



HAL
open science

Grotte des Fées (Châtelperron): History of Research, Stratigraphy, Dating, and Archaeology of the Châtelperronian Type-Site

João Zilhão, Francesco d'Errico, Jean-Guillaume Bordes, Arnaud Lenoble, Pierre-Jean Texier, Jean-Philippe Rigaud

► **To cite this version:**

João Zilhão, Francesco d'Errico, Jean-Guillaume Bordes, Arnaud Lenoble, Pierre-Jean Texier, et al.. Grotte des Fées (Châtelperron): History of Research, Stratigraphy, Dating, and Archaeology of the Châtelperronian Type-Site. *Paleoanthropology*, 2008, pp.1-42. halshs-00423544

HAL Id: halshs-00423544

<https://shs.hal.science/halshs-00423544>

Submitted on 7 Mar 2023

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Grotte des Fées (Châtelperron): History of Research, Stratigraphy, Dating, and Archaeology of the Châtelperronian Type-Site

JOÃO ZILHÃO

Department of Archaeology and Anthropology, University of Bristol, 43 Woodland Road, Bristol, BS8 1UU, UNITED KINGDOM; Joao.Zilhao@bristol.ac.uk

FRANCESCO D'ERRICO

PACEA/UMR 5199 du CNRS, Institut de Préhistoire et de Géologie du Quaternaire, UFR de Géologie, Bât. B18, Avenue des Facultés, 33405 Talence, FRANCE; and Department of Anthropology, George Washington University, Washington, D.C., 20052, USA; f.derrico@jpgq.u-bordeaux1.fr

JEAN-GUILLAUME BORDES

PACEA/UMR 5199 du CNRS, Institut de Préhistoire et de Géologie du Quaternaire, UFR de Géologie, Bât. B18, Avenue des Facultés, 33405 Talence, FRANCE; jg.bordes@iquat.u-bordeaux1.fr

ARNAUD LENOBLE

PACEA/UMR 5199 du CNRS, Institut de Préhistoire et de Géologie du Quaternaire, UFR de Géologie, Bât. B18, Avenue des Facultés, 33405 Talence, FRANCE; arnaud.lenoble@inrap.fr

JEAN-PIERRE TEXIER

PACEA/UMR 5199 du CNRS, Institut de Préhistoire et de Géologie du Quaternaire, UFR de Géologie, Bât. B18, Avenue des Facultés, 33405 Talence, FRANCE; jp.texier@ipgq.u-bordeaux1.fr

JEAN-PHILIPPE RIGAUD

PACEA/UMR 5199 du CNRS, Institut de Préhistoire et de Géologie du Quaternaire, UFR de Géologie, Bât. B18, Avenue des Facultés, 33405 Talence, FRANCE; rignaud@iquat.u-bordeaux1.fr

ABSTRACT

After the demonstration that no Châtelperronian/Aurignacian interstratifications existed at Roc-de-Combe, Le Piage, and El Pendo, the Grotte des Fées remained the single instance conceivably documenting the putative long-term regional contemporaneity of the two technocomplexes which is required by the “acculturation” and “imitation” models of the innovations (ornaments, decorated bone tools) that characterize the Châtelperronian. Based on our own inspection and study of the lithic and faunal collections and of the site itself, on consideration of the published and unpublished literature, and on the available dating evidence, we show that the putative interstratified deposits reported by Henri Delporte, who last excavated at the Grotte des Fées in 1951–54 and 1962, are in fact 19th-century backfill. *In situ* remnants may have been found in 1962, but, in the part of the site excavated at that time, Delporte failed to recognize the previously described interstratification. The stratigraphic consistency of 10 (out of the 13) radiocarbon dates available relates to the fact that those 10 dates are on samples from the conceivably *in situ* remnants excavated in 1962. Three samples from Level B5 date the Châtelperronian occupation to ca 39–40,000 ¹⁴C BP, while seven samples from Level B1–3 relate to carnivore denning at the site throughout the ca 36,500–34,500 ¹⁴C BP interval. Subsequent sporadic incursions by bearers of an Aurignacian I tool-kit are documented by diagnostic material scattered from top to bottom of the backfill deposits excavated by Delporte between 1951 and 1954. Originally, that Aurignacian material must have been contained in a surficial occupation lens capping the site’s Mousterian-to-Châtelperronian stratigraphic succession.

INTRODUCTION

In the 1950s and 1960s, the notion that the taxonomic units of the Paleolithic could represent long-lasting cultural traditions that did not necessarily develop in time-ordered fashion and that might even stand for coeval ethnic entities became very popular. This notion eventually triggered the functional variability debate of the 1970s, in the

context of which it is the significance of the different Bordeesian variants of the Mousterian that more often comes to mind (Binford 1973; Bordes 1973). But, the debate also had Upper Paleolithic ramifications; namely, the proposition, initially put forward by Peyrony (1933, 1948), that, in the classical region of southwestern France, the early part of the Upper Paleolithic had seen the parallel development

of two separate industrial phyla—the Aurignacian and the “Perigordian.”

Eventually, it became clear that the Lower Perigordian (or Châtelperronian) was separated from the Upper Perigordian (or Gravettian) by several millennia (Laville et al. 1980), and that, at the other end of the putative 15,000 year-long interval of coexistence, the “Aurignacian V” capping the Upper Perigordian sequence at the site of Laugerie-Haute was not related to the true or “typical” Aurignacian (Sonneville-Bordes 1982). As a result, the concept of the Perigordian as defined by Peyrony and Bordes gradually disappeared from the literature, the word being used nowadays simply to designate a particular regional entity of the Gravettian in France. These developments, however, fell short of addressing the validity of one of the fundamental premises of that concept—the contemporaneity between Châtelperronian and Aurignacian inferred from the interstratifications reported by Bordes and Labrot (1967), Champagne and Espitalié (1981), and Bernaldo de Quirós (1982) for, respectively, Roc-de-Combe and Le Piage, in France, and El Pendo, in Spain. As a result, ethnicity (in addition to site function or change through time) remained a viable explanation for assemblage variability during the period of emergence of the Upper Paleolithic in Europe.

Until the discovery of the Saint-Césaire skeleton and attendant implications for the authorship of the Châtelperronian (Lévêque and Vandermeersch 1980), the Upper Paleolithic was widely assumed to have been made by anatomically modern humans only. With the Saint-Césaire discovery, the paleoanthropological significance of interstratification changed dramatically—from being simply related to the interpretation of patterns of cultural variability within *Homo sapiens*, it became crucial evidence in the assessment of cultural contrasts between modern and non-modern humans (and, consequently, in the definition of modernity itself). In fact, taking the Châtelperronian and the Aurignacian as proxies for Neandertals and early modern Europeans, respectively, and assuming normal rates of sedimentation for Roc-de-Combe, Le Piage, and El Pendo, interstratification implied that, at the time of contact, and despite close neighborhood, separate ethnical identities had been maintained for many millennia. Moreover, given such long periods of regional coexistence, interstratification also implied ample opportunities for occasional exchanges to occur across what would otherwise have been rather stable and impermeable biological and cultural frontiers. In the framework of the Human Revolution paradigm (Mellars and Stringer 1989), which saw Neandertals as cognitively handicapped and bioculturally inferior to immigrating modern humans, interstratification thus became the empirical keystone for views of the cultural innovations of the Châtelperronian (ornaments, decorated bone tools) as a byproduct of either “imitation without understanding” or “acculturation” (Demars and Hublin 1989; Hublin et al. 1996; Hublin 2000; Mellars 1999; Stringer and Gamble 1993).

Paradoxically, as these views were being elaborated and popularized, continued geoaarcheological research and

an improved understanding of taphonomy and site formation processes began to sow doubts on the validity of the supporting interstratification evidence (d’Errico et al. 1998; Rigaud 2001). Eventually, those doubts led to investigations that generated proof. El Pendo was shown to be a redeposited sequence from top to bottom (Montes and Sanguino 2001; Montes et al. 2005); the small area of Le Piage with a Châtelperronian lens interstratified in the Aurignacian was shown to be a slope deposit yielding a mix of Châtelperronian, Aurignacian, and surface-weathered Mousterian items throughout; and, finally, the Aurignacian lens interstratified in the Châtelperronian of Roc-de-Combe was shown to be a post facto theoretical construct assembled from several true excavation units, all of which featured a mix of Gravettian, Aurignacian, Châtelperronian, and Mousterian pieces (Bordes 2002, 2003, 2006; Rigaud 2001). Coupled with the realization that significant problems of sample association and sample contamination (especially when dealing with bone) affected radiocarbon determinations in this time range (Higham et al. 2006; Jöris et al. 2003; Zilhão and d’Errico 1999), these empirical developments established the chronological anteriority of the Châtelperronian (otherwise indicated by numerous archeostratigraphic successions), and were instrumental in the promotion of alternative views of this technocomplex that questioned central tenets of the Human Revolution paradigm—because its emergence significantly predated any evidence for the Aurignacian or modern humans in Europe, the Châtelperronian could only be interpreted as representing the Neandertals’ independent transition to full cultural modernity (d’Errico 2003; d’Errico et al. 1998; Zilhão 2001, 2006, 2007).

The publication by Gravina et al. (2005) of a series of radiocarbon dates for the Grotte des Fées (Châtelperron, Allier, France)—the type-site of the Châtelperronian—added new evidence to this debate. Gravina et al. argued that the consistency of their dates proved that there was a genuinely *in situ* lens of Aurignacian material (Dufour bladelets and scrapers or scraper fragments bearing typical Aurignacian scalariform retouch) in the middle of the site’s thick Châtelperronian sequence, implying Châtelperronian reoccupation after a brief Aurignacian incursion and, hence, the long-term regional coexistence of Neandertals and moderns predicted (and required) by the “acculturation” or “imitation” models. In contrast, our analysis of the collections and associated documentation, kept at the Musée d’Archéologie Nationale (MAN), St.-Germain-en-Laye, France (Zilhão et al. 2006), led us to believe that the Châtelperronian-bearing deposits overlying the Aurignacian lens at the Grotte des Fées were 19th-century backfill, and to argue that interstratification was as illusory at the Grotte des Fées as everywhere else. Mellars et al. (2007), however, have since claimed refutation of our diagnosis and confirmation of Gravina et al.’s (2005) original conclusions. This, then, forms the basis of the current debate and our contribution here is intended to present a more comprehensive set of arguments and data in support of the case previously presented in summary form by Zilhão et al. (2006).

In their 2007 paper, Mellars et al. sought to reduce the differences of interpretation to a simple clash between fact (their view) and fiction (ours)—according to Mellars et al., our strict compliance to a given “theoretical agenda” affected our ability to duly consider the empirical evidence. We find it difficult to believe, however, that Mellars et al. themselves operate in a theoretical void, and we do not deny that paradigmatic bias may explain our views to some extent. The high profile of the interstratification debate owes much to its implications for models of modern human emergence, and it is almost inevitable that the different positions taken in that debate are to some extent influenced by an awareness of such implications. In our opinion, however, the primary interest of the Grotte des Fées controversy lies not in such epistemological questions, but rather in issues of methodology related to the broader archeological problem of how to deal with the evidence inherited from the fieldwork carried out by past generations of researchers. Therefore, and because, despite the shortcomings of the documentation, enough material exists to support a discussion

of excavation history, taphonomy, and sample association, we feel justified in returning to the site for a more detailed assessment of its basics than has hitherto been possible or attempted.

Intense controversy often carries the benefit of helping to bring the key issues more clearly into focus, and the Grotte des Fées is no exception; thus, the following necessarily builds upon previous exchanges, and could hardly be framed in any other way than as a response to the main points raised by Mellars et al. (2007). For each one of those points, therefore, we begin with a presentation of their position, using direct quotes in order to avoid ambiguity or confusion, and then proceed to explain why we perceive that position to be either logically inconsistent or in direct contradiction to the empirical evidence. After reconstructing excavation history, to which we add several new elements, we deal with stratigraphy, dating, and artifacts; a synthesis is provided in the Discussion section, and we sum up the broader methodological and paleoanthropological implications of the Grotte des Fées in the Conclusion.

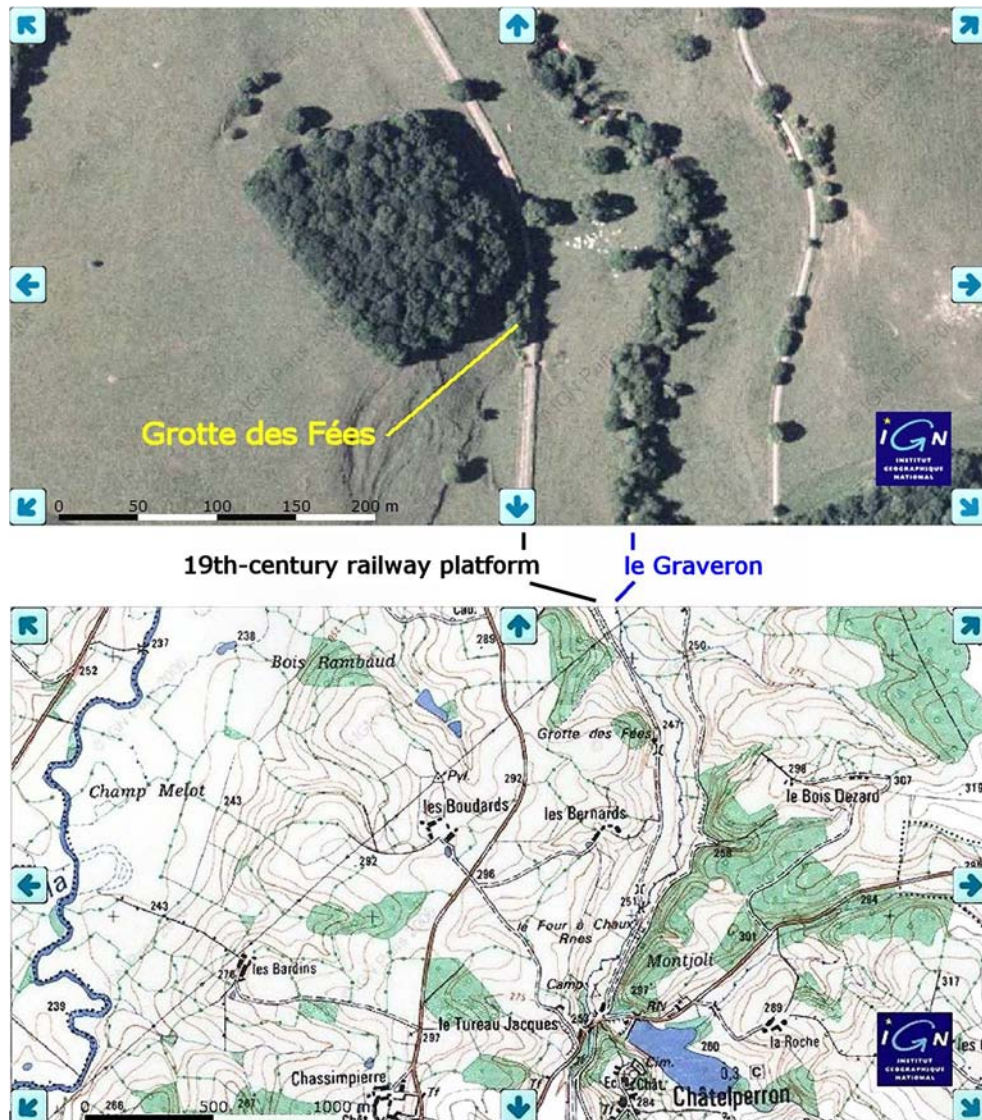


Figure 1. Geographical location of the Grotte des Fées (map and orthophoto from www.geoportail.fr).



Figure 2. View of the Grotte des Fées karstic complex from the opposite side of the valley (above) and zoom-in on the cave entrances (below). The Grotte Poirrier is left, the Grotte Bailleau in the middle, and the Grotte Effondrée a few meters right (i.e., north) of the latter. Photos taken, as well as those in Figures 3–4 and 12, in the late afternoon of March 30, 2007, ca 4:30 pm.

RESEARCH HISTORY

The Grotte des Fées (03° 38' 18" E, 46° 24' 42" N; www.geoportail.fr) consists, in fact, of two different, albeit interconnected, cave entrances, located 5–6m above the bed of the Graveron stream (Figures 1–2). These entrances are the Grotte Poirrier and the Grotte Bailleau, named by Henri Delporte—who last excavated at the site (Delporte 1955, 1957, 1976, n.d.; Delporte et al. 1999)—after his predecessors (Figure 3). A few meters to the north of the Grotte Bailleau, a third locus exists—the Grotte Effondrée, a karstic chamber whose vault had disappeared by the middle of the 19th century (Figure 4). This third locus is where both Bailleau and Delporte collected all of the Châtelperronian ma-

terial generally provenienced to the Grotte des Fées karstic complex.

As recounted by Bailleau (1869, 1872) and Delporte (1957), recognition of the site began between 1840 and 1850 with the discovery of fossiliferous deposits rich in Quaternary faunal remains. These deposits were revealed by the excavation of a 4m wide, 1m deep trench opened in front of the caves for the construction of a railway transporting the coal mined in the upstream Bert-Montcombroux basin to ironworks located downstream in the town of Dompierre-sur-Besbre. This construction work created the extant topography, the platform of the now abandoned railway currently being used as a rural road between Châtelperron and Vaumas.



Figure 3. The entrances to the Grotte Poirrier (left) and the Grotte Baillieu (right).



Figure 4. Photomosaic (equirectangular projection) of the face of the Grotte des Fées limestone outcrop, showing the entrance to the Grotte Bailleau and the access to the Grotte Effondrée.

The engineer in charge of the construction work, A. Poirrier, was also a paleontologist, and he continued to explore the deposits cut by the railway trench in subsequent years, eventually amassing a large collection of fine specimens. Bailleau himself first visited the site sometime between 1864 and 1867, and was immediately struck by the large number of flint artifacts abandoned on the surface, which he inferred to be a byproduct of Poirrier's earlier investigations. While Poirrier seemingly failed to recognize, or simply ignored, their presence, the finding of such flints led Bailleau, a local doctor and dedicated amateur prehistorian, to start his own excavations at the site, which began in the autumn of 1867 and continued until 1870–1872.

Initially, Bailleau focused his efforts in the two caves. The first (Delporte's Grotte Poirrier) featured two levels—at the bottom, fluvial silts and sands accumulated by the Graveron river and, at the top, a disturbed deposit with scarce Gallo-Roman pot sherds. No Pleistocene bones or flint artifacts were found, which may in part be due to the fact that the entrance area of this cave had already been emptied, either by its Gallo-Roman occupants or by Poirrier and the railway workers. The second cave (Delporte's Grotte Bailleau), however, was still intact. Two levels again were observed—at the top, a black earth accumulated in recent times (namely via an opening in the cave roof) which contained weathered remains of modern animal species (rabbits, birds, and other prey accumulated by foxes) and, at the bottom, an eboulis enveloped in a reddish silty matrix which yielded abundant, well-preserved remains of a Pleistocene fauna, including, among others, hyena, cave bear, horse, and reindeer. However, with the possible exception of two nodules that Bailleau interpreted as hammerstones used to break bones (but that, in all likelihood, were a natu-

ral component of the deposits), no flint artifacts were recovered in this cave either. The breakage of the bones and the few instances of "bone tools" found in the Pleistocene level were nonetheless taken by Bailleau as evidence for the coeval presence and activity of humans (Figure 5).

Having excavated into the deposits up to a distance of 15m from the entrance and encountering large collapsed boulders preventing further exploration of the gallery, Bailleau was eventually forced to stop working at this second



Figure 5. The bones that Bailleau (1869: 12; Pl. I) mistakenly identified as artifacts that would document use of the second cave of the Grotte des Fées complex, later christened after him by Delporte: "In these caves, I saw no evidence of man's settlement of the area other than the bones that he broke, all in the same fashion, one or two cores or nodules of flint used as a device for the breaking; and, at the entrance, an aurochs metatarsal flaked as a point (Fig. 13) and two small bones extracted from the ear of horse or aurochs and polished. (Fig. 3, 4). They were worn as amulets or collar beads."

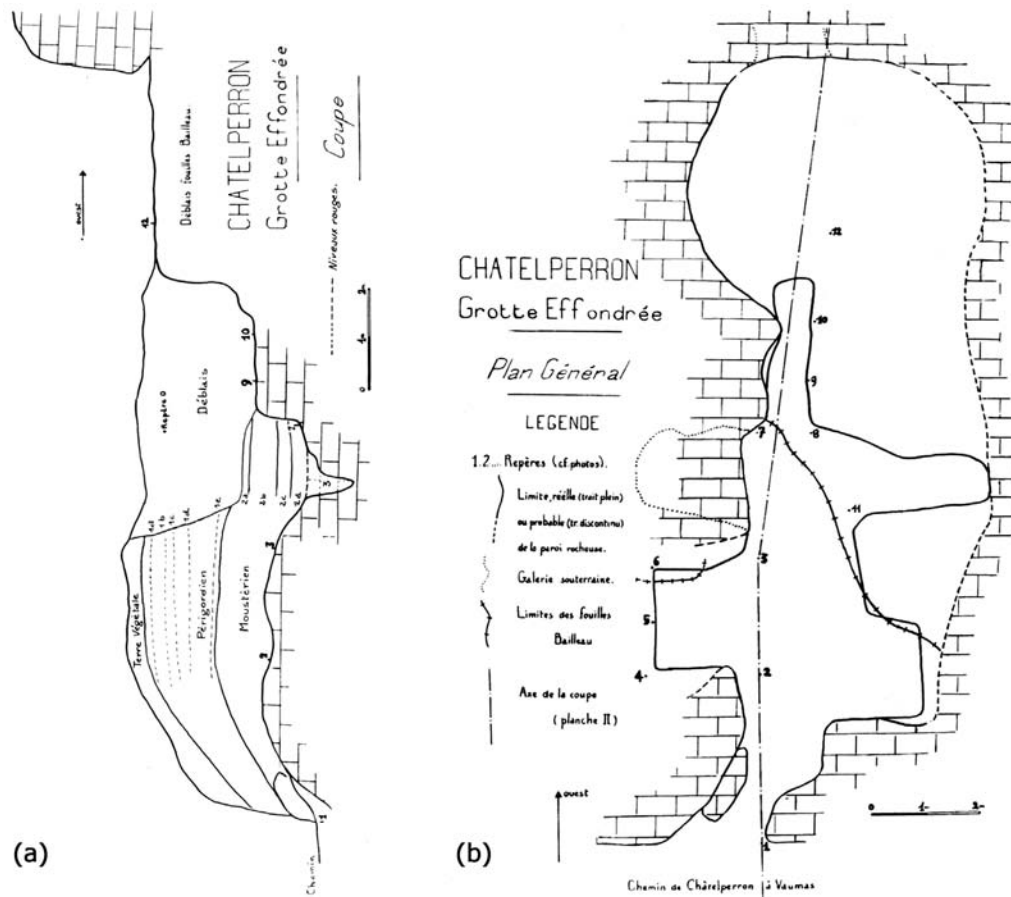


Figure 6. Delporte's published topographic documentation (cf. Figure 8 for a translation of the French captions). (a) Longitudinal profile after the 1954 season (Delporte 1955: Figure 2). (b) Plan after the 1954 season (Delporte 1955: Figure 1, 1957: Pl. I).

cave and turned his attention to an adjacent site, which he called the foyer and where he found abundant flint artifacts. To explain the contrast with the scarcity of products of Pleistocene human industry in the fill of the previously excavated loci, Bailleau (1869: 12–14) invoked two kinds of explanations—taphonomical (the richer areas of the two caves would have been those located outside the respective entrances, which the railway trench had entirely removed), and functional (this third site would have corresponded to a fireplace used for cooking, eating and tool-making activities by the Pleistocene dwellers of the adjacent caves). During work carried out in the spring of 1870, however, he realized that this foyer was simply the entrance area of a third cave whose vault had collapsed, producing a mass of large boulders (most of which, by then, had already been quarried away) and exposing as ground surface what once had been the surface of a cave fill. As a result, he changed his mind, and now argued that Pleistocene humans used this site only, the other two caves having never been inhabited in prehistoric times (Bailleau 1872: 112, 116–118).

The concluding remarks of Bailleau's last paper on the Grotte des Fées (1872: 126), dated May 20, 1872, imply that, by then, his digs had already come to an end.¹ Until 1951, when Delporte placed a series of tests in the three loci, no fieldwork was carried out at the site (except for the odd small-scale surface collection of scattered finds [Delporte

et al. 1999: 10]), and the only event of major relevance for its history was Lacaille's (1947) extensive publication of the 19th-century collections that had ended up in England. Delporte's 1951 tests failed to find any archaeology in the Poirrier and Bailleau caves, but identified seemingly *in situ* remnants in the Grotte Effondrée, which he subsequently re-excavated over four field seasons (1952, 1953, 1954 and 1962), generating the topographic plans and profiles reproduced in Figures 6–7.

Figure 8 combines these documents with available written accounts to produce a synthetic view of the excavation history of the Grotte Effondrée². Our reconstruction implies that Delporte's 1962 work, the only year for which we lack published information, was carried out in the palier sud, which he extended another 2m further back and where he excavated the west profile of 1954 up to the cave wall behind. Although we could find no caption for the 1962 plan (see Figure 7a) in Delporte's (n.d.) incomplete and unpublished site monograph, kept in the archives of the MAN alongside the lithic and faunal collections from his excavations, this reconstruction is supported by the associated account.³

Delporte never provided an explanation for the eight year hiatus in his work between 1954 and 1962, or for the reasons why the site monograph he had begun to compile eventually remained unpublished. His last written word on

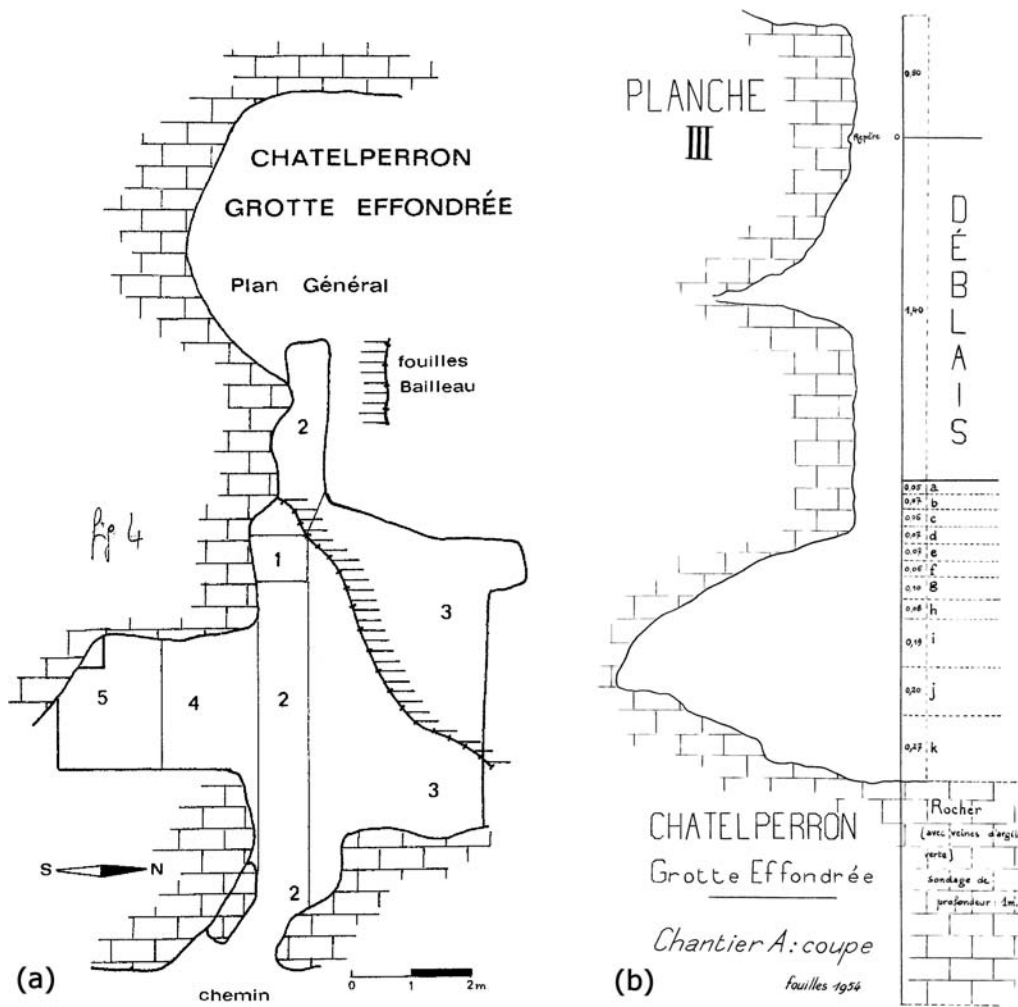


Figure 7. Left, Delporte's unpublished excavation documents. (a) Last excavation plan (n.d.: Figure 4), where, by comparison with Figure 6a, the "fouilles Bailleau" caption corresponds here to the profile's "déblais" and "déblais fouilles Bailleau" (i.e., to backfill), and where the different numbered areas are as follows: area 1 is the initial 1951 test pit; 2-east and 2-middle mark the 1952 trench; 2-west and 3-west mark the 1953–54 perpendicular extensions of this trench into the backfill accumulated against the northern and western walls of the cave; 3-east is the palier nord excavated in 1952 and 1954; area 4 is the palier sud excavated in 1953–54; area 5, not represented in the 1954 plan, can only correspond, therefore, to the area excavated in 1962. (b) Transversal profile in the area (between points 3 and 7 of the longitudinal profile in Figure 6a) of the inferior gallery with a Mousterian fill (Delporte n.d.: Pl. III).

the Grotte des Fées is found in a short pamphlet written for a wider audience (Delporte et al. 1999). This work is divided in several sections, each individually signed. Authored by Delporte himself are only those sections concerning the history of site and the collections, the biography of Bailleau, and the appropriate spelling for the culture-stratigraphic unit named after the site. The description of the stratigraphy and finds is made by F. Surmely and A. Urgal, with Delporte additionally co-authoring a couple of paragraphs on the significance of the site's Aurignacian finds.

In this latter section (Delporte et al. 1999: 33), the evidence from the Grotte Effondrée is interpreted in the light of Bordes's view of interstratification at Le Piage and Roc-de-Combe, i.e., as documenting an alternating use of the site by different human groups. This interpretation, however, departs significantly from what Delporte himself had written before (e.g., 1957: 474)—that is, that the few diagnostic Aurignacian items found in an otherwise ho-

mogeneous Châtelperronian sequence represented not a stratigraphically distinct Aurignacian occupation horizon but extra-regional cultural influence. In such a scenario, the Châtelperronians living at the type-site, located north of the Massif Central, would have belonged to an evolved phase of the culture, contemporary with the Aurignacian of the Aquitaine basin, and the contacts and exchanges maintained with the Aurignacian groups of southwestern France explained the abandonment at the site, by the Châtelperronians themselves, of items of Aurignacian affinities acquired via the exchange of objects or manufactured using borrowed technical concepts.

Delporte et al.'s (1999) belated effort to integrate the Châtelperron in the interstratification orthodoxy of the later 20th century contrasts with the fact that Bordes himself never used the Grotte Effondrée in support of his arguments concerning the parallel development of the Aurignacian and the Perigordian. Bordes' major discussion of the

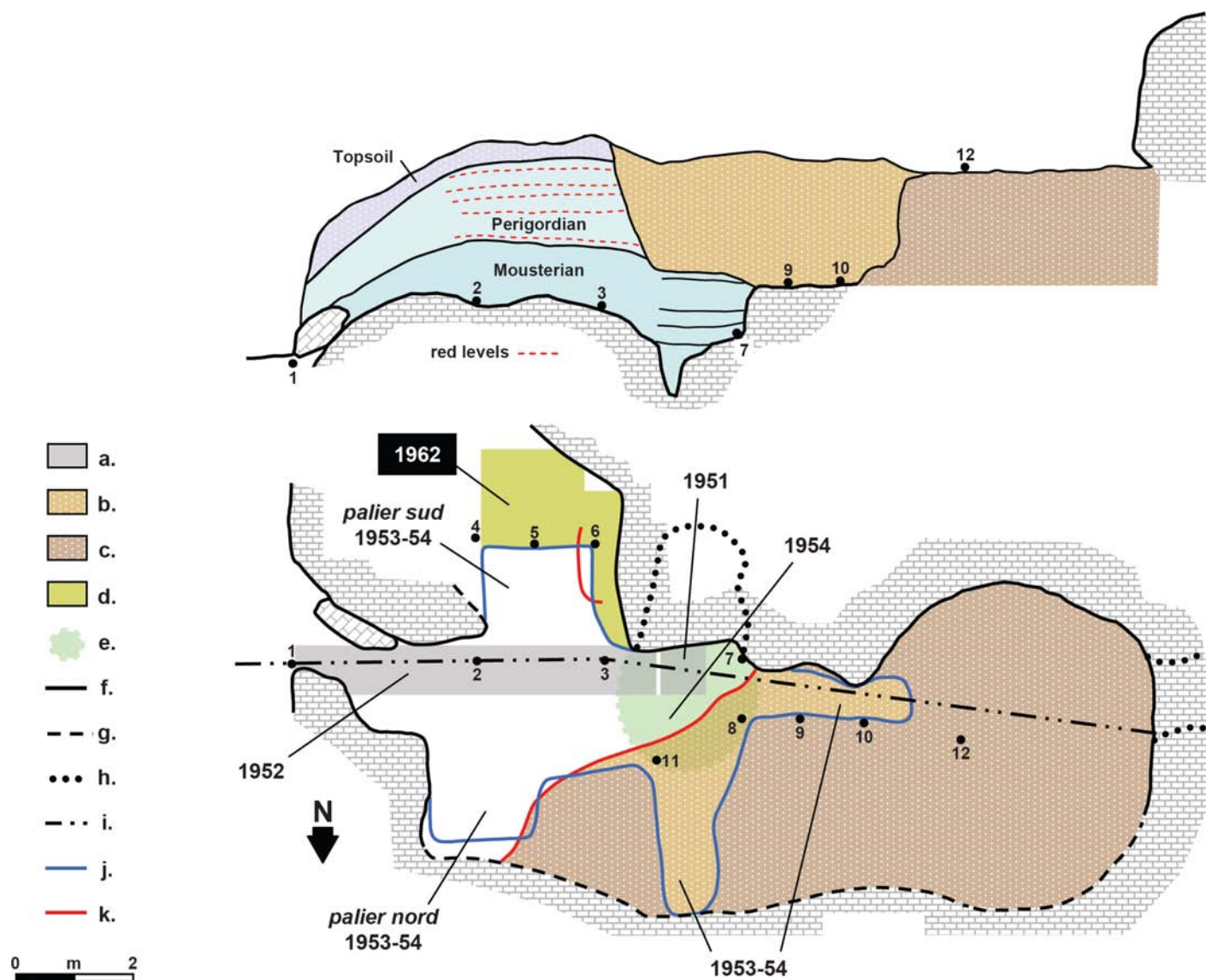


Figure 8. Grotte des Fées excavation history (reconstructed after Delporte, 1955, 1957, n.d.; the numbered points are topographic markers). Above, longitudinal profile along the E-W trench of 1952; between points 2 and 3, the stratigraphy recorded here by Delporte is identical to that schematically illustrated in the subsequently excavated palier sud (cf. Figure 9). Below, plan of the cave with indication of the areas excavated by Delporte: a. initial test and trench; b. trenches into Bailleau's backfill; c. Bailleau's backfill over bedrock; d. areas excavated in 1962; e. in situ Mousterian levels in an inferior gallery; f. observed limit of the cave wall; g. probable limit of the cave wall; h. walls of underground galleries; i. axis of the longitudinal profile; j. limits of Delporte's 1954 excavations; k. limits of Bailleau's excavations at the elevation of the Mousterian.

issue, in fact, ignores the site altogether, except for inclusion in a list of old excavations yielding evidence pertaining to the *Périgordien ancien* (Bordes 1968: 60). Later researchers of the Châtelperronian and of its relations with the Aurignacian followed suite. Harrold (1988), for instance, mentions the Grotte des Fées only once, in a table where he includes the site among those having yielded personal ornaments in a Châtelperronian context, while Pelegrin (1995), although confirming the unquestionable Aurignacian nature of the lithics found by Delporte in the middle of the site's Châtelperronian sequence, carefully refrains from taking this diagnosis as evidence supporting the broader paleo-anthropological implications of the interstratification para-

digm. The fact that, for more than 50 years, all researchers of the Châtelperronian largely ignored the Grotte des Fées in their discussions of the interstratification issue reflects the widespread skepticism—maintained throughout by the community of French Paleolithic archeologists—about the reliability of the evidence reported by Delporte. In retrospect, this skepticism was fully justified, and makes it all the more surprising that Mellars et al. (2007: 3662) felt confident enough about the site to make the bold claim that an ebb and flow of the Châtelperronian/Aurignacian frontier in east-central France is “archaeologically strongly documented” by the Châtelperron sequence. The exact opposite is true, as we further show below.

STRATIGRAPHY

In the presumably intact areas of the Grotte Effondrée, buried under the disturbed topsoil (Level A), Delporte recognized five stratified Châtelperronian levels, characterized by a distinct reddish color (from top to bottom, B1, B2, B3, B4, and B5). These were underlain by Mousterian deposits (Level C). He also identified three intermediate sublevels (B3a, B4a, and B5a) and noted a concentration of Aurignacian material in B4-B4a. Both Gravina et al. (2005) and Mellars et al. (2007) fully accepted the validity of this succession, while Zilhão et al. (2006) argued that: 1) Levels B1 to B3 were backfill; 2) only Levels C and, to some extent, B4-B5, were conceivably intact; and, 3) even if B4-B5 were broadly undisturbed, the best interpretation for the Aurignacian finds in B4-B4a would be post-depositional intrusion, not interstratification.

DRAWING VS. PHOTOS

Our argument was supported by photographic evidence that we found in the archives of the MAN (Figure 9), and Mellars et al. (2007) agree that this evidence records a SW corner in the palier sud excavation area, for which a strati-

graphic drawing also is available (Delporte 1957: Figure 2). They further accept that the photographed western profile is disturbed, and explain the discrepancy with the drawing, where Delporte records a succession of undisturbed levels, as resulting from the fact that the photos represent a different stage of the work:

“Delporte recorded that the **eastern** [our emphasis] limit of the 19th-century excavations overlapped for a short distance (*ca.* 30 cm) into the western end of this box section. (...) the deposits eventually exposed by Delporte in the western face of this section, marked by a dense mass of protruding roots, does [*sic*] indeed represent the loose backdirt of the earlier excavations, whereas the section exposed in the immediately adjacent southern face (partially shown on the left-hand side of the photograph, and with no visible protruding roots) represents the *in situ* occupation levels (...). This of course would presumably imply that the drawn section of this trench was recorded by Delporte before the extension of the excavation into the overlap zone with the 19th-century excavations (...)” (Mellars et al. 2007: 3659).

Delporte’s statement that the excavation of the palier sud was carried out over two years (1953–54) makes it pos-

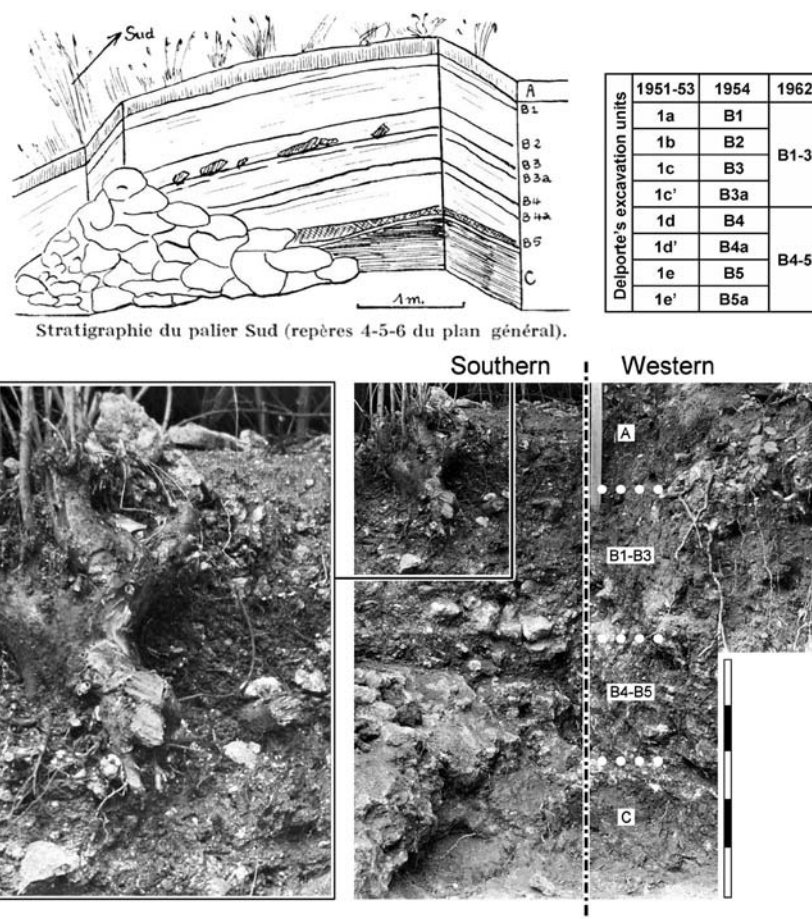


Figure 9. Top left: schematic stratigraphy of the palier sud (Delporte 1957). Top right: equivalence between the different level designations used by Delporte over the years. Bottom right: mosaic of Delporte’s photos of profiles from the Grotte des Fées, probably documenting the SW corner of the palier sud (scale bar: 1m), and blown-up view (bottom left) of the framed area in the southern face (after Zilhão et al. 2006: Figure 1).

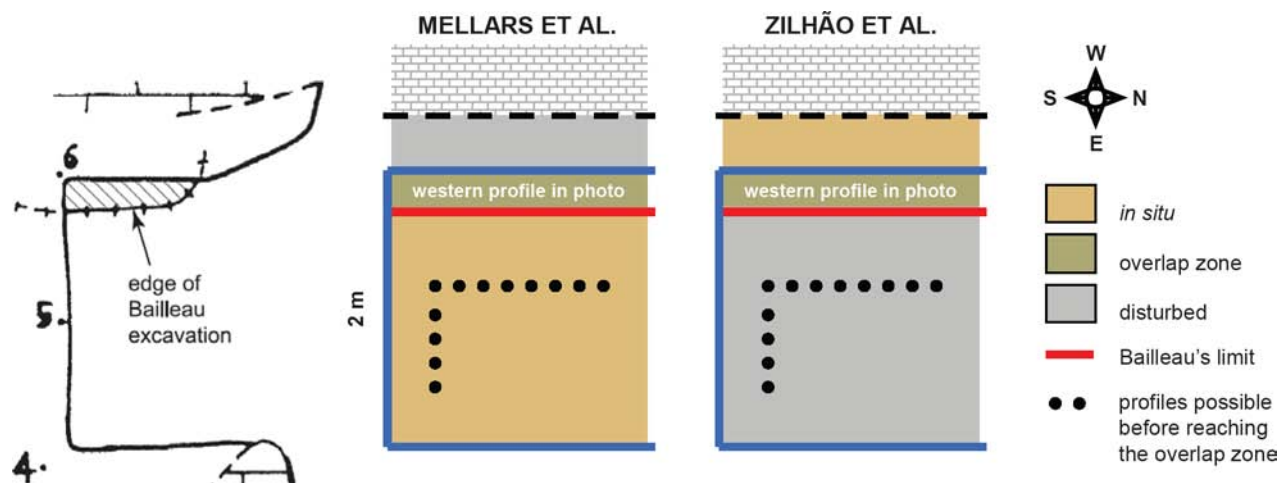


Figure 10. Blown-up plan of the palier sud as published by Mellars et al. (2007: Figure 1) showing why their topological model for the discrepancy between intact deposits in the drawing and disturbed deposits in the photos is unlikely. Since Delporte's line represents the western, not the eastern limit of the 19th century excavations, any profiles drawn inside the palier sud **before** the overlap zone was reached would have cut through disturbed deposits from top to bottom.

sible that intermediate profiles were indeed generated before he reached the limits recorded in 1954 (cf. Figures 6b and 8). Mellars et al.'s (2007) reasoning, however, assumes that the lines drawn by Delporte to identify the area affected by the 19th century excavations represent the **western**, not the **eastern** limits of that area. Delporte (1957: 456), in fact, leaves no doubt that the line described in the caption to his plan as "limites des fouilles Bailleau" (see Figure 6b; "fouilles Bailleau" in Figure 7a) can only be interpreted as the outer boundary of the area lying between that line and the cave entrance. His description of how the location of the palier nord and palier sud excavations relate to Bailleau's is unambiguous: Delporte's work was carried out **north** and **south**, not **east** of the area excavated in the 19th century.⁴ Therefore, the lines in Delporte's published excavation plan (see Figure 6b) indicating the "limites des fouilles Bailleau" must indeed represent the western limit of Bailleau's excavations, in the palier sud, and their northwestern limit, in the palier nord and in the central part of the site above the inferior gallery that contained a Mousterian remnant. In these circumstances, any profiles recorded in the palier sud **before** the excavation reached the overlap zone would have cut through disturbed deposits, and it would have been only **after** he reached that zone that Delporte could have recorded anything intact (Figure 10).

Correcting Mellars et al.'s (2007) topological error and reversing the terms of their argument, i.e., assuming that the drawing represents *in situ* deposits found beyond the limits of Bailleau's excavations, and that the photo represents profiles documenting the disturbed fill removed along the way, could Mellars et al.'s explanation still hold? Conceivably, but with the problem that in no way can the drawing be accommodated to the concrete topographic indications given in Delporte's plans (cf. Figure 11). First, the western face of the drawn profile is only 1m, whereas, in order to extend beyond the limit of Bailleau's excavations

in this part of the cave, it would have to be >2m long. Second, the southern face is drawn >3m long, whereas, at the end of the 1954 field season, the palier sud was only 2m on all sides, and any 3m long profile cutting the deposits 1m behind the southern face of the 1952 trench would have to record rock faces, not sediment fill, at both ends.

These inconsistencies suggest, as we argued before, that Delporte's 1957 drawing (cf. Figure 9) is a *post facto* schematic rendition of the site's stratigraphy, combining elements of the 1952 trench and the 1953–54 palier sud excavations, not the recording of any profile physically extant at any time during the excavation process. Thus, contra Mellars et al. (2007), it is clear that, when it comes to assessing the nature of the deposits, the photographic evidence is much more reliable. The drawing was never meant to be literal representation of observed reality, only graphic presentation of the excavator's idealized stratigraphic model.

INTACT LEVELS IN THE SOUTH PROFILE OF THE PALIER SUD?

If the photographic evidence combined with simple topographic logic suffices to demonstrate that the deposits excavated by Delporte in the western side of the palier sud can only be backfill, could it be that he found *in situ* levels further east, in which case, such levels would show on the south profile? Mellars et al. (2007) contend that such is indeed the case, but the photographic evidence proves otherwise. The tree stump shown bottom left in Figure 9 is at least 40cm in diameter and affects the deposits to a depth in excess of 60cm. Given that Level A was only 30cm thick (Delporte 1955: 81), this tree stump and associated large roots penetrated deeply beyond the topsoil and well into Levels B1 to B3. Thus, by the criteria set by Mellars et al. (2007) themselves, the evidence for disturbance in the southern face is even more conspicuous than that provided

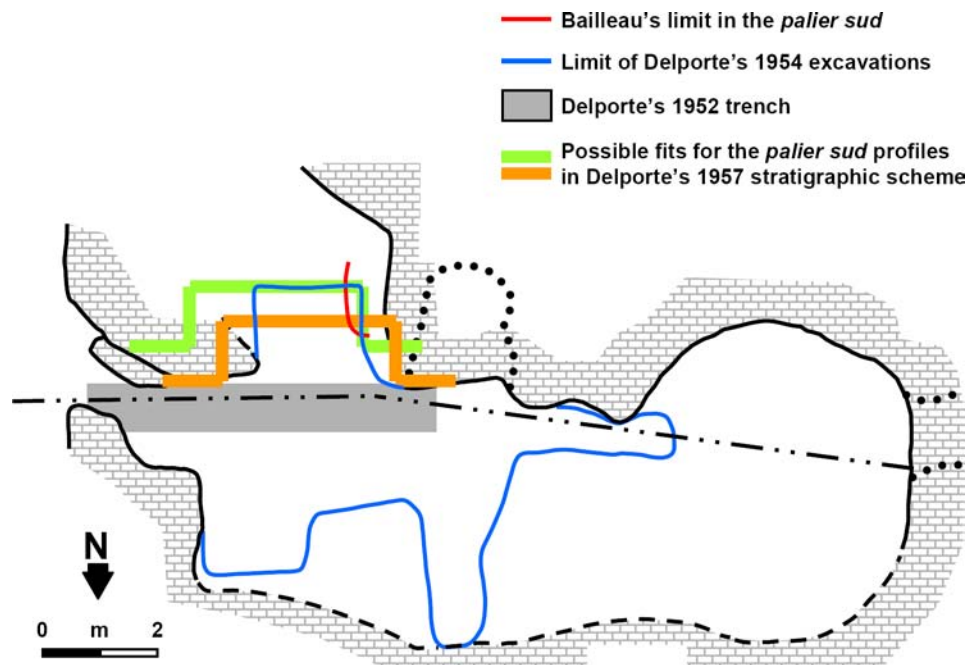


Figure 11. The spatial inconsistency between the stratigraphic drawing of the *palier sud* in Delporte (1957) and the plan of the excavations in Delporte (1955), both recording the situation at the site after the 1954 field season, makes it clear that the drawing was meant to be a *post facto* graphic rendition of the excavator's stratigraphic model, not the accurate representation of observed profiles.

by the readily apparent protruding roots of the western face. That such is the case should come as no surprise, given the location of the area affected by Bailleau's excavations, and the three-dimensional configuration of their limit: "only approximate," "recorded at the level of the Mousterian," and "tending to widen in the Perigordian" (Delporte 1955: 79, 81).⁵

Given this upward-widening (*évasement*), Bailleau's limits would therefore have to lie well beyond the southern edge of Delporte's 1954 *palier sud* excavations in at least the upper part of the Châtelperronian-bearing deposits. In fact, a further implication of the geometry of Bailleau's excavation limits is that the overlap zone noted by Mellars et al. (2007) in the western side of the *palier sud*, only some 20cm wide at Mousterian elevation, would have been much reduced or non-existent in uppermost Levels B1 to B3, where, inevitably, both limits (Bailleau's and that of Delporte's 1953–54 work) must have been broadly coincident. It is possible that at some point Delporte saw the western face of his 2m x 2m box as the vertical interface between Bailleau's backfill and intact, peripheral deposits preserved against the cave wall, and that he took the photos to record the finding of such an interface. If that were the case, the photos prove that the profile still cut through disturbed deposits, at least in its upper part.⁶

These observations contradict Delporte's consistent reference to the five main reddish levels with find concentrations as true occupation surfaces "clearly distinct by their coloration"⁷ (Delporte et al. 1999: 18). Mellars et al. (2007: 3661) think that "this clear and sharply defined stratigraphic sequence is totally inconsistent with any version of the 19th century backdirt hypothesis." In our experience, how-

ever, redeposited stratigraphies are often characterized by alternating lenses of sharply contrasting color (cf. Texier et al. 2004).

BAILLEAU CONTRA DELPORTE AND MELLARS ET AL.

Besides being in contradiction with Delporte's own account, Mellars et al.'s (2007) misplacement of the area affected by the 19th century excavations becomes immediately apparent if we consider the implication that, following their reasoning, Bailleau would have left the central part of the *palier sud* intact and limited himself to the digging of a very narrow N-S trench along its western wall. This is not only rather unlikely; it is also, given the narrowness of such a trench and overall spatial constraints (cf. Figure 12), a practical impossibility.

Knowing the *modus operandi* of 19th century excavators, one also must be instinctively skeptical of the possibility that, at a site as small as the foyer area of the Grotte Effondrée, Bailleau would have left any significant portion of the deposits untouched. That one such portion would have been located immediately beyond the narrow (ca 1m wide) aperture between large boulders that leads from the adjacent path into that foyer is even harder to believe. Such a large baulk, in fact, would have represented an impossible obstacle for the safe and efficient removal of sediments from the areas further west that Delporte identified as filled with 19th century backdirt (Figure 13).

Bailleau's (1869: 13–14; 1872: 112, 116–118; Figures 14–15) concrete information on how he proceeded with operations at the site fully corroborates that: 1) Delporte erred



Figure 12. Photomosaics (equirectangular projection) with different interior perspectives of the foyer area of the Grotte Effondrée, indicating the approximate position of several topographic features of relevance for the assessment of the site's excavation history.

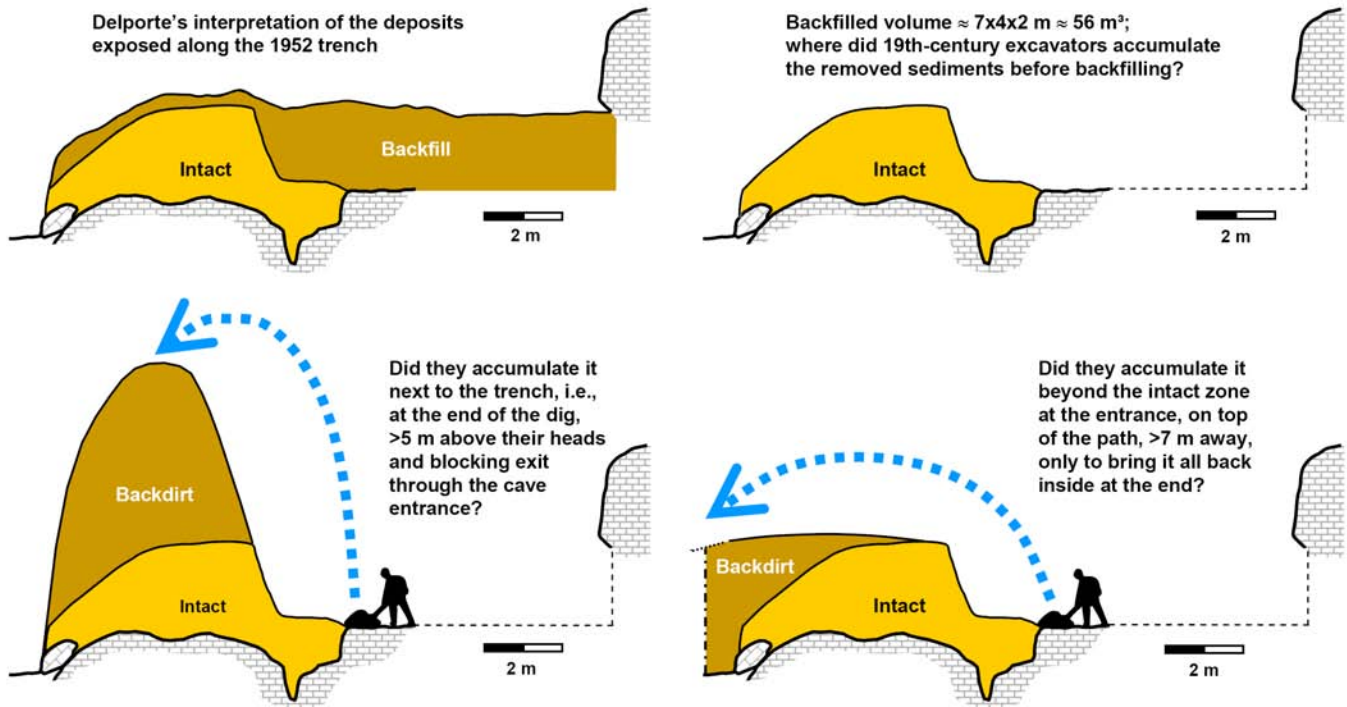


Figure 13. This figure shows the improbability of 19th century excavators leaving a 2m-high intact baulk between the narrow entrance to the cave and their area of operations.

in diagnosing the south face of his 1952 trench as an intact stratigraphy; and, 2) Mellars et al. (2007) erred in interpreting the limits of Bailleau's work at the Grotte Effondrée as established by Delporte as eastern, instead of western. Bailleau's explicit narrative, in fact, leaves no doubt that:

- the foyer was an area between large boulders corresponding to the former entrance of a now vaultless chamber located behind (i.e., given local topography, to the west);⁸
- the foyer area was located in front of and at some distance from the vaultless chamber space, access to which was via a rather steep slope;⁹
- by 1869, "a space six meters long and four meters wide," where "several successive occupations would have taken place" across a thickness of "more than one meter" had already been excavated in the foyer area;¹⁰
- it was only in the spring of 1870, once the foyer area had already been extensively excavated, that Bailleau realized that the space behind corresponded to a former cave and began working there;¹¹ and,
- this new space continued for 5–6m into the interior of the massif as a vaulted gallery ca 2.5m wide; although interesting fossils were collected in this part of the site, including artifacts, the latter were for the most part concentrated in the foyer area.¹²

That the archeological remains in Bailleau's collection mostly come from the foyer area and that he extensively excavated here before realizing that a collapsed cave existed behind can be further corroborated by comparing the

artifact illustrations. Plates II–III of the 1869 paper, published at a time when only the foyer was known, feature 18 pieces, while Plate II of the 1872 paper, published after the cave was discovered, features 25. Although the drawing style is different and some pieces are flipped or mirrored, 17 of the 18 pieces from 1869 are recognizable among the 25 pieces from 1872. Even if the eight new ones all came from the 1870–72 digs (which is not necessarily the case), the comparison suggests that Bailleau saw the 1869 material as representative of the human occupation of the Grotte Effondrée as a whole. This conclusion agrees well with the notion that the site's Châtelperronian deposits were indeed mostly located in the area excavated until 1869, i.e., the foyer, not the cave. In these circumstances, the richness of the 19th century lithic assemblage (cf. Lacaille 1947) can only be explained by the fact that the foyer, i.e., the same general area where Delporte opened his 1952 trench and his 1953–54 paliers, was indeed the object of extensive exploration by Bailleau.

Moreover, Delporte's longitudinal profile (see Figures 6a and 8) shows: 1) that bedrock outcropped immediately to the west of where he found the outer edge of the 19th century excavations; and, 2) that the maximum length of the area lying between that outer edge and the narrow passage between boulders leading to the adjacent path is some 6m, i.e., precisely the size given by Bailleau for the area where he excavated down to >1m. If we combine Delporte's topographic observations with Bailleau's descriptions of his own work, the conclusion is inescapable (Figure 16). Where Delporte identified an "intact" stratigraphy of well-defined

Les sillons tracés par les dents humaines sont faciles à distinguer de ceux laissés sur les mêmes ossements par les carnassiers. Sur la mâchoire qui nous occupe, le sillon tracé par la dent commence par une empreinte légère et aiguë, va en augmentant, puis se termine brusquement d'une manière large et carrée. Les empreintes des dents de carnassiers, au contraire, n'offrent qu'un sillon plus ou moins profond, mais toujours aigu et moins large que dans les empreintes dont je parle ; son étendue est aussi ordinairement plus considérable.

Cette mâchoire d'aurochs est une pièce des plus rares, c'est la seule que j'ai rencontrée présentant ce caractère d'une manière aussi tranchée. Elle prouve non-seulement la présence certaine de l'homme dans ces cavernes, mais elle m'explique pourquoi, sur les crânes humains, trouvés dans les sépultures de l'âge des cavernes, les dents incisives sont toujours plus usées que les autres. On dit pour expliquer cette particularité que c'était parce que ces peuplades mâchaient sur leurs dents incisives, je crois pouvoir ajouter que c'était aussi parce qu'elles rongeaient les os avec elles.

3^e Foyer (plus à l'Est). J'arrive à la partie la plus intéressante de mon travail, quoique je n'ai fait que glaner en cet endroit, dans les fouilles que M. Poirrier y avait fait exécuter antérieurement ; c'est encore là que j'ai recueilli les objets les plus nombreux et les plus précieux.

Situé comme je l'ai dit, à droite des cavernes et à un niveau supérieur, cet emplacement, entouré de rochers, était parfaitement choisi, en ce qu'il était

protégé des vents du nord par le coteau qui s'élève derrière lui ; dominant les grottes, il était admirablement placé pour découvrir ce qui se passait au loin dans la vallée et devait servir de poste avancé pour veiller sur l'ennemi.

Pendant longtemps l'homme y a établi son séjour, c'est là qu'il préparait ses repas, ainsi que l'attestent les cendres, les charbons et les débris d'ossements rongés, qu'on y trouve accumulés sur une épaisseur de plus d'un mètre. Plusieurs occupations successives ont dû se faire dans cet espace de six mètres de long sur quatre de large ; on rencontre en effet, à différentes profondeurs, en fouillant le sol, des plaques de schiste juxtaposées qui ont servi à l'édification des foyers. C'est en remuant ces cendres et ces débris que j'ai recueilli, outre les instruments de silex qui les avaient tués, les vestiges de tous les animaux dont l'homme a fait sa nourriture pendant cette époque si longue et si reculée.

J'y ai rencontré toute la faune trouvée dans les cavernes, entre autres plusieurs défenses de mammoth, dont l'une assez bien conservée avait plus de deux mètres de long, sur 0,30 centimètres de diamètre à sa base, brisée à sa racine, je n'en ai pu extraire que 1^m50 environ. Nous l'avons offerte au musée impérial de Saint-Germain-en-Laye. C'est aussi parmi ces débris que j'ai recueilli des quantités considérables de silex, éclats, nucléi et instruments entiers, ainsi que plusieurs objets en os ou en ivoire travaillé. Ces restes, d'une industrie primitive, prouvent qu'une fois le repas achevé, l'homme demeurait encore près du feu qu'il avait allumé et passait

Figure 14. Facsimile reproduction of Bailleau's (1869: 13–14) account of the excavation work that he carried out at the Grotte Effondrée.

red levels is exactly where Bailleau extensively excavated a dense human occupation deposit extremely rich in artifacts, bones (including mammoth tusks) and structured, stone-lined hearths. Thus, it is clear that, in Delporte's time, no intact Châtelperronian deposits could have survived in the Grotte Effondrée anywhere along the 1952 trench. At best, such deposits conceivably existed beyond the "overlap zone" of the palier sud discussed by Mellars et al. (2007), but not east or north of that zone (see Figure 10).

In short, there can be no doubt that Delporte's 1952 trench cut through a disturbed stratigraphy, one found before the excavation of the palier sud itself had been initiated (and, consequently, before the putative intact deposits therein eventually encountered could themselves be excavated). Thus, if reproducing intact deposits observed within the palier sud beyond the limits of Bailleau's excavation, the southern face of the 1957 drawing in Delporte could hardly exhibit the exact same stratigraphy as that described by Delporte for the southern face of the 1952 trench! Put another way, since the stratigraphy represented in Fig-

ures 6a and 9 is identical, it is in both cases either an intact stratigraphy or a disturbed stratigraphy. It simply cannot be that one figure (Delporte's drawing of a section in the palier sud) records an intact stratigraphy, while the other (Delporte's drawing of the south face of the 1952 trench) records a disturbed one. Since we established that the stratigraphy recorded by Delporte in the 1952 trench is that of a backfill deposit, it follows that such is also the case with the stratigraphy that he reports having observed in the palier sud.

DELPORTE'S INCONSISTENCY

The discrepancy between Delporte's topographic observations and stratigraphic interpretations is too obvious for him not to have perceived it at some point. Having found Bailleau's excavation limits where he placed them in the 1954 plan, Delporte should have realized that any deposits excavated in the central part of the site east of that limit had to be disturbed and, specifically, that the "red levels"

— 112 —

trées, MM. Christy et Lartet, et je n'eus plus qu'un désir, celui d'y faire des recherches afin d'y découvrir les restes de l'homme primitif ou de son industrie.

Ces fouilles, commencées pendant l'automne 1867 avec MM. Collas de Chatelperron et de Bure, m'ont occupé à différentes reprises et ce n'est qu'au printemps 1870, que j'ai découvert la 3^e caverne.

Dans la première notice que j'ai écrite sur la grotte des fées, je disais qu'elle se composait de deux cavernes habitées autrefois, et d'une troisième partie que je supposais être le lieu où l'homme qui y vécut aux temps préhistoriques, établit ses foyers pour préparer ses aliments. Aujourd'hui mes recherches sont plus complètes, et je puis avancer qu'il n'y eut véritablement que la troisième caverne d'habitation : ce que j'ai pris pour un foyer seulement, n'était que l'entrée de cette grotte aujourd'hui disparue.

Je vais du reste passer en revue chacun de ces trois points et dire ce que j'y ai rencontré jusqu'à ce jour. La moisson n'a été ni riche ni abondante, mais je n'ai fait que glaner là où d'autres avant moi avaient ramassé à pleines mains.

Le chemin de fer dans sa construction, ayant enlevé les terrains situés devant les grottes, c'était là qu'étaient les objets les plus précieux. M. Poirier en recueillit un grand nombre, et ceux qu'il négligea sont enfouis pour longtemps dans un remblai situé à quelques mètres de distance.

1^{re} Caverne de gauche (Sud-Est).

Cette caverne, par laquelle j'ai commencé les fouilles, ne m'a pas donné de résultats satisfaisants ;

— 117 —

mine les choses de plus près, on trouve, à travers les différentes couches de ses foyers superposés, des silex taillés en quantités innombrables, des ossements d'une grosseur prodigieuse, et l'explorateur reste stupéfait en trouvant presque à fleur du sol, dans ces cendres, d'énormes défenses de mammoths empilées les unes sur les autres. J'en ai mesuré quelques-unes, elles atteignaient plus de deux mètres de longueur sur 0^m, 30 centimètres de diamètre à leur base.

Le temps qui détruit tout, semblait avoir voulu les respecter pour les étaler à nos yeux ; mais ce fut presque tout ce que nous en pûmes retirer. Je n'ai pu en effet, après de minutieux efforts, que débarrasser en partie l'une d'elles des terres et des cendres qui l'avaient protégée jusque-là. Sa longueur est encore d'un mètre cinquante centimètres ; nous l'avons offerte, M. Collas de Chatelperron et moi, au musée de St-Germain-en-Laye.

Ces foyers se prolongeaient assez avant dans la grotte à laquelle on descendait par une pente assez raide. C'est en continuant nos fouilles, que nous avons ramassé sur cette pente de belles dents canines d'*Ursus spelæus*, plusieurs dents de *rhinocéros tichorhini*, et un certain nombre d'énormes molaïres de mammoth, alternant avec de petites dents de lait de ces mêmes animaux.

Les restes de l'industrie primitive de l'homme de cette époque étaient épars à travers l'espace parcouru par nos déblais. Mais la majeure partie était concentrée autour des foyers sur une épaisseur de 0^m 75 centimètres environ. Ce serait une preuve que

— 116 —

rare ou amulette (pl. 1^{re}, fig. 14, 15 et 16.) Je n'ai pu vider entièrement cette caverne ; des blocs de rochers énormes écroulés de la voûte m'ont barré le chemin. Les premières fouilles entreprises à la lueur de la lampe du mineur sont cependant devenues plus faciles dans la suite, après un éboulement qui m'a permis de recevoir directement la lumière à travers la coupole de la caverne.

Je me suis arrêté à 15 m. de l'entrée sans rencontrer d'autres vestiges que ceux précédemment décrits. La caverne semble s'incliner vers le fond sur la gauche, et il se pourrait bien qu'elle communiquât par un couloir avec la première.

3^e Caverne de droite. (Nord-Est).

J'arrive maintenant à la partie la plus intéressante de mon travail, la description des vestiges recueillis dans l'habitation de l'homme préhistorique.

Cette troisième caverne, située à un niveau supérieur de deux mètres environ à celui des deux autres, est précédée d'un petit plateau entouré de rochers sur lequel les habitants primitifs de cette demeure établirent leurs foyers ; c'est dans les cendres que j'ai retrouvé les débris des repas de nos ancêtres et les restes de leur primitive industrie.

On reconnaît sur cet emplacement les dalles de schiste encore en place, sur lesquelles furent allumés les feux d'il y a plusieurs milliers d'années : on y reconnaît leurs cendres et leurs charbons, rien n'a été dérangé dans ces lieux, et l'on croirait à première vue qu'on remue un brasier éteint d'hier. Mais si l'on exa-

— 118 —

l'homme, une fois son repas achevé, demeurait autour du feu qu'il avait allumé et passait ses loisirs à préparer ses instruments de travail ou ses ornements,

La caverne s'enfonçait dans le coteau, mais son étendue facile à reconstituer n'était pas considérable, 2^m 50 de large sur 5 à 6 de long. Lorsque je commençai à la déblayer, la voûte écroulée jadis n'existait plus, les débris en avaient été employés par l'industrie. Il ne restait plus que les terres de remplissage à enlever, c'était donc un travail des plus faciles, et d'autant plus agréable qu'à chaque pas on mettait à jour quelque objet nouveau.

C'est dans cette troisième caverne et ses foyers que j'ai recueilli tous les spécimens de l'industrie de ses habitants, ainsi que les ossements des animaux dont j'ai dressé la liste pour établir leur contemporanéité avec l'homme de cette époque.

Les silex, à part quelques rares exceptions, sont tous taillés dans la même matière ; c'est toujours le silex en roche d'eau douce, à pâte peu homogène, jaunâtre ou jaspé. Il est facile d'en reconnaître la provenance. Il a été apporté des ateliers de Tilly dont j'ai parlé, et dont la distance à vol d'oiseau peut être évaluée à 10 kilomètres. Les habitants de la Grotte des Fées venaient chercher leurs provisions de blocs de silex à Tilly, et une fois rentrés chez eux ils les façonnaient à leur guise autour de leur foyer, comme le prouvent les éclats et les nuclei qu'on y retrouve par milliers. Les autres silex travaillés, qui ne proviennent pas de Tilly, sont des cailloux roulés, si connus sur les bords de la Loire ou dans les terrains argilo-siliceux de Vaumas et de ses environs.

Figure 15. Facsimile reproduction of Bailleau's (1872: 112; 116–118) account of the excavation work that he carried out at the Grotte Effondrée.

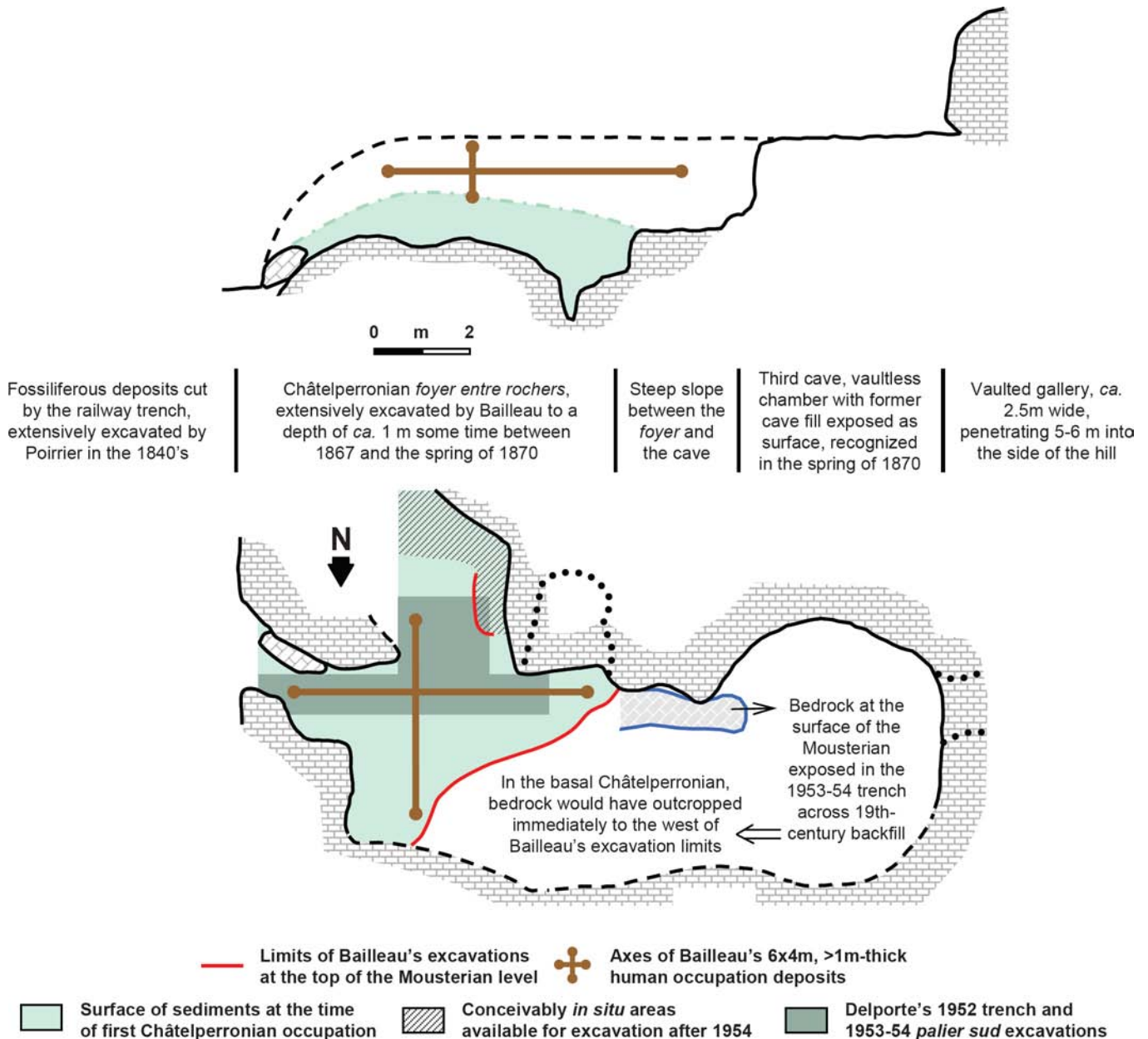


Figure 16. Given the size and location of Bailleau's *foyer* area, both Delporte's 1952 trench and 1953–54 *palier sud* excavations could only have been made into 19th century backfill. In this external part of the Grotte Effondrée, intact Châtelperronian remnants only could have existed beyond the southern face of Delporte's *palier sud* and between the latter's western profile and the cave wall. The dashed line in the profile view represents the hypothetical ground surface at the time of Bailleau using Delporte's (cf. Figures 6a, 8 here) as an approximation.

between points 2 and 3 of the longitudinal profile (i.e., the southern face of the 1952 trench; cf. Figures 6a and 8) could not be *in situ* Châtelperronian occupation levels, as he first thought. That he may have wondered whether rectification was in order is actually suggested by the concluding paragraph of his 1954 excavation report: “the excavations were carried out at a site, if not emptied, at best containing intact remnants of a *peripheral nature* [Delporte's emphasis], hence infinitely less rich than the central zone that contained the important hearths studied by Bailleau ca 1870” (Delporte 1955: 84).¹³

There is thus a clear contradiction between this categorical statement and the concept that intact deposits existed in the central part of the site, as claimed in the profile Delporte published (Figure 6a here). We believe that, despite the apparent consistency of his accounts, Delporte must have been well aware of the problems. Perhaps that is why he never published these excavations in any detail, and, in private, always expressed cautious reservation on the use of the Grotte des Fées as a valid instance of Châtelperronian/Aurignacian interstratification (F. Bon, personal communication to J.-G. Bordes).

couche A (végétale et déblais).....	22		
niveau B 1.....	10		
B 2.....	7		
B 3.....	34	...75	...203
B 3a.....	10		
B 1-2-3 (mal précisé).....	15		...181
B 4.....	32		
B 4a.....	11		
B 5.....	49	...106	
B 5a.....	3		
B 4-5 (mal précisé).....	11		

Figure 17. Delporte's (n.d.: 28) table of retouched tool-types per stratigraphic unit in the Châtelperronian levels of his excavations at the Grotte des Fées. The "poorly defined" [*mal précisé*] qualification refers to stratigraphic provenience, not tool-typology. The "B1-2-3" unit, which did not exist in the papers published by Delporte prior to his 1962 work at the site, must correspond to the "B1-3" unit present in find labels with a 1962 excavation date. This inference is corroborated by the fact that the "B4-5" provenience unit, also encountered exclusively in find labels associated with a 1962 date, is likewise defined as *mal précisé*.

RADIOCARBON DATES

The radiocarbon dates provide Mellars et al.'s (2007) strongest argument:

"The striking consistency (...) of the eight dates secured for the upper Chatelperronian levels (B1-B3) is particularly significant. Apart from their internal consistency, why is it that not one of these samples produced a date in the range of 39,000-40,000 BP, which one would inevitably expect if these samples derived from the excavation backdirt of the underlying, *in situ* Chatelperronian levels in layers B4 and B5?" (p. 3659-3660).

SAMPLE PROVENIENCE

Elsewhere (p. 3659), Mellars et al. (2007) refer to the eight samples in question as coming from "B1-B3 (combined)," but the actual labeling (correctly given by them before in Gravina et al. 2005: Table 1), is "B1-3". This designation (equivalent to the "B1-2-3" provenience unit of Figure 17), as well as that of "B4-5," corresponds not to a conflation of material coming from levels originally recognized in the field as distinct but to a single provenience unit from an area where the stratigraphy was "poorly defined." An explicit comment in Delporte's ca 1964 unpublished manuscript (n.d.: 56) concerning the provenience of an Aurignacian scraper that, in the MAN collections, bears the ink label "Ch 62." and the pencil label "B1/3" (Figure 18 here) makes this point very clearly: "found in an area where level differentiation was poor."¹⁴ Moreover, whenever associated with the year of excavation, all artifacts marked "B1-3" or "B4-5" are also marked 1962, and the same applies to the labels in the bags of bones. That the B1-3 and B4-5 pro-

venience categories relate exclusively to finds made in the 1962 excavations also is indicated by the fact that they are absent from Delporte's 1955 and 1957 site reports.

In sum, the evidence is that:

- "B1-3" and "B4-5" represent two single provenience units, ones that were recognized in 1962 only, and in an area where the stratigraphy appeared to Delporte, by comparison with that observed in 1952-54, to be "poorly defined;"
- the designations chosen for these two units suggest that B1-3 corresponds to a thickness of deposits broadly identical to, and found at similar elevation as that of the B1 to B3 block of levels from 1952-54 (and likewise for B4-5 of 1962 and B4 to B5 of 1952-54); and,
- put another way, a lateral variation was observed that precludes considering the 1962 B1-3 deposits as stratigraphically, taphonomically, and chronologically the same as the B1 to B3 succession of 1952-54.

Although complete certainty is impossible, the parsimonious reading of this evidence (cf. Figures 6b, 7a and 8) is that the 1962 areas with poorer stratigraphic resolution (i.e., with only two levels, B1-3 and B4-5, instead of the five levels and three sublevels originally described) are those excavated that year beyond the 1954 southern face of the palier sud. On the other hand, since some items from 1962 are also labeled B4 and B5, it seems reasonable to infer that such items relate to the excavation, also undertaken that year, of the basal deposits of the remnant located between the cave wall and the 1954 western profile of the palier sud, a profile that Delporte had used previously for stratigraphic



Figure 18. An Aurignacian scraper featuring “1962” and “B1–3” as provenience information. Delporte (n.d.: 56) reported this item as coming from “an area where the differentiation of the levels was poor.”

reference. If so, the consistency of the three dates for B5, all on samples from 1962 (Table 1), agrees well with the notion that intact deposits of Châtelperronian age, albeit with rare Aurignacian intrusions, indeed existed in that basal part of the remnant.

In any case, there are at least two unambiguous conclusions to be drawn from sample provenience: 1) the B1–3 and B5 samples come from different areas of the site featuring different stratigraphic configurations; and, 2) no dates in the B5–B4 range were obtained for samples from the overlying levels of the area where Delporte identified the interstratification (i.e., Levels B1, B2 and B3 of 1952–54), because no such samples were dated.

SIGNIFICANCE OF THE B1–3 RESULTS

Establishing the actual significance of the B1–3 dates requires consideration of their immediate archeological con-

text and the nature of the samples. The composition of the rather poor lithic assemblages recovered in B1–3 and B4–5 (Table 2) allows three possible interpretations (see Table 1): 1) both levels were geologically *in situ* and were a palimpsest of Châtelperronian through Aurignacian age, perhaps as a result of syndepositional mixing; 2) B4–5 was an intact deposit of Châtelperronian age, the one Dufour bladelet recovered therein being intrusive from B1–3, which alone would represent a Châtelperronian through Aurignacian palimpsest; or, 3) the area with this “poorly defined” stratigraphy was composed of disturbed deposits (e.g., back-fill) from top to bottom. Whichever the case, these data simply cannot be construed as an “interstratification.” By definition, even if the B4–5 and B1–3 levels were both *in situ* and superimposed, interstratification would require three stratigraphic units where only two exist.

When deposits are conceivably mixed or disturbed, only the age of anthropically modified bones (e.g., cut-

TABLE 1. STRATIGRAPHY OF THE B LEVELS IN DIFFERENT AREAS OF THE GROTTTE DES FÉES.

1951–54 sectors and west profile of the palier sud			1962 southward extension of the palier sud (area 5 in Figure 2a)		
Stratigraphy	Archaeology	¹⁴ C BP	Stratigraphy	Archaeology	¹⁴ C BP
B1	• Châtelperronian		B1–3	• Aurignacian	34,550±500
				• Châtelperronian	34,940±330
B2	• Solutrean			• Mousterian	35,400±450
	• Aurignacian			fauna	35,890±380
	• Châtelperronian				36,000±1000
B3	• Châtelperronian				36,250±750
B3a					36,340±320
					>53,900
B4	• Aurignacian	35,540±280	B4–5	• Aurignacian	
B4a	• Châtelperronian	39,780±390		• Châtelperronian	
	[both				
	1951–54				
	samples]				
B5	• Aurignacian	39,150±600			
	• Châtelperronian	39,240±380			
		40,650±600			
B5a	• Châtelperronian	[all 1962			
	samples]				

The provenience (level and excavation year) of the radiocarbon samples from B4 and B5 is that given in the declaration kept in the archives of the MAN where Brad Gravina (Gravina et al. 2005) lists the provenience of the bones from those levels taken by him for dating on October 7, 2004. The B1–3 samples must all come from the 1962 excavations, the only year when this provenience unit was used.

TABLE 2. FINDS FROM THE B1–3 AND B4–5 LEVELS OF THE GROTTTE DES FÉES (DELPORTE’S 1962 EXCAVATIONS).

	B1–3	B4–5
Diagnostic Châtelperronian		
Unretouched bipolar blades	3	1
Backed pieces	8	5
Truncations	1	1
Diagnostic Aurignacian		
Aurignacian endscrapers	1	-
Dufour bladelets	-	1
Nondiagnostic		
Total Lithics	39	17
Total Lithics	52	25
Bones	162	-

After Zilhão et al. (2006) and unpublished data. The eight radiocarbon dated samples from B1–3 were added to the bone count. Based on raw-material and aspects of technology, the nondiagnostic lithics are likely to be Châtelperronian in most, if not all, cases.

marked) is a secure proxy for the chronology of the human activity represented by the artifacts contained therein. Gravina et al. (2005) report anthropic modifications in none of the dated samples from the Grotte des Fées and, where those from B1–3 are concerned, 16% of the 154 bones that remained for analysis after sampling were either regurgitated or carnivore-gnawed (Table 3; Figure 19). This evidence strongly suggests that the deposition of the entire B1–3 faunal assemblage, including the dated samples, relates to carnivore, not human activity, a conclusion that Mellars et al. (2007) do not dispute. In such a situation, the contemporaneity between the artifact and bone components of B1–3 that underlies Mellars et al.’s reading of the dates cannot be assumed, because the bone could have become mixed with human-accumulated Châtelperronian material contained in preexisting sediments as a result of a number of post-depositional processes (e.g., carnivore activity taking place on the surface of those sediments at a later time).

The outline of the limit of Bailleau’s excavations as given in Delporte’s 1954 plan does not exclude the possibility that the deposits in the 1962 extension of the palier sud were geologically *in situ*, at least in part. Ironically, the “poorer precision” of the stratigraphy noted here by Delporte (presumably because he could not observe the sharp, alternating color contrasts encountered before) may well be corroborating evidence to that effect. Even in such a situation, however, the stratigraphic association between carnivore-accumulated bones and Châtelperronian artifacts could still reflect apparent, rather than real contemporane-

TABLE 3. BONE (TEETH EXCLUDED) AND LITHIC ARTIFACT FINDS IN THE DIFFERENT B LEVELS OF DELPORTE’S EXCAVATIONS AT THE GROTTTE DES FÉES.

Level	Bone		Lithics	
	N	%	N	%
B1	2	1	61	8
B2	2	1	68	9
B3	—	—	76	10
B3a	3	1	63	8
B4	4	1	164	22
B4a	7	2	73	10
B5	5	2	151	20
B5a	127 (a)	41	16	2
B1–3	162 (b)	52	52	7
B4–5	—	—	25	3
Total	312	100	749	100

(a) 4 burnt, 1 carnivore-gnawed, 84 regurgitated
(b) 2 burnt, 2 carnivore-gnawed, 22 regurgitated

After Zilhão et al. (2006: Table 2). This inventory relates to the collections of the MAN. The 13 radiocarbon dated samples were added to the bone counts.

ity, as in two of the alternative scenarios listed in Table 1: those where B1–3 or both B1–3 and B4–5 would represent palimpsests of separate moments of activity by different agents, implying that dating of the bones would not be akin to dating the human occupations represented by the stone tools.

If, at the time of carnivore activity, the Grotte des Fées was not in use by humans, the results for B1–3 simply provide limits, *ante quem* for the Châtelperronian and *post quem* for the Aurignacian, that are fully consistent with the overall chronostratigraphic pattern of the Middle-to-Upper Paleolithic transition in Europe (e.g., Zilhão 2007: Figure 4). The fact that no traces of the Protoaurignacian were found among the lithics (the Aurignacian material is entirely of Aurignacian I or Aurignacian II affinities; see below) also suggests an interruption in the human use of the area, in agreement with the hypothesis that the B1–3 range of dates represents a period during which only carnivores dwelled at the site. However, since some overlap exists between the earlier B1–3 results and the Châtelperronian, on one hand, and between the later B1–3 results and the Aurignacian I, on the other (Table 4; Figure 20), it cannot be excluded that at least those overlapping results relate to human activity too. But, bearing the regional context in mind, there is no reason why these data should indicate continued Châtelperronian occupation throughout the entire interval. Even if humans were there at a time when the site was principally a carnivore den, it is rather more likely that their presence was short and intermittent, and that such humans were

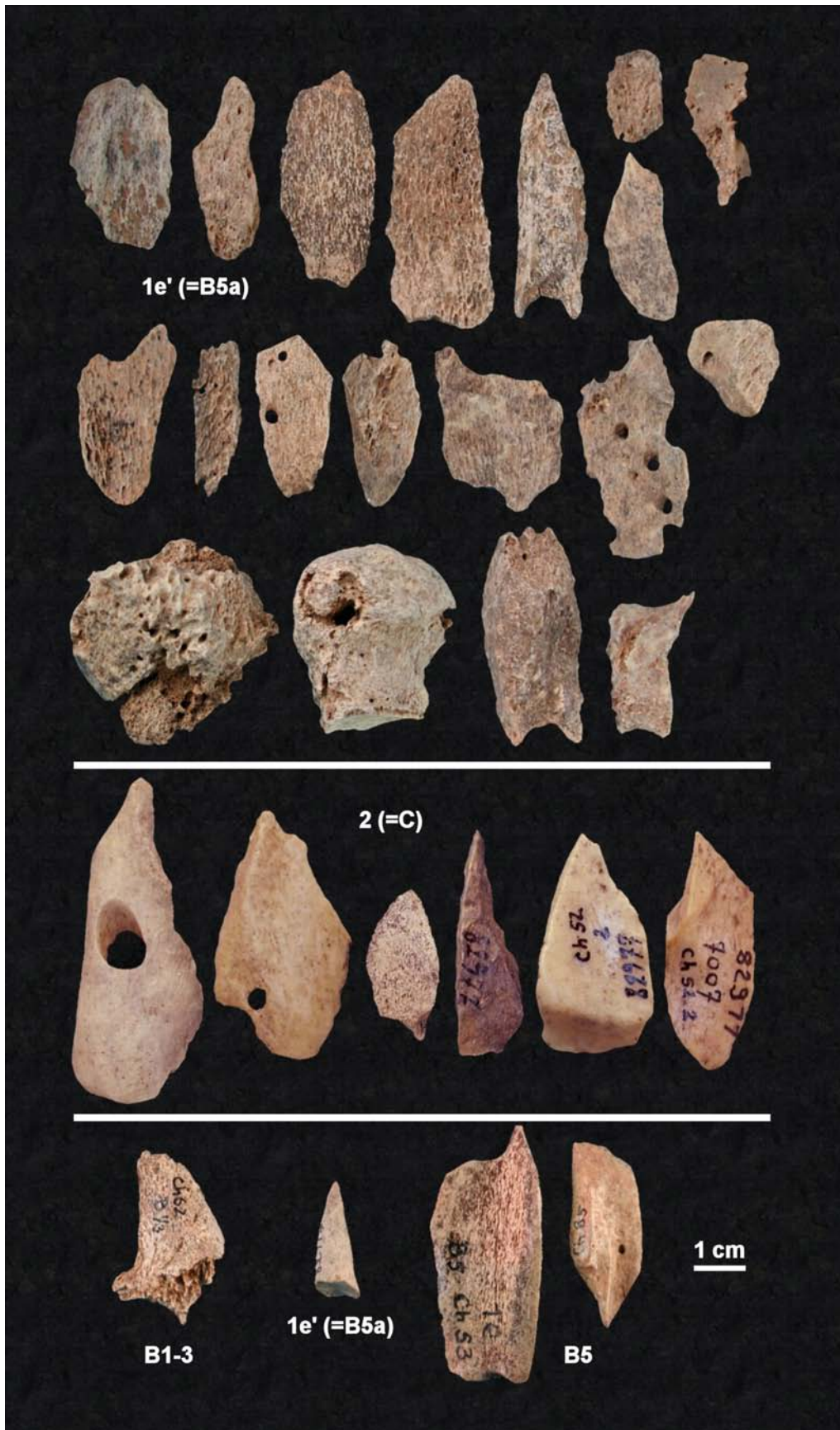


Figure 19. Faunal remains from various levels of Delporte's excavations at the Grotte des Fées bearing features typical of hyena digestion (etched scalloped surface, thin edges, perforations produced by gastric acids), including pseudo-awls and pseudo-points such as that from B5a in the bottom row, similar to those reported from African and Pleistocene hyena dens (Villa and d'Errico 2001).

TABLE 4. AMS ¹⁴C RADIOCARBON RESULTS (ALL ON BONE) FOR THE GROTE DES FÉES, THE CHÂTELPERRONIAN, THE FRENCH AURIGNACIAN I, AND DIRECTLY DATED HUMAN FOSSILS CONCEIVABLY ASSOCIATED WITH THESE TECHNOCOMPLEXES.

Site	Level	Culture/Fossil	Lab number	Result BP	calBP (2σ)
Kleine Feldhofer Grotte	Backdirt	Neandertal	ETH-19660	39240±670	42290-44650
Oase	Sala Mandibulei	Early Modern	OxA-11711/GrA-6165	34950/+990/-890	38410-42490
Grotte des Fées	B5	Châtelperronian	OxA-13621	40650±600	43040-45560
Grotte des Fées	B4	Châtelperronian	OxA-14319	39780±390	42770-44730
Grotte des Fées	B5	Châtelperronian	OxA-14320	39240±380	42450-44490
Grotte des Fées	B5	Châtelperronian	OxA-13622	39150±600	42270-44590
Grotte des Fées	B4	Châtelperronian	OxA-14318	35540±280	41040-42040
Roc-de-Combe	8 (square K9)	Châtelperronian	Gif-101265	45100±2100	43910-53270
Roc-de-Combe	8 (square K9)	Châtelperronian	Gif-101266	40000±1300	42110-45830
Roc-de-Combe	8 (square K9)	Châtelperronian	Gif-101264	39540±970	42230-45030
Grotte XVI	B	Châtelperronian	AA-2674	>39800	—
Grotte XVI	B	Châtelperronian	AA-2997	38100±1670	40760-45040
Grotte XVI	B	Châtelperronian	GifA-95581	35000±1200	37890-42730
Combe Saunière	X	Châtelperronian	OxA-6503 (tripeptide)	38100±1000	41600-44320
Abri Dubalen	EBC2	Châtelperronian	GifA-101045	36130±690	39800-42920
La Quina, aval	4	Châtelperronian	OxA-10261/Ly-1367	35950±450	40280-42600
Caune de Belvis	7	Châtelperronian	AA-7390	35425±1140	38380-42900
Grotte des Fées	B1-3	Carnivore den	OxA-13620	>53900	—
Grotte des Fées	B1-3	Carnivore den	OxA-14165	36340±320	41470-42390
Grotte des Fées	B1-3	Carnivore den	OxA-13724	36250±750	39900-42980
Grotte des Fées	B1-3	Carnivore den	OxA-13723	36000±1000	38840-43200
Grotte des Fées	B1-3	Carnivore den	OxA-13618	35890±380	40390-42510
Grotte des Fées	B1-3	Carnivore den	OxA-13619	35400±450	39190-42550
Grotte des Fées	B1-3	Carnivore den	OxA-14166	34940±330	39020-42220
Grotte des Fées	B1-3	Carnivore den	OxA-13617	34550±500	38790-41990
Caminade	F	Aurignacian I	GifA-97186	35400±1100	38450-42850
Roc-de-Combe	7c	Aurignacian I	OxA-1263	34800±1200	37490-42730
Roc-de-Combe	7b	Aurignacian I	OxA-1262	33400±1100	35830-42230
Le Flageolet I	XI	Aurignacian I	GifA-95559	34300±1100	36710-42630
Le Flageolet I	XI	Aurignacian I	OxA-598	33800±1800	35300-42940
Le Flageolet I	XI	Aurignacian I	GifA-95538	32040±850	35270-39750
Tuto de Camalhot	70-80?	Aurignacian I	GifA-99093	34750±570	38820-42140
Tuto de Camalhot	70-80?	Aurignacian I	GifA-99674	32180±570	35740-39540
Combe Saunière	VIII	Aurignacian I	OxA-6507	34000±850	36670-42430
Grotte des Hyènes	2DE	Aurignacian I	GIF/LSM-11034	33600±240	36410-41570
Grotte des Hyènes	2DE	Aurignacian I	GifA-98105	32410±370	36210-39450
Grotte des Hyènes	2E	Aurignacian I	GIF/LSM-11035	31960±160	36400-37400
La Quina, aval	3	Aurignacian I	OxA-6147/Ly-256	32650±850	35930-40130

Sources: Bon 2002; Bordes 2002; Dujardin 2001; Henry-Gambier et al. 2004; Gravina et al. 2005; Mellars 1999; Rigaud 2001; Schmitz et al. 2002; Trinkaus et al. 2003. Calibration uses the CalPal software (Weninger and Jöris 2007).

Châtelperronian and Neandertal in the earlier part of the interval, but Aurignacian, presumably modern, in its later part.

Bearing these considerations in mind, we conclude: 1) for B4, that uncertainty in the nature and provenience of the samples and the disparate results obtained preclude any productive discussion of their significance; 2) for B5, that

the dates are acceptable as proxies for the Châtelperronian because, whatever the agent of accumulation, they seemingly come from samples collected in a broadly intact remnant; and, 3) for B1-3, which, at best, represents a geologically intact but mixed unit, that the parsimonious reading of the results is that they date a major episode of carnivore activity at the site between 36,340±320 ¹⁴C BP (OxA-14165)

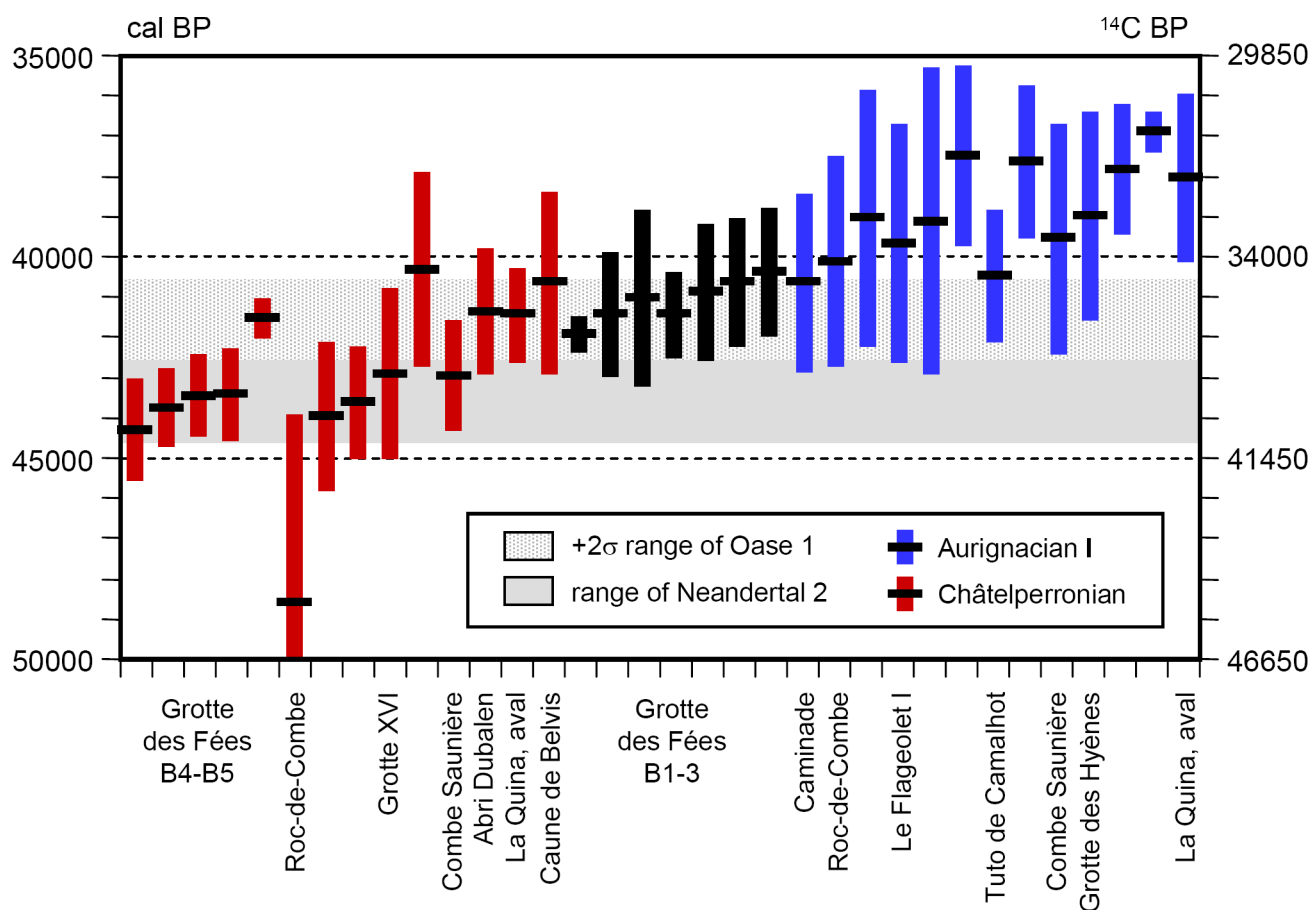


Figure 20. Two-sigma plot of the non-infinite dates in Table 4. Note that the results for Abri Dubalen, La Quina Aval, and Caune de Belvis are on non-ultrafiltrated samples and, hence, likely underestimated (Higham et al. 2006); the result for La Quina Aval in particular comes from a “poorly preserved” bone (Dujardin 2001). At Grotte XVI, bearing in mind the ensemble of results for Level B, the younger date is also an underestimation, not evidence for long-term contemporaneity with the Aurignacian. Given provenience uncertainties, the younger B4 result from the Grotte des Fées likely relates to the episode of carnivore activity documented in B1–3, not to the Châtelperronian.

and $34,550 \pm 500$ ^{14}C BP (OxA-13617). In short, the results for B1–3 provide support neither for interstratification at the scale of the site nor for long-term contemporaneity at the scale of the region.

A CASE OF SERENDIPITY?

Given the scarcity of artifacts, the taphonomy of the bone assemblage, and the fact that, as argued above, the B1–3 level designation can only refer to the stratigraphy of the 1962 extension of the palier sud, one must conclude from the dates that, after ca 36,500 radiocarbon years ago, this recess in the southern wall of the collapsed chamber functioned as a carnivore den. This inference is further corroborated by Delporte’s (1955: 81; 1957: 457) Level B5a, which suggests that this was an area of choice for carnivore denning not only immediately after, but also immediately before the time of Châtelperronian human occupation. According to Delporte, in fact, B5a was a *cuvette* in the palier sud that penetrated 18cm into the underlying Mousterian, and one where, despite its small size (0.06m², i.e., a circle

<30cm in diameter), an important concentration of bone fragments was recovered—127, no less than 41% of the total for the combined B levels (Table 3). And since no less than two thirds of these B5a bones are regurgitated, there can be little doubt that carnivores were the agent responsible for the accumulation of the faunal material in B5a.

Use of this area of the site primarily, if not exclusively, by carnivores rather than humans explains why Mellars et al.’s (2007) puzzlement with our interpretation of the Grotte des Fées stratigraphy and dates is unjustified (Figure 21). Mellars et al.’s faith in the validity of the B1–3 results as dating the Châtelperronian is based on the implicit assumption that human-accumulated bones contemporary with the stone tools should also be present in the B1–3 faunal assemblage; therefore, the corresponding chronological signal should have been picked up by the dating process, whereas, according to our argument, it was not. However, the area from where the dated B1–3 samples came is clearly beyond the limits of Bailleau’s 6m x 4m human occupation area in the center of the collapsed chamber. And there is every reason to believe that Bailleau would have excavated

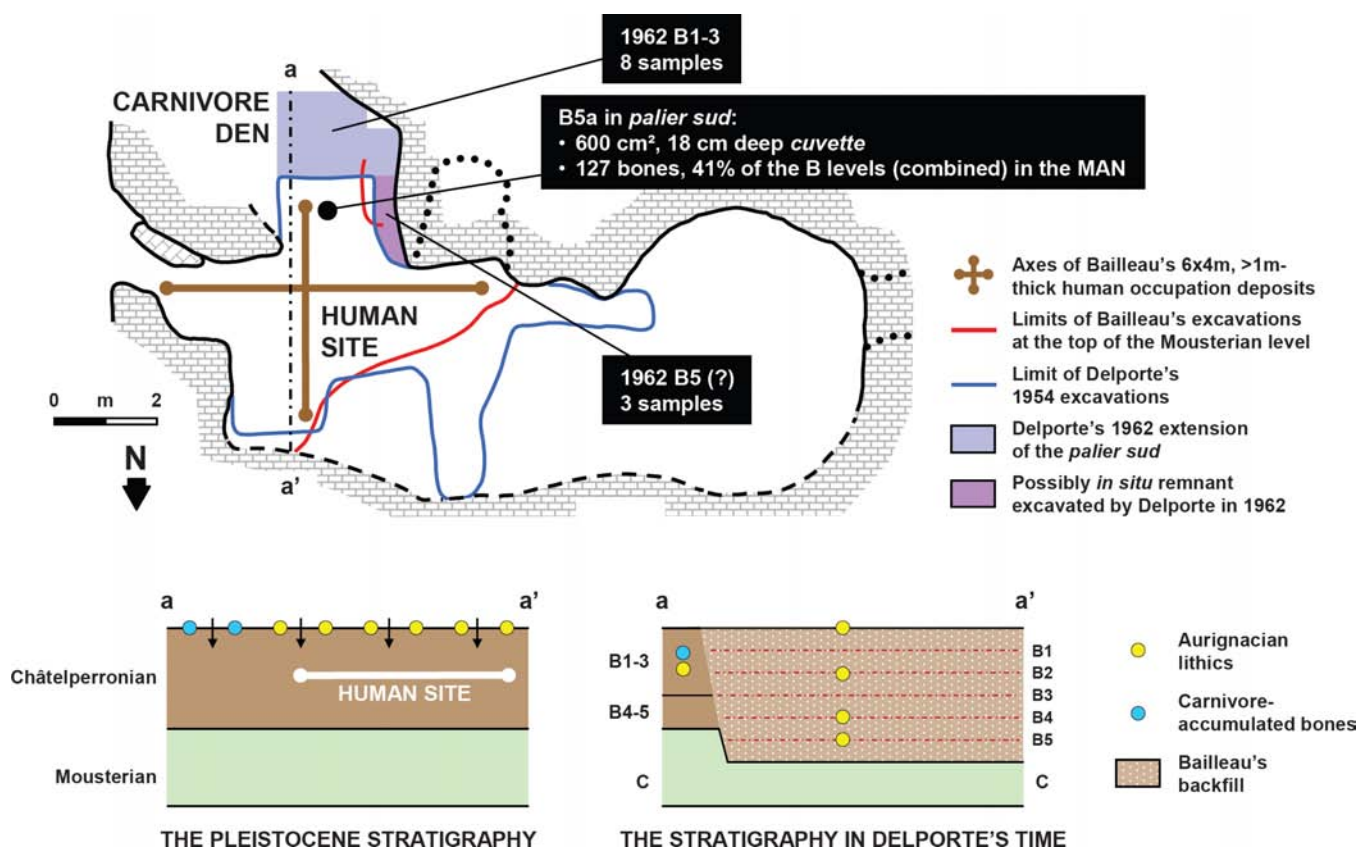


Figure 21. Top, radiocarbon sample provenience and horizontal stratigraphy at the Grotte de Fées; since the B5 samples probably come from an *in situ* remnant in the periphery of the Châtelperronian habitat, and the B1–3 samples from a post-Châtelperronian carnivore den in a recess of the south wall of the cave, consistency in dating relates to spatial patterning. Bottom, model stratigraphic configurations for the Grotte des Fées along a N-S axis, for: immediately post-Châtelperronian times (left), and the situation encountered by Delporte after the site had been intensively explored in the 19th century (right).

these rich deposits to exhaustion, i.e., up to the outer limits of the finds' distribution; put another way, there is every reason to believe that the limits of the Châtelperronian habitat did not extend beyond the limits of Bailleau's dig as observed by Delporte.

Our analyses (Zilhão et al. 2006: 12644–12645) established that the rest of the faunal collection kept at the MAN, likewise mostly made up of carnivore or carnivore-accumulated bones, is taphonomically no different from the B1–3 assemblage (see Figure 19). From this composition, we inferred a similar taphonomy for all the dated samples. It must be borne in mind, however, that Bailleau's description of the site (see Figures 14–15) implies that the Châtelperronian deposit once contained significant amounts of anthropically accumulated animal remains. The few burnt bones in the MAN collection may bear witness to that component, and our failure to detect a stronger anthropic signal probably derives from the fact that no less than 93% of the fauna in the different B levels combined belong to only two units (B1–3 and B5a; cf. Table 3), which, as discussed above, relate to small, spatially well-delimited carnivore activity areas. These units, however, are unlikely to constitute a faithful reflection of the fauna that Bailleau excavated in the main, human occupation area of the site. Thus, we cannot

exclude the presence of anthropically accumulated material in the other units of Delporte's excavations (including those that Gravina et al. (2005) also sampled for dating, i.e., B4, B4a, B5).

Bearing the above in mind, the consistency of the dates for the B5 samples is not difficult to explain. That they could well come from *in situ* deposits is not a point of contention. And, since they were collected in 1962, they probably came from the remnant behind the west profile, in the outer periphery of the concentration that Bailleau excavated, i.e., from an area where one would expect to find not only Châtelperronian artifacts but also faunal remains accumulated either by Châtelperronian humans or by coeval natural agents.

Conversely, one would expect that, at a time of intensive human use of the site, few faunal remains would accumulate in the area to the south of the palier sud that carnivores used as a den both before and after that time. If such remains eventually became a small proportion of the post-Châtelperronian palimpsest eventually created there by carnivore activity, then it is easy to see that the probability of randomly sampling one such bone of Châtelperronian age from that particular area might well have been rather low. For instance, if that proportion was inferior to 1:8, then,

in terms of probabilities, failure to detect a Châtelperronian signal in the eight B1–3 samples is fully within the expectations of our model. And the fact that radiocarbon did pick up a Mousterian signal (the sample dated to >53,900 ¹⁴C BP; cf. Table 4) is also fully consistent with the notion that this area of the cave was used by large carnivores principally before and after (but not during) the Châtelperronian.

Mellars et al. (2007) appear not to have considered such probability issues in their reasoning. If they had, they would not have erroneously considered that an inevitable prediction of our model was that radiocarbon results in the range of 39–40 ka ¹⁴C BP, representing material derived from the underlying deposits, should have been obtained for B1–3 samples. As shown by the data in Table 3, B4–5 was very poor; it contained only 3% of the artifact total for the combined B levels and, more to the point, no bones. Clearly, the probability that bones will be displaced from deposits where they are nonexistent can only be nil.

Gravina et al. (2005) evidently thought that their sampling procedure would securely test—via radiocarbon dating—the reliability of Delporte’s stratigraphic framework. They take the consistency of 10 out of their 13 samples as a “passed” result. In fact, those 10 samples were drawn from only two stratigraphic units (B5–B5a and B1–3), ones for which, when the year of excavation is 1962, we can infer spatial provenience and implied geological integrity with some certainty. The results are consistent with the inferences, but tell us little or nothing about the integrity (or lack thereof) of the other stratigraphic units. Contra Gravina et al. (2005) and Mellars et al. (2007), we contend that the consistency of those 10 results derives not from the reliability of Delporte’s vertical stratigraphy but from the distinct spatial patterning (and attendant horizontal stratigraphy) of human and carnivore uses of the site.

Finally, let us not forget that those two provenience categories (B5–B5a and B1–3) that conceivably correspond to geologically *in situ* deposits yielded as much as 93% of the fauna from the different B levels of the Grotte des Fées (Table 3), despite accounting for no more than some 10% of the area excavated by Delporte (cf. Figures 6b, 7a, 8). Given such a disparity, the 10 over 13 success rate obtained by Gravina et al. (2005), the successful samples being all from B5–B5a and B1–3, is hardly surprising. Clearly, in these circumstances, randomly sampling the MAN collections and turning up broadly consistent results might be construed as a case of serendipity, but is definitely not proof that the area excavated by Delporte consisted of undisturbed deposits in its entirety.

LITHIC ASSEMBLAGES

Mellars et al. (2007) question our conclusions about the lithic assemblages based on arguments relating to seven different points. We now deal with these following the order in which they were raised.

SURFACE CONDITION

“Why the much higher frequency of ‘surface weathered’ pieces in the upper as opposed to lower levels should favor the backdirt interpretation is again unclear to us, because according to the backdirt model all of these pieces must derive directly from the underlying (much less patinated) Chatelperronian material in levels B4 and B5, which were subsequently dumped on top of the *in situ* B4 and B5 levels in the course of the 19th century excavations, only 80 years before the time of Delporte’s excavations. How the lithic artifacts in levels B1–B3 could have acquired this greatly increased ‘surface alteration’ in the 80 years between the 1870s excavations and those of Delporte in the 1950s remains unexplained. (...) in either event, the increased surface weathering of the pieces in the upper levels is strongly opposed to the recent backdirt derivation of these pieces from the immediately underlying, basal Chatelperronian levels.” (Mellars et al. 2007: 3658–3659).

In a given part of any given site, if intact deposits are overlaid by backdirt or backfill, the only place from where the finds contained in such disturbed deposits cannot have come is exactly ... the “immediately underlying” intact levels. If that were to be their provenience, then, by definition, those “immediately underlying” levels would not be “intact.” Rather, they would have been disturbed by the extraction of the material subsequently recovered in the overlying deposits. Taking the palier sud area as an example, our model implies that most finds made in its B1 to B3 levels would have come from elsewhere at the site and would have ended up where Delporte excavated them only after displacement over an unknown distance. If the finds in those levels were indeed more patinated, that could simply indicate a different depositional environment in their place of origin.

However, in equating “much higher frequency of ‘surface weathered’ pieces” with “greatly increased ‘surface alteration’ in (...) 80 years”, Mellars et al. (2007) simply misunderstand the elementary statistical concept of frequency variation. In proportion to level totals, B1 to B3 yielded many more patinated and edge-damaged artifacts than B4–B5, not artifacts that were more altered than those in B4–B5 (Figure 22). Earlier workers would have preferentially missed or discarded small, broken, or damaged items (which, returned to the soil, would then be found by later excavators of the disturbed sediments left behind), while items larger, complete, and in more pristine condition would have been preferentially kept (and made their way into the collections produced by 19th century excavators). The data from the Grotte des Fées fit the expectation that a corresponding contrast should exist between B1 to B3 (backfill) and B4–B5 (partly broadly *in situ*) and, therefore, support our site formation model.

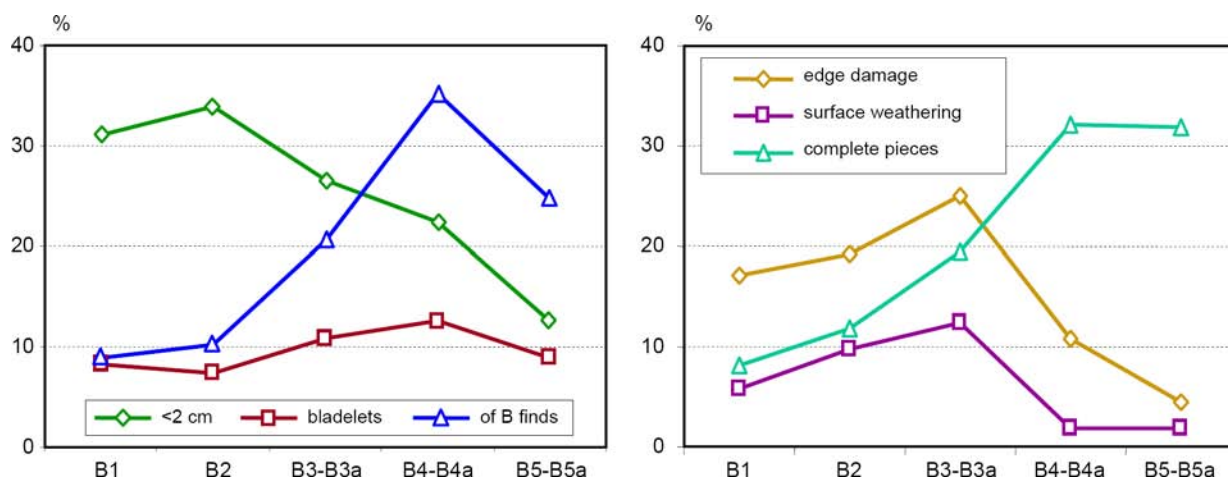


Figure 22. Lithic indicators of taphonomic process in the B levels. Left: relative frequencies per level of bladelets and items <2cm, and percentage of the overall B finds represented by each level. Right: relative frequencies per level of edge-damaged, surface-weathered, and unbroken pieces (chips and chunks excluded) (after Zilhão et al. 2006: Figure 3).

BREAKAGE AND RETOUCED TOOLS

Mellars et al. (2007) ask “why so many retouched pieces were overlooked during the 19th century excavations only to find their way into the discarded backdirt deposits” and “what exactly were the 19th century excavators looking for in their excavations, if not retouched stone tools?” (p. 3660).

As predicted by our model, the “so many retouched pieces” in Delporte’s Levels B1 to B3 are almost exclusively small, often atypical broken items that the modern lithic analyst recognizes but that 19th century fossil hunters (and archaeologists) routinely discarded, and the same applies to debitage products (Figure 23). In fact, Levels B1 and B2 yielded not a single Châtelperron point to Delporte, the closest approximation being the B1 item framed in Figure 23, which he describes as “a rather atypical form of backed blade” because “there is no characteristic backing, simply accommodation of the edge with an incomplete and not quite abrupt retouch” (Delporte 1957: 466–467; Pl. VI, no. 31).¹⁵ In contrast, the numerous Châtelperron points in Lacaille’s (1947) monographic publication of the 19th century collections from the Grotte des Fées are large, typical, and complete (Figure 24).

A piece from Delporte’s Level B2 features a fresh break covered by a semi-concreted sediment film and apparently produced by a metal tool (Figure 25). The film implies that the piece broke long before it was transported to the MAN, and that it returned to the soil after breakage, where it stayed until Delporte found it again. This piece constitutes material evidence that Delporte’s levels B1 to B3 do contain items discarded by the 19th century excavators of the Grotte des Fées.

THE PIECE WITH INVASIVE RETOUCHE

“As regards the fragmentary Solutrian piece, we note that Delporte never mentioned or illustrated this piece in his own meticulous analysis of the lithic material (...) and that Zilhão et al. provide no illustration of this supposedly crucial piece in their paper” (Mellars et al. 2007: 3660).

The piece in question (Figure 26) is unambiguously labeled “Ch B2”. An illustration is given in B. Depraetere’s (2000) inventory of the collection, a task that she carried out with Delporte’s assistance. Although small, the fragment is entirely covered, dorsally, with the kind of flat, invasive retouch typically found in Solutrean lithics (Demars and Laurent 1989: Figure 51; Inizan et al. 1992; Smith 1966; Tixier et al. 1980). In our combined experience, based on the hands-on analysis of hundreds of thousands of artifacts from the Upper Paleolithic of Western Europe, this mode of retouch is unknown in the Châtelperronian. In additional contrast to all the diagnostic Châtelperronian pieces, which are exclusively made on local flints, this piece is made on an exotic, fine-grained raw material—a highly homogeneous, translucent, blond flint containing rare Turonian marine fossils (Aubry 1991; Depraetere 2000).

Occasionally, the dorsal modification exhibited by this specimen also is found on the proximal or distal ends of tool-types from other technocomplexes, namely the Gravettian (Klaric 2003: Figure 165) and the Magdalenian (Demars and Laurent 1989: Figure 11, nos. 4–5; Figure 27, no. 5). The possibility cannot be excluded that such invasive retouch patterns can be generated by the “skidding” of scalariform retouch scars, especially when this form of typical Aurignacian retouch is applied to the extremities of thick blade blanks with a convex dorsal face, as in this case. Thus, assignment to the Magdalenian, the Gravettian, or the Aurignacian, instead of the Solutrean, although not

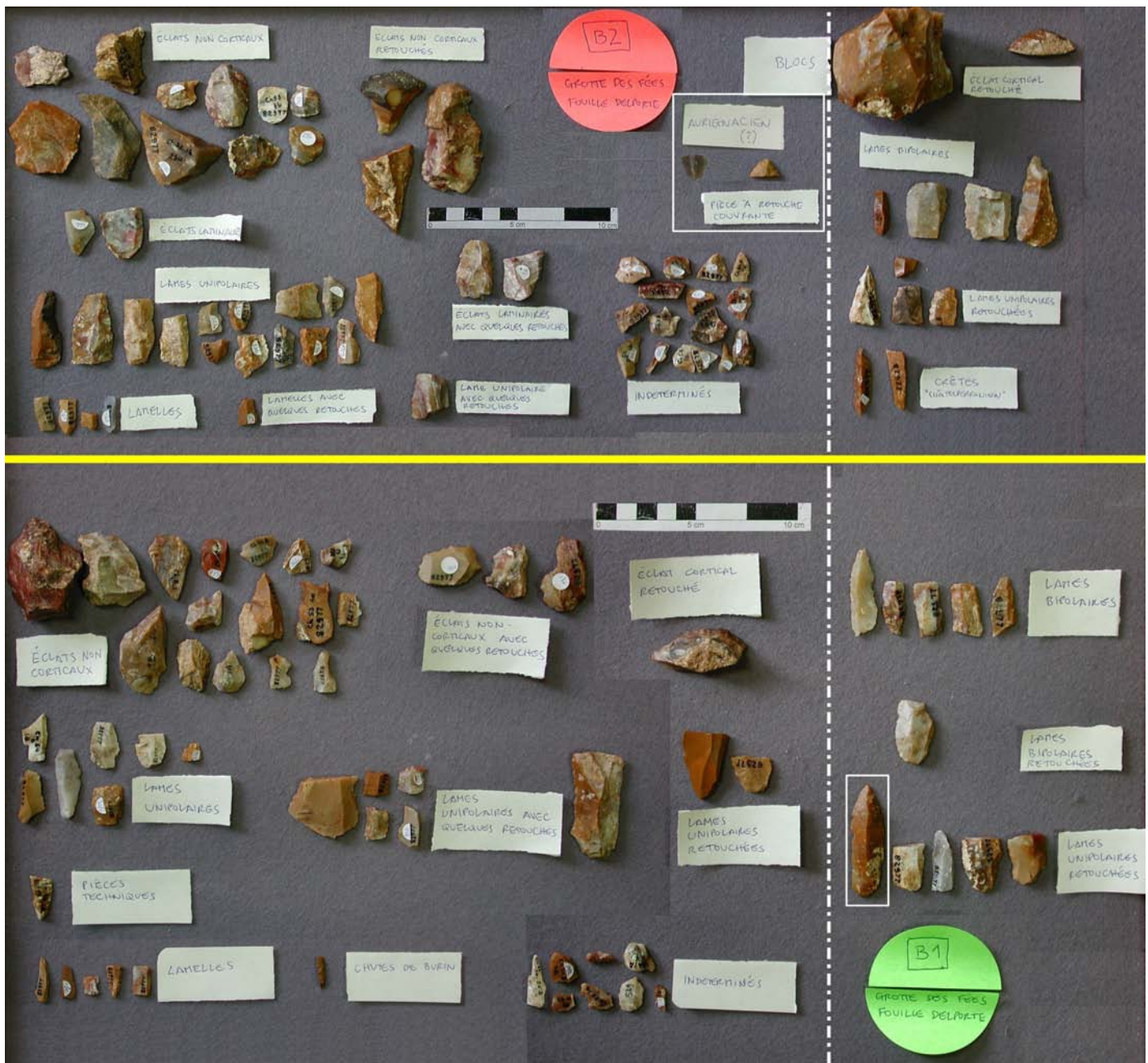


Figure 23. Overall view of the lithic assemblages from Levels B1 (bottom) and B2 (top) of the Grotte des Fées, assembled from photographs taken at the MAN in November 2005 as the material was being laid out for the eventually published analyses (Zilhão et al. 2006). These assemblages are good examples of the kind of material that 19th century excavators would have discarded and that Delporte would have collected when re-excavating their backfill. The Châtelperronian diagnostic material is situated right of the vertical dashed white line; the framed piece in B1 indicates the single, atypical Châtelperron point found in these two units; the framed area in B2 isolates two small pieces, one possibly Solutrean, the other diagnostically Aurignacian (cf. Figures 26, 28-b).

parsimonious, remains conceivable; even so, however, this piece would still represent evidence that B2 is not a “pure” Châtelperronian level and, if Aurignacian, would provide additional confirmation that such material was scattered throughout Delporte’s entire sequence, not concentrated in a discrete occupation lens (cf. *infra*).

DUFOUR BLADELET TYPOLOGY

“We are equally unconvinced by their interpretation of the small, retouched Dufour bladelet from level B4 as a diagnostically ‘Aurignacian II’ artifact” (Mellars et al. 2007: 3660).

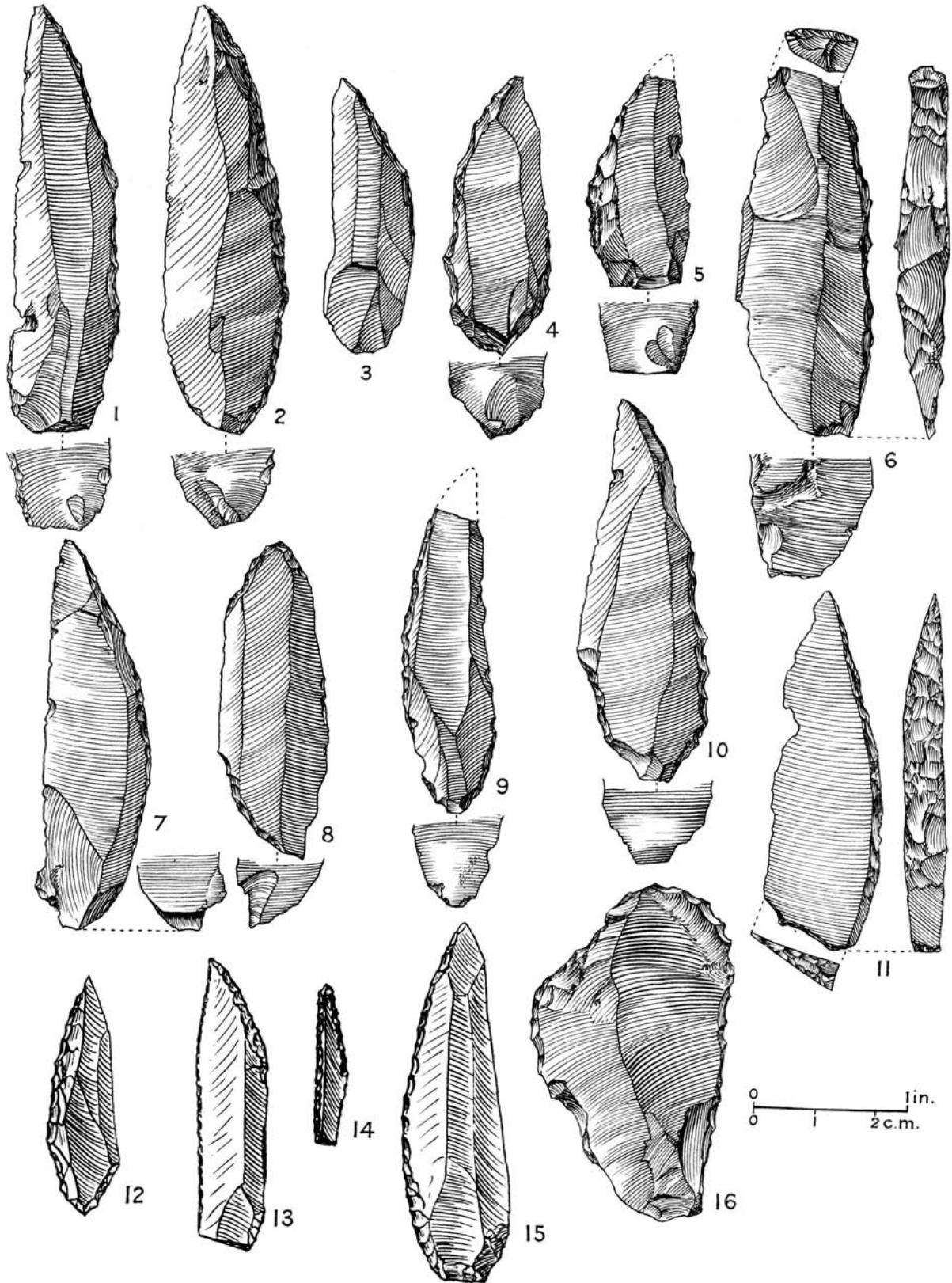


Figure 24. Lacaille's (1947: Figure 2) illustration of "steeply dressed flint implements" from Châtelperron.



Figure 25. A flint piece with a fresh break covered by a semi-concreted sediment film from Level B2 provides corroborating evidence that these levels correspond indeed to 19th century back-fill.

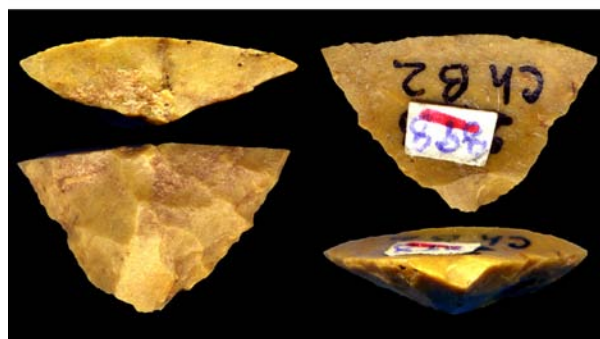
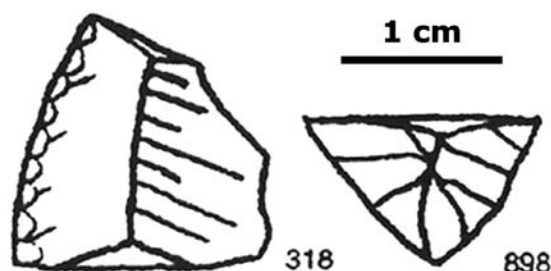


Figure 26. Above: the “retouched blades” from the Grotte des Fées, after Depraetere (2000: Figure 34); she describes no. 318 as a “blade with abrupt retouch” and no. 898 as a “blade with large retouche.” Below: different views of object no. 898, showing the kind of flat, invasive retouch commonly found in the Solutrean and unknown in the Châtelperronian.

We stand by our identification but, because other views exist in the field, the differences concerning the chronostratigraphic significance of this Dufour bladelet cannot be resolved at present. We also note that Mellars et al. (2007: 3661) consider “highly typical,” and indicative of a “further, brief episode of occupation by later Aurignacian groups,” the two Dufour bladelets found in the topsoil

(Level A) (Figure 27-a,b). Given their provenience, such a chronological significance can only come from typological considerations. However, the Dufour bladelet from basal level B4–5 of the 1962 excavations (Figure 27-c) is identical to those from Level A. Following Mellars et al. (2007), thus, one would be led to the conclusion that “later Aurignacian” material is present in the basal Châtelperronian deposits, as we indeed argued on the basis of the B4 piece.

DISTRIBUTION OF AURIGNACIAN ITEMS

“Whether any diagnostically Aurignacian pieces were found in any other levels [i.e., other than B4] of the Châtelperronian sequence appears to us open to serious doubt. We are frankly unconvinced by the tiny (≈ 2 cm) fragment of a supposedly ‘end scraper on Aurignacian blade’ recovered from level B2” (Mellars et al. 2007: 3661).

“We conclude that (...) there was a clear concentration of diagnostically Aurignacian artefacts within or immediately adjacent to level B4 of his [Delporte’s] stratigraphy, clearly stratified between the typically Châtelperronian material in his [Delporte’s] level B5 and the equally typical Châtelperronian material in the overlying levels B1–B3” (Mellars et al. 2007: 3661–3662).

The first remarkable thing concerning Mellars et al.’s “serious doubt” that diagnostically Aurignacian pieces were found in any levels other than B4 is that it directly contradicts Delporte’s (n.d.: 56–57) own assessment of the corresponding vertical distribution pattern:

“These pieces are not found together in a level overlying the Perigordian (...). To the contrary, they are scattered throughout the mass of the Perigordian deposits; it must be noted, however, that they tend to be located, in so far as can be judged from their small number, towards levels B.2 to B.4a, and particularly in level B.4.”¹⁶

Where the piece from B2 is concerned, it is no smaller than two other fragments in B4 and B5 that Mellars et al. (2007) accept and previously illustrated themselves (Gravina et al. 2005: Figure 2, nos. 6, 8; described as “edge-retouched Aurignacian blades” in their figure caption). Issues of size apart, this supposedly unconvincing object features the same kind of edge retouch seen in the others, which is typical of the Aurignacian I. Most importantly, this B2 object is made on the same “distinctive, high quality imported” flint that, as Mellars et al. emphasize (2007: 3661), was exclusively used for diagnostically Aurignacian material (Figure 28). This very distinct raw material is found in the valleys of the Cher and the Indre, some 200km away (Aubry 1991; Depraetere 2000), and is represented neither in the assemblage of diagnostically Châtelperronian artifacts nor among the nondiagnostic material.

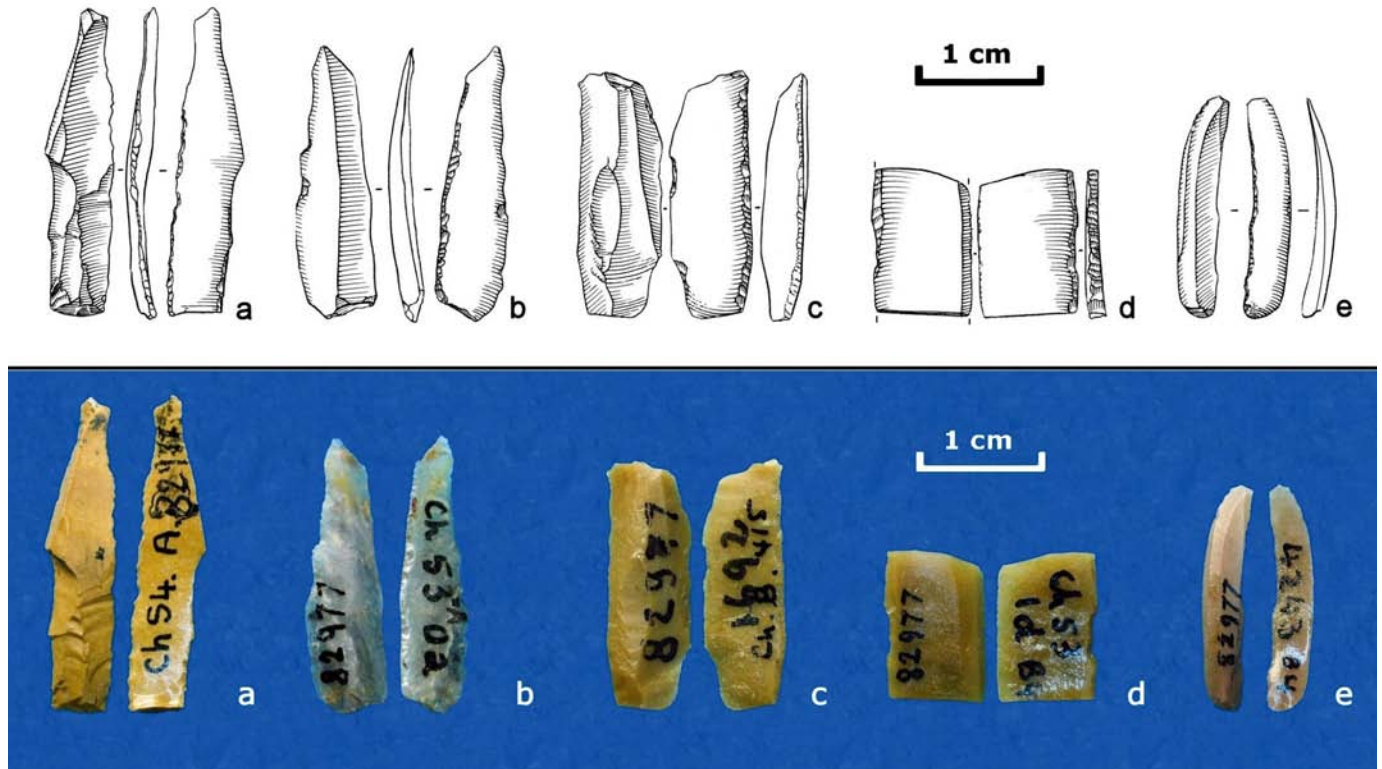


Figure 27. Dufour bladelets from the Grotte des Fées: a–b. Level A (a. 1954; b. 1953); c. Level B4–5 (1962); d–e. Level B4 (d. 1953; e. 1954).

Whatever its cause, the vertical scatter of Aurignacian items, from A at the top to B5 at the bottom, is unquestionable. And, when the year of excavation (and, hence, available spatial provenience) is considered, the most striking aspect of the B4–B4a concentration to which Mellars et al. (2007) attach such great significance is that, out of five objects, three are from 1952 (cf. Figure 28-a,d; the other is a carinated “scraper”—Zilhão et al. 2006: Figure 2c). If we consider the ornaments, one of which is also conceivably Aurignacian (see below and Figure 33), the proportion is four out of six. Put another way, two-thirds of the items in that “concentration” come from the longitudinal trench that cut across the backfill deposits in the central area of the site excavated by Bailleau.

In short, the argument that Mellars et al. (2007) clearly perceive as most powerful is in fact critical evidence against their position. Rather than in B4–B4a, the “concentration” is in the year 1952, and it proves not interstratification but provenience from backfill. In fact, of the Aurignacian material recovered by Delporte, only two items (the B5 end-scraper fragment and the B4–5 Dufour bladelet, both from the 1962 field season—see Figures 27-c, 28-c) are conceivably post-depositional intrusions into geologically *in situ* remnants. Of the other, seven (out of 12, i.e., 58%) clearly came from backfill deposits—two from Level A, one from B2, four from the 1952 trench—and that is also very likely the case with the remaining three, all from the years 1953 and 1954, when most if not all of the sediments excavated

by Delporte were backfill too. No wonder, therefore, that Delporte’s finding of Aurignacian items among the principally Châtelperronian material recovered in his excavations simply replicates Bailleau’s (Figure 29).

Incidentally, the fact that Bailleau’s material comes from the foyer area is impossible to reconcile with the notion that, in Delporte’s time, an intact Aurignacian lens, buried under a significant thickness of *in situ* Châtelperronian deposits, existed at the Grotte des Fées. Even if that had been the original Pleistocene configuration of the stratigraphy, the fact that Bailleau recovered such Aurignacian material then would carry, of necessity, the implications that: 1) in the foyer area, his excavations extended to at least the depth of the lens; and, 2) consequently, it would have been impossible for Delporte to find that lens in an undisturbed condition along the south face of his 1952 trench.

Simply put, the notion that the entrance area of the Grotte Effondrée originally featured an interstratified Aurignacian occupation is in direct logical contradiction to the notion that, in 1952, such an undisturbed Aurignacian level could still exist along the trench excavated by Delporte. Conversely, if the Aurignacian occupation of the foyer area was originally contained in a surficial, post-Châtelperronian level, then it is easy to understand how any items belonging to it that escaped Bailleau’s attention could well have ended up scattered throughout the 19th century backfill, as indeed Delporte eventually found them.

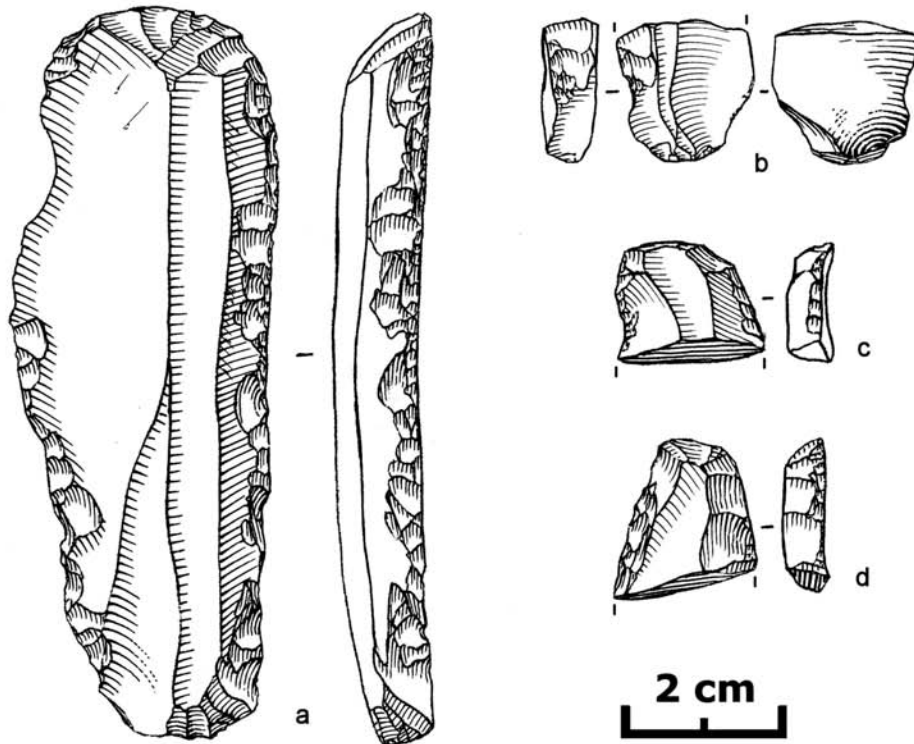


Figure 28. Retouched tools made on an exotic flint raw material that, in the Grotte des Fées, was exclusively used for diagnostic Aurignacian pieces: a: endscraper with characteristic Aurignacian edge retouch, typical of the Aurignacian I, from B4 (1952); b–d: small tool (possibly endscraper) fragments with the same kind of edge retouch and made in the same raw material (b from B2, 1953; c from B5, 1962; d from B4, 1952).

REFITTING

“It might also be noted that the only instance of refitting within the Châtelperron sequence was recorded by Delporte himself (...) for two fragments of a Châtelperron point recovered respectively from level B3 and the topsoil horizon (layer A), confirming his conclusion that the topsoil horizon did contain some genuine backdirt from the 19th century excavations. Significantly, Zilhão et al. (...) found no examples of refits between the material from levels B4–B5 and their inferred backdirt in levels B1–B3” (Mellars et al. 2007: 3661).

When dealing with intact deposits in primary position, one is allowed to interpret the low or nil occurrence of inter-level refits as independent confirmation of an undisturbed stratigraphy. But when dealing with a backfilled site, one should expect low success rates anyway, because the situation is then comparable to that of displaced or redeposited, albeit geologically *in situ*, archeological contexts. For instance, it is obvious that a low inter-level refitting success rate in a fluvatile terrace does not prove that the assemblages found therein are in primary position. By the same token, given the inferred formation process, it is



Figure 29. Left, ornaments (Aurignacian, according to Mellars et al. 2007), and edge-retouched blade with scalariform retouch typical of the Aurignacian I, reported by Bailleau as coming from the excavation of the foyer (after Bailleau 1869: 20–21, Pl. I–II). Right, the same Aurignacian blade as illustrated by Delporte (n.d.: Figure 20, no. 131).

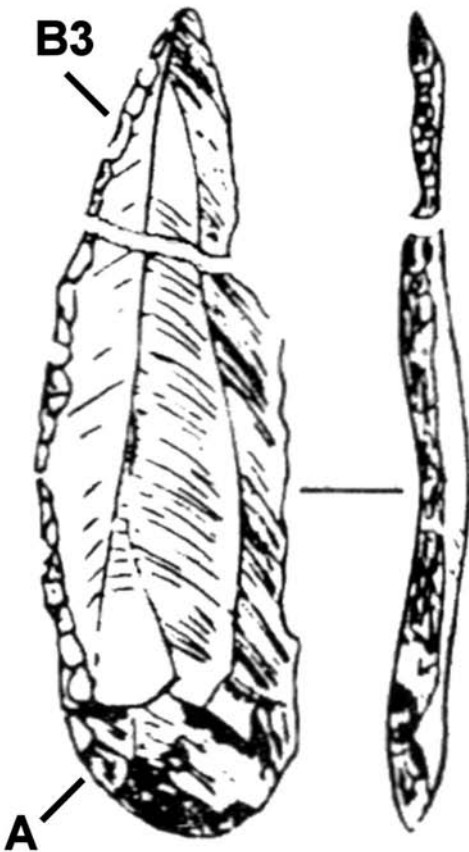


Figure 30. Châtelperron point refitted by Delporte from two fragments, the tip in Level B3 and the base in the disturbed topsoil (Level A). Drawing after Delporte, 1957 (Pl. VI, no. 26, modified).

no less obvious that a low inter-level refitting success rate at the Grotte Effondrée would constitute neither proof that the site is intact nor refutation of our backfill hypothesis—in a backfill deposit consisting mainly of discarded debris, an overall low refitting rate can be predicted upfront for both intra- and inter-level analyses. This said, we did find other refits (for instance, between two fragments of a core in B5a), but did not look for them systematically because, in this particular instance, the technique is of little use in the assessment of site taphonomy.

In any case, the true relevance of the piece mentioned by Mellars et al. (2007) is that linking A to B3 with a refit, while matching the expectations of the backfill interpreta-

tion of levels B1 to B3, is hard to reconcile with the notion that intermediate levels B1 and B2 were *in situ*, as interstratification inevitably requires. The same applies to the observation that, of the two conjoined parts, that in A was the large basal one and that in B3 the tiny tip fragment (Figure 30). How could disturbance have reached B3 without affecting overlying B1–B2, and how would one explain, in such a context, that, of the two fragments, the upwardly displaced, from B3 into A, is by far the largest? On the contrary, if B1–B3 are backfill and as disturbed as A, conjoining a fragment in A with one in B3 is fully within expectations, regardless of their respective sizes.

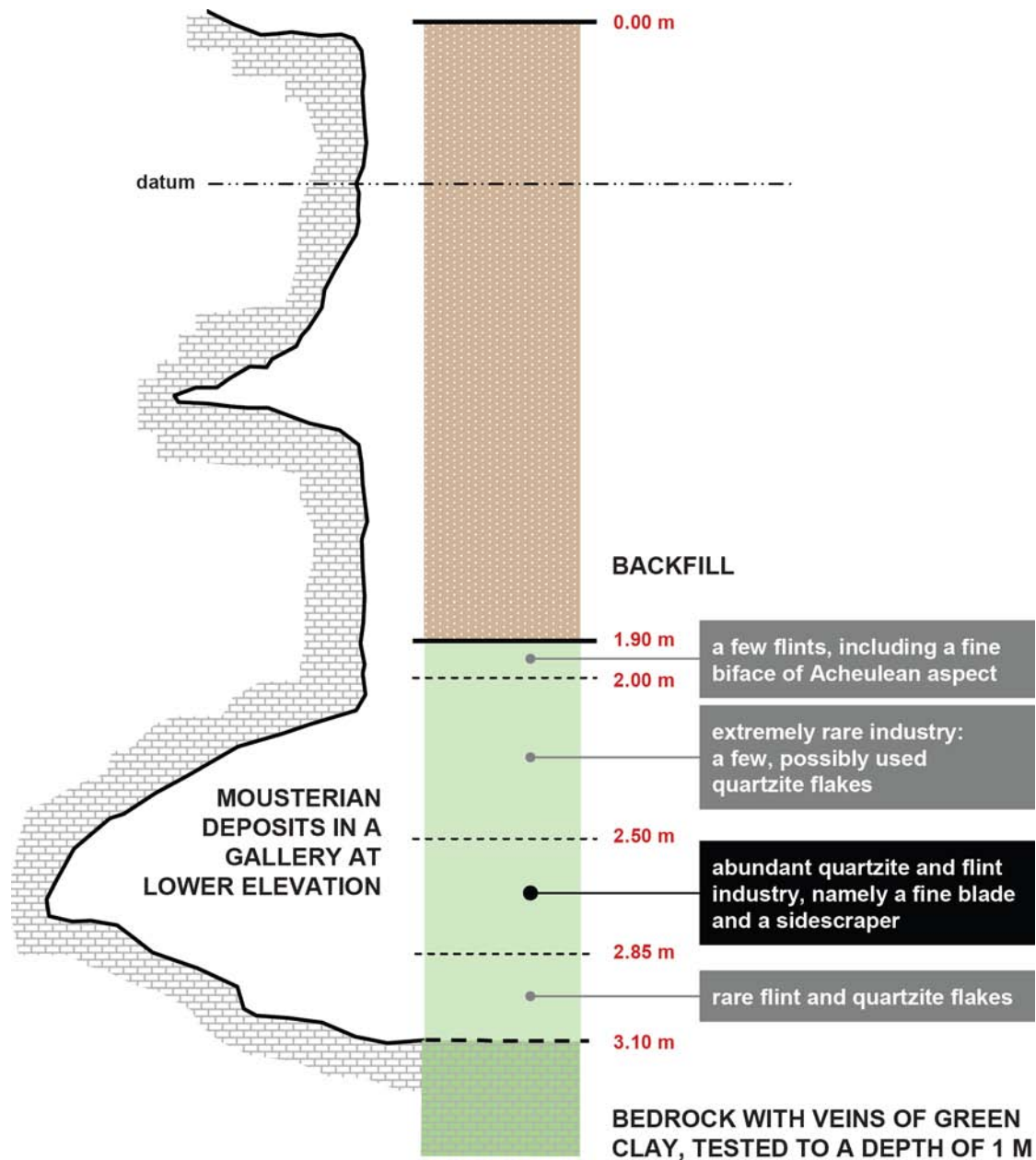


Figure 31. Stratigraphy of the Mousterian deposit excavated by Delporte in a gallery at lower elevation of the Grotte Effondrée (Chantier A of 1954). Topographic details after Delporte (n.d.: Pl. III; reproduced as Figure 7b here), and level descriptions after Delporte (1955: 83).

TABLE 5. TOOL-TYPES FROM THE MOUSTERIAN LEVELS OF THE GROTTÉ DES FÈES.

Type	Bailleau's collection	Delporte's level C	Total
Sidescraper	3	3	6
Point	—	3	3
Naturally backed knife	—	1	1
Retouched blade	—	1	1
Biface	3	3	6
Total	6	11	17

After Bailleau (1872) and Delporte (1957).

DISTRIBUTION OF MOUSTERIAN ITEMS

“Finally, we would ask why none of the upper, supposedly backdirt levels (B1–B3) yielded any trace of typically Mousterian artifacts (...) because we know that the basal Mousterian levels were extensively excavated during the 19th century work on the site” (Mellars et al. 2007: 3661).

Level A, topsoil containing artifacts discarded on the surface of the site in the framework of previous excavations, also yielded no trace of “typically Mousterian artifacts.” Bearing Level A in mind, the lack of Mousterian material in Levels B1 to B3 does not contradict the backfill model from a logical point of view; more importantly, there is no empirical contradiction either.

Mellars et al.’s (2007) statement that the basal Mousterian levels of the Grotte Effondrée were “extensively excavated” in the 19th century is unsupported. Bailleau’s human occupation deposit was excavated by him to a depth of >1m and, in that part of the site, adjacent to the entrance, Delporte found intact Mousterian levels at a depth of ca 1.5m below the top soil (cf. Figures 14–16). Why Bailleau did not penetrate much deeper into the fill is easy to understand from Delporte’s (1955: 83, 1957: 457) Mousterian stratigraphy, as recognized in the remnant located at lower elevation in a side gallery at the western end of the 1952 trench (Figure 31; cf. *Chantier A* in Figure 7b, or area e. in Figure 8). It was only at a depth of 60cm below its surface, i.e., 2.5m below ground surface, that he found an “abundant industry,” the overlying levels being “poor” or “almost sterile.”

The number of “typically Mousterian artifacts” in the collections from the 19th century excavations is thus very small (Table 5), and addresses Mellars et al.’s (2007) question about why the upper levels (B1–3) did not contain typically Mousterian artifacts—there simply were few such pieces overall at the site. Delporte’s (1957) inventory lists six, and the collection from his own excavations (Figure 32), with 11 pieces, is only slightly more numerous. In marked contrast, Delporte counted 203 retouched tools among the lithics from combined Level B (see Figure 17), and described the substantial difference between the Mousterian and the overlying Châtelperronian in unambiguous terms:

“despite the reduced surface of the space available for excavation, a fundamental difference could be observed between the clear levels of the upper layer and the diffuse remains, and in small number, of the lower layer;



Figure 32. Left, the “fine blade” from the main Mousterian level (C3) in the gallery at lower elevation; the marking indicates excavation spit (2j), area/year (*Chantier A*, 1954), and depth below datum (215–235, i.e., 2.65–2.95m below ground surface). Right, a “fine biface of Acheulean aspect” from Level 2, 1952 (Level C1 in Delporte 1957: 457; Pl. III, no. 2), reportedly found at the same depth as a 1954 piece from 1.90–2.00m below ground surface (Delporte 1955: 83).

in fact, this poverty of the industry is confirmed by the study of the Bailleau series, much richer in Upper Paleolithic pieces than in Mousterian pieces" (Delporte 1957: 457-458).¹⁷

Moreover, it is far from certain that the few Mousterian pieces in Bailleau's collection actually come from the pre-Châtelperronian fill of the Grotte Effondrée. Given the abundant material scattered on the surface of the general site by the opening of the railway trench and by Poirrier's paleontological excavations in front of the first two caves, it may well be that those few Mousterian items actually come from Bailleau's "gleaning" of his predecessors' spoils (Bailleau 1869: 13). In at least the case of one of the only three bifaces that he found at the site (Bailleau 1872: 125)—the *tête de lance ou hache, type dit de Saint-Acheul* illustrated in his first report (Bailleau 1869: 21; Pl. III, no. 35)—we are indeed told that the piece in question was collected in deposits located under the railway platform that had become exposed as a result of maintenance work.¹⁸

In sum, there is no reason to believe that Bailleau extensively excavated the Mousterian deposits, possibly because they would have appeared to him as essentially sterile clays. Even if he had indeed explored them significantly, his chances of finding any artifacts (and, hence, the chances that missed or discarded items ended up in backfill) would have been very small anyway. It is little wonder, then, that typical Mousterian pieces are not found in Delporte's Level A or, for that matter, in B1 to B3.

ORNAMENTS

Mellars et al. (2007) argue that the two animal tooth pendants recovered in Level B4 are Aurignacian and dismiss the possibility that they could belong to the Châtelperronian:

"Although Zilhão et al. (...) suggest that the latter [the two perforated animal tooth pendants (...) also recovered by Delporte from this level] could conceivably be Châtelperronian specimens (by analogy with the finds from the Grotte du Renne at Arcy-sur-Cure), one of the teeth in question has already been described by Randall White (...) as showing techniques of perforation 'consistent with that of the hundreds of Aurignacian pierced teeth I have examined, and in contrast with the hole perforation techniques I have observed (...) at Arcy and Quinçay'. We note that not a single additional specimen of a perforated tooth was recovered from any of the other levels at Châtelperron, from either the basal (B5) or overlying (B1-B3) Châtelperronian levels" (p. 3660).

We note that Mellars et al. (2007) accept that our identification (Zilhão et al. 2006: 12648) of the tooth they previously described as belonging to a large feline (Gravina et al. 2005: Figure 3) is in fact the heavily worn canine of a red deer (Figure 33). Based on published criteria, derived from the study of two red deer populations of known age and sex from Scotland and England (d'Errico and Vanhaeren 2002), we can now add that this tooth probably belonged to a 14–16 year old hind.

Previously, Mellars et al. (2007) also had described both ornaments as made by "initial scraping to thin the root of the tooth, followed by perforation of the hole" (Gravina et al. 2005: 53), whereas now they seem to think that the technique was used in only one case, but they do not specify which tooth. Our analysis reveals that, in fact, each pendant was made with a different technique. The perforation on the root of the fox canine was made by scraping the root longitudinally with a lithic point and subsequently punching the thinned root wall, whereas the canine of the hind was pierced by rotation, although both pre- and post-perforation scraping marks also can be observed around the hole.



Figure 33. The ornaments found by Delporte in Level 1d (=B4). Left, heavily worn red deer canine from the 1952 field season with perforation obtained mostly by rotation. Right, fox canine from the 1953 field season with perforation obtained by longitudinal scraping. Scale bar = 1cm.

This difference can be interpreted in only two ways. First, the two techniques may have co-existed (in the Aurignacian, in the Châtelperronian, or in both), which would contradict the very possibility of culturally assigning ornaments from mixed assemblages on the basis of perforation method alone. Second, the two ornaments may have been produced by the two different cultures, possibly at different times, which would counter Mellars et al.'s (2007) claim that both ornaments are Aurignacian. In order to choose between these alternatives we would need to gain a better insight into the variability of the personal ornaments used during the Aurignacian and the Châtelperronian, and into the way in which they were manufactured. A comprehensive georeferenced database of bead types found at Aurignacian sites is available (Vanhaeren and d'Errico 2006), but almost all securely associated Châtelperronian ornaments come from two incompletely published sites, Quinçay and the Grotte du Renne at Arcy-sur-Cure. Despite the shortcomings, the evidence from Quinçay suffices to establish that both fox and red deer canine pendants occur at Châtelperronian sites with no Aurignacian or later Upper Paleolithic occupations, a fact that should at least temper Mellars et al.'s (2007) confidence in attributing to the Aurignacian the two specimens from the Grotte des Fées.

Where ornament manufacture is concerned, use of a punching motion to perforate teeth is documented at Quinçay (Granger and Lévêque 1997: 541). In the case of the fox canine, a technique of preparation by scraping prior to punching was followed; this is a common method in the Aurignacian, but recorded in the Châtelperronian as well—according to White (2001: Table 5), two reindeer phalanges from levels IX and X of the Grotte du Renne were perforated with the exact same procedure. In contrast, the rotating technique used for the hind canine seems at present to be exclusively Aurignacian. A number of red deer canines from Quinçay, however, bear large, sub-circular, heavily worn perforations (Granger and Lévêque 1997: Figure A; Soressi and d'Errico 2007) that may have been made by rotation.

In short, there is no reason, with the present state of our knowledge, to attribute the perforated teeth of the Grotte des Fées to the Aurignacian instead of the Châtelperronian. A stronger case can be put together for the hind pendant but, even if Aurignacian, this object still would not support interstratification. It comes from B4, but the year of excavation is 1952, i.e., it was recovered in the backfill deposits across which Delporte excavated that year's longitudinal trench (cf. *supra* and Figures 8 and 16).

DELPORTE'S COMPETENCE

Mellars et al. (2007) strongly emphasize the issue of Delporte's competence as an excavator:

"Perhaps the most extraordinary (...) aspect of the Zilhão et al. backdirt hypothesis is the remarkable degree of archaeological incompetence it implies in the conduct

and recording of Delporte's excavations at Châtelperron" (p. 3661).

We disagree that challenging Delporte's stratigraphic interpretation equates to passing a judgment of incompetence, and believe that science should reject arguments based on criteria of authority that preclude reasonable questioning of the results from past research. Honest error is an inherent and fundamental component of the scientific enterprise, where progress often comes from correcting and building on past mistakes (including one's own).

We argued before (Bordes 2002, 2003, 2006; Rigaud 2000, 2001) that other prestigious scholars made the same error as Delporte—most notably, François Bordes, one of the most influential Paleolithic archeologists of the 20th century. Mellars et al. (2007: 3662) express respect for our critique of interstratification at Roc-de-Combe. We would strongly reject the notion that, in expressing such views, Mellars et al. are implicitly condoning or endorsing an accusation that François Bordes was guilty of gross incompetence in the conduct and recording of his excavations at that site.

DISCUSSION

The Grotte des Fées had been extensively explored prior to Delporte's 1950s work and his excavations were neither recorded nor published with the detail needed for full testing of the different interpretations. For instance, finds were not piece-plotted, and, for most years, there is no indication of where exactly the finds come from in the different areas excavated by Delporte. As we pointed out (Zilhão et al. 2006: 12647), this situation sets limits to the extent to which the original stratigraphic configuration of the site can be reconstructed, and carries the implication that any model will leave aspects of the evidence unexplained.

Mellars et al. (2007: 3657) make much of what they perceive as a change in the "precise basis for the rejection of the Châtelperron sequence" between Zilhão et al. (2006) and a previous version of our paper, given as a presentation to the 2006 Annual Meeting of the Paleanthropology Society (<http://www.paleoanthro.org/journal/content/PAS2006A.pdf>). They seemingly perceive a contradiction between our initial suggestion that "at least Châtelperron levels B1–B3, and in all likelihood the entire B1–B5 sequence, represent reworked sediments and archaeological material, probably backdirt from the excavations conducted on the site in the nineteenth century" and our eventually published hypothesis that "the material from the basal Châtelperronian levels (Delporte's levels B4 and B5) was in fact almost certainly *in situ* and (...) only the material from the overlying, upper Châtelperronian levels (levels B1–B3) should (...) be interpreted as a 19th century 'backdirt' accumulation" (Mellars et al. 2007: 3657). While the putative "initial" version of our argument is given as a direct quote from the meeting's book of abstracts, the putative "final" version is only Mellars et al.'s perception, not what we actually wrote, which

is the following:

“These data [the vertical variation in the frequencies of taphonomically significant lithic attributes] suggest that, whereas levels B4 to B5a may well have been broadly *in situ*, B1 and B2 were not; given the marked surge in edge-damaged items from B4 to B3, the same probably applies to the latter” (Zilhão et al. 2006: 12647).

We also said that, of the only two possible interpretations of the sequence—either Layer B is “entirely disturbed” or Levels B1–B3a are disturbed but levels B4–B5a are “*in situ* Châtelperronian occupation with a few Aurignacian intrusions”—the second was that which was favored by “our analyses, and Delporte’s 1962 reading of the stratigraphy, as made up of three blocks” (*ibidem*). We did not say that this second hypothesis was “most certain,” and much less have we said, nor would ever have said, that our analyses excluded the first hypothesis.

If the site originally featured a very rich Châtelperronian occupation contained in deposits overlying almost sterile Mousterian ones and capped by a very thin lens of Aurignacian material, and if Bailleau’s excavation had entirely emptied the site down to the nearly sterile upper part of the Mousterian, leaving no remnants at all, then Bailleau’s backfill would consist mostly of discarded Châtelperronian artifacts and bones, with a few Aurignacian items scattered throughout. This is exactly what we see in the composition of the lithic assemblages from Delporte’s B levels. In such a situation, and unless a sufficiently large number of samples were to be dated, consistent radiocarbon results could still be obtained. For instance, assuming for the bone material in the collection a proportion of Aurignacian to Châtelperronian items identical to that obtained for the diagnostic lithics, i.e., a proportion of 1:16 (Zilhão et al. 2006: Table 4), obtaining three consistent Châtelperronian results for three samples from B5 is in itself no sufficient demonstration that this provenience unit is unmixed or undisturbed.

Our confidence that Delporte’s Levels B4 and B5 include material collected in intact remnants derives from the topographic evidence, not the radiocarbon dates. The marked contrast between the B levels and the underlying Mousterian deposit—a “yellow clay much more compact and homogeneous” (Delporte 1955: 83)¹⁹—suggests that accurately exposing the scar of Bailleau’s penetration into the Mousterian would not have been too difficult a task and, therefore, that the outline of that scar given in Delporte’s plans is reliable. If so, despite the upward-widening (*évasement*) noted by Delporte, sufficient space would remain between the scar and the cave walls for remnants of the basal Châtelperronian deposits to have been preserved, and excavated (cf. Figures 6, 8, 11, 16, and 21). At the same time, given that there are pieces marked B4 and B5 (actually, “1d” and “1e”) that bear a 1952 date, and that, in 1952, Delporte’s work consisted of a trench through Bailleau’s backfill in the central part of the site, we are no less confident that B4 and B5 also contain material from disturbed deposits. This does

not invalidate our previous comparisons between the two blocks of levels (Zilhão et al. 2006: Figure 3; reproduced as Figure 22 here). If B1 to B3 are exclusively backfill, a significant proportion of *in situ* material in B4–B5 would still manifest itself through concordant, consistent shifts in the frequency values obtained for different indicators of lithic taphonomy, as our graphs indeed show.

The change of emphasis (not position) between our Paleoanthropology Society presentation and the PNAS paper relates to the fact that, in the published version, we concentrated on the interstratification issue and its wider paleoanthropological implications, not in explaining the Grotte des Fées *per se*; and, where that issue was concerned, demonstrating that Levels B1 to B3 were not *in situ* sufficed to make our point, regardless of whether B4 and B5 were disturbed or intact. Thus, to focus the argument, we conceded that, despite containing some Aurignacian material, B4 and B5 could have been “broadly *in situ*.” However, as the evidence given above clearly shows, that is far from certain. A strong presumption of non-disturbance is legitimate for the B4 and B5 material from the 1962 field season, but that is not necessarily the case for the 1952–54 material from those levels.

For the sake of clarity, we provide below a summary statement of our view of the Grotte des Fées stratigraphy:

- we have no doubt that Levels B1 to B3 of Delporte’s excavations at the Grotte Effondrée are backfill, and we believe that some of the B4–B5 material—but in an unknown percentage, and clearly not all of it—comes from *in situ* remnant deposits;
- originally, the site contained a rich Châtelperronian fill capped by surficial deposits containing remains of later, sporadic human incursions, namely during the Aurignacian; and,
- the B5 samples may well date an *in situ* remnant preserved in the periphery of the Châtelperronian habitat excavated by Bailleau at the center of the chamber, while the B1–3 samples clearly date a post-Châtelperronian carnivore denning context located in a recess of the south wall of the cave, beyond the limits of the human occupation area.

CONCLUSION

The preceding sections will hopefully have made it clear that we see our most fundamental difference with Mellars et al. (2007) as being one of approach. Theirs consisted of going through the MAN collections for dating samples, then sending these to a radiocarbon laboratory, and interpreting the results in the light of a literal reading of the site’s stratigraphy as published 50 years ago. They did not study the original literature or examine the artifacts and the faunal collection from which they obtained their samples in order to assess such issues as agent of accumulation, degree of stratigraphic integrity, and relevance of the samples for the archeological problem at hand. In sum, their approach lacked sufficient critique in evaluation of the sources. We hope that, regardless of whether we are eventually proven

right or wrong on the issues of empirical substance, this controversy will have aided in setting the standards and research protocols that should be followed whenever using old collections to assess current issues. This is all the more so in the case of dating samples from museum collections because, as scientists dramatically improve the accuracy and precision of chronometric techniques, it is the purely archeological problems of sample association and sample significance that more and more become of paramount importance in such dating projects.

We believe that Mellars et al.'s (2007) approach eventually led them to an impossible position on two counts. First, as they were forced to rely entirely on our own analyses, they eventually fell into the double standard of accepting the reliability of our analyses when convenient, only to reject them when our results were inconsistent with their interpretation of the site. Second, they ended up having to give value of ultimate proof to the argument that the competence of Delporte as an excavator sufficed to validate his stratigraphy of the Grotte des Fées, which raises the question of why anyone would reexamine the site in the first place—given that the argument carries the obvious implication that the excavator has to be right even if the dating experiment had suggested otherwise.

Where the issue of interstratification in relation to Neandertals and moderns is concerned, an elementary point of logic is that obtaining Châtelperronian dates from samples collected in the backdirt of a Châtelperronian site is at best confirmation that the backdirt came from that site, not proof that the backdirt is an intact deposit, contra Mellars et al. (2007)—for an analogy, cf. the recent work at the Neandertal type-site (Schmitz et al. 2002). Moreover, by organizing their argument in refutation format, Mellars et al. failed to give due consideration to a second major logical issue, that of the side upon which the burden of proof must fall. Of the four instances of interstratification that have been proposed so far, Mellars et al. do not dispute that three (Roc-de-Combe, Le Piage, and El Pendo) should be rejected. Over the last 50 years, no other site excavated with modern techniques yielded anything even remotely similar to the interstratifications originally argued for these sites. Therefore, arguing for interstratification at the Grotte des Fées with attendant implications for the Neandertal debate would have required a very solid case. Mellars et al. (2007) equate the putative refutation of our model with the automatic confirmation of theirs, but this is a logical fault—regardless of whatever problems might exist with our own backfill model of the Grotte des Fées, interstratification still would have to be proven **beyond reasonable doubt**. Neither Gravina et al. (2005) nor Mellars et al. (2007) have provided such proof and, as we have shown here, our backfill model explains more of the evidence, and in a fully parsimonious way.

As in other fields of science, here too ultimate proof must come from an argument of replication, not authority. In their concluding remarks, Mellars et al. (2007: 3662) frame the situation at the Grotte des Fées in regional terms—interstratification might be wrong in the Périgord

sites but could still hold for the Allier because the latter is geographically closer to the source areas of modern human immigrants, making it more likely that sites preserve a record of the ebb and flow of the frontier between Neandertals and moderns. We disagree with this notion, because we think that such situations of territory interdigitation would have been much shorter than required for the geological record of caves and rock shelters to have preserved them as distinct interstratifications, and we believe that is exactly why no unambiguous instances of interstratification have been found so far. In any case, if Mellars et al. (2007) are right, they should be able to prove their point via searching the Allier and adjacent regions for new sites featuring indisputable evidence of interstratification. Their challenge consists in finding and excavating such new sites, not in reasserting the validity of Delporte's patently questionable stratigraphic interpretation of the Grotte des Fées against the overwhelming weight of the empirical evidence.

ACKNOWLEDGEMENTS

We thank the staff of the Musée d'Archéologie Nationale, particularly Catherine Schwab and Sandra Bercut, for invaluable assistance, Boris Valentin and Marian Vanhaeren for their help with sources and illustrations, Jacques Pelegrin for advice on the possibly Solutrean piece from B2, Paul Bahn, Alistair Pike, and Erik Trinkaus for their comments on earlier versions of the manuscript, and Donald K. Grayson for a very useful peer-review. This research was supported by the European Science Foundation's Eurocore program "Origin of Man, Language, and Languages", the "Environnement et Climat du Passé: Histoire et Evolution" program of the Centre National de la Recherche Scientifique, the Aquitaine Region's "Transitions" project, and the University of Bristol's Faculty of Arts Research Fund.

ENDNOTES

1. "A note to researchers: as far as I am concerned, if chance eventually comes in support of my hopes, I will be happy to restart new excavations and to write up the new papers arising from them." [*Avis aux chercheurs: de mon côté, si le hasard vient seconder mes espérances, je serai heureux de recommencer de nouvelles fouilles et d'en faire l'objet de nouvelles communications*]
2. Delporte (1957) told the July 1956 Congrès Préhistorique de France that he first worked at the Grotte des Fées in 1951 (p. 455), and that the excavations went on for a total of four years (p. 469–470). His other accounts (Delporte 1955, n.d.) are consistent with this information. Thus, we infer that the dates of Delporte's work at the site were 1951–1954 and 1962, and that any references to work carried out in 1955 or 1956 (cf. Gravina et al. 2005: 51) represent errors in the marking or reading of find labels. Our table of equivalence between unit designations (Zilhão et al. 2006: Figure 1) is here (cf. Figure 9) modified accordingly. A small discrepancy exists concerning the date of the earliest work in the palier nord area: 1952 (Delporte 1955: 81) or 1953 (Delporte n.d.: 10; in this reference, 1952 is mentioned solely in relation to the excavation of the longitudinal trench). The latter version makes topographical sense and, being the last in date, was retained in the elaboration of Figure 8. Finally, it should also be noted that, in the report on his last excavation of the 1950s, Delporte (1955) still uses a 0-1-2 system of levels; therefore, the equivalent A-B-C system found in Delporte (1957) must be a *post facto* change, explaining the frequent instances of double marking seen in the lithic collection.

3. "Our work was organized in three successive stages (Figure 4): test close to the wall (1951), which revealed the existence of untouched layers; longitudinal trench (1952), which allowed us to accurately gauge the importance and emplacement of the untouched layers; excavation by natural stratigraphic units of the blocks [paliers] on both sides of the trench (1953, 1954, 1962)." [Nos travaux ont été organisés en trois phases successives (Figure 4): sondage à proximité de la paroi (1951), sondage qui nous a révélé l'existence de couches vierges; tranchée longitudinale (1952), qui nous a permis de préciser l'importance et la localisation des couches vierges; décapage par couches des paliers situés de part et d'autre de la tranchée (1953, 1954, 1962)] (Delporte n.d.: 10).
4. "I have already indicated (...) the different stages of the excavations thus undertaken; above all, they allowed the identification and study of 3 interesting remnants: 2 périgordian ensembles located respectively North and South of Bailleau's excavations, and a mousterian ensemble at greater depth and over a surface unfortunately very small." [J'ai déjà indiqué (...) les différentes étapes des fouilles ainsi entreprises; elles ont surtout permis de déterminer et d'étudier 3 témoins intéressants: 2 ensembles périgordiens situés respectivement au Nord et au Sud des fouilles Bailleau, et un ensemble moustérien situé en profondeur, sur une surface malheureusement très réduite]
5. la limite des fouilles Bailleau n'est qu'approximative: elle a en effet été relevée au niveau de la couche moustérienne et elle tend à s'élever dans les niveaux périgordiens
6. In Delporte's (n.d.) plan (Figure 2a), Bailleau's limit in the palier sud, as given in the 1957 plan, is missing. We can only speculate as to why. One possibility, of course, is that, after 1962, Delporte came to the conclusion that the deposits in this part of the cave that he had previously diagnosed as *in situ* remnants were in fact disturbed too.
7. nettement distincts par leur coloration
8. "This third cavern, located at an elevation some two meters above the others, is preceded by a small plateau surrounded by boulders where the primitive inhabitants of this dwelling established their fireplaces." [Cette troisième caverne, située à un niveau supérieur de deux mètres environ à celui des deux autres, est précédée d'un petit plateau entouré de rochers sur lequel les habitants primitifs de cette demeure établirent leurs foyers] (Bailleau 1872: 116; our emphasis).
9. Ces foyers se prolongeaient assez avant dans la grotte à laquelle on descendait par une pente assez raide (Bailleau 1872: 117).
10. "Man lived there for a long time. That is where he prepared his meals, as attested by the ashes, the charcoal and the gnawed bone remains accumulated over a thickness of more than one meter. Several successive occupations must have taken place in this space six meters long and four meters wide; excavating the soil, we find in fact, at different depths, juxtaposed schist plaques used for the construction of the fireplaces." [Pendant longtemps l'homme y a établi son séjour. C'est là qu'il préparait ses repas, ainsi que l'attestent les cendres, les charbons et les débris d'ossements rongés, qu'on y trouve accumulés sur une épaisseur de plus d'un mètre. Plusieurs occupations successives ont dû se faire dans cet espace de six mètres de long sur quatre de large; on rencontre en effet, à différentes profondeurs, en fouillant le sol, des plaques de schiste juxtaposées qui ont servi à l'édification des foyers] (Bailleau 1869: 14).
11. "... it was not until the spring of 1870 that I discovered the 3rd cavern. (...) what I had seen as simply a fireplace is in fact the entrance to a cave that does not exist any more" [... ce n'est qu'au printemps 1870, que j'ai découvert la 3e caverne. (...) ce que j'ai pris pour un foyer seulement, n'était que l'entrée de cette grotte aujourd'hui disparue] (Bailleau 1870: 112).
12. "The remains of the primitive industry of the man of this epoch were scattered throughout our excavation area. But most were concentrated around the fireplaces over a thickness of some 0.75 m. (...) The cavern penetrated into the hillslope, but only in an extension of 5–6 m and over a width of 2.5m was its extension easy to recognize." [Les restes de l'industrie primitive de l'homme de cette époque étaient éparpillés à travers l'espace parcouru par nos déblais. Mais la majeure partie était concentrée autour des foyers sur une épaisseur de 0.75 m environ (...) La caverne s'enfonçait dans le coteau, mais son étendue facile à reconstituer n'était pas considérable, 2.50 m de large sur 5 à 6 de long] (Bailleau 1872: 117–118).
13. les fouilles ont porté sur une station, sinon vidée, tout au moins ne contenant plus que des lambeaux de couches vierges de caractère périphérique, par conséquent infiniment moins riches que la zone centrale qui contenait les importants foyers étudiés par Bailleau vers 1870
14. recueilli dans une zone où les niveaux se différencient mal
15. forme de lame à dos peu typique; il n'y a pas d'abattage caractérisé, mais simplement accommodation de l'arête par une retouche incomplète et peu abrupte
16. Ces pièces ne se trouvent pas réunies dans un niveau sus-jacent au Périgordien (...). Au contraire, elles sont dispersées dans la masse des niveaux périgordiens; il faut cependant noter qu'elles tendent à se situer, dans la mesure où leur nombre permet d'en juger, vers les niveaux B.2 à B.4a, et plus spécialement dans le niveau B.4
17. Malgré la faible surface de l'espace fouillable, une différence fondamentale a pu être constatée entre les niveaux nets de la couche supérieure et la diffusion de vestiges, ainsi que leur petit nombre, dans la couche inférieure; cette pauvreté de l'industrie est d'ailleurs confirmée par l'étude de la série Bailleau, beaucoup plus riche en pièces du Paléolithique supérieur qu'en pièces moustériennes.
18. L'instrument que je figure a été ramassé sous la voie du chemin de fer, pendant qu'on y exécutait des réparations.
19. argile jaune beaucoup plus compacte et homogène

REFERENCES

- Aubry, Th. 1991. *L'exploitation des ressources en matières premières lithiques dans les gisements solutréens et badegouliens du bassin versant de la Creuse (France)*. Ph.D. dissertation, University of Bordeaux I.
- Bailleau, J.-G. 1869. *Grotte des Fées de Chatelperron*. Desrosiers, Moulins.
- Bernaldo de Quirós, F. 1982. *Los inicios del Paleolítico Superior Cantabrio*. Centro de Investigación y Museo de Altamira, Madrid.
- Binford, L. 1973. Interassemblage variability: The Mousterian and the "functional" argument. In Renfrew, C. (Ed.), *The Explanation of Culture Change. Models in Prehistory*. Duckworth, London, pp. 227–254.
- Bon, F. 2002. *L'Aurignacien entre Mer et Océan. Réflexion sur l'unité des phases anciennes de l'Aurignacien dans le sud de la France*. Société Préhistorique Française, Paris.
- Bordes, F. 1968. La question périgordienne. In *La Préhistoire: problèmes et tendances*. CNRS, Paris, pp. 59–70.
- Bordes, F. 1973. On the chronology and contemporaneity of different paleolithic cultures in France. In Renfrew, C. (Ed.), *The Explanation of Culture Change. Models in Prehistory*. Duckworth, London, pp. 217–226.
- Bordes, F. and Labrot, J. 1967. Stratigraphie de la grotte de Roc-de-Combe (Lot) et ses implications. *Bulletin de la Société Préhistorique Française*. Études et Travaux 64, 15–28.
- Bordes, J.-G. 2002. *Les interstratifications Châtelperronien/Aurignacien du Roc de Combe et du Piage (Lot, France)*. Analyse taphonomique des industries lithiques: conséquences archéologiques. Ph.D. dissertation, University of Bordeaux I.
- Bordes, J.-G. 2003. Lithic taphonomy of the Châtelperronian/Aurignacian interstratifications in Roc de Combe and Le Piage (Lot, France). In Zilhão, J., d'Errico, F. (Eds.), *The Chronology of the Aurignacian and of the Transitional Technocomplexes. Dating, Stratigraphies, Cultural Implications*. Instituto Português de Arqueologia, Lisbon, pp. 223–244.
- Bordes, J.-G. 2006. News from the West: a reevaluation of the classical Aurignacian sequence of the Périgord. In Bar-Yosef, O., Zilhão, J. (Eds.), *Towards a Definition of*

- the Aurignacian*. Lisbon, American School of Prehistoric Research/Instituto Português de Arqueologia, pp. 147–171.
- Champagne, F., Espitalié, R. 1981. *Le Piage, site préhistorique du Lot*. Société Préhistorique Française, Paris.
- d'Errico, F. 2003. The Invisible Frontier. A Multiple Species Model for the Origin of Behavioral Modernity. *Evolutionary Anthropology* 12, 188–202.
- d'Errico, F. and Vanhaeren, M. 2002. Criteria for Identifying Red Deer (*Cervus elaphus*) Age and Sex from Their Canines. Application to the Study of Upper Palaeolithic and Mesolithic Ornaments. *Journal of Archaeological Science* 29, 211–232.
- d'Errico, F., Zilhão, J., Baffier, D., Julien, M., and Pelegrin, J. 1998. Neanderthal Acculturation in Western Europe? A Critical Review of the Evidence and Its Interpretation. *Current Anthropology* 39, S1-S44.
- Dawkins, R. 2006. *The God Delusion*. Bantam, London.
- Delporte, H. 1955. Les fouilles des grottes paléolithiques de Châtelperron (Allier). *Gallia* 13, 79–84.
- Delporte, H. 1957. La Grotte des Fées de Châtelperron (Allier). In *Congrès Préhistorique de France. Comptes-Rendus de la XVème Session*. Société Préhistorique Française, Paris, pp. 452–477.
- Delporte, H. 1976. Les civilisations du Paléolithique supérieur en Auvergne. In Lumley, H. (Ed.), *La Préhistoire Française*. CNRS, Paris, pp. 1297–1304.
- Delporte, H. n.d. La station de Châtelperron. Unpublished manuscript (ca 1964, on file at the Musée d'Archéologie Nationale, Saint-Germain-en-Laye).
- Delporte, H., Surmely, F., and Urgal, A. 1999. *Châtelperron: Un grand gisement préhistorique de l'Allier*. Conseil General de l'Allier, Moulins.
- Demars, P.-Y. and Hublin, J.-J. 1989. La transition néandertaliens/hommes de type moderne en Europe occidentale : aspects paléontologiques et culturels. In Otte, M., Laville, H. (Eds.), *L'Homme de Néandertal 7: l'extinction*. Université de Liège, Liège, pp. 29–42.
- Demars, P.-Y. and Laurent, P. 1989. *Types d'outils lithiques du Paléolithique supérieur en Europe*. CNRS, Paris.
- Depraetere, B. 2000. *Technologie lithique chatelperronienne. Présentation et étude du matériel lithique de Châtelperron (Allier)*. M.A. dissertation, University of Paris I.
- Dujardin, V. 2001. Sondages à la Quina aval (Gardes-le-Pontaroux, Charente, France). *Antiquités Nationales* 33, 21–26.
- Granger, J.-M. and Lévêque, F. 1997. Parure castelperronienne et aurignacienne: étude de trois séries inédites de dents percées et comparaisons. *Comptes-rendus de l'Académie des Sciences de Paris* 325, 537–543.
- Gravina, B., Mellars, P., and Bronk Ramsey, C. 2005. Radiocarbon dating of interstratified Neanderthal and early modern human occupations at the Chatelperronian type-site. *Nature* 438, 51–56.
- Harrold, F.B. 1988. The Chatelperronian and the Early Aurignacian in France. In Hoffecker, J.F., Wolf, C.A. (Eds.), *The early Upper Paleolithic: evidence from Europe and the Near East*. British Archaeological Reports, Oxford, pp. 157–191.
- Henry-Gambier, D., Maureille, B., and White, R. 2004. Vestiges humains des niveaux de l'Aurignacien ancien du site de Brassempouy (Landes). *Bulletins et Mémoires de la Société d'Anthropologie de Paris* n.s. 16, 49–87.
- Higham, T.F.G., Jacobi, R.M., and Bronk Ramsey, C. 2006. AMS radiocarbon dating of ancient bone using ultrafiltration. *Radiocarbon* 48, 179–195.
- Hublin, J.-J. 2000. Modern-nonmodern hominid interactions: A Mediterranean perspective. In Bar-Yosef, O., Pilbeam, D. (Eds.), *The Geography of Neandertals and Modern Humans in Europe and the Greater Mediterranean*. Peabody Museum, Cambridge (MA), pp. 157–182.
- Hublin, J.-J., Spoor, F., Braun, M., Zonneveld, F., and Condemni, S. 1996. A late Neanderthal associated with Upper Palaeolithic artifacts. *Nature* 381, 224–226.
- Inizan, M.-L. ; Roche, H., and Tixier, J. 1992. *Technology of knapped stone*. CERP, Valbonne.
- Jöris, O., Álvarez, E., and Weninger, B. 2003. Radiocarbon Evidence of the Middle to Upper Paleolithic Transition in Southwestern Europe. *Trabajos de Prehistoria* 60, 15–38.
- Klaric, L. 2003. *L'unité technique des industries à burins du Raysse dans leur contexte diachronique. Réflexions sur la diversité culturelle au Gravettien à partir des données de la Picardie, d'Arcy-sur-Cure, de Brassempouy et du Cirque de la Patrie*. Ph.D. dissertation, University of Paris I.
- Lacaille, A. D. 1947. Châtelperron: a new survey of its Palaeolithic industry. *Archaeologia* 92, 95–119.
- Laville, H., Rigaud, J.-Ph., and Sackett, J. 1980. *Rock shelters of the Périgord*. Academic Press, New York.
- Lévêque, F. and Vandermeersch, B. 1980. Découverte de restes humains dans un niveau castelperronien à Saint-Césaire (Charente-Maritime). *Comptes-rendus de l'Académie des Sciences de Paris* 291D, 187–189.
- Mellars, P.A. 1999. The Neanderthal Problem Continued. *Current Anthropology* 40, 341-350.
- Mellars, P.A., Gravina, B., and Bronk Ramsey, C. 2007. Confirmation of Neanderthal/modern human interstratification at the Chatelperronian type-site. *Proceedings of the National Academy of Sciences USA* 104, 3657–3662.
- Mellars, P.A and, Stringer, C.B. (Eds.), 1989. *The Human Revolution*. Edinburgh University Press, Edinburgh.
- Montes, R. and Sanguino, J. (Eds.). 2001. *La Cueva del Pendo. Actuaciones Arqueológicas 1994-2000*. Ayuntamiento de Camargo/Gobierno de Cantabria/Parlamento de Cantabria, Santander.
- Montes, R., Sanguino, J., Martín, P., Gómez, A.J., and Morcillo, C. 2005. La secuencia estratigráfica de la cueva de El Pendo (Escobedo de Camargo, Cantabria): problemas geoarqueológicos de un referente cronocultural. In Santonja, M., Pérez-González, A., Machado, M. (Eds.), *Geoarqueología y patrimonio en la Península Ibérica y el entorno mediterráneo*. ADEMA, Almazán (Soria), pp. 127–138.
- Pelegrin, J. 1995. *Technologie lithique: le Châtelperronien de Roc-de Combe (Lot) et de la Côte (Dordogne)*. CNRS, Paris.

- Peyrony, D. 1933. Les industries «aurignaciennes» dans le bassin de la Vézère. *Bulletin de la Société Préhistorique Française* 30, 543–559.
- Peyrony, D. 1948. Le Périgordien, l'Aurignacien et le Solutréen d'après les dernières fouilles. *Bulletin de la Société Préhistorique Française* 45, 305–328.
- Rigaud, J.-Ph. 2000. Late Neandertals in the southwest of France and the emergence of the Upper Paleolithic. In Stringer, C., Barton, R.N.E., Finlayson, J.C. (Eds.), *Neanderthals on the edge: papers from a conference marking the 150th anniversary of the Forbes' Quarry discovery, Gibraltar*. Oxbow, Oxford, pp. 27–31.
- Rigaud, J.-Ph. 2001. À propos de la contemporanéité du Castelperronien et de l'Aurignacien ancien dans le nord-est de l'Aquitaine: une révision des données et ses implications. In Zilhão, J., Aubry, Th., Carvalho, A. F. (Eds.), *Les premiers hommes modernes de la Péninsule Ibérique*. Instituto Português de Arqueologia, Lisbon, pp. 61–68.
- Schmitz, R.W., Serre, D., Bonani, G., Feine, S., Hillgruber, F., Krainitzki, H., Pääbo, S., and Smith, F.H. 2002. The Neandertal type site revisited: Interdisciplinary investigations of skeletal remains from the Neander Valley, Germany. *Proceedings of the National Academy of Sciences USA* 99, 13342–13347.
- Smith, Ph. 1966. *Le Solutréen en France*. Delmas, Bordeaux.
- Sonneville-Bordes, D. 1982. L'évolution des industries aurignaciennes. In *Aurignacien et Gravettien en Europe, II, Cracovie-Nitra-1980*. Université de Liège, Liège, pp. 339–360.
- Soressi, M. and d'Errico, F. 2007. Pigments, gravures, parures : les comportements symboliques controversés des Néandertaliens. In Vandermeersch, B., Maureille, B. (Eds.), *Les Néandertaliens. Biologie et cultures*. Éditions du CTHS, Paris, pp. 297–309.
- Stringer, C. and Gamble, C. 1993. *In Search of the Neanderthals*. Thames and Hudson, London.
- Texier, J.-P., Kervazo, B., Lenoble, A., and Nespoulet, R. 2004. *Sédimentogenèse des sites préhistoriques du Périgord*. Association des Sédimentologues Français, Bordeaux.
- Tixier, J., Inizan, M.-L., Roche, H., and Dauvois, M. 1980. *Préhistoire de la pierre taillée. I. Terminologie et technologie*. CERP, Valbonne.
- Trinkaus, E., Moldovan, O., Milota, Ş., Bilgär, A., Sarcina, L.; Athreya, S., Bailey, S.E., Rodrigo, R., Mircea, G., Higham, Th., Bronk Ramsey, C.H., and van der Plicht, J. 2003. An early modern human from the Peştera cu Oase, Romania. *Proceedings of the National Academy of Sciences USA* 100, 11231–11236.
- Vanhaeren, M. and d'Errico, F. 2006. Aurignacian ethno-linguistic geography of Europe revealed by personal ornaments. *Journal of Archaeological Science* 33, 1105–1128.
- Villa, P. and d'Errico, F. 2001. Bone and ivory points of the Lower and Middle Paleolithic of Europe. *Journal of Human Evolution* 41, 69–112.
- Weninger, B. and Jöris, O. 2007. The Cologne Radiocarbon Calibration & Paleoclimate Research Package (<http://www.calpal.de>).
- White, R. 2001. Personal Ornaments from the Grotte du Renne at Arcy-sur-Cure. *Athena Review* 2, 41–46.
- Zilhão, J. 2001. *Anatomically Archaic, Behaviorally Modern: The Last Neanderthals and Their Destiny*. Stichting Nederlands Museum voor Anthropologie en Praehistoriae, Amsterdam.
- Zilhão, J. 2006. Neandertals and Moderns Mixed, and It Matters. *Evolutionary Anthropology* 15, 183–195.
- Zilhão, J. 2007. The emergence of ornaments and art: an archaeological perspective on the origins of behavioral “modernity.” *Journal of Archaeological Research* 15, 1–54.
- Zilhão, J. and d'Errico, F. 1999. The chronology and taphonomy of the earliest Aurignacian and its implications for the understanding of Neandertal extinction. *Journal of World Prehistory* 13, 1–68.
- Zilhão J., d'Errico, F., Bordes, J.-G., Lenoble, A., Texier, J.-P., and Rigaud, J.-Ph. 2006. Analysis of Aurignacian interstratification at the Châtelperronian-type site and implications for the behavioral modernity of Neandertals. *Proceedings of the National Academy of Sciences USA* 103, 12643–12648.