



# Aurignacian only? New evidence for a Gravettian component in the lithic and bone industry from Didon's excavations at Abri Blanchard

*Ausschließlich Aurignacien? Neue Belege für eine Gravettien-Komponente im lithischen und organischen Fundmaterial aus den Ausgrabungen Didons im Abri Blanchard*

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**ABSTRACT** - The article presents for the first time the collection from Didon's excavations at Abri Blanchard hosted in the Naturhistorische Gesellschaft Nürnberg. Bought by the Gesellschaft in 1912 through the agency of Hugo Obermaier, the material consists of lithic artifacts, artifacts from bone, antler and ivory, personal ornament, faunal remains and pieces of the brecciated archaeological layer(s). The analysis shows that most of the lithic and osseous artifacts fit well into the variability of the Aurignacian. The bone points can formally be attributed to an early Aurignacian, characterized by split-based points, and a later Aurignacian, indicated by the presence of massive-based points. Although Gravettian artifacts have already been identified in one of the collections hosted in other museums, these were restricted to isolated pieces among the osseous industry. The present study for the first time identified not only additional Gravettian pieces among the osseous industry, but at the same time also a small series of Noailles-type burins, several Gravette points, and a bidirectional core alongside a Pavlovian smoother ("Geweihstecher"). The article discusses how these new findings compare to existing hypothesis about the origin of a non-Aurignacian component at the site.

**ZUSAMMENFASSUNG** - In dem vorliegenden Artikel werden erstmals Artefakte und Faunenreste aus den Ausgrabungen Didons im Abri Blanchard beschrieben, die sich im Archiv der Naturhistorischen Gesellschaft Nürnberg befinden. Das Inventar wurde 1912 nach Vermittlung von Hugo Obermaier angekauft und enthält neben Steinartefakten und Artefakten aus Knochen, Geweih und Elfenbein auch Faunenreste, Schmuckanhänger und Brekzien-Bruchstücke aus der Fundschicht. Die meisten Steinartefakte und Artefakte aus Knochen, Geweih und Elfenbein können in das Aurignacien gestellt werden. Die Geschosspitzen erlauben bei Anwendung der klassischen französischen Gliederung die Unterscheidung eines frühen Aurignacien mit Geschosspitzen mit gespaltener Basis einerseits, und eines entwickelten Aurignacien mit Geschosspitzen mit massiver Basis andererseits. Wie in bereits publizierten Analysen an Albeständen in Museen in Europa und den Vereinigten Staaten, so konnte auch in dem Nürnberger Inventar eine Gravettien-Komponente erkannt werden. Im Unterschied zu existierenden Untersuchungen liegen hier jedoch nicht nur isolierte Stücke vor, sondern eine Serie von Noailles-Sticheln und Gravette-Spitzen sowie ein großer bidirektionaler Kern. In dem Artikel werden die neuen Erkenntnisse mit bereits vorliegenden Ergebnissen aus älteren Studien verglichen sowie verschiedene Hypothesen zum Vorliegen einer Komponente, die nicht in das Aurignacien gestellt werden kann, diskutiert.

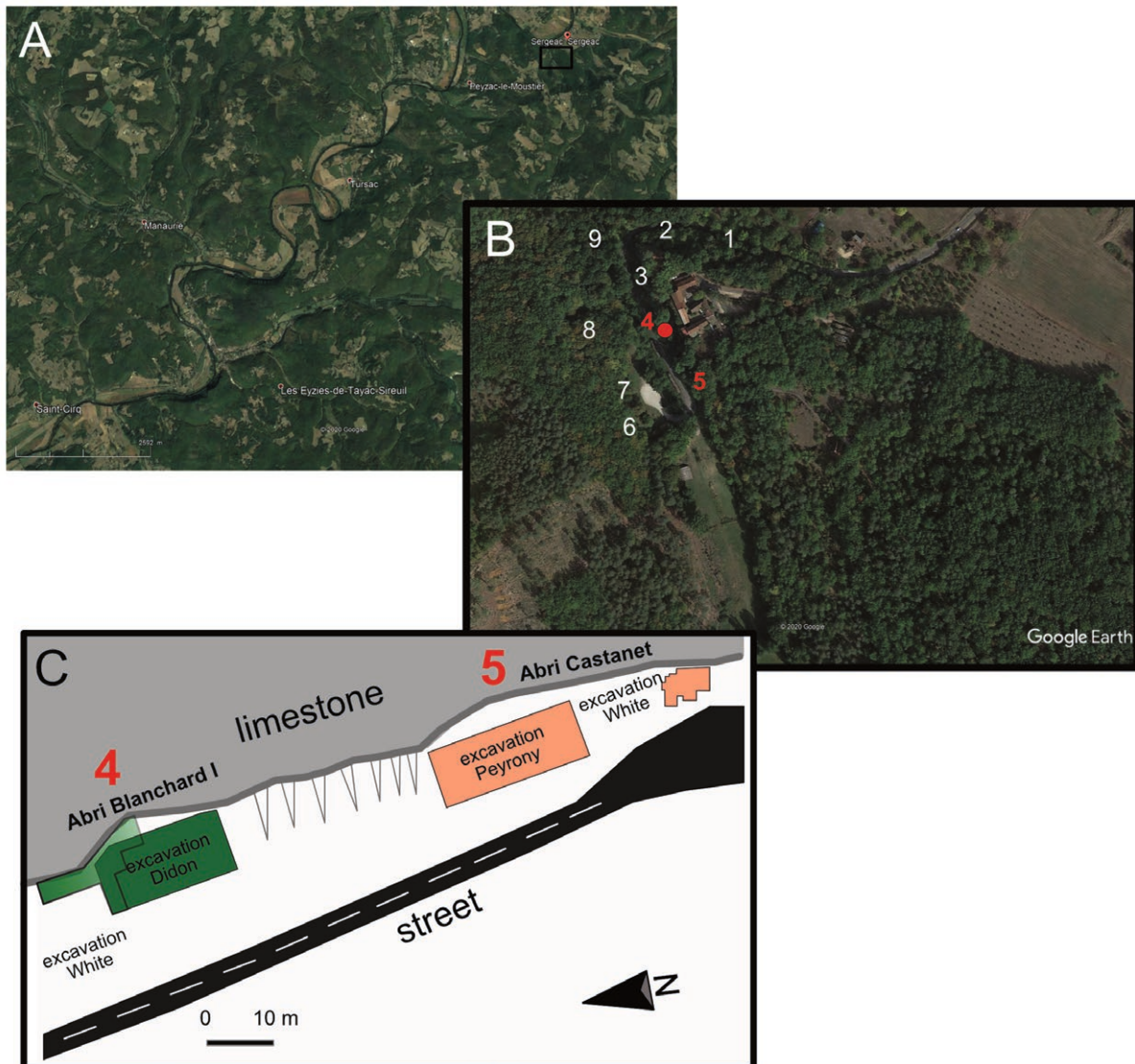
**KEYWORDS** - Dordogne, lithic artifacts, artifacts from bone, antler, and ivory, faunal remains, Aurignacian, Noailian  
*Dordogne, Steinartefakte, Knochen-, Geweih- und Elfenbeinartefakte, Faunenreste, Aurignacien, Noailien*

## Introduction

The Abri Blanchard (Fig. 1), situated only a few hundred meters to the Southwest of the small village of Sergeac in the Department Dordogne in Southwestern

France, is a well-known key site of the French Aurignacian. The rock shelter (Fig. 2) is part of a site cluster along the limestone cliffs of the Castel-Merle Valley and situated in close vicinity to the Abri Castanet and the Abri-Sous-le-Roc, which are also located along

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**Fig. 1.** Location of Abri Blanchard: (A) location of Abri Blanchard in the region of Les-Eyzies-de-Tayac (black square indicates position of B); (B) location of Abri Blanchard in the Castel-Merle Valley (1 - Abri des Merveilles, 2 - Abri Blanchard II, 3 - Abri Sous-le-Roc, 4 - Abri Blanchard (red point), 5 - Abri Castanet (in red), 6 - Abri Reverdit, 7 - Abri du Roc d'Acier, 8 - Abri Labattut and 9 - La Souquette); (C) location of the excavations in Abri Castanet and Abri Blanchard. (A from Google Earth Pro 7.3.4.8248 (2021) Site de Castel-Merle 44°59'59.96"N, 1°06'05.76"O, elevation 33 km [online] available at: <http://www.google.com/earth/index.html> [accessed 2 August 2021], B from Google Earth Pro 7.3.4.8248 (2021) Site de Castel-Merle 44°59'59.96"N, 1°06'05.76"O, elevation 300 m [online] available at: <http://www.google.com/earth/index.html> [accessed 2 August 2021], location and numbering of sites taken from Tartar et al. (2014: Fig. 1), C redrawn from Tartar et al. (2014: Fig. 1), with additions by the authors).

**Abb. 1.** Lage des Abri Blanchard: (A) Lage des Abri Blanchard in der Umgebung von Les-Eyzies-de-Tayac (das schwarze Quadrat markiert die Position des Kartenausschnittes in B); (B) Lage des Abri Blanchard im Tal von Castel-Merle Valley (1 - Abri des Merveilles, 2 - Abri Blanchard II, 3 - Abri Sous-le-Roc, 4 - Abri Blanchard (roter Punkt), 5 - Abri Castanet (in rot), 6 - Abri Reverdit, 7 - Abri du Roc d'Acier, 8 - Abri Labattut und 9 - La Souquette); (C) Lage der Ausgrabungen in Abri Castanet und Abri Blanchard. (A übernommen und verändert aus Google Earth Pro 7.3.4.8248 (2021) Site de Castel-Merle 44°59'59.96"N, 1°06'05.76"O, Sichthöhe 33 km [online] verfügbar unter <http://www.google.com/earth/index.html> [zugegriffen am 2. August 2021], B übernommen und verändert aus Google Earth Pro 7.3.4.8248 (2021) Site de Castel-Merle 44°59'59.96"N, 1°06'05.76"O, Sichthöhe 300 m [online] verfügbar unter <http://www.google.com/earth/index.html> [zugegriffen am 2. August 2021], die Position und Nummern für die Fundstellen wurden aus Tartar et al. (2014: Fig. 1), C nach Tartar et al. (2014: Fig. 1) mit Ergänzungen der Autoren).

the Eastern limestone walls of the small, canyon-like valley (O'Hara et al. 2015). The Abri Castanet, excavated in two portions ("Secteur Peyrony" and "Secteur Sud"), and the Abri La Souquette on the opposite side of the valley all yielded Aurignacian material as well (Bourrillon et al. 2018; O'Hara et al. 2015). Systematic excavations in the Abri Blanchard were first conducted between 1910 and 1912 by

Castanet, supervised and paid by Didon. Didon (1911) reported two archaeological levels separated by a sterile layer with large limestone blocks from the collapse of the rock shelter ceiling. Both find horizons contained a rich Aurignacian industry with lithic artifacts, utilitarian artifacts made from bone and antler, personal ornament as well as engraved and, in smaller numbers, painted limestone blocks



**Fig. 2.** Abri Blanchard, view from Northwest. In the foreground to the right is the area of Peyrony's excavations at Abri Castanet (A), whereas Abri Blanchard is on the same side of the valley in the background (B) (photo: Th. Uthmeier).

**Abb. 2.** Abri Blanchard, Blick von Nordwesten. Im Vordergrund rechts Bereich der Ausgrabungen von Peyrony im Abri Castanet (A); das Abri Blanchard befindet sich ebenfalls auf der rechten Seite des Tals im Hintergrund des Bildes (B) (Foto: Th. Uthmeier).

with depictions of animals and stylized female genitalia (Didon 1911: 251; Bourrillon et al. 2018: 2). Renewed fieldwork began in 1994 by White, who – based on geophysical surveys – was able to locate larger limestone blocks in the area of the previous excavation (Tartar et al. 2014: 322). During the subsequent excavations in 2011 and 2012, the in situ remains of the lower archaeological level in Sector 4/5 were found to yield one engraved limestone block embedded in an Aurignacian context. The second, overlying Aurignacian layer reported by Didon was identified as representing sediment in a secondary position (Tartar et al. 2014). The successful excavations of White brought Abri Blanchard back into the discussion about the age of Aurignacian parietal art. The newly discovered engraving from Abri Blanchard is characterized by aligned punctuations also found in the red series of the Grotte Chauvet as well as on Aurignacian mobile artworks from numerous sites in France and Germany (Bourrillon et al. 2018). While the primary context of the lower Aurignacian with the engraved block is undisputed, it is still a matter of debate if the sediments above

contain exclusively Aurignacian artifacts or also a Gravettian component (Tartar et al. 2014; Chiotti et al. 2015). The presence of a bone point of Isturitz type, as well as an antler fragment with traces of the groove and splinter technique, in one of the old collections is until today explained by an accidental admixture with artifacts from the Abri Labattut (Tartar et al. 2014: 321). Didon excavated the latter in parallel to Abri Blanchard, and numerous bone points of this type (Movius 1973; Tartar et al. 2014) characterize the assemblage from Abri Labattut. In this article, we present for the first time a part of the material from Didon's excavations found in the archives of the Naturhistorische Gesellschaft Nürnberg (Germany). In contrast to previous analysis of the lithic assemblages from Abri Blanchard, which all stress the lack of artifacts other than those of the Aurignacian, the hitherto unpublished material from the Naturhistorische Gesellschaft Nürnberg shows a considerable number of lithic and bone artifacts typical for the Gravettian. We present the material and discuss different reasons for the presence of the non-Aurignacian component at Abri Blanchard.

## Material and methods

The 323 artifacts and faunal remains analyzed here were archived in the Naturhistorische Gesellschaft Nürnberg in two boxes under the number 7745 (Tab. 1). A note found in one of the boxes contained the information „Abri Blanchard I. St. León-sur-Vézère. UNr. 165, 180, 181, 194, 195, 199, 200. Gefunden im vorderen Teil des oberen Arbeitsraumes am 8.3.1991.“ („Abri Blanchard I. St. León-sur-Vézère. UNr. 165, 180, 181, 194, 195, 199, 200. Found on the 8<sup>th</sup> of March 1991 in the front part of the working room in the upper floor”, translation by the authors). The note indicates that the present artifact numbers result from a novel inventory after 1991. According to the information in the archives of the Naturhistorische Gesellschaft Nürnberg, Konrad Hörmann originally bought the finds in 1912 directly from Didon through the agency of Hugo Obermaier, who at the time held a position at the Institute de Paléontologie Humaine in Paris. In addition to the finds, the boxes also yielded pieces of breccia with lithics and faunal remains embedded in it. It is more than probable that the pieces of breccia are samples from the find bearing layer(s). However, after the novel excavations of White (Bourrillon et al. 2018) revealed that not only the upper layer (Didon 1911), but also the lower layer was brecciated, it is not possible to solve the question about the stratigraphical provenance of these samples. Although Hörmann bought the finds in 1912, it is rather unlikely that the collection in Nürnberg yields finds from all Didon’s field campaigns. Because the transfer certainly needed time for preparation, it is more probable to assume that materials in Nürnberg go back to the excavations of 1910 and/or 1911.

The collection in the archives of the Naturhistorische Gesellschaft Nürnberg is only a small part of the overall archaeological finds from Abri Blanchard. Without the finds of the recent excavations by White, the known assemblages from Didon’s excavations of the two Aurignacian layers comprise 1,500 lithic artifacts, 200 bone points, 350 objects of personal ornament, 14 kg of pigments and 40 limestone blocks with engravings and paintings (Tartar et al. 2014).

Due to the assumed similarities of the finds from the two layers, Didon merged the find materials into one assemblage. The most recent re-evaluation of the finds available by the time, and the stratigraphy, showed that the lower layer contained artifacts of an early Aurignacian (Aurignacian I), whereas the upper layer contained artifacts of a later Aurignacian (Aurignacian II) found in secondary position on a step of the limestone bedrock (Tartar et al. 2014; Bourrillon et al. 2018). Only part of the original assemblage remained in the property of the Castanet family, while other parts were sold to museums in Europe and the United States (Tab. 2). Surprisingly, whilst all collections yield lithic artifacts, artifacts made from bone, ivory and antler, and often personal ornament, only those from the American Museum of Natural History in New York, the Chicago Field Museum of Natural History and the Naturhistorische Gesellschaft Nürnberg have faunal remains.

The methods applied in the analysis of the lithic artifacts take into consideration that the assemblage represents not only an admixture of the two find-bearing layers, but in addition a selection of what was assumed most informative at the beginning of the 20<sup>th</sup> century. For example, retouched formal tools among the lithic artifacts account for 78.3 % (compared to between 4.5 % and 7 % in the recent excavations: Chiotti et al. 2015), and the remainder mainly consists large blades and blade cores. Regarding the lithic artifacts, the analysis aims more at the detection of chronologically relevant technological and typological features on a broader level than at a differentiation between different facies within Upper Paleolithic industries, i.e., facies within the Aurignacian (but see the discussion in Bataille et al. 2018) or facies/industries of the Gravettian (Pesesse 2017). Therefore, the data collection of lithic artifacts is mainly based on the type-list for the French Upper Paleolithic established by Sonnevile-Bordes (Sonneville-Bordes & Perrot 1953, 1954, 1955, 1956a, 1956b). The type-list of Sonnevile-Bordes is preferred here due to the history of research alone; we are well-aware of the fact that carinated pieces are cores rather than tools (Bordes & Tixier 2002: 187; Brou & Le Brun-Ricalens 2013)

Find category	Total	Sample analyzed in the present study	Sampling criteria	Remarks
Lithic artifacts	166	166	No sampling	Mainly retouched pieces (“fossiles directeurs”), few cores, no chips
Artifacts from bone, ivory and antler	96	40	Points, pointed pieces and by-products of their manufacture	-
Faunal remains	61	61	No sampling	Faunal remains in pieces of brecciated sediment were excluded; the assemblage includes personal ornament (perforated teeth and mollusks)
Total	323	267		

**Tab. 1.** Overview of the material from Didon’s excavations (1910-11) in the collection of the Naturhistorische Gesellschaft Nürnberg.

**Tab. 1.** Überblick über den Fundbestand aus den Grabungen Didon’s (1910-11) in der Sammlung der Naturhistorischen Gesellschaft Nürnberg.

Country	Town	Institution	Lithic artifacts	Artifacts from bone/ivory/antler	Personal ornament	Engraved blocks	Fauna
France	Sergeac	Musée de Castelmerle	X	X	X	X	?
	Périgeux	Musée du Périgord	X	X	X	X	?
	Paris	Musée de l'Homme	X	X	X	-	?
		Institut de Paléontologie Humaine	X	X	X	X	?
	St. Germain-en-Laye	Musée d'Archéologie Nationale	X	X	X	X	?
Chambéry	"Special collection"	?	?	?	?	?	
Switzerland	Basel	Museum of Basel	X	X	X	-	-
Polen	Wroclaw	Archaeological Museum	X	X	X	-	-
Great Britain	Jersey	Jersey Museum	X	X	X	-	-
	London	British Museum	X	X	-	-	-
	Cardiff	National Museum of Wales	?	?	?	?	?
United States of America	New York	American Museum of Natural History	X	X	X	X	X
	Castine	Wilson Museum	X	X	X	-	-
	Beloit	Logan Museum of Anthropology	X	X	X	X	-
	Chicago	Field Museum of Natural History	X	X	X	-	X
Germany	Nürnberg	Museum der Naturhistorischen Gesellschaft Nürnberg	X	X	X	-	X
Number of collections with find category			14	14	13	6	3

**Tab. 2.** Finds from Didon's excavations at Abri Blanchard in different museum collections. Data except for Nürnberg taken from Tartar et al. (2014).

**Tab. 2.** Funde aus den Ausgrabungen Didon's im Abri Blanchard in den Sammlungen verschiedener Museen. Mit der Ausnahme von Nürnberg wurden alle Daten aus Tartar et al. (2014) übernommen.

and indicate this by the annotation "/core" or "/burin core" behind the respective tool types. In contrast to comparisons based on cumulative graphs as suggested by Sonnevile-Bordes (1960; for a critical assessment of this method see Kolpakov & Vishnyatsky 1989: 108), we use a histogram of the relative frequencies of tool types to compare the assemblage from the Naturhistorische Gesellschaft Nürnberg with Aurignacian assemblages from Abri Blanchard (collection Vésignié) and Abri Castanet, layers I and II published by Sonnevile-Bordes (1960).

All analysis presented in this article must consider that the finds were selected for sale and cannot be taken as a quantitatively adequate sample of the excavated assemblages. This also applies for the analysis of artifacts from bone, antler, and ivory. Therefore, we decided to concentrate on the investigation of the technology and typology of formal osseous tools. The sub-sample investigated here consists of 28 tools made from antler or ivory and 12 fragments and pieces from the production waste. The research methods applied here combine a typological and a techno-ecological approach. For the data collection of the attributes of points, we follow the list provided by Albrecht et al. (1972). The typology is taken from Hahn (1977, 1988a, 1993) and Barth (2007) as well as the "Fiches typologiques de l'industrie osseuse

préhistorique" (Delporte & Mons 1988a, 1988b; Hahn 1988b; Hahn 1988c). We assume that split-based points are typical for the early (Proto-)Aurignacian (Hahn 1988c; Tartar 2015), whereas massive-based points are most numerous in later phases of the Aurignacian (Tartar 2015; Hahn 1988b; Doyon 2017: 38; for a more critical view see Kitagawa 2020), but also appear in other Upper Paleolithic industries, such as the Gravettian (Barth 2007; Wolf et al. 2016, for a chronological and geographical distribution see Hahn 1988b: 2). The Gravettian is characterized by high frequencies of single-beveled points (Delporte & Mons 1988a; Goutas 2016: 93) or – in less numerous cases – double-beveled points (Delporte & Mons 1988b; Goutas 2016: 96). In some rare but well documented cases, double-beveled points were also found in Aurignacian layers (Wolf et al. 2016; Delporte & Mons 1988b: 2). In addition, points of Isturitz type, double points and points with lateral groove complete the typological variability of Gravettian points (Goutas 2008: 47; Sonnevile-Bordes 1988). To investigate technological aspects of the assemblage from Abri Blanchard, we try to reconstruct basic elements of the operational chain by using both traits of the manufacture on the points itself and by-products such as tongued pieces (Tartar 2015). We assume that during the Aurignacian, most osseous tubular raw material pieces were

fractured into segments and then splintered using a wedge (Hahn 1993: 318; Liolios 2006; Tejero et al. 2018: 107; for a discussion of possible Aurignacian forerunners of the groove and splinter technique at Wildscheuer and Geißenklösterle see Hahn 1988a: 202ff., 1993: 319). According to experiments by Tejero et al. (Tejero et al. 2018: 108), this method allows a certain predetermination of the size and the length of the blank. It could also be demonstrated that blanks show certain common characteristics like a rectangular shape and straight or oblique lateral edges (Tejero et al. 2018: 110). To differentiate between the Aurignacian and later technological approaches, we suggest that the groove and splinter technique *sensu stricto*, with two parallel grooves to pre-define the splinter (Pfeifer 2016: 71ff. & Figs. 62f.; Goutas 2009: 441), is an important chronological marker that appears at the beginning of the Gravettian (Barth 2007: 184; Hahn 1993: 319, for further discussion on the emergence of the groove and splinter technique see Goutas 2009). A simpler longitudinal fragmentation of segmented antler, which is using wedges to split the pieces in halves and then reduces the halves subsequently into smaller splinters by either using a unilateral longitudinal groove or wedges to control the longitudinal fragmentation (Pfeifer 2016: 71ff. & Figs. 59ff.; Doyon 2017: 40), is applied in the Gravettian as well (Hahn 1993: 319; Goutas 2009: 442). Due to the length of the blanks, Wolf et al. (2016) discuss this technology for working ivory in the Swabian Aurignacian, although direct evidence is missing. In the Pavlovian (Klíma 1987; cf. Hahn 1993: 320), medial sections of fragmented antler were splintered along two bilateral grooves, which led to a more oblique (than longitudinal) fracture of the workpiece.

The overall 61 faunal remains were analyzed by using the following attributes: species, skeleton element, preserved part of the bone, left or right side of the sagittal plane, sex, rough and fine (if possible) estimation of age at death, anthropogenetic alteration(s), weight, and metric measurements. Except for horse remains, which were measured following Eisenmann et al. (1988), all measurements followed the method given by Driesch (1976).

## Results

It must be stressed that, due to the non-representative character of the assemblages analyzed here, the data collected is interpreted as presence-absence, rather than quantitative, data. Although some conclusions are possible, new insight into the archaeological material from Abri Blanchard relies on the presence of formerly unknown components.

### Lithic artifacts

The raw material used to manufacture the lithic artifacts are in good accordance with the results of Chiotti et al. (2015) and Blades (1999), who investigated Upper

Paleolithic assemblages from the Castel-Merle Valley. All are made from fine-grained chert with numerous inclusions of microfossils. Most pieces are fresh and have sharp edges. However, the dominating greyish as well as the brownish variant include numerous patinated pieces and one piece with traces of heat alteration. From 166 blanks in the assemblage (Tab. 3), nine are secondary crested blades and five are core tablets from the rejuvenation of striking platforms. These items testify an on-site re-preparation of cores and show that at least part of the core reduction was conducted at the site. There are eight burin spalls, which underline that the reduction of carinated burins/burin cores and/or the modification of blanks into burins also happened on the spot. One of the two cores of the assemblage (Fig. 3: 1) is a bidirectional blade core with two opposed striking platforms used to exploit one and the same flaking surface, which in this case expands to the lateral part of the core ("semi-circumferential": Falcucci et al. 2017: 10). However, due to the relatively wide flaking surface, the core does not fall into the category of the Magdalenian "pièces arquées" (Kelley 1960; Pigeot 1987). It is important that the two opposite striking platforms were used in the same phase of the reduction sequence. This is in sharp contrast to the reduction method applied during the Aurignacian, where most blade cores were unidirectional. Aurignacian cores with more than one striking platform result from turning the core to start another phase of the core reduction after the first striking platform was abandoned (Uthmeier 2012; Falcucci et al. 2017). Although present in several Upper Paleolithic industries that post-date the Aurignacian, bidirectional blade cores are also typical for the Middle Upper Paleolithic of Southwestern France (Morala & Turq 1991; Klaric 2007; Onoratini et al. 2010; Pelegrin 2012; Pasda 2013). The question if the core from Abri Blanchard results from the Middle Upper Paleolithic Corbiac method described by Bordes &

Blank category	N	Percentage
Flake	31	18.7
Trimming flake	1	0.6
Core tablet	5	3.0
Blade	95	57.2
Crested blade	9	5.4
Bladelet	15	9.0
Burin spall	8	4.8
Core	2	1.2
Total	166	100.0

**Tab. 3.** Frequencies of blank types in the assemblage of Didon's excavation at Abri Blanchard (1910-11) hosted in the Naturhistorische Gesellschaft Nürnberg.

**Tab. 3.** Häufigkeiten von Grundform-Klassen in dem Inventar der Grabung Didon im Abri Blanchard (1910-11) aus dem Bestand der Naturhistorischen Gesellschaft Nürnberg.

Crabtree (1969) cannot be answered without the respective detached blanks.

Most of the modified pieces (44.6 %) are chronologically indifferent (Tab. 4). Among these, end scrapers with lateral retouch, burins on retouch, multiple burins and burins on lateral retouch are the most numerous tool-types. Aurignacian tool types *sensu stricto* (i.e., “fossiles directeurs”) account for little less than one third of the analyzed sample (Tab. 4). Most of them are carinated end scrapers/cores, followed by flat nosed end scrapers. Blades with a notched edge (“lame aurignacienne à encoche”: Sonnevile-Bordes & Perrot 1956: 552), carinated nosed end scrapers/cores and carinated burins/burin cores are present with a few items. It is almost certain that the frequency of carinated end scrapers/cores as the most indicative “fossile directeur” of the Aurignacian results from a selection by Didon, who obviously aimed at choosing the most representative pieces for his classification of the excavated industry. In contrast to the tools with combined modifications, which occupy the third place in the relative frequencies and are also congruent with an Aurignacian classification, eight burins of Noailles type (Fig. 3: 6-8) and six Gravette points (Fig. 3: 2-5) certainly contradict to a classification as early Upper Paleolithic. Noailles burins can be securely attributed to the Noaillian industry of the Early Middle Gravettian of the Southwestern Aquitaine (David 1985; David & Bricker 1987; Klaric 2007; Rigaud 2008; Onoratini et al. 2010; Pesesse 2017). Backed pieces, to the contrary, are chronologically less sensitive and, even when disregarding their occurrence in the Solutrean, Magdalenian and Azilian, are solely characteristic for a Gravettian *sensu lato* (Pesesse 2017: 111f.). While some authors underline the ubiquitous presence of Gravette points in Noaillian assemblages (Rigaud 2008: 154), Pesesse (2017: 111f.) points out that Gravette points in Noaillian contexts are rare and often represented by microlithic backed points and backed points with a

marginal retouch. The examples from Abri Blanchard do not belong to these specific forms. However, they still fall into the variability of simple Gravettian points that may occur in all Gravettian industries (Rigaud 2008).

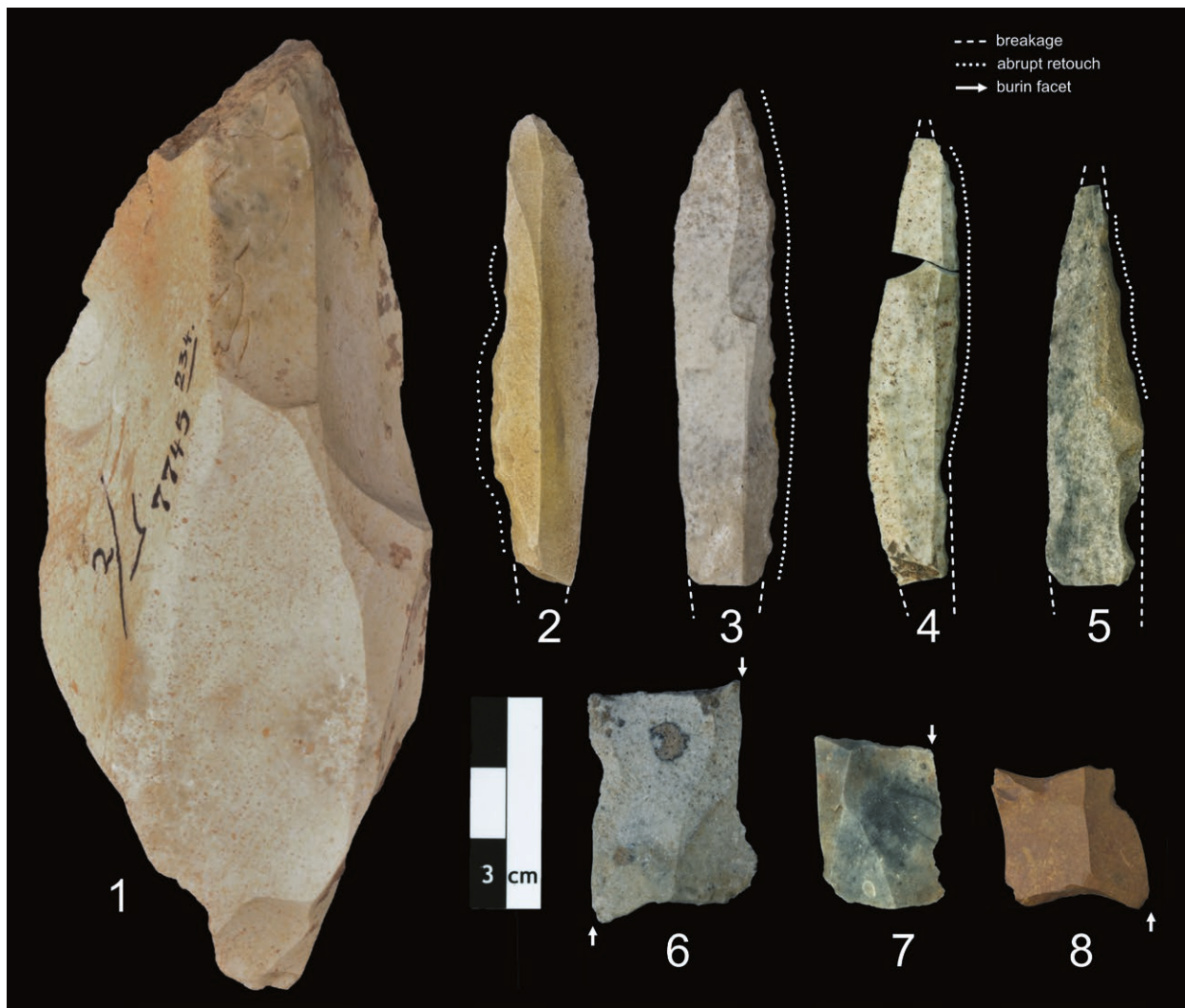
Quantitative comparisons are made difficult by the selective character of the known assemblages from Abri Blanchard. We nevertheless used a histogram with percentages (Fig. 4) in addition to the tool classes provided in table 4 to first and foremost give an overview of the frequencies resulting from the type-list of Sonnevile-Bordes. Furthermore, the comparison of the assemblages from Abri Blanchard (collections from Naturhistorische Gesellschaft Nürnberg and Vésignié) and Abri Castanet, layer I and layer II show two things: first, all of the compared assemblages are very similar with regard to the Aurignacian component; second, there are marked differences between the assemblage from the Naturhistorische Gesellschaft Nürnberg one the one hand, and all other assemblages on the other, with regard to backed pieces and burins. The presence of Gravette points and Noailles burins has already been discussed in length, but in addition, the diagram reveals a generally higher variability of burins in the assemblage from the Naturhistorische Gesellschaft Nürnberg, which is caused by the presence of several burin types with retouched truncation.

**Osseous points**

The sub-sample investigated here consists of eleven bone points, 17 other tools, five unidentified fragments and seven pieces from the production of points (Tab. 5). Points were all made from antler, whereas awls and smoothers were manufactured from bone. One unidentified fragment is from ivory. Eight pieces show evidence for transversal segmentation, which in three cases results from simple breakage, in four cases from the application of two horizontal grooves and in one case from a segmentation by direct blow with

	Aurignacian tool types					Gravettian tool types		Indifferent modifications						Tools with combined modifications					Total
	Carinated endscraper	Nosed carinated endscraper	Nosed endscraper	Carinated burin	Blade with 1 notch	Burin of Noailles type	Gravette point	Lateral retouch	Endscraper	Endscraper with lateral retouch	Multiple burins	Burin on retouch	Borer	Endscraper-endscraper	Nosed endscraper-burin	Laterally retouched simple endscraper-burin	Borer-endscraper	Others	
N	19	2	13	1	3	8	6	11	6	16	11	12	2	8	3	4	2	3	130
Percent	14.6	1.5	10.0	0.8	2.3	6.2	4.6	8.5	4.6	12.3	8.5	9.2	1.5	6.2	2.3	3.1	1.5	2.3	100.0
	29.2					10.8		44.6						15.4					

Tab. 4. Tool types in the assemblage of Didon’s excavation at Abri Blanchard (1910-11) hosted in the Naturhistorische Gesellschaft Nürnberg.  
 Tab. 4. Häufigkeiten von Werkzeugformen in dem Inventar der Grabung Didon im Abri Blanchard (1910-11) aus dem Bestand der Naturhistorischen Gesellschaft Nürnberg.



**Fig. 3.** Gravettian artifacts in the assemblage of Didon’s excavation at Abri Blanchard (1910-11) hosted in the Naturhistorische Gesellschaft Nürnberg: 1 - bidirectional core, 2-5 - Gravette points and 6-8 - burins of Noailles type (photos: U. Maaß).

**Abb. 3.** Artefakte des Gravettien in dem Inventar der Grabung Didon im Abri Blanchard (1910-11) aus dem Bestand der Naturhistorischen Gesellschaft Nürnberg: 1 - bipolarer Kern, 2-5 – Gravettespitzen und 6-8 – Noaillesstichel (Fotos: U. Maaß).

a sharp tool (for an illustration of the techniques see Pfeifer 2016: 71 & Fig. 57ff.). However, in this article we concentrate on chronologically sensitive items, which in this case are points and a distinctive type of smoother (Fig. 5). In addition, we also consider pieces that are by-products of the antler-production or show technological traces of it.

Apart from four points with a degree of fragmentation that does not allow for a classification of a specific point type, the sample analyzed here in greater detail (Tab. 6) is dominated by five split-based points (Fig. 6: 2) typical for an early Aurignacian (Aurignacian I according to Peyrony 1933; Bourrillon et al. 2018; for a discussion of the succession of Aurignacian split-based points and massive-based points in Southwestern Europe see Doyon 2017: 71ff.). The manufacture of this type of point is attested by “tongued pieces”, which so far are regularly found in association with split-based points and therefore considered to be waste from the intentional splitting

of the base (Fig. 6: 1). One point has a massive base, which is a typical feature of the developed Aurignacian (Aurignacian II according to Peyrony 1933; Hahn 1988b: 2; Bourrillon et al. 2018), but also occurs in the Gravettian, Solutrean and Magdalenian (Hahn 1993: 335, Hahn 1988b: 2). Whereas these types represent classical “fossiles directeurs” of the Aurignacian, two specimens are in less good agreement to such a classification, or even contradictory to it. One of these is the basal fragment of a point with double-beveled base (Fig. 7: 2). Although double-beveled points are usually assigned to the Magdalenian or the Gravettian (more specifically the “Noaillian”: Goutas 2016: 96), Hahn (1993: 340) mentions Aurignacian occurrences as well. However, Hahn reports ivory as the only raw material for the examples from the Aurignacian, whilst the piece from Abri Blanchard is made from antler. This makes a classification as Gravettian, Solutrean or rather Magdalenian more probable than assuming a belonging of the piece to the Aurignacian.



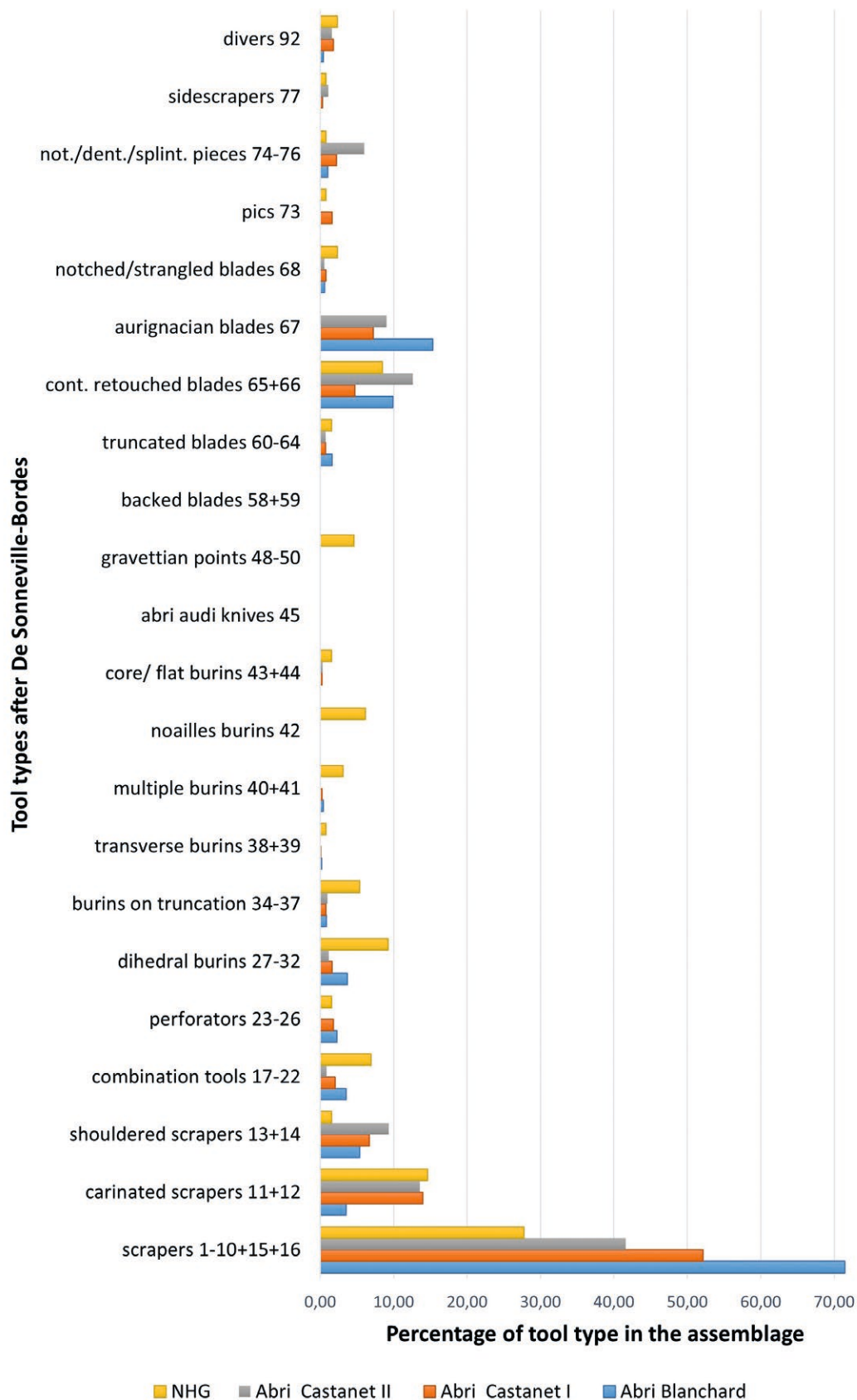


Fig. 4. Comparison of the relative frequencies of tool types (according to the type list of Sonnevillle-Bordes) in the lithic assemblages from Abri Blanchard: in yellow collection of the Naturhistorische Gesellschaft Nürnberg [NHG], in blue collection Vésignié), and from Abri Castanet I (in orange) and Abri Castanet II (in grey); except for NHG, raw data was taken from Sonnevillle-Bordes (1960).

Abb. 4. Vergleich der prozentualen Häufigkeiten von Werkzeugtypen (nach der Liste von Sonnevillle-Bordes) in Inventaren aus dem Abri Blanchard: in gelb Sammlung der Naturhistorischen Gesellschaft Nürnberg [NHG], in blau Sammlung Vésignié), sowie aus dem Abri Castanet I (in orange) and Abri Castanet II (in grau); mit Ausnahme der von uns erhobenen Daten für die Sammlung der NHG stammen die Rohdaten aus Sonnevillle-Bordes (1960).

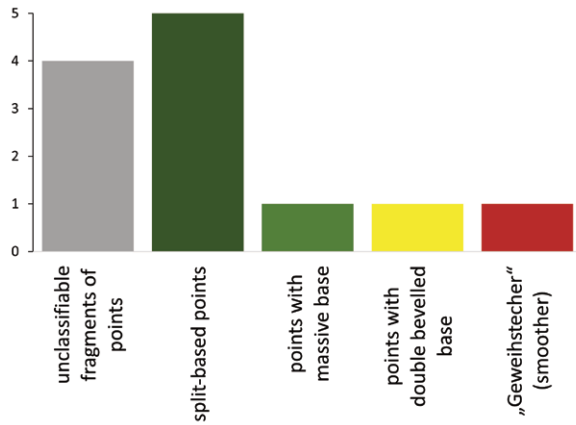
ID	Tool Type	Material	Sum for tool types
774550	Osseous point	Antler	11
774565	Osseous point	Antler	
774571	Osseous point	Antler (?)	
774574	Osseous point	Antler	
774576	Osseous point	Antler	
774577	Osseous point	Antler	
774579	Osseous point	Antler	
774580	Osseous point	Antler	
774581	Osseous point	Antler	
774582	Osseous point	Antler	
774583	Osseous point	Antler	
774511+774513	Piece from production	Antler	7
774512	Piece from production	Antler	
774514	Piece from production	Antler	
774544	Piece from production	Antler	
774551	Piece from production	Antler	
774553	Piece from production	Antler	
774555	Piece from production	Antler	
774545	smoother	Bone	1
774546	Fragment, indeterminable	Ivory	2
774548	Fragment, indeterminable	Indeterminable	
774570	Smoother	Bone	9
774552	Smoother	Bone	
774567	Smoother	Bone	
774569	Smoother	Bone	
774562	Smoother	Bone	
774564	Smoother	Bone	
774563	Smoother	Bone	
774554	Smoother (?)	Bone	
774568	Smoother (?)	Bone	
774578	Awl	Bone	4
774572	Awl	Bone	
774573	Awl	Bone	
774575	Awl	Bone	
774566	Tongued piece	Antler	3
774560	Tongued piece	Antler	
774558	Tongued piece	Antler	
774556	Fragment, indeterminable	Indeterminable	3
774559	Fragment, indeterminable	Antler	
774557	Fragment, indeterminable	Indeterminable	

**Tab. 5.** Overview of the osseous artifacts analyzed in this study (the ID number refers to the inventory numbers in the Naturhistorische Gesellschaft Nürnberg).

**Tab. 5.** Überblick über die analysierten Artefakte aus Knochen, Geweih und Elfenbein (die ID-Nummern beziehen sich auf die Inventarnummern der Stücke in der Sammlung der Naturhistorischen Gesellschaft Nürnberg).

Finally, a Pavlovian smoother (“Geweihstecher”) was identified, too (Fig. 7: 1). The classification is not only based on the characteristic form (Hahn 1993: Fig 106,1; Klíma 1987), which hardly can be confused with other types. In addition, the distinct method of production,

characterized by a variant of the groove and splinter technique that leads to an oblique fragmentation, is so far only described for the Pavlovian (see smoother-like antler tools from Pavlov I Southeast published in Brühl (2005: 271f.) for analogous examples).



**Fig. 5.** Frequency of antler points and pointed tools from antler in the assemblage of Didon's excavation at Abri Blanchard (1910-11) hosted in the Naturhistorische Gesellschaft Nürnberg (1910-11) aus dem Bestand der Naturhistorischen Gesellschaft Nürnberg (colors indicate the degree of agreement to a classification of the respective type as Aurignacian: grey = not relevant, dark green = good agreement, green = agreement, yellow = agreement insecure, red = no agreement).

**Abb. 5.** Häufigkeit von Geschosspitzen und spitzen Werkzeugen aus Geweih in dem Inventar der Grabung Didon im Abri Blanchard (1910-11) aus dem Bestand der Naturhistorischen Gesellschaft Nürnberg (die Farben geben den Grad der Übereinstimmung mit einer Einordnung in das Aurignacien an): grau = nicht relevant, dunkelgrün = gute Übereinstimmung, grün = Übereinstimmung, gelb = Übereinstimmung fraglich, rot = keine Übereinstimmung.

Other specimen indicative of the application of the (less particular) groove and splinter technique (Fig. 8) equally underline the presence of more than one industry. One piece (Fig. 8: 1) is the waste generated when the raw splinter is cut to its desired length. The piece shows a longitudinal fracture along a groove at one lateral and a rough longitudinal fracture on the opposite lateral side. This allows to classify the piece as belonging to a simpler reduction sequence with an initial longitudinal breakage using wedges and a subsequent fragmentation along prepared grooves. The second item (Fig. 8: 2) is a medial fragment that shows parallel grooves from an initial stage of the production process when the grooves were not yet cut deep into the compacta and, thus, did not reach the spongiosa. The piece underlines the presence of the elaborated groove and splinter technique, which is based on removing the laterally predefined blank by using a lever. In general, items indicative of the application of the groove and splinter technique occur mainly at the beginning of the Gravettian (Barth 2007: 184; Goutas 2009: 441), although Hahn (1988a: 202ff, Hahn 1993: 319) discusses pieces from the Aurignacian of Wildscheuer III and Geißenklösterle as representatives of this technology.

Industry	Points		By-products/technological traces		Remarks
	Type	N (Σ = 12)	Description	N (Σ = 7)	
No classification possible	Typologically unclassifiable fragments of point	4	-	-	-
Aurignacien I	Split-based point	5	Tongued pieces	3	Restricted to early Aurignacian contexts*
Aurignacian II (?)	Massive-based point	1	-	-	Ubiquitous occurrence in the Upper Paleolithic**, with most frequent occurrence in the Aurignacian II*
Aurignacian, Gravettian or Magdalenian	Double-beveled point	1	-	-	Mainly in the Magdalenian, but also occurs in the Gravettian (Noaillian)*** and rare occurrence in the Aurignacian****
Gravettian to Magdalenian	-	-	Pieces with traces of „Groove-and-splinter“-technique	3	Both the waste of a further processed splinter (with the distal end and remnants of the lateral fracture along the groove) and a piece with initial traces of the grooves are present
Pavlovian	„Geweihstecher“ (smoother)	1	Parallel bilateral grooves for an oblique fracture of the antler section	1	So far restricted to the Pavlovian**

**Tab. 6.** Points and pointed tools from antler in the assemblage of Didon's excavation at Abri Blanchard (1911) hosted in the Naturhistorische Gesellschaft Nürnberg. Typology, chronological classification and waste products from their production (information for classification taken from \*Tartar et al. 2014; \*\* Hahn 1993; \*\*\*Goutas 2016; \*\*\*\*Wolf et al. 2016).

**Tab. 6.** Geschosspitzen und spitze Werkzeuge aus Geweih in dem Inventar der Grabung Didon im Abri Blanchard (1910-11) aus dem Bestand der Naturhistorischen Gesellschaft Nürnberg. Typologie, chronologische Einordnung und dazugehörige Produktionsabfälle (die Klassifikation und Datierung beruht auf Informationen aus \*Tartar et al. 2014; \*\* Hahn 1993; \*\*\*Goutas 2016; \*\*\*\*Wolf et al. 2016).



**Fig. 6.** (1) Fabrication waste from the production of a tongued piece; (2) split-based point (both from antler) in the assemblage of Didon's excavation at Abri Blanchard (1910-11) hosted in the Naturhistorische Gesellschaft Nürnberg (photos: C. Lechner).

**Abb. 6.** (1) Herstellungsabfall aus der Erzeugung einer gespaltenen Basis "tongued piece"; (2) Geschosspitze mit gespaltenen Basis (beide aus Geweih) in dem Inventar der Grabung Didon im Abri Blanchard (1910-11) aus dem Bestand der Naturhistorischen Gesellschaft Nürnberg (Fotos: C. Lechner).

### Faunal remains

The faunal assemblage consists of 61 specimens (Tab. 7) with an overall weight of 1.4 kg. Without nine mollusks, eleven species were recognized. Six of them are ungulates, and five are represented by carnivores. None of the remains belong to domesticated species, and even though some are indicative of moderate climatic conditions, such as wild boar (*Sus scrofa*) or roe deer (*Capreolus capreolus*), all species can nevertheless be found in Pleistocene habitats of the region (see for example Delpéch et al. 2000). At Abri Blanchard, ungulates are dominated by reindeer (*Rangifer tarandus*, number of identified specimens [NISP] = 13, minimal number of individuals [MNI] = 5), which is represented by comparably large individuals. Among all in all (at minimum) five individuals were three calves aged six to nine months. This indicates that they were killed between November and February, i.e., in the winter season. One item shows traces of the extraction of marrow, whereas another one (Fig. 9: 6) has parallel

cutmarks that resemble those documented at the base of the double-beveled point (Fig. 7: 2). Among the remains of bovid, it was not always possible to differentiate between steppe bison (*Bison priscus*) and aurochs (*Bos primigenius*). The MNI of horse (*Equus ferus*) is two. However, speaking in NISP, horse is as frequent as reindeer. Again, one of the two individuals is comparably large, which may be taken as indication for the presence of cold-adapted animals. Giant deer (*Megaloceros giganteus*), wild boar (*Sus scrofa*) and roe deer (*Capreolus capreolus*) are represented by isolated teeth only. Giant deer belongs to the fauna of the regional Aurignacian, but is also attested for the Early Gravettian (Delpéch & Textier, 2007: 16). Among the carnivore remains, which are composed of a questionable wolverine (*Gulo gulo*), wolf (*Canis lupus*), Arctic fox (*Alopex lagopus*, syn. *Vulpes lagopus*), red fox (*Vulpes vulpes*), and polecat (*Mustela putorius/evermanni*), those of wolf (*Canis lupus*) are the most frequent ones. Seven



**Fig. 7.** (1) Pavlovian smoother "Geweihstecher"; (2) basal fragment of a point with double-beveled base (both from antler) in the assemblage of Didon's excavation at Abri Blanchard (1910-11) hosted in the Naturhistorische Gesellschaft Nürnberg (photos: C. Lechner).

**Abb. 7.** (1) Geweihstecher; (2) Basalfragment einer Geschosspitze mit doppelt abgeschrägter Basis (beide aus Geweih) in dem Inventar der Grabung Didon im Abri Blanchard (1910-11) aus dem Bestand der Naturhistorischen Gesellschaft Nürnberg (Fotos: C. Lechner).



**Fig. 8.** By-products of the „groove-and-splinter“-technique in the assemblage of Didon's excavation at Abri Blanchard (1910-11) hosted in the Naturhistorische Gesellschaft Nürnberg: (1) waste representing one of the ends of a splinter blank after it had been cut to the desired length with a breakage along a groove on the left lateral and a rough breakage on the right lateral going back to a previous longitudinal fragmentation of the antler using wedges; (2) half-product of the elaborated "groove-and-splinter"-technique with two parallel grooves (photos: C. Lechner).

**Abb. 8.** Abfälle der „groove-and-splinter“-Methode in dem Inventar der Grabung Didon im Abri Blanchard (1910-11) aus dem Bestand der Naturhistorischen Gesellschaft Nürnberg: (1) Endstück eines Spans nach dessen Kürzung auf die gewünschte Länge, linkslateral mit glatter, durch Stichelbahn erzeugter Rille, rechtslateral mit rauer Bruchkante, die aus der vorhergehenden Spaltung des Geweihstückes mittels Zwischenstücken resultiert; (2) Stück mit parallelen Rillen zur Vorbereitung der „groove-and-splinter“-Methode (Fotos: C. Lechner).

Species	NISP	Weight in g	MNI	Cold	Cold/warm	Warm
<b>Ungulates</b>						
<i>Rangifer tarandus</i>	13	273.1	5	X	-	-
<i>Bos primigenius/Bison bison</i>	5	194.0	2	X	X	X
<i>Equus ferus</i>	13	728.0	2	X	X	X
<i>Bos primigenius</i>	3	115.6	1	-	-	X
<i>Megaloceros giganteus</i>	1	60.8	1	X	-	-
<i>Sus scrofa</i>	1	1.3	1	-	X	X
<i>Capreolus capreolus</i>	1	0.1	1	(X)	X	X
<b>Carnivores</b>						
<i>Canis lupus</i>	7	8.9	3	X	X	X
<i>Gulo gulo?</i>	1	0.2	1	X	-	-
<i>Alopex lagopus</i>	2	0.7	1	X	-	-
<i>Vulpes vulpes</i>	2	0.7	1	X	-	X
<i>Vulpes (sp.)</i>	2	1.2	1	X	X	X
<i>Mustela putoris/eversmanni</i>	1	0.1	1	X	-	X
<b>Others</b>						
<i>Molluscs indet.</i>	9	15.6	-	-	-	-
<b>Total</b>	<b>61</b>	<b>1,400.3</b>	<b>21</b>	<b>-</b>	<b>-</b>	<b>-</b>

**Tab. 7.** Number of identified specimen (NISP), weight, minimal number of individuals (MNI) and possible temporal assignment by means of climate preference for each species identified among faunal remains of Didon’s excavation at Abri Blanchard (1910-11) hosted in the Naturhistorische Gesellschaft Nürnberg.

**Tab. 7.** Anzahl der Knochenfundstücke (NISP), des Gewichts, die minimale Anzahl der Individuen (MNI) und die konventionelle Zuordnung anhand der Klimapräferenzen für die Arten, die in dem Fauneninventar der Grabung Didon im Abri Blanchard (1910-11) aus dem Bestand der Naturhistorischen Gesellschaft Nürnberg erkannt werden konnten.

teeth from at least three individuals could be distinguished. The estimation of the MNI is not only based on the fact that one tooth is an artifact, but on the additional observation that the others differ in the degree of abrasion. Because animal teeth were systematically used in the Aurignacian as raw material blanks for personal ornament (Vanhaeren & d’Errico 2006), and since one wolf tooth is perforated, it cannot be excluded that the teeth result from anthropogenic selection. Therefore, it is worth mentioning that at least two wolf individuals must have been of extremely large body size. In general, the occurrence of species indicative of both cold and moderate climatic conditions (Tab. 7) does not contradict to a Pleistocene date. However, on first look the remains of red fox (*Vulpes vulpes*) could be seen as intrusive. However, red fox is common in the Aurignacian and the Gravettian even of the Swabian Jura (Baumann et al. 2020) with its comparably harsh conditions. Consequently, it is also found in the Aurignacian and Gravettian of Southwestern France with its more moderate climatic conditions (Lacarrière 2015: 44). In addition to two mollusks with intentional perforations (Fig. 9: 2 & 4), there are three animal teeth with perforated roots. These include the wolf incisor, which is not only perforated, but also intentionally smoothed around the perforation (Fig. 9: 5), a fox canine (Fig. 9: 1), and a horse canine (Fig. 9: 3).

## Discussion

The assemblage from Abri Blanchard hosted in the Naturhistorische Gesellschaft Nürnberg mainly consists of lithic and osseous artifacts that fit well into the variability of the Aurignacian. Carinated end scrapers/cores, carinated nosed end scrapers/cores, carinated burins/burin cores and blades with a lateral notch are all indicative for an Aurignacian industry. The other lithic tools belong to the “outillage de fond commun” of the Upper Paleolithic and neither support nor contradict to an Aurignacian classification. This finding confirms the results of previous analysis of finds from Didon’s excavations now archived in museums in the United States of America (Tartar et al. 2014) as well as those from studies of the most recent finds from the novel excavations (Chiotti et al. 2015; Bourrillon et al. 2018). There is a constant debate about the Aurignacian in general whether a differentiation between different chronological facies of the Aurignacian is possible (Teyssandier 2007; Tartar et al. 2014; Chiotti et al. 2015), or if, instead, the variability observed is better explained by site function and/or processes of regionalization (Bataille & Conard 2018; Kitagawa & Conard 2020). Unfortunately, the materials excavated from the Abri Blanchard cannot contribute to the solution of this question. First, although Didon (1911) recognized two archaeological layers, he did not keep the respective assemblages separated, most probably



**Fig. 9.** Personal ornament and faunal remain with anthropogenic cutmarks in the assemblage of Didon's excavation at Abri Blanchard (1910-11) hosted in the Naturhistorische Gesellschaft Nürnberg: (1) perforated fox canine; (2 & 4) intentionally perforated mollusk; (3) perforated horse canine; (5) perforated and intentionally flattened wolf incisor; (6) reindeer humerus with distinct cutmarks (photos: K. Pasda).

**Abb. 9.** Schmuckanhänger und Stück mit Schnittspuren aus dem Inventar der Grabung Didon im Abri Blanchard (1910-11) aus dem Bestand der Naturhistorischen Gesellschaft Nürnberg: (1) durchbohrter Eckzahn vom Fuchs; (2 & 4) durchbohrte Schnecken; (3) durchbohrter Eckzahn vom Pferd; (5) durchbohrter und im Bereich der Bohrung geglätteter Schneidezahn eines (großen) Wolfs; (6) Humerus von Rentier mit starken Schnittspuren (Fotos: K. Pasda).

because at the time the internal variability of the Aurignacian was not yet recognized. In addition, the upper layer was identified as being not in situ in the course of the recent excavations (Tatar et al. 2014; Bourrillon et al. 2018). This is the more disappointing as the analysis of the lithic material from these excavations (Chiotti et al. 2015) indicate the presence of two technologically and typologically different Aurignacian assemblages (Tab. 8): the lower layer (Sector 4/5) yielded carinated end scrapers/cores, whereas the upper layer (Sector 1) not only had carinated end scrapers/cores with a narrower front, but also nosed carinated end scrapers and carinated burins/burin cores. The authors conclude on the presence of an earlier and a later Aurignacian. The lithics in the collection of the Naturhistorische Gesellschaft match very well the differences observed among the recently excavated artifacts from Abri Blanchard. Like the assemblages from Sector 4/5 and Sector 1 (as the stratigraphical equivalents of Didon's lower and upper layer), the carinated pieces analyzed here can be subdivided into an (earlier) group with carinated end scrapers/

cores on the one hand and a (later) group containing nosed carinated end scrapers/cores and carinated burins on the other. This bipartite character of the archaeological finds has also been found in the analysis of the newly excavated points from bone, ivory, and antler (Bourrillon et al. 2018) and in the re-analysis of osseous materials from Didon's excavations now being archived in the United States (Tatar et al. 2014). If the classification scheme of Tartar et al. (2014) for osseous points and its chronological interpretation is also applied here (Tab. 3), then it is possible to also differentiate the points from the Naturhistorische Gesellschaft Nürnberg in an earlier Aurignacian with split-based points (corresponding to the equally present tongued pieces), and a later Aurignacian with massive-based points (Tab. 8).

However, there are artifacts that fall out of the Aurignacian variability. Among the lithic artifacts, these are Noailles burins, Gravette points and a bidirectional core. Furthermore, there are also items among the osseous artifacts that are almost certainly of post-Aurignacian origin (Tab. 8), i.e., a double-beveled

Classification based upon new excavations (R. White) and re-analysis of museum collections	Didon 's/ Castanet 's excavations 1910	White 's excavations 2011-12		Re-analysis of old collections	
	Stratigraphical observations		Artifacts from well-documented strata	Collections in the US (New York, Castine, Beloit, Chicago)	Collection of the Naturhistorische Gesellschaft Nürnberg
	Didon 1910	Chiotti et al. 2015 ; White et al. 2016		Tartar et al. 2014	This study
Pavlovian	Not present in the excavated area			Not present	„Geweihstecher“, antler blank produced by Pavlovian method
Post-Aurignacian Upper Paleolithic	"Groove-and-splinter"-method Backed points, bi-directional core, longitudinal methods for the manufacture of blanks from bone/antler, double-beveled point Point of Isturitz type Noailles burins			"Groove-and-splinter"-method	Backed points, bi-directional core, longitudinal methods for the manufacture of blanks from bone/antler, double-beveled point
Noaillien				Point of Isturitz type	Noailles burins
Recent Aurignacien (Aurignacien II)	Upper Layer	Sector 1: not in situ: deposited by gravity, affected by running water	retouched bladelets („Roc-du-Combe“-type), carinated cores (elongated carinated end scrapers with narrow front, carinated nosed end scrapers, carinated burins), Vachons type burins	In addition to the characteristics of the lithic assemblage: points with massive base	In addition to the characteristics of the lithic assemblage: points with massive base
-	Limestone blocks from the collapse of the ceiling		No archaeological finds	Assemblages from the Lower and Upper Layer not kept separately by Didon	
Early Aurignacien (Aurignacien I)	Lower Layer	Sector 4/5: in situ, brecciated	retouched bladelets („Roc-du-Combe“-type), carinated cores (carinated end scrapers)	In addition to the characteristics of the lithic assemblage: split-based points	In addition to the characteristics of the lithic assemblage: split-based points, „tongued pieces“, fauna with well-preserved surface

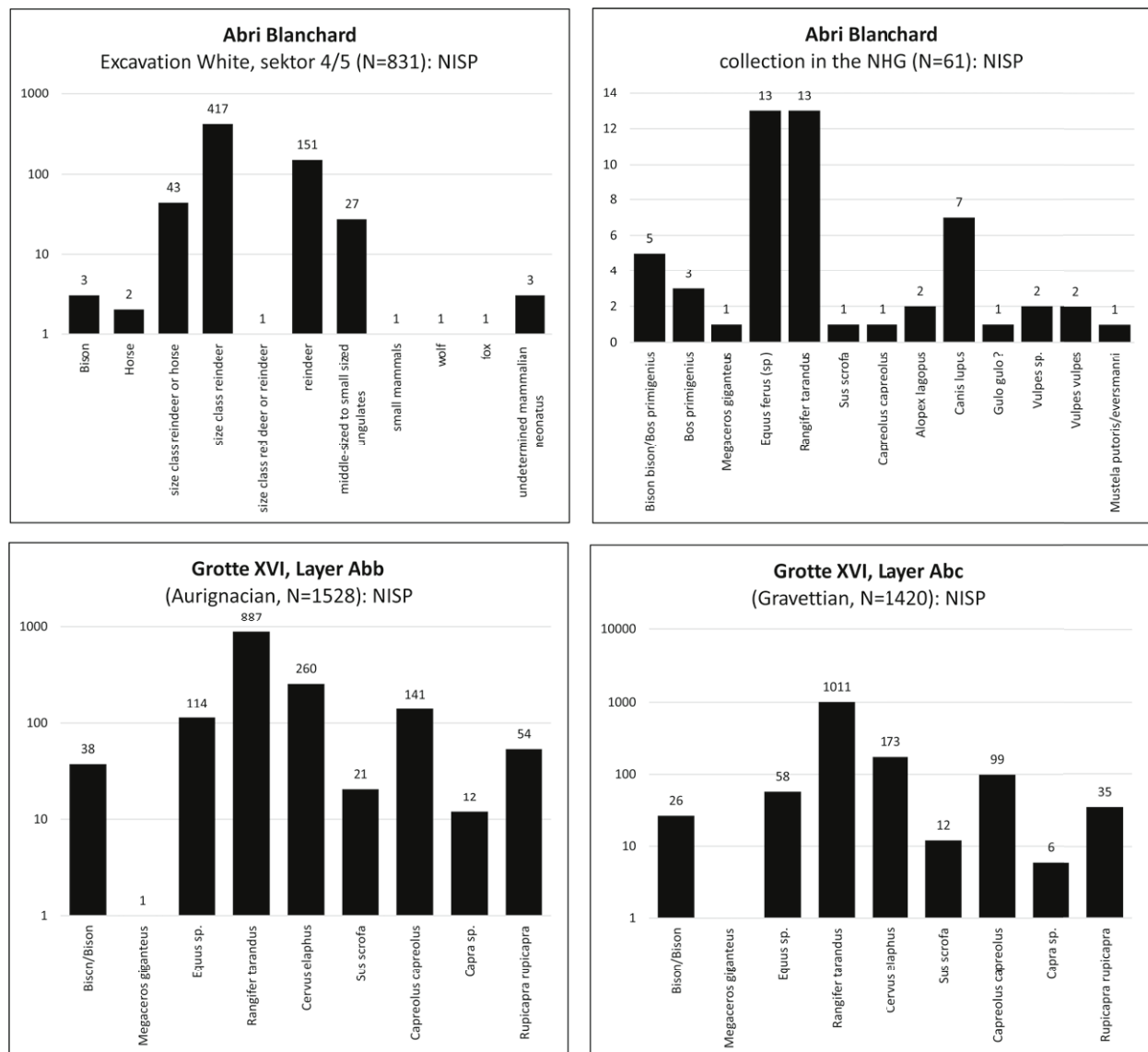
**Tab. 8.** Schematic representation of the results from previous studies of the lithic and osseous assemblages from different excavations and collections at the Abri Blanchard compared to those from the present study: (green) results are in good agreement with a classification as Aurignacian; (yellow) results are indicative of post-depositional processes; (orange) results contradict to a classification as Aurignacian, but are in good agreement with the regional Upper Paleolithic record; (red) results not only contradict to a classification as Aurignacian, but at the same time contradict to a regional Upper Paleolithic origin.

**Tab. 8.** Schematische Wiedergabe der bisherigen Forschungsergebnisse zu den Inventaren der Steingeräte und der Artefakte aus Knochen, Geweih und Elfenbein aus verschiedenen Grabungen und Sammlungen im Vergleich zu den Ergebnissen der vorliegenden Untersuchungen: (grün) Ergebnisse unterstützen eine Klassifikation als Aurignacien; (gelb) Ergebnisse zeigen post-depositionale Prozesse an; (orange) Ergebnisse widersprechen einer Klassifikation als Aurignacien, aber passen in den Kontext des regionalen Jungpaläolithikums; (rot) Ergebnisse widersprechen nicht nur einer Klassifikation als Aurignacien, sondern stehen gleichzeitig auch im Widerspruch zu einer Einordnung in das regionale Jungpaläolithikum.

point, a Pavlovian smoother ("Geweihstecher"), and pieces that stem from the application of the groove and splinter technique. The Noailles burins, the Gravette points and the bidirectional core would comfortably fit to the presence of a Gravettian component at the site, as already detected among the osseous industry in the collections in the United States by Tartar et al. (2014). However, the association of these potentially Gravettian pieces with a smoother indicative for a Pavlovian, and a possible Magdalenian component consisting of a double beveled point made from antler, unfortunately increase the number of possible explanations for the non-Aurignacian component. In the following, we discuss arguments for and against four not mutually exclusive hypothesis which can be deduced from this.

Hypothesis 1: There is only one non-Aurignacian component, which is Gravettian. It has already been underlined that only the Noailles burins in the non-Aurignacian component allow a precise classification in one of the industries or facies of the Gravettian, i.e., the Noaillien. However, also a combination of Noailles burins, Gravette points, bidirectional cores (Pesesse 2017) and double-beveled points (Goutas 2016) would allow a classification as such. To the contrary, the postulate of several mixing events for the Gravettian component (with material from different Gravettian layers and/or sites) would imply an additional, in our view unnecessary, complexity of the argumentation. However, the presence of the Pavlovian smoother ("Geweihstecher") clearly speaks against hypothesis 1.





**Fig. 10.** Comparison of the number of identified specimen (NISP) in the faunal assemblages from Abri Blanchard and Grotte XVI: (**upper left**) Abri Blanchard excavations White, data taken from Bourrillon et al. (2018: Tab. 2); (**upper right**) Abri Blanchard this study; (**lower left**) Grotte XVI layer Abb, data taken from Grayson & Delpech (2003: Tab. 2); (**lower right**) Grotte XVI layer Abc, data taken from Grayson & Delpech (2003: Tab. 2).

**Abb. 10.** Vergleich der Knochenfundzahl ("number of identified specimen/NISP") in den Fauneninventaren aus dem Abri Blanchard und der Grotte XVI: (**oben links**) Abri Blanchard Grabungen White, Daten verändert aus Bourrillon et al. (2018: Tab. 2); (**oben rechts**) Abri Blanchard Daten aus der vorliegenden Untersuchung); (**unten links**) Grotte XVI Schicht Abb, Daten verändert aus Grayson & Delpech (2003: Tab. 2); (**unten rechts**) Grotte XVI Schicht Abc, Daten verändert aus Grayson & Delpech (2003: Tab. 2).

**Hypothesis 2: The non-Aurignacian component consists of artifacts from several industries.** Hypothesis 2 is most strongly supported by the combination of the Noailles burins and the Pavlovian smoother ("Geweihstecher"). The geographic distributions of the two types exclude each other. In France, Noailles burins are distributed South of the Loire and North of the Ebro in France, and they are also found in Northern Italy (Klaric 2007: 186 & Fig. 8). Pavlovian smoothers ("Geweihstecher"), to the contrary, are only known from Central and Eastern Europe (i.e., the Upper Danubian corridor: Svoboda 2004).

**Hypothesis 3: The non-Aurignacian component is the result of post-excavation intermixture with materials from other sites.** What favors hypothesis 3

is the fact that an admixture with lithic "fossiles directeurs" of the Gravettian was neither observed during the recent excavations nor were they reported by Didon (1911: 251). The only Gravettian component detected prior to our studies was published by Tartar et al. (2014), who identified a piece from antler with traces of the groove and splinter technique and a point of Isturitz type. Therefore, Tartar et al. (2014) assume that Didon, while selecting items for sale, by mistake mixed artifacts from his contemporaneous excavations in the Castel-Merle Valley. Such an interpretation is supported by the fact that Didon's excavations at the Abri Labattut unearthed Gravettian layers with Noailles burins (Vignoles et al. 2021) and Isturitz points (Movius 1973). Other excavations in the

Castel-Merle Valley with Upper Paleolithic materials prior to the sale of artifacts from Abri Blanchard to the Naturhistorische Gesellschaft Nürnberg were, for example, conducted by Peyrony, who in 1909 investigated a small sector of Abri Blanchard II (Sonneville-Bordes 1960: 210).

Hypothesis 4: The Gravettian part of the non-Aurignacian component was found at Abri Blanchard. What casts doubt on the assumptions that the non-Aurignacian components result from an admixture with objects from sites other than the Abri Blanchard is the careful selection of all components in the collection hosted in the Naturhistorische Gesellschaft Nürnberg. The aim to provide a representative sample is more than obvious. Almost all lithics are well preserved, large – if not “beautiful” – and highly typical examples for what was recognized at Didon’s time as type fossils. Not only the lithics (dominance of carinated pieces), but also the (split-based and massive-based) bone points and faunal remains seem to be handpicked even regarding their frequencies. This also applies for the faunal remains. The frequencies of the animal species are quite similar to those of the faunal assemblage from the recent excavations (Bourrillon et al. 2018). In addition, they give a good impression of the anthropogenic alterations as they include examples of personal ornament. This careful selection, probably caused by the supervision of the sale transfer by Obermaier, makes an (at least extensive) unintended confusion of lithics from several sites less probable. What contradicts to this notion is the fact that Didon himself (Didon 1911) does not mention a Gravettian component at Abri Blanchard, and that the collection from the Naturhistorische Gesellschaft is the only one so far to contain Noailles burins. It seems highly unlikely that Didon did not keep examples of this highly distinctive Gravettian type for his own collection. In addition, the burins in the collection studied here show a higher typological variability than other assemblages from old excavations at Abri Blanchard and Abri Castanet. It cannot be excluded that most part of the burins on retouched truncation, which are almost absent in the Aurignacian collections studied by Sonneville-Bordes (Fig. 4), are also of Gravettian origin. This would point to an even more pronounced mixing – and a less careful selection – of pieces by Didon.

Hypothesis 5: The analysis of the faunal remains allows to estimate the degree of admixture with a non-Aurignacian component. In general, the faunal remains from Abri Blanchard do not allow to securely decide for or against the presence of mixing. The main reason for this is that the observed presence of species supposed to prefer more moderate climatic conditions, like roe deer and wild boar, and cold adapted species cannot be used for any correlations with specific climatic conditions and, therefore, fauna from different time periods. For example, both the Aurignacian and the Gravettian faunal assemblages

of the nearby Grotte XVI (Grayson & Delpech 2003: Tab. 2) include reindeer and horse alongside with red deer, roe deer, and wild boar (Fig. 10). Even giant deer, which in the case of Grotte XVI is only present in the Aurignacian layer, is known from other sites of the regional Gravettian (Delpech & Texier 2007: 16). Obviously, the regional and local conditions enabled a mosaic of different plant and animal communities to coexist in a relatively small area. Almost certainly, narrow and wind protected valleys like the Castel-Merle Valley would have profited from slightly higher temperatures and more moderate local conditions. This could have provided conditions suitable for the red fox, which has been reported from Gravettian sites of Southwestern France (Lacarrière 2015). These occurrences testify the general presence of red fox in the wider region and weaken the argument that its exclusive presence in Nürnberg among the collections from Abri Blanchard indicates a mixing with fauna originally coming from distant site clusters.

## Conclusion

In the course of a revision of Paleolithic assemblages archived in the Naturhistorische Gesellschaft Nürnberg, the authors found a hitherto unpublished collection from Didon’s excavations in the Abri Blanchard. The assemblage consists of 323 objects including lithic artifacts, osseous artifacts, and fauna. In addition, there are pieces of brecciated sediment with faunal remains and fragments of lithics artifacts in it. The assemblage was bought by the Naturhistorische Gesellschaft Nürnberg in 1912 directly from Didon through the agency of Obermaier. Unfortunately, Didon is known for not having separated the finds he made in the lower and upper layer of Abri Blanchard. This also applies for the collection studied here. In addition, recent excavations (Bourrillon et al. 2016) revealed that the lower layer was in situ, whereas the upper find horizon was deposited by colluvial processes. Lithic and osseous artifacts from the modern excavations as well as those from other collections studied so far were subdivided in an earlier Aurignacian and a later Aurignacian (Tartar et al. 2014; Chiotti et al. 2015). This subdivision can also be applied to the collection from Nürnberg. Among the “fossiles directeurs” of the Aurignacian, which make up one third of the lithic assemblage, carinated end scrapers/cores are conventionally acknowledged to be typical for an early Aurignacian, whilst carinated nosed end scrapers/cores and carinated burins/burin cores are a characteristic element of a later Aurignacian. Most of the osseous industry from Nürnberg matches well with the bipartite Aurignacian structure of the lithic assemblage. It is characterized by split-based points and tongued pieces on the one hand, and massive-based points on the other. In this, the Aurignacian component among the lithic and osseous artifacts from Nürnberg is similar to other collections

from Abri Blanchard. The same applies for the faunal remains, which are dominated by reindeer, bovinds and horse and correspond well to the composition of the recently excavated materials. The collection from Naturhistorische Gesellschaft Nürnberg also contains perforated animal teeth and mollusks interpreted as personal ornament. Unlike the materials from the well documented recent excavations at Abri Blanchard, and in contrast to other collections from Didon's excavation in the United States, the material from the Naturhistorische Gesellschaft Nürnberg contains pieces inconsistent with a classification as Aurignacian. Several Gravette points and a bidirectional core would comfortably fit into a Gravettian *sensu lato*. A small series of Noailles burins can be taken as an indication that the Gravettian pieces more precisely may belong to a Noaillian. A classification as Noaillian is supported by an osseous point of Isturitz type found in collections from Abri Blanchard hosted in the United States (Tartar et al. 2014). This re-analysis also detected antler pieces with traces of the groove and splinter technique, which we were able to identify, too. It has already been assumed that the Gravettian component in the old collections from Abri Blanchard results from an unintended mixture of finds from Abri Blanchard (Aurignacian) and Abri Labattut (Noaillian), which were both excavated by Didon (Tartar et al. 2014) at about the same time. The situation in the Naturhistorische Gesellschaft Nürnberg is complicated by the fact that there are two other items that enlarge the number of possible post-Aurignacian components. One is a double-beveled point from antler, and the other a Pavlovian smoother ("Geweihstecher). That the Pavlovian smoother indicates an additional event of admixture with material foreign not only to the Castel-Merle Valley, but to Southwestern Europe in general, is almost certain. The fact that Pavlovian sites are known from Bavaria (Reisch 2008) opens the possibility that the Pavlovian smoother originally belonged to a hitherto unknown excavation in the wider vicinity of Nürnberg. To give only one example, Obernedler is reported to have test-trenched the site of Abri I im Dorf in the Lower Altmühl Valley in 1910 without finding artifacts, although later excavations of the small rock shelter unearthed a lithic assemblage associated with a shovel-like tool made from ivory typical for the Moravian Pavlovian (Reisch 2008: 43; for comparable pieces from Pavolv see Wojtal & Wilczyński 2015: Fig. 10). Given the many not documented excavation activities until the 1950ties especially in the Franconian Alb, it is quite probable that the smoother comes from a Bavarian Pavlovian site. If so, then the admixture happened in the Naturhistorische Gesellschaft Nürnberg. To the contrary, due to its large geographic and chronological distribution, the origin of the double-beveled antler point is difficult to assess. If its presence alone should already be taken as an indicator for a Magdalenian component also among the lithic artifacts, is far from certain, even

more so as double-beveled points are also part of the Noaillian osseous tool kit (Goutas 2016). Therefore, a sub-division into Aurignacian, Gravettian and Magdalenian would not help to explain the structure of the lithic assemblage better than the simpler combination of (mainly) Aurignacian and (some) Gravettian lithic artifacts.

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