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SPY CAVE

125 years of multidisciplinary research
at the Betche aux Rotches
(Jemeppe-sur-Sambre, Province of Namur, Belgium)

Edited by Hélène ROUGIER & Patrick SEMAL

Volume 1

2013

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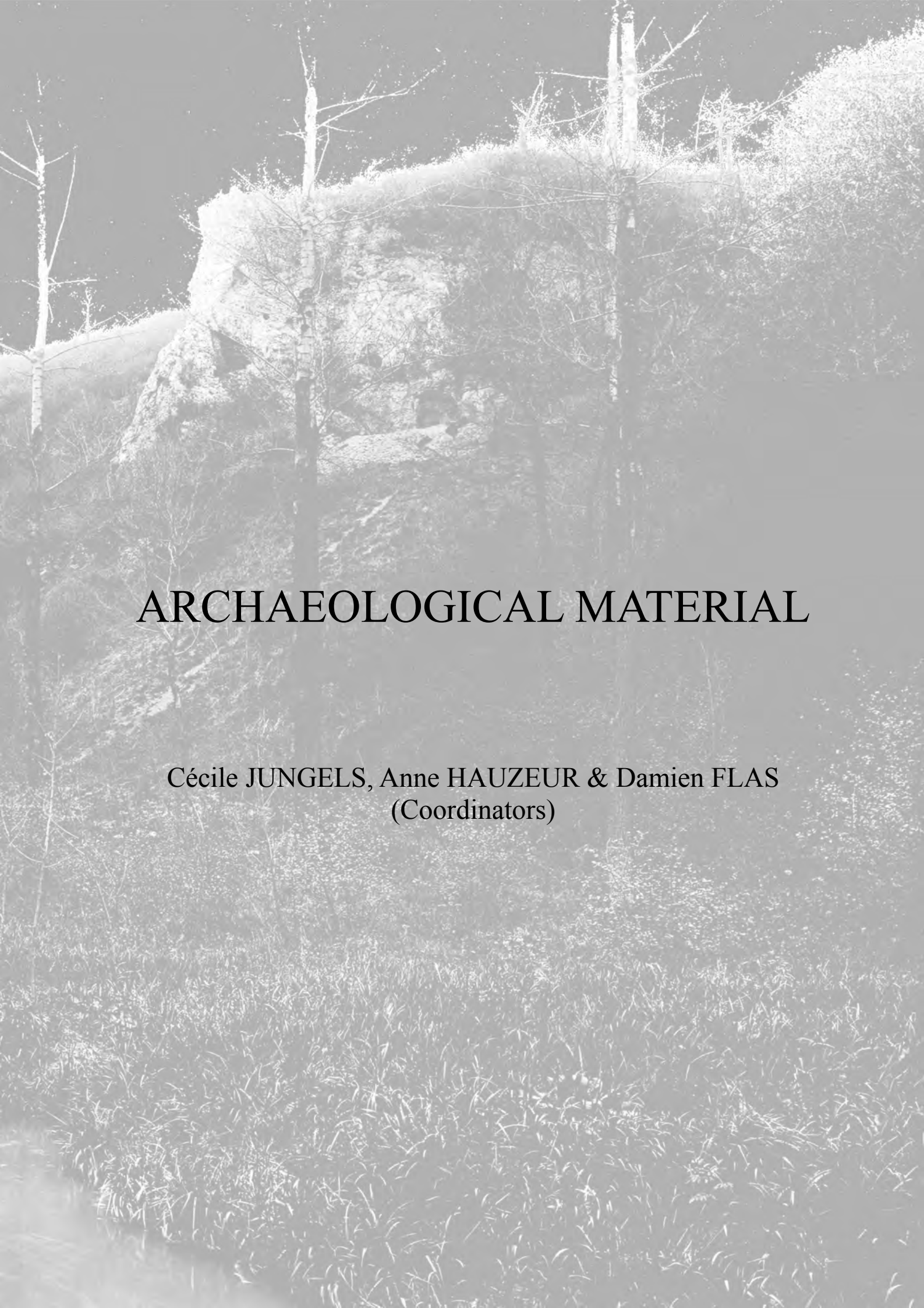

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CHAPTER IX

WHAT DO WE KNOW TODAY ABOUT THE MIDDLE PALAEOLITHIC OF SPY?

Kévin DI MODICA, Cécile JUNGELS & Anne HAUZEUR

Abstract

Numerous studies concerning the almost entirely Middle Palaeolithic material from Spy cave have focused on trying to define the cultural context of the Neandertal remains recovered from the site. Over the last 125 years, various interpretations have been proposed, with several different Middle Palaeolithic or so-called "transitional" cultural facies having been identified. This chapter presents a critical review of the available stratigraphic and spatial data concerning the Middle Palaeolithic at Spy, complemented by an investigation of taphonomic aspects, raw material use, technology and typology. A new interpretation of the site's Middle Palaeolithic occupation distinguishes at least 3 different assemblages. Influences from both Western Europe and Central/Eastern Europe have been highlighted, and it is proposed that the Spy Middle Palaeolithic material reflects several Neandertal occupations extending from MIS 5 to MIS 3. Finally, several possibilities concerning the cultural attribution of the Neandertal skeletal material are explored.

INTRODUCTION

Spy cave is a major Palaeolithic site in Belgium, primarily due to the 19th century discovery of well-preserved Neandertal remains from a known stratigraphic context that considerably enhanced the site's international prestige. Substantial archaeological material was recovered from the site in the course of multiple excavations beginning in 1879 and continuing sporadically thereafter for more than a century. Unfortunately, these excavations seem to have totally emptied the cave of what was largely Middle Palaeolithic cultural material. Subject of numerous studies (e.g. Ulrix-Closset, 1975; see Semal *et al.*, 2011 for further details), probably the most controversial aspect of this material remains the cultural association of the Neandertal skeletal material (e.g. Bordes, 1959). In the framework of this monograph devoted primarily to the Neandertal remains recovered from the site, we present a critical re-examination of the Middle Palaeolithic collections and their significance.

The early date of the most consequential excavations at Spy, coupled with the numerous subsequent fieldwork campaigns (Semal *et al.*, this volume: chapter II), today complicates the study of the archaeological material for several reasons:

- Excavations were undertaken by various scientific institutions or amateur archaeologists resulting in the material being dispersed amongst numerous public and private collections across Belgium.
- The integrity of these collections has suffered to varying degrees (e.g. loss, theft, destruction of archival material) or were mixed and/or re-assigned to different stratigraphic layers based on stone tool typology.
- The lack of accurate information concerning the stratigraphic position and spatial distribution of the artefacts also makes elucidating their context and defining discrete archaeological assemblages complicated, if not impossible.
- Not all the archaeological material was collected during the various fieldwork campaigns, creating obvious biases in terms of the site's original contents.

Consequently, the fact that the original subdivision of the Middle Palaeolithic artefacts into multiple "archaeological levels" was based on unreliable stratigraphic information renders technological or typological criteria the sole means of assigning certain stone tools to this

period. In much the same way, it is impossible to associate the human skeletal material or faunal remains with a particular stone tool production system, especially as the former have no chronological relevance. The above clearly demonstrates the suite of problems that need to be taken into consideration when re-examining the totality of available data prior to any consideration of the site's Neandertal occupation such that unsupported interpretations can be avoided (e.g. Germonpré *et al.*, 2012).

While the original stratigraphic attributions may be partially useful, they should be employed cautiously given advances over the last two decades in our understanding of the complex periglacial sedimentary processes active in cave entrance contexts. Recent research, notably at Scladina cave, has highlighted the impact of sedimentary dynamics on both the spatial and stratigraphic distribution of archaeological materials as well as their preservation (Texier & Bertran, 1993; Bertran, 1994, 2004, 2006; Bordes, 2000; Lenoble *et al.*, 2003, 2008, 2009; Texier *et al.*, 2004; Pirson, 2007; Pirson *et al.*, 2008, 2011; Bonjean *et al.*, 2009). In these contexts, notions such as "occupations" or even "sites" (*sensu* Depaepe, 2010) are inappropriate, meaning that today Spy should most accurately be described simply as a "*gisement*" (*sensu* Depaepe, 2010) from which only the most significant cultural or technological trends can be identified.

These numerous limitations render obsolete the traditional view of the Middle Palaeolithic occupation of Spy, which is based primarily on the typologically focused analyses of H. Breuil (1912), F. Bordes (1959), and M. Ulrix-Closset (1975). The identification of "archaeological levels" and their correlation with sedimentary deposits divided into "fauna-bearing levels" as well as the proposed association of at least part of the archaeological material with the Neandertal remains is no longer tenable. A re-examination of the lithic material thus appeared the logical first step for investigating its interest for understanding the Middle Palaeolithic occupation of Spy.

The first part of this chapter retraces the key historical aspects that have influenced the overall vision of the Middle Palaeolithic from Spy, while the second part outlines the sampling strategy adopted for re-examining collections and describes the archaeological material. The final section discusses the Middle Palaeolithic material against the backdrop of the Middle Palaeolithic in Belgium and the broader North-West European context.

HISTORICAL PERSPECTIVES CONCERNING THE MIDDLE PALAEOLITHIC OF SPY

Since the earliest discoveries, the archaeological material from Spy has been the subject of numerous commentaries. Although several different "cultural levels" have gradually been identified (Table 1), their integrity, relevance to the stratigraphy (especially the "fauna-bearing levels" identified on the terrace by M. De Puydt and M. Lohest in 1886), and possible post-depositional disturbances have all been the subject of critical discussions (e.g. Breuil, 1912; Bordes, 1959; Ulrix-Closset, 1975; Jungels, 2009; Semal *et al.*, 2011). Several of these "cultural levels" are either Middle Palaeolithic or relate to the so-called Middle-to-Upper Palaeolithic "transition", and are traditionally connected to the "second and third fauna-bearing levels" identified on the terrace as well as deposits within the cave (see Semal *et al.*, this volume: chapter II; see Table 1 for their major characteristics).

A Middle Palaeolithic component of at least part of the archaeological material was identified early on (Table 1). While only one Mousterian level, described as being "contemporaneous with mammoth", was recognised by M. De Puydt & M. Lohest (1886: 38) during their first excavation campaign, the three now well-known "fauna-bearing levels" were distinguished during the second season and deemed illustrative of three evolutionary stages of the Mousterian, each associated with a faunal assemblage typical of the "Mammoth Age" (De Puydt & Lohest, 1887). Shortly thereafter, the "first fauna-bearing level" was assigned to the Upper Palaeolithic ("Goyet type" or "Pont-à-Lesse type" of Ed. Dupont, 1872; Fraipont & Lohest, 1887; Rutot, 1904; Breuil, 1907a, 1907b; de Loë & Rahir, 1911). Since then, discussions concerning the Middle Palaeolithic focused solely on the "second and third fauna-bearing levels" identified on the terrace and deposits within the cave.

Cultural succession based on the stratigraphy				
Terrace			Cave	
"First fauna-bearing level"	*"Second fauna-bearing level"*	*"Third fauna-bearing level"*		
			"Pont-à-Lesse type"	Rucquoy, 1886-1887
a single Mousterian level				De Puydt & Lohest, 1886
Mousterian	Mousterian includes bone industry and ceramics	Mousterian **Associated Neandertal remains**		De Puydt & Lohest, 1887
Similar to the "1st fauna-bearing level" at Goyet cave	No comparison "*Évoque le Moustérien par la taille du silex et le Magdalénien par la manufacture sur os et sur ivoire*"			Fraipont & Lohest, 1886, 1887
			"*Quelques instruments du type chelléen*" found in the lowest layer by A. Rucquoy	Fraipont, 1891
"Pont-à-Lesse type"				Dupont, 1892
Eburnean "Goyet type"	Eburnean "Pont-à-Lesse type"	Eburnean "Montaigle type" **Associated Neandertal remains**		Rutot, 1904
"Pont-à-Lesse type" = Upper Aurignacian or Solutrean	"Montaigle type" = Middle Aurignacian	"Hastière type" = Lower Aurignacian		Rutot, 1906
"Pont-à-Lesse type" "*avec pointes à soie et […] prototypes solutréens habituels*"	"Montaigle type" "*riche en pointes moustériennes et racloirs, en grattoirs carénés […] ; il y avait, avec de nombreux ivoires travaillés, des poinçons en os, des pointes en os, à base fendue, du type d'Aurignac*"	"*Niveau inférieur, à silex moustériens et os utilisé*"		Breuil, 1907a
"Pont-à-Lesse type" "*Rappelle ce que je considère en France comme le passage de l'Aurignacien au Solutréen*"	"Montaigle type" = Middle Aurignacian	"Hastière type" = Mousterian with utilised bones		Breuil, 1907b
Upper Aurignacian	Middle Aurignacian	Lower Aurignacian		Rutot, 1909
Upper Aurignacian	Middle Aurignacian	"Quina and Hastière type industry" = Lower Aurignacian **Associated Neandertal remains**		Rutot, 1910
"Pont-à-Lesse type" = Upper Aurignacian	"Montaigle type" = Middle Aurignacian	"Hastière type" = Lower Aurignacian	Equivalent to the "3rd fauna-bearing level" of the terrace	de Loë & Rahir, 1911
			Early Mousterian with bifaces Older than the "3rd fauna-bearing level" on the terrace	Hamal-Nandrin *et al.*, 1939

Cultural succession based on stone tool typology					
Final Aurignacian, transition toward Solutrean. Solutrean might be present in the "1st fauna-bearing level" of de Loë & Rahir excavations	Typical Aurignacian End of Mid. Aurignacian, in De Puydt & Lohest's "2nd fauna-bearing level", or de Loë & Rahir's "2nd fauna-bearing level"	Upper Mousterian **Associated Neandertal burials** In De Puydt & Lohest's "2nd fauna-bearing level", or de Loë & Rahir's "3rd fauna-bearing level"	"Early Mousterian" In De Puydt & Lohest's "3rd fauna-bearing level", in de Loë & Rahir's "3rd fauna-bearing level"	"*une couche intacte avec éclats d'aspect général grossier, et six coups-de-poing assez grands*"	Breuil, 1912
"*Aurignacien final avec toute la transition vers le solutréen, et peut-être un peu de celui-ci*"	Typical Aurignacian, end of the Middle phase	Late Mousterian **Associated Neandertal remains**	"Early Mousterian" Inside the cave and in the "3rd fauna-bearing level" of the terrace		de Loë, 1928
Final Aurignacian	Typical Aurignacian	Late Mousterian **Associated Neandertal remains**	"Early Mousterian" on the terrace		Rahir, 1928
		Charentian of Quina type **Associated Neandertal remains**		Mousterian of Acheulean Tradition (MTA)	Bordes, 1959
Evolved Perigordian (Font-Robert type) in the "1st fauna-bearing level"	Typical Aurignacian in the "2nd fauna-bearing level"	Evolved Mousterian in the "2nd fauna-bearing level" "*probablement contemporain du Paléolithique supérieur*"	Charentian of Quina type in the "3rd fauna-bearing level"	Mousterian of Acheulean Tradition (MTA)	Ulrix-Closset, 1975

Table 1. Cultural sequence with special attention paid to the different interpretations of the Middle Palaeolithic occupations and the attribution of the Neandertal remains.

At the beginning of the 20th century, the presence of bone artefacts within the "third fauna-bearing level" together with an elaborate osseous industry, portable art, and ceramics from the "second fauna-bearing level" led researchers to not only consider these levels to be more recent than the Mousterian, but also as being representative of intermediate stages connecting the Mousterian and Solutrean (Table 1; "Eburnean", "Hastière type" or Aurignacian; Rutot, 1904; Breuil, 1907b; de Loë & Rahir, 1911). Thereafter, thanks to H. Breuil's (1912) typological analysis, the typically Mousterian character of the "third fauna-bearing level" and part of the "second fauna-bearing level" was recognised (Table 1). The presence of bone artefacts in the former and mixed Mousterian and Aurignacian artefacts alongside ceramics in the latter was therefore considered the product of post-depositional disturbances (Breuil, 1912). Additionally, H. Breuil was the first to question the integrity of the stratigraphic sequence at the site and define a cultural succession based primarily on stone tool typology (Table 1).

Subsequent research has slowly helped identify several different cultural facies, most notably the work presented in M. Ulrix-Closset's doctoral dissertation (1975). Building on F. Bordes' study (1959), M. Ulrix-Closset reinforced the traditional view of the Middle Palaeolithic cultural facies represented at Spy as well as their stratigraphic position (Table 1). At the base of the deposits, she documented an "early Mousterian of Acheulean Tradition (MTA)", represented by several bifaces and Levallois flakes, overlain by the "third fauna-bearing level" containing a "Quina-type Charentian" associated with the human skeletal material. Overlying these two levels in the "second fauna-bearing level" was an "evolved Mousterian" ("*Moustérien évolué*") characterised by Mousterian points and bifacial tools. This cultural level, considered contemporaneous with the Early Upper Palaeolithic, was distinguished from the Charentian Mousterian on both technological and taphonomic grounds (Ulrix-Closset, 1975). Finally, elements of a so-called transitional industry known as the Lincombian-Ranisian-Jerzmanowician or LRJ (see Otte, 1981; Flas, this volume: chapter XI), mixed with "evolved Mousterian", Aurignacian, and several Gravettian artefacts, have gradually been identified in the "second fauna-bearing level".

Although several cultural levels are identifiable, it is impossible to define exactly what lithic material belongs to each or the number of occupations represented. Several arguments (see Pirson & Di Modica, 2011 for details) led M. Ulrix-Closset to propose a chronological interpretation – the "early MTA" would date to the Early Middle Palaeolithic (end of the Riss or very beginning of the Würm glaciation), while the "Quina-type Charentian" and "evolved Mousterian" would correspond to different phases of the Late Middle Palaeolithic, emerging just after the first glacial maximum of the Early Weichselian (Ulrix-Closset, 1975, 1981, 1990).

Analytical methods and approaches to the interpretation of lithic assemblages have developed significantly in the ensuing years. The re-examination of the Spy cave Middle Palaeolithic presented here continues this trend, offering an up-to-date overview of the site's lithic assemblage. In order to do so, the site's somewhat tumultuous research history, combined with the unequal quality of the collections, has meant that not all the lithic material was retained for analysis. Multiple criteria were considered in selecting only the collections we considered most informative (see below).

SAMPLE SELECTION

The Middle Palaeolithic material from Spy is today scattered amongst more than 50 private and public collections with varying degrees of analytical value (see Semal *et al.*, this volume: chapter II). Their historical relevance, the existence of pertinent stratigraphic information or spatial data as well as the presence of typologically diagnostic artefacts (such as bifaces, bifacial tools or Mousterian points) were all taken into consideration when selecting collections, or parts of collections, to be included in this analysis.

Numerous private collections, either bought or built from exchanges (e.g. Rutot, Tomballe and Stainier collections), were excluded as they contain limited numbers of artefacts and lack reliable contextual data. Similarly, collections derived from the backdirt

(e.g. Éloy, Beaufays and Carpentier collections) or which do not relate to the cave, its terrace, as is the case for Twiesselmann's excavations of the slope deposits leading to the Orneau River, or the river bank (Dewez, 1980, 1981) were also left out.

The most informative collection is without doubt that from M. De Puydt and M. Lohest original 1885-1886 excavations. This material can not only be directly related to the three "fauna-bearing levels" they identified on the terrace, but comprises a certain quantity of artefacts discovered near the Neandertal remains. Moreover, artefacts from this collection are clearly linked with both stratigraphic and spatial information.

Among other potential collections, the material recovered by A. Rucquoy is also of great interest as he was the first to excavate inside the cave. Whereas the material from the 1885-1886 excavations primarily concerns the cave's terrace, Rucquoy's collection provides an indication of the archaeological material originally present within the cave. A. de Loë and E. Rahir's excavations for which stratigraphic and spatial information is available were also included, as was the J. Hamal-Nandrin collection (Hamal-Nandrin *et al.*, 1939; Ophoven & Hamal-Nandrin, 1949-1950), and part of the material recovered by F. Twiesselmann's excavation of the "*fissures*" that also has relevant contextual data (André, 1981).

METHODOLOGY

A brief history of each collection is provided, including pertinent contextual information (stratigraphic attributions, spatial distribution, diagnostic artefacts, etc.), together with perceptible conservation biases (loss of material, mixing of artefacts from different levels, sorting, etc.), as they introduce substantial limitations for interpreting the material.

Given the above, the lithic material will be briefly presented only in qualitative terms describing taphonomic aspects, raw material, technology and typology. The occasional quantitative data discussed has only limited value given numerous problems affecting the material and the non-exhaustive aspect of the present study. Lithic material described and/or illustrated in the excavation reports, and for which we possess contextual information, was favoured as much as possible. However, the value and reliability of this information depends largely on the quality of the original observations noted by the actual excavators as well as accurately connecting them to the studied material.

COLLECTIONS

De Puydt collection

Marcel De Puydt's collection includes the lithic material from the 1885-1886 excavations that is mostly stored at the *Grand Curtius* Museum in Liège. The few artefacts donated to the *Musée Archéologique de Namur* (Anonymous, 1886) were not included in the present study.

The collection consists of 1029 individually numbered artefacts (cf. *Grand Curtius* Museum inventory register dated from 1920) and additional batches of artefacts from three main locations: the terrace (Figure 1), from where most of the material was recovered, within the cave, or from the overlying plateau. Artefacts from the plateau were not retained for analysis as they have no direct link with the cave or terrace.

In terms of taphonomy, artefacts unearthed from the terrace are remarkably fresh for a site in a karstic context. Artefacts from the "second and third fauna-bearing levels" are unpatinated, have fresh or only slightly damaged edges, fresh ridges, and are almost totally free of lustre. Although artefacts from the "first fauna-bearing level" have well-preserved edges and surfaces, they bear a greyish-white patina. Conversely, artefacts recovered from within the cave systematically carry a fairly substantial patina and present various degrees of edge or surface damage.

The reliability of the objects' stratigraphic attributions remains delicate; the handwritten inventory of lithic material was created only after the artefacts were donated by Marcel De Puydt to the *Grand Curtius* Museum, some

Figure 1. Plan of Spy cave (based on Twiesselmann, unpublished) and photo indicating the main spatial units, locations of the various excavations discussed in the text, and the approximate position of the Neandertal remains according to De Puydt & Lohest (1887). Limits between the areas excavated by the various teams are not indicated as no reliable information exists. Note that, except for André (1981), who discussed Twiesselmann's excavation of "*fissures B* and *E*", no published information refers to excavations carried out in the main chamber of the cave. This could indicate earlier investigations in the cave for which we have no information (for further details, see Semal *et al.*, this volume: chapter II; photo & illustration by K. Di Modica & A. Hauzeur).

34 years after the excavation (Figure 2; De Puydt, 1939: 149; Cammaert, 2010, this volume: chapter IV). Part of the lithic material is unmarked or is accompanied by handwritten notes casting doubt on their attribution to a precise "fauna-bearing level", the site itself, or even to the Marcel De Puydt collection. Individually labelled artefacts are marked in either red or black ink, while others have two sets of labels, adding additional confusion concerning

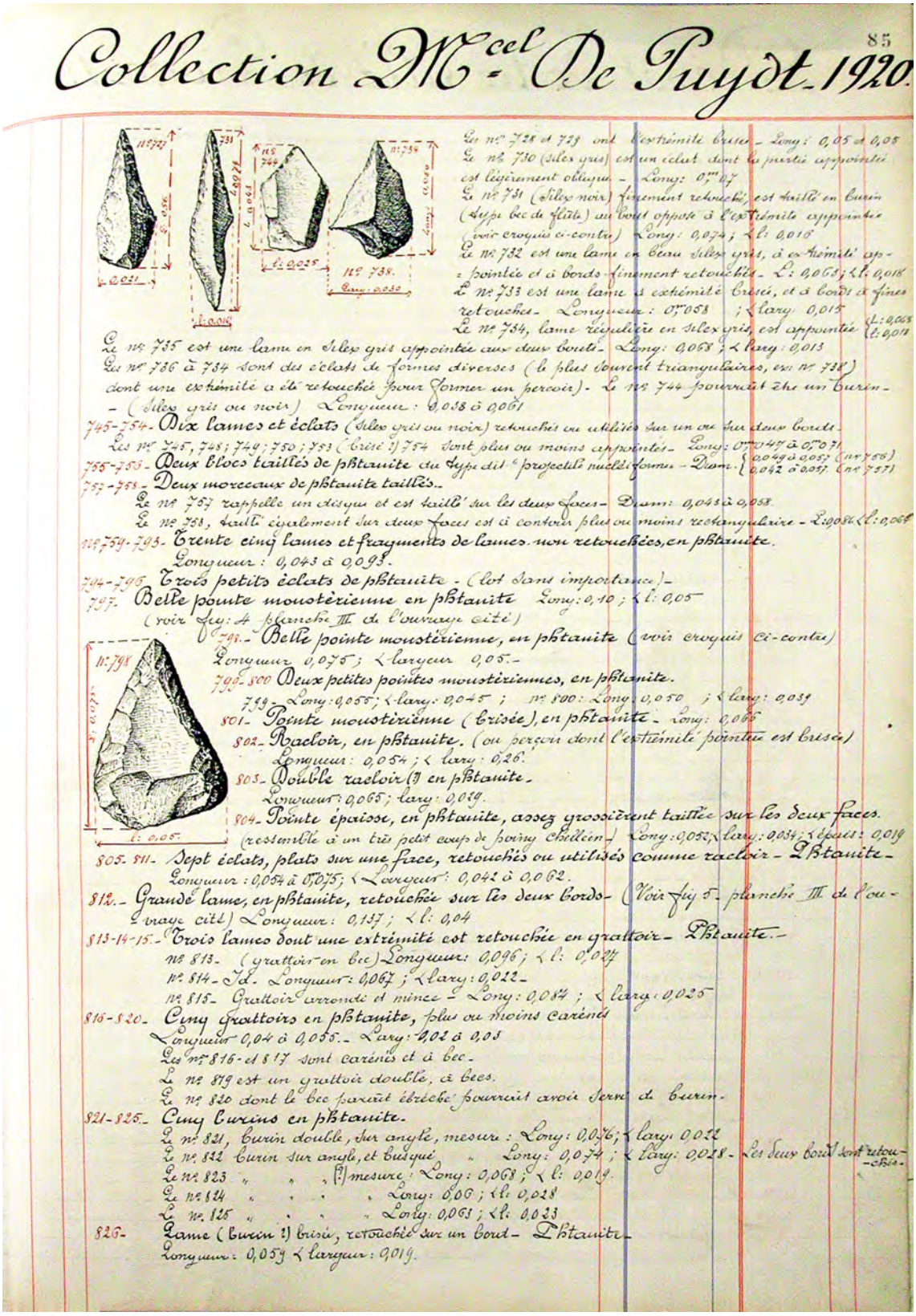

Figure 2. Extract from the handwritten inventory of M. De Puydt's collection stored at the *Grand Curtius* Museum. This page refers to the content of the "second fauna-bearing level" (photo by A. Hauzeur; archives *Grand Curtius* Museum).

Figure 3. Varying artefact labels in M. De Puydt's collection. Although the red labels seem to correspond to the 1885 excavations, they give no precise stratigraphic details (1) or indicate a single "fauna-bearing level" ("Spy I") (2). The black labels often assign (1) or reattribute (2) artefacts to the "second fauna-bearing level". Labels indicating "Goyet" on several artefacts (3) seem to correspond to the material initially collected from the cave by M. De Puydt prior to the 1885-1886 excavations (De Puydt, 1939; Servais, 1940; Semal *et al.*, this volume: chapter II) (photos & illustrations by K. Di Modica & A. Hauzeur).

their stratigraphic attribution (Figure 3). Several dozen artefacts are marked in red ink indicating "Spy", "Spy B.A.R." (Betche aux Rotches) or "Spy M.D.P." (Marcel De Puydt), occasionally accompanied by a stratigraphic attribution to "fauna-bearing level I". None of the artefacts labelled exclusively in red ink belong to the "second or third fauna-bearing level". A label in black ink frequently accompanies the information in red, adding, for example, "M.D.P." when this information is missing or an individual inventory number. Stratigraphic attributions are often corrected in black ink, frequently re-attributing the material to the "second fauna-bearing level". The labels in black ink correspond almost perfectly with the handwritten inventory[1].

This partial "double labelling" could reflect the site's excavation history – material recovered during the initial fieldwork in 1885, during which time only one "fauna-bearing level" was identified, seems to correspond with the red labels, with objects recovered the following year labelled in black. Additional black labels correcting those originally in red could correspond to the stratigraphic reattribution of artefacts recovered during the 1885 campaign to one of the three "fauna-bearing levels" identified in 1886 (see fig. 8 in Semal *et al.*, this volume: chapter II).

Middle Palaeolithic material from the "first fauna-bearing level"

The inventory assigns 220 mostly Upper Palaeolithic artefacts to the "first fauna-bearing level". The clearest Middle Palaeolithic artefact is a convergent scraper with a distal fracture (no. 111; ST1). Its uncertain stratigraphic attribution is evident from a label in pencil indicating "*second niveau, peut-être premier?*" ("second level, maybe first?"). Apart from this object, techno-typologically Middle Palaeolithic artefacts are labelled with red ink, although this does not necessarily mean they actually come from the "first fauna-bearing level" defined during the 1886 campaign (see above).

[1] Except for nos. 228 to 232 attributed to the "first fauna-bearing level" in the handwritten inventory, but labelled "second fauna-bearing level".

Middle Palaeolithic material from the "second fauna-bearing level"

The "second fauna-bearing level" is the richest, containing around 600 mostly Aurignacian and Middle Palaeolithic artefacts[2]. Made almost exclusively in flint, several artefacts attest to the limited use of *phtanite*, "*grès-quartzite de Rommersom*" ("Rommersom quartzitic sandstone"; nos. 852-853), and siliceous sandstone (Goffin-Cabodi, 1985; see also Hauzeur *et al.*, this volume: chapter VII) as well as "*grès-quartzite de Wommersom*" ("Wommersom quartzitic sandstone"; no. 746; Figure 4).

Techno-typologically, the "second fauna-bearing level" comprises two main tool types in addition to side-scrapers: numerous Mousterian points and the occasional bifacial tool. Several flakes and generally large cores in a fine-grained flint constitute the only *débitage* products from this level. Overall, the Middle Palaeolithic artefacts bear witness to the use of several flint varieties.

Mousterian points are made on well-prepared flakes measuring up to 10 cm, a majority of which have faceted butts. Although most are made in a fine-grained flint, examples exist in a coarser-grained flint, *phtanite*, and siliceous sandstone (nos. 314 & 843; nos. 295, 797-798 & 800). A recent detailed study has highlighted a high degree of standardisation evident with these points both in terms of technology and typology (Jungels *et al.*, 2006, this volume: chapter X).

Bifacial tools are made from a coarse-grained flint retaining a residual fluvial cortex most likely indicative of procurement from an alluvial context. Among these artefacts, two asymmetric bifaces, in section as well as in plan, have a cortical lateral edge facilitating prehension (nos. 236 & 239). An irregular elongated biface with a cortical base (no. 237) in addition to several convergent bifacial tools are also made in this same type of raw material. The latter includes points (nos. 240-241), partial foliates (no. 238), one foliate piece (no. 242), and pointed bifacial scrapers (nos. 243 & 245bis).

Middle Palaeolithic material from the "third fauna-bearing level"

The "third fauna-bearing level" is underrepresented amongst the individually labelled artefacts, comprising only 22 mostly Middle Palaeolithic lithic artefacts. Among them, eight have an additional label indicating their discovery close to the Neandertal remains (several are mentioned in De Puydt & Lohest, 1887).

The majority of the artefacts are made on flint varieties similar to those from the "second fauna-bearing level". These include three cores, several recurrent flakes, and only a single retouched flint (no. 988) – a distal fragment of Mousterian point, morphologically similar to the one attributed to the "second fauna-bearing level". This point is still embedded in a hardened block of yellowish-brown sediment containing bone fragments.

Non-flint raw materials were also used: a *phtanite* Mousterian point similar to those from the "second fauna-bearing level" and two siliceous sandstone flakes, including a prepared flake still cemented in a hardened reddish sediment reminiscent of the colour of the "second fauna-bearing level".

De Puydt and Lohest noted that small flint fragments were particularly abundant near the human bones, and that the same types of raw materials used in the "second fauna-bearing level" were also present in the "third fauna-bearing level". More specifically, the excavators mention that "*un silex grossier provenant probablement du gravier était particulièrement abondant au niveau des squelettes*" ("a coarse-grained flint probably derived from the gravel was particularly abundant in the vicinity of the skeletons"; De Puydt & Lohest, 1887: 233-234), suggesting that most of the artefacts from the "third fauna-bearing level" were probably made from a local flint with a residual fluvial cortex. Unfortunately, they have been lost or were not collected.

[2] Some are related to the LRJ (Flas, this volume: chapter XI), others to the Gravettian (no. 729).

Figure 4. Various lithic raw materials in the M. De Puydt collection:
(1) flint, (2) *phtanite*, (3) "*grès-quartzite de Wommersom*", (4) "*grès-quartzite de Rommersom*", (5) siliceous sandstone (photos & illustrations by K. Di Modica; coll. *Grand Curtius* Museum).

Middle Palaeolithic material recovered from within the cave

The handwritten inventory distinguishes two groups of artefacts recovered from within the cave. The first includes the "double-labelled" artefacts bearing an initial red ink label attributing them to "Spy I" alongside a second label in black ink correcting them to "Spy II?". The second group of artefacts lacks any further stratigraphic precision. Material from inside the cave differs slightly from the terrace material in that the artefacts are heavily patinated, occasionally lustred, and frequently present edges damaged by pseudo-retouch. Despite no reliable stratigraphic information being available, this material can be assigned to both the Middle and Upper Palaeolithic.

The raw materials are identical to those recovered from the terrace. Techno-typologically, several cores and flakes indicate recurrent flake production. Genuinely retouched tools are few; however, while several convergent tools, including a convergent side-scraper similar to the Mousterian points recovered from the terrace, are present, there are no bifacial tools comparable to those from the terrace.

The single biface from this collection seems to come from inside the cave as it was originally part of the Rucquoy collection (see below). Despite this artefact being drawn in the handwritten inventory (no. 221), we were unable to relocate it.

The Rucquoy collection

Housed at the Royal Belgian Institute of Natural Sciences (RBINS), this collection has a two-fold interest. First, it comes from the first documented investigations of Spy cave, and second, it comes from the right gallery inside the cave (Figure 1), thus giving it certain spatial coherence. Unfortunately, the collection lacks any additional stratigraphic information.

A. Rucquoy published the material without any reference to the stratigraphic sequence he described (Rucquoy, 1886-1887). The rare stratigraphic information that is available concerning the provenance of the material consists of accompanying handwritten labels, most probably made by A. Rutot at the beginning of the 20th century. He proposed reattributing the material to the "second or third fauna-bearing level" or to one of his three stages of Aurignacian (Rutot, discussion in Breuil, 1907b). These typologically-based attributions do not rest on any consistent or verifiable field data. Only a *phtanite* biface has basic contextual information; Rutot mentions it being found at the back of the right gallery "*dans le niveau limoneux inférieur et reposant sur le sol*" ("in the lower loamy level and lying on the floor"; Rucquoy, 1886-1887: 322).

While the Rucquoy collection includes artefacts which clearly belong to different periods, most seem to be techno-typologically Middle Palaeolithic in nature. In terms of taphonomy, the artefacts are patinated, sometimes lustred, and frequently present edges damaged by mechanical retouch. This poorly preserved material is in a similar state to the M. De Puydt collection from within the cave, but differs from the artefacts recovered from the terrace.

Although the raw materials represented are similar to those documented from the M. De Puydt collection, the A. Rucquoy collection contains a higher proportion of *débitage* products; numerous flint cores and flakes, including a series of *éclats débordants* and pseudo-Levallois points attesting to a recurrent *débitage* system (Jungels *et al.*, 2006). Most of the *débitage* products seem to reflect locally available flint, whereas the few, larger Levallois-like flakes may have been introduced to the site.

Tool types in the Rucquoy collection differ slightly from those recovered from the terrace deposits by M. Lohest and M. De Puydt. Mousterian points – well represented on the terrace – are practically absent in Rucquoy's collection. Only one such tool was recovered by Rucquoy and now forms part of the *Université de Liège* (ULg) collections following artefact exchanges between various researchers and associated institutions[3]. Scrapers are rare, although it is

[3] Other evidence of such exchanges exists. For example, the Rucquoy collection contains a Mousterian point published by J. Hamal-Nandrin in his excavation report. The ULg collections contain a biface, a Mousterian point, and two *phtanite* flakes from the RBINS.

important to note difficulties in distinguishing clear anthropic retouch given their poorly preserved edges. On the other hand, Rucquoy's collection is notable in the presence of six bifaces to which can be added at least two further examples (one part of the De Puydt collection discussed above [no. 221], and one from the ULg collections). Among these bifaces is a large cordiform example (length: 14 cm) made in *phtanite*, for which A. Rucquoy provided some information concerning its stratigraphic position (see above). Bifaces made from small, locally available flint pebbles are smaller, asymmetric, less regular, and often have a cortical base.

Material from A. de Loë and E. Rahir excavations

This collection, stored at the Royal Museums of Art and History (RMAH) in Brussels, comes from one of the most substantial excavations carried out on the terrace and at the entrance to the cave (Figure 1) for which stratigraphic information is available (de Loë & Rahir, 1911). Technologically and typologically representative of the Middle Palaeolithic material from Spy, it also includes a series of bifaces recovered from within the cave.

Unfortunately, the collection has been poorly conserved since the excavation; the majority of the associated documentation is now untraceable. Furthermore, most of the typologically significant artefacts are today devoid of any spatial or stratigraphic information. Furthermore, the integrity of the collection itself seems to have been compromised: a biface illustrated in the excavation report (de Loë & Rahir, 1911: pl. III, fig. 7), as well as most of the bifaces drawn by M. Ulrix-Closset (1975: figs. 120, 123, 127, 128 and 131), were not found during our research.

While a portion of the collection is comparable with the material recovered by M. Lohest and M. De Puydt from the terrace (well-preserved, presence of Mousterian points and bifacial tools), a second component is similar to the material from inside the cave (poorly preserved, bifaces). In terms of raw materials, flint is the most represented, with *phtanite* and siliceous sandstone only sporadically employed.

The rare available stratigraphic information concerning the Middle Palaeolithic material links the Mousterian points and a small irregular biface with the "third fauna-bearing level" of the terrace that also contains blades and carinated end-scrapers typical of the Aurignacian (de Loë & Rahir, 1911: plate VI). Three bifaces and two Mousterian points from within the cave are attributed to the "third fauna-bearing level", as are two bone awls and three blades that are not Middle Palaeolithic. The "third fauna-bearing level" defined by de Loë and Rahir seems to contain a mix of artefacts from various periods both inside the cave and on the terrace, whereas the "first and second fauna-bearing levels" contain only Upper Palaeolithic material. Therefore, their three "fauna-bearing levels" cannot be correlated with the three "fauna-bearing levels" defined by De Puydt and Lohest.

Material collected by J. Hamal-Nandrin

Material recovered during personal investigations carried out by J. Hamal-Nandrin (Ophoven & Hamal-Nandrin, 1949-1950) is today housed at the RMAH. It is sometimes difficult to distinguish material from this collection from that of de Loë and Rahir given alterations suffered by both collections (missing archives, poor conservation conditions, mixing of the two collections).

The main interest of this collection lies in the presence of two artefacts for which contextual information is available – a large, triangular flint biface (length: 14 cm) and a cordiform *phtanite* uniface. Both were found "*à l'entrée de la grotte, à la base de l'un des côtés du rocher; ces deux pièces gisaient ensemble dans un recoin, non fouillé par les premiers explorateurs*" ("at the entrance of the cave, at the base of a rock wall; these two pieces lay together in a nook left un-excavated by the first investigators"; Ophoven & Hamal-Nandrin, 1949-1950: 7).

The ULg excavations (Hamal-Nandrin *et al.*)

The main interest of this collection stored at the ULg's *Service de Préhistoire* is the contextual information that is available for a series of published artefacts (Hamal-Nandrin *et al.*, 1939). This material comes from four areas

within the right gallery of the cave (Figure 1), giving it a certain spatial coherence. Derived from deposits located "*sous 2 mètres environs de déblais provenant des fouilles antérieures*" ("under approximately 2 metres of backdirt from previous excavations"; Hamal-Nandrin *et al.*, 1939: 144), this assemblage has been considered a single Mousterian level despite the deposits being some two metres thick at "*emplacement I*". J. Hamal-Nandrin considered this Mousterian level to be older than the third level excavated on the terrace by M. De Puydt and M. Lohest (Hamal-Nandrin *et al.*, 1939: 146) given the presence of bifaces, despite the fact that it was impossible to link their stratigraphy with that identified by De Puydt and Lohest on the terrace.

While the condition of the lithic material is quite variable, it is generally less well preserved than the artefacts collected from the terrace by De Puydt and Lohest. The artefacts are heavily patinated, the edges are frequently damaged by pseudo-retouch, and part of the material is lustred. In taphonomic terms, this collection is comparable with others from the cave's interior.

A large, *phtanite* cordiform biface (length: 11.5 cm) was found alongside several patinated Mousterian points and numerous *débitage* products from a 25 cm thick level at "*emplacement I*" near the porch of the cave (Figure 1; Hamal-Nandrin *et al.*, 1939: 145). Four small bifaces (length: < 6 cm), three in flint and one *phtanite*, were found at "*emplacement II*" (Figure 1). The excavation also yielded the occasional flint or *phtanite* side-scraper, and one *déjeté* Mousterian point. *Débitage* products are less numerous than at "*emplacement I*" (Hamal-Nandrin *et al.*, 1939: 145). A triangular biface (length: 11.2 cm), three small irregular bifaces (length: ca. 7 cm), two cores together with one flint and one *phtanite* scraper were recovered from "*emplacement III*" (Figure 1) in association with a few *débitage* products (Hamal-Nandrin *et al.*, 1939: 145). Finally, only a few flakes and faunal remains were documented from "*emplacement IV*".

It is worth drawing attention to the fact that no typologically Upper Palaeolithic artefacts were found during this excavation, and the description of the *débitage* products suggests a decrease in the quantity of archaeological material from the entrance toward the back of the cave.

F. Twiesselmann's excavation of the "*fissures*"

This small collection housed at the RBINS comes from F. Twiesselmann's excavation of three limestone fissures (Figure 1) in the left wall of the terrace near the porch ("*fissure C*"), and at the entrance of the main chamber ("*fissures B* and *E*").

Already discussed in a short article (André, 1981), this collection is of limited value given the small number of typologically diagnostic artefacts. Although spatial information is available for some artefacts, the stratigraphic information is of little use; the mixed Middle and Upper Palaeolithic tool types supposedly come from a "*zone brune*" ("brown zone").

A transverse *phtanite* side-scraper was found in "*fissure C*", and two convergent tools were recovered from "*fissure E*" – a Mousterian point and a bifacial point. These latter artefacts are similar to those collected from the terrace by M. De Puydt and M. Lohest.

MAIN ASPECTS OF THE MIDDLE PALAEOLITHIC OF SPY CAVE

Main techno-typological characteristics

Raw materials: acquisition and exploitation

The Middle Palaeolithic artefacts are made on various raw materials; Cretaceous flint is the most abundant, with *phtanite*, siliceous sandstone, "*grès-quartzite de Wommersom*", and "*grès-quartzite de Rommersom*" used only occasionally.

Non-flint raw materials

Both Upper and Middle Palaeolithic tools (a Levallois core, flakes, bifaces, Mousterian points, and side-scrapers) were made from *phtanite*. On the terrace, Mousterian points and scrapers, alongside a Levallois core and flakes, are present in the "second fauna-bearing level", while in the "third fauna-bearing level" only a single Mousterian point is made on *phtanite*.

This point is techno-typologically similar to those attributed to the "second fauna-bearing level", and was discovered beside the "Spy no. 1" Neandertal remains according to De Puydt & Lohest (1887).

Inside the cave, *phtanite* is represented by a Levallois core, several flakes (SF9), and 2 bifaces, one found lying on the bedrock in the right gallery (Rucquoy, 1886-1887), the other at the entrance to the same gallery (Hamal-Nandrin *et al.*, 1932, 1939).

Siliceous sandstone is present in the form of Upper Palaeolithic *débitage* products and Middle Palaeolithic tool types, notably two Mousterian points from the De Puydt collection, and a distal fragment of a Mousterian point from the RMAH collections. No bifaces or bifacial tools were made in this type of raw material that was discovered from both the "second and third fauna-bearing levels" on the terrace. There is no evidence that this raw material was found inside the cave.

The use of "*grès-quartzite de Wommersom*" is attested to by a single retouched tool in the De Puydt collection from the "second fauna-bearing level" of the terrace. Two flakes provide evidence for the use of "*grès-quartzite de Rommersom*" in the "second fauna-bearing level" of the terrace.

Figure 5. Variability of flint pebbles available from alluvial terraces in the cave's surroundings (photos & illustrations by K. Di Modica).

Flint

Almost all the Middle Palaeolithic flakes and tools are made from several varieties of flint that can be separated based on texture (fine/coarse grain), colour (blackish, greyish, brownish), and cortex type (chalk, eroded chalk, fluvial).

An ancient alluvial terrace of the Sambre River lies less than 300 m from the cave. Surface surveys of this terrace produced various types of flint nodules and pebbles whose maximum dimensions do not exceed 12 cm. These fine- to coarse-grained flints with alluvial or eroded chalky cortex (Figure 5) correspond macroscopically to most of

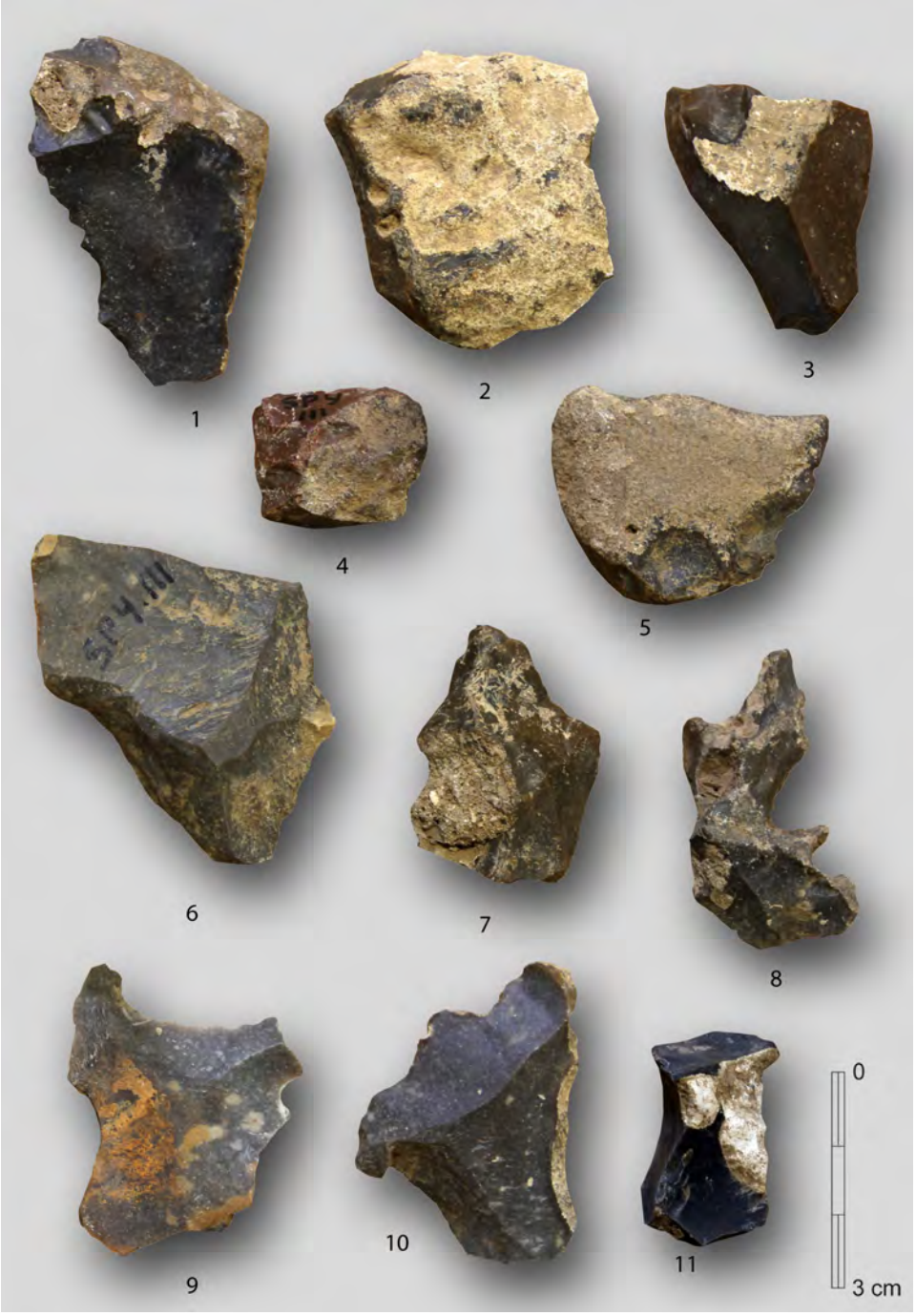

Figure 6. Lithic artefacts from the De Puydt collection attesting to the reduction of locally available flint pebbles (photos & illustrations by K. Di Modica; coll. *Grand Curtius* Museum).

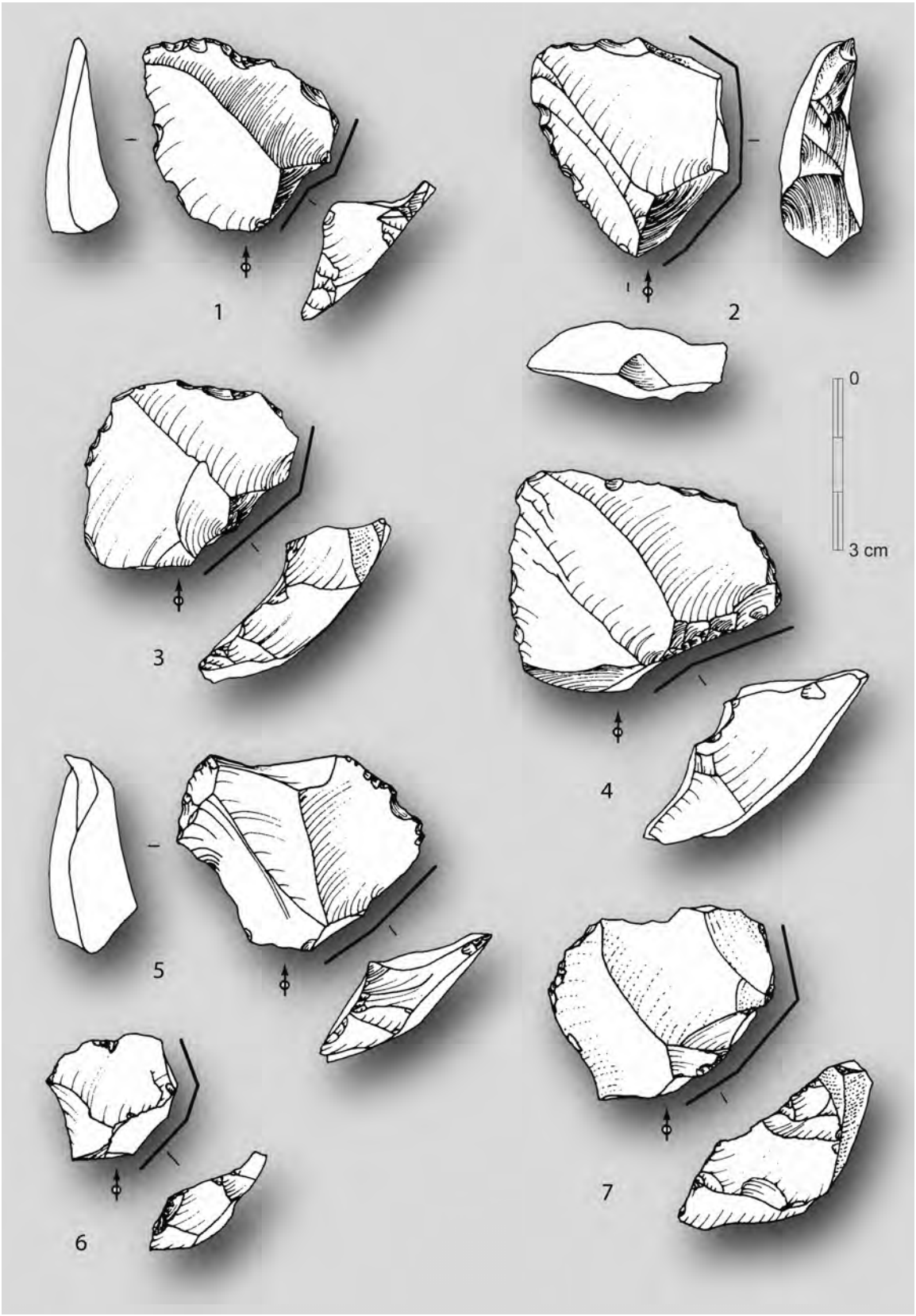

Figure 7. Pseudo-Levallois points made on locally available flint pebbles from A. Rucquoy's collection (drawings by F. Laurent, ADIA; illustrations by K. Di Modica; coll. RBINS).

the lithic artefacts recovered from the site. Moreover, the dimensions and cortex of these nodules are compatible with those observed for the *débitage* products (SF1-8), indicating these locally available flint varieties may have been introduced to the cave and subsequently exploited.

M. De Puydt and M. Lohest's excavations on the terrace recovered artefacts in similar flint varieties. Although some are individually labelled – particularly those found close to the Neandertal remains – most are grouped in batches for which the stratigraphic attribution is dubious (Figure 6). Nevertheless, De Puydt & Lohest (1887) mention these flint varieties to be particularly abundant near the Neandertal remains.

This material is well represented in Rucquoy's collection from the cave's interior and provided the basis for an initial description of lithic reduction strategies in local flint (Jungels, 2006; Jungels *et al.*, 2006). Characterised by an optimised reduction strategy adapted to the small size of the locally available flint nodules and pebbles, blanks selected to be reduced possessed a pre-existing morphology amenable to the immediate initiation of *débitage* without preparation. These regularly plano-convex blanks formed by the intersection of secant cortical surfaces were exploited according to a mostly multidirectional recurrent conception often involving only a single surface. Polyhedral cores with multiple exploited surfaces are also frequent. Production is limited to only a few small flakes (mostly 3-5 cm long), a characteristic probably linked to the small size of the initial blanks. *Éclats débordants* are frequent alongside numerous pseudo-Levallois points (Figure 7; SF10-11). The relatively simple toolkit is composed of retouched flakes and side-scrapers (SF14-15) as well as small irregular bifaces (see below).

Most of the Mousterian points and some of the large Levallois flakes and cores are made on a fine flint variety that is most likely non-local. Moreover, their size and degree of elaboration require nodules larger than those available in the site's vicinity. Finally, no clear traces of core preparation (i.e. cortical flakes) are present. Taken together, these elements suggest that at least the well-prepared flakes, if not already transformed into Mousterian points, were imported to the site from another location on or close to Cretaceous outcrops where such flint nodules can easily be found. The two most likely procurement zones are the Hesbaye region (around 20-25 km as the crow flies) and the Mons Basin (around 30-35 km as the crow flies). This type of flint, well represented in the "second fauna-bearing level" of the De Puydt collection from the terrace, can also be found amongst the material from the "third fauna-bearing level". It is also represented by a series of heavily weathered artefacts from within the cave.

Overall, two raw material exploitation strategies can be identified; the predominant exploitation of locally available flint, and the use of tools manufactured elsewhere and introduced to the site.

Bifacial tools

MTA types

Several cordiform and triangular bifaces, symmetrical in both section and plan, and measuring between 10 and 15 cm, have been found at Spy (Figure 8; SF12). These conspicuous artefacts were paid special attention by the excavators, often noting their stratigraphic and spatial context.

When such relevant data is available, these bifaces are systematically assigned to the "right gallery" (Figure 8). A. Rucquoy unearthed an elongated cordiform biface in *phtanite* at the back of this gallery (Figure 8: 3), and A. de Loë and E. Rahir discovered six flint bifaces while excavating the "right gallery" in 1909. Although they provide no details as to their exact location, their published plan of the site (de Loë & Rahir, 1911) indicates them to come from the first part of the gallery. Thirty years later, J. Hamal-Nandrin *et al.* (1939) found a heavily damaged triangular flint biface at the back of the same gallery ("*emplacement III*"; Figure 8: 1), and a *phtanite* cordiform biface at the entrance of this gallery ("*emplacement I*"; Figure 8: 2). No bifaces were found during the 1885-1886 excavations on the terrace (De Puydt & Lohest, 1887). In fact, only one biface was recovered from the terrace (de Loë & Rahir, 1911: pl. VI, fig. 12) during de Loë and Rahir work on the west side. However, this artefact

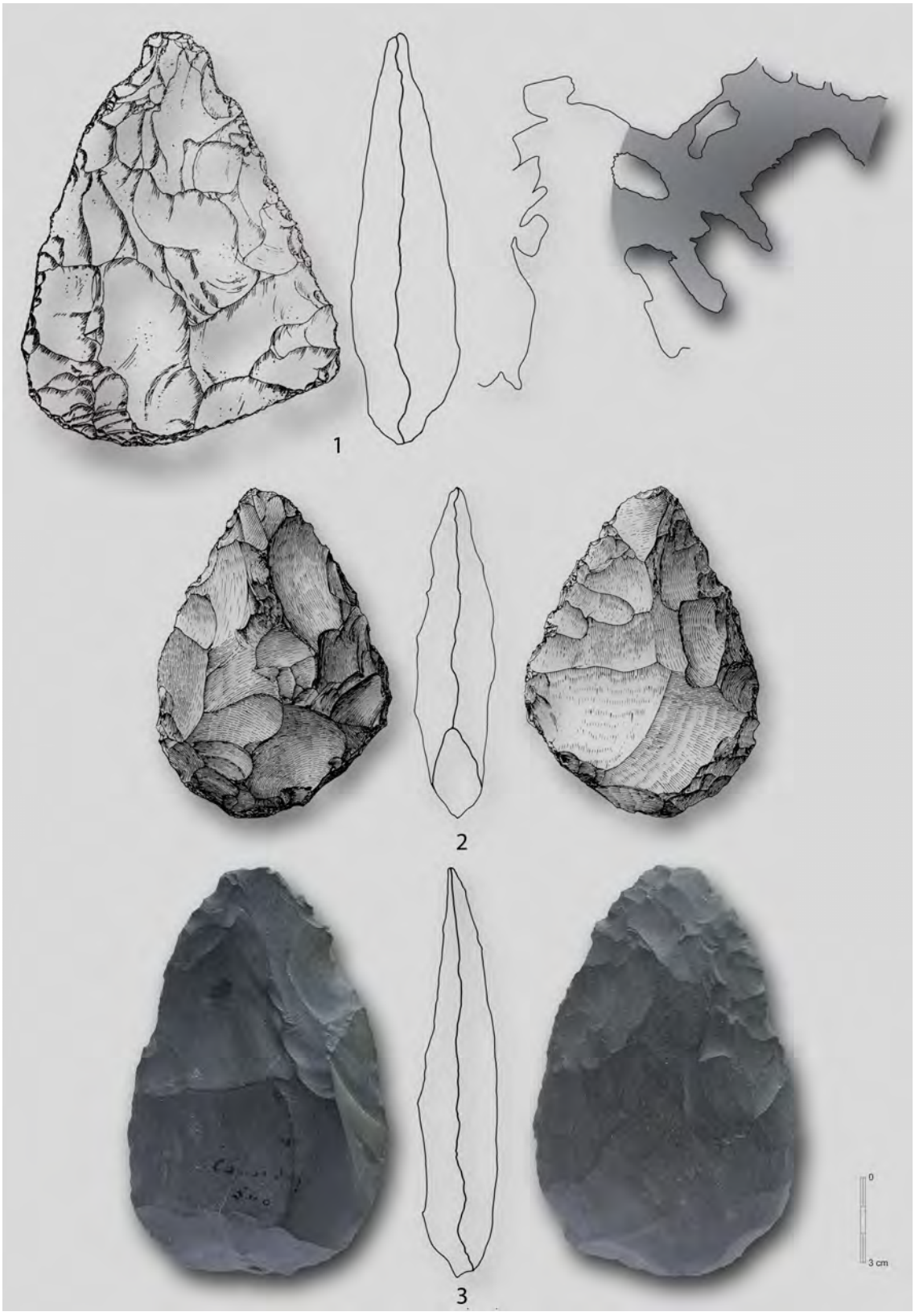

Figure 8. Cordiform and triangular MTA bifaces from the right gallery (1: drawing from Ophoven & Hamal-Nandrin [1949-1950], coll. RMAH; 2: drawing from Ulrix-Closset [1975], coll. ULg; 3: photo by A. Hauzeur & C. Jungels, coll. RBINS; illustrations by K. Di Modica).

seems to come from heavily disturbed deposits and/or backdirt from previous excavations as it is attributed to the same level as blades, bladelets, carinated end-scrapers, and a perforated baton (de Loë & Rahir, 1911).

While information concerning their stratigraphic position is rare, they are nonetheless referred to as coming from the base of the deposits. A. Rucquoy (1886-1887) mentions that the cordiform biface he found was lying on the bedrock. An examination of the text and profile published by de Loë & Rahir (1911) locates the bifaces in up to 50 cm thick deposits encountered immediately below approximately two metres of backdirt. During his work at the site, J. Hamal-Nandrin found a sub-triangular flint biface for which conflicting stratigraphic information exists: it was found at the base of the rocks at the entrance of the cave according to Ophoven & Hamal-Nandrin (1949-1950), or in immediate contact with – or even overlying – Gravettian tools (Breuil, 1912). Later, J. Hamal-Nandrin *et al.* mentioned having encountered two metres of backdirt above the *in situ* deposits containing the biface. In this case, the deposits considered *in situ* were up to 2 m thick at the entrance of the right gallery ("*emplacement I*"). However, the biface was found together with other artefacts – including Mousterian points, scrapers, and numerous *débitage* waste – over a depth of 25 cm (Hamal-Nandrin *et al.*, 1932).

The presence of these bifaces led part of the Spy collections to be assigned to the MTA (Bordes, 1959; Ulrix-Closset, 1975), which was supposedly older than the "third fauna-bearing level". However, this interpretation should be considered with caution as no reliable correlation can be established between the deposits observed on the terrace in 1886 and those described from within the cave (Pirson *et al.*, this volume: chapter VI). Furthermore, nothing guarantees that these various bifaces form a chronologically coherent assemblage, in other words, that they are contemporaneous.

Similar bifaces have been discovered at several Belgian sites. Clear MTA assemblages are represented by large cordiform and triangular bifaces (Ruebens & Di Modica, 2011) both in caves (Trou Magrite, grotte de l'Hermitage, Abri Sandron, Trou Bodson, Caverne des Grands Malades) and open-air sites (Huccorgne–Hermitage, Godarville–Canal, Obourg–Bois du Gard, Saint-Symphorien–Hardenpont Quarry, Saint-Symphorien–Hélin Quarry). These MTA sites extend from the mouth of the Schelde River (Antwerpen–Koraalberg) to the extreme southeast of the country (Villers-sur-Semois). Although available chronological data suggest they mostly date to the Early Weichselian (MIS 5d-a) as is the case with several bifaces from Liège–Sainte-Walburge, Saint-Symphorien–Hélin Quarry and Godarville–Canal (Pirson & Di Modica, 2011; Ruebens & Di Modica, 2011), rare reworked bifaces have been discovered in MIS 3 deposits at Scladina cave, as well as at Saint-Amand-les-Eaux (Inrap, 2007; Feray *et al.*, 2010). These occurrences indicate that this MTA trend is not strictly limited to the Early Weichselian but continues into the Late Middle Palaeolithic.

Keilmessergruppen *tradition types*

Several plano-convex foliates and asymmetrical bifacial backed knives have been documented from Spy (Figure 9). The latter have a backed edge extending along the length of the tool opposite a rectilinear cutting edge, placing them amongst the "Bockstein type" *Keilmesser* (Bosinski, 1967). Most were recovered by De Puydt and Lohest from the terrace and assigned to the "second fauna-bearing level" (Figure 9: 1-6). A single foliate piece comes from inside the cave and was discovered by F. Twiesselmann in "*fissure E*" of the cave's main chamber (André, 1981: fig. 52; Figure 9: 7).

Like the rest of the material from the "second and third fauna-bearing levels", *Keilmesser*-type tools from the terrace are unpatinated. Made from a coarse-grained flint with a residual cortex possibly indicative of a local, most likely alluvial source, this contrasts with the main tool type from the "second fauna-bearing level", Mousterian points, which seem to have been made primarily on a fine-grained, probably non-local flint.

Both the Mousterian points and *Keilmesser* types have been attributed to the "*Moustérien évolué*" ("evolved Mousterian") given their careful manufacture and stratigraphic position (Ulrix-Closset, 1975). The idea of an

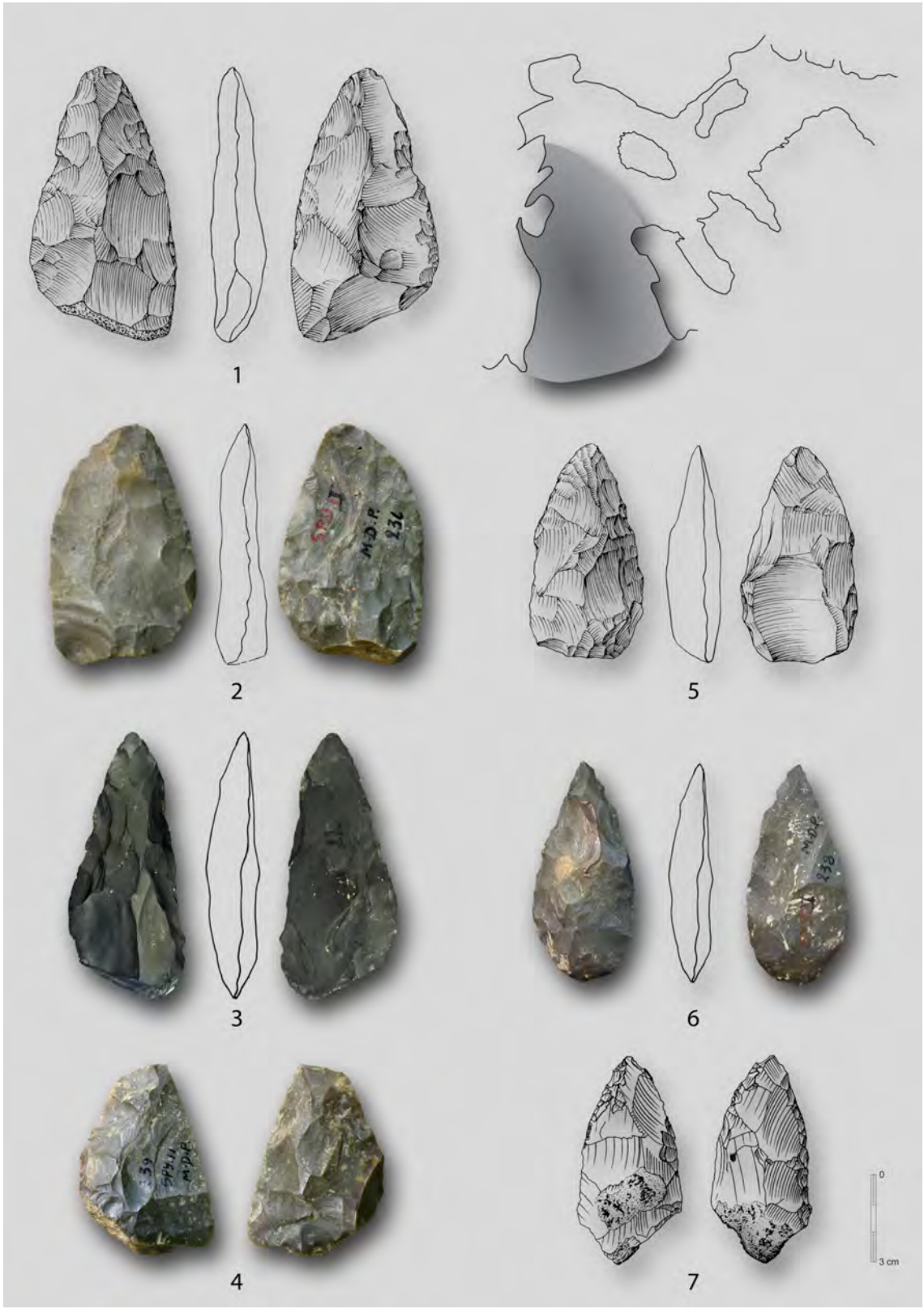

Figure 9. *Keilmesser* and foliates pieces recovered from the terrace (1-6) or from the cave's entrance (7). They are made on locally available flint pebbles (1-2, 4-7) or *phtanite* (3) (1, 5: illustrations from Ulrix-Closset [1975]; 2-4, 6: photos by C. Jungels & A. Hauzeur; 7: illustration from André [1981]; 1-6: coll. *Grand Curtius* Museum; 7: coll. RBINS).

"evolved Mousterian" persisting in the Meuse Basin and perhaps being coeval with the Early Upper Palaeolithic (Ulrix-Closset, 1975) remains problematic (Flas, 2011). Nothing guarantees that the *Keilmesser* and foliate pieces at Spy belong to the same archaeological assemblage or that they are associated with the Mousterian points. In later work, M. Ulrix-Closset substituted the term "evolved Mousterian" – an idea heavily influenced by the conceptual framework of the Middle-to-Upper Palaeolithic transition – with the more descriptive term, "recent Mousterian with foliate points" (Ulrix-Closset, 1995).

Other Belgian Middle Palaeolithic sites have produced *Keilmesser* of various morphologies. Some can be assigned to the "Klausennische type" (backed knife with a convergent distal end) as at Ramioul cave, Grotte du Docteur, and at the open-air find spot of Ans (Ruebens & Di Modica, 2011). Bockstein types similar to those from Spy have been found at Grotte du Sureau and Grotte du Docteur. No reliable stratigraphic information or any contextual data allowing a chronological attribution of these tool types is available for any of these sites. The *Keilmesser* from Spy represent the best argument for attributing these tool types to MIS 3 as none of the radiocarbon dates from either the Neandertal or faunal remains indicate an age older than 45,000 BP (Semal *et al.*, this volume: chapter XVI).

The morphology of these tool types undoubtedly indicates influences from Central and Eastern Europe as they show clear affinities with the *Keilmessergruppen* and/or *Blattspitzengruppen* from Germany (Jöris, 2002, 2004, 2006; Ruebens & Di Modica, 2011). Ulrix-Closset's (1995) hypothesis of such influences first appearing during MIS 5, and then again in MIS 3, seems plausible. Several open-air sites from the Early Weichselian encompassing MIS 5d and the debut of MIS 4 (Liège–Sainte-Walburge, Liège–Mont-Saint-Martin, Remicourt–*En Bia Flo I*, Veldwezelt–Hezerwater) have indeed produced bifacial pieces portraying such influences.

Small bifaces

Several small bifaces have been recovered from Spy. Mostly irregular with cortical bases, they are made from small, alluvial flint pebbles similar to those employed for most of the lithic reduction activities (Figure 10; SF13). Although asymmetrical examples exist, they are frequently symmetrical and can be divided into cordiform, oval, and triangular varieties.

Small bifaces are present in both the Rucquoy and de Loë collections, and are mentioned and illustrated by J. Hamal-Nandrin amongst the material from "*emplacement II* and *III*". Conversely, they are missing from the De Puydt collection, suggesting these tool types were not present on the terrace (Figure 10). This is further reinforced by the fact that all the small bifaces are heavily patinated, have damaged edges and lustred surfaces comparable with the material from the inside of the cave. These small bifaces are commonly associated with the "third fauna-bearing level" despite none being connected to the terrace stratigraphy established in 1886.

These bifaces have been referred to as "*dégénérés*" (degenerate) in the past and associated with a Quina Mousterian in several sites, mainly caves, in Belgium (Ulrix-Closset, 1975). Comparable with *Fäustel* (Bosinski, 1967), they are frequently found associated with *Keilmesser*, *Faustkeilblätter*, and *Halbkeile* typical of the Central European Micoquian (Bosinski, 1967; Jöris, 2004, 2006). In Belgium, these tool types have been found in cave sites such as Hermitage cave, Trou Magrite, Goyet cave and Grotte du Docteur as well as from the open-air sites of Moha–Station du Gros Bois, Liège–Sainte-Walburge, and Oosthoven–*Heieinde* (Ulrix-Closset, 1975, 1990, 1995; Di Modica, 2010; Ruebens & Di Modica, 2011).

While both the *Fäustel* and *Keilmesser* from Spy suggest eastern influences, they can be differentiated on the basis of the raw material, taphonomic characteristics, and spatial distribution. The *Fäustel* also invite comparisons with western sites assigned to the "*Moustérien à petits bifaces dominants*" ("Mousterian with mostly small bifaces"), notably Saint-Julien-de-la-Liègue (Cliquet & Lautridou, 1988; Pinoit, 2001) and Saint-Brice-sous-Rânes (Cliquet *et al.*, 2001b). Their presence over an extensive area from the Atlantic Coast to Belgium raises the possibility of a techno-complex

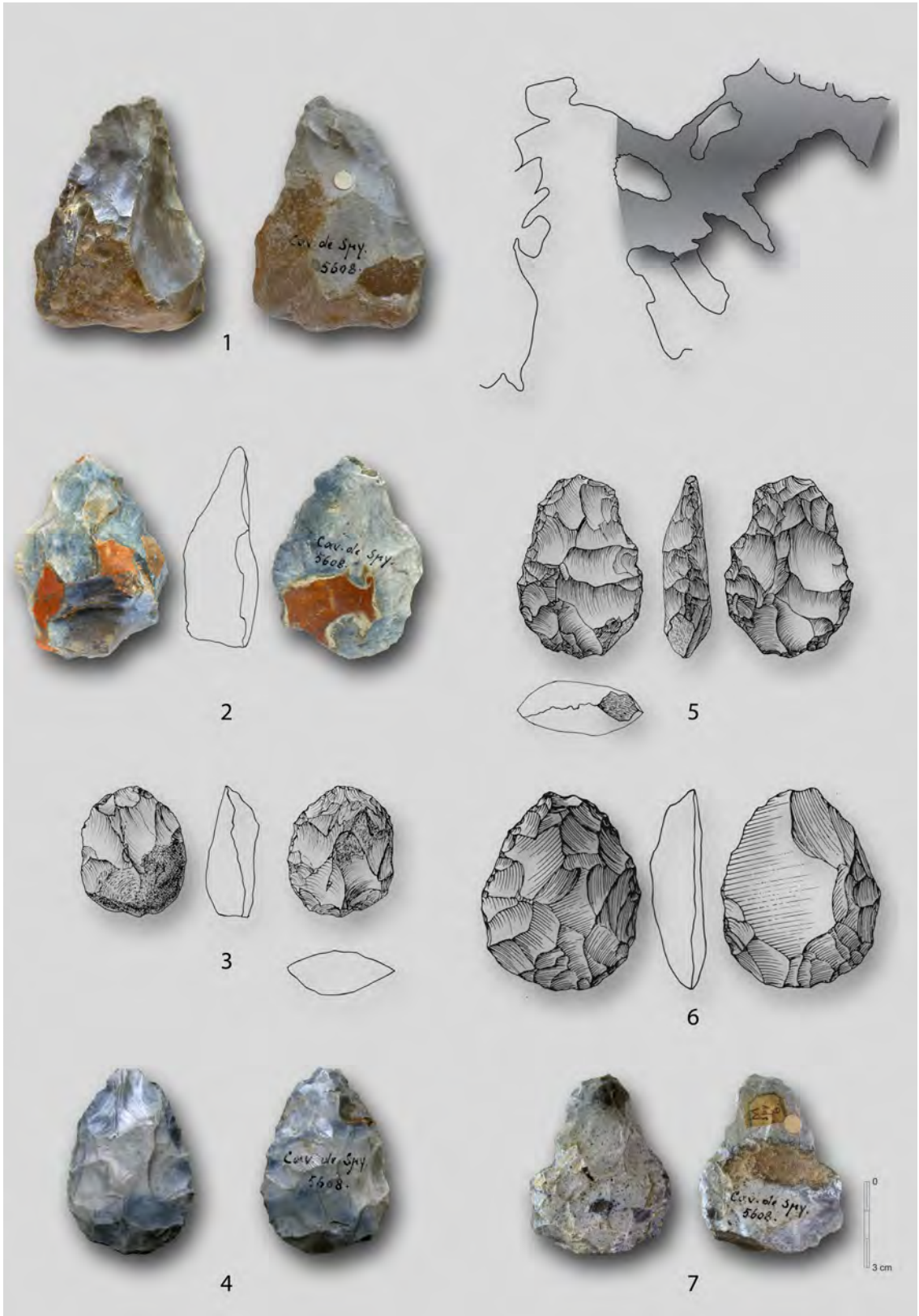

Figure 10. *Fäustel* from the right gallery made in locally available flint pebbles (1-5, 7) or *phtanite* (6) (1-2, 4, 7: photos by C. Jungels & A. Hauzeur; 3, 5: drawings by A.-M. Wittek, ADIA; 6: drawing from Ulrix-Closset [1975]; 1-3, 6-7: coll. RBINS; 4: coll. ULg; 5: coll. RMAH; illustrations by K. Di Modica).

specific to North-West Europe (Ruebens & Di Modica, 2011). Unfortunately, reliable chronological data is still sorely missing. At Tréissény (Brittany), the lithic material was found lying on a fossil beach attributed to MIS 5 (Molines *et al.*, 2001), while at Karreg-al-Yellan and Traou-an-Arcouest the stratigraphic position of the archaeological material could date to the end of MIS 5 or the beginning of MIS 4 (Molines *et al.*, 2001). The lithic material at Bois-du-Rocher was found in gravel deposits overlying a possible MIS 5 palaeosol (Giot *et al.*, 1998; Molines *et al.*, 2001). Finally, at Saint-Brice-sous-Rânes, the lithic material was recovered from silt covering an Early Weichselian gravel (Cliquet *et al.*, 2001b).

Mousterian points

The number and quality of Mousterian points from Spy makes the assemblage stand out amongst other Middle Palaeolithic sites in the Meuse Basin (Ulrix-Closset, 1975; SF16-18). The Mousterian points are mainly made on large Levallois blanks in a fine-grained, non-local flint. These tools were either manufactured on-site from these large, imported Levallois flakes or introduced already as points. These characteristics establish a technological link between the several Levallois flakes and cores made from the same type of raw material. A small number of points in a coarse-grained flint may have been produced on locally available flint varieties. Several Mousterian points are also made from siliceous sandstone and *phtanite*, including a *phtanite* example found close to the Spy no. 1 remains (De Puydt & Lohest, 1887).

From a technological perspective, most of the Mousterian points are skewed or *déjetées* (SF18) as a consequence of one edge being more heavily reduced or connected to the original morphology of the blank. This intensive reduction also results in a slightly asymmetric cross-section with one of the edges being more abrupt and more intensively reduced (for more details, see Jungels *et al.*, 2006, this volume: chapter X).

The majority of these points were recovered during the 1885-1886 excavations of the terrace (Figure 11). Mousterian points are also present in the RMAH collections, recovered by A. de Loë and E. Rahir during their fieldwork on the terrace and the first part of the "right gallery". Interestingly, they note that the Mousterian points from the terrace were not patinated, whereas those found inside the cave were both patinated and damaged (de Loë & Rahir, 1911). Several patinated Mousterian points were also found from within the cave ("*emplacement I* and *II*") during both the ULg excavations[4] (Hamal-Nandrin *et al.*, 1939) and the RBINS investigations of the fissures in the cave's left wall (André, 1981). One of the Mousterian points in the ULg collection is from Rucquoy's personal excavation[5].

Pertinent stratigraphic information is available only for the 1885-1886 excavations. Some 60 Mousterian points are reported as being found from the single archaeological level identified during the 1885 fieldwork (De Puydt & Lohest, 1886). The publication following the important discoveries in 1886 mentions about 140 Mousterian points from the "second fauna-bearing level", which also likely includes those discovered in 1885. The "third fauna-bearing level" apparently produced only one typologically Mousterian point, the *phtanite* example unearthed close to the Spy no. 1 Neandertal remains (De Puydt & Lohest, 1887).

Together with the *Keilmesser*, these Mousterian points compose the "evolved Mousterian" discussed above. Mousterian points are present on several Belgian sites, and morphological and technological similarities can be noted between examples from Engis cave, Goyet cave, Trou du Diable, Trou du Sureau, and Saint-Symphorien–Carrière Hélin. Furthermore, Mousterian points are not associated with *Keilmesser* at any of these sites.

Context of the Middle Palaeolithic material

The three "fauna-bearing levels" recognised by M. De Puydt and M. Lohest on the terrace during their 1886 fieldwork have always been considered reliable, so much so that the

[4] One of these points is today part of the Rucquoy collection.

[5] Probably a product of an artefact exchange between the RBINS and ULg.

Figure 11. Mousterian points made on flint (1, 2, 5-8) or *phtanite* (3-4) discovered on the terrace (1-4 and 8, remarkably fresh) or in the first part of the cave (all patinated, lustred and edge-damaged: 5 found by Rucquoy, 6 by Twiesselmann, 7 by De Puydt & Lohest) (photos by C. Jungels & A. Hauzeur; drawing from André [1981]; 1-4, 7-8: coll. *Grand Curtius* Museum; 5-6: coll. RBINS; illustrations by K. Di Modica).

artefacts previously recovered by A. Rucquoy were later reclassified according to these subdivisions. Moreover, all subsequent excavators attempted to correlate their own stratigraphic observations with those of De Puydt and Lohest (e.g. Hamal-Nandrin *et al.*, 1939). Up until now, this subdivision constituted the generally accepted framework for discussions concerning the chrono-cultural sequence at Spy, including the most recent publications (Semal *et al.*, 2009; Germonpré *et al.*, 2012).

A critical re-examination of available field data, coupled with a taphonomic, petrographic, and techno-typological analysis of the archaeological material questions the validity of these stratigraphic divisions and, at the very least, rejects its somewhat unjustified generalisation to describe the whole of the deposits on both the terrace and within the cave.

The terrace

This tripartite division of the deposits as representing a genuine archaeological succession is in fact a simplification of M. De Puydt and M. Lohest's field observations as is evident from the minutes recorded following the discovery of the Neandertal remains (Fraipont & Lohest, 1886: 209 and enclosed minutes). Moreover, their description of the three "fauna-bearing levels" is based on a single profile from the 1886 work on the terrace. The 1885 excavation report mentions only one "fauna-bearing level" in the lower part of a brownish clay deposit (De Puydt & Lohest, 1886). It is therefore likely that the material collected in 1885 that has been labelled twice, first in red ink followed by a second in black ink, represents the re-attribution of certain artefacts to the "second fauna-bearing level".

The lithic material stored at the *Grand Curtius* Museum in Liège contains Middle Palaeolithic artefacts from all three "fauna-bearing levels" of the terrace. Upper Palaeolithic artefacts found in all three levels and pottery from the "second fauna-bearing level" clearly demonstrate that not only is at least part of the sequence disturbed, but that the original stratigraphic observations are unreliable and should be considered with caution.

Relatively few Middle Palaeolithic tools have been documented from the "first fauna-bearing level" containing primarily Upper Palaeolithic material. Two convergent flint scrapers are patinated in a similar manner to the Upper Palaeolithic tool types. From a taphonomic perspective, it is interesting to note that although patinated artefacts are absent from the "second and third fauna-bearing levels", they are common amongst the material from inside the cave. The freshness of the material from the "first fauna-bearing level" is however more similar to that typical of the underlying levels of the terrace than it is to the material from inside the cave. The lithic material from the "second and third fauna-bearing levels" of the terrace is well preserved (i.e. unpatinated with fresh edges). Taphonomically, there is no difference between the "second" and the "third fauna-bearing level", and several other lines of evidence permit the validity of their separation to be explored.

First, the reddish colour of the "second fauna-bearing level" is most likely linked to the post-depositional colouration of a certain thickness of the sediments by ochre from an Upper Palaeolithic occupation surface, as already suggested by De Puydt & Lohest (1887: 213). In such a case, the red colouration could have affected several layers, explaining why the "second fauna-bearing level" contains a mix of Middle Palaeolithic, LRJ, Aurignacian, and even Gravettian material. Second, in regards to the probability that the material collected in 1885 was reattributed to the "second fauna-bearing level", the 1885 excavation report states that the archaeological material was found in the lower part of a brownish clay. If so, at least part of the material today related to the "second fauna-bearing level" was not collected from reddened sediments considered as typical of this level (De Puydt & Lohest, 1887). Third, almost all the individually labelled Middle Palaeolithic material is attributed to the "second fauna-bearing level", with only twenty such artefacts related to the "third fauna-bearing level" including a Mousterian point similar to those from the "second fauna-bearing level". Moreover, Upper Palaeolithic material is also present in the "third fauna-bearing level". Finally, post-depositional disturbances, such as bioturbation, and the presence of Neolithic burials partially affected the archaeological sequence and account for the ceramic

fragments amongst the material from the "second fauna-bearing level".

The existence of distinct Middle Palaeolithic assemblages in the "second and third fauna-bearing levels" of the terrace is not supported taphonomically, nor evident in the typology and technology of the material. However, the lithic material still stored in the De Puydt collections represents only a small and likely biased sample of the thousands of artefacts De Puydt and Lohest mention the site originally containing. The distinction between a Middle Palaeolithic industry in the "third fauna-bearing level" and another in the "second fauna-bearing level" therefore relies on relatively weak arguments and ought to be considered with caution, especially as part of the material from the 1885 excavation was reattributed to levels defined the following year. As for the few artefacts from the "first fauna-bearing level", post-depositional processes having reworked the sediments could explain their position in the upper portion of the stratigraphy and their condition, which differs from the rest of the Middle Palaeolithic material.

Therefore, the Middle Palaeolithic material from the terrace should be considered as a whole, independent of the dubious stratigraphic attributions. It is characterised by the occasional Levallois product, numerous Mousterian points, several bifacial backed knives and foliate pieces made on different varieties of mostly locally available flint, alongside *phtanite*, "*grès-quartzite de Wommersom*", and "*grès-quartzite de Rommersom*". None of the MTA bifaces were recovered from the terrace.

None of the subsequent excavations confirmed M. De Puydt and M. Lohest's 1886 subdivision of the deposits, and there exists no evidence permitting the three "fauna-bearing levels" described by A. de Loë and E. Rahir to be correlated with those of De Puydt and Lohest. Moreover, the obvious mix of Middle and Upper Palaeolithic artefacts in each of de Loë and Rahir's "fauna-bearing levels" clearly highlights processes having reworked the deposits.

The cave's interior

A portion of the lithic material recovered from inside the cave – particularly during Rucquoy's excavation – shows petrographic, technological, and typological affinities with the terrace material. This is particularly evident for the Mousterian points, found both on the terrace and within the cave. Differing surface states of the artefacts, the mix of Middle and Upper Palaeolithic tool types as well as techno-typological and petrographic similarities with the material from the terrace suggest that at least part of the artefacts found within the cave could correspond partially with those from the current terrace, perhaps in a secondary position.

However, significant differences between the material recovered from the cave's interior and the terrace may also reflect different occupations, techno-complexes, or cultures. Mousterian points and bifacial backed knives, well represented on the terrace, were almost absent inside the cave, while MTA biface forms were not documented on the terrace, but found within the cave, especially in the "right gallery". When stratigraphic data is available, these bifaces are attributed to the base of the deposits, sometimes in contact with the bedrock. Small *Fäustel* have also been found inside the cave, but not on the terrace.

SYNTHESIS

The actual context of the Middle Palaeolithic artefacts recovered from Spy is difficult, if not impossible to discern with any certainty. From a strictly stratigraphic perspective, nothing supports a succession of distinct Middle Palaeolithic levels related to different occupations, techno-complexes, or cultures. However, the spatial analysis of the Middle Palaeolithic artefacts reveals significant differences in the preservation of the material – well preserved on the terrace, damaged inside the cave – as well as the distribution of specific tool types. Mousterian points were recovered almost exclusively from the terrace. Bifacial backed knives and foliate pieces were documented on the terrace with only a single foliate piece discovered in one of the fissures in the first chamber of the cave, while MTA bifaces and *Fäustel* were discovered exclusively inside the cave, more specifically in the "right gallery". This uneven distribution of different tool types together with the differential preservation of the artefacts may be linked to depositional processes

typical of karst contexts (Bertran, 1994; Texier, 2000; Texier *et al.*, 2004; Pirson, 2007; Lenoble *et al.*, 2008, 2009).

Differing taphonomic factors between the terrace and the cave's interior could correspond to the reworking and displacement of well-preserved lithic material (the middle of the terrace) towards places where it is considerably damaged (inside of the cave). As the spatial distribution of tool types shows significant differences between the current terrace and the cave, it might also reflect distinct archaeological assemblages with different post-depositional histories. In this case, a distinction could be made between at least a Middle Palaeolithic including MTA bifaces and *Fäustel*, and another Middle Palaeolithic including Mousterian points and bifacial backed knifes. The chronology of these two hypothetical assemblages is impossible to determine given the lack of reliable stratigraphic information and the impossibility of correlating deposits from within the cave with those identified on the terrace.

The Middle Palaeolithic deposits of Spy are normally described as containing three different components: a Mousterian of Acheulean Tradition at the base, a Quina Mousterian in the "third fauna-bearing level", and an "evolved Mousterian" in the overlying "second fauna-bearing level", considered likely contemporaneous with the beginning of the Upper Palaeolithic (Ulrix-Closset, 1975). Our revision proposes a slightly different interpretation.

The presence of cordiform and triangular bifaces, made in both flint and *phtanite*, makes the existence of an MTA component in the Spy lithic material fairly clear (Figure 12). Typological comparisons with dated discoveries in Belgium (Godarville, unpublished) and in France (Vanne Valley: Depaepe, 2001; St-Just-en-Chaussée: Tuffreau, 1977; Le Tillet: Bordes, 1954) seem to indicate an Early Weichselian age. However, a more recent age cannot be excluded as cordiform and triangular bifaces are also known from MIS 3 contexts at Saint-Amand-les-Eaux (Inrap, 2007; Feray *et al.*, 2010) and Scladina cave (Bonjean *et al.*, 2011).

Two groups of artefacts indicate Central European influences (Figure 12): the *Fäustel* from within the cave, and the bifacial backed knives and foliate pieces discovered on the terrace. For M. Ulrix-Closset (1975), the *Fäustel* form part of the Quina Mousterian whereas the bifacial tool types belong to the "evolved Mousterian". Interestingly, *Fäustel* and *Keilmesser* are occasionally found together in German sites (Bosinski, 1967; Jöris, 2002, 2004, 2006). However at Spy this does not seem to be the case given taphonomic differences and the spatial distribution of the two distinct archaeological assemblages. These differences seem to suggest that these two tool types reflect eastern influences during two different periods.

The *Fäustel* from Spy are comparable to those from several cave sites in Belgium (Ruebens & Di Modica, 2011), the open-air site of Oosthoven–*Heieinde* (Ruebens & Van Peer, 2011), and sites in Western France (Cliquet *et al.*, 2001a; Molines *et al.*, 2001; Monnier *et al.*, 2002) where these small bifaces are particularly abundant and do not seem to be associated with *Keilmesser*, foliate pieces, or *Blattspitzen*. In Western France, techno-complexes with numerous small bifaces date to between MIS 5d and the beginning of MIS 4.

Keilmesser, foliate pieces, and *Blattspitzen* are found almost exclusively on the terrace and form a homogeneous assemblage in terms of both raw material and taphonomy. In Belgium, these types of artefacts have been found in several sites including cave sites such as Goyet and Trou Magrite, in addition to open-air sites like Oosthoven–*Heieinde*. However, the chronology of these artefacts in Belgium and surrounding regions remains poorly understood. In Belgium, a few small asymmetric and flat bifaces have been recovered from MIS 5d-a and MIS 4 contexts, whereas foliate pieces from Couvin seem to date to MIS 3 (Ruebens & Di Modica, 2011). In Germany, the closest comparison is Salzgitter-Lebenstedt (Pastoors, 1998) and the "G-Complex" from Sesselfelsgrotte (Richter, 2006), both dated to ca. 50,000 to 40,000 BP. These comparisons, added to the fact that none of the radiocarbon dates on the terrace yielded an age greater than ca. 44,000 BP (Semal *et al.*, 2009, this volume: chapter XVI), could indicate that this group of artefacts reflects an MIS 3 lithic assemblage portraying eastern influences.

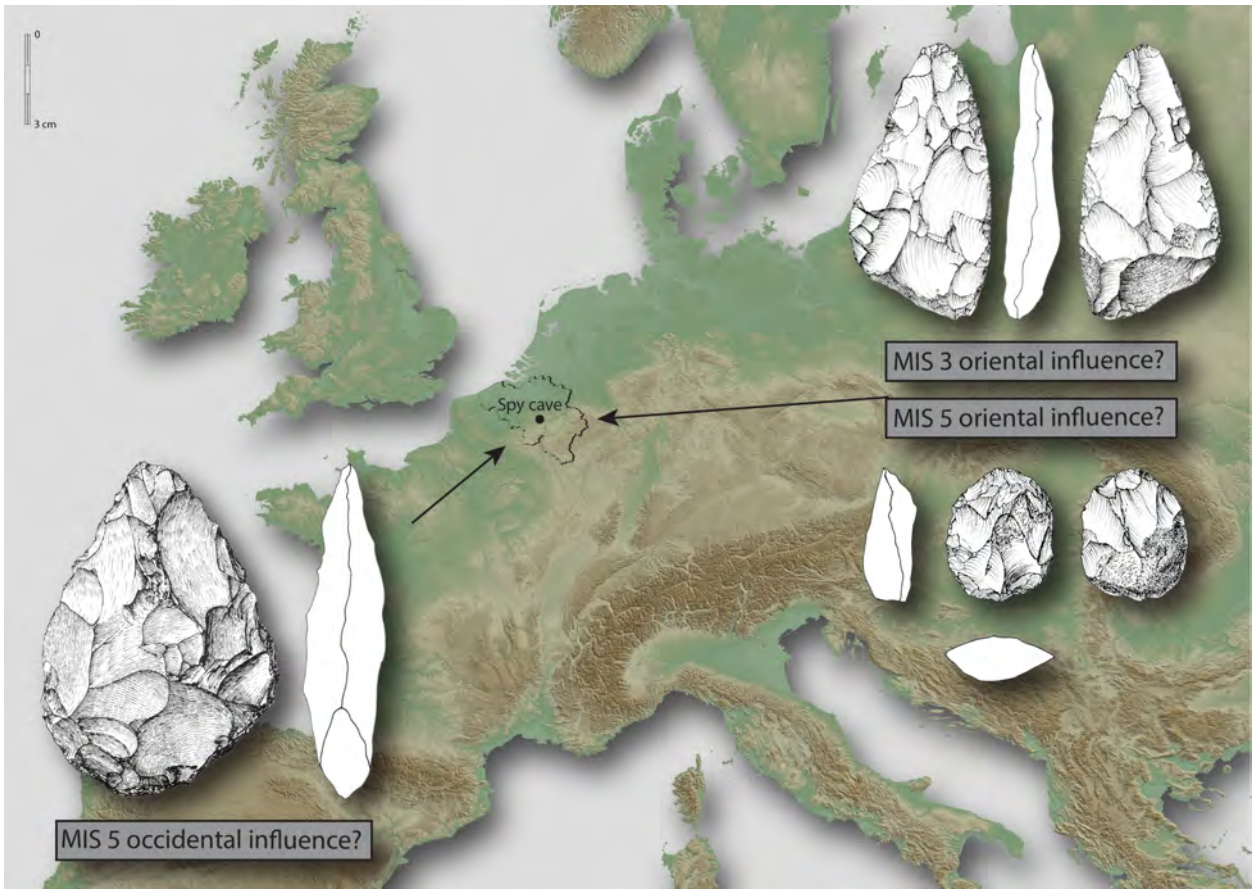

Figure 12. The Belgian territory was a crossroad of cultural influences during the Middle Palaeolithic. This is particularly well illustrated by bifacial tools from Spy cave that reveal influences from both Western Europe and Central/Eastern Europe. The material from Spy cave and regional comparisons suggest at least two lithic assemblages dating to MIS 5, and one lithic assemblage from the MIS 3 (drawing from Ulrix-Closset [1975] [left] and by A.-M. Wittek, ADIA [right]; illustrations by K. Di Modica).

Mousterian points, found almost exclusively on the terrace, form the last major tool type documented at Spy. Their spatial distribution suggests they form part of the same archaeological assemblage as the bifacial tools, a possibility already proposed by M. Ulrix-Closset (1975). Nevertheless, it is important to note that the flint varieties used for the production of bifacial tools differ somewhat from those used for the Mousterian points. This suggests two possibilities; either differences in raw material use reflect a single archaeological assemblage in which raw material strategies varied according to the objective, or the existence of two distinct archaeological assemblages. In the latter case, the fact that no radiocarbon date exceeds 44,000 BP suggests that the same argument advanced for placing the bifacial tools in MIS 3 also applies to the Mousterian points.

The interpretations advanced here are based solely on the main tool types recovered from Spy as most of the other lithic material recovered from the site unfortunately cannot be attributed to any of the archaeological assemblages proposed here. This is especially the case for *débitage* products either in locally available raw materials or on imported flint. In this sense, the association between MTA bifaces and Levallois products as proposed by M. Ulrix-Closset (1975) no longer appears tenable. The impossibility of associating tool types with *débitage* products also leads us to abandon the previously proposed attribution of part of the material to the Quina Mousterian (Ulrix-Closset, 1975). Such an attribution was based on the supposed association between the rare *Fäustel*, occasionally step-retouched scrapers, and a non-

Levallois reduction strategy employing locally available flint. Moreover, it has subsequently been demonstrated that the "Charentian aspect" of some Belgian industries can be linked with raw material constraints and not cultural trends (Di Modica, 2010).

Finally, there remains the delicate question concerning the association of the Neandertal skeletal remains with the archaeological material discovered at Spy. The spatial distribution of the lithic component makes unlikely their association with the MTA and *Fäustel* assemblages found uniquely within the cave. With that said, there remains three possibilities; the Neandertal skeletal material could be associated with (1) the Middle Palaeolithic of the terrace, (2) the LRJ complex also found on the terrace, or (3) with none of the lithic assemblages from the terrace. The first possibility has been the most popular given the *phtanite* Mousterian point recovered beside the Spy no. 1 individual (De Puydt & Lohest, 1887). The second hypothesis is supported by the direct radiocarbon dates obtained for the Neandertal remains, which indicate an age of ca. 36,000 BP and thus place them closer to the chronological range of the LRJ than that of the final Mousterian in Northwestern Europe (Pirson *et al.*, 2012). The third possibility is more theoretical; in the absence of precise and reliable stratigraphic information, the possibility that graves were cut into the deposits from an unoccupied surface cannot be excluded. At present, despite uncertainties concerning the archaeological context of the Neandertal remains, the evidence from Spy nevertheless constitutes one of the latest Neandertal occupations in Northwestern Europe.

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