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THE LITHIC INDUSTRIES FROM BLANCHARD AND CASTANET ROCK SHELTERS (DORDOGNE, FRANCE):

Data from the 2005-2012 Excavations

Laurent CHIOTTI, Catherine CRETIN, André MORALA

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THE LITHIC INDUSTRIES FROM BLANCHARD AND CASTANET ROCK SHELTERS (DORDOGNE, FRANCE):

Data from the 2005-2012 Excavations

Laurent CHIOTTI, Catherine CRETIN, André MORALA

Abstract

Renewed excavations directed by R. White in two Aurignacian rock shelters in the Vallon des Roches (Sergeac, Dordogne, France), Castanet (2005-2012) and Blanchard (2011-2012), have yielded reliable new series, and have improved our knowledge and reflections of the Aurignacian from these two reference sites.

Castanet Rock shelter was excavated over a surface of several square meters and yielded a single level, lying directly on the rocky substratum. Blanchard Rock shelter had been practically emptied by early excavations, but nonetheless contained two relatively rich archeological vestigial deposits, without stratigraphic overlap. Excavations in these two contiguous rock shelters, at the foot of the same cliff, yielded sufficient collections for a reliable typo-technological analysis and an updated cultural attribution.

Consequently, one of the series from Blanchard and the series from Castanet can be attributed to an Early Aurignacian, whereas the second series from Blanchard corresponds to a Recent Aurignacian. This provides us with a number of new observations concerning technical behaviors, raw material procurement and chronocultural informations that were not possible to affirm on the older collections.

Keywords

Aurignacian, Castanet, Blanchard, typology, technology, bladelet production, raw materials.

Introduction

The study of the beginning of the Upper Paleolithic in Europe raises fundamental questions concerning the identity and the cultural specificity of modern humans, the colonization of Europe and the establishment of modern human dominance on all of the occupied continents. The Aurignacian is the first Pan-European culture attributed to *Homo sapiens sapiens* and comprises original components that extend throughout the whole Upper Paleolithic: the first figurative representations, generalization and diversification of personal ornaments, generalization and organization of technical systems for osseous and lithic materials (including blades and bladelets), etc. Apart from these material aspects, social organization modes and the economic exploitation of the environment also appear to be specific to modern humans, or at least different to those of Neanderthals, their predecessors (for a discussion on the cultural differences between Neanderthals and modern humans, see for example D'Errico, 2003; Henshilwood *et al.*, 2003; Teyssandier *et al.*, 2010; Zilhão, 2011; Banks *et al.*, 2013).

These issues are as fundamental for prehistoric research as they are for human evolution and require the acquisition of new data. Old series are often dispersed, present biases due to sorting and are frequently associated with insufficient stratigraphic data. Here, we have the opportunity to evaluate our knowledge from the early pioneering work at Blanchard and Castanet with new and reliable observations from excavations conducted between 2005 and 2012.

A - The sites and their environment

The Blanchard and Castanet sites are located 25 m apart, in the commune of Sergeac (Dordogne, France). Both sites are collapsed rock shelters, carved into the Upper Cretaceous limestone of the eastern cliff of the vallon des Roches. This small valley, perpendicular to the Vézère River, contains ten or more Paleolithic sites (Sonneville-Bordes, 1960; figures 1-2).

The surrounding Cretaceous limestone massif contains good quality flint deposits, particularly in the Santonian horizons, providing abundant raw materials within a radius of several kilometers. These materials are accumulated at the base of the slopes in the colluviums. The color, cortex and structure of these rocks were modified in Tertiary detrital deposits with high concentrations of iron. They are also found in alluvial formations, where they are mixed with pebbles from more distant sources (quartz, gneiss, granite, schist, basalt, sandstone, ...) and associated with silicifications (flint and jasper) from the southwest foothills of the Massif Central (Demars, 1994; Morala, 2010, in press).

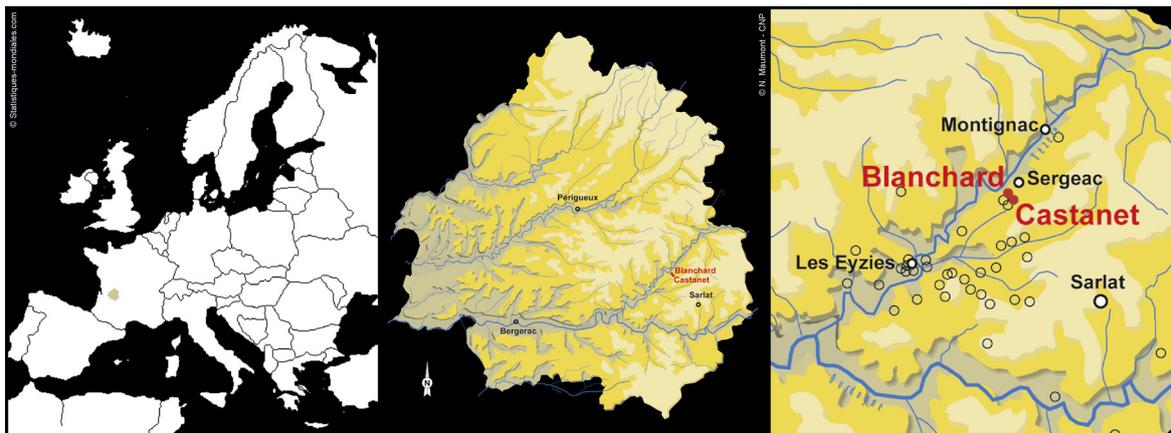


Figure 1 - Map showing the location of abri Castanet and abri Blanchard (CAD: N. Cahoreau, CNP).

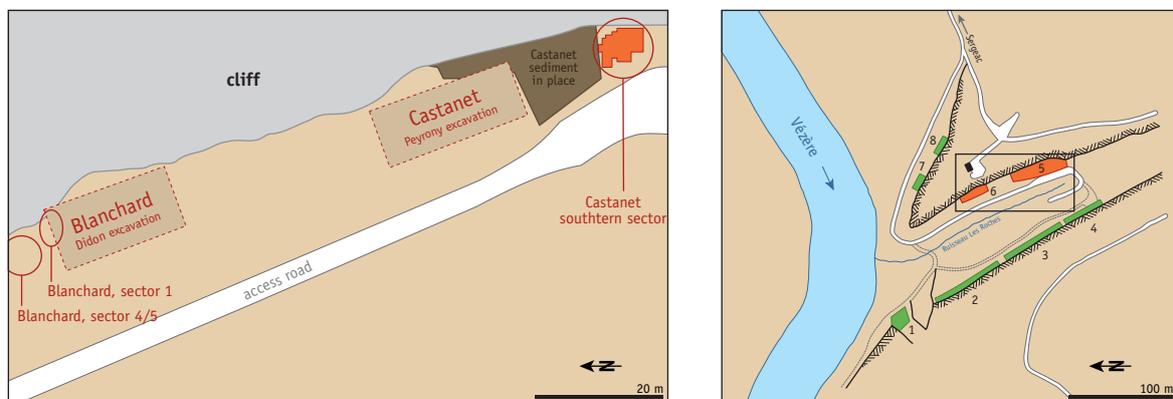


Figure 2 - Map of the vallon des Roches (after Sonneville-Bordes, 1960, modified) and the location of the different excavated sectors at Castanet and Blanchard (CAD: L. Chiotti). 1: abri de La Souquette; 2: abri Labattut; 3: abri du Roc de l'Acier; 4: abri Reverdit; 5: abri Castanet; 6: abri Blanchard; 7: abri Blanchard II; 8: abri des Merveilles.

B - Excavation history

Blanchard Rock shelter was excavated in 1910-1911 by L. Didon (Didon, 1911; Delluc, Delluc, 1981a) and Castanet in 1911-1912 and 1924-1925 by D. Peyrony (1910, 1935). For both sites, M. Castanet was “the right-hand man”, who identified the sites, conducted the excavations and wrote detailed reports of his work for L. Didon and D. Peyrony.

Two levels were identified in both shelters, and the base levels in both sites were clearly attributed to the Aurignacian I (or Early Aurignacian). The upper levels were more difficult to determine and were considered by D. Peyrony, then by D. de Sonneville-Bordes, as Aurignacian II (or Recent Aurignacian¹) on the basis of the presence of several lozenge-shaped points (Peyrony, 1935; Sonneville-Bordes, 1960).

After the excavations, the collections from these sites underwent different treatment: the collections from Blanchard were mixed up by L. Didon and then scattered among various French and foreign institutions (Delluc, Delluc, 1981b; White, 1992). The D. Peyrony collections from Castanet were curated at the Musée national de Préhistoire in Les Eyzies. They are thus more completely preserved.

The opposite occurred for the excavation archives: M. Castanet’s reports from Blanchard were kept by the Didon family (Delluc, Delluc, 1981a), whereas those from Castanet have not been located, as is true of a large part of D. Peyrony’s archives.

From 1995 to 1998, research resumed at Castanet, directed by J. Pelegrin and R. White, and resulted in the identification of the location of D. Peyrony’s trench and the excavation of a still intact sector in the south, which had however been truncated by the widening of the nearby road. These excavations were then pursued by R. White from 2005 to 2012. In this sector, only the Early Aurignacian level was identified. Investigations conducted in the valley (test pits, geophysical prospection, etc.) identified several small strips of layers with archeological remains at the northern end of the Blanchard Rock shelter, which were then excavated in 2011-2012. Two sectors, Blanchard 1 and Blanchard 4/5, yielded sufficient quantities of objects for a chronocultural attribution and a reliable analysis.

C - The recent lithic series from Castanet and Blanchard

It is difficult to assess how representative the recent series are of the original site content. From a quantitative point of view, they only represent a very limited portion of the site. In Castanet, the recently excavated southern sector extends over less than 25 m², as opposed to 120 m² for D. Peyrony’s excavation. From a qualitative viewpoint, on the other hand, these series did not undergo any technological or dimensional sorting.² It is important to note that for the southern sector of Castanet, the proportion of remains less than 15 mm long reaches 96%. These lithic complexes are thus much more representative of the techno-economic activities carried out in the excavated sectors.

1. The term Recent Aurignacian corresponds to the most frequently used appellation in current literature to designate D. Peyrony’s stages II, III and IV (Peyrony, 1933, 1934) and the middle, recent and final phases of H. Delporte (Delporte, 1991). For Castanet and Blanchard, the upper levels are attributed to D. Peyrony’s Aurignacian II (corresponding to H. Delporte’s middle phase). However, for the purposes of this article, we prefer to use the more generic term “Recent Aurignacian”, rather than the “Middle Aurignacian” to designate this phase, especially as the term Middle Aurignacian was recently re-used with a different definition to that of H. Delporte (Michel, 2010).
2. During the recent excavations (southern sector of Castanet and sectors 1 and 4/5 of Blanchard), the archeological remains were recorded up to a lower limit of 1.5 cm and the sediments were sieved using two different superimposed sieves: one with mesh 4 (6.14 mm) and the other with mesh 12 (0.91 mm).

2 - Castanet southern sector

Between 2005 and 2010, 115 518 lithic pieces were unearthed in the southern sector of Castanet. Most of these (110 999 objects, or 96% of the series) correspond to pieces less than 15 mm long found in sieve residues (table 1). Among these pieces, 7 090 objects were analyzed, 4 519 of which were recorded on-site (superior to 15 mm) and 2 571 of which were extracted from sieve residues. The latter correspond mainly to bladelets, or to specific pieces such as burin spalls or proximal blade fragments. The rest of the objects collected from sieve residues were counted but not analyzed.

Lithic materiel		Number of pieces	
Studied pieces	Coordinate pieces	7 090	4 519
	Pieces coming from sieve refusal		2 571
Sieve refusal (< 15 mm)	Studied pieces	110 999	2 571
	Pieces counted by dimensional classes		108 428

Table 1 - Inventory of the lithic material from the 2005-2010 series from Castanet southern sector.

A - Raw material economy

The assemblage includes local and more distant raw materials.

The local materials are all derived from the Senonian and represent 96% of all the analyzed objects. All the identified raw materials were found during field survey within two to three kilometers of the site (Morala, in press). The mineral environment around the Castanet site was thus favorable and the Aurignacian populations occupying the site did not necessarily have to cross the river to collect raw materials (figure 3).

The group of non-local flint (4%) is mainly made up of Upper Campanian flint (Fernandes *et al.*, 2012), known as Bergeracois (3%) and orange-yellow jaspers from the Infralias from Brive Basin (1%). The former are from about 50 km upstream of the site and the latter from about 40 km downstream. The Vézère River cut through the original formations of these rocks, but given the non-altered aspect of the cortex, they were not gathered in alluviums, but were collected from or beside primary outcrops.

Several materials from further away were also identified in small frequencies: Turonian flint from Fumel (Lot-et-Garonne; 60 km), Tertiary flint from Aurillac (Cantal; 100 km) and Grains de Mil flint from Saintes-Jonzac (Charente Maritime; 140 km).

B - The toolkit

The lithic toolkit from the 2005-2010 excavations includes 374 tools, or 5.3% of the overall material (table 2).

Most of these are end scrapers (33.3%), and they are generally flat and often on retouched blades. The Aurignacian scrapers³ (8.4%) are mainly made up of carinates with rather wide retouch fronts (26.5 mm on average).

3. We include the end scrapers / cores in both the toolkit and the technological analysis. Although we consider them primarily as cores, they are present in typological lists and removing them would thus hinder comparisons with counts from other sites. In addition, if we excluded them from the typological counts, we would have to be sure that they were not used as tools, yet certain use-wear studies (still too few and far between) tend to prove the opposite (Hays, Lucas, 2000). Lastly, it is important to bear in mind that these tool categories / technological pieces are present-day interpretative guides and do not correspond to Paleolithic realities.

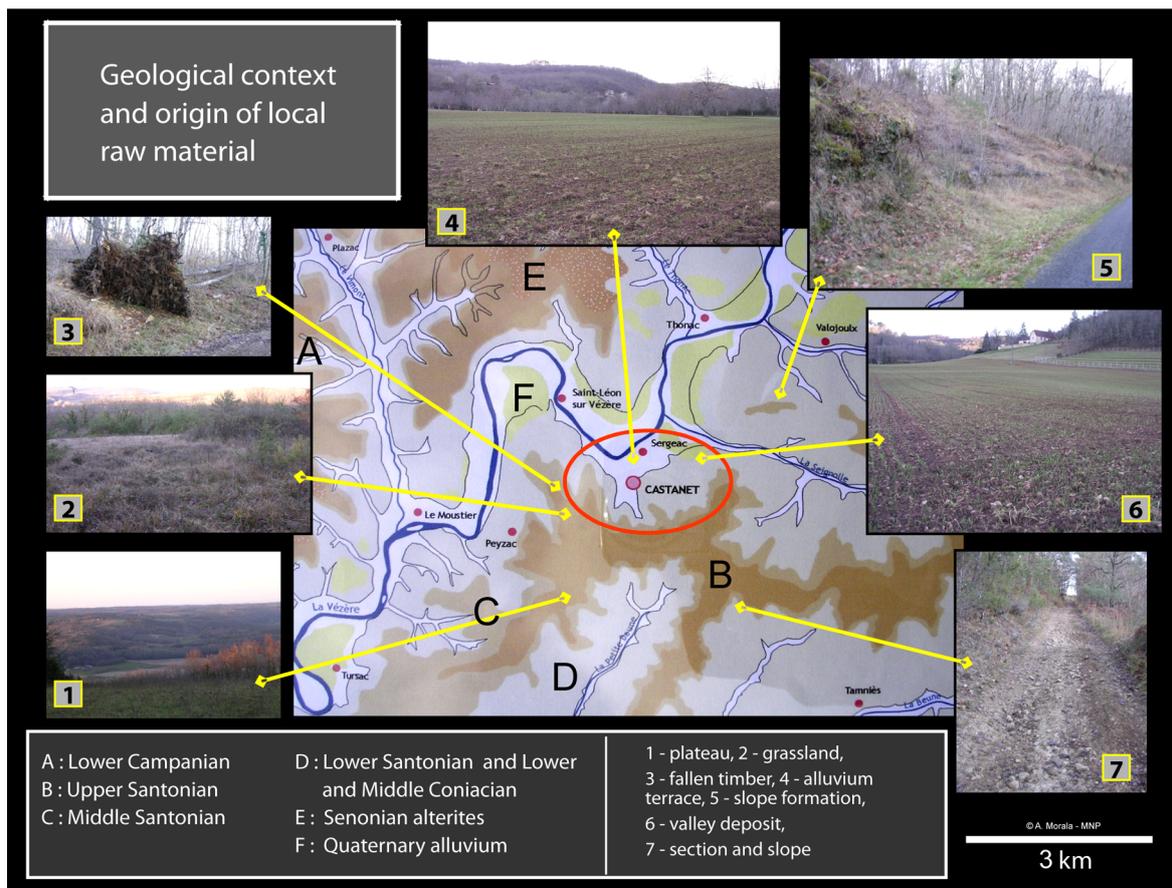


Figure 3 - Origins and lithological conditions of the local raw materials present in Castanet southern sector (photos and CAD: A. Morala).

Tool (Sonneville-Bordes, Perrot type list)	Nb.	%
1 End scraper	21	6,3
2 Atypical end scraper	10	3,0
3 Double end scraper	8	2,4
5 End scraper on retouched blade	30	9,0
6 End scraper on Aurignacian blade	7	2,1
8 End scraper on flake	5	1,5
11 Carinate scraper	20	6,0
12 Atypical carinate scraper	6	1,8
13 Nose-ended scraper	2	0,6
14 Flat nosed scraper or shouldered end-scraper	2	0,6
17 End scraper / burin	1	0,3
18 End scraper / truncated blade	1	0,3
20 Borer or point / truncated blade	1	0,3
21 End scraper / beak	1	0,3
23 Borer or point	9	2,7
30 Burin on break	1	0,3
40 Multiple burin on truncation	1	0,3
41 Mixed multiple burin	2	0,6
44 Flat burin	1	0,3
60 Piece with straight truncation	4	1,2
61 Piece with oblique truncation	2	0,6
62 Piece with concave truncation	2	0,6

Tool (Sonneville-Bordes, Perrot type list)	Nb.	%
65 Piece with continuous retouch on one edge	57	17,1
66 Piece with continuous retouch on both edges	21	6,3
67 Aurignacian blade	11	3,3
68 Strangled blade	1	0,3
73 Pick	1	0,3
74 Notched piece	22	6,6
75 Denticulate piece	2	0,6
76 Splintered piece	9	2,7
77 Side-scraper	3	0,9
89 Notched bladelet	9	2,7
90 Dufour bladelet	8	2,4
92 Various	52	15,6
Total liste type	333	100,0

Outside Sonneville-Bordes, Perrot type list	Nb.
Flake with discontinuous or partial retouch	18
Blade with discontinuous or partial retouch	12
Bladelet with discontinuous or partial retouch	11
Total outside type list	41
Total	374

Table 2 - Typological count of the 2005-2010 series from Castanet southern sector.

The rare burins (1.5%) are not standardized and are made on natural surfaces or fractures. Retouched blades are well represented (27%), with several Aurignacian or strangled blades (3.6%).

Tools on bladelets represent 10.2%. They bear irregular, often discontinuous or partial retouch, which generally seems to result from bladelet use rather than intentional retouch.

The typological characteristics of this assemblage are similar to those of the Peyrony series (layers A and C; Sonnevile-Bordes, 1960) and Pelegrin/White (1995-1998; Pelegrin, O'Farrell, 1998). The main difference is the rarity of retouched bladelets in the Peyrony series, which is due to the excavation methods used.

C - The blanks

By order of importance, the lithic material is made up of bladelets, flakes, and then blades, in much smaller quantities. As a result of the careful examination of the lithic material fine fraction, 76% of the counted bladelets are from sieve residues.

The fragmentation rate is lowest for flakes (34.2%). Blades are practically never whole and present a fracture rate of 94.4%, with abundant multiple fractures (57.3% of medial fragments). Fragmentation rates are lower for bladelets (75.5%).

The taphonomic origin of bladelet fragmentation is probably very significant. On the other hand, the very high blade fragmentation rate could be of anthropogenic origin. The blade category is clearly different from all the other categories of blanks on account of a high transformation rate (44.3%). On the other hand, flakes are very seldom used in the toolkit (only 3.5%). In spite of considerable bladelet production (44.3% of the studied material), very few of them were transformed into tools (4.4%).

D - Bladelet production

Chaîne opératoire and bladelet production

The best documented knapping activity (45.4% of the pieces) is bladelet production from carinate scrapers/cores. All the techno-economic phases of this activity are represented in the series.

Recent refitting revealed knapping of large thick flakes, used as blanks for carinate scrapers/cores. Several thick pieces (N = 7) with no bladelet scars are interpreted as carinate pre-forms (Chiotti, Cretin, 2011). Flakes derived from lateral shaping, maintenance and resharpening of carinate cores were found along with more than 3 000 bladelets.

Bladelet morphometry

We distinguished two categories of bladelets from carinate scrapers / cores on the basis of morphometric and technological criteria (figure 4):

- small regular bladelets (10 to 20 mm long and 3 to 10 mm wide), representing the primary production aim;
- larger bladelets from the shaping or maintenance of the debitage surface (end scraper front), considered as by-products of the *chaîne opératoire* rather than the main goal of the reduction sequence.

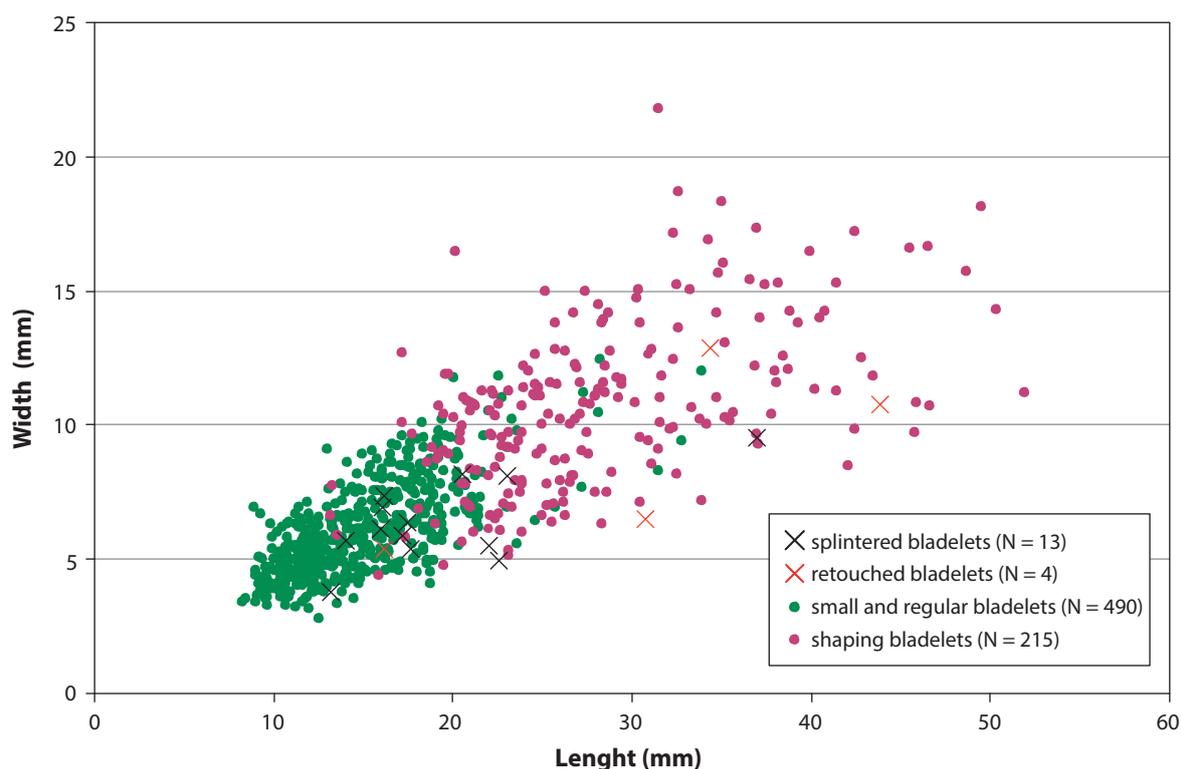


Figure 4 - Length / width ratio of the different types of bladelets derived from carinate scraper production from Castanet southern sector, excavated from 2005-2010. Only whole pieces are considered.

What were bladelets used for?

The very low number of retouched bladelets ($N = 33$) raises questions as to the aims of this production. Although some pieces ($N = 101$) show use damage (figure 5), the total number of retouched and/or utilised pieces represents but a small portion of overall bladelet production; less than 4.3%.

After a first analysis of the macroscopic traces present on the bladelets, several types of multiple or isolated use damage were observed:

- axial micro-flaking on the central axis of the piece, or on one of the edges;
- lateral transverse or oblique micro-flaking, generally confined to a single edge (figure 6).

The former may correspond to impact marks. On the other hand, the origin of lateral and oblique micro-flaking is less clear. Are these traces directly linked to the use of the cutting edge of the bladelets, do they result from impacts and hafting methods, or are these marks due to contact with bone when they penetrated into the animal?

In order to reply to these questions, a use-wear study is in progress, as well as hafting and propulsion experiments.⁴

4. Use-wear analysis is conducted by Joseba Rios, University of Burgos and the experiments by Élise Tartar and Florent Le Mené.

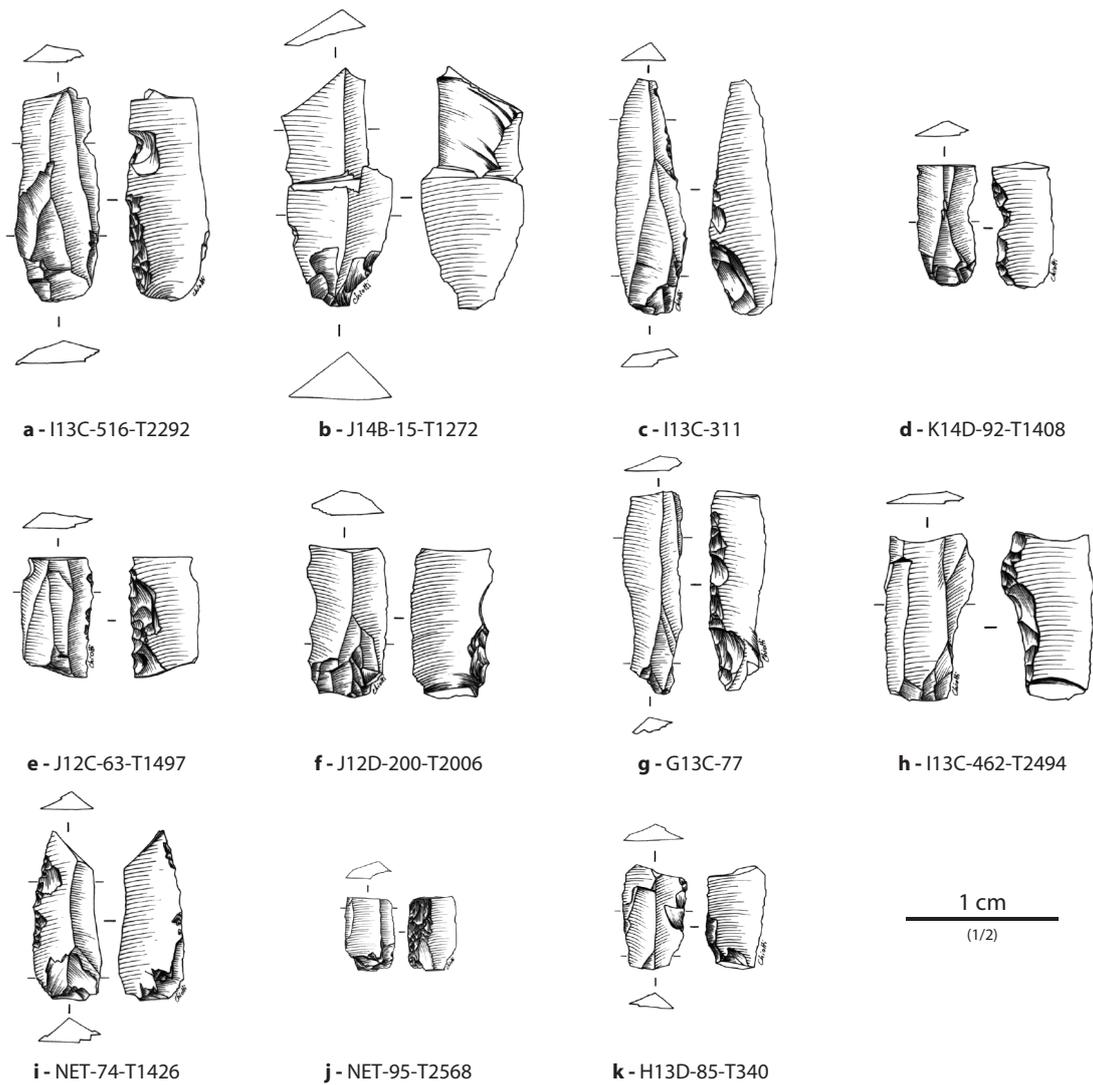


Figure 5 - Use-damaged bladelets from Castanet southern sector (drawings: L. Chiotti).

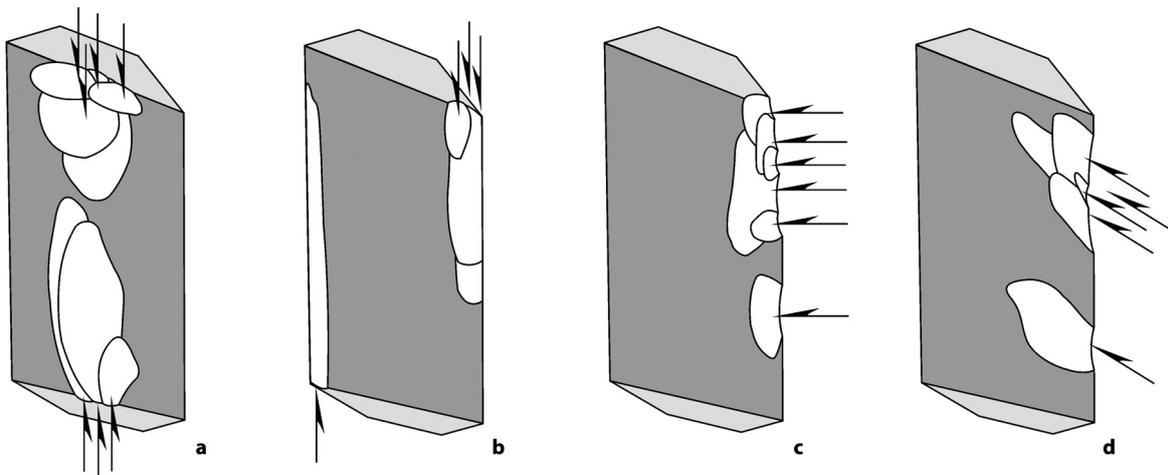


Figure 6 - Types of use damage (*esquillements*) on the bladelets from the southern sector of Castanet. a: axial micro-flaking on the central axis of the bladelet; b: axial micro-flakes on the edges of the bladelet; c: transverse lateral micro-flaking; d: oblique lateral micro-flaking (CAD: L. Chiotti).

The distribution of the length and width of whole bladelets, all categories combined, shows that use-damaged bladelets are similar to the small bladelets targeted by the production process (cf. [figure 4](#)). This could be an argument in favor of the use of these elements with no further transformation, whereby micro-flaking would result from use.

Retouched bladelets do not make up a coherent typological group but are similar to large bladelets, considered to be by-products. Although these pieces do not correspond to the aim of bladelet production, they may correspond to the opportunistic use of existing blanks.

E - Blade production

Evidence of blade production is not very frequent in the southern sector of Castanet, with only 431 blades, or 6.1% of all the blanks. These blades are practically all fragmented (95.4%). The length of the 20 whole blades is between 46.8 and 93.1 mm. We did not identify any distinct populations within the blade group.

Most of them were produced by unipolar debitage with a soft hammer. Particular care was taken with the striking platform, and the striking surface was practically systematically prepared, and very frequently displays edge abrasion.

As for the other blank categories, local flint is predominant, but the proportion of imported flint, and particularly Bergeracois flint, is higher for this category of pieces (11.8%).

Given that a large proportion of the products are absent, in particular the cores, this series only provides a fragmentary vision of blade debitage. Almost all of the production seems to have occurred outside the excavated zone (outside the site or in another sector of the habitat?).

3 - Blanchard sector 4/5

Discovery conditions were not *a priori* ideal as this series comes from a very limited, more or less concreted layer fragment, in contact with the bedrock, in an uncertain sedimentary context with very different patinas. Three stratigraphic units were identified at the excavation, mainly on the basis of sedimentological criteria. However, the refits (which concern 8.7% of the objects over 15 mm) linking these three units show the integrity of this series.

These results, combined with those from the geoarcheological analysis, point to a chronologically consistent series subject to post-depositional water percolation.

This series of 2 566 lithic pieces is mainly made up of bladelets (43.2%) and flakes (31.1%), then blades (12.5%). Blades are thus better represented than in the southern sector of Castanet (6%), but relative blank proportions remain very similar.

A - The toolkit

Sector 4/5 yielded 112 tools, representing 4.5% of the series ([table 3](#)). Retouched blades make up the main category, including three Aurignacian blades. End scrapers represent the second most important category, with a majority of flat end scrapers, more than half of which are on retouched blades or Aurignacian blades. There are also seven carinate scrapers. They have wide fronts, on average 26 mm, very similar to those from the southern sector of Castanet. There are no nosed scrapers. Six burins are present, but there are no Aurignacian burins (*busqué*, carinate or Vachons).

The bladelet toolkit is made up of 11 pieces with rather irregular retouch (including several Dufour bladelets). Four other bladelets present very marked use damage. All of these characteristics are relatively similar to those from the southern sector of Castanet.

Tool (Sonneville-Bordes, Perrot type list)	Nb.	%	
1	End scraper	6	5,9
2	Atypical end scraper	1	1,0
3	Double end scraper on Aurignacian blade	1	1,0
5	End scraper on retouched blade	9	8,9
6	End scraper on Aurignacian blade	1	1,0
11	Carinate scraper	7	6,9
17	End scraper/burin	1	1,0
21	End scraper/point	2	2,0
22	Burin/point	1	1,0
23	Point or beak	6	5,9
27	Straight dihedral burin	1	1,0
30	Burin on natural surface	3	3,0
37	Burin on truncation	1	1,0
41	Mixed multiple burin	1	1,0
60	Piece with straight truncation	2	2,0
62	Piece with concave truncation	1	1,0
65	Piece with continuous retouch on one edge	11	10,9
65	Bladelet with continuous retouch on one edge	5	5,0
66	Piece with continuous retouch on both edges	12	11,9

Tool (Sonneville-Bordes, Perrot type list)	Nb.	%	
66	Bladelet with continuous retouch on both edges	1	1,0
67	Aurignacian blade	3	3,0
73	Pick	1	1,0
74	Notched piece	1	1,0
76	Splintered piece	7	6,9
89	Notched bladelet	1	1,0
90	Dufour bladelet	3	3,0
92	Various (tool fragments)	12	11,9
Total liste type		101	100,0

Outside Sonneville-Bordes, Perrot type list	Nb.
Flake with discontinuous or partial retouch	3
Blade with discontinuous or partial retouch	7
Bladelet with discontinuous or partial retouch	1
Total outside type list	11
Total	112

Table 3 - Typological count of the 2011-2012 series from Blanchard sector 4/5.

B - Bladelet production

A large proportion of the bladelets, 43.1%, were produced from Aurignacian scrapers.

The whole *chaîne opératoire* is represented, including pre-forms, shaping flakes and bladelets and resharpening flakes.

Several generally larger and more rectilinear bladelets (8.3%), seem to come from another production system. In addition, four bladelet cores are present: two relatively flat cores, with two alternating opposed striking platforms, and two unipolar cores with a single striking platform on a flake and a block fragment.

C - Blade production

Three-hundred and twenty-two blades, most of which are unipolar, were counted in this series. Only 31 of them are whole, with lengths ranging between 23 and 104 mm.

The refits brought to light evidence of on-site production of large blades, with lengths superior to 150 mm and widths of over 35 mm (figure 7), and of smaller blades representing most of the blade production (figure 8). Refits of smaller blades reveal the use of blocks of average dimensions, which could not have been used earlier for the production of large blades. On the other hand, we do not have enough elements to determine whether the cores producing the large blades were subsequently reduced in order to produce smaller blades. In other words, we cannot assess whether there is a single production system, with progressive core reduction, or whether there are two independent production systems.

The large blades are in local Senonian flint, which represents the majority of the raw materials used at the site. There is thus no selection of specific materials for the production of these large modules.



Figure 7 - Refit of a large blade debitage sequence from Blanchard sector 4/5 (photos: L. Chiotti).

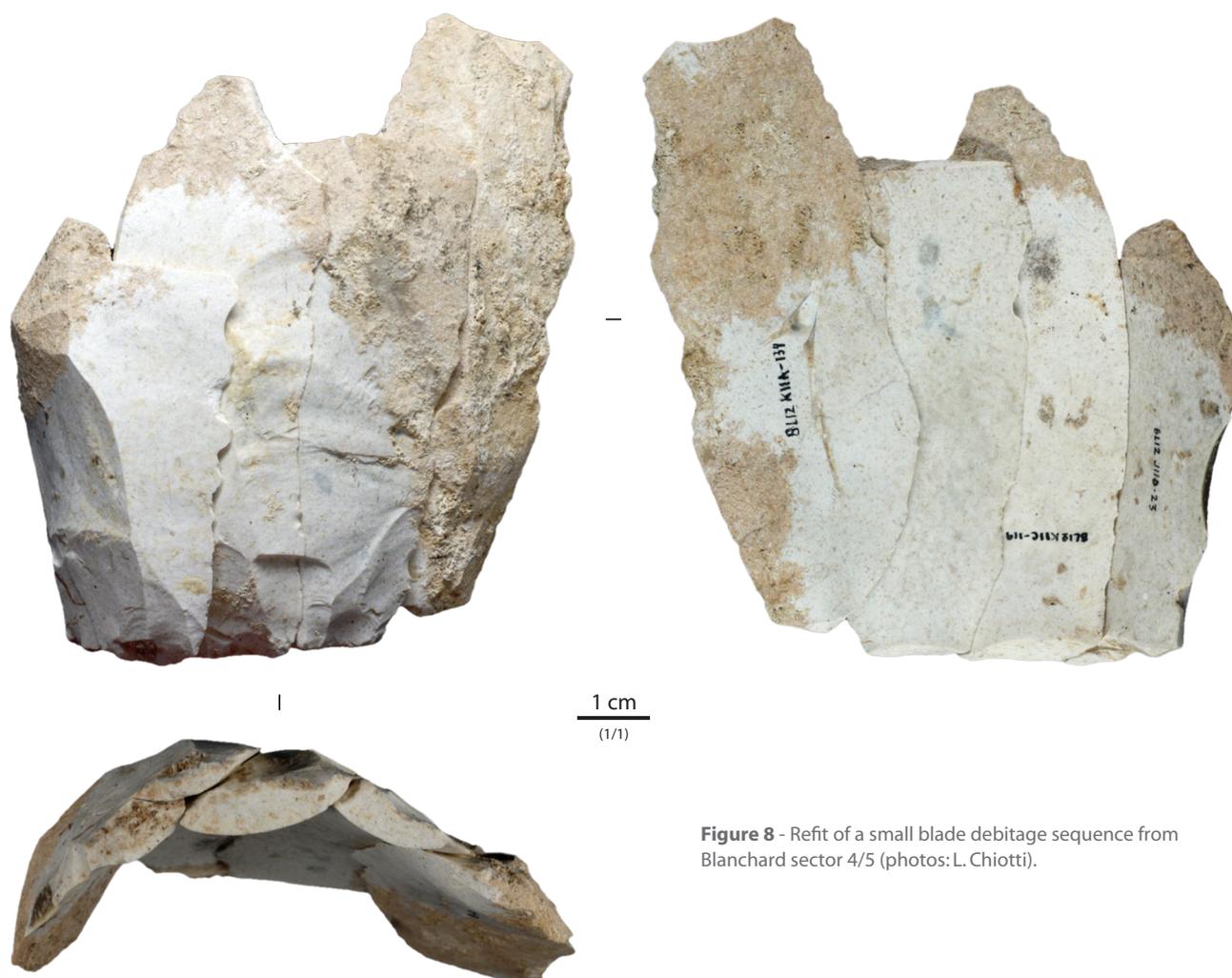


Figure 8 - Refit of a small blade debitage sequence from Blanchard sector 4/5 (photos: L. Chiotti).

4 - Blanchard sector 1

The series from sector 1 contains a total of 1494 lithic pieces, mainly made up of bladelets (44.4%) and flakes (36.8%). Blades are relatively rare (6.8%).

A - The toolkit

The series is comprised of 103 tools (table 4), or 7% of the lithic assemblage.

The best-represented category is by far the Roc de Combe subtype Dufour bladelets, which represent 34.4% of the tools. Overall, the proportion of tools on bladelets is 40.6%.

The end scraper group is dominated by thick Aurignacian scrapers: carinate scrapers (6.2%) and nosed scrapers (7.3%). They all show much narrower fronts than the preceding series, with an average width of 17 mm.

Burins are also well represented, and include four Aurignacian burins: three carinate burins (including a multiple dihedral burin) and a Vachons burin (figures 9-10). These are all irregular, relatively atypical objects. There are no *busked burins*.



Figure 9 - Carinate burins from Blanchard sector 1 (photos: L. Chiotti).

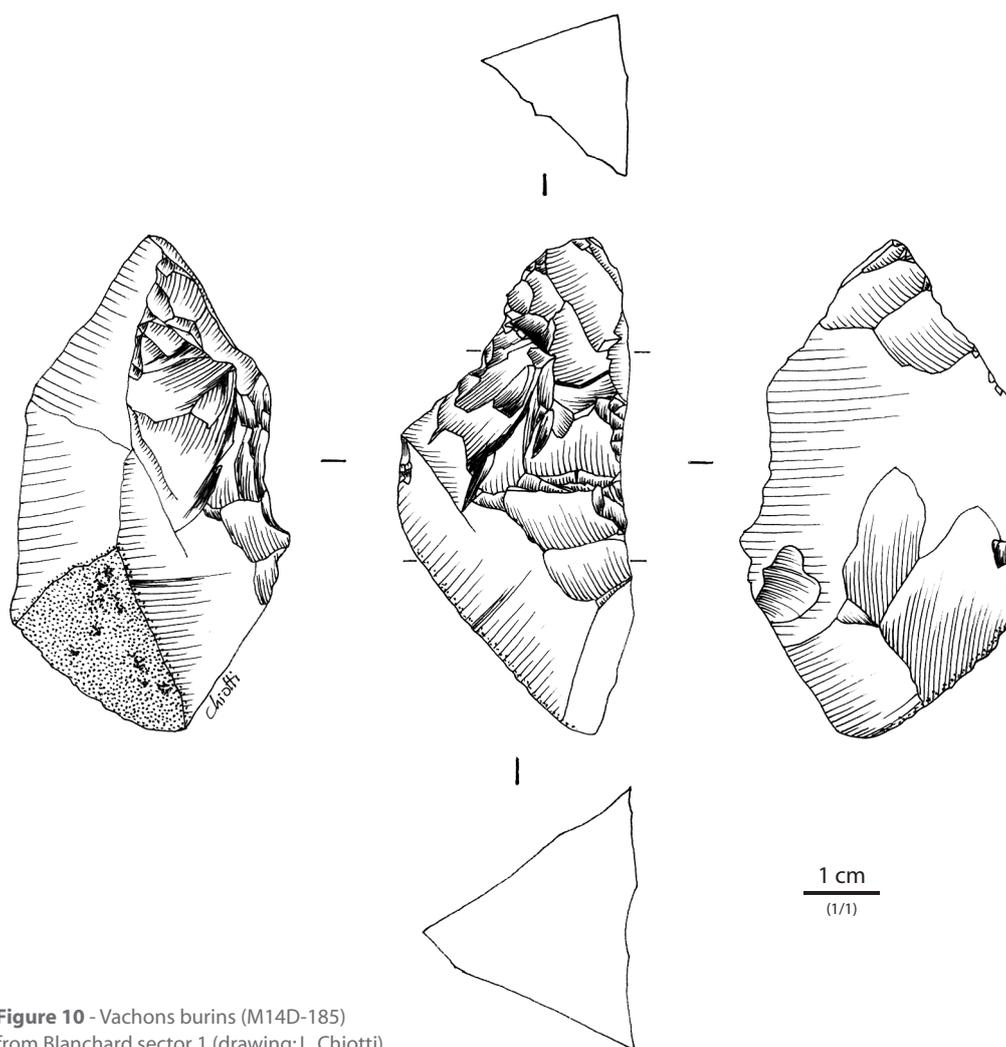


Figure 10 - Vachons burins (M14D-185) from Blanchard sector 1 (drawing: L. Chiotti).

Tool (Sonneville-Bordes, Perrot type list)	Nb.	%
1 End scraper	5	5,2
2 Atypical end scraper	2	2,1
5 End scraper on retouched blade	2	2,1
11 Carinate scraper	5	5,2
12 Atypical carinate scraper	1	1,0
13 Nosed scraper	7	7,3
17 End scraper / burin	1	1,0
27 Straight dihedral burin	1	1,0
28 Asymmetrical dihedral burin	1	1,0
29 Dihedral burin on angle	1	1,0
30 Burin on natural surface	2	2,1
31 Multiple dihedral burin	3	3,1
32 Carinate burin	2	2,1
32 Vachons burin	1	1,0
35 Burin on oblique truncation	2	2,1
60 Piece with straight truncation	2	2,1
61 Piece with oblique truncation	1	1,0
65 Piece with continuous retouch on one edge	9	9,4

Tool (Sonneville-Bordes, Perrot type list)	Nb.	%
65 Bladelet with continuous retouch on one edge	5	5,2
66 Piece with continuous retouch on both edges	2	2,1
66 Bladelet with continuous retouch on both edges	1	1,0
74 Notched piece	3	3,1
90 Dufour bladelet	33	34,4
92 Various (tool fragments)	4	4,2
Total liste type	96	100,0

Outside Sonneville-Bordes, Perrot type list	Nb.
Flake with discontinuous or partial retouch	2
Blade with discontinuous or partial retouch	3
Bladelet with discontinuous or partial retouch	2
Total outside type list	7
Total	103

Table 4 - Typological count of the 2011-2012 series from Blanchard sector 1.

The series contains ten other burins, dihedral, on natural surfaces, on truncations or on breaks. Four of them are on blades, and the others are on relatively thick flakes.

Continuously retouched pieces represent 11.5% of the toolkit, but no Aurignacian blades were identified.

The 33 Dufour bladelets are all Roc de Combe subtype, with a very specific morphology, showing a clear selection from within the bladelet group. They are small in size, with a maximum length of 16 mm, an average width of 3.2 mm and an average thickness of 1.1 mm. They are produced on Aurignacian scrapers or Aurignacian burins and are mainly curved, twisted and offset to the right. They bear fine inverse retouch on the right edge, generally on the whole edge and sometimes with more intense retouch on the proximal part. Some of them also bear retouch on the left edge, which is generally direct.

Eight other bladelets are retouched. When blank morphology can be determined, it is similar to that of the Dufour bladelets. Retouch is generally very regular, and thus comparable to retouch on Dufour bladelets.

B - Bladelet production

The majority of the bladelets, or 76.5%, were produced from Aurignacian scrapers (carinate and nosed scrapers) and Aurignacian burins (carinate and Vachons). For most of them (375 pieces), it is impossible to distinguish between end scraper or burin production. Only 12 determinable pieces clearly derive from Aurignacian scrapers and 121 from Aurignacian burins. The latter are identifiable thanks to the presence of an abrupt surface on one of the edges which corresponds to part of the lower surface of the burin blank (Chiotti, 2003).

The Aurignacian scraper *chaîne opératoire* is comparable to that described in the southern sector of Castanet (2005–2010), although front width is much narrower. Similar shaping procedures to those applied to carinate scraper / core pre-forms from Castanet were also observed (Chiotti, Cretin, 2011).

As well as the bladelets themselves, the production of Aurignacian burins is clearly evidenced by the presence of four (carinate and Vachons) burins.

Several generally larger and more rectilinear bladelets (28 pieces, 4.2%) come from a different type of debitage, represented by knapping along the thickness of four cores on small plaques or blocks.

C - Blade production

Out of the 102 blades from sector 1, only 13 are whole and present lengths ranging between 29 and 92 mm. Average blade width and thickness are 24.1 mm and 8.4 mm, respectively.

Four blade cores were found. These are unipolar prismatic cores, some of which have a secondary striking platform for core maintenance. No large blades, comparable to those from sector 4/5 were found in this series.

D - Chronocultural attribution

The overall characteristics from sector 1 at Blanchard thus clearly differentiate this assemblage from the southern sector of Castanet and from sector 4/5 at Blanchard, due to the presence of:

- a much higher proportion of nosed scrapers;
- more elongated carinate scrapers/cores with narrower fronts than those from the other two series;

- a higher proportions of all types of burins;
- Aurignacian burins (carinate and Vachons burins);
- abundant bladelets from Aurignacian burins;
- large quantities of small Roc de Combe subtype Dufour bladelets.

These different elements point towards a Recent Aurignacian attribution for this industry.

The presence of a Vachons burin, which is an element from the end of the Aurignacian sequence (Pesesse, Michel 2006; Michel, 2010) and the absence of busked *burins* would argue in favor of a more recent Aurignacian than the “Aurignacian II”. However, on account of the small number of pieces in the series, the depositional conditions (level in secondary position; Tartar *et al.*, 2014) and the existence of other badly characterized facies for the end of the Aurignacian, we will cautiously advance a *sensu lato* Recent Aurignacian attribution.

5 - Contribution of new data

The study of the recent lithic material series from Abri Castanet and Abri Blanchard provides us with a number of new observations concerning technical behaviors, the exploitation of the lithic environment and chronocultural data.

A - Technical behavior

At Castanet and Blanchard, similar behavior in relation to the Aurignacian lithic material indicates close technical proximity. However, some differences can be discerned for the technical procedures and the toolkit.

In all cases, lithic production is oriented towards bladelet production from thick end scrapers, generally made on flakes. Some of the carinate scrapers / cores underwent specific shaping to create a precise volume for long sequences, thereby limiting debitage surface maintenance (Chiotti, Cretin, 2011). This volumetric construction of carinate scrapers / cores is present in all of the studied series. However, the carinate scrapers / cores from the recent level present a morphological difference, as they are more elongated with a much narrower front. In this same recent level, bladelet production diversifies to include productions on nosed scrapers and Aurignacian burins.

Bladelet production is thus a fundamental element of Aurignacian industrial identity, with technological and typological variations within Early and Recent Aurignacian assemblages.

The production of blades is well represented, with characteristic thick and slightly curved Aurignacian products. Other types of blade debitage produce much smaller and thinner blades. Both of these productions only partially occurred on-site (or on the recently excavated parts of the sites).

Although production clearly targets bladelets, consumption is oriented towards blades, which are the most widely-used blanks for the toolkit. The fragmentary state of these pieces shows that they were often intensively used, resharpened and sometimes deliberately fractured.

Flake debitage occurs in the southern sector of Castanet and Blanchard 4/5, and was partly oriented towards blank production for carinate scrapers / cores.⁵

5. We do not yet have these data for the Recent Aurignacian from sector 1 at Blanchard.

B - Exploitation of the lithic environment

Lithic raw material acquisition patterns for Castanet show that flint procurement was mostly centered on in situ or nearly in situ Santonian horizons in the surrounding valleys, whereas materials from fluvial deposits were not often used. Debitage methods for these local materials are not very elaborate. Whole or tested nodules were probably brought to the site where they were used to produce modest-sized blades and thick flakes, future blanks for carinate scrapers / cores.

More occasionally, better quality local raw materials were selected, such as blond or black Upper Santonian flints from plateau deposits on the left bank of the Vézère a little further away.

The lithic inventory also includes raw materials from more distant sources, raising the broader questions of the territorial economies and cultural choices. The presence of flint from the Upper Campanian (known as Bergeracois), of jasper from the Brive Basin, of Charente flint and rare occurrences of flint from the Fumel region and the Lot, points either to mobility throughout these territories, or to direct contact with individuals occupying these different zones.

Regardless of how they were brought there, their presence necessarily implies detailed knowledge of these materials and their properties as they are perfectly integrated into the exploitation and consumption systems. Moreover, some of them were preferentially used.

Blade blanks were favored for the Bergeracois flint. A number of pre-knapped blanks were brought to the site where most of them were transformed into tools. Practically all of them were produced on different cores. Although on-site production is minimal, the presence of abundant retouch flakes indicates high blade and tool consumption.

Corrèze jasper was brought to the site as small elements and was then used for perfectly controlled bladelet production, showing the appeal of this material for bladelet fabrication.

C - Chronocultural setting

The typo-technological study of the lithic material leads to the differentiation of two main chronocultural complexes: an Early Aurignacian in both sites, the southern sector of Castanet and sector 4/5 of Blanchard and a Recent Aurignacian in sector 1 from Blanchard.

Recent excavations in the southern sector at Castanet only yielded Early Aurignacian pieces. As we did not observe the second level during recent excavations we have no new elements to add to the study by D. de Sonneville-Bordes of the Peyrony series (Sonneville-Bordes, 1960). We examined the Peyrony series rapidly and no elements cast doubt on the conclusions of the former study. However, the absence of bladelets in the early series is detrimental to this sort of attribution.

About fifteen radiocarbon dates were conducted, yielding well-grouped results, centered around 37 000 cal BP (White *et al.*, 2012a).

These dates are very recent for an Early Aurignacian chronocultural attribution, as most dates for this chronocultural level are on average between 38 000 and 40 000 cal BP (for the question of early Aurignacian dates, see for example Higham *et al.*, 2009; 2011; Higham, 2011; Wood *et al.*, 2014).

At sector 4/5 at Blanchard, the identified Early Aurignacian corresponds to L. Didon's lower level (B) (1911).

Four dates were obtained for this sector. Two of them are centered around 36 000 cal BP and two around 34 000 cal BP (White *et al.*, 2012b). These dates are even more recent than those for Castanet, whereas, once again, this complex clearly presents Early Aurignacian characteristics.

This discrepancy between the industrial facies and the radiometric dates has yet to be explained. At Blanchard in sector 1, a Recent Aurignacian is now well evidenced from the study of the lithic material from recent excavations. This probably represents a strip of a layer related to L. Didon's upper layer (D) (1911).

Therefore, the study of this lithic industry confirms the presence of a Recent Aurignacian level at Blanchard, which had up until now only been suggested by isolated markers: presence of several characteristic tools, losenge-shaped points (Leroy-Prost, 1975) or nosed scrapers (Sonneville-Bordes, 1960). The study of a coherent assemblage now enables us to confirm this attribution. However, due to an insufficient number of pieces, it is not possible to attribute an exact Recent Aurignacian facies to the series.

The first samples taken from Blanchard sector 1 did not contain enough collagen and thus for now, there is no date for this small complex. However, new dating analyses are in progress.

Conclusion

Recent excavations at Castanet, and Blanchard provide us with representative samples (quantitatively, qualitatively, including the fine fraction) from the Aurignacian levels of these two rock shelters.

The technological analysis of the lithic material enabled us to propose chronocultural attributions for the series from Blanchard with very few pieces, and unfortunately with very little bone industry. It also highlights the fundamental contribution, already pointed out by other authors (Bon, 2002; Le Brun-Ricalens *et al.*, 2005; ...) of the bladelet component of these lithic complexes during the two main Aurignacian phases.

Continued analyses (economic, spatial and use-wear), as well as the assessment of other material cultural elements, will undoubtedly enable us to refine these first comparisons.

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