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New perspectives on the Chatelperronian

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INTRODUCTION

In the Last Glacial prehistory of much of Europe and Asia, the distinction between the industries of the Middle Paleolithic and those of the Upper Paleolithic is generally thought to be an important one (e.g., Bordes, 1968a, 240-41; Clark, 1967, 47; Mellars, 1973; Klein, 1980; Bricker, 1976). Especially when one compares each complex as a unit with the other, there are clear and well-known differences in characteristics. Upper Paleolithic assemblages tend to have more numerous and more clearly patterned lithic and bone tool types than Middle Paleolithic (Mousterian) ones; there are generally more numerous and larger sites in the Upper Paleolithic, and some evidence for more efficient subsistence patterns, as well as more evidence for symbolic behavior, ranging from pierced teeth to incised bone artifacts to cave paintings (Conkey, 1978; Marshack, 1972). Finally, Upper Paleolithic burial practices are on the whole more elaborate and varied (Harrold, 1980).

It is widely held that these differences indicate behavioral contrasts — that cultures of the Upper Paleolithic were generally more complex and adaptively successful than those of the Middle Paleolithic.

However, earlier Upper Paleolithic industries tend to contrast with Mousterian ones less strikingly than later traditions, and there is less consensus about them than the above generalizations might imply.

The whole period (roughly 45,000 to 30,000 years ago) during which Upper Paleolithic industries replaced Middle Paleolithic ones is still imperfectly understood, and still the subject of considerable dispute among prehistorians. At the heart of the disagreements is the question of the processes whereby Upper Paleolithic traditions succeeded earlier ones. Did these traditions, somehow adaptively superior, arise in a restricted area and then spread widely? And if so, was their spread due to diffusion, migration, or both? Or did the Upper Paleolithic evolve independently in different areas from local Middle Paleolithic complexes? Or was there some combination of all these processes?

These issues are further complicated by the fact that this same general period saw, at least in much of Europe and Asia,

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the replacement of Neanderthals *(Homo sapiens neanderthalensis)* by populations of anatomically modern people *(Homo sapiens sapiens)*. How did this transition occur? Did some populations of Neanderthals, or all, or none, evolve into modern form? Since the human remains associated with Mousterian archeological levels are usually Neanderthals, and since until recently all remains from Upper Paleolithic contexts were anatomically modern, it seems that these two great changes are somehow related; exactly how is in disagreement.

Any hope of reliably answering these questions depends on a broad synthesis, which in turn depends upon a whole series of studies, each gathering and analyzing in detail the relevant evidence from a restricted block of space and time — archeological, stratigraphic, radiocarbon, paleoclimatic, and subsistence-related — bearing on these questions.

A suitable subject for such a study is the Chatelperronian, one of the two earliest Upper Paleolithic industries of much of France and Spain. This tradition has had a complicated history in archeological theory (see below). At the same time, however, it has seldom been treated in detail in discussions of the early Upper Paleolithic, because its known assemblages were few and often poor, or of dubious provenience.

However, research since World War II, particularly in the past 20 years, has provided a new corpus of data, which (though far from ideal) considerably extends our knowledge of this industry. This corpus, including my own examination of most extant Chatelperronian lithic assemblages, was the subject of a doctoral dissertation (Harrold, 1978). This article deals with its findings and with more recent developments. It will summarize current knowledge of the Chatelperronian, including climatostratigraphic context, lithic and bone industries, regional and temporal variability, human remains, and possible relations with other industries.

THE CHATELPERRONIAN IN ARCHEOLOGICAL SYSTEMATICS

Since Bailleau's publication (1872) of his activities at the eponymous site of Chatelperron, prehistorians have recognized the distinctiveness of certain early Upper Paleolithic assemblages characterized particularly by the curved, pointed backed blades called Châtelperron knives (or points). But they have disagreed over what collections to include in this tradition, and how to understand it.

The first systematic treatment of the Chatelperronian — variously referred to also as the Lower Perigordian, Perigordian I, or Castelperronian — was by Breuil (1913, 1937), who grouped together all Upper Paleolithic industries antedating the Solutrean into the Aurignacian, with three succesive stages: Lower Aurignacian, with Châtelperron knives and both Upper Paleolithic implements like burins and endscrapers, and Mousterian ones such as denticulates and sidescrapers (i.e., what is today called the Chatelperronian); Middle Aurignacian, with keeled and nosed scrapers, strangulated blades, etc. (i.e., the industry today called Aurignacian); and Upper Aurignacian, with Gravette points, and tanged and shouldered points (today's Upper Perigordian).

Breuil's scheme was later supplanted

by that of Denis Peyrony (1933). Working with a larger and better body of data, Peyrony proposed a framework still used in its main outlines today. He divided Breuil's Aurignacian into two distinct and parallel industrial phyla. The Perigordian, characterized especially by backed tools, was an amalgam of Breuil'ls old Lower and Upper Aurignacian — now seen as one evolving tradition, in five stages:

Perigordian I (Chatelperronian).
Perigordian II (at Bos-del-Ser and La Ferrassie E').
Perigordian III (at Laugerie Haute).
Perigordian IV and V (Upper Perigordian).

The Aurignacian, characterized by numerous scrapers, a special style of retouch, and other traits, was likewise divided into five temporal stages.

The essential idea of separate Perigordian and Aurignacian traditions is still widely accepted today. However, subsequent work showed some details of Peyrony's scheme to be incorrect. Of particular interest here, Sonneville-Bordes, a pioneer in quantified analyses of entire assemblages, showed (1955a, 1955b) that Peyrony's «Perigordian II», with finely-retouched Dufour bladelets, is in fact Aurignacian in character; it is now referred to as Aurignacian 0 or Archaic Aurignacian.

Furthermore, Bordes (1958a) established that the «Perigordian III» at Laugerie-Haute was stratified *above* Perigordian V; it is now called Perigordian VI. Thus the two links connecting the Perigordian I with later Perigordian industries had been sundered. However, most prehistorians today accept that Chatelperronian and Upper Perigordian assemblages are part of the same cultural tradition (e.g., Sonneville-Bordes, 1958-59, 1960a, 1960b, 1966; Bordes, 1968b), though there are dissenters (see discussion below).

As research during the postwar period began producing more well excavated Chatelperronian assemblages (of which there had always been a critical shortage), more attention began to be turned to the question of this tradition's origins. Both Breuil (1909) and Peyrony (1922) had originally viewed the Chatelperronian as evolving from the French Mousterian, but each later argued that it, and the Upper Paleolithic in general, had arrived with intrusive populations of anatomically modern people, who replaced the Neanderthals (Breuil, 1913; Peyrony, 1933; Peyrony and Peyrony, 1951).

Since then, however, the view has reemerged that the Chatelperronian (though probably not the Aurignacian) emerged indigenously from the Mousterian (e.g., Sonneville-Bordes, 1972; Delporte, 1970; Leroi-Gourhan, 1963; Bricker, 1976; Movius, 1969a). More specifically, Bordes (1958b, 1972) has argued that the Chatelperronian arose from the Mousterian of Acheulean Tradition, type B, which has relatively high proportions of Upper Paleolithic-group tools.

Other interpretations have also been put forward. Both Howell (1964) and S. Binford (1972) have suggested that the Chatelperronian is a terminal Mousterian, while Lynch (1966) doubted its very existence, though he was writing before publication of most recent sites. Klein (1973) suggests it may represent the response of indigenous Mousterian populations to intrusive (Aurignacian) influence. For Laplace (1966a) the Chatelperronian represents a relatively undifferentiated stage which gave rise to both Aurignacian and Perigordian.

Several other dissenting authors have argued that the temporal gap and typological differences between Chatelperronian and Upper Perigordian do not justify placing them in one industrial phylum (e.g., Cheyner, 1963; Smith, 1966; Binford, 1972). These issues will be discussed further, in light of recent research, below.

Climatostratigraphic Background

Any attempt to understand past cultural systems requires some comprehension of the environments to which people had to adapt, as well as a chronostratigraphic framework which orders occupation levels in a framework of climatic change over time (aided if possible by absolute dating methods). Recent advances in the paleoclimatic study of the Last Glacial period in Europe have greatly improved the resolution with which past climates and their oscillations can be reconstructed.

On a global scale, no methods can match the depth and completeness of the climatic records from oxygen-isotope and planktonic studies of cores of deep-sea sediment (Imbrie and Imbrie, 1979; Shackleton and Opdyke, 1973). More complete than terrestrial records, these deposits have made it clear, for instance, that Pleistocene glacial cycles were more numerous and complex than had been previously realized (Butzer, 1976).

However, these methods cannot be directly applied to the paleoclimatic context of a geographically-restricted industry like the Chatelperronian. People live, and leave occupation levels on land, in deposits which must be analyzed and only then compared to the general sea-core record. Furthermore, the slow sea-floor sedimentation rate seldom allows shorter-term climatic oscillations, lasting less than several thousand years, to be recognized, though it is just such oscillations which are of interest to us here. Finally, global climatic pulsations may be translated into different forms in different areas, in ways which cannot be predicted *a priori*, but must be learned from terrestrial sediments.

Paleoclimatic records relevant to the Chatelperronian — those from the middle part of the Last (Würm) Glacial period in Western Europe — fall into two main categories, geological and palynological. Faunal studies are also relevant, but generally reveal less climatic resolution at this relatively fine temporal scale.

Among geological studies, those of Last Glacial loess and other open-air deposits have played a crucial role in our conceptions of the course and periodization of the Last Glacial. These studies range from Central Europe to the north European plain, as in Czechoslovakia (Kukla, 1975), the Netherlands (Van der Hammen *et al.*, 1967; Vogel and Van der Hammen, 1967; Zagwijn, 1974), where there is a good series of radiocarbon dates, Belgium (Haesaerts, 1974), and northern France (Bordes, 1954; Lautridou, 1968; Lautridou and Sommé, 1974). Additionally, open-air studies of colluvial deposits are being done in southern France, includind Chatelperronian sites like Basté, La-Côte, and Les Tambourets (see table 1). These sorts of studies have constructed the basic climatostratigraphic subdivisions of the Last Glacial, both Bordes' four-stadial (Würm I-IV) scheme, and

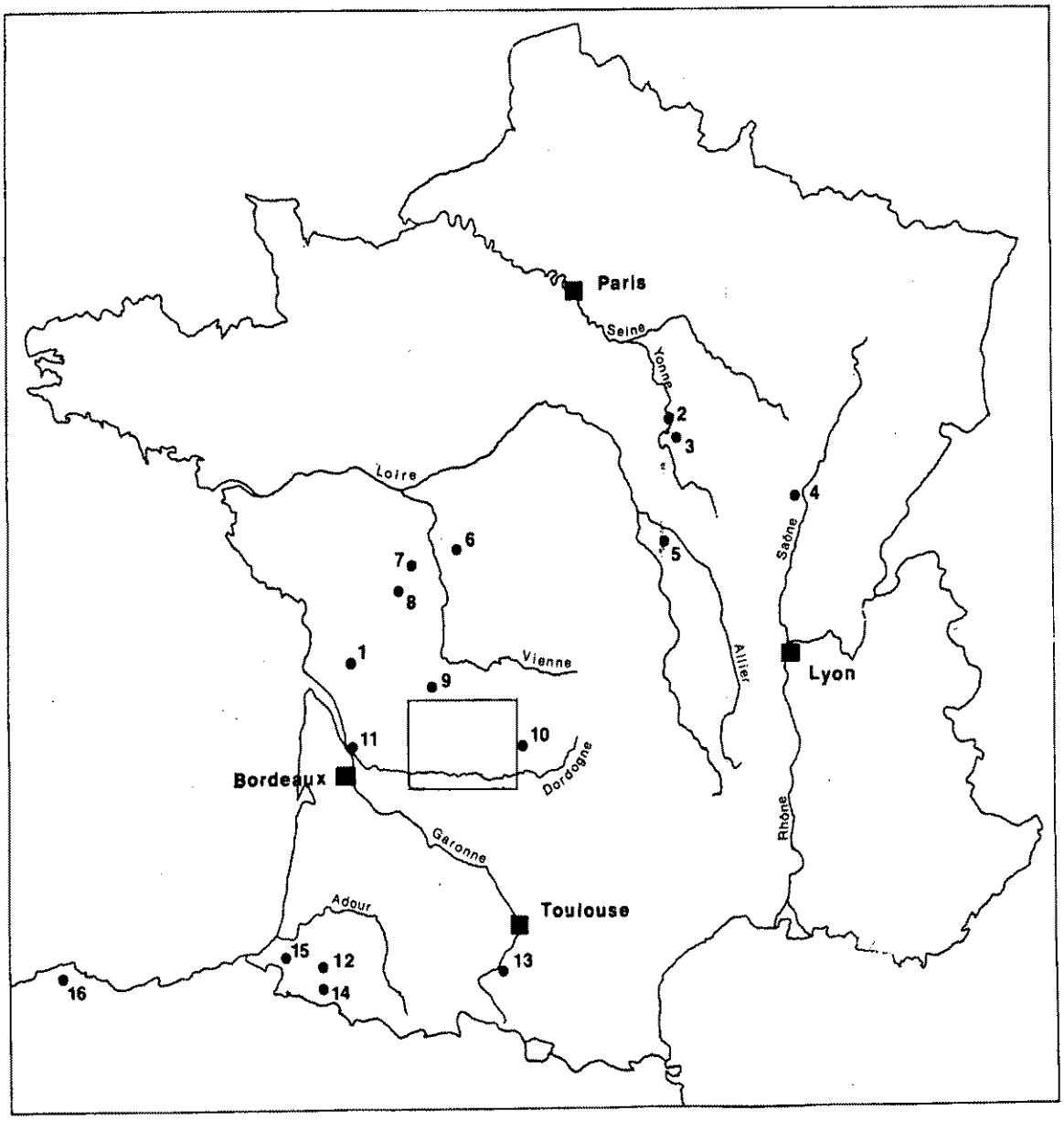

Fig. 1. — Map of certain to possible Chatelperronian sites (see figure 2 for sites in Perigord Inset). Key: 1, Saint-Césaire; 2, Grotte du Renne (Arcy-sur-Cure); 3, Roche-au-Loup; 4, Germolles; 5, Châtelperron; 6, Les Cottés and Fontenioux; 7, La Grande Roche; 8, Belleroche; 9, Fontechevade and Abri du Chasseur; 10, Grotte du Loup and Bos-del-Ser; 11, Pair-non-Pair; 12, Isturitz; 13, Les Tambourets; 14, Gatzarria; 15, Basté; 16, Cueva Morín and Cueva del Pendo.

others which depict a series of cold stadials and warmer, named, interstadials.

Even more important for the Chatelperronian sphere are stratigraphic and sedimentological analyses of cave deposits, the contexts in which most Chatelperronian levels occur. This exacting and complex field of study is not without its interpretive difficulties, but has evolved a widely-accepted set of methods and interpre-

tive models (see Laville, Rigaud, and Sackett, 1980, 45-103; Farrand, 1975; Butzer, 1981). Results of these studies agree fairly well with those of pollen analyses at the same sites, and in one case, with those of micro-pedological analysis (at Pech de l'Azé II; Goldberg, 1979).

Cave sedimentologies have been studied, and local climatostratigraphic sequences developed, by Laville (1975; Laville *et al.*, 1980) in the Perigord, by Butzer (1981) in Cantabrian Spain, by Raynal (1975) in the Corrèze, and by Miskovsky (1974) in the French Midi. Only the last area lacks Chatelperronian deposits.

Pollen studies have been of equal importance in developing our picture of the Last Glacial. Usually, they are used in close conjunction with sediment studes, as in northern Europe (Woillard, 1978; Zagwijn, 1974; Van der Hammen *et al.*, 1972), and, more relevant to the Chatelperronian, to the south as well. Notable among these is Paquereau's (1974-75a, 1974-75b, 1976, 1978) long-term study of sites in the Perigord, which has produced a detailed climatostratigraphy closely paralleling Laville's. Other relevant analyses have dealt (see table 1) with the Chatelperronian sites of Les Cottés, Grotte du Renne, and Cueva Morín, as well as the Abri du Facteur (Leroi-Gourhan, 1968). Finally, Leroi-Gourhan and Renault-Miskovsky (1977) have produced a useful attempt at synthesizing pollen analyses from the Last Glacial of much of Western Europe.

TABLE 1

Sources of paleoclimatic evidence for Chatelperronian sites

Sites	Geological Evidence	Pollen Evidence
Roc de Combe Le Piage La Chèvre Font-de-Gaume La Ferrassie Le Moustier	Laville, 1975; Laville, *et al.*, 1980	Paquereau, 1974-75a, 1974-75b, 1976, 1978 (La Ferrassie and Le Moustier only)
La-Côte	Gaussen and Texier, 1974	
Grotte du Loup	Raynal, 1975	
La Quina		Leroi-Gourhan and Renault-Miskovsky, 1977
Les Cottés		Bastin *et al.*, 1976
Grotte du Renne	Chavaillon-Dutrievoz and Chavaillon, 1952	Leroi-Gourhan and Leroi-Gourhan, 1964
Basté	Thibault, 1970; Chauchat and Thibault, 1967	
Les Tambourets	Laville (in progress)	Paquereau, 1978
Gatzarria	Levêque, 1966	
Cueva Morín El Pendo	Butzer, 1971, 1973, 1980, 1981	Leroi-Gourhan, 1971, 1980

All these studies, based on different sorts of evidence from different localities, cannot now be fully correlated to provide a unitary picture of climatic change through time. But the evidence for the mid-Last Glacial relevant to the problem of the Chatelperronian can be tentatively ordered, and roughly dated, by reference to radiocarbon dates in the Chatelperronian sphere (see table 3) as well as those to the north, as mentioned above (Harrold, 1978, has detailed discussion).

It is first important to note that in the Perigord and Cantabria, climatostratigraphies have been reveloped linking numerous sites (and based on both sediments and pollen in the former case), whereas elsewhere, sequences tend to be based on few sites, and to be sketchier and less certain (see table 1).

Laville's Perigord sequence is taken here as the initial point of comparison (see table 2). After the final cold phase of the Würm II stadial, associated with Mousterian industries, came an important period of warmer climate (the Würm II/III interstadial). In the Perigord, this phase saw a cycle of nondeposition, pedogenesis, and erosion in caves; we thus lack a record of pollen, sediments, or artifacts from that period. This interstadial appears also (though less markedly) in Butzer's Cantabrian sequence, in Raynal's Corrèze sites, and in Bastin's pollen analysis at Les Cottés, where it is called the Cottés Interstadial; here and in Cantabria, conditions were not such that relevant deposits were eroded away.

This phase presumably correlates, at least part, with the Hengelo interstadial of geological and pollen studies in Holland and elsewhere to the north (Van der Hammen *et al.*, 1967; Vogel and Van der Hammen, 1967). However, there is some inconsistency in relevant radiocarbon dates. The Hengelo interstadial seems bracketed between about 39,000 and 37,000 years B.P., while in France the Würm

TABLE 2

Regional chronostratigraphic frameworks and the Chatelperronian

Perigord (Laville, 1975)			Cantabria (Butzer, 1981)		
Phase	Climate	Industries	Phase	Climate	Industries
Würm III, Phase III	Mild, humid	Aurignacian I, II, III	Unit 31	Temperate	Early Aurignacian; Chatelperronian
Würm III, Phase II	Very cold, dry	Aurignacian I, II	Unit 30	Cold	Early Aurignacian; Chatelperronian
Würm III, Phase I	Fluctuating, humid	Aurignacian 0, I Chatelperronian			
Würm II/III Interstadial	Warm, humid	Unknown due to erosion	Unit 29	Temperate	Mousterian
Würm II, Phase VIII	Cold, dry	Mousterian	Unit 28	Cold	Mousterian

TABLE 3

Radiocarbon dates from Chatelperronian and other relevant contexts

Dates are excluded which are merely minima (e. g., > 35.000), or obviously incorrect due to contamination or other causes.

Provenience	Years B. P.	Date Number	Source
Mousterian			
La Rochette 1.7	36.000 ± 550	GrN-4362	(1)
La Quina, Final Mousterian	35.250 ± 530	GrN-2526	(1)
	34.100 ± 700	GrN-4494	(1)
Les Cottés c. I	37.600 ± 700	GrN-4421	(1)
Renne (Arcy) XII	34.600 ± 850	GrN-4217	(1)
Camiac	35.100 ± 2000 — 1500	Ly- 1104	(2)
Chatelperronian[a]			
Renne (Arcy) VIII	33.500 ± 400	GrN-1736	(3)
	33.860 ± 250	GrN-1742	(3)
Les Cottés c. G	33.300 ± 500	GrN-4333	(1)
	31.900 ± 430	GrN-4510	(1)
Aurignacian O			
Abri Pataud l. 14	34.250 ± 675	GrN-4507	(1)
	33.330 ± 410	GrN-4720	(1)
	33.300 ± 760	GrN-4610	(1)
Abri Pataud l. 12	33.000 ± 500	GrN-4327	(1)
Aurignacian I			
Abri Pataud l. 11	32.600 ± 550	GrN-4309	(1)
	32.000 ± 800	GrN-4326	(1)
La Ferrassie c. F	33.200 ± ?	?	(4)
La Quina, c. 1	31.400 ± 350	GrN-1493	(3)
Les Cottés c. E	30.800 ± 500	GrN-4258	(1)
	31.000 ± 320	GrN-4296	(1)
	31.200 ± 410	GrN-4509	(1)
Upper Perigordian (Oldest dates only)			
Abri Pataud l. 5 rear	28.150 ± 225	GrN-4634	(1)
	27.660 ± 260	GrN-4662	(1)
	26.600 ± 200	GrN-200	(1)

[a] Nine other dates from 5 levels at 4 sites (Grotte du Renne, Cueva Morin, Grotte du Loup, Grande-Roche) are omitted as being clearly far too old or young, or minimum dates only.

Sources:

(1) Vogel and Waterbolk, 1967.
(2) Delibrias and Evin, 1980.
(3) Vogel and Waterbolk, 1963.
(4) Leroi-Gourhan and Renault-Miskovsky, 1977.

II/III began at an indefinite time (perhaps anywhere between 40,000 and 37,000 B.P.), and ended around 35,000 ago, judging from C-14 dates of early Upper Paleolithic sites from the ensuing phase (see table 3). The apparently rather late Mousterian C-14 dates in table 3, none of which can be directly inserted into Laville's sequence, may indicate that the two warm periods were not coterminous; but is should be remembered that these dates are at or near the practical limits of the radiocarbon method, where a tiny amount of contamination can have important effects.

At any rate, the interstadial was followed in the Perigord by a phase (phase I of the Würm III stadial) with temperatures fluctuating from cool to cold in a humid context. Laville dates all Chatelperronian assemblages from studied sites, and some Aurignacian ones, to one of the four subphases of this phase. Then came the very cold and dry phase II, and the milder phase III, which probably corresponds to the Arcy phase noted in Leroi-Gourhan's pollen analysis (Leroi-Gourhan and Renault-Miskovsky, 1977), and the first part of the Denekamp interstadial to the north. Phases II and III are associated with Aurignacian assemblages only.

The other Chatelperronian occurrences for which there are good paleoclimatic records apparently also date to after the Würm II/III. In most cases, we cannot yet be sure whether the Chatelperronian was precisely synchronous with Laville's phase 1, although that seems to be the case at the Grotte du Loup and Basté at least. In two cases on the periphery of the Chatelperronian sphere, however, the industry seems to have persisted longer. At the Grotte du Renne (Yonne), Leroi-Gourhan's pollen study found evidence of increasingly severe conditions in Chatelperronian levels 10, 9, and 8, followed by milder climate in level 7 (Aurignacian II), which marks the widely-recognized Arcy Interstadial of about 31-30,000 B.P. This apparently parallels the progression in the Perigord from fluctuating phase I to severe phase II, to mild phase III. Thus the Chatelperronian at the Grotte du Renne apparently continues through the cold period corresponding to Laville's phase II.

In Cantabria, Butzer dates the Chatelperronian occupations at Cueva Morín and El Pendo, respectively, to climatostratigraphic units 30 and 31 (which follow temperate unit 29 [=Würm II/III]). Butzer identifies temperate phase 31 with the Arcy Interstadial; thus El Pendo would be the latest known Chatelperronian assemblage. The preceding cold unit 30 apparently equates with both phases I and II of Würm III in Laville's sequence.

It should not be considered remarkable that Laville's and Butzer's sequences are not identical, unit for unit. They derive, after all, from two distinct geographical and climatic regions whose processes of deposition and post-depositional modification of sediments differ somewhat (e.g., Cantabrian caves are notably wetter than those of the Perigord). What is remarkable is rather the level of agreement between the two frameworks, an indication that both are detecting the main lines of Last Glacial climatic change.

Thus a general picture is available, but a tentative one in view of the need for more regional syntheses, and more Chatelperronian sites with paleoclimatic analyses. Chatelperronian sites postdate the Würm II/III (or Cottés) Interstadial, probably occuring as far back as 35,000 B.P. The Chatelperronian may have continued

for 2,000 years or less in the Perigord, and apparently for another 1,000 or 2,000 years as far away as the Yonne and Cantabria.

Current data do not allow more precise estimates. The Chatelperronian thus appers to have continued over a timespan of at least the same order of magnitude as those of other Western European Upper Paleolithic traditions.

PALEOENVIRONMENTS

Here too, evidence is uneven in quality and quantity, with the greatest amount available from the Perigord. The Last-Glacial Perigord was not the treeless Arctic tundra sometimes visualized. Paquereau's pollen studies show that the landscape apparently shifted, with climatic oscillations, from mostly steppic in the most severe periods, through various degrees of parkland, to forest-steppe in the mildest phases.

Vegetation was influenced by the considerable relief, with protected valleys and south-facing slopes often supporting deciduous trees, and valley floors containing marshes. Though arboreal pollen may be represented only by pine in the coldest periods, the area's function as a refuge for thermophilous trees has been pointed out (Wilson, 1975). The mosaic nature of the environment is also emphasized by Delpech (1975), whose faunal study shows that mammalian species which today inhabit very different environments (e.g., reindeer and boar) were present, presumably exploiting different micro-environments. Climatic changes led to proportional changes in faunal composition.

Given the above, one could expect for the earliest Würm III in this region a relatively humid parkland environment, with important vegetational and faunal contrasts among plateaux, slopes, and valley bottoms. It would be a rich environment for hunter-gatherers. This expectation is met by the available evidence from Perigord phase I contexts, especially by the prominence of bovines *(Bos* or *Bison)* at the expense of reindeer at Roc de Combe and La Ferrassie.

To the north of the Perigord, more severe conditions would be expected, with fewer trees and a colder fauna. The scattered evidence available is consistent with this expectation at Les Cottés, Fontenioux, Châtelperron, and the Grotte du Renne — where, for example, reindeer dominate the fauna, woolly rhinoceros and mammoth are important, and red deer are absent.

One could also expect more severe conditions in the Pyrenees, but the documentation for this period is poor.

Finally, Cantabria, which today is rainier and more equable than the Perigord, shows signs of having been milder in Last Glacial times as well. Geology, palynology, and faunal analysis (Freeman, 1973) all point to this conclusion (e.g., the rarity of reindeer and mammoth). Little is yet established about Chatelperronian times, except what is suggested by the small pollen sample from level 10 of Cueva Morín (Leroi-Gourhan, 1971). Arboreal pollen is nearly 50 % of the total, though it is nearly all pine. Wet — or dry — indicative taxa are poorly represented, evoking a picture of parkland vegetation.

In sum, the available data do not allow

vivid reconstructions of Chatelperronian environments, except by extrapolation of what in known of Last Glacial environments in general, particularly in the Perigord. These environments, always rich in large herbivores, probably ranged from relatively mild to severe, allowing us to infer that the makers of Chatelperronian assemblages were able to adapt to a wide range of resources and conditions.

CHATELPERRONIAN SITES

This section will consider which sites and levels should properly be included in the Chatelperronian. Basic information is presented in tables 4-6, under three groupings:

1) Major assemblages (table 4): those from reasonably well-excavated and well-reported sites. Most represent true archeological levels, in the sense of single occupation horizons, though Châtelperron B and the assemblages from the Grotte du Loup and the Grotte du Renne are to some degree amalgamations of several scanty levels.

2) Other Chatelperronian assemblages (table 5) are those of limited use for comparative purposes because of small size or incomplete excavation, or because of loss of information due to natural disturbance, poor excavation or recording, or incomplete publication.

3) Probable Chatelperronian sites (table 5), because of the same sources of information loss, were judged only as *likely* to have contained assemblages of this tradition.

4) Finally, possible Chatelperronian sites (table 6) are those for which available data only allow us to judge that a Chatelperronian assemblage *may* be involved. They are frequently those where a few Châtelperron knives have been reported from uncertain contexts.

One of the major tasks of my study was to determine by examination of the artifacts and assessment of the literature, into which (if any) of these categories fell the approximately 114 sites reported at one time or another as Chatelperronian (or Castelperronian, Lower Perigordian, Perigordian I, or Breuil's Lower Aurignacian). Nearly 50 of these attributions were incorrect, but were often repeated in secondary literature. A common reason for this was the persistent notion of the Chatelperronian as a transitional, and therefore mixed industry. Excavators who recovered collections mixed by natural causes like cryoturbation, or who failed to recognize stratigraphic distinctions and mixed assemblages themselves, have often attributed such melanges to the Chatelperronian. For example, at La Crouzade (Aude), Héléna (1926-27) excavated a Mousterian level containing a split-base bone point (probably derived from the overlying Aurignacian level), and some pieces showing what he called the «timid appearance» of Aurignacian retouch (Quina retouch?). Working with Breuil's framework, he decided the industry was mixed, therefore transitional, therefore Lower Aurignacian. This attribution was repeated and translated into modern terminology as Lower Perigordian by Méroc (1963), though there is in fact no evidence of the Chatelperronian at La Crouzade or anywhere in its vicinity (Sacchi 1976).

TABLE 4

Major Chatelperronian assemblages

Region and Site	Level	Tools[a]	Sources[b]	Remarks
Perigord				
Roc de Combe (Lot)[c] . . .	8	513	(1)	Couche 9 is Aurignacian
	10	46	(1)	
Le Piage[c]	F1	137	(2,3)	Overlies 4 Aurignacian levels
Trou de la Chèvre[c]	1	139	(4)	
(Dordogne)	1a	162	(4)	
	2	342	(4)	
	2a	302	(4)	
La Côte[c]	III	104	(5)	Open-air site
La Ferrassie[c]	L3a	69	(6)	Few details published;
	L3b	156	(6)	Delporte's re-excavation
Canaule II[d]		4-500	(7)	Open-air site; few details published
Corrèze				
Grotte du Loup[c]	3	72	(8-10)	Partially published
	4	243	(8-10)	
	5	583	(8-10)	
Charentes/Gironde				
Saint-Césaire (Charente-Maritime)	Ejop	?	(11-14)	Neanderthal skeleton in upper of two Chatelperronian levels. Analysis underway
Vienne				
Les Cottés[c]	G	464	(15)	
Fontenioux[c]	B	91	(16)	
La Grande Roche		?	(17)	Several rich Chatelperronian levels; few details published
North-Central France				
Châtelperron (Allier)[c] . . .	B	217	(18)	Delporte's excavation
Grotte du Renne	8	?	(19-21)	Numerous superimposed
	9	?	(19-21)	occupation horizons
	10	?	(19-21)	
Pyrenees				
Basté[c] (Basses-Pyr.)	3bm	89	(22-23)	Open-air site
Les Tambourets[d] (Haute-Garonne)	B1	> 600	—	Open-air site complex; not yet published
Cantabrian Spain				
Cueva Morín	10	520	(24-25)	
Cueva de El Pendo	VIII	79	(26)	

[a] Number of retouched tools, according to Sonneville-Bordes/Perrot (1954-56) typology.

[b] Principal sources only. Extensive bibliographical details and discussion are found in Harrold (1978). Good secondary sources for many of these sites include Sonneville-Bordes (1960a), Lynch (1966) and the regional syntheses in de Lumley (1976).

[c] Collections examined by the author.

[d] Portions of these collections examined by the author.

Sources:

(1) Bordes and Labrot, 1967.
(2) Champagne and Espitalie, 1967.
(3) Champagne and Espitalie, 1971.
(4) Jude and Arambourou, 1964.
(5) Gaussen and Texier, 1974.
(6) Delporte, 1976.
(7) Guichard, 1976.
(8) Mazière, 1971.
(9) Raynal, 1975.
(10) Mazière and Tixier, 1976.
(11) Lévêque and Vandermeersch, 1980a.
(12) Lévêque and Vandermeersch, 1980b.
(13) Lévêque and Vandermeersch, 1981a.
(14) Lévêque and Vandermeersch, 1981b.
(15) Pradel, 1961.
(16) Pradel, 1952.
(17) Vandermeersch, 1974, 488-89.
(18) Delporte, 1957.
(19) Leroi-Gourhan, 1959.
(20) Leroi-Gourhan and Leroi-Gourhan, 1964.
(21) Leroi-Gourhan, 1976b.
(22) Chauchat and Thibault, 1967.
(23) Thibault, 1970.
(24) González Echegaray and Freeman, 1971.
(25) González Echegaray and Freeman, 1973.
(26) González Echegaray, 1980.

TABLE 5

Other certain or probable Chatelperronian assemblages[a]

Region and Site	Level	Principal sources
Perigord		
Font-de-Gaume[b] (Dordogne)	4-5	Prat and Sonneville-Bordes, 1969
Laussel[b]	6	Lalanne and Bouyssonie, 1941-46
Roc de Combe-Capelle[b]	A	Peyrony, 1943
La Ferrassie[b]	E	Peyrony, 1934
Le Moustier (lower shelter)[b]	K	Peyrony, 1930
La Rochette[c]	5d/4ab	Delporte, 1962
La Combe[b,c]	4?	MacCurdy, 1914
Correze		
Bos-del-Ser[b]	—	Bouyssonie, 1923; Pradel, 1972
Charentes/Gironde		
La Quina (Charente)	4	Henri-Martin, 1961, 1976
Fontechevade[c]	—	Henri-Martin, 1957
Abri du Chasseur[c]	—	Balout, 1957; Debenath, 1976
Pair-non-Pair[b]	—	Cheynier and Breuil, 1963; Roussot, 1976
Vienne		
Belleroche	1	Laplace, 1966a, 199ff
North-Central France		
Roche-au-Loup[c] (Yonne)	—	Breuil, 1911, 66-70; Leroi-Gourhan, Brézillon, and Schmider, 1976
Germolles[c] (Saône-et-Loire)	—	Combier, 1959
Pyrenées		
Gatzarria (Basses-Pyrenées)	Cjn3	Laplace, 1966b; Lévêque, 1966
Gargas[c] (Hautes-Pyrenées)	3	Breuil and Cheynier, 1954-55
Rachat[c] (Haute-Garonne)	—	Clottes, 1976
Terrier-Ferrage[c] (Hte.-Gar.)	—	Méroc, 1963

[a] Many of these collections represent Chatelperronian assemblages mixed by nature or man with assemblages from other traditions.
[b] Collections examined wholly or in part by the author.
[c] *Probably* a Chatelperronian assemblage.

TABLE 6

Possible Chatelperronian sites[a]

Perigord (Dordogne)

Le Moustier (upper shelter)
Chancelade (Raymonden-Nord)
Abri Blanchard
Abri du Pas-Estret
Bonhomme
Abri des Merveilles
Abri Lartet
Pech de Bourre
La Cavaille
Gour de l'Arche
Cassenade

Charentes/Gironde

Gros-Roc (Charente-Maritime)
Bouil Bleu
La Chaise (Charente)
Les Planes
Edon
La Vernière (Gironde)
Haurets
Cornemps

North-Central France

Grotte du Trilobite (Yonne)
Grotte du Loup
Le Carrouge (Saône-et-Loire)
Abri Virely (Côte d'Or)

Pyrenées

Isturitz (Basses-Pyrenées)
Bidart
Salies-de-Béarn
Villefranche
Gahuzère I (Haute-Garonne)
Montmaurin
Bouzin
Le Portel (Ariège)

[a] For bibliographical and other details, see Harrold (1978); Lynch (1966); Sonneville-Bordes (1960a); regional summaries in de Lumley (1976).

CHATELPERRONIAN LITHIC ASSEMBLAGES

Despite Lynch's (1966) arguments to the contrary, it became abundantly clear during the course of my research that the Chatelperronian is a distinct lithic industry. Later discussion will treat regional and temporal variation among Chatelperronian assemblages, but this section will deal with their common characteristics. The data base used here includes 20 assemblages noted in table 4, including all which I was able to examine (Roc de Combe 8 and 10, Le Piage F1, Trou de la Chèvre 1, 1a, 2, and 2a, La-Côte III, La Ferrassie L3a and L3b, Grotte du Loup 3, 4, and 5, Châtelperron B, Basté 3bm, and Les Tambourets B1), along with the published Morín 10 and El Pendo VIII. These assemblages, ranging in size from 46 to over 600 retouched tools, are sufficiently numerous, and geographically broad and typologically diverse, to yield a good notion of the typological dimensions of the Chatelperronian. Additionally, as table 4 shows, there are a number of important Chatelperronian assemblages (e.g. Grotte du Renne) which I was unable to examine and which are not yet fully reported. It is possible, of course, that future publication of these or of totally new sites may modify generalizations stated here.

Several qualifications apply to the

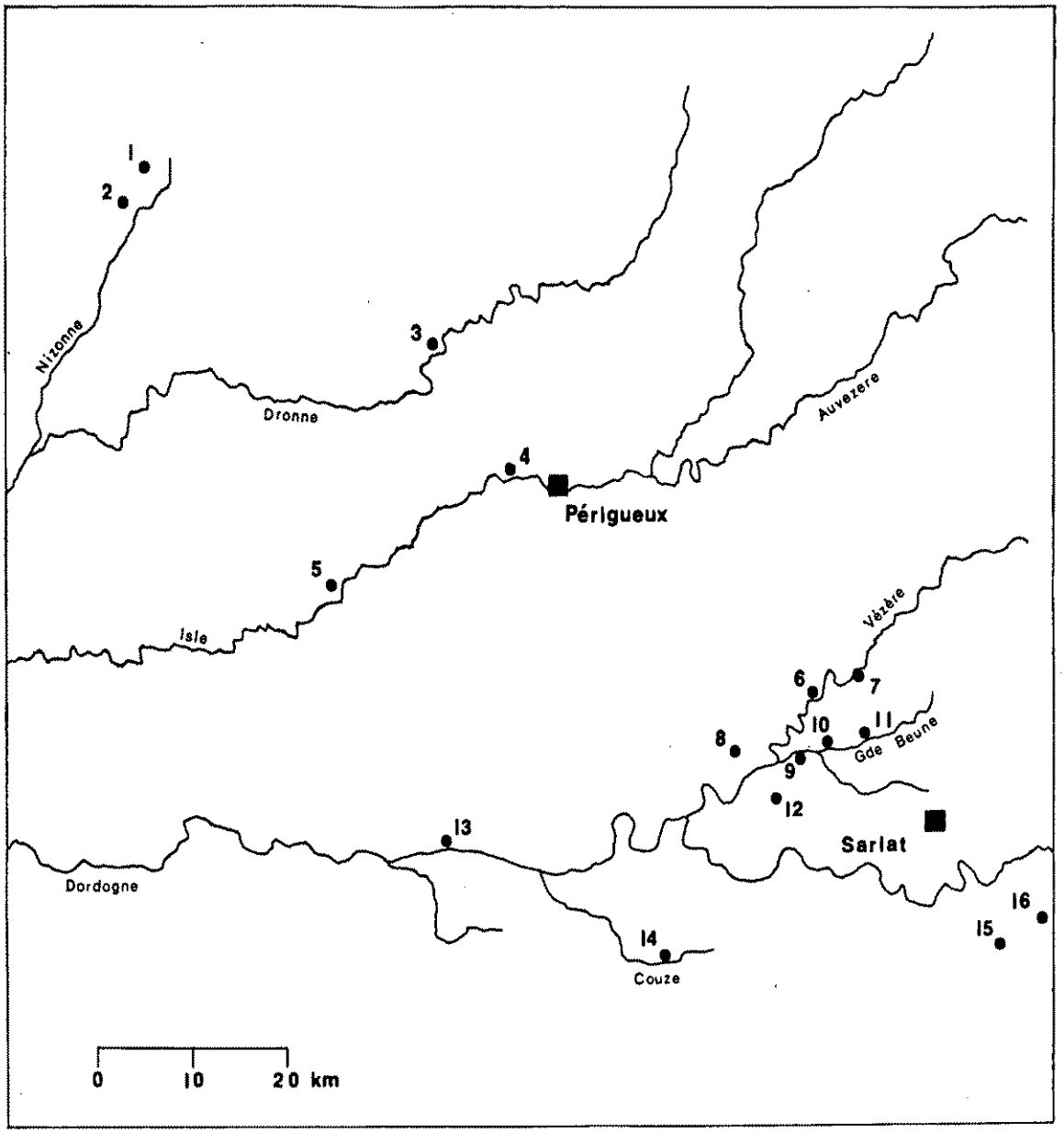

Fig. 2. — Map of certain to possible Chatelperronian sites in or near the Perigord. Key: 1, La Quina; 2, Trou du Cluzeau; 3, Trou de la Chèvre; 4, Chancelade: 5, La-Côte; 6, Le Moustier; 7, La Rochette; 8, La Ferrassie; 9, Font-de-Gaume; 10, Cro-le-Biscop; 11, Laussel; 12, La Combe; 13, Canaule II; 14, Combe-Capelle; 15, Roc de Combe; 16, Le Piage.

20 assemblages treated here. Four fall short of the sample size of 100 which is an arbitrary but widely accepted minimum considered necessary for analysis, while several represent agglomerations of very small assemblages from superimposed occupation levels. Furthermore (and this problem is hardly confined to the Chatelperronian), all of these assemblages are to some degree incomplete samples of

the occupation levels whence they derive, due to partial excavation of sites, or to prior removal of deposits by human or natural causes. The possibility of biased samples must be kept in mind. For example, the collection of 131 tools excavated at Les Tambourets in 1973 by Bricker, which I was able to examine, contained over 27.5 % burins. But the larger 1975 collection (which I have not seen) contains only about 15 % burins (Bricker, personal communication). Thus the proportions of tool types in single Chatelperronian assemblages should be regarded cautiously. Ranges of tool frequencies across several assemblages are more reliable indicators of their general importance than data from one site.

Finally, four anomalous assemblages merit particular attention: La Ferrassie L3a and L3b, El Pendo VIII, and Fontenioux B. Despite the Châtelperron knives and other traits which connect them with the other 16 assemblages, they exhibit features which differentiate them strongly from the others (especially the Gravette points of Fontenioux and the «Mousterian types» — notches, denticulates, and sidescrapers — of the others). Perhaps significantly, three of them fall short of 100 tools. These assemblages will be discussed below again, along with the question of their Chatelperronian status. At best, they might be described as «atypical» Chatelperronian, whose composition sets them apart from the other, «typical» assemblages. These collections, along with three others numbering less than 100 tools, are excluded from table 7, which depicts the variation in proportional representation of major tool classes in the 13 typical Chatelperronian assemblages which contain over 100 tools. Interestingly, however, it was found that the seven excluded assemblages, when included in the statistics of table 7, had marked effects only on the proportions of Châtelperron knives (whose median frequency be-

TABLE 7

Lithic variability among typical Chatelperronian assemblages[a]

Type Class	Frequency range	Median frequency	Present in cases	Most frequent class in cases
Châtelperron knives (types 46,47)	1.9-46.1 %	17.3 %	13	5
Endscrapers (types 1-15) (=IG)	5.1-26.1 %	16.6 %	13	4
Burins (types 27-44) (=IB)	3.1-27.5 %	7.3 %	13	1
Perforators (types 23-26) (=IP)	0-9.6 %	2.9 %	12	0
Backed blades (types 58-59)	0-8.7 %	5.0 %	12	0
Truncated blades (types 60-64)	2.1-15.4 %	6.7 %	13	0
Retouched blades (types 65-66)	0-14.4 %	2.9 %	11	1[b]
Notched pieces (type 74)	0.7-19.2 %	9.1 %	13	1
Denticulates (type 75)	1.0-14.6 %	4.6 %	13	0
Sidescrapers (type 77)	0-14.4 %	2.8 %	12	1[b]

[a] As measured by percentage frequency among Sonneville-Bordes/Perrot Upper Paleolithic types for the following assemblages: Les Tambourets B1, Roc de Combe 8, Le Piage F1, Trou de la Chèvre 1, 1a, 2, and 2a, La-Côte III, Grotte du Loup 4 and 5, Morín 10, Châtelperron B, and Les Cottés G.

[b] At Morín, the most numerous classes were retouched blades and sidescrapers, each with 14.4 % of the total assemblage.

came 11.9 %), denticulates (range 1-20.5 %, median 7.7 %), and sidescrapers (range 0-37.2 %, median frequency 4.6 %). Otherwise, inclusion of the seven groups had minimal effect.

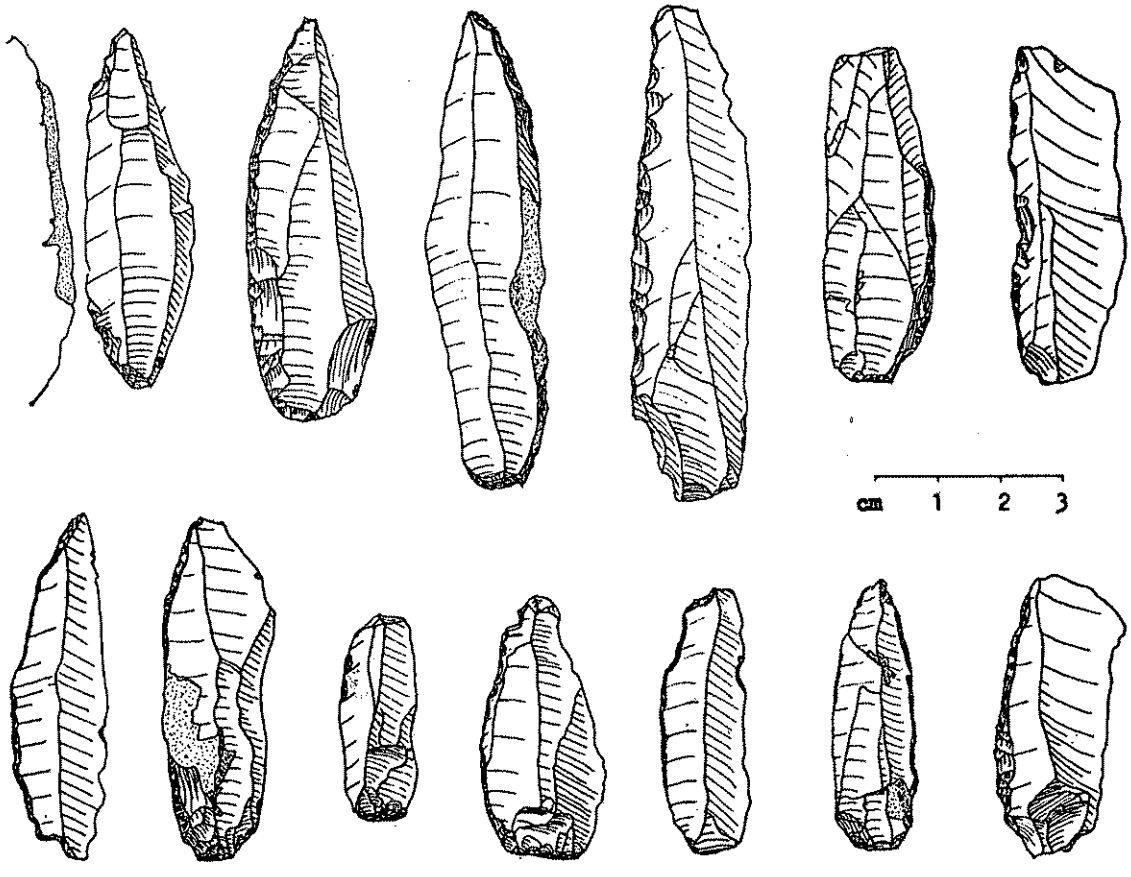

Fig. 3. — Châtelperron knives from Roc de Combe, couche 8.

Due to the general scope of this article, discussion of Chatelperronian assemblages (based mainly on data presented in table 7) will primarily emphasize gross typological groupings of Sonneville-Bordes/Perrot Upper Paleolithic types (such as the endscraper and burin indexes), though some finer distinctions are made. Its aim is to draw the main outline of Chatelperronian assemblage variability.

Two tool classes found in all assemblages clearly tend to predominate. The curved, backed fossil director of this tradition, the Châtelperron knife, has the broadest frequency range of any tool class, and is nearly always an important component (see figure 3 for illustrations of Châtelperron points, and Figure 4 for other tool classes discussed here). In three cases, however (Les Tambourets, Morín, La Chèvre 1a) they comprise less than 5 % of the total.

About equally important are endscrapers, with a narrower range of variation (in 9 cases of 13 they are between 9.6 % and 23 %). Simple endscrapers (types 1-7) clearly predominate (range 3-14 %, me-

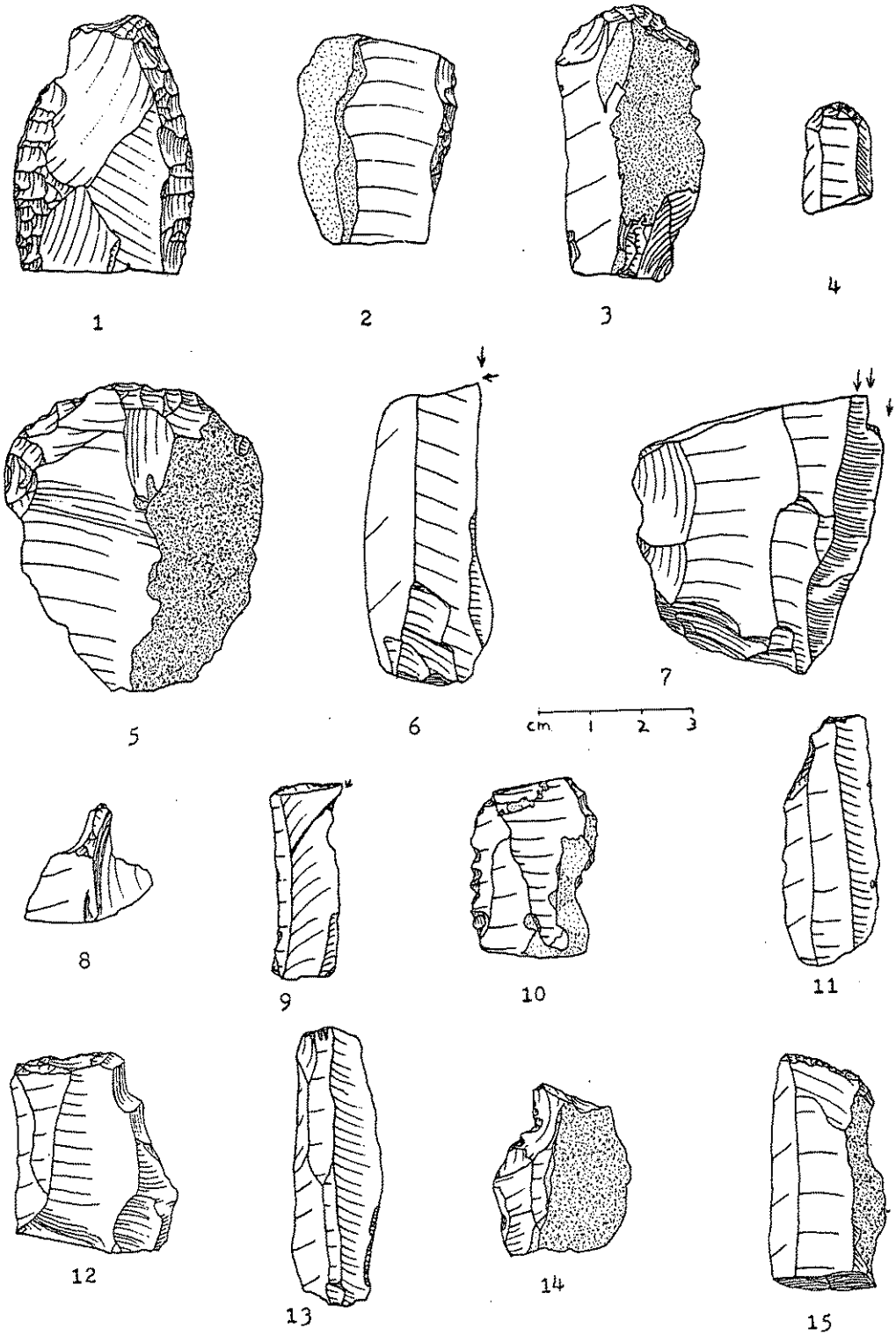

Fig. 4. — Tools from Roc de Combe, couche 8: sidescrapers (1, 2), endscrapers (3-5), burins (6, 7, 9), perforator (8), denticulate (10), backed blade (11), truncated blades (12, 15), retouched blade (13), notched piece (14).

dian frequency 8.6 %) over either endscrapers on flakes (types 8-10; range 1.8-9.6 %, median 4.2 %), or keeled and other thick scrapers (types 11-13 and 15), which range from 0 to 7.4 % (median 1.4 %).

Burins are important and always present, but usually markedly less numerous, numbering in 10 cases between 3 % and 15 %. Only in the 1973 Les Tambourets assemblage are they the most numerous class; but as discussed above, subsequent excavation markedly lowered their proportion. The next-greatest frequency of burins is 20.3 % at Châtelperron. Dihedral burins (range 1.8-24.4 %, median 4.5 %) consistently predominate over burins on truncation (range 0.6-5.2 %, median 1.6 %), outnumbering them in 11 of 13 cases. Interestingly, this tendency is like that cited by Sonneville-Bordes (1960a) for the Aurignacian in the Perigord, and unlike that in the Upper Perigordian. Bordes, however, pointed out (personal communication) that valid Perigordian IV assemblages were few in number at that time (1960); at least several such assemblages at the Upper Perigordian site of Corbiac have dihedral burins predominant over truncation burins, as do the two oldest Upper Perigordian assemblages from the Abri Pataud (Bricker 1973). This ratio is thus a poor discriminator between Aurignacian and other assemblages.

Similar in importance to burins are truncated blades, always present but never the predominant class. They exceed 10 % of only one assemblage (15.4 % at La-Côte). Backed blades, and retouched blades (less than 5 % in 10 cases) are next in descending order of importance, followed by perforators and becs. These four classes are always or nearly always represented, but usually at frequencies below 10 %.

These last three of the main implement classes — notches, denticulates, and sidescrapers — are also constant, and usually important, assemblage components. Their frequency is rather higher than in other Upper Paleolithic traditions, but they are far from dominant, as has been thought in the basis of mixed collections such as La Ferrassie E and Le Moustier K. In table 7, notches, denticulates, and sidescrapers exceed 10 % representation in 6, 5, and 2 cases respectively. Their frequencies are notably higher in three excluded assemblages (from La Ferrassie and El Pendo), to be discussed below.

The 10 categories of stone tools listed above comprise the bulk of any Chatelperronian assemblage — never less than 77 %, except at the Grotte du Loup (for reasons discussed below). These types occur, even including rare Châtelperron knives, in other Upper Paleolithic traditions, but not in the distinctive range of frequencies seen here.

Other types occur more sporadically. *Pièces esquillées* — which are unlikely to be deliberately manufactured tools — are found occasionally, except in the three assemblages from the Grotte du Loup, where they range from 43.7 % of the assemblage in level 3, to 23.2 % in level 5. Raclettes are reported in 6 cases (including all four levels at Trou de la Chèvre, where cryoturbation may have produced some of them). Audi knives (range 0-4.9 %) are found in 9 assemblages. These backed knives, which look like Châtelperron knives transposed onto flakes, have been seen as evidence of the Mousterian-Chatelperronian transition (Breuil, 1911, 75), but in fact are not often encountered in the Mousterian, except at the little-known Abri Audi (Peyrony 1909).

Other tool types are noteworthy for

their absence or rarity in Chatelperronian assemblages. Lacking entirely are Sonneville-Bordes/Perrot types nos. 20, 50-53, 55, 56, 68-72, 79-84, and 86. Although numerous endscrapers and some thick scrapers have been noted, Aurignacian fossil directors are not numerically important. Sonneville-Bordes' Aurignacian Group (types 4, 6, 11-13, 32, 67, 68), or GA, ranges from 0 (in three cases) to a maximum of 6.5 % (at Morín) in the cases shown in table 7. Dufour bladelets, characteristic of the Aurignacian 0, occur in four cases (range 0-1.4 %), and such Classic Aurignacian types as strangulated blades or busked burins are absent or very rare.

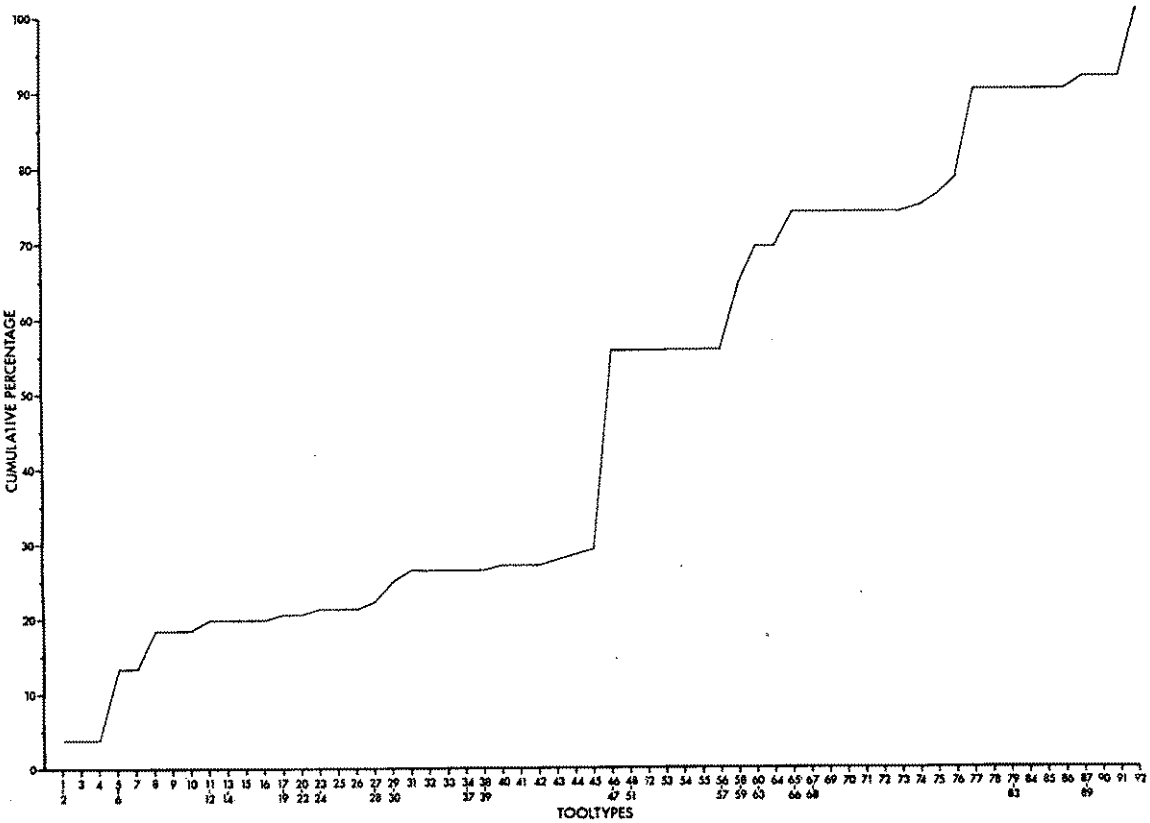

Fig. 5. — Cumulative graph, La Piage couche F1 (131 retouched tools).

The situation regarding Sonneville-Bordes' Perigordian Group (types 45-64, 85-87), or GP (range 7.5-55.8 %), is more complex. Some of this group's components (Châtelperron knives, backed blades, truncated blades) are highly characteristic of the Chatelperronian. Others are typical of Upper Perigordian industries and are rare or unknown in the Chatelperronian. For instance, the 20 assemblages discussed here contain a total of 3 Noailles burins, 2 flechettes, and no Font-Yves or tanged points. Except for Fontenioux (discussed below), only 2 Gravette points (one atypical) derive from these Chatelperronian contexts.

Finally, and not surprisingly, fossil directors of the Solutrean and later Upper

Paleolithic industries are entirely lacking.

To summarize, Chatelperronian assemblages are distinguished by a set of tool classes, dominated especially by Châtelperron knives and endscrapers, which co-occur within distinguishable limits, as well as by the near- or total absence of types characteristic of other industries.

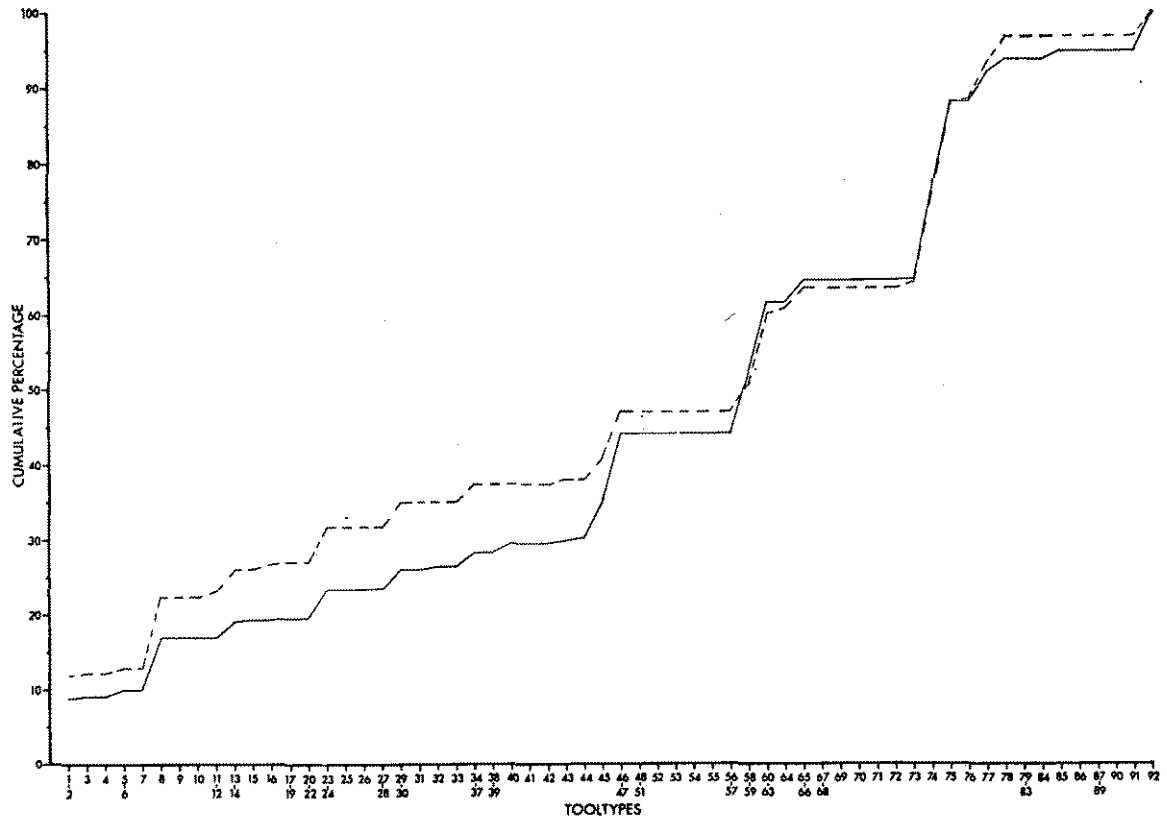

Fig. 6. — Cumulative graphs, Trou de la Chèvre levels 2 (solid line, 342 tools) and 2a (broken line, 302 tools).

Though I was unable in several cases to examine unretouched flakes and blades, or cores and waste flakes, some remarks on other aspects of Chatelperronian technology are in order. Like other archaic Upper Paleolithic industries, the Chatelperronian exhibits a considerable range in workmanship and refinement of its artifacts, from the usually stumpy blades and sometimes crude implements of Trou de la Chèvre and Châtelperron, to the often slender blades and carefully retouched tools at Les Cottés and Canaule II. The quality of raw material is an important, if not exclusive, factor in this variation (as in the examples just mentioned). Flint, of quality from poor to excellent, is the main raw material, but chert, jasper and quartzite are also encountered, and even sandstone, limestone, and quartz.

Debitage is undeniably Upper Paleolithic in nature, as measured by the proportion of flakes which are prismatic blades among retouched tools only (IL), or among all pieces (ILt). The IL for 11 typical Chatelperronian assemblages (all

those for which data were available) ranged from 39.3 to 87.2 with a median frequency of 57.7. The ILt for the same sample ranged between 25.3 and 79.7 (median 62.4).

Similarly, of 524 cores recovered from 11 typical Chatelperronian assemblages, 281 (53.6 %) were prismatic blade cores; the range for individual assemblages was from 35.8 % to 75 %. Some 141 of them (26.9 % of the grand total) were blade cores with two opposed striking platforms (range, 17.6 % to 38.5 %). According to Bordes (1968b), arguing for Chatelperronian-Upper Perigordian continuity, such cores are found in the Upper Perigordian (with unreported frequency) but not in the Aurignacian. In any case, they comprise an important proportion of Chatelperronian cores, about half of all blade cores.

Bone industry, other artifacts, and features

Chatelperronian bone artifacts are seldom impressive in quantity or quality, though exceeding what is usually found in Mousterian contexts. Only 7 typical Chatelperronian sites, and Fontenioux, are known to have yielded bone artifacts (see table 8). This paucity can only partly be explained by the occurrence of several sites in sandstone caves (Grotte du Loup) or open-air contexts where bones are not

Table 8

Chatelperronian bone artifacts

Sites:	A	B	C	D	E	F	G	H
Types								
Points	1	X[a]				X		
Awls/needles			4		X	XX	X	X
Lissoirs		1			X			
Baguettes						XX		
Digging tools						20		
Miscellaneous tools	2		2		X	X		1
Pierced or grooved teeth or bones			1	X	2	XX		
Pendants					2	XX		
Plaques					1			
Incised pieces			2			XX		1

[a]X = present
XX = numerous

Sites:

A = Trou de la Chèvre
B = Laussel
C = Roc de Combe. c. 8
D = Grande Roche
E = Châtelperron
F = Grotte du Renne, c. 9 and 10
G = Les Cottés
H = Fontenioux

preserved. The Chatelperronian simply has a mediocre bone industry, particularly in the south. The northerly sites of Grotte du Renne and Châtelperron have the richest industry, while none at all is yet verified to the south of the Perigord. *Batons de commandement,* split-base bone points, or tools incised with depictions of animals are unknown. Perhaps the artifacts closest to being a diagnostic Chatelperronian bone type are the digging tools from the Grotte du Renne, fashioned from the ribs of large animals.

A broad category of artifacts of great interest is the set of items indicative of artistic, decorative, or other symbolic behavior. Their relative abundance in the Upper Paleolithic, and absence in the Mousterian, has long been regarded as an important difference between the two. Several of these items are found in table 8. The grooved or pierced teeth and pendants from four sites were presumably for body decoration. Mollusc shells, pierced for suspension, were found with the Combe-Capelle burial, but cannot be certainly associated with the Chatelperronian (see discussion below). At the Grotte du Renne, a stalagmite fragment was found, grooved as if for suspension.

Ocher and other mineral coloring materials are known from the Mousterian, and almost ubiquitous in the Chatelperronian. In several cases — Grotte du Renne 10 and 9, Grotte du Loup 5, Châtelperron, and Fontenioux — ocher fragments and powder were so thickly abundant as to stain occupation levels. Grinding stones for ocher were also found at the Grotte du Renne, along with several enigmatic fist-sized balls of ocher, studded with flint flakes and, in one instance, a bone fragment.

While ocher is abundant, no direct evidence of artistic production is yet known. It is interesting to note, however, that the transitory Chatelperronian occupation at Font-de-Gaume was nearly 100 meters deep in the cave. A connection between this occupation and any of the cave's parietal art cannot be established, but at the same time, a purely utilitarian explanation for such a deep penetration, far from daylight, seems improbable.

Several pieces of bone at Roc de Combe (c. 8) and the Grotte du Renne (levels 10 and 9) are incised with *marques de chasse,* small, apparently ordered markings similar to those interpreted by Marshack (1972) as notational systems. However, they have not been intensively studied. Also reported are a limestone plaque from the Grotte du Renne and a bone one from Roc de Combe, both with rectilinear incisions. Finally, fossil molluscs, presumably collected and conserved, are known from the Grotte du Renne and Trou de la Chèvre.

The artifacts of this general class are less impressive than those from the later Upper Paleolithic; but at the same time, they exceed what is found in Mousterian contexts, and are roughly comparable to those from the contemporary Aurignacian 0.

Archeological features of various sorts are found, though not abundantly, in the Chatelperronian. Identifiable hearths, as distinct from occupation levels discolored by ash and charcoal, are reported from Trou de la Chèvre (level 1), Grotte du Renne (levels 10 and 9), and the Grotte du Loup (c. 4 and perhaps 5).

Structures are known in only two cases. At the Grotte du Renne, the only certain remains of habitation structures from the Chatelperronian — and the earliest reported from the Western European Upper

Paleolithic — are found in levels 10 and 9. They were apparently huts, reconstructed several times during the accumulation of the levels. It is unclear from the principal reports (Hours, 1965; Leroi-Gourhan, 1961, 1976a; Movius, 1969a) how many there were at any one time. They tend to be vaguely elliptical or circular, some 3-4 meters in diameter, with several peripheral postholes (in one case, 11), which average 10 cm. in diameter, and 15 cm. in depth. These postholes had held, at least sometimes, mammoth tusks and perhaps femora (probably used because wood was scarce), which evidently served as structural supports. The hut interiors are usually marked by one or two hearths (some of which contained river pebbles, and ocher lumps in various states of calcination), as well as partial «pavements» of flat limestone slabs; hard-packed ocher-stained floors; and grindstones, some used for ocher. Phalanges of fur-bearing carnivores found inside the huts have been interpreted as evidence of animal skins. Thus several probable uses for the structures are suggested: food preparation (hearths with pebbles), sleeping and/or clothing manufacture (skins), and, probably, non-utilitarian activities involving ocher. These remarkable structures are without contemporary parallels in Western Europe; their closest analogues appear to be certain Middle Paleolithic and, especially, Upper Paleolithic structures of mammoth bone from the USSR (Klein, 1973). Interestingly, no such huts are found in overlying level 8; its only feature is a small pit filled with reindeer bones.

In couche 5 at the Grotte du Renne, Mazière reports a puzzling feature consisting of several large, flat sandstone blocks resting horizontally atop a thin charcoal-rich horizon. It is not yet apparent whether this structure, probably only partially uncovered, represents a sort of hearth, a pavement, or even part of a habitation structure.

A potentially fruitful avenue of site study (e.g., Van Noten *et al.* 1980) involves spatial analysis of the relationships among features and different artifact classes, and attempts to refit blades and flakes to their original cores or parent pieces. There is some indication that this sort of analysis could supply information about how Chatelperronian sites were used by their inhabitants. At the Grotte du Loup (c. 5), for example, Mazière and Tixier (1976, 1282-83) report that tools associated with the structure mentioned above were generally found whole, while those in the central part of the site, presumably with more human traffic, were usually found broken, with fragments of the same artifact often meters apart.

Open-air sites are less cramped than most caves and rock shelters, and their occupations are often more transitory. It could be expected that as a consequence, different activity areas would tend to be more sharply segregated, and their residues less subject to blurring by long or repeated occupations than in caves. These expectations seem to be borne out at three open-air Chatelperronian sites, Les Tambourets, Basté, and Canaule II. In each, the excavators have reported not only marked spatial clustering of artifacts, but also differing spatial distributions of different artifact types. Unfortunately, in each case the excavated area is only a small proportion of the entire site; however, the Canaule II and Tambourets spatial analyses are not yet published, so more information may be forthcoming.

GEOGRAPHIC RANGE AND VARIATION

This section will discuss both the geographic extent of Chatelperronian industries, and local variation within these boundaries.

Enough data exist to outline a fairly clear pattern of Chatelperronian geographical distribution. The 35 certain and probable Chatelperronian sites listed in tables 4 and 5 occur mostly in southwestern and central France (see figures 1 and 2). More specifically, they are most common in «classic» southwestern France, the Perigord and its environs. A second concentration of sites is found from the central French Pyrenees and their foothills west to the Atlantic, and extending into Cantabrian Spain. A somewhat more diffuse distribution occurs in central and north central France, especially in the basin of the Vienne River, skirting the northern edge of the Massif Central, and reaching to the edge of the Paris Basin (at Arcy-sur-Cure). Even if all 33 possible Chatelperronian sites listed in table 6 are added to those from tables 4 and 5, the geographical area covered remains almost the same, expanding only slightly.

The Chatelperronian has a more restricted distribution than many other Upper Paleolithic traditions (notably, the Aurignacian). There is no compelling evidence for its existence in Mediterranean France or Catalonia, the eastern Pyrenees, the Massif Central, or any areas north of the Grotte du Renne or east of France (Harrold, 1978). Claims for occurrences in these areas were found generally to involve either non-Chatelperronian industries, as at the Grotta del Cavallo in Lecce province, Italy (Palma di Cesnola, 1965-66), or isolated occurences of one or two pieces described as Châtelperron knives or points, as at Reclau-Viver in Gerona, Spain (Soler, 1979; Estévez, 1976).

Within the general sphere outlined above, some regional peculiarities can be pointed to, despite the ever-present problems of samples which are too small, incomplete, or otherwise biased.

The Perigord

Given its great wealth in Paleolithic remains, it is hardly surprising that this area has the greatest number of known or suspected Chatelperronian sites (see tables 4, 5, and 6). Unfortunately, many collections from the Perigord, including those from classic sites such as Le Moustier and Combe-Capelle, are from old excavations, and are mixed or otherwise unsuitable for analysis. In suitable collections, no simple trends emerge, but there are some possible variations at an even smaller, local scale.

In the extreme southeast of the region (in the department of the Lot), the three assemblages from the nearby sites of Roc de Combe and Le Piage share high proportions of endscrapers and Châtelperron knives, and fairly low frequencies of other types (see fig. 5 for a cumulative graph of the Le Piage assemblage). In the northwestern Perigord, the four assemblages from Trou de la Chèvre share high frequencies of endscrapers (including thick scrapers), notches, and denticulates, but relatively low numbers of Châtelperron knives (9 % or less), burins (7 % or less), and retouched blades (2.9 % or less) (see figure 6 for a cumulative graph of levels 2 and 2a). Some of the keeled scrapers,

notches, and denticulates reported from these levels are no doubt geofacts produced by cryoturbation at the site, rather than artifacts (Bordes, personal communication), but my examination of the assemblages found relatively few geofacts among these types.

For most of the classic sites in the Vézère locality of the Perigord, we lack the information to characterize their Chatelperronian assemblages. One exception, however, is La Ferrassie. Level E, from Peyrony's (1934) excavations, was once the type assemblage for the Chatelperronian; but it came to be realized (by Peyrony and others) that the Level E collection is in fact a melange, due to cryoturbation, of materials from a Chatelperronian and a much richer underlying Mousterian level or levels.

Delporte's excavations at La Ferrassie, from 1968 to 1973 (which also included a restudy of the stratigraphy and sedimentological analysis by Laville) involved a relatively small but important area of the site, pushing back both the transverse and sagittal profiles left by Peyrony. Delporte, too, found that the Chatelperronian deposit (in the couche now designated L in Laville's revised stratigraphy) was badly affected by cryoturbation. But he reports that there were two thin undisturbed layers of limited extent, L3a and L3b, which contain unique assemblages, as well as a deeper level, M1a, with a very poor assemblage (20 pieces) which, except for three Châtelperron knives, appears typically Mousterian (though too small to characterize much further).

Levels L3a and L3b (containing, respectively, 69 and 156 retouched tools), are dominated by Mousterian types; sidescrapers number over 26 % and 37 % in the two assemblages, and notches and denticulates are also frequent. Upper Paleolithic types are also represented, especially endscrapers (18.8 % and 9 %) and Châtelperron knives (8.6 % and 7.0 %). The cooccurrence of typically Upper Paleolithic blade tools with numerous sidescrapers and other flake tools is striking. Delporte (personal communication) holds that this sequence of three levels is evidence for a gradual cultural transition from Middle to Upper Paleolithic, in which blade tools appear in M1a and gradually become more numerous. Certainly the M1a assemblage appears Mousterian except for the Châtelperron knives, and the L3b assemblage has a greater proportion of Mousterian types than the younger L3a; it includes a broken Mousterian point and some 30 Levallois flakes, while notches, denticulates, and sidescrapers combined comprise 74.8 % of the assemblage (in the Sonneville-Bordes/Perrot typology). These facts are consistent with Delporte's hypothesis.

Are there other possible explanations for the characteristics of these assemblages? Two alternatives present themselves. One is sampling error, the possibility that the assemblages recovered do not represent well the levels from which they derive. It must be noted that the assemblages derive from a relatively small area of the site, and that furthermore, two of them fall well below 100 tools in size — slim evidence upon which to base a developmental sequence. On the other hand, the larger L3b assemblage is by itself a stronger candidate for a transitional industry.

Another possibility is that the collections are mixtures of material from different levels, due to the cryoturbation known to have affected many of the deposits of that age at La Ferrassie. Unfortunately, Laville's detailed stratigraphic and sedimentological study of the site did

not extend to levels L and M and so cannot be brought to bear on this problem. There are a number of pieces with abrupt and alternating retouch (numbers 46-50 in Bordes' Middle Paleolithic typology), known sometimes to be products of cryoturbation, in L3a and L3b. But at the same time, these assemblages did not exhibit the widespread crushing which often results from that process. It should be noted as well that many of the sidescrapers recovered from L3a and L3b exhibit Quina or demi-Quina retouch (by my count, 11 of 18 examples from the former assemblage, and 17 of 58 from the latter). Such retouch is not characteristic of the Chatelperronian, nor of the Mousterian of Acheulean Tradition (the Mousterian facies most often proposed as the antecedant of the Chatelperronian), but it does occur very often (along with Levallois flakes) in the Ferrassie Mousterian underlying these deposits, in Peyrony's level D.

On the other hand, the excavator of the site is sure that the assemblages were recovered from intact deposits, in a part of the site unaffected by cryoturbation. Final judgements must await publication of these levels, but in the meantime, La Ferrassie presents the best case to date for direct filiation between Mousterian and Chatelperronian.

Little can be noted about other Chatelperronian peculiarities in this region, except the presence of «La Gravette» endscrapers (endscrapers on large flakes, often with the worked edge at a right angle to the axis of the flake) at Canaule II.

Corrèze

Only one well-documented Chatelperronian site is known from this region. At the Grotte du Loup, the most striking aspect of the three Chatelperronian assemblages is the extraordinary abundance of *pièces esquillées* (43.7 % of the assemblage from couche 3, 33.3 % in couche 4, and 23.2 % in couche 5). The reason for the frequency of these enigmatic pieces remains unknown. However, they are also numerous in the Aurignacian and Perigordian of the Corrèze (Mazière, personal communication), an example of a practice in lithic technology in one area which transcended boundaries between culture-stratigraphic units. At Bos-del-Ser — whose lithic collection, as Bordes (1963) has argued, is probably a melange of Chatelperronian and Aurignacian — Bouyssonie (1923) reported some 500 *pièces esquillées* among 5500 tools.

Another local peculiarity, shared by some specimens from both the Grotte du Loup and Bos-del-Ser, is Correzian retouch — fine, rather than thick, backing on many Châtelperron knives and other backed pieces.

Charentes and Gironde

As tables 4-6 indicate, a number of certain and probable Chatelperronian sites are known from these departments to the west of the Perigord, but published data are still inadequate for the characterization of any of the industries, except for the famous site of La Quina. There, Henri-Martin (1961, 1976) reported a Chatelperronian assemblage (which I was unable to examine), with high frequencies of keeled scrapers and denticulates. It is thus reminiscent of Trou de la Chèvre, some 30 kilometers to the east. However, here, too, it is likely that at least some of these pieces are geofacts created by cryoturbation (Debenath, 1976).

Vienne and environs

In this area, two important sites are located within 400 meters of each other. Les Cottés and Fontenioux. A third rich and multi-level site, Grande Roche, is in the same department, but discussion of it must await publication of Levêque's excavations.

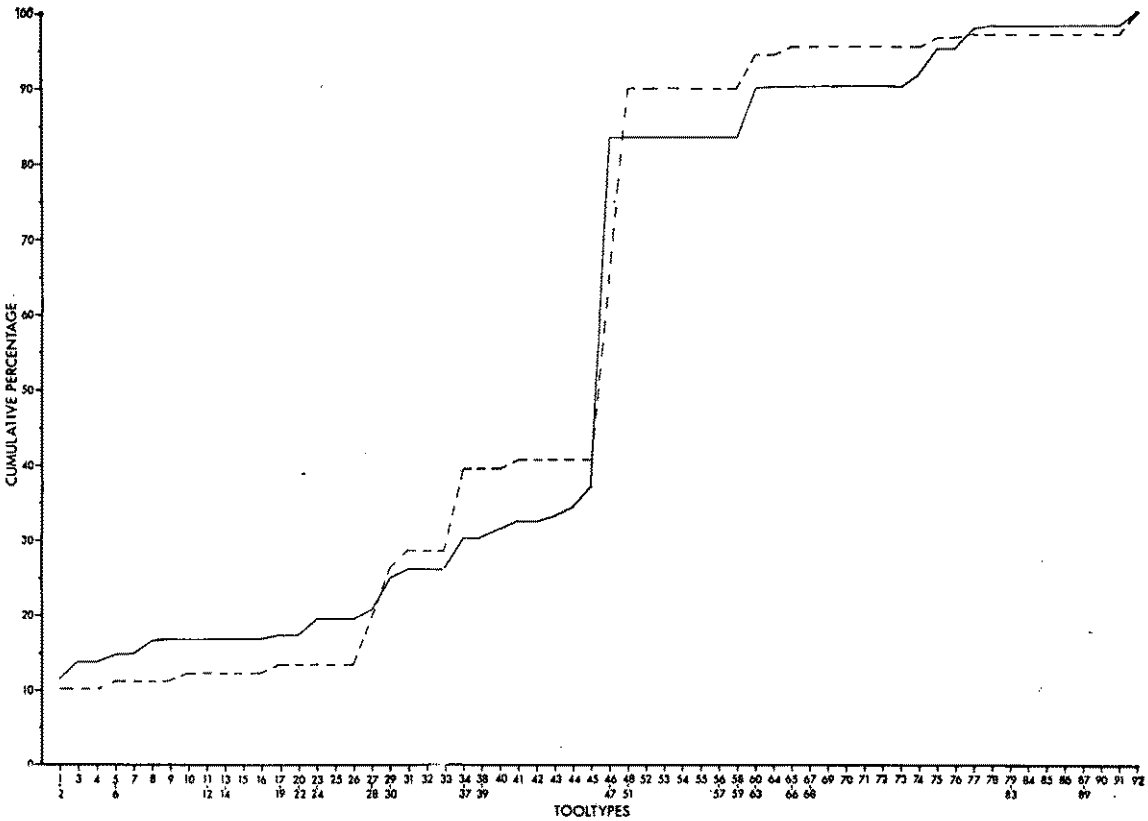

Fig. 7. — Cumulative graphs, Les Cottés couche G (solid line, 464 tools) and Fontenioux couche B (broken line, 91 tools).

The assemblages in question from Les Cottés (couche G) and Fontenioux (couche B) are distinctive and similar in several respects (see figure 7 for their cumulative graphs). Made largely from local flint of high quality, both are characterized by excellent workmanship and well-made tools on long blades. The laminar index is high in both cases (IL = 83 at Les Cottés, 94.5 at Fontenioux). Both assemblages are dominated by backed knives or points, endscrapers, and burins, with other tool types few or absent. And in both cases, some obliquely truncated blades feature such acute angles of truncation that they resemble incomplete Châtelperron knives.

But there are notable differences between the two assemblages as well. The Les Cottés collection (464 tools) is one of the largest Chatelperronian assemblages, while Fontenioux B numbers only 91

tools.[1] The other differences lie in the ratio of burins to endscrapers (nearly equal at Cottés, but 27.5 % to 12.1 % at Fontenioux), and in backed knives or points (simple backed blades are absent at both sites). The 228 such pieces at Les Cottés (49.1 % of the assemblages) include 13 Audi knives, 214 Châtelperron knives (including the more slender examples termed Cottés points by Pradel), and one straight-backed piece best classified as a Gravette point. At Fontenioux, the 45 backed pieces (49.5 % of the total) exhibit a range of continuous variation unlike that found in any other known assemblage: from typical Châtelperron knives to unequivocal (if large) Gravette points, and including many pieces of intermediate morphology.

While the Les Cottés assemblage fits fairly well into the range of variation of the typical Chatelperronian assemblages of table 7, the Fontenioux collection does not, mixing two fossil directors normally not found together, Gravette points and Châtelperron knives. The Les Cottés and Fontenioux assemblages have been interpreted as representing two successive steps in the evolutionary link between Chatelperronian and Upper Perigordian (e.g., Pradel, 1953, 1961, 1970; Bordes, 1968b; Sonneville-Bordes, 1960a, 176-77; Movius, 961). However, this opinion has not been unanimous (Daniel, 1952; Delporte, 1955a), and one can point to a lack of resemblance between Fontenioux and Perigordian IV assemblages such as those from Abri Pataud on several points, especially the lack of Upper Perigordian types other than Gravette points (e.g., type numbers 50-59). Of course, the small size of the Fontenioux collection is also an obstacle to comparison and interpretation. Finally, we still lack radiocarbon dates or climatostratigraphic studies to tell us just how old this assemblage is, and whether it really is, as would be expected in the interpretation mentioned above, older than known Upper Perigordian levels and younger than Chatelperronian ones. Thus, we cannot say with certainty where the Fontenioux B assemblage fits; if it is to be provisionally called Chatelperronian on the basis of its Châtelperron knives, then it is certainly not a typical Chatelperronian assemblage. Like the Aurignacian V assemblage at Laugerie-Haute, it is anomalous.

Allier and Yonne

The eponymous site of Châtelperron is, ironically, isolated; the nearest confirmed Chatelperronian site is at Arcy-sur-Cure, some 130 kilometers to the north. However, the closest resemblances of the Châtelperron B assemblages are to those from Vienne to the west. Like Cottés G and Fontenioux B, the Châtelperron assemblage has a high laminar index (IL = 87.2) high proportions of Châtelperron knives (30.2 %) and burins, and low frequencies of «Middle Paleolithic» tools. It has been described as evolved (Combier, 1955, 603). Unfortunately, the collection is an amalgamation of several archeological levels from the small proportion of the site found intact by Delporte, and its comparative value is thus limited.

The Grotte du Renne at Arcy-sur-Cure is the most northerly Chatelperronian site, and in several ways the most remarkable. I was unable to examine its collections, and a final publication is still awaited,

1. Sonneville-Bordes count of this assemblage (1960a: 262) found 78 tools; the reason for this discrepancy, mostly in numbers of burins and backed pieces, is uncertain.

but considerable information is available from a series of reports already issued (see table 4).

Underlying the Chatelperronian at the Grotte du Renne in couches 12 and 11, and ocurring at the nearby Grotte de l'Hyène, is an industry characterized by Leroi-Gourhan as Post-Mousterian, transitional between Mousterian and Chatelperronian. However, Girard's (1974) study has characterized the Post-Mousterian of the Grotte de l'Hyène as a Mousterian, rich in sidescrapers and naturally-backed knives.

The Chatelperronian occupation levels at the Grotte du Renne are grouped by Leroi-Gourhan into two main ensembles, that of couches 10 and 9, and that of couche 8. Although no fully-quantified description is yet available, it is noted that Châtelperron knives and sidescrapers (often, small triangular «pediform» examples) are numerous, and endscrapers, burins, composite tools, and *pièces esquillées* are present, along with an impressive bone industry. The heavy deposits of ocher and the structures discussed above are from this complex of several separate occupation horizons.

Overlying couches 10 and 9 is couche 8, with a distinctive industry; along with well-made Châtelperron knives, and more small sidescrapers, the rest of the industry consists mostly of crude denticulates and raclettes. The bone industry is scanty, and no structures were found. It may be that this industrial change reflects a shift in the way in which the cave was used by human groups (i.e., on a more sporadic basis). Hyena remains are also found in couche 8, as though occasional human occupation alternated with use by carnivores.

Leroi-Gourhan (1968) has noted that the small sidescrapers of the sort noted above are not confined to the Chatelperronian at the Grotte du Renne, but are also found in the Mousterian, and in succeeding Upper Paleolithic levels. Thus we find an analogy to the *pièces esquillées* of the Corrèze, in which at least some local toolmaking habits survive industrial shifts.

Pyrenees

This area, from foothills to mountains and from the Bay of Biscay to the central Pyrenees, was probably an important locus of human activity during the Chatelperronian; 14 possible to certain sites are known (see tables 4-6). But in most cases, little can be said about the assemblages involved. Only three instances are thoroughly reported, and one of those, Gatzarria, probably involves a melange between a Chatelperronian and a Mousterian level, due to cryoturbation (Laplace, 1966b, 124).

The other two instances are both open air sites, Basté near Biarritz and Les Tambourets near Toulouse. The two assemblages share several traits: sampling problems because of their origins in small sectors of large sites; often poor raw material and resulting crude appearance; relatively low frequencies of Châtelperron knives (11.1 % at Basté and only 3.9 % at Les Tambourets), and fairly high proportions of endscrapers and burins. Considering the amount of flaking debris and cores recovered, both sites probably served, at least to some extent, as workshops or *ateliers de taille*.

The Basté assemblage contains only 89 retouched tools, including a chopping tool and six choppers, the only report of such artifacts from the Chatelperronian.

I examined from Les Tambourets the 131 tools excavated in 1973; Bricker recovered over 500 more in 1975. Additionally, he has studied the large and unpublished collections from the surface and from cuttings made by L. Méroc over the years in the neighborhood of the site. Les Tambourets is part of a complex of open-air sites, including Rachat and Terrier Ferrage, near the confluence of the Garonne and Volp rivers. These sites are evidently the result of many separate, probably transitory, occupations of the same general area over a long period of time. This contrasts with Canaule II in the Perigord, which was the only Chatelperronian site found in a complex of open-air stations. Appearance of both of Bricker's analyses will greatly increase our knowledge of this important locality.

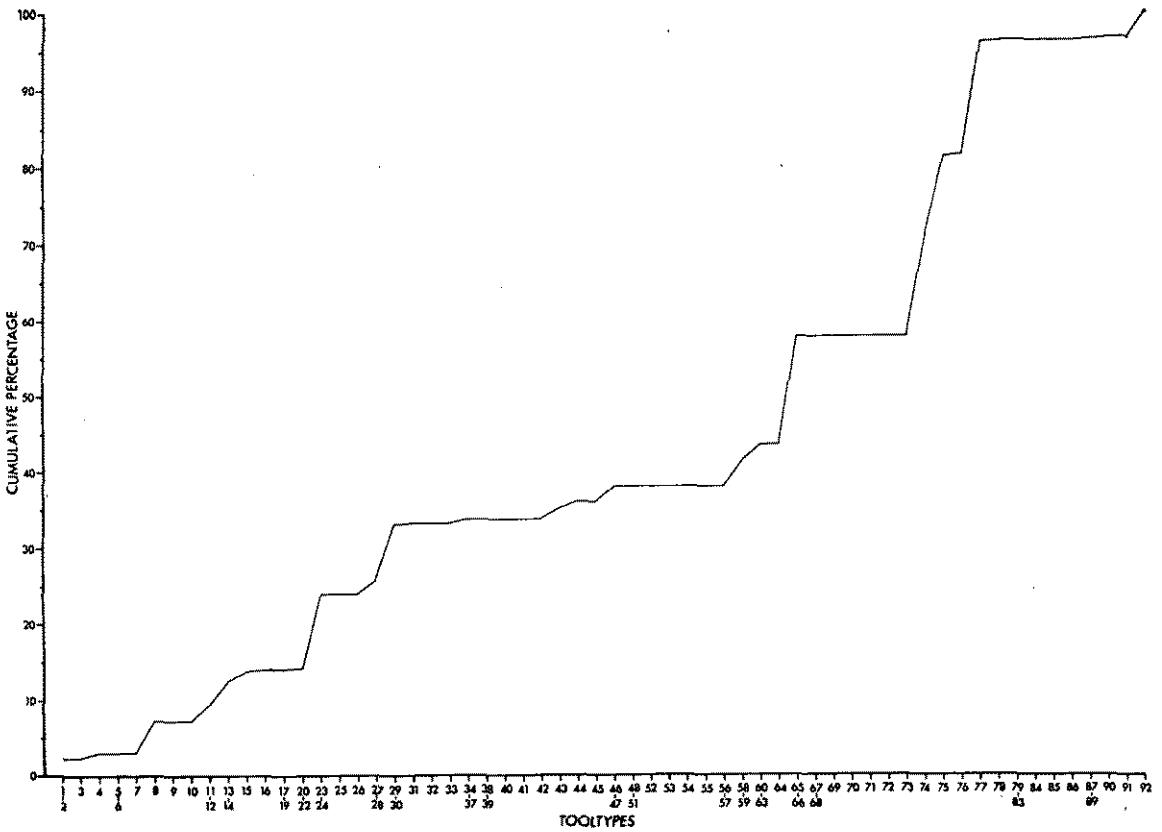

Fig. 8. — Cumulative graph, Cueva Morín level 10 (520 tools).

Cantabria

The Chatelperronian of Cantabrian Spain was verified only in the 1960's, and is still known from only two sites, Cueva Morín (level 10) and El Pendo (level VIII). The Morín assemblage is large (520 tools) and notable for its abundance of both retouched blades and sidescrapers (each comprising 14.4 % of the assemblage), as well as comparable numbers of endscrapers, burins, notches, denticulates, and perforators and becs, while Châtelperron knives are few (only 1.9 %). The El Pendo

assemblage, which overlies two Archaic Aurignacian levels, is poor (79 tools); but it still show some similarities to Morín 10: denticulates, endscrapers and burins are well represented, sidescrapers are extremely abundant (36.7 %), and Châtelperron knives few (3.8 %).

The main regional peculiarity apparent in Cantabria lies in the greater degree of typological similarity between Chatelperronian and Archaic Aurignacian assemblages than is found to the north, though the two are still distinguishable from each other. The Aurignacian and Perigordian tool groups (Sonneville-Bordes' GA and GP) are more nearly equal than is common between assemblages from the two traditions. Indeed, it was only after analysis that El Pendo VIII was identified as Chatelperronian. For example, the GA and GP indices respectively are 6.0 and 7.5 at Morín 10, and 6.3 and 6.3 at El Pendo VIII. For several Archaic Aurignacian levels at the same sites, the GA and GP are 11.8 and 3.4 (Morín, 9), 11.9 and 4.2 (Morín, 8b), and 15.3 and 8.5 (El Pendo, VIIIa). Notches, denticulates, and sidescrapers are relatively frequent in assemblages of both traditions. Châtelperron knives are present in several Aurignacian assemblages (2.2 % in Pendo, VIIIa), and unusually rare in both Chatelperronian assemblages. And retouched blades are fairly frequent in both Chatelperronian and Aurignacian levels at Morín, reminiscent of the *pièces esquilées* at the Grotte du Loup and the small sidescrapers at the Grotte du Renne. Why these two traditions should share toolmaking and site-forming behavior to a greater extent in Cantabria than elsewhere, and why the Chatelperronian is so rare here, are questions for future research.

In sum, there is considerable local variation to be found in the Chatelperronian — in the occurrence and proportions of various tool types, in subtler technological dimensions (e.g., Correzian retouch), in bone industries, and in aspects of site size and, possibly, function. Unfortunately, there are still so few well-studied assemblages that regional variation is often hard to separate from idiosyncratic or other variation. On the whole, however, this sort of geographical variation has more in common with that of other Upper Paleolithic industries than with the facies and other variation of the Mousterian.

Temporal variation

The question of how Chatelperronian assemblages changed over time is logically related to the issue of their relationships with the Mousterian and the Upper Perigordian. Those who maintain that the Chatelperronian evolved out of the former, and into the latter, argue for at least one trend of unidirectional change: Chatelperronian assemblages becoming, over time, less Mousterian-like and more Upper Perigordian-like. Only Delporte (1955, 1956) has systematized this notion into a 5-stage developmental scheme; more often, it is simply expressed or implied that a Chatelperronian assemblage with well-made blade tools and few Mousterian types is more evolved, and later, than one with poorer workmanship and more sidescrapers, notches, and denticulates — e. g., Bordes' classification of the Trou de la Chèvre and Roc de Combe assemblages as *ancien*, and Les Cottés and Fontenioux as *evolué* (Bordes, 1974).

Such reasoning is certainly logical, but

it runs the risk of the fallacy of assuming what one is setting out to learn. What evidence, beyond the *a priori* hypothesis of evolutionary transformation, can be brought to bear on the issue of Chatelperronian temporal change?

Three kinds of evidence can apply. First, there are cases of stratigraphic superposition of Chatelperronian levels. These situations have the advantage of being sure indicators of the relative age of two or more assemblages. Unfortunately, however, they tell us nothing about absolute ages, and of course they can apply only among levels at one site.

There are four such cases published in the Chatelperronian. At Roc de Combe, couche 8 overlies couche 10. Unfortunately, the latter consists of only 46 tools, not enough for good typological characterization. Some points, though, can be made; the two assemblages are similar in raw materials and appearance. The older assemblage is proportionately richer in endscrapers, backed blades, and denticulates, and poorer in burins and Châtelperron knives. Considering its small size, though, we cannot be sure how significant these differences are.

At Trou de la Chèvre, there are four successive Chatelperronian levels (from the base), 1, 1a, 2, and 2a. Their general similarity has been noted above. Although Jude and Arambourou (1964) have argued for a gradual evolution in these assemblages from less evolved to a more evolved state, they rely on often quite small differences in tool type percentages, and unidirectional trends in assemblage composition are not as clear as might be expected. For example, the percentage representation of the Perigordian Group (GP) in levels 1 through 2a is (in order, from the base) 17.3, 20.4, 32.5, and 22.8. Or consider the behavior of the summed percentages of the principal Mousterian types (notches, denticulates, and sidescrapers): 32.4 %, 39.5 %, 27.8 %, and finally, 29.1 %, only slightly lower than at the beginning. No trend obviously presents itself toward less Mousteroid assemblages; considering the possible effects of sampling error in comparisons, very little change is verifiable.

The Grotte du Loup contains three Chatelperronian levels (from the base), 5, 4, and 3; the last has only 72 tools. Even keeping in mind level 3's small sample, a clear but surprising pattern does emerge: the proportion of Châtelperron knives decreases through time from 38.4 % to 12.6 %, while that of *pièces esquillées* climbs from 23.2 % to 43 %. This trend contradicts what should be expected according to the conventional model of Chatelperronian evolution. Even if *pièces esquillées* are subtracted from the assemblages and from computations — on the grounds that they are not really retouched tools, and that it is their increase which makes Châtelperron knives appear to decrease — the trend is the same. Châtelperron knives decrease from 49.8 % (couche 5) to 34 % to 22 % (c. 3). Otherwise, Mousterian types remain uniformly low, while burins become somewhat less numerous, and truncated pieces, more numerous. Here is a picture of change over time which simply does not conform to the conventional model.

Fourthly, at the Grotte du Renne, numerous Chatelperronian occupation levels of couches (from the base) 10, 9, and 8 are superimposed. Though many details are not yet available, there can be no doubt that it is the collection from the youngest couche, 8, which is least evolved according to the usual criteria; it has

been referred to by Leroi-Gourhan as a degenerate Chatelperronian. Couche 8 contains fewer endscrapers and burins, and more raclettes and denticulates, than the underlying couches, and has a poorer bone industry.

Thus, none of the cases of superposition published to date offers much support for the usual model of Chatelperronian temporal evolution, and two of them contradict it. At the very least, this suggests that unidirectional evolution is not an adequate explanation for interassemblage variability in the Chatelperronian.

Radiocarbon dating is the second source of evidence relevant to temporal change. Unfortunately, it is not yet very helpful. Only two Chatelperronian levels are reasonably well-dated by this method. The dates presented in table 3 allow assignment of an age of 33,000+ years to couche 8 at the Grotte du Renne, somewhat older than the probable age in the 32,000 - 33,000 year range for Les Cottés couche G. The latter assemblage is certainly more evolved, under the conventional model, than the older Grotte du Renne assemblage; thus the sole available radiocarbon date comparison is compatible with that model.

Finally, archeological levels can be dated relative to each other if they can be placed in a sequence of climatic change established from study of sediments or pollen — i. e., in a climatostratigraphic sequence. In only two areas has this been achieved for more than one Chatelperronian site: the Perigord (Laville, 1975) and Cantabrian Spain (Butzer, 1981).

In the latter case, Laville has divided the fluctuating Phase I of the Würm III stadial into four subphases; nine Chatelperronian levels from four sites have been fitted into this framework, seven of them at the level of subphases (see table 9). Some of these temporal relationships are already known from superposition of levels; but in addition, the Roc de Combe occupations are now seen as being somewhat early, Le Piage late, and Trou de la Chèvre as extending at least intermittently through the whole phase. Although the assumption of Chatelperronian industrial evolution already discussed would necessitate an early date for the La Ferrassie assemblages, their sediments were not analyzed, and we do not know to which subphase they belong. As for the other assemblages, the relative dating provided by Laville does not strongly support the unidirectional model of assemblage evolution. Le Piage F1 and Trou de la Chèvre 2a are both dated to subphase d, and thus are at least roughly contemporary, but neither is very «evolved», and each has its closest typological resemblance to another assemblage: Trou de la Chèvre 2a to the other assemblages at that site (especially 2), and Piage F1 to the older assemblage from Roc de Combe 8.

TABLE 9

Relative dating of Chatelperronian levels in Perigord

After Laville (1975)

Subphase of Würm III, Phase I:	Roc de Combe	Le Piage	La Chèvre	La Ferrassie
d: milder, more humid		F1	2a	
c: cold, humid			2	L3a
b: milder, more humid	8		1a	L3b
a: cold, humid	10		1	

In Cantabria, Butzer places El Pendo VIII in Unit 31, later than Morín 10, which is dated to Unit 30, though with its heavy component of sidescrapers and other Mousterian types, the El Pendo as-

semblage would be considered less evolved. Indeed, as Butzer correlates his Unit 31 to the Arcy Interstadial and to Laville's Phase III of Würm III, the El Pendo level apparently is youngest of any Chatelperronian levels dated by this means, despite its primitive appearance.

Thus, the available evidence for the absolute and relative ages of Chatelperronian assemblages lends little support to the conventional unidirectional model. Indeed, at this point no clear temporal trend is apparent in assemblage composition, though more published sites may change the situation. It would seem that we should consider seriously other possible causes for interassemblage variability along with temporal evolution, such as regional differences in toolmaking traditions, adaptive demands of different environments, and the differential use of sites or parts of sites.

HUMAN LIFEWAYS

Our picture of human lifeways during the Chatelperronian is still unfortunately vague, though evidence of several kinds is of some help.

Subsistence

Although we may presume that the people who made Chatelperronian assemblages ate plant foods, there is no direct evidence for it (hardly unusual in Paleolithic archeology). Our knowledge of subsistence must rest on faunal remains. Unhappily, data are deficient in this category. Bones were not preserved at several sites (particularly open-air localities), and quantified faunal reports are published for only 13 levels at ten Chatelperronian sites — Roc de Combe and La Ferrassie (Delpech, 1975), Font-de-Gaume (Prat and Sonneville-Bordes, 1969), Trou de la Chèvre (Bouchud 1964), Les Cottés (Bouchud, 1961), Fontenioux (Pradel, 1952), Châtelperron (Bouchud, 1963, Delporte, 1957), Gatzarria (Lévêque, 1966), Cueva Morín (Altuna, 1971), and cryoturbated couche K at Le Moustier (Peyrony, 1930). Qualitative data are available from six more sites (Harrold, 1978).

Even for the quantified sites, there are interpretive difficulties; faunal data are presented in not-easily-comparable manners — variously, in terms of the minimum numbers of animals represented by the remains assigned to each species, by the number of bone fragments of each species, or, in one case, by the percentages which the bone fragments from each taxon represent of an unreported total number of fragments. Furthermore some samples are so small as to be banal (e. g., the seven bone fragments from Roc de Combe level 10). The largest sample is from Les Cottés, where a minimum of 15 herbivores are represented (8 horses, 2 reindeer, 4 bovines, and a woolly rhinoceros).

According to the spotty data available, three groups tend to dominate Chatelperronian faunas, the reindeer (*Rangifer tarandus*), horse (*Equus caballus*), and bovines (*Bos* or *Bison*, which can seldom be distinguished). They are present in most faunas, and one of them is always the most numerous form. Also found, in roughly decreasing order of importance, are the red deer (*Cervus elaphus*), woolly rhinoceros (*Coelodonta antiquitatis*), ibex (*Capra ibex*), chamois (*Rupicapra rupica-*

pra), woolly mammoth *(Mammuthus primigenius)*, and unspecified «Asiniens», roe deer *(Capreolus capreolus)* and boar *(Sus scrofa)*. The cold-adapted mammoth and rhino are usually found in the sites in the colder north or Pyrenees, but are only numerous at the northernmost of all, the Grotte du Renne. Although a wide range of fauna and habitats is apparently represented in these assemblages, the relatively low frequencies of reindeer (when compared with other Upper Paleolithic faunas) and the relatively high numbers of bovines and horses are consistent with the attribution of most Chatelperronian levels to fairly moderate climatic phases.

Remains of animals other than herbivores are found as well. Carnivores ranging from foxes to cave bears are known. Several of them (badgers, foxes, perhaps wolves) might have been taken for their fur (as discussed above, there is some indication of this at the Grotte du Renne), but the larger carnivores presumably derive from periods of human abandonment of the sites. There are also a few animals which could have been taken for either fur or meat (hares at three sites, a rabbit at Roc de Combe, and a marmot at the Grotte du Renne).

No remains of fish or mollusks are known from Chatelperronian levels, but microfauna, mostly rodents, occur in several. They are most likely burrowers, or the remains of pellets from raptorial birds, from periods of human abandonment of the sites. The latter origin seems likely as well for the unusual avian and amphibitian fauna from couche 8 at Roc de Combe (Delpech, 1975), where remains of two raptorial birds are found — kestrel *(Falco tinnunculus)* and Cornish chough *(Coracia pyrrhocorax)* — along with seven species of other birds, as well as numerous remains of frogs and toads, which are the prey of a large variety of birds (Palmer and Fowler, 1975). Human predation cannot be ruled out, however, for several of the bird species, especially partridge *(Perdix perdix)* and grouse *(Lagopus* sp.) are common human prey.

In summary, the available faunal evidence from Chatelperronian contexts indicates predation on at least 11 taxa of large mammals, especially reindeer, horse, and bovines. The lack of large samples and of published data on age-sex structure of faunal populations does not yet allow any fruitful discussion of hunting practices or seasonality. While some animals were apparently taken primarily for pelts, several potential food sources (fish, mollusks, and probably birds) were apparently ignored. There is certainly no indication of the sort of intensive «wild harvesting» of particular rich resources which can sometimes be found in the later Upper Paleolithic, for example in Cantabria (Freeman, 1981), but which is sometimes cited as a general characteristic of the Upper Paleolithic.

Settlement Patterns

Here, as above, there are currently more questions for future research than definitive answers. Chatelperronian levels have usually been characterized as thin and few. But we now know of several rich sites with thick multiple levels, indicating continuous or intermittent occupation during long periods of the 2,000 - 4,000+ year span of this tradition.

However, Chatelperronian sites do still seem to be relatively sparse. In the Perigord, where documentation is best, Sonneville-Bordes (1960a) listed 19 possible Chatelperronian sites, as against 44 for the Aurignacian I, whose duration is com-

parable to that of the Chatelperronian (Laville, *et al*, 1980, 271-76). Today, the number of known or possible Chatelperronian sites has increased to 27, still well below the Aurignacian I figure. Other areas, particularly Cantabrian Spain with its two occurrences, present a similar picture. There is thus some suggestion that the population densities of the people who produced this industry may have been low compared to those of other Upper Paleolithic traditions.

A few generalizations can be made about types and functions of Chatelperronian sites. Rockshelters, caves, and open-air sites were utilized, and we can variously point to examples of prolonged occupations of sites (Grotte du Renne), repeated visits to a locality (Les Tambourets), and brief stays (Font-de-Gaume). Special-purpose sites, intended primarily for activities besides subsistence and habitation are hard to identify without a good sense of the settlement pattern as a whole, but the brief occupation deep in the cave of Font-de-Gaume is a possibility. Lithic debris indicative of toolmaking is found at every site, but it is particularly abundant at the open-air sites, one of which (Canaule II) is close to a good source of flint. At the same time, none of these sites can be identified exclusively as an *atelier de taille*.

Presumably, Chatelperronian sites were left by relatively small groups of hunter-gatherers; with the exception of Laussel, individual occupation levels are not very extensive, and only a few animals are represented in most faunal samples. Presumably, too, these groups were mobile, their movements depending on when and where important resources became available. But we can now only speculate about just how large and mobile these groups were, or how they used different sites and scheduled movements. There is hope for answering such questions in intensive local studies of environmental, faunal, and artifactual data (e.g., Clark *et al.* 1980), but such research lies in the future.

Symbolic behavior

The makers of Chatelperronian assemblages often used ocher lavishly, and sometimes decorated themselves with drilled or grooved teeth or bones, in both cases to a greater extent than is found in the Mousterian. They occasionally collected fossils, or incised bones or stones with markings (not yet analyzed) which may have notational or other symbolic import. There is no evidence yet that they produced either parietal or mobiliary art, though considering Font-de-Gaume, the possibility remains. In evidence for symbolic behavior as in lithic and bone artifacts, the Chatelperronian is an Upper Paleolithic tradition, but an archaic one preceding the full development of the later Upper Paleolithic.

The Chatelperronian and human remains

The Aurignacian (as well as later Upper Paleolithic industries) has been associated with anatomically modern man, but there has long been uncertainty about the Chatelperronian, particularly given its putative evolution from the Mousterian.

Were the makers of the Chatelperronian Neanderthals, or *Homo sapiens sapiens*, or perhaps intermediate forms?

This question touches on the complex issue of the evolutionary relationship between *H. sapiens neanderthalensis* and *H. sapiens sapiens* — whether all Neanderthal populations evolved into modern man, or some, or none. This problem is far from settled (e. g., Howells and Trinkaus, 1979; Brace, 1979), and discussion of it is beyond the scope of this paper. It is germane to the Chatelperronian, however, since all diagnosed human remains from the Mousterian in the Chatelperronian sphere are Neanderthal, and all those from post-Chatelperronian Upper Paléolithic contexts are modern.

The relevant skeletal evidence is not plentiful, and was long equivocal. The skeleton of an anatomically-modern man was found in 1909 at Combe-Chapelle by the antiquarian Hauser (Hauser and Klaatsch, 1909; Klaatsch and Hauser, 1910). There is little doubt that it was a deliberate burial, with grave goods, of Upper Paleolithic age. However, though Hauser said that the skeleton derived from the site's Chatelperronian level, his notorious methodology leaves open the possibility that the skeleton was found in the overlying Aurignacian level (separated from the Chatelperronian by a sterile bed) — or, that even if found in the Chatelperronian level, as Peyrony (an eyewitness) maintained, it could have been an intrusive burial in a trench dug from the upper level. Authors have argued both for the Chatelperronian origin of the burial (e. g., Peyrony, 1943; Sonneville-Bordes, 1959; Bordes, 1981) and against it (e. g., Delporte, 1966; Leroi-Gourhan, 1965, 76; Lévêque and Vandermeersch, 1981b), but lacking the proper documentation and even the skeleton (almost totally destroyed in World War II), we will never be sure of its origin.

Until recently, the only human remains firmly associated with the Chatelperronian were teeth — an undescribed deciduous tooth from Font-de-Gaume (Sonneville-Bordes and Prat, 1969) and seven or eight teeth from the Grotte du Renne (Leroi-Gourhan, 1959). Leroi-Gourhan proposed that the latter group, because of their large size and some archaic traits (such as a marked cingulum), derived from a transitional *Homo post-neanderthalensis*. However, the teeth do fall within the size range of *Homo sapiens sapiens* (Wolpoff, 1971), and by themselves are insufficient to identify their owners as Neanderthals, modern men, or something in between. The question remained unsettled.

Then, in 1979, Levêque and Vandermeersch (1980a, 1980b, 1981a, 1981b) excavated a partial skeleton, identified as Neanderthal, from one of two Chatelperronian levels at Saint-Césaire (Charente-Maritime). Analysis of both industry and skeleton are incomplete, but the latter's Neanderthal status is indisputable. The incomplete cranium exhibits a large supraorbital torus, low frontal, and various other Neanderthal traits, both cranial and post-cranial. The excavators are also quite positive about its Chatelperronian provenience. Saint-Césaire represents the first known occurrence of a Neanderthal with an Upper Paleolithic industry. Since modern people have been found in association with the Mousterian at Qafzeh and Skhül in Israel — and by an unverified claim at Carigüela in Spain (cf. Harrold, 1978) — we now know of exceptions to both of the old equations of modern man with the Upper Paleolithic, and Neanderthals with the Mousterian.

This find has important implications. One concerns what, to use Klein's (1973) term, might be called the biopsychological capabilities of Neanderthals. It has often been concluded that the Neanderthals must have been innately inferior in some cognitive abilites to modern man — thus their less complex archeological record, and rapid disappearance. But a Neanderthal found with an Upper Paleolithic industry suggests that a reassessment of this notion is in order.

There is also an implication for the question of whether the Neanderthals in western Europe, and especially in the Chatelperronian sphere, evolved into anatomically modern populations, or were replaced or absorbed by them. The former hypothesis (gradual evolution) would require an appreciable span of time — presumably some thousands of years — for the necessary morphological transformations to take place. The earliest datable modern remains in France, at Cro-Magnon (Aurignacian), are probably about 30,000 years old (Movius, 1969b). Heretofore, the latest reasonably-well dated French Neanderthal (and many can not be dated) was probably the Le Moustier adolescent from the mid-Würm II (Border, 1955; Vandermeersch, 1965). Its absolute age, uncertain but well over 40,000 years, thus left a considerable gap between the latest well-dated Neanderthal and the earliest well-dated modern remains. Saint-Césaire, probably between 31,000 and 35,000 years old, almost completely closes this gap, leaving a vanishingly small time for such important morphological changes. At this point, the Saint-Césaire remains offer support for the notion of replacement of Neanderthals by *Homo sapiens sapiens.*

Bordes (1981), in reply to Levêque and Vandermeersch, pointed to the lack of evidence that the Saint-Césaire subject was buried, and raised the possibility that, far from having been a Chatelperronian occupant of the site, she (the remains are of a female) may have been killed, even eaten, by them. Levêque and Vandermeersch (1981b) replied that there were no butchering traces on the skeleton, or other indications of cannibalism, and that even if the subject had been killed or eaten, it is *a priori* as likely to have been done by Neanderthals as by modern people. With Bordes' further point that one skeleton does not prove that all Chatelperronian assemblages were made by Neanderthals, Levêque and Vandermeersch concur. In the sense of absolute proof, Bordes was surely right. It is also true, however, that a second or third Saint-Césaire would not prove that Neanderthals made *all* Chatelperronian assemblages — nor do the five skeletons from Cro-Magnon prove that only *Homo sapiens sapiens* made the Aurignacian. But the association now exists, and if provisional conclusions are to be drawn, Neanderthals currently have a better claim as manufacturers of the Chatelperronian than do anatomically modern men.

This leads us to a third important implication of Saint-Césaire, one for the relationship between the Chatelperronian and the Mousterian. It will be discussed below.

Unsettled Issues

Most of the questions about the Chatelperronian sort out into three basic problems.

Considering the cautions in this article about small or otherwise unsatisfactory data bases, it is hardly surprising that none of these problems is fully resolved today. However, evaluation of competing hypotheses in the light of current evidence can at least sharpen the issues and allow comparison of competing viewpoints.

The relationship of the Chatelperronian to the Mousterian

The Chatelperronian postdates the Mousterian, and in many French sites there is evidence of a hiatus between the two — not necessarily a period of abandonment of an area, but simply a period for which we lack archeological evidence. In the Perigord, this is the Würm II/III interstadial, marked by non-deposition and erosion in caves, but it is also apparent elsewhere — for example, the Les Cottés interstadial seen in sterile level H at that site, or the sterile level between couches 11 and 10 at the Grotte du Renne. (It is not found in Cantabrian Spain, however, where the Mousterian persisted into the temperate period probably corresponding to the Würm II/III.) Indications are that this hiatus may have lasted 2,000-4,000 years. Human remains or artifacts from this period are generally missing from the archeological record of France.

As the hiatus ended, the Chatelperronian appeared. As was emphasized above, this industry is not transitional in the sense of being midway between Middle and Upper Paleolithic in assemblage composition; it is Upper Paleolithic (if archaic) in its lithic technology and typology, bone artifacts, and *parure*. There are at the same time somewhat larger proportions of «Mousterian» tools than are usual in the Upper Paleolithic, and now, an apparent association with Neanderthal remains. Three main hypotheses have been put forward to explain the Mousterian-Chatelperronian relationship (for citations, refer to the section above on the Chatelperronian in archeological systematics):

a) *The Chatelperronian is an intrusive tradition in France and Spain, brought in by anatomically modern man* (although it is conceivable, I am unaware of any proposals that it was imported by Neanderthals). This has long been a minority view. The clear typological differentiation between Chatelperronian and Mousterian favors this hypothesis, as does the sudden appearance of the Chatelperronian at the end of a hiatus. On the other hand, the atypical El Pendo and La Ferrassie assemblages and the Saint-Césaire find are inconsistent with this hypothesis. Nor is it helped by the fact that no plausible «predecessor» industry is known from elsewhere. If the Chatelperronian arrived from the outside, where did it come from?

b) *The Chatelperronian is an indigenous development from the local Mous-*

terian, related to the local evolution of Neanderthals into Homo sapiens sapiens. This is the majority opinion today; often added to the above is Bordes' proposal that the Mousterian of Acheulean Tradition type B gave rise to the Chatelperronian. A less widely-accepted alternative is Laplace's (1966 a) synthetotype theory involving a Denticulate Mousterian origin.

In opposition, one could point to the lack of resemblance between assemblages of the Chatelperronian and those of the Mousterian, even including the M.A.T. type B, with its almost total lack of blade technology, paucity (when compared to the Chatelperronian) of Upper Paleolithic types, and naturally-backed knives (Harrold, 1978). It could be rejoined that, if the Chatelperronian is not the transitional industry it has been thought to be, the Würm II/III hiatus provides (at least in some areas) the time during which a true transitional industry could have developed, its traces either destroyed or yet to be found. Furthermore, the assemblages from El Pendo and La Ferrassie are both candidates for transitional status, with high proportions of Mousterian types, especially sidescrapers.

The first rejoinder is certainly plausible, but on currently available evidence, is an argument *ex silencio*. The second relies on assemblages subject to reservations on sample-size and other grounds discussed earlier. Furthermore, we are not sure that they are old enough to be transitional; La Ferrassie's exact age is not yet resolved, while El Pendo VIII is apparently quite young. It is also worth noting that none of these three sidescraper-rich levels shows any resemblance to the M.A.T.-B, usually seen as the predecessor of the Chatelperronian. In short, pending further publications and finds, the «missing link» transitional industry, with indisputable credentials of sample size, context, and dating, has yet to be established.

The Saint-Césaire find also raises problems for this hypothesis, insofar as it implies — as it usually does — that the industrial transition was accompanied by a physical one from Neanderthal to modern man. Indeed, some have argued that this was no coincidence: that early Upper Paleolithic technological innovations led to selective pressures which transformed Neanderthal morphology (e.g., Brose and Wolpoff, 1971). Yet at Saint-Césaire there is apparently a Neanderthal associated with an Upper Paleolithic industry at most only a short time before Cro-Magnon man is found in the region. There is thus much room for doubt that the processes of industrial and physical transition under discussion are necessarily connected. If both transitions were indigenous processes, why do we see, in a short period of time, the appearance of two Upper Paleolithic traditions — one associated apparently with Neanderthal man, and the other (resembling industries to the east), associated with modern man?

c) *The Chatelperronian is in some sense a local response to exposure to Upper Paleolithic lifeways*, either by indirect diffusion or by direct contact with intrusive peoples (presumably Aurignacian). This hypothesis would easily accomodate — even expect — the Saint-Césaire remains. It could at the same time explain the apparently rapid appearance of the Chatelperronian, and the lack of transitional industries (in terms of rapid responses to introduced changes), as well as the apparent persistence of some Mousterian

artifact traits. It would also explain the subsequent disappearance of both the Chatelperronian and Neanderthals, in terms of their eventual replacement or absorption.

On the other hand, the Chatelperronian does not look like a borrowed or modified Aurignacian. As discussed below, the two industries share an important substrate, but have important technological and typological differences. Nonetheless, it seems arguable that indigenous peoples could have borrowed some artifact-making practices while rejecting others, retaining and developing still others of their own (e.g., cores with opposed striking-platforms), resulting in an original industry. It is of interest that, in both the Perigord and Cantabrian Spain, the two traditions are interstratified, and that at least in the former area, they are contemporaneous from the first subphase of Würm III. Thus, rather than a predecessor, it is possible that the Chatelperronian could in some sense be derivative from the Aurignacian, at least in some areas.

Currently, none of these hypotheses can be either eliminated or firmly established. But Hypothesis (a) has lost credibility since the Saint-Césaire discovery; Hypothesis (b) has also been damaged; while Hypothesis (c) appears plausible, and merits further consideration.

The relationship of the Chatelperronian to the Aurignacian

Interstratification of Chatelperronian and Aurignacian levels at Roc de Combe, Le Piage, and El Pendo, and geological analysis by Laville and Butzer, leave no doubt about the temporal overlap of these two traditions.

In an effort to explain this contemporaneity, S. Binford (1972) offered the intringuing hypothesis that the two industries were merely seasonal or activity variants of the same adaptive system. However, there is no strong indication of different subsistence habits or seasonality between the two (though the notion has never been exhaustively tested). There is also an association of the two traditions with two different human types. Furthermore, the typological differences between the two are great enough (though less so in northern Spain) that few prehistorians intimately familiar with the data seriously consider such a «functional» explanation (Laville *et al.*, 1980, 285). In France, at least, «fossil directors» of one tradition may be found in the other, but rarely (a situation found among other Upper Paleolithic traditions). And the few supposedly mixed-character «Aurignaco-Perigordian» assemblages are generally known to be melanges from originally-distinct archeological levels (Laville *et al.*, 1980, 285-86).

Given that the Chatelperronian and Aurignacian are distinct traditions of artifact production, it is generally presumed that they represent human groups differing from each other to an unknown extent in cultural traditions besides those of toolmaking. In overlapping territories, they apparently managed to maintain their separate traditions for many centuries. The cultural mechanisms which would have maintained this separation for so long are currently a matter for speculation, although the evident association of the two traditions with different physical types offers one avenue of explanation.

We are hampered here by our ignorance of what sorts of social groupings are represented by Upper Paleolithic industrial traditions. Despite our use of such terms as «culture» and even «civilization» for such traditions, we do not know whether they represent cultures, culture areas, or even entities unknown among contemporary hunter-gatherers. Nor are we yet sure to what extent inter-tradition artifact differences are due to arbitrary differences in toolmaking habits, or to demands imposed by different tasks. Various avenues of research show promise of progress in these areas, notably microwear analysis of tool use and manufacture.

But currently it should not be surprising that the significance of the separate yet interstratified Chatelperronian and Aurignacian traditions is yet to be understood.

The relationship of the Chatelperronian to the Upper Perigordian

Most prehistorians maintain that a single cultural tradition unites the Chatelperronian with the Upper Perigordian (most particularly, the Perigordian IV), despite the gap caused by the invalidation of Peyrony's original Perigordian II and III. The linchpin of this position is the resemblance between Châtelperron knives and Gravette points (Sonneville-Bordes, 1966, 23), though other common elements are pointed to as well (Bordes, 1968b): blade cores with two opposed striking platforms, bidirectional backed blades, truncated blades, and round endscrapers. The industries are easily distinguishable, however; «fossil directors» of one are rarely found in the other. And in regard to the issue of Châtelperron knives and Gravette points, my study of macrowear placement on 1316 Châtelperron knives and 216 Gravette points from 24 sites showed such different patterns of wear occurrence that the two types were clearly used in different ways (probably as knives and points, respectively) (Harrold, 1978, 432). If there is continuity, it is in elements of form, not use.

The biggest obstacle to the notion of Chatelperronian-Upper Perigordian continuity is the considerable time gap between the two. In the Perigord, all Chatelperronian levels are from Phase I of Würm III, while the earliest Perigordian IV dates to Phase IV (Laville, 1975). As for absolute dating, the Les Cottés Chatelperronian may be as young as 32,000 years (and in Spain, that at El Pendo may be somewhat younger still), while Movius (1975, 12) estimates that the only reliably carbon-dated Perigordian IV occupation, at Abri Pataud, may date as far back as 29,000 BP — although the actual C-14 dates, from the upper part of the occupation, are not that old (see table 3). There is thus a radiocarbon-date gap of 3,000 years or so between the two industries (perhaps somewhat less if El Pendo VIII in Spain is considered). If the two represent a common tradition, where did it go for two or three millenia? Where are the transitional assemblages?

The Fontenioux B assemblage, of course, has been proposed as the «missing link» in this chain, and — problems of sample size aside — has some claim typologically, based on its unusual series of backed pieces. However, we do not know its age, lacking both isotopic and climato-

stratigraphic evidence from Fontenioux. If it could be shown that Fontenioux B is between about 32,000 and 29,000 years old, its claim as a transitional industry would be strengthened. But until the gap can be filled, it would seem that Chatelperronian-Upper Perigordian continuity must remain a hypothesis. The fact that two industries share several traits, especially in occurrence of backed artifacts, does not necessarily imply filiation without demonstrated temporal continuity. Disregard for this principle in the past has led to now-discarded hypotheses, such as filiation between the Aterian and the Solutrean, or among all Circum-Mediterranean industries featuring backed blades. The temporal gap is relatively smaller in this case, but the principle remains the same.

Directions for further research

As has no doubt become clear in the course of this article, we still have more questions than answers about the Chatelperronian. Nonetheless, a sense of recent progress can be gotten if we compare the state of knowledge today with that at the time of Sonneville-Bordes' (1960a) monumental synthesis of the Upper Paleolithic in the Perigord. There are today far more well-excavated assemblages, vastly more paleoclimatic data, and, apparently, associated human remains in secure context. We now have a good notion of the temporal and climatic parameters of the Chatelperronian, its interassemblage variability, and its resemblances to other lithic traditions.

But the need for further research is also clear. The kinds needed point out the important gaps in our knowledge:

1) We need more sites and assemblages to be excavated and reported. We have enough for meaningful discussion of the Chatelperronian as a whole; but breakdowns on regional or temporal bases often leave groups too small for useful analysis. More sites would also increase the chances of obtaining more human remains and radiocarbon dates, badly needed, and other kinds of evidence.

2) We also need more completely excavated sites. The problems of sampling error, and small inconclusive samples (both lithic and faunal) from sites left mostly unexcavated have been emphasized too plainly already to repeat here.

3) There is a great need for more paleoclimatic work, especially to construct detailed climatostratigraphic sequences for areas (e. g., Vienne) where they are lacking.

4) The application of multivariate statistical methods to assemblage comparison holds the prospect of revealing patterns of variation not otherwise apparent, both within the Chatelperronian, and between it and other traditions.

5) Finally, a whole set of methodologies is applicable to analysis at the site or local level, aimed at learning about the human behavior which produced Chatelperronian archeological levels. These include: (a) faunal analysis, with attention to age-sex structure of populations, seasonality, and subsistence-settlement patterns; (b) analysis of lithic debris in order to learn about the steps in the production, modification, and discard of stone artifacts; (c) analysis of microwear

(cf. Keeley, 1977), and residues (cf. Anderson, 1980) on stone tools, for information about their use; and (d) spatial analysis of the occupational residues within sites in order to learn something about the behavior which produced them (cf. Cahen *et al.*, 1979).

Given the realities of archeological funding and manpower, the preceding is meant to suggest avenues of research rather than predict that they will be followed.

However, there is reason to be optimistic; if the pace of discovery and analysis in the next two decades matches that of the last two, then our picture of the actual human adaptations, behavior, and groupings represented by the Chatelperronian industry should be a good deal clearer.

RESUMEN

NUEVAS PERSPECTIVAS SOBRE EL CHATELPERRONIENSE

Este artículo presenta un intento de síntesis e interpretación de la información existente (mucha de la cual es reciente) sobre el Chatelperroniense (o Perigordiense Inferior). El Chatelperroniense, paralelamente al Auriñaciense Arcaico, señala el inicio del Paleolítico Superior en la mayor parte de Francia y en la España cantábrica. En base a las evidencias del radiocarbono y paleoclimáticas, se fecha aproximadamente entre los años 35.000 y 31.000. Se caracteriza mejor como un Paleolítico Superior antiguo que como una industria musteriense o de transición, con una alta proporción de hojas procedentes de núcleos prismáticos. El Chatelperroniense se caracteriza por variables proporciones de puntas de chatelperron, raspadores, buriles, hojas retocadas, raederas, muescas y otros tipos de piezas, y también por una modesta industria de hueso. No se conocen objetos de arte en el Chatelperroniense, aunque el uso de ocre era importante. Los medios de vida y los patrones de subsistencia del Chatelperroniense no se pueden aún reconstruir con suficiente detalle para conocer qué diferencia puede haber con respecto al Musteriense o al Paleolítico Superior más tardío. La hipótesis de que el Chatelperroniense procede del Musteriense ha sido confirmada recientemente por la asociación del mismo con restos del hombre de Neandertal, pero la transición aparentemente no fue gradual y coincide aproximadamente con la aparición del Auriñaciense, que está asociada con el hombre anatómicamente moderno *(Homo sapiens sapiens)*. La supuesta evolución del Chatelperroniense hacia el Perigordiense Superior no ha podido ser todavía establecida.

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Abbreviations:

L'A: *L'Anthropologie.*
BSMSP: *Bulletin de la Société Méridionale de Spéléologie et de Préhistoire.*
BSPF: *Bulletin de la Société Préhistorique Française.*
BSHAP: *Bulletin de la Société Historique et Archéologique du Périgord.*
G-P: *Gallia-Préhistoire.*
LPF: *La Préhistoire Française*, ed. by H. de Lumley, Paris, 1976.

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