Unpublished portable art from Bourrouilla cave in Arancou (Pyrénées-Atlantiques, France): techno-stylistic and chrono-cultural data

Art mobilier inédit du gisement de Bourrouilla à Arancou (Pyrénées-Atlantiques, France) : données techno-stylistiques et chrono-culturelles

Lise Aurière, François-Xavier Chauvière, Frédéric Plassard, Carole Fritz and Morgane Dachary

Electronic version

URL: <http://journals.openedition.org/paleo/2863>

DOI: 10.4000/paleo.2863

ISSN: 2101-0420

Publisher

SAMRA

Printed version

Date of publication: 15 December 2013

Number of pages: 192-217

ISSN: 1145-3370

Electronic reference

Lise Aurière, François-Xavier Chauvière, Frédéric Plassard, Carole Fritz and Morgane Dachary, « Unpublished portable art from Bourrouilla cave in Arancou (Pyrénées-Atlantiques, France): techno-stylistic and chrono-cultural data », *PALEO* [Online], 24 | 2013, Online since 18 September 2015, connection on 07 July 2020. URL : <http://journals.openedition.org/paleo/2863> ; DOI : <https://doi.org/10.4000/paleo.2863>

This text was automatically generated on 7 July 2020.

PALEO est mis à disposition selon les termes de la licence Creative Commons Attribution - Pas d'Utilisation Commerciale - Pas de Modification 4.0 International.

Unpublished portable art from Bourrouilla cave in Arancou (Pyrénées-Atlantiques, France): techno-stylistic and chrono-cultural data

Art mobilier inédit du gisement de Bourrouilla à Arancou (Pyrénées-Atlantiques, France) : données techno-stylistiques et chrono-culturelles

Lise Aurière, François-Xavier Chauvière, Frédéric Plassard, Carole Fritz and Morgane Dachary

We wish to thank Anne Eastham, Sandrine Costamagno, Stéphane Madelaine and Clément Birouste for the anatomical and specific determination of the decorated bone pieces. Several of the pieces presented in this article were restored by the companies Materia Viva, ArtéMuse and Utica. These restorations were financed by the Aquitaine SRA and the Musée National de Préhistoire des Eyzies, to whom we convey our sincere thanks. We also thank Jean-Jacques Cleyet-Merle, director of the MNP, as well as Peggy Bonnet-Jacquement and Bernard Nicolas for facilitating access to the material curated at the MNP. The site of Bourrouilla is the property of the town of Arancou, to whom we are grateful for material support during the excavations. Thanks also to Christine Desdemaines-Hugon, for her help with the abstract and the captions in English.

Introduction

Site localization and presentation

- 1 Bourrouilla is a small cave situated in the Atlantic Pyrenees, on the townland of Arancou. It is just 9 km away from the rock shelters of Pastou Cliff (Duruthy, Grand Pastou, Petit Pastou and Dufaure) and 15 km from the Isturitz-Oxocelhaya-Erberua

complex (fig. 1). The site was discovered in 1986, at the same time as a clandestine excavation inside the cavity. The spoil from the clandestine excavation was sieved and sorted and revealed the potential and the wealth of the site. After this, an exterior test pit was excavated in order to identify the extension of the occupations and the thickness of the stratigraphy (Chauchat et al. 1999), and programmed excavations were then conducted from 1998 onwards, directed, first of all by Cl. Chauchat, and then by M. Dachary.

- 2 The site is classically divided into four sectors (fig.2): the exterior zone (bands 25 to 28), the vestibule directly below the entrance porch (bands 22 to 24), the corridor (bands 19 to 21) and the back chamber (bands 15 to 18). Excavations in the exterior sector, the vestibule and the back chamber have revealed Magdalenian occupations in these zones.
- 3 The infilling displays lateral variations, but the stratigraphy is identical in the vestibule and the exterior zone (Dachary 2005): the Pleistocene levels are located beneath the Holocene Iron Age, Neolithic and Mesolithic occupation levels (Dachary et al. 2013). The A complex, attributable to the terminal Magdalenian, corresponds to the last Tardiglacial installations, which are rare in the sector (Dachary et al. 2008 and 2014). The upper Magdalenian occupations are grouped together in complex B. This series of occupations presents three major phases (Chauchat et al. 1999), identified on the basis of the analysis of the vertical distribution of the artefacts. These are relatively standardized, characterized by the presence of bilaterally barbed harpoons, a lithic toolkit with abundant burins and backed bladelets and a shouldered point (Bonnissent and Chauvière in Chauchat et al. 1999; Dachary in Chauchat et al. 1999). In addition to the manufacture of bladelets from cores on flake slices, blocks and, at the top of the sequence, on keel-shaped scrapers, blades are the predominant transformed products (Dachary 2002). The fauna is dominated by the red deer and also includes the horse and the reindeer (Fosse in Chauchat et al. 1999).
- 4 Beneath complex B, complex C, excavated over a limited surface, is difficult to characterize in spite of the presence of points with bifurcated bases and tools on bladelets with abundant truncations (Bonnissent and Chauvière in Chauchat et al. 1999; Dachary in Chauchat et al. 1999). It could be related to the pivotal period between the middle Magdalenian and the upper Magdalenian (Pétillon 2007).

Figure 1 - Localization map of Bourrouilla site in Arancou (Pyrénées-Atlantiques, France).

- 5 SU 2007, excavated in the back chamber, appears at present as a bench at the edge of the clandestine excavation; it has only been excavated over a surface of about 3 m². Up until now, no physical link (refit, connection between finds, stratigraphic match) has been established between the back chamber and the vestibule. From the section, SU 2007 was initially described as a homogeneous complex about 70 cm thick, but the excavation revealed the presence of several stony dark-coloured levels with an average thickness of about 10 cm, possibly lenticular and rich in archaeological material. The different levels are separated by thin layers of yellow sterile silt. In this way, we distinguish SU 2007 sensu lato, and from top to bottom, SU 2007A, 2007B, 2007CC, and 2007E.
- 6 From an archaeological point of view, the different levels are similar (Dachary et al. 2008). The large fauna is dominated by the red deer and the reindeer, alongside a remarkably abundant and well-preserved avifauna (mainly made up of the snowy owl), as well as ichthyofauna remains. Blade tools dominate the lithic industry, although burins are abundant. The bone industry associates antler pieces (harpoons, projectile points and technical pieces) with bone working (perforated needles). The ornamental pieces include shell fragments, sawn herbivore incisors and perforated red deer canines.
- 7 From one level to another, several differences emerge in the fauna (relative abundance of avifauna and ichthyofauna), and in the lithic industry (variable abundance of bladelets). Furthermore, SU 2007 AB contains a combustion structure and a waste zone whereas in SU 2007E, square L17 is clearly a discharge area.

Figure 2 – Site plan of Bourrouilla with the localization of the excavated areas.

- 8 SU 2006 is in contact with SU 2007 and only appears in lenticular form. It is made up of reworked sediments from the vestibule containing sorted archaeological material attributable to the upper Magdalenian.
- 9 The chronological relationships between the different levels of complex B and SU 2007 are difficult to establish even though these levels undoubtedly correspond to repeated occupations over a short period of time, during the course of the upper Magdalenian (tab. 1).

Material studied and research aim

- 10 During the sieving of the spoil from the clandestine excavation, 22 fragments of objects of art were discovered, half of which bear figurative representations. These pieces have already been subjected to very detailed analyses, from both a stylistic and technological point of view (Fritz and Roussot in Chauchat et al. 1999; Fritz 1999). They comprise 13 objects on hemi-ribs: polishers and pendants with a perforated suspension loop. The upper sides (compact tissue) present traces of scraping and/or polishing, while the spongy tissue on the underside shows different stages of regularization. The edges of six of these pieces have been decorated with festoons. The ornamentation is often very detailed and very finely worked (ibid.). The spoil also contained fragments of a semi-circular rod with geometric decoration and a tube in bird bone bearing two horse and bird representations. Thus, from the outset of the programmed excavations in 1998, the discovery of further elements of portable art was expected, and was one of the major issues at stake in the research conducted in Bourrouilla Cave in Arancou. Until recently, most of the ornamental remains came from reworked zones (clandestine excavation, SU 2006, SU 2017). Consequently, the discovery of artefacts in stratigraphic

position, since 2009, as well as the physical connection between one of these pieces and others from a more poorly-defined context, are primordial for refining the chronology of portable art production at Arancou. It is now possible to propose a chrono-cultural attribution for the unpublished pieces and for some of the objects from the clandestine excavation spoil. More generally, this work provided us with the opportunity to establish an associated archaeological context for the objects of art discovered in the clandestine excavation and to propose a chronological attribution for similar objects from formerly excavated sites with poorly-established stratigraphies.

- 11 We will begin by a presentation of the immediately accessible thematic, stylistic and technical data, but we will also attempt to understand the accumulation modalities of the decorated bone or lithic objects from Arancou. By recording the presence or the absence of activity markers, such as manufacture waste, we aim to distinguish the elements made on site from those that could have been brought to the site as finished objects, or transported outside the site.

Table 1 - Radiocarbon dating of the Magdalenian levels at Bourrouilla after Fontugne and Hatté, in Chauchat et al. 1999 and Szmidt et al. 2009. Datings are calibrated with the software Calib 6.0.1 (Stuiver and Reimer 1993) and given with 2 sigma.

Couche	Attribution culturelle	Référence	Age BP	Age cal BP
Couche B2	Magdalénien supérieur	GIF 9986 (LSM 9986)	12395 ± 35	14920 - 14110
Couche B2	Magdalénien supérieur	GIF 10002	12260 ± 120	14900 - 13840
Couche B3	Magdalénien supérieur	GIF 10255	12780 ± 40	15590 - 14910
Couche C1	Magdalénien moyen	GIF 10234	12700 ± 40	15260 - 14680
Couche C2	Magdalénien moyen	GIF 10254	13220 ± 80	16690 - 15390
Couche C4	Magdalénien moyen	GIF 10235	12710 ± 90	15610 - 14550
US 2007, Harfang	Magdalénien supérieur	OxA-19696	12 540 ± 50	15120 - 14410
US 2007, Renne	Magdalénien supérieur	OxA-19698	12 610 ± 55	15210 - 14500
US 2007, Cerf	Magdalénien supérieur	OxA-19697	12 880 ± 50	15930 - 15000

- 12 The analysis of the spatial distribution of these spectacular remains also provides the opportunity to identify the types of activities associated with this portable art, and to understand the functional relations between these activities, in relation to the tripartite layout of the cavity (exterior zone, vestibule and back chamber). It is thus pertinent to incorporate the study of the portable art into a wider framework focusing on the internal structure of the Palaeolithic living space at Arancou; and to confirm the first indications of a differentiation between the manufacturing zones, use or discharge areas glimpsed from the analysis of other types of remains (Dachary 2005; Dachary et al. 2008).
- 13 Effectively, the contextual relationship between the different data relating to the portable art is part of a broader approach to the technological continuities/discontinuities underlying the formation of the archaeological complexes of Arancou. It also influences our understanding of the variability of very specific graphic expression

on portable objects, on the scale of the site, but also on the scale of the western Pyrenees during the Magdalenian (Dachary et al. 2006).

1 - Methodology

- 14 In addition to the thematic and stylistic approach, we opted for a very technical analysis of the portable art elements from Arancou. The “chaîne opératoire” concept, or operative sequence (Leroi-Gourhan 1943; Pelegrin et al. 1988; Perlès 1991) is the methodological tool used to sequence all the observed elements, in a strict order.
- 15 The recorded marks are first of all related to the different technical phases involved in the manufacture of the decorated objects, and mostly to the main shaping phase (preparation of the surfaces to be engraved by scraping and/or polishing; implementing the ornamentation by fine or deep incisions, etc.). Other marks, such as breaks or heating marks, provide information on the use and discard of the portable art objects.
- 16 All the objects were observed macroscopically and using different magnifications (up until 20 times), with a classical binocular stereomicroscope (Olympus, magnification x10) and a magnifier (Dinolite) with observation on a computer screen.

2 - Presentation of the newly-discovered pieces (tab. 2)

Table 2 - List of the objects described in this paper.

Année	Carré	n° inventaire	Localisation	Stratigraphie	Matériau	Dimensions (en mm)	Préparation du support	Décor	Illustration
ARA03	K24	2170	vestibule-extérieur	Ensemble B	fémur droit, Cerf	86 x 24 x 6	/	gravure, figuration nageoire caudale de mammifère marin	fig. 3
ARA11	L23 S1	300/302	vestibule-extérieur	Ensemble B	grès brun-rouge	17 x 10 x 2,5	/	gravures fines, patte	fig. 4.2
ARA11	L23 S1	300/302	vestibule-extérieur	Ensemble B	grès brun-rouge		/	gravures fines, patte	fig. 4.2
ARA10	L24	2937	vestibule-extérieur	B2	grès brun-rouge	38 x 28 x 3	/	gravures fines, tête indéterminée	fig. 4.1
ARA10	L24	3117	vestibule-extérieur	Ensemble B	grès brun-rouge	24 x 24 x 3	/	gravures fines, patte	fig. 4.2
ARA09	L24	2838	vestibule-extérieur	Ensemble B	grès brun-rouge	33 x 28 x 7	/	gravures fines	
ARA00	K25	507	vestibule-extérieur	B2	plaque de grès	77 x 72 x 10	/	incisions non figuratives ?	
ARA00	L25	199	vestibule-extérieur	B2	plaque de grès	93 x 72 x 17	/	incisions non figuratives ?	
ARA10	L24	3230	vestibule-extérieur	B2	roche métamorphique	68 x 41	/	traces couleur rouge	
ARA09	L16	110	intérieur grotte	US2007	2ème côte gauche, Cerf	137 x 18 x 4	/	gravure, figuration de deux canidés	fig. 6
ARA06			intérieur grotte	US 2003	bois de cervidé	28 x 6 x 5	/	gravures, motifs en "parenthèses"	fig. 15.4
ARA 98			intérieur grotte	Fouille clandestine	bois de cervidé	74 x 11 x 4	/	baguette demi-ronde, motifs en "parenthèses"	fig. 15.2
RH18A01-465-ATRI			intérieur grotte	Fouille clandestine	bois de cervidé	18 x 8 x 3	/	gravures, motifs en chevrons	fig. 15.3
ARA11	L17	3092	intérieur grotte	US2007	Côte ?	20 x 11 x 2	raclage	gravure, figuration d'un cervidé	fig. 7
ARA11	L17	2777	intérieur grotte	US2007	Côte, cerf	103 x 17 x 6	/	gravure, figuration de deux chevaux	fig. 5
ARA09	L17 S1	370/372	intérieur grotte	US 2007E	héli-côte	7 x 7 x 1	raclage	"lissai" à bord festonné	fig. 17
			intérieur grotte	Fouille clandestine	héli-côte	22 x 9 x 2	raclage, polissage	pièce festonnée, figuration d'un salmonidé	fig. 10
			intérieur grotte	Fouille clandestine	héli-côte	32 x 10 x 3	/	gravures, figuration de deux ours	fig. 11
			intérieur grotte	Fouille clandestine	héli-côte	19 x 5 x 2	/	gravure, figuration d'un cervidé	fig. 12
			intérieur grotte	Fouille clandestine	héli-côte	41 x 14 x 1	raclage	gravure, motifs en triangle	fig. 13
			intérieur grotte	Fouille clandestine	héli-côte		raclage, polissage	pendeloque à bélière, gravure	fig. 14
			intérieur grotte	Fouille clandestine	héli-côte	31 x 10 x 1	raclage	"lissai" à bord festonné	fig. 17
			intérieur grotte	Fouille clandestine	héli-côte	19 x 10 x 1	raclage	"lissai" à bord festonné	fig. 17
ARA05	L17	1074	intérieur grotte	US2007	Ulna, Chouette harfang	80 x 5	raclage	gravure, non figuratif	fig. 8
			intérieur grotte	Fouille clandestine	bois de cervidé	47 x 12 x 5	/	baguette demi-ronde à tubérosités	fig. 15.1
			intérieur grotte	Fouille clandestine	calcaire	63 x 34 x 9	/	gravures fines	fig. 16.1
ARA11	L17	3122	intérieur grotte	US 2007	calcaire allochtone	45 x 32 x 14	/	gravure fine	
ARA12	N17 S1	376/378	intérieur grotte	US 2007	calcaire allochtone	33 x 16 x 4	/	gravure profonde	fig. 9.1
ARA04	M17	856	intérieur grotte	US 2007	calcaire local	70 x 70 x 7	/	gravures fines	
ARA05	N17	454	intérieur grotte	US 2007	calcaire local	67 x 50 x 10	/	gravures fines	
ARA05	N17	464	intérieur grotte	US 2007	calcaire local	48 x 33 x 6	/	gravures fines	
ARA04	M16 S3	348/350	intérieur grotte	US 2006	galet	15 x 12 x 7	/	gravure	
ARA07			intérieur grotte	US 2017	grès	75 x 38	/	gravures fines, traces couleur rouge	fig. 16.2
			intérieur grotte	Fouille clandestine	grès	149 x 83 x 16	/	incisions non figuratives ?	
			intérieur grotte	Fouille clandestine	grès	135 x 90 x 15	/	incisions non figuratives ?	
ARA09	L17	2363	intérieur grotte	US 2007	grès à grain grossier	59 x 47 x 6	/	gravure	
ARA09	L17	2435	intérieur grotte	US 2007	grès à grain grossier	95 x 66 x 8	/	gravure	
ARA05	M17	1223	intérieur grotte	US 2007	grès à grain grossier	85 x 55	/	gravure, arrière-train de boviné	fig. 9.2

2.1 – The unpublished pieces from the in situ levels in the vestibule and the exterior (complex B)

2.1.1 – Diaphysis fragment (ARA03 K24 2170) (fig. 3)

Figure 3 - Engraved red deer femur diaphysis (pinniped?). Photos F. Plassard, tracing L. Aurière.

**MATERIAL: RED DEER RIGHT FEMUR FRAGMENT DIM: 8.6 X 2.4 X 0.6 CM SECTION: SEMI-CIRCULAR
CONTOUR: BROKEN EDGES PROFILE: RECTILINEAR**

- 17 This is a shaft fragment, with timeworn breaks on all sides that occurred after the engraving. The surface does not present any clear preparation marks before the decoration. The engraving is made up of quite wide lines, made by several passages. The incomplete pattern is difficult to interpret. However, we interpret it as the tail fin of a pinniped. This interpretation would tend to be in agreement with the tapered morphology of the body. Moreover, marine mammals are not rare in Magdalenian art in the western Pyrenees and the Cantabrians (cetacean at Arancou (fig. 18.6), seal at Duruthy, ..., Serangeli 2003).

2.1.2 - Pieces in mineral materials

- 18 Ten possibly decorated pieces on mineral blanks were recorded for the upper Magdalenian at the exterior (test pit KL 25-28) and in the vestibule (KL 23-24). Two sandstone plates (ARA90 K25 507 and ARA90 L25 199) bear lines, but it is difficult to verify the deliberate and symbolic nature of these lines. A fragment of metamorphic rock (ARA10 L24 3230) presents traces of ochre. However, we have no means of proving if it is a decorated piece or accidental colouring or the result of a technical gesture.

- 19 On the other hand, seven pieces in stratified brown-red sandstone bear irrefutable engravings. These very small remains undoubtedly come from the same, currently fragmented object. They were discovered in squares L23 and L24, and some of these pieces fit together while others can just be matched on the basis of the raw material. Three fragments do not provide any particular information. However, one piece bears clear engravings, including an indeterminate head (fig. 4.1). It presents a left profile with an elongated muzzle with a rounded end. The image is cut off on the right by the broken edge of the fragment. The last three fragments fit into a small plate representing a finely engraved leg. No specific identification of the latter is possible (fig. 4.2).

Figure 4 - 1 - Sandstone plate engraved with various lines including the left profile of an animal head. 2 - Sandstone plate engraved with a leg. Photos and tracing F. Plassard.

2.2 – Unpublished pieces from the in situ levels in the cave (SU 2007)

2.2.1 – The rib with horses (ARA11 L17 2777) (fig. 5)

Figure 5 - 1- Upper and lower sides of the rib engraved with horses. 2- Detail of the hindquarters of the right-hand horse engraving (x20). 3 - Detail of the head of the right-hand horse figure (x20). 4- Detail of the head of the left- hand horse figure (x20). 5- Tracing. Photos F. Plassard and L. Aurière, tracing L. Aurière.

**MATERIAL: BONE, RED DEER RIB DIM: 10.3 x 1.7 x 0.7 CM SECTION: PLANO-CONVEX
CONTOUR: CONVERGENT TOWARDS ONE END
PROFILE: RECTILINEAR**

- 20 In comparison with the series of small polishers, this object is not in perfect condition; break, desquamation of the surfaces and concretions complicate the interpretation of the decoration.
- 21 A zone with marked scraping is identifiable on each edge, over a length of about 1 cm. These could be marks from a failed attempt to split the rib in two. Neither side bears visible traces of scraping prior to the engraving.
- 22 The left part of the outer side (in its current state) is convex and decorated with two right profile horse representations. The first only depicts the front part of the head, due to a break, whereas the second is complete.
- 23 The first horse (fig. 5.4) thus only represents the forehead, the nose, the upper lip, the eye and part of the mandible ramus. The nostrils are not present. The eye is formed by two small parallel curves, convex towards the top. The nose is rectilinear while the forehead is slightly convex at eye level. The tip of the nose and the upper lip are indicated although the muzzle is not depicted.
- 24 The second horse engraving is located to the right of the first, and is also a right profile. It is whole but the head is not as detailed as the first (fig. 5.3). The nose is convex, the nostril and the mouth are not depicted while the jaw and the mandible ramus form a single line that joins the chest. The eye is not visible, but the bone surface is cracked in this zone, so it is impossible to say whether it was portrayed or not. The mane and the neck are represented by two parallel lines that form a crest above the

forehead. Three finer incisions mark out several mane hairs falling onto the shoulder. The back and the rump are drawn with the same line in reverse. The rear is not shown whereas several long lines evoke the tail. The rear limbs are not depicted. The rear part of the ventral line is strongly curved towards the top whereas it is almost rectilinear towards the front. It is cut off at the front leg, evoked by the foreleg.

- 25 The whole picture is quite awkwardly executed. The internal details are not illustrated. The front legs, the rear end and the tail are badly positioned, or not entirely shown.
- 26 Gestural errors have been identified: these characterize difficulties in controlling the angle of the active part of the tool on the surface of the bone (Fritz 1999). They include, in particular, marks of accidents like that visible on the stomach, which entailed the removal of matter from the edge of the line (fig. 5.2). We can also note lines going too far, at the jaw and the chest.

2.2.2 – The rib with canids (ARA09 L16 110) (fig. 6)

Figure 6 - 1 – Upper and lower sides of the engraved rib with canidae figures. 2 – Tracing. 3- Left-hand canidae figure (x 30). 4- Right-hand canidae figure (x 30). Photos F. Plassard and L. Aurière, tracing L. Aurière.

Determination: bone, 2nd left red deer rib

Dim: 13.7 x 1.8 x 0.4 cm

Section: Plane

Contour: Convergent edges at both ends

Profile: Curved

- 27 This piece is partially burnt and was found as 34 fragments. The preservation status is mediocre and the reading of certain details is thus difficult. Quite deep scraping striations are visible along one of the edges, as well as on the left part of the upper side.

- 28 On the lower side, the right profile of two animal representations is engraved. Both of these depictions are complete but damaged by breaks. Only the profiles are shown. The overall effect is static, and the well-constructed limbs on the edge of the bone appear to mark out the ground.
- 29 The animal on the left is the more complete of the two. It portrays a triangular head with a pointed muzzle and a projecting ear. The dorsal line is almost flat with the right chest and the neck constricted against the ascent of the head. The rear end is very rounded, depicted by a split line. The hind leg is slightly offset towards the rear and the tail is absent. There are two oblique and convergent incisions on the upper part of the flank. The second animal is not so easy to read as it is fragmented by numerous breaks. The cervico-dorsal line is very slightly concave, the (incomplete) head seems more thickset and the chest appears to be more robust. The ventral line is residual; the fore limb is straight and pointed at the end. A robust, well-marked out chest is engraved as the continuity of the forelimb. The whole picture is prolonged by the beginning of a robust and wide neck that appears to be associated with the start of a triangular head surmounted by four vertical lines that seem to represent the ears.
- 30 As for the first figure, there are two oblique and convergent incisions on the flank, but in this case, these are on the lower part. The specific determination of these representations is difficult. The morphology and the position of the animals point to cervids or canids. However, the animal on the left is more like a canid and we will therefore retain the latter hypothesis.
- 31 On the upper side, left of the scraping, we can make out the rather sketchy engraving of the left profile of an animal head. The upper part of the rectangular line is similar to the ear of the first canid on the other side.
- 32 The depiction of these figures is very concise, without anatomical details, and portrays a certain hesitation in the execution of the drawing. Several lines go too far, particularly the curve of the chest for the animal on the left. Moreover, certain lines are very faint, whereas others are grazed, showing a poor inclination of the tool on the surface of the bone (Fritz 1999).

2.2.3 – The bone plate with a cervid (ARA11 L17 3092) (fig. 7)

Figure 7 - Engraved bone fragment with a cervid head figure. Photos F. Plassard, tracing L. Aurière.

MATERIAL: BONE, RIB?

DIM: 2 x 1.1 x 0.2 cm

SECTION: PLANE

CONTOURS: BROKEN EDGES

PROFILE: RECTILINEAR

- 33 This is probably a fragment of a hemi-rib broken on all sides after the engraving. The piece is in very good condition. The whole surface presents fine scraping marks made before the engraving.
- 34 In spite of the very fragmentary condition of this object, a segment of the left profile of the head is clearly visible. The forehead marks the sub-orbital ridge and then narrows until the ears. The latter are large and portrayed in perspective. The beginning of the neckline is almost immediately cut off by a break. The remains of the eye are visible on the lower edge of the piece. The whole head is covered in short parallel or sub-parallel dashes portraying the animal's coat. The size of the ears and the shape of the nose imply that this is a cervid.
- 35 Technically, the engraving is very confident, with deeper lines for the outlines and lighter lines for the internal attributes.

2.2.4 – Bird bone (ARA05 L17 1074) (fig. 8) Material: Ulna, Snowy owl

Figure 8 - Engraved snowy owl ulna. Photos F. Plassard.

DIM: LENGTH: 8.05 CM; MAX. DIAM.: 0.5 CM

SECTION: CIRCULAR

CONTOUR: PARALLEL EDGES

PROFILE: CURVED

- 36 One end of this bird bone was broken after the decoration. A lengthwise crack is present, resulting from a longitudinal groove.
- 37 The surface was scraped first. One of the ends (on the left on the photo) bears flint sawing marks. Two series of incisions cover more than two-thirds of the length of the object. The first series is made up of long and fine incisions, whereas the second comprises shorter and deeper lines.
- 38 It seems as though the first lines were made before the groove, whereas the second were made afterwards, inserted between the former.

2.2.5 - Pieces on mineral blanks

- 39 Up until now, eight pieces engraved on mineral blanks have been found during excavations of the upper Magdalenian levels (SU 2007) of the cave. Three of these (two of which refit) are limestone fragments, identical to the surrounding rock, engraved with occasional, very fine lines, for which no interpretation can be advanced. Two others are fragments in a different limestone from outside the site. One is engraved with an elongated pattern with fine lines (fig. 9.1), whereas the other is made up of a single deep line. A small pebble fragment bears clear incisions but these do not form any figurative or geometric pattern. Lastly, three coarse-grained sandstone plates are clearly engraved. The two refitting fragments only bear non-decipherable engravings, whereas the third piece is decorated with a fragmentary rear end. The lower part of the back, the beginning of the tail and the contour of the rounded rump are visible. This engraving appears to represent a bovine figure (fig. 9.2).

Figure 9 - 1- Engraved limestone pebble, 2- Engraved sandstone plate with bovine hindquarters. Photos and tracing F. Plassard.

2.3 – The unpublished pieces from the reworked complexes

2.3.1 The festooned fragment (fig. 10)

Figure 10 - 1- Engraved festooned fragment with a salmon figure. 2- Detail (x 20). 3 and 4- Details of the two salmon figures on the polishing-tool called “the doe with salmon”. Photos F. Plassard and L. Aurière.

MATERIAL: BONE, HEMI-RIB
DIM: 2.26 x 9.1 x 0.26 cm
SECTION: PLANE
CONTOUR: THREE BROKEN EDGES
PROFILE: RECTILINEAR

- 40 This engraving was made on a hemi-rib. The compact tissue on the upper side was regularized by scraping and polishing, whereas the spongy tissue is visible on the underside. One of the edges is partly decorated with festoons. The decoration is a detailed salmonid representation with part of the head missing, due to a break. The anal, adipose, dorsal and tail fins are portrayed, as is the lateral line. “Pits” in the upper half indicate the coloured stains typical of the species. Under the animal, the remains of another graphic element are visible. These are made up of a straight line with short parallel oblique striations.
- 41 This salmonid representation is reminiscent of the piece referred to as “the doe with salmon” (fig. 18.3). However, these two pieces do not match. The morphology of the fragment and the presence of festoons indicate that they are part of two distinct pieces.
- 42 The salmonidae depicted on these two objects are graphically similar. The salmon associated with the doe are slightly more geometrized, but the formal construction schema is identical in both cases with a tapered shape and similar anatomical details. Due to the small dimensions of the surface, the craftsman had to adopt jerky movements and the tool movement is a lot less fluid (fig. 10).

2.3.2 - Additional fragment of the hemi-rib with bear engravings (fig. 11)

Figure 11 - 1- Additional fragment of the hemi-rib with bear figures before restoration. 2 and 3- Front and back after restoration. Photos F. Plassard.

MATERIAL: BONE, HEMI-RIB

DIM: 3.18 x 1.02 x 0.31 CM SECTION: PLANO-CONVEX CONTOUR: PARALLEL EDGES PROFILE: RECTILINEAR

- 43 The discovery of a new fragment of only a few millimetres (a nacelle) fits on to the right-hand side of the object and enhances the interpretation of a right profile of a carnivore, the front of which was missing. This image had been interpreted as a “canid(?)” by A. Roussot and C. Fritz (in Chauchat et al. 1999), but this refit backs up the hypothesis of a bear representation, advanced by E. Man-Estier (2011). The animal on the right is now complete enough to be able to identify a short tail and a slightly humped back, both of which are characteristic of ursids. Nonetheless, the head of the animal on the right appears to be too thick for a bear.

2.3.3 – Additional fragment of the large pendant depicting a cervid (fig. 12)

Figure 12 - Additional fragment of the large pendant with a cervid figure. The new fragment is indicated by an arrow. Photo F. Plassard.

MATERIAL: BONE, HEMI-RIB

DIM: 1.94 x 0.49 x 0.21 CM SECTION: PLANO-CONVEX CONTOUR: PARALLEL EDGES PROFILE: RECTILINEAR

- 44 A small fragment with a lower festooned edge completes the largest known perforated pendant from the site (Fritz and Roussot in Chauchat et al. 1999; Fritz 1999). This refit, which fits into the lower part of the object, concludes the reading of the rear left leg of the cervid, the main figure of this piece.

2.3.4 – Additional fragment of the engraved piece with triangles (fig. 13)

Figure 13 - Engraved pendant with triangular patterns. Photos F. Plassard.

MATERIAL: BONE, HEMI-RIB?

DIM: 4.1 x 1.4 x 0.1 CM

SECTION: PLANO-CONVEX CONTOUR: PARALLEL EDGES PROFILE: RECTILINEAR

- 45 A. Roussot and C. Fritz describe (in Chauchat et al. 1999) a small flat bone plate decorated with triangular patterns with fine notches on the edges. The 2002 excavation

of a reworked pocket of sediments brought to light three fragments that match the previously known piece. This series of pieces now forms a fragmentary perforated pendant. The initial morphology of this pendant is difficult to decipher but we can nonetheless propose an outline. The proximal part of the pendant does not seem to be decorated, apart from the two fine notches on the edge, similar to those described on the distal part.

2.3.5 - Fragment of the perforated pendant (fig.14)

Figure 14 – Perforated pendant. 2- Detail of the decoration around the suspension loop. 3- Detail of the large pendant with a similar perforation (x 40). Photos F. Plassard and L. Aurière.

MATERIAL: BONE, HEMI-RIB
DIM: 2.21 x 0.5 x 0.26 cm
SECTION: PLANE
CONTOUR: CONVERGENT EDGES IN THE PROXIMAL ZONE
PROFILE: RECTILINEAR

- 46 This is a worked hemi-rib fragment with an identifiable perforation. Both sides were made by scraping and polishing, as was the opening on the intact edge. No decoration is visible on this fragment, apart from a line highlighting the outline of each side. The latter is similar to another perforated pendant (with a cervid, fig. 12), where the contour is also outlined by an engraving.

2.3.6 – The rod with tuberosities (fig. 15.1)

Figure 15 - 1- Engraved «baguette demi-ronde», semi-circular rod, with tuberosities. 2- Engraved «baguette demi-ronde» with bracket patterns. 3- Antler flake decorated with herring-bone pattern. 4- Decorated fragment of a biconical point. Photos F. Plassard.

MATERIAL: CERVID ANTLER (PROBABLY REINDEER ANTLER)
DIM: 4.7 x 1.2 x 0.5 CM FOR THE THREE REFITTED FRAGMENTS;
2.7 x 1.3 x 0.4 FOR THE ISOLATED PART. SECTION: PLANO-CONVEX
CONTOUR: PARALLEL EDGES
PROFILE: RECTILINEAR

- 47 This piece is made on cervid antler and comprises four fragments. Three of them have been refitted. The fourth could not be refitted but appears to be part of this semi-circular rod with tuberosities. The rod was probably made by double grooving. The underside of the object still bears spongy tissue and does not present adhesion incisions. On the upper side, at least nine tuberosities are visible along a central ledge. The fractures on this piece cannot be interpreted from a functional viewpoint.

2.3.7 – Decorated semi-circular-rod (ARA 98, rear chamber, clandestine excavation) (fig. 15.2)

Material: Cervid antler (probably reindeer antler)
 Dim: 7.4 x 1.1 x 0.4 cm Section: Plano-convex
 Contour: Parallel edges
 Profile: Rectilinear

- 48 This decorated semi-circular antler rod is in remarkably good condition. One end of the object bears a tongued fracture and the other a saw tooth fracture. The whole surface of the piece was scraped. After that, the upper side of the rod was decorated on both edges by a series of deep incisions forming a “bracket”-like pattern. Near the edge of the piece, the centre of each bracket is decorated by a line perpendicular to the axis of the piece, or a small herring-bone. The underside of the piece bears clearly visible adhesion incisions.

2.3.8 – Cervid antler flake (RH 18A01 (1224)-465-ATR1) (fig. 15.3)

Material: Cervid antler
 Dim: 1.8 x 0.8 x 0.3 cm Section: Biconvex
 Contour: Irregular
 Profile: Rectilinear

- 49 This is a fragment of compact antler of unknown origin. On the upper side, two series of aligned herring-bone patterns are visible, forming a zigzag decoration on each edge.

2.3.9 – Biconical point base (ARA 06, SU 2003, reworked) (fig. 15.4)

Material: cervid antler

Dim: 2.8 x 0.6 x 0.5 cm Section: Circular

Contour: Parallel edges Profile: Rectilinear

- 50 This object with a circular section is made on antler and bears scraping marks over the whole surface. Two “bracket”-like patterns were probably engraved on the underside. A similar decoration could have been engraved on the upper side, but the latter is altered and thus difficult to read. Before these engravings, fine parallel incisions were engraved transversally to the axis of the piece. They evoke adhesion incisions, implying that this object could be the base of a biconical point (projectile?).

51 .

2.3.10 – Pieces on mineral objects

- 52 The reworked sedimentary complexes yielded just four potentially decorated pieces. Three of them are from the sieving of the spoil from the clandestine excavation whereas the last is from SU 2017 (reworked complex with archaeological material without any definite chronological attribution).
- 53 None of these pieces bear decipherable decorations. They are made up of a limestone pebble, with many incisions on the surface, organized in parallel series (fig. 16.1), two sandstone plates engraved with several enigmatic lines and a sandstone plate decorated with diffuse red points.

Figure 16 - 1- Engraved limestone pebble with many fine incisions, sometimes organized in parallel series (clandestine excavation). 2- Engraved sandstone plate (US 2017). Photos F. Plassard.

- 54 The limestone pebble and the plate from SU 2017 bear clear engravings (fig. 16.2), but caution is called for in the interpretation of the other pieces: occasional lines without organization or diffuse colouring could be incidental or result from purely technical gestures without any symbolic connotation.

2.4 – The connection between the clandestine excavation and an in situ level (fig. 17)

Figure 17 - 1- Festooned polishing-tool composed of 2 fragments from the clandestine excavations and one newly- found piece discovered in stratigraphic context. 2- Detail of one of the refits (x 40). Photos F. Plassard and L. Aurière.

- 55 Three parts of a polisher on a hemi-rib with a festooned edge refit together. The distal part comes from clandestine excavations and was published in 1999 (Chauchat et al. 1999: fig. 30). It measures 3.14 cm long, 0.95 cm wide and 0.14 cm thick.
- 56 The proximal fragment was discovered in the recently re-examined “non-determinable faunal remains drawer” from the clandestine excavation. It measures 1.93 cm long, 0.99 cm wide and 0.13 cm thick. The under surface of the hemi-rib is totally regularized and the upper surface bears fine lines which appear to be due to scraping, rather than engraving. The festoons are perfectly positioned in the prolongation of the first fragment.
- 57 The last fragment is smaller and fits into the middle, between the two other fragments. It fits directly with the element on the right, whereas a piece is still missing on its left. This small fragment (0.7 x 0.7 x 0.1 cm) is important as it was discovered in 2009 in in situ occupation levels (SU 2007E) in the back chamber.

3 – Technological and stylistic analyses

- 58 The choice of the bone materials used is standard. Apart from the fragments of semi-circular rods, bone is the predominant raw material, with the widespread use of ribs and long bone shafts from birds.
- 59 All the objects of art from the clandestine excavation present major transformations of the raw material (cutting in order to obtain a hemi-rib, elaborate manufacture of both sides and the carving of festoons) in order to obtain pendants or polishers. However, two of the unpublished pieces (fig. 5 and 6) stand out due to the almost total absence of

preparation. Only several scraping marks on the edges suggest a failed attempt to split the bone.

- 60 The third piece (fig. 7), probably made on a hemi-rib, bears traces of surface preparation by scraping on the upper face.
- 61 It appears to be similar to pendant or polisher specimens. However, due to fractures, it is not possible to characterize this piece from a typological viewpoint.
- 62 The differences observed in the preparation of the blanks are accentuated by the different engraving techniques. The representations on whole ribs are large in size, compared to the average dimensions of the previous discoveries, which include some of the smallest representations in Magdalenian portable art. The latter range from 0.8 to 1.3 cm. They are detailed and naturalist and result in a clear identification of the depicted species (red deer, horse, salmon, nightjar,... (Fritz and Roussot in Chauchat et al. 1999; Fritz 1999). Conversely, the horse and the canids (fig. 5 and 6) measure between 2.4 and 4.5 cm long but are paradoxically more static and do not present any internal detail. These images also present anatomical inconsistencies with regard to the proportions, the development of certain elements or the absence of others (eye, tail,... etc.). Technically, some overlapping lines and grazed lines are visible in the rectilinear and curved lines. These are linked to a poor tool angle in relation to the surface of the blanks.
- 63 The third piece (fig. 7) is different from the others on account of the technical investment prior to the engraving and the graphic precision of the engraving. In spite of the fragmentary condition of this object, the engraving portrays many details; the fur, the eye and the ear. Lastly, the lines are deep and do not bear marks of accidents in spite of their limited length (often just several millimetres long).
- 64 The engraved shaft fragment found in the vestibule (ARA03 K24 2170, fig. 3) seems to be part of a short operative fabrication sequence, with no prior blank preparation. Due to the fragmentary condition of the object, it is difficult to judge the technical and graphical quality of the engraving.
- 65 It is difficult to compare the objects on organic blanks to those on mineral blanks as the latter group of pieces are fragmented and not very explicit. However, diverse raw materials were used: sandstone, limestone (identical to or different from the surrounding cave limestone), pebbles and metamorphic rock. These blanks do not present any traces of preparation. The only two pieces with identifiable images (a leg engraved on a piece discovered in the vestibule (fig. 4.2) and the partial hindquarters (fig. 9.2) on a plate from the cave) indicate good technical mastery. In both cases, the engraved curves are regular and the different segments of the contour link up with each other smoothly.
- 66 Although the new discoveries somewhat modify the techno-stylistic characteristics of the works of art from Bourrouilla, the spectrum of the represented themes remains practically unchanged. Effectively, the bestiary of the new discoveries (canids, horses and cervids) is broadly consistent with the bestiary published in 1999. At times, two animals are associated on the same piece, but in this case they belong to the same species, unlike most of the previous discoveries. Altogether, eight animal combinations are present: bear ?/bear, horse/bird, fish/indeterminate, cervid/fish, bird/indeterminate, red deer/cetacean, horse/horse, canid/canid. Apart from the significant variability in the themes of Arancou, another thematic element is clear: the presence of

rarely-represented species in Magdalenian portable art, the under-representation of the horse and the bison and the fact that the reindeer is not depicted.

4 – The objects of art in their archaeological context

4.1 – Chrono-cultural attribution

- 67 Up until now, the spoil from the clandestine excavation has yielded 15 objects made on hemi-ribs, including four pendants. Most of the other pieces can be classified in the typological category of polishers (fig. 18). The width and the thickness of these pieces are consistent. They have a plano-convex section and a rectilinear profile. Due to the extensive scraping and polishing marks during fabrication, it is not possible to interpret the debitage marks (Fritz and Roussot in Chauchat et al. 1999). The tongue fractures on the mesial part and the presence of multidirectional striations associated with a polish on the distal part imply that this piece was used in dormant percussion with soft materials (Averbouh and Buisson 1996, 2003). The similar shape and fabrication of these pieces suggests that they are part of the same contemporaneous production series.
- 68 In this context, the discovery of a small fragment of a polisher in a well-preserved level (SU 2007E) with a clear chrono-cultural attribution, that refits with pieces from the spoil from the clandestine excavation, provides precious information. This find confirms the attribution of this type of object to the upper Magdalenian. In the same way, the discovery of an engraved tube in SU 2007AB, made on a snowy owl long bone shaft, is in accordance with the attribution of another snowy owl shaft to the upper Magdalenian. The latter piece is decorated with two horses and a bird. More generally, all the pieces of portable art on bone discovered at Arancou can be more confidently attributed to the upper Magdalenian.
- 69 For the exterior and the vestibule, the data are more scant but all the decorated remains can nonetheless be ascribed to the upper Magdalenian.
- 70 However, up until now, no decorated pieces in antler have been discovered in the upper Magdalenian levels. The fragments of semi-circular rods from the clandestine excavation spoil are undoubtedly from the middle Magdalenian (Feruglio 1992), and their counterparts are probably to be found in the levels underlying SU 2007, and /or in complex C.

Figure 18 - 1- Festooned polishing-tool composed of two fragments from the clandestine excavations and one newly-found piece discovered in stratigraphic context. 2- Polishing-tool engraved with spindle-shaped patterns (anthropomorphic figures?). 3- Festooned polishing-tool engraved with deer and salmon figures. 4- Polishing-tool engraved with a schematic cervid figure. 5- Festooned polishing-tool engraved with a nightjar and indeterminate four-legged figures. 6- Festooned pendant engraved with a cetacean and deer figures. 7- Fragment of a festooned polishing-tool. 8- Large pendant engraved with a cervid figure. Photos F. Plassard.

4.2 – Spatial distribution of the activities and spatial structuring

- 71 However, the presence of a polisher fragment in SU 2007E, of the engraved rib with two canids and the sandstone plates decorated with lines suggests that the series of objects of art from this level is not totally standardized, as far as the operative production schema (shaping, engraving) and the type of blanks are concerned. In the same way, the coexistence of the tube in bird bone, the rib with the engraved horses, the sandstone plate with the engraving of the hindquarters of a bovid and limestone plates identical to the surrounding bedrock in SU 2007AB, reflect the plurality of the graphic production associated with this occupation level. Broadly speaking, SU 2007, attributed with certainty to the upper Magdalenian, provides a varied spectrum of art on lithic and organic blanks, on prepared and non-prepared surfaces, where both careful and skillful representations are depicted with simpler and more awkward engravings.
- 72 The identification of remains characteristic of bone and cervid antler working (blanks, rough-outs, waste), clearly points to the in situ production of at least part of the arms (projectile heads) and the toolkit (perforated needles) in these levels (Chauvière, ongoing study). Can the same be said for the objects of art on organic blanks? The relatively high proportion of small decorated polishers and of perforated pendants at the Arancou site, compared to the ratios observed in other sites in the Pyrenees-Cantabrian mountain range (see below), could also indicate that these objects were made before being brought to the site. For the moment, it is difficult to confirm or infirm this hypothesis as it is not easy to establish a clear and systematic distinction between the operative schemas for decorative objects and those devoted to the

fabrication of equipment for specific tasks, whereby objects of art would just be an accessory (the only difference being the decoration of the object). The ubiquity of some waste products complicates the issue further. This question is crucial for the small decorated polishers on hemi-ribs and the elements potentially connected to the sphere of projectiles, such as the semi-circular rods (fig. 15.1 and 15.2) or the biconical point (fig. 15.4). It is also valid for the bird bones. For example, is the decorated snowy owl ulna (fig. 8) described in this article associated with the intensive exploitation of the avifauna (Eastham 1998; Eastham in Chauchat et al. 1999)? The abundance of aviary bone remains in the cave and the marks that they bear point to a contextual and theoretical association, although the possibility that the piece was brought to the site already made cannot be ruled out.

- 73 Out of all the decorated pieces discovered since 1998, eleven decorated fragments were found in the exterior zone or in the vestibule. Only four of these present decipherable decorative elements: three on lithic materials and one on a diaphysis fragment. These pieces are associated with a sector of the excavation identified as a hearth, previously described as a zone where activities linked to the maintenance of hunting weapons took place (Dachary et al. 2008).
- 74 The rear chamber contained 40 decorated pieces. Thirty-one of them were made on bone materials and these are associated with the abundant faunal remains bearing isolated anthropogenic marks, which are generally no more than 2 cm long. In spite of their small size, these fragments, and particularly the bird bones, bear marked incisions, which could be considered to be more “artistic”, rather than strictly technical.
- 75 The sandstone plate engraved with the hindquarters of a bovid is clearly associated with a hearth identified in SU 2007 AB, whereas the tube in bird bone and the rib with the horses were discovered in a waste zone. The rib with the canid figures bears heating marks, implying that if it was not incidentally heated, it could have been recycled as a combustible. It is thus legitimate to question the status of these decorated objects, with an enigmatic function and which were abandoned and/or destroyed once they were finished. The voluntary destruction or reuse of a decorated object is widely observed during the Magdalenian (de Beaune 1989, 1996, 1997; Tosello 2003, 2005). The decoration only appears to have a transitory value, perhaps just during the fabrication of the object (Fritz and Pinçon 1989).

Conclusions

- 76 The discovery of new decorated pieces, some of which are in stratigraphic context, leads to an enhanced understanding of the artistic production of Bourrouilla. This production is more complex than previously thought, based on the description published by Chauchat et al. 1999. Three major results are identifiable.
- 77 The first of these concerns the materials and their preparation. They are more varied than suggested by previous studies, combining lithic blanks and non-prepared bone pieces. However, in spite of variability in terms of raw materials, techniques and themes, the techno-stylistic study of the artistic production shows that part of the production is homogeneous. This observation confirms the conclusions of the first study of these remains (Fritz and Roussot in Chauchat et al. 1999). The typological similarities between the polishers and the perforated pendants with festooned edges,

and the style of the decoration (small dimensions, same filling-in technique for the fur and the presence of dot-like patterns) (fig.18), are clearly comparable.

- 78 The series currently comprises 17 worked and/or decorated pieces on ribs. For the unfinished pieces, this sample is sufficient for documenting at least the shaping phase of the materials, then the decoration and/or use phase.
- 79 The decorated objects on ribs display two distinct management methods of the same raw material. On one hand, a set of shaping methods leads to the production of elaborate objects. On the other hand, for some of the objects presenting a low level of technical transformation, the decoration makes up the main modification and their function remains unknown (Aurière 2009, in press).
- 80 The first of these production types is associated with quality engravings, from both a technical and graphic point of view, whereas the second is characterized by more basic representations.
- 81 This distinction implies that these objects were not produced by the same people, or even that they have different functions. Although it is straightforward to envisage the function of the tools and the role of the ornamentation of the polishers and the pendants, the slightly transformed objects remain more enigmatic. The recurrent presence on these pieces of awkwardly drawn lines suggests that these blanks were used for engraving apprenticeship (Fritz 1999; Rivero 2010; Aurière 2012). On another note, the discovery of new decorated pieces in stratigraphic context enables us to attribute these pieces to the upper Magdalenian. This led to the attribution of comparable pieces from the clandestine excavation spoil to the same chrono-cultural phase.
- 82 Lastly, the latest discoveries provide information on the location of symbolic productions within the habitat. Given the current excavation data concerning the distribution of
- 83 objects in the site, it appears that the rear chamber was the main sector for the production of works of art. The same occupation levels yielded decorated elements on lithic and bone objects, some of which were prepared. Nonetheless, for the time being, no specialized area for artistic creation is clearly identifiable and the decorative objects were abandoned near the hearth or in waste zones. The clearly voluntary abandon, destruction and reuse of these objects imply that they had a more complex status or value than previously thought.
- 84 The sieving of the spoil from the clandestine excavation at the beginning of the 1990s brought to light an important series of pieces on hemi-ribs. These remains are often decorated with miniatures and are similar to pieces from several Pyrenean-Cantabrian sites (El Pendo, Isturitz, Espalungue Lortet, le Mas d'Azil, La Vache, ...) (Chollot
- 85 1964; Thiault and Roy 1996; Baffier et al. 2003, etc.). The pieces from La Vache and Isturitz can be attributed to the upper Magdalenian, but for the other sites, the objects are from early excavations and can only be ascribed to the Magdalenian.
- 86 The refit described above, associating two pieces from the clandestine excavation with one element from in situ levels, confers a clear archaeological context on the shaped hemi-ribs from Bourrouilla and consequently enables us to propose a chronological attribution for similar pieces discovered at other sites.
- 87 With this chronological context, it is possible to tackle the questions of territory, mobility and contact between human groups, particularly by studying formal and

thematic analogies of objects of art (Conkey 1987; Sauvet et al. 2008; Fritz et al. 2007; Rivero 2010). As mentioned above, the production of objects on ribs, such as small polishers or pendants, extends across the Pyrenean-Cantabrian Mountains, but these objects remain rare. The rather high number of these objects at Arancou thus seems disproportionate to the small size of the site. This raises the question of the role of this site in a wider, western Pyrenean Magdalenian context (Dachary 2002, 2009; Dachary et al. 2008). In other words, is this relative abundance of polishers/pendants the result of a specific activity carried out at Arancou or is it a ubiquitous production that is better documented at Arancou than at other contemporaneous sites? Does it reflect technical behaviour from a very brief period of the upper Magdalenian, only preserved at a small number of sites?

- 88 The only way to grasp a better understanding of the degree of standardization of these morphologically comparable objects is to reexamine the material from former excavations at the other sites from a techno-stylistic and functional perspective.

BIBLIOGRAPHY

AURIÈRE L. 2009 - Approche technologique de l'art mobilier paléolithique en matières osseuses : premières recherches sur la phase de préparation. In : *L'Art des Sociétés Préhistoriques, Rencontres Internationales Doctorants et Post-doctorants 1ère édition*, Toulouse avril 2008, Préhistoire, Art et Sociétés, LXIV, p. 7-15.

AURIÈRE L. 2012 - L'art mobilier magdalénien, du support au décor. Les choix technologiques et leurs implications dans l'élaboration des objets ornés en matières osseuses. Etude de cas dans la vallée de l'Aveyron : les gisements de Plantade, Lafaye, Montastruc et Courbet. Thèse de Doctorat, Université Toulouse le Mirail, 2 tomes.

AURIÈRE L. sous presse - Réflexions autour des choix technologiques dans l'art mobilier magdalénien en matières osseuses. In : E. López-Montalvo et M. Sebastián López (coord.) *El Legado Artístico de las sociedades prehistóricas*.

AVERBOUH A., BUISSON D. 1996 - Approche morpho-fonctionnelle des objets nommés "lissoirs" : essai d'établissement d'une fiche analytique théorique. *Antiquités Nationales*, 28, p. 41-46.

AVERBOUH A., BUISSON D. 2003 - Les lissoirs. In : J. Clottes et H. Delporte (Dir.), *La grotte de la Vache (Ariège). Fouilles Romain Robert. I- Les occupations du Magdalénien*, Paris, Coédition CTHS-RMN, vol. 1, p. 309-324.

BAFFIER D., BUISSON D., DELPORTE H., FRITZ C., GUY E., KANDEL D., MONS L., SIMONNET R., TOSELLO G., WELTÉ A.-C. 2003 - Lissoirs. In : J. Clottes et H. Delporte (Dir.), *La grotte de la Vache (Ariège). Fouilles Romain Robert. II- L'art mobilier*, Paris, Coédition CTHS-RMN, vol. 2, p. 279-319.

BEAUNE S. A. (de) 1989 - Fonction et décor de certains ustensiles paléolithiques en pierre. *L'Anthropologie*, 93(2), p. 574-584.

BEAUNE S. A. (de) 1996 - L'art au Paléolithique supérieur : éphémère ou durable ?. *Antiquités Nationales*, 28, p. 135-138.

- BEAUNE S. A. (de) 1997 – Les galets utilisés au Paléolithique supérieur. Paris, CNRS éditions (Suppléments à Gallia Préhistoire, 22), 298 p.
- CHAUCHAT Cl. (dir.), FONTUGNE M., HATTE C., DACHARY M., BONNISSENT D., CHAUVIÈRE F.-X., ROUSSOT A., FRITZ C., FOSSE Ph., EASTHAM A., MARTIN H., LE GALL O., GAMBIER D. 1999 – L'habitat Magdalénien de la grotte Bourrouilla à Arancou (Pyrénées Atlantiques). Gallia Préhistoire, 41, p. 1-151.
- CHOLLOT M. 1964 – Musée des Antiquités Nationales : collection Piette. Art mobilier préhistorique. Paris, Editions des Musées Nationaux, 479 p.
- CONKEY M. W. 1987 – L'art mobilier et l'établissement de géographies sociales. In : J. Clottes (Dir.), L'art des objets au Paléolithique : les voies de la recherche, Colloque de Foix-Le Mas d'Azil, Paris, Ministère de la Culture, p. 163-17.
- DACHARY M. 2002 – Le Magdalénien des Pyrénées occidentales, Thèse de Doctorat nouveau régime, Université de Paris X, 2 tomes.
- DACHARY M. 2005 – La grotte de Bourrouilla à Arancou (Pyrénées-Atlantiques) : bilan des fouilles 2002 à 2004. Archéologie des Pyrénées occidentales et des Landes, 24, p. 7-18.
- DACHARY M. 2009 – Les Magdaléniens des Pyrénées occidentales. Réflexions sur l'exploitation d'un territoire. In : Djindjian F. et Oosterbeek L. (Eds). Symbolic Spaces in Prehistoric Art, Territories, travels and site locations. Proceedings of the XV. Congress of the U.I.S.P.P., Session C28, Archaeopress, 5 fig., p. 39-45.
- DACHARY M. (dir.), CHAUVIÈRE F.-X., COSTAMAGNO S., DAULNY L., GAMBIER D., LAROU LANDIE V. 2006 – « Les Magdaléniens à Duruthy », catalogue d'exposition (7 octobre-10 décembre 2006), Hastings, Centre Départemental du Patrimoine, 188 p.
- DACHARY M., CHAUVIÈRE F.-X., COSTAMAGNO S., DAULNY L., EASTHAM A., FERRIER C., FRITZ C. 2008 – La grotte Bourrouilla à Arancou : une puissante stratigraphie au service de la perception de la fin du Magdalénien pyrénéo-cantabrique. In : J. Jaubert, J.-G. Bordes, I. Ortega (dir.), Les sociétés paléolithiques dans un Grand Sud-Ouest : nouveaux gisements, nouvelles méthodes, nouveaux résultats. Journée SPF, Bordeaux, 24-25 novembre 2006, Paris, Société Préhistorique Française (mémoire 47), p. 355-370.
- DACHARY M., PLASSARD F., MERLET J.-Cl., BONNET-JACQUEMENT P., CHAUVIÈRE F.-X. sous presse – L'Azilien des Pyrénées occidentales : Vers une révision de l'attribution chrono-culturelle des séries archéologiques. In : C. Cretin, O. Ferullo, J.-C. Castel (org.) « Deuxième moitié et fin du Paléolithique supérieur. Pour une confrontation entre le modèle classique et les perceptions interdisciplinaires actuelles sur le thème des unités, continuités et discontinuités ». Acte de la session F du XXVII^e Congrès Préhistorique de France. Paris, Société préhistorique française.
- DACHARY M., MERLET J.-Cl., MIQUÉOU M., MALLYE J.-B., LE GALL O., EASTHAM A. 2013 – Les occupations mésolithiques de Bourrouilla à Arancou (Pyrénées-Atlantiques). Paleo, ce volume.
- EASTHAM A. 1998 – Magdalenians and snowy owls : bones recovered at the Grotte de Bourrouilla, Arancou (Pyrénées-Atlantiques). Paleo, 10, p. 95-107.
- FERUGLIO V. 1992 – Fiche baguettes demi-rondes. In : H. Camps-Fabrer (Dir.), Fiches typologiques de l'industrie osseuse préhistorique. Cahier V. Bâton percé, baguettes. Treignes, CEDARC, p. 71-83.
- FRITZ C. 1999 – La gravure dans l'art mobilier magdalénien ; du geste à la représentation. Paris, Editions de la Maison des sciences de l'Homme (Documents d'Archéologie Française, 75), 216 p.

- FRITZ C., PINÇON G. 1989 — L'art mobilier paléolithique : valeur d'instant, de la création à la destruction. In : J-P. Mohen (Dir.), *Le temps de la Préhistoire*, Dijon, Archéologia-Société préhistorique française, t. 2, p. 161-163.
- FRITZ C., TOSELLO G., SAUVET G. 2007 — Groupes ethniques, territoires, échanges : la « notion de frontière » dans l'art magdalénien. In : N. Cazals, J. González Urquijo et X. Terradas (dir.), *Frontières naturelles et frontières culturelles dans les Pyrénées préhistoriques*, Université de Cantabria, Santander, p. 165-181.
- LEROI-GOURHAN A. 1943 — *Evolution et techniques I ; L'homme et la matière*. Paris : Editions Albin Michel, 348 p.
- MAN-ESTIER E. 2011 — *Les Ursidés au naturel et au figuré pendant la Préhistoire*, Liège, Université de Liège (ERAUL, 127), 801 p.
- PELEGRIN J., KARLIN Cl., BODU P. 1988 — « Chaînes opératoires » : un outil pour le préhistorien, In : J. Tixier (dir.), *Technologie préhistorique*, Paris, Éditions du CNRS (Notes et monographies techniques, 25), p. 55-62.
- PERLES C. 1991 — Économie des matières premières et économie du débitage : deux conceptions opposées ? In : *25 ans d'études technologiques en Préhistoire, bilan et perspectives*, Juan-les-Pins, APDCA, p. 35-45.
- PÉTILLON J.-M. 2007 — Les pointes à base fourchue de la zone pyrénéo-cantabrique : un objet à la charnière entre Magdalénien moyen et Magdalénien supérieur ? In : *Frontières naturelles et frontières culturelles dans les Pyrénées préhistoriques*, N. Cazals, J. González Urquijo, X. Terradas (dir.), Santander, Ediciones de la Universidad de Cantabria, p. 245-264.
- RIVERO O. 2010 — *La movilidad de los grupos humanos en el Magdaleniense de la Región Cantábrica y los Pirineos : Una visión a través del arte*. Thèse de Doctorat, Université de Salamanque, 2 tomes.
- SAUVET G., FORTEA J., FRITZ C., TOSELLO G. 2008 — Crónica de los intercambios entre los grupos humanos paleolíticos. La contribución del arte para el periodo 20.000-12.000 años BP., *Zephyrus*, LXI (1), p. 33-59.
- SERANGELI J. 2003 — La zone côtière et son rôle dans les comportements alimentaires des chasseurs-cueilleurs du Paléolithique supérieur. In : Patou-Mathis, M., Bocherens, H. (Eds.), *Le Rôle de l'Environnement dans les Comportements des Chasseurs-cueilleurs Préhistoriques*. BAR International Series 1105, Oxford, p. 67-82.
- STUIVER M., REIMER P.J. 1993 — Extended 14C data base and revised CALIB 3.0 14C Age calibration program. *Radiocarbon*, 35(1), p. 215-230.
- SZMIDT C., LAROULANDIE V., DACHARY M., LANGLAIS M., COSTAMAGNO S. 2009 — Harfang, Renne et Cerf : nouvelles dates 14 C par SMA du Magdalénien supérieur du Bassin aquitain au Morin (Gironde) et Bourrouilla (Pyrénées-Atlantiques). *Bulletin de la Société préhistorique française*, 106(3), p. 583-601.
- THIAULT M.-H., ROY J.-B. 1996 — *L'art préhistorique des Pyrénées*. Paris : Réunion des Musées Nationaux, 371 p.
- TOSELLO G. 2003 — *Pierres gravées du Périgord Magdalénien. Art, symboles, territoires*. Paris, CNRS éditions (Suppléments à Gallia Préhistoire, 36), 590 p.
- TOSELLO G. 2005 — Un contexto social para el arte mueble paleolítico en Franciado (Eds.), *La materia del lenguaje prehistórico : el arte mueble paleolítico de Cantabria en su contexto*, Santander, Gobierno de Cantabria, p. 53-65.

ABSTRACTS

Since the beginning of the excavation programme in 1998 of the Magdalenian levels of Bourrouilla (Arancou, Pyrénées-Atlantiques), the discoveries of mobile art have multiplied. There are nineteen new pieces and three fragments completing artefacts known from the 90's presented from a thematic, stylistic and technical approach. The discovery of decorated works on lithic supports and the discovery of engravings on bones without preliminary preparation for the engraving give a new dimension to the symbolic production of this site. In fact, until now, the portable art has been characterized by the presence of a series of very standardized, polishing-tools on much-worked half ribs.

The discovery of nine of these objects in the stratified Magdalenian levels allows us to propose a chrono-cultural attribution for the new pieces as well as for some of those from the clandestine excavations. The contextual data obtained during the excavation and the technological data offer new perspectives on the understanding the modalities of the production of these objects, on their place in the site and on their function for the human groups.

Depuis le début de la fouille programmée en 1998, les découvertes d'art mobilier dans le gisement Magdalénien de Bourrouilla (Arancou, Pyrénées-Atlantiques) se sont multipliées. Ainsi, ce sont dix-neuf pièces inédites et trois raccords avec des pièces déjà connues qui sont présentés d'un point de vue thématique, stylistique et technique. La découverte d'œuvres d'art sur support lithique, ainsi que celle de gravures sur des pièces osseuses n'ayant subi que peu de préparations préalables à la gravure, éclairent d'un jour nouveau la production symbolique de ce site jusque-là caractérisée par la présence d'une série de lisseurs très standardisés, réalisés sur des hémicôtes intensément façonnées.

La découverte de neuf de ces objets au sein des occupations magdaléniennes, en contexte stratigraphique, permet de proposer une attribution chrono-culturelle des pièces inédites et de certaines de celles issues de la fouille clandestine. Par ailleurs, les données contextuelles et technologiques obtenues conduisent à engager une réflexion sur les modalités de production de ces objets, sur leur place au sein du gisement et leur fonction au sein du ou des groupes humains qui les ont réalisés et utilisés.

INDEX

Keywords: upper Magdalenian, mobile art, stratigraphic context, bone industry, bone technology, Pyrénées occidentales

Mots-clés: Magdalénien supérieur, art mobilier, contexte stratigraphique, industrie osseuse, technologie osseuse, Pyrénées occidentales

AUTHORS

LISE AURIÈRE

Université Toulouse-II-le Mirail, UMR 5608 - TRACES - Maison de la recherche, 5 allée Antonio Machado, FR-31058 TOULOUSE cedex - lise.auriere@gmail.com

FRANÇOIS-XAVIER CHAUVIÈRE

Office du Patrimoine et de l'Archéologie de Neuchâtel, section archéologie, Laténium, CH-2068 Hauterive - francois-xavier.chauviere@ne.ch

FRÉDÉRIC PLASSARD

Université Bordeaux 1, UMR 5199 - PACEA - avenue des Facultés, FR-33400 Talence –
frederic.plassard@wanadoo.fr

CAROLE FRITZ

Université Toulouse-II-le Mirail, UMR 5608 - TRACES - Maison de la recherche, 5 allée Antonio
Machado, FR-31058 TOULOUSE cedex - carole.fritz@univ-tlse2.fr,

MORGANE DACHARY

Université Toulouse-II-le Mirail, UMR 5608 - TRACES - Maison de la recherche, 5 allée Antonio
Machado, FR-31058 TOULOUSE cedex - morgane-dachary@orange.fr