer 52 of Combe-Grenal, still Typical Mousterian. So we have here two different types of Mousterian under the same general environment. On the other hand, layer 4C2 corresponds to an 'arboreal ratio' (arboreal/non-arboreal pollen) growing progressively from 15% to 30%, with still numerous heliophile plants and an indication of vast stretches of damp meadow. In the bone remains, the dominant animal is the red deer. In layer 4B, with an arboreal ratio of 50%, a true forest stage with maximum of hazel, the dominant animal is the horse. One could have expected *a priori* an inverse distribution of the animal remains, and so it seems that the Denticulate Mousterian hunters *chose* their game. Each time one finds Denticulate Mousterian, the proportion of horse in the animal remains is high or dominant. Should we conclude that this has nothing to do with culture, but that denticulate tools were 'adapted' to horse butchering? We prefer to think that horse hunting was part of the traditions of the Denticulate Mousterian people. Of course when horses were scarce, these people hunted what they found, without changing much the relative proportion of their denticulate tools in the tool kit, even when reindeer, not horse, was the dominant game.

Typical Mousterian, as well as M.T.A. or Charentian people, lived all through Würm I and II under very different climates and environments. The M.T.A. of Godarville (Belgium, excavations by J. de Heinzelin) developed under a climate which was probably different enough from the one prevailing near Bergerac (Dordogne), but the differences from Toutifaut are small.

So, it seems probable that things happened in south-west France during the Pleistocene in a different way from Australia. In a recent work, Carmel White and Nicholas Peterson (1969) analyse the prehistory of western Arnhem Land. This zone was inhabited for some 20,000 years, with first a culture lasting from about 20,000 to 6,500 B.P.

(about 13,500 years), then another culture which would present a dichotomy linked to seasonal changes of sites: rainy season on the plateau, dry season on the coastal plain. But when one takes a closer look, the difference between these two seasonal variants of the same culture seems to be very small: 'The main tool types present at Tyimede are similar to the range found in the plain sites, including points, small scraper-adzes, utilized flakes and edge ground axes, but the Tyimede assemblages differ in one major way from their plain counterparts, for many of the stone tools here seem to have been manufactured *in situ*: the overall ratio of tools to wastes flakes is 1 to 25' (in the plain sites, the ratio is 1 to 5), 'and the size and the shape of the primary flakes is consistent with the view that they are the by-products of the manufacture of the associated implements' (White and Peterson 1969: 53–4).

Roughly speaking, we have to do with two sites belonging to the same culture, but in one of which tools were frequently made on the spot, and in the other less so. In our graphs, where we do not count flakes, even utilized, with the 'true' tools, the two sites, following what the authors say, would very probably yield very comparable diagrams, and we would never interpret them as different industries. Competely different is the case of the Mousterian facies, where, in the first place, we have to do with semi-sedentary people present all the year round at the site, and, in the second place, we are concerned with differences in the tool types and their proportions, which are sometimes very strong. Even if some day the Typical Mousterian is to be lumped with the Charentian, the Mousterian of Acheulian Tradition and the Denticulate Mousterian would remain apart.

Lastly, cultural differences are often marked by differences in style. This is a difficult notion to use, for it is difficult to find objective stylistic criteria. However, any experienced prehistorian utilizes, sometimes unconsciously, the notion of style. After the first tools had been found, we were able to predict to Professor Movius that there was a Proto-magdalenian (in Peyrony's sense) layer at Pataud shelter. In a test trench, after seeing about ten or twenty tools, or even sometimes flakes, one can tell if a Mousterian assemblage belongs to the Quina or M.T.A. facies, even if no Quina scraper or handaxe has yet been found. Before the discovery of the first Noailles burin, one can tell if one is dealing with a Noailles level by the style of the other burins on truncation. But as yet this is a subjective matter of 'experience', and the difficult, if not impossible task of defining these subtle differences, felt but rarely explainable, is yet to be done. One could say, for instance, that in the M.T.A. the side scrapers are worked like the edges of handaxes, with first elongated retouch, followed by small regularization retouches, different from the wider, scale-like retouch of the Quina Mousterian.

Admitting the existence of the different Mousterian types as representing different cultures or different traditions, these traditions, albeit not immutable, certainly lasted for a very long time. D. F. Thompson (1964: 406) insists on the importance of tradition in tool making among the Australian Aborigines. In another place (Bordes, F. 1968), we have insisted on the difference between intelligence and creativity, the latter being much rarer and probably a function of the size of the population. During Palaeolithic times, the population was certainly sparse, and the human groups relatively isolated. Contacts between different traditions may well have been rarer than is usually thought, and not always peaceful. The semi-sedentary population would, at rather long intervals,

move from one shelter to another inside a given territory, and, more rarely, change its territory, leaving the abandoned one open to occupation by other groups. However, and this does not speak in favour of the hypothesis of different activities, some territories seem to have been occupied for very long times by the same type of Mousterian. In Charente, the M.T.A. is not quite unknown, but rare, while the Charentian seems to be almost the absolute master. The Combe-Grenal region seems to have been occupied throughout Würm I by Typical Mousterian, with the exception of a very brief incursion of Denticulate Mousterian (layer 38). In Provence (de Lumley 1965: 135) territorial continuities seem very strong, and the M.T.A. is unknown. One cannot help wondering what kinds of activities were undertaken in Dordogne under this facies which were unnecessary in Provence. The same question can be asked for older times about the scarcity or absence of handaxes over wide regions of Eastern Europe or Asia. And if the answer is that the same activities were being performed in a different way, then may we ask the following question: since there are several ways of performing the same activities with different tool kits, why not admit that the different Mousterian types just represent these different ways, and that the difference is cultural?

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Abstract

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The significance of variability in palaeolithic assemblages

Statistical analysis of Mousterian assemblages shows that they can be classified into several discrete types. It remains to explain the reasons for these differences. Two main points of view are possible: either they represent different traditions, or they represent different activities carried on at different places or times by essentially the same kind of people. The authors give their reasons for favouring the former interpretation.