MULTAS PER GENTES ET MULTA PER SAECULA

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AMICI MAGISTRO ET COLLEGAE SUO
IOANNI CHRISTOPHO KOZŁOWSKI DEDICANT

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(editors)

KRAKÓW 2018

The edition and publication of this book was funded by the Faculty of History at the Jagiellonian University in Kraków

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Photograph on the page 10: Prof. Janusz K. Kozłowski (photo by Anna Wojnar)

Proofreading: Steven Jones and authors
Translation of the Latin text on the cover: Tomasz Polański

Typesetting and layout: Elżbieta Fidler-Źrałka
Correction of figures: Urszula Bąk

Kraków 2018, Edition I

ISBN 978-83-948382-3-2 (Institute of Archaeology, Jagiellonian University in Kraków)
ISBN 978-83-64449-68-0 (Alter Publishing House)

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http://www.wydawnictwoalter.pl
E-mail: alter@wyd-alter.pl

JAGIELLONIAN UNIVERSITY
IN KRAKÓW

Printed in Poland

CONTENTS

Keilmesser with tranchet blow from Grotte de la Verpillière I (Germolles, Saône-et-Loire, France)

Jens Axel Frick, Klaus Herkert, Christian Thomas Hoyer, Harald Floss

This contribution is dedicated to J.K. Kozłowski, R. Desbrosse and J. Zuate y Zuber whose groundbreaking study enlarged, 40 years ago, the knowledge about this Middle Paleolithic tool.

Abstract: This paper is centered on *Keilmesser* with a lateral tranchet blow modification on the cutting edge from Grotte de la Verpillière I in Germolles, France. It is demonstrated that the production of these lithic objects follows specific rules, regardless of the matrix used, resulting in a vast range of morphologies. Different assemblages from the site contain *Keilmesser* with tranchet blows as well as corresponding tranchet-blow blanks. They are known from the first excavation on site in 1868, from surface collections in the 1950s and 1970s, as well as from the newly performed excavations on site. Analysis of the production sequences clearly demonstrate that the performance of a tranchet blow can be an additional task for re-sharpening, but mostly the performance of a tranchet blow was an integral part of the production. Moreover, the entire production is targeted and planned to perform such a tranchet blow, whose performance is thus comprehended as important cutting edge regularization and part of the regular production sequence of these tools.

Keywords: *Keilmessergruppen*, Middle Paleolithic, Prondniks, Eastern France, Litho-technological study

Introduction

In the course of the entire Paleolithic research history bifacial lithic objects were consistently part of studies and contributed to definitions of definitions of cultural entities such as the *Chelléen*, *Acheuléen* or the *Moustérien* by de Mortillet (1883). Within the typological facies definition of Bordes (e.g., Bordes, Bourgon 1951) bifaces were a definitional part of the *Moustérien de tradition acheuléenne* (MTA). In Central Europe particular lithic objects were also used to define entities, namely the *Keilmessergruppen* (KMG, Mania 1990) and *the Blattspitzengruppen* (e.g., Bolus, Rück 2000) in the Middle Paleolithic or the *Federmessergruppen* at the final Paleolithic (Schwabedissen 1954).

40 years ago, under the guidance of Desbrosse, some highly characteristic bifacial tools from Grotte de la Verpillière (hereafter VP I) were analyzed (Desbrosse, Texier 1973; Desbrosse *et al.* 1976), deriving from the collection of Jeannin and unearthed during the 1868 excavation directed by Méray (see Méray 1869). Studies from the 1970s compared these lithic objects with similar types from other Middle Paleolithic sites in Central Europe such as Ciemna cave (Poland) or Buhlen (Germany). As type designation for backed knives the frenchified term *Prondnik* was used for these tools, a name adopted from the Polish term *Prądnik* established by Krukowski (1939-1948). As far as we know, these studies were the first that described such outstanding tools from western European assemblages detailed.

Since 2003, new research under the auspices of Floss focusing on the assemblages of VP I have been conducted with the aim to collect all available data about the site, the assemblages of ancient excavations and surface collections (Frick 2010; Dutkiewicz 2011; Dutkiewicz, Floss 2015; Floss 2005) as well as performing new excavation on the site (see e.g., Floss *et al.* 2013; Floss *et al.* 2015; Floss *et al.* 2017; Hoyer, Floss 2016; Hoyer *et al.* 2016; Frick, Floss 2017). In 2006, the former Grotte de la Verpillière was renamed in Verpillière I (VP I), because on the same sub-district Verpillière another Middle Paleolithic site (VP II) was detected and is under research since then (e.g., Frick, Floss 2015; Frick, Floss 2017; Frick 2016a; 2016b).

Both sites are situated on the eastern cliff face of the Jurassic Montadiot massif in the small Orbize valley in the village Germolles (*commune* Mellecey) around 10 km West of Chalon-sur-Saône, Saône-et-Loire department in Eastern France (Fig. 1). Therefore, the site is often called Grotte de Germolles or just Germolles.

This paper is prevalently focusing on technological analysis of the outstanding tools called *Keilmesser* (abbrev. KM) with tranchet blow (TB) and their corresponding tranchet-blow blanks (TBB) from VP I, succeeding the general overview of lithic analysis of bifacial objects from both sites (Frick, Floss 2017) and to round off the first analyses of Desbrosse and colleagues.

The dating attempts of GH 3 and GH 4 of VP II (also placed within the KMG) suggest an early OIS 3 context for these assemblages (Richard *et al.* 2016; Zöller, Schmidt 2016; Heckel *et al.* 2016). Preliminarily, this age suggestion seems also valid for the *Keilmesser* with tranchet blow and corresponding TBBs from VP I.

In this context, the name *Keilmesser* is favored as synonym for asymmetrically (bifacially) backed knives (ABBK), because it combines its wedge shape (German *Keil*) in cross section and the supposed function as knife (German *Messer*). They are, "*in general, bifacially worked core tools possessing a single sharp working edge, which is formed by bifacial retouch from one side after the other, opposed by an unworked or roughly worked (in rare cases more carefully worked) back* […]*. In the terminal part of the tool the back often changes to a second, quite sharp edge, which converges with the distal end of the working edge to form a more or less pointed tip (*[...]*).*" (Jöris 2006: 292).

Research history

The research history shows a strong connection between KMs and the Micoquian (Frick *et al. in print)*. The beginning of analysis of KMs with TB can be seen in the seminal work of Krukowski (1939-1948) in the 1930s. Jacob-Friesen (1949), the first using the term KM in a Paleolithic context (to our knowledge) described special forms of backed bifaces. In the 1960s, Bosinski used the term KM for ABBKs from the *Micoquien* assemblages from the western part of Central Europe (e.g., Bosinski 1967), with a clear connection to La Micoque N/6 (Bosinski 1970).

From the 1990s onwards, confusion in term use was intensively re-examined. At first Mania (1990), introduced the KMG for *Keilmesser*-bearing assemblages from Europe, which was preferred by scholars such as Veil *et al.* (1994) or Jöris (2001) and even adopted by Bosinski (2000-2001). The linkage between assemblages from Central Europe and La Micoque (mainly layer N(6)) was strongly questioned and resulted that insecure stratigraphic information and impossibilities in dating layer N(6) of La Micoque (see e.g., Falguères *et al.* 1997; Rosendahl 2004) disqualifies the assemblage as serving to name assemblage entities (see discussions in Veil *et al.* 1994; Jöris 2003). In using the term KMG we are following the attempt of other scholars, e.g., Blaser and Chaussé (2016: 176): "*It would nonetheless be advisable, following the example of the German works, to abandon the term Micoquian, and to find* […] *new name*[s] *to denote th*[ese] *archeological entit*[ies]*.*"

Because of the presence of bifaces at VP I, the Middle Paleolithic component of the assemblages was set into different entities, such as the *Moustérien de tradition acheuléenne* (Delporte 1955; Desbrosse *et al.* 1976), *Acheuléen* (Gros, Gros 2005), *Micoquien* (Gouédo 1999), *Charentien de influence micoquienne* (Farizy 1995), *Moustérien mit Micoque-Option* (Richter 1997) or the KMG (Jöris 2003).

This and other studies (Frick 2010; Frick *et al. in print*; Frick, Floss 2017; Frick 2016a; 2016b) contribute to find a useful denomination of the Middle Paleolithic components at the site. The new excavation found evidence for a Middle Paleolithic occupation under the ancient rock shelter (Litzenberg 2015; Hoyer *et al.* 2016) containing Levallois elements and a bifacial preform, as well as indications in front of the rock shelter of the old Méray trench from 1868 and many additional KMTBs and TBBs from the back dirt and in colluvium sediments there (Hoyer *et al.* 2016). A much earlier occupation is indicated by the presence of double symmetrical bifaces from the old collections, as well as from one biface-preform in a trench downwards the hill in front of the site (Hoyer *et al.* 2016; Frick, Floss 2017).

Morphological and techno-functional description

Morphologically, a KM possesses a lithic volume surrounded by (at least) one cutting edge, a back, a bow and a base (Fig. 1:2). The (main) cutting edge

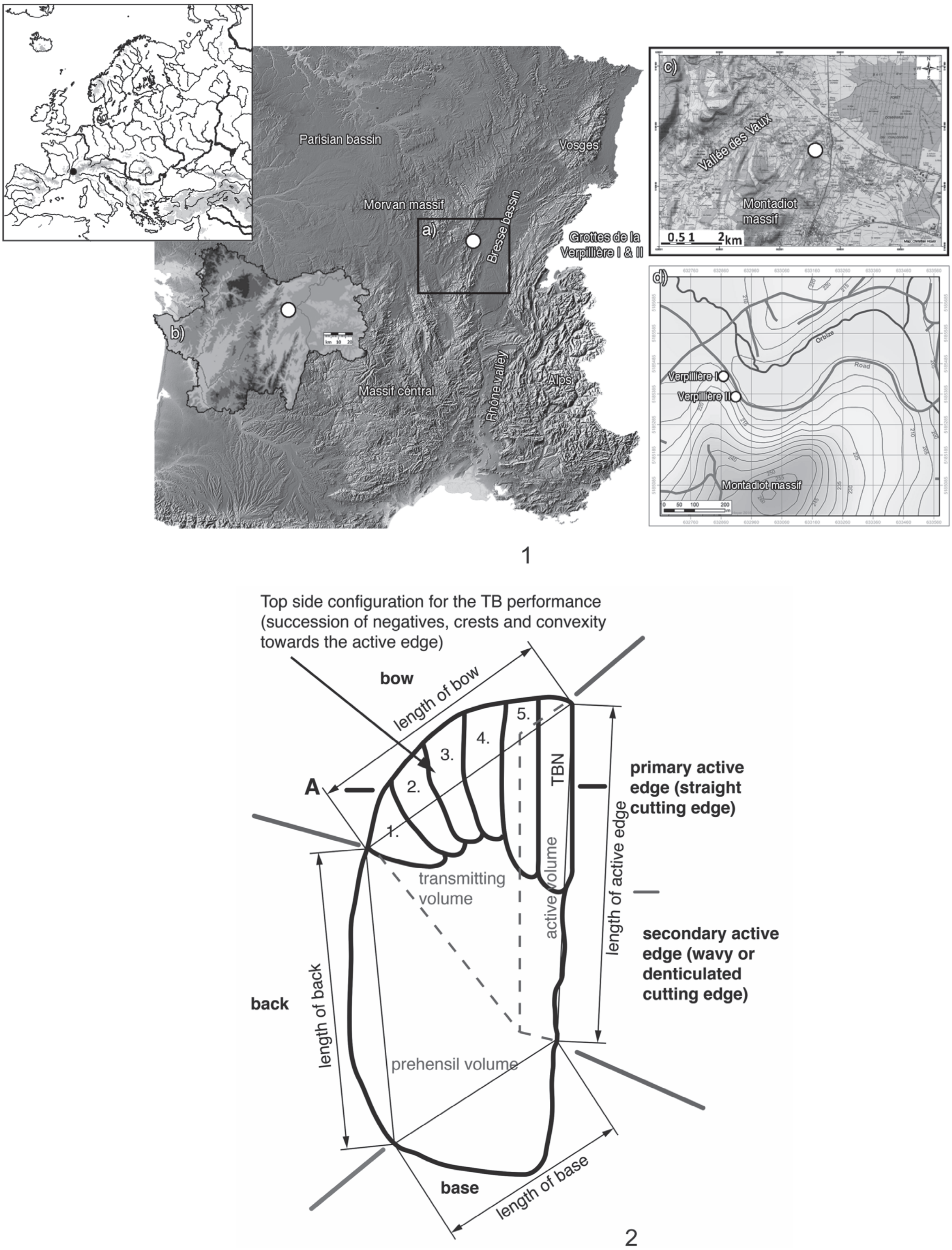

Fig.1. 1. Location of Grotte de la Verpillière I & II (white point with black fringe). a) Position of VP I on a relief map in Eastern France. The frame shows the positon of the Saône-et-Loire departemnt (base map: NASA, SRTM 2000, www.pacha-cartographie.com); b) Position of VP I on a relief map of Saône-et-Loire department (base map: NASA, SRTM 2000 from S.R.A. Bourgogne); c) Position of VP I on a topographical map of the Côte chalonnaise, the logistic area around the site (base map: 25k TOP map, Beaune-Chagny from the Institut géographique national, IGN 2005, coordinates in UTM T31N, GIS: Hoyer) and d) Positon of VP I and II on a topographical map of the immediate surrounding of the sites (base map: 25k TOP map, Beaune-Chagny from the Institut géographique national, IGN 2005, coordinates in UTM T31N, GIS: Hoyer); 2. Schematic illustration of a KMTB showing measurements used, top side configuration and techno-functional volumes.

is interpreted as being for mostly longitudinal cutting-in (Jöris 2006; Urbanowski 2003) or transversal whittling (cutting-off, pers. comm. O. Jöris in 2015). This edge can be confected using retouch (retouch negatives are oriented orthogonally to the edge) and TB techniques (tranchet-blow negatives (TBNs) are oriented along the edge). Before the performance of a TB mostly the prospective cutting edge is bifacially worked in the manner similar to the *wechselseitig-gleichgerichtete Kantenbearbeitung* (term could be translated into alternating unidirectional edge regularization, AUER) as described by Bosinski (1967). The subsequent TBN is normally situated lateral on the more convex surface (top side) of the object. Afterwards the cutting edge can be regularized using unifacial or bifacial retouch techniques. In many cases, the active edge is separated into two sections, a straight (if viewed from lateral) possessing the TBN and a wavy or denticulated one. In opposition to the cutting edge (on the other lateral side) a back is placed, which can be natural (e.g., cortical) or worked. The back continuous into the terminally situated bow, which consists a truncation as striking platform and convex surface modification for guiding the TB. In a techno-functional approach (see Fig. 1:2) a KMTB consists a volume at back and base as handle (prehensile part), a volume represented at the bow (transmitting part) and the active-edge volume as transformative part. KM and KMTB are prevalently interpreted as being hand-held and not fixed in a haft (e.g., Jöris 2006).

General production sequence of KMTBs

The general production sequence (*chaîne opératoire*) for KMTBs is quite well understood (see Bosinski 1967, 1969; Jöris 2001, 2006; Koulakovskaya *et al.* 1993; Krukowski 1939-1948; Urbanowski 2003) and listed in the following (see also: Frick, Floss 2017):

1. Selection of a suitable matrix (raw piece, core, frost shard or blank).
2. (If necessary) roughing out or coarse shaping.
3. Production of a back or using a natural back.
4. Shaping of the flatter surface (bottom side) or using a flat surface (e.g., ventral face).
5. Shaping of the more convex surface (top side).
6. Production of a striking platform at the bow (truncation).
7. (If necessary) bifacial shaping of a lateral crest on the future active edge.
8. Production of crests or an adequate convexity on the top side for guiding the TB.
9. Removal of the TBB.
10. (If necessary) regularization of the active edge which can have a bipartition (primary active edge is straight in lateral view and secondary is wavy or denticulated).

Assemblages of KMTBs and TBBs from VP I

Altogether there are until now n=44 KMTBs known from VP I deriving from different assemblages (Table 1). On the one hand, they are known from the first excavation by Méray in 1868 stored in different collections. On the other hand they derive from the newly performed excavations of Floss from the years 2011, 2015 and 2016 (n=26) that could evaluate the

Table 1. Assemblages of KMTBs (*Keilmesser* with tranchet blow) and TBBs (Tranchet-blow blanks) from VP I

Denomination	Collection	Activity	Year	Number
Keilmesser with tranchet blow	Méray	Méray excavation	1868	4
Keilmesser with tranchet blow	Jeunet	Méray excavation	1868	5
Keilmesser with tranchet blow	Jeannin	Méray excavation	1868	9
Keilmesser with tranchet blow	Floss	Floss excavation	2011, 2015 & 2016	26
Tranchet-blow blank	Jeannin	Méray excavation	1868	1
Tranchet-blow blank	Pelatin	Surface collection or excavation	1970s	4
Tranchet-blow blank	Aimé	Surface collection or excavation	1970s	1
Tranchet-blow blank	Gros	Surface collection or excavation	1950s	3
Tranchet-blow blank	Floss	Floss excavation	2015 & 2016	46
Total				**99**

position of the majority of the old excavation trenches (Hoyer *et al.* 2016). With the exception of one KMTB from the interior of the rock shelter (found in a mixed sediment unit, GH 15/18) all other pieces were situated directly in front of the former rock shelter and its entrance in colluvial sediment units.

The distribution of the known n=55 TBBs is slightly different. They are also present in old collections but their majority (n=46) derives from the recent excavations from the front of the rock shelter. A selection of these TBBs is displayed in Fig. 2.

KMTBs and TBBs can be described as left- and right-sided (Table 2) because of a more convex and a flatter surface. In addition, the TBBs as waste product of the production of the TBNs on the KMTBs can therefore also be described as left and right sided. Summarizing, there are n=7 left-sided KMTBs, in opposition to n=36 right-sided KMTBs. One KMTB can be described as left- and right-sided, because either side possesses a TBN. For TBBs, there are n=11 left-sided and n=44 right-sided TBBs. As Table 2 demonstrates, there are much more right sided KMTBs, as well as TBBs available (left/right for KMTBs 7/35 and for TBBs 11/44). Nevertheless, the amount of left-sided objects is much higher than percentages Jöris (2001: 34) presented for Buhlen. There, more than 90% of the KM are right-sided and respectively 85,4% of the TBBs. Buhlen yielded n=2 "*Pradnik-Schaber*" that possess TBNs on either side. This double installation of TBNs is also visible on one KMTB from VP I (see Fig. 3:1a).

Table 2. Amount of left- and right-sided KMTBs and TBBs from all collections

Denomination	Méray excavation in 1868 (coll. Jeannin, coll. Jeunet & coll. Méray	Coll. Gros from the 1950s	Coll. Pelatin and coll. Aimé from the 1970s	Floss excavation in 2011	Floss excavation in 2015	Floss excavation in 2016	Total
Left sided KMTB	4	0	0	0	0	3	7
Right-sided KMTB	13	0	0	1	9	12	36
Left- and right-sided KMTB	1	0	0	0	0	0	1
Left-sided TBB	0	1	1	0	4	5	11
Right-sided TBB	1	2	4	0	7	30	44
Total	**19**	**3**	**5**	**1**	**20**	**45**	**99**

Reduction-sequence reconstruction of KMTBs

For the production of the KMTBs prevalently flakes (n=33) are selected as production matrix (examples in Fig. 3:1a and Fig. 3:2b), followed by frost shards (n=6), blades (n=2) and formerly entirely cortical raw pieces (n=2, example in Fig. 3:1c). The predominant use of blanks (flakes and blades) as matrix is also visible in other sites, such as Abri du Musée (Bourguignon 1992), whereas in other assemblages, such as Buhlen (Jöris 2001) flat raw pieces are preferred. One advantage in using flakes for the production is that a specific flake morphology can be selected that possesses an asymmetrical but plano-convex cross-section. Such a morphology is close to the resulting one in shaping a KMTB out of a raw piece and therefore some production steps are not necessary to perform.

The majority (n=36) of the KMTBs is made from local flint from the *argiles à silex* (FAS). Another n=4 are made from *Chaille* (local Jurassic chert) and n=3 are made from a yet unknown variety of flint. For the TBBs, n=52 are made from FAS, one is made from an oolithic chert variety and n=2 from local *Chaille*.

As visible in the "standardized" production-step sequence (see above), normally, at first, a back is created. At VP I, this is only true for n=10 KMTBs. All other KMTBs use existing edges and surfaces as back, without any modification (see Fig. 3:2b). Therefore, another n=28 possess a cortical back (see Fig. 3:1c), for n=1 the platform of the blank functions as back and n=4 use old surfaces of the blank as back. But regardless if created or existing, the back is the starting point of KMTB shaping. On n=29 pieces the bottom side is shaped first and on n=14 the top side. On another n=3 the base is shaped first (see Fig. 3:2a and 3:2b) and on one a flake from an old KMTB is used to produce a new one (see Fig. 3:2c). Before performing the TB on all of the KMTBs the surface where the TBN will be situated is shaped by creating some negatives on the more convex surface (top side) as crests (exemplified in Fig. 3:1c). A stumping of the active edge as additional crest for guiding the TB performance, as described by Jöris (2001),

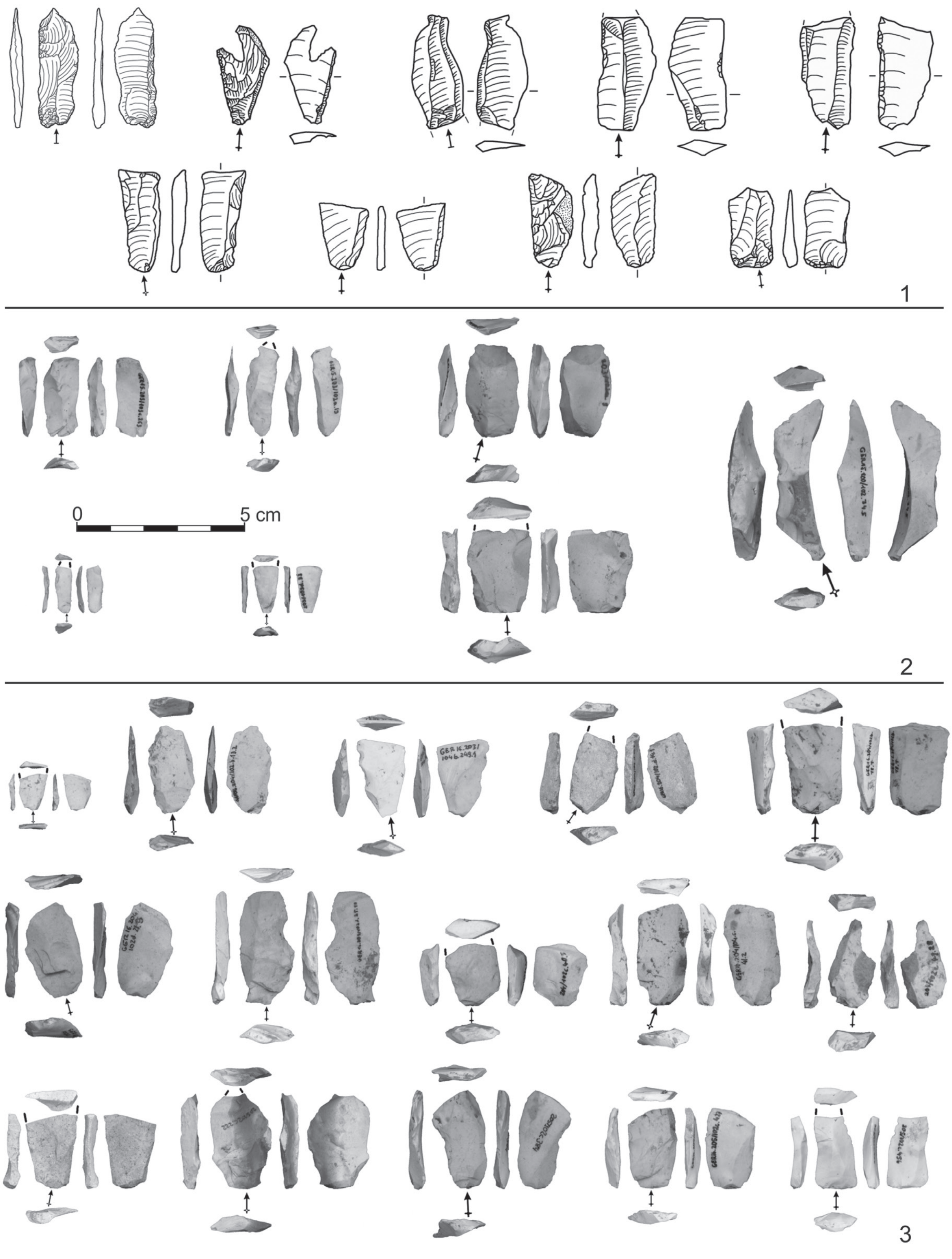

Fig. 2. Selection of TBBs from VP I. 1. TBBs from ancient collections; 2. TBBs from the 2015 excavation and 3. TBBs from the 2016 excavation campaign.

is only visible on n=4 KMTBs, whereas n=17 TBBs show such. On n=14 KMTBs, after the performance of the TB, the active edge was regularized with some retouch negatives (see Fig. 3:2c).

KMTBs from VP I possess a maximum length between 34.9 mm and 99.6 mm, a width between 21.0 mm and 58.1 mm and a thickness between 7.5 mm and 25,8 mm. For specific dimensions of

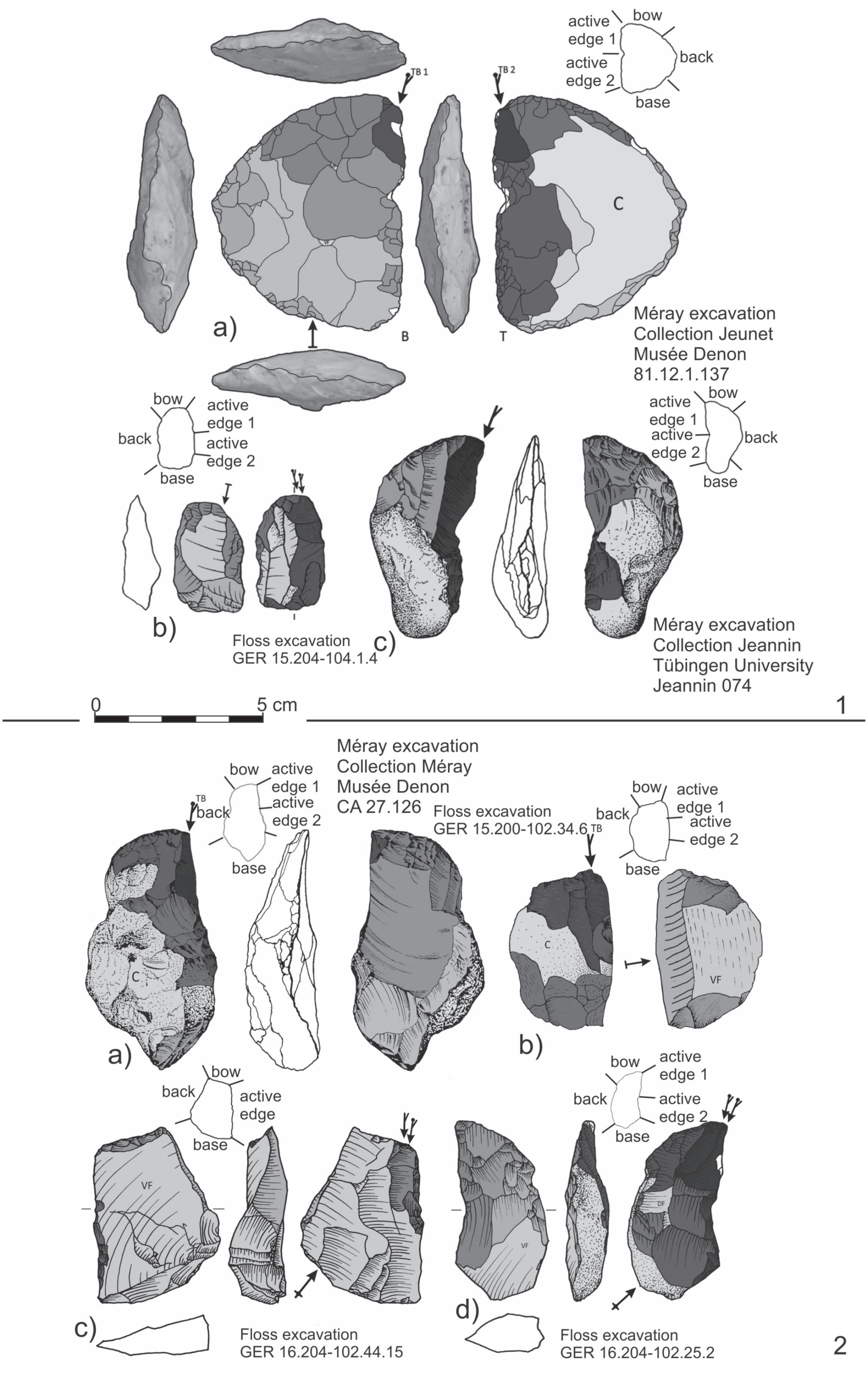

Fig. 3. 1. Selection of KMTBs from VP I. a – double-sided TBNs; b – TBNs in succession and c – repeated TBs performed on a nodule; 2. Selection of KMTBs from VP I. a – base is shaped first; b – base is shaped first, existing surface and edge used as back; c – an old KM on flake is used to produce a new KMTB and d – a cortical flake is used.

parts of the outline of KMTBs from VP I (Fig. 3) we note that the length of the bow varies between 6.5 mm and 39.3 mm, those of the back between 21.7 mm and 76.2 mm and the length of the base varies between 11.7 mm and 43.3 mm. Compared to these measurements, the active edge seems quite short and ranges between 22.0 mm and 88.9 mm, with a mean of 41.4 mm.

Concerning the TBBs, they range in length between 11.8 mm and 51.2 mm, between 4.9 mm and 32.5 in width, as well as 1.9 mm and 9.0 mm in thickness. A linear correlation between length and thickness is visible for most of the TBBs situated at around L=8T. Most of the time, the performance of a TB lowered the angle of the active edge, a fact which is evident for KMTBs as well as for TBBs. But it is also visible that in some cases the active-edge angle was not lowered under a threshold of 60°, a value Gladilin (1976) used to separate knifes from scrapers. Unfortunately, the patina on the artifact seems too dense to perform use-wear analyses on the active edges to find evidence for the use as knives.

Altogether the n=44 KMTBs show the performance of n=77 TBNs. There are n=21 KMTBs with one TBN, n=20 KMTBs show two TBNs, n=1 KMTBs possess five TBNs and n=2 KMTB shows even six TBNs. In dimensional comparison (length and width), TBNs and TBBs overlap in ranges but are not congruent. Self-evidently, this makes sense for the width comparison because they cannot be equal (the reason is that TB removes material from the active edge and the resulting TBN on the KMTB is always narrower as the TBB). On the other hand, the length bandwidth of TBNs is slightly different to them of the TBBs. This circumstance could be a hint that the entirety of the KMTBs and corresponding TBBs is not complete. An impression that is supported by the fact that up to now all refitting attempts between KMTBs and TBBs from the new excavation were unsuccessful.

Conclusion

The production sequences of the KMTBs from VP I demonstrate clearly that the performance of a TB was not an option on these lithic objects. Even more, the entire production was targeted and planned in advance to perform a TB on the active edge to create a straight, sharp and low angled cutting edge. The succession of production steps of the KMTBs is in congruence to other analyses (see Jöris 2001; Urbanowski 2003). The only difference is that at VP I a vast amount of KMTBs were produced using blanks as matrix. Therefore, the production of a flat bottom side, as well as the installation of a back was not always necessary to fulfill the requirements of the concept *Keilmesser* with tranchet blow. The presence of KMTBs as well as TBBs on the site demonstrate that the performance of TB was done on site (if TBBs are seen as waste products and if the explicite import of TBBs is excluded).

Since the 1970s studies of Desbrosse and colleagues (Desbrosse, Texier 1973; Desbrosse *et al.* 1976) the inventory of KMTBs, as well as TBBs could be massively increased. Desbrosse *et al.* (1976) described n=9 KMTB from the coll. Jeannin (Méray excavation in 1868) and displayed n=7 of them. This study could add another n=90 items (n=55 TBBs and n=35 KMTBs) to the assemblage of these protruding lithic objects from VP I and demonstrates that the presence of these items is not a singularity but an important part of the Middle Paleolithic lithic assemblages of the site. In addition to the KMTBs from VP I, new studies could evaluate that there are more sites in the surrounding *Côte chalonnaise* that possess also such items (Frick *et al. in print*; Herkert *et al.* 2015; Frick, Floss 2017; Frick 2016a; 2016b) and thus, supports hypothesis about regional patterns in the late Middle Paleolithic of this area.

In addition to the presence of KMTBs and TBBs, the presence of other phenomena makes it possible to classify these assemblages as part of the KMG (Micoquian *sensu* Bosinski). Such phenomena are a) a morphological diversity of other bifacial objects (produced in the framework of specific rules), b) the prevalent production of blanks using the Levallois concept, c) small amount of blades and *Groszaki*, d) ventral reduction for the configuration of Levallois cores and bulb reduction of blanks, e) minor presence of other blank-production concepts, f) small amount of an “Upper Paleolithic” tool component, g) high diversity of modifications on cores and blanks for the tool production and h) morphological evidences for hafting of unifacial objects (Frick, Floss 2017; Frick 2016a; 2016b).

Acknowledgements

This paper is dedicated to all authors that studied the ancient assemblages of KMTBs from Meray's 1868 excavation in Germolles in the 1970s. Research presented here were financed in the course of the DFG project FL 244/5-1, by the PCR "*Le Paléolithique supérieur ancien en Bourgogne* *méridionale*", UMR 6298 ARTeHIS) associated at Université de Bourgogne, Dijon and the DFG CRC 1070 "*RessourcenKulturen*" at University of Tübingen. Thanks to the DRAC Bourgogne SRA, Dijon for the excavation opportunity at VP I. This paper could not have been realized without the great assistance of many students that prepared the finds from the ancient collections and excavation at VP I between 2006 and 2016. The base drawings for the figures of the KMTBs and TBBs were made by H. Würschem, N. Pasianotto, St. Wettengl and N. Huber. Furthermore, we would like to say thanks a lot to the editors and anonymous reviewers of the manuscript, whose suggestions helped to transform the initial manuscript into a paper worthy of publication.

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