SOME OBSERVATIONS ON PLATFORM PREPARATION AT SUNGIR', RUSSIA

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ABSTRACT

Here we document striking platform preparation at the Upper Palaeolithic site of Sungir' (Vladimir Oblast, Russia) comparable to the en éperon *(spurring) technique. Its employment has resulted in butts with particularly large and wide spurs. Such preparation was apparently used during creation and maintenance of blade debitage surfaces, but not during* plein débitage *blade production. This may relate to the often poor raw materials worked at Sungir'. The same technique is evident on one blade in the small assemblage from nearby Rusanikha.*

Full reference: Dinnis, R., Reynolds, N., Bessudnov, A. & Denisova, A. 2017. Some observations on platform preparation at Sungir', Russia. *Lithics: the Journal of the Lithic Studies Society* 38: 18–26.

Keywords: Upper Palaeolithic, Streletskian, Sungirian, blade technology, *en éperon*, Russia, Rusanikha

INTRODUCTION

The careful preparation of striking platforms prior to individual removals is a well-documented feature of Palaeolithic stone-knapping (Inizan *et al*. 1995; Pelegrin 2012). The best-known example is the isolation of striking points on preferential Levallois flakes, resulting in characteristic *chapeau de gendarme* butts. Upper Palaeolithic blade core striking platforms were often maintained by the removal of large, thick rejuvenation flakes from a large part or all of the striking platform surface. In addition, individual blade removals were sometimes preceded by intensive platform preparation. One well-documented technique (Figure 1) is the creation of a "spur" (= *éperon*), whereby small removals from the core's striking platform isolate a raised point (the spur) at the core edge, and serve to locally alter the product's *angle de chasse* (the angle between its butt surface and dorsal surface). The resulting isolated area on the core edge then serves to guide the blade's detachment, in particular guarding against any imprecisions in the striking action, and helping to control the dimensions of the blade produced (Pelegrin 2012). This technique is thought to be associated with usage of a "soft" organic hammer (Pelegrin 2012: 144–145).

In western Europe spurred or *en éperon* platforms are now documented in Early Aurignacian, Middle Gravettian, Final Gravettian (= Protomagdalenian) and Late Upper Palaeolithic/Magdalenian assemblages (e.g. Barton 1990; Klaric 2003; Pigeot 2004; Surmely & Alix 2005; Pelegrin 2012 and references therein). In eastern Europe the same platform preparation technique has been identified at sites belonging to the Kostënki-Avdeevo Culture (= Kostenkian/Eastern Gravettian *sensu stricto*) (Giria & Bradley 1998) and in the Gravettian assemblages from Gagarino and Khotylëvo 2 (Es'kova 2013, 2015). In all of these cases the technique relates to the production of long blades.

During a recent month-long study of the Upper Palaeolithic lithic assemblage from Sungir' (Vladimir, Vladimir Oblast, Russia) we recognised multiple examples of comparable platform preparation, as well as a single instance from the nearby site of Rusanikha. Here we document the technique, and offer a few thoughts as to the reason for its use at Sungir'.

SUNGIR' AND THE STUDIED LITHIC ASSEMBLAGE

The open-air site of Sungir' (Сунгирь), situated on the outskirts of Vladimir *ca* 200 km east of Moscow, ranks among the most iconic

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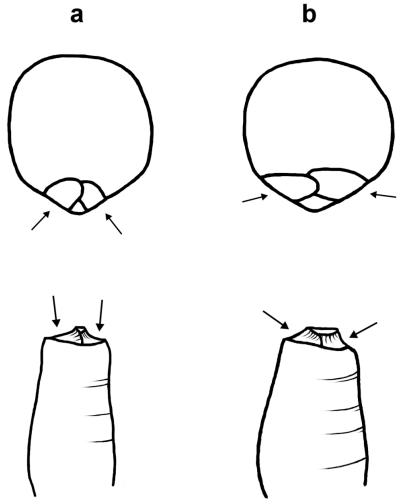

Figure 1: Schematic representations of a 'typical' en éperon *platform preparation (a) and platform preparation as observed in the Sungir' assemblage (b). The top row shows preparatory removals on the core's striking platform prior to the detachment of the blade. The bottom row shows the butt/ventral surface of the resulting blade. Note the comparatively large, wide spur on the butt of b. Figure partially based on Giria (1997, Appendix, Fig. 1, p.165).*

Upper Palaeolithic sites in Europe. The principal excavations at Sungir' were carried out by O.N. Bader between 1957 and 1977, over an area totalling 4,500 m^2 (Bader & Bader 2000: 21). Bader's best-known discoveries were elaborate burials, including an adult male and the double burial of an adolescent and a child. These graves contained thousands of ivory beads, which apparently once adorned the burial attire, as well as worked ivory, antler and flint artefacts (Bader 1967, 1970, 1978; Trinkaus & Buzhilova 2012). Further small-scale excavations were carried out during the 1980s, 1990s and 2000s (Bader & Mikhailova 1998; Seleznëv 2008), and fieldwork at the site recommenced in 2014, led by K.N. Gavrilov.

The large lithic collection from the site totals more than 50,000 pieces, not counting small flakes and chips. The vast majority (~99%) comes from Bader's 1957–1977 excavations (Bader 1978; Bader & Mikhailova 1998; Seleznëv 2008). The retouched assemblage contains many edge-retouched blades and flakes as well as large numbers of endscrapers and splintered pieces, with a smaller number of simple burins and at least nine complete or fragmentary Streletskian points.

Today Bader's Sungir' lithic collection is primarily organised by excavation year. It is then separated into "retouched" and "unretouched" assemblages according to his accession documentation, with ~4,000 pieces in the former category. It should be noted that this category includes many unretouched pieces thought by Bader to be of particular importance, including ~1,000 artefacts he categorised as "knife-like blades" (*ножевидные пластины/nozhevidnye plastiny*). Most of the complete or near-complete *plein débitage* blades[1] are therefore found in the "retouched" assemblage, irrespective of whether they bear retouch or use-related modification. Conversely, our examination of the assemblages suggests that very few retouched artefacts are present in the "non-retouched" part of Bader's collection. For example, in the "non-retouched" 1966 assemblage of >8,000 pieces we identified only four retouched pieces.

During our study of the collections we saw all "retouched" artefacts from Bader's 1957–1977 excavations. We surmise that this constitutes almost all of the retouched pieces and "knife-like blades". We also examined the entirety of the "non-retouched" assemblage from his 1966 excavations, totalling >8,000 pieces. A more thorough analysis was made of the "retouched" assemblage from the 1957 and 1966 excavations (totalling 860 pieces), and a portion of the "non-retouched" material from 1966, totalling 1251 pieces (or roughly 15% of the total "non-retouched" material from that year's field season).

In addition, we examined the complete assemblage of ~900 pieces from the site of Rusanikha, located on the west side of Vladimir, *ca* 8 km from Sungir', and excavated in 1981 (Mikhailova 1985). Rusanikha was thought by Mikhailova (1985) to be related to Sungir' due to perceived similarities in the compositions of the lithic assemblages from the sites (despite the absence of Streletskian points at Rusanikha) and their analogous pedostratigraphic positions and topographic settings. Radiocarbon dates for Rusanikha and Sungir' are consistent with both belonging to the earlier part of the Upper Palaeolithic (Sinitsyn *et al*. 1997 and references therein; Marom *et al*. 2012; Nalawade-Chavan *et al*. 2014).

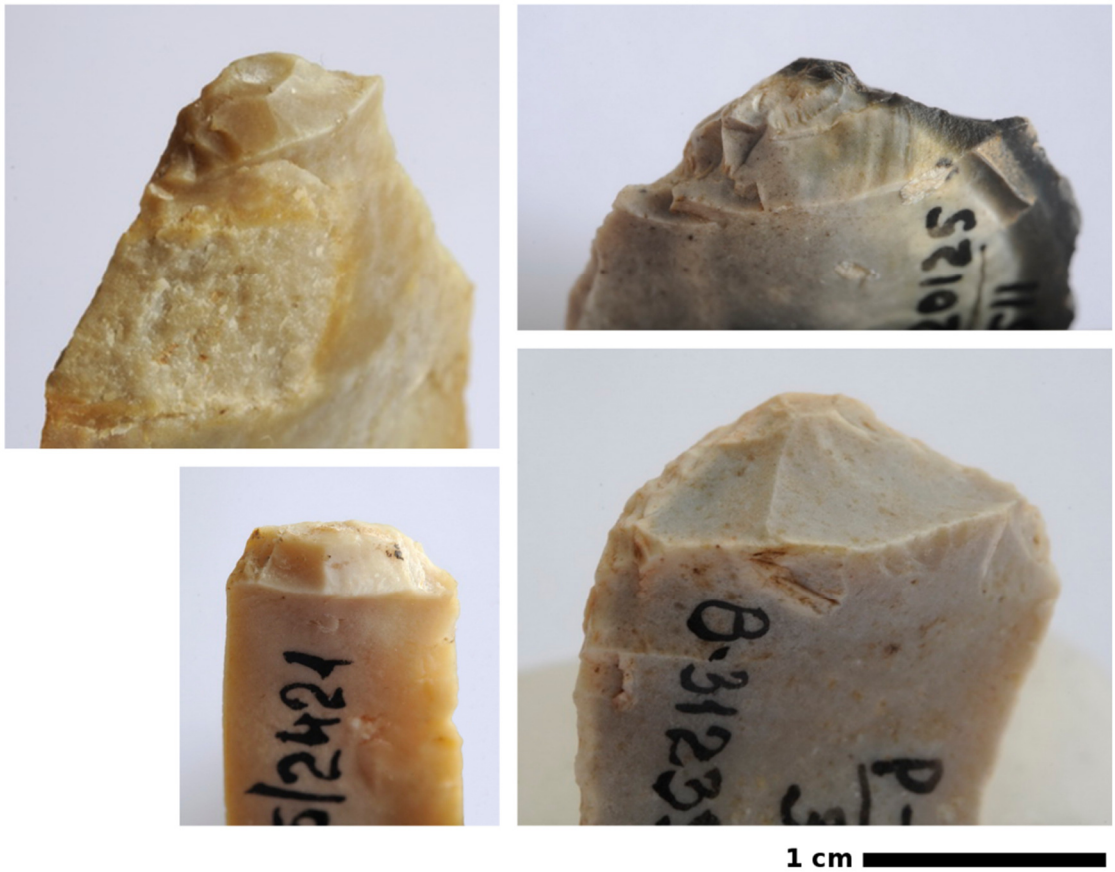

Figure 2: Butts of blades from Sungir' (top row and bottom left) and Rusanikha (bottom right) showing evidence of en éperon *platform preparation. Clockwise, from bottom left: C-70/2421, C-77/1960, C-66/6989, P-81/303.*

PLATFORM PREPARATION AT SUNGIR'

During our examination of the Sungir' and Rusanikha assemblages we noted evidence for platform preparation on the butts of blades, as shown in Figure 2. Conceptually the technique is *en éperon*, although at Sungir' it has generally created butts with particularly large and wide spurs in comparison to examples documented elsewhere (e.g. Surmely & Alix 2005) (Figure 1). To borrow Bradley and Giria's (1996; Giria 1997: 164–168) terminology, preparatory flaking at Sungir' emphasised the "release" (=*освобождение/osvobozhdenie*) of the striking point more than its "isolation" (=*изолирование/izolirovanie*). In other words, the preparation appears to have been used primarily to ensure that the striking point was positioned away from the very edge of the core (Figure 1*b*).

We identified 17 examples of this platform preparation in the Sungir' assemblage during our study (Table 1), although given the number of pieces left unexamined we are confident that there are more. We also identified a single example in the small assemblage from Rusanikha. The ventral morphology of all the identified pieces is consistent with their having been struck using a "soft" organic or stone hammer (*cf.* Pelegrin 2000) (Figure 2).

One feature of the artefacts listed in Table 1 is their raw material profile relative to the assemblage overall. Only one example (C-66/4191) is made on the assemblage's largest raw material group – a fine-grained opaque brown flint with few inclusions deriving from relatively large nodules. This was apparently the preferred raw material at Sungir', as demonstrated by its greater representation in Bader's "retouched" assemblage than in the assemblage overall (Bader 1978: 116–117; see also Seleznëv 2008), and by the small size of discarded cores relative to those of other materials. Other raw materials in Table 1 were likely more problematic, for example the

Table 1: Spurred butts identified in the searched collections from Sungir' and Rusanikha (to nearest 10%).*

Site	***Artefact no.***	***Raw material***	***Blank/ portion***	***Cortex/skin (% of dorsal surface)****	***Artefact dimensions (mm)***			***Butt dimensions (mm)***		***Notes***	***Figure***
					Length	*Width*	*Thickness*	*Thickness*	*Length*		
Sungir'	Дб-57/5750	Opaque beige/light brown medium-grained chert	Crested blade (complete)	10	53	26.7	13.1	9.2	23.4	-	-
Sungir'	Дб - 57/6238	Black/white medium-grained flint	Bladelet (proximal)	20	30.8	13.6	3.9	2.6	7.3	-	-
Sungir'	C-63/1434	Coarse-grained flint, mid-grey patina	Blade (proximal)	10	35.7	15.6	2.4	5	10.2	-	-
Sungir'	C-64/1894	Medium-grained flint, dark grey patina	Blade (complete)	70	75.7	19.9	9.2	6.1	5.2	-	-
Sungir'	C-66/6989	Black/white fine-grained flint	Blade (proximal)	30	21.4	23	8.8	7.5	17.3	-	Figure 2, top right
Sungir'	C-66/3743	Coarse-grained light brown flint, light white/yellow patina	Blade (proximal)	Indet.	18.2	23.1	10.3	11.4	23.6	-	-
Sungir'	C-66/4212	Opaque beige/light brown medium-grained chert	Blade (proximal)	None	24.1	22.9	5.8	3.8	14.1	Large inclusion of coarse "cortical" material visible on both dorsal and ventral surfaces	-
Sungir'	C-66/4191	Fine-grained, lustrous, opaque mid-brown flint	Blade (proximal)	10	15.2	16.2	3.8	4.1	8.2	-	-
Sungir'	C-66/4394	Fine-grained mid-brown translucent flint, light white patina	Lamellar flake (complete)	Indet.	24.7	11.7	4.7	4.5	7.7	Core-edge blade?	-

Site	***Artefact no.***	***Raw material***	***Blank/ portion***	***Cortex/skin (% of dorsal surface)****	***Artefact dimensions (mm)***			***Butt dimensions (mm)***		***Notes***	***Figure***
					Length	*Width*	*Thickness*	*Thickness*	*Length*		
Sungir'	C-66/3800	Medium-grained striped flint, light grey/white patina	Flake (hinge termination)	None	26	32.9	6.2	5.3	15.9	-	-
Sungir'	C-66/3524	Opaque, coarse-grained mid-brown flint	Blade (complete)	10	55.3	18.6	3.8	4.9	14	-	-
Sungir'	C-66/3031	Black/white fine-grained flint	Blade (proximal)	50	29.2	13.8	5.4	4.5	11.1	-	-
Sungir'	C-66/8582	Opaque, coarse-grained mid-brown flint	Blade (proximal)	None	39.7	22.4	6	3.4	7.1	Debitage surface renewal blade (scar of previous hinged removal on dorsal)	-
Sungir'	C-66/1479	Opaque, coarse-grained mid-brown flint	Blade (proximal)	20	46.4	19.7	7.2	5	12.8	-	
Sungir'	C-70/2421	Medium/fine-grained flint, patinated	Blade (proximal)	40	26.5	11	5.3	3.8	9.5	-	Figure 2, bottom left
Sungir'	C-73/768	Coarse-grained yellow chert	Blade (proximal, *languette* break)	30	46.6	14.8	8	6.9	13.2	-	-
Sungir'	C-77/1960	Opaque beige/light brown medium-grained chert	Blade (complete)	None	91.1	25.3	9.9	4.2	11.2	Core-edge blade	Figure 2, top left
Rusanikha	P-81/303	Coarse-grained light grey flint, white patina	Blade (proximal)	None	32.8	18.1	5.7	8.7	16.8	Debitage surface renewal blade (scar of previous stepped removal on dorsal)	Figure 2, bottom right

Table 2: Butt type of blades from plein débitage and debitage surface modification, in Bader's 1957 and 1966 collections from Sungir' (see text for details). "Debitage surface modification" blades include core-edge blades, crested blades and blades struck to clear the debitage surface of problems.

Blade type	***Butt type***							***Total***
	Plain	*Facetted*	*Flat-facetted*	*Dihedral*	*Point only*	*Spurred*	*Crushed/ Indet.*	
Plein débitage	28	23	14	3	4	0	8	80
Debitage surface modification	17	16	3	2	4	5	2	49
Total	45	39	17	5	8	5	10	129

black/white fine-grained flint, which is present only in small nodules.

Although all the artefacts in Table 1 can be reasonably attributed to blade core working, none of them is a *plein débitage* blade. Instead, most or all apparently relate to the creation and maintenance of blade debitage surfaces (hereafter, "debitage surface modification"). The blades retaining cortex/skin derive from the edge of a core, as does the non-cortical blade C-77/1960 as indicated by its dorsal scar pattern. Others are crested blades (Д6-57/5750), or blades struck to clear the core's debitage face of problems, such as a large inclusion (C-66/4212) or the remnants of a previous mis-hit (C-66/8582). Similarly, the sole example from Rusanikha (P-81/303) shows that an attempt to remove a large step-fracture from the debitage face via a renewal blade struck from the core bottom had failed, thereby necessitating a second renewal blade struck from the core's primary striking platform. This removal was prepared with a spur on the striking platform.

To enable a valid comparison of blades produced during debitage surface modification with those resulting from *plein débitage*, we systematically recorded the butts of a sample of the 1966 "unretouched" assemblage and the complete 1957 and 1966 "retouched" assemblages (Table 2). Half of the *plein débitage* blades had facetted butts (i.e. facetted, flat-facetted and dihedral: n = 40 of 80), suggesting that some form of striking platform preparation was often used. However, none of the *plein débitage* blades had a butt that could be reasonably described as spurred. In contrast, 10% (n = 5 of 49) of butts on blades produced during debitage surface modification were spurred, supporting the notion that spurring of the striking platform was reserved for technical pieces related to the creation or maintenance of the debitage face.

As noted above, other examples of spurring of Upper Palaeolithic blade core striking platforms apparently relate to the production of large *plein débitage* blades (e.g. Barton 1990; Inizan *et al*. 1995; Giria & Bradley 1998). Furthermore, Giria (1997: 182) notes that at Zaraisk some form of careful striking platform preparation is evident on the majority of blades, but that most of those lacking such preparation are core-edge blades. This appears very different from the pattern seen at Sungir'.

Why would the signature at Sungir' differ from these other sites? In our view the answer may lie in the nature of the raw material worked. The overriding signature of the Sungir' assemblage is the exhaustive working of the limited material available. Many cores have been worked to the point of near shapelessness, and even small flake fragments have had edges retouched for use/re-use. Given that some of the raw material worked was clearly not well suited for blade production (i.e. small nodules and/or those with imperfections), careful attention to core shaping and core shape maintenance is to be expected. In particular, the successful detachment of large core-edge blades would be vital to retaining the core's transversal convexity (*cintrage*), thereby extending the core's usable life. *En éperon* platform preparation would help to mitigate failure during this key step in the debitage process. The relatively sharp angle between the core side and the debitage face, as well as the desire to remove a wide and robust blade from the core's edge, would then lead to the observed large, wide spurs. This suggestion could easily

Table 3: Butt thicknesses (where measurable) of blades from plein débitage and from debitage surface modification, in Bader's 1957 and 1966 collections from Sungir' (see text for details). "Debitage surface modification" blades include core-edge blades, crested blades and blades struck to clear the debitage surface of problems.

	Butt thickness		
Blade type	*≤3mm*	*>3mm*	***Total***
Plein débitage	40	28	68
Debitage surface modification	14	31	45
Total	54	59	113

be tested with further characterisation of the raw materials used at Sungir'.

Although we consider this the best interpretation, we retain a degree of caution over the apparently total absence of spurred butts from the *plein débitage* blade assemblage. The butts on *plein débitage* blades are notably smaller than those from blades relating to creation and maintenance of the debitage surface (Tables 1 and 3), and it is difficult to definitively identify spurring such as that shown in Figure 2 on butts ≤3 mm thick. Furthermore, even when platform spurring was used for production of *plein débitage* blades, it is sometimes only evidenced on a minority of *plein débitage* blade butts (Giria 1997; Klaric 2003; but see Surmely & Alix 2005 regarding Magdalenian blade production at Les Tarterêts). A more complete examination of the Sungir' collection would confirm whether the pattern seen in Table 2 is representative of the total assemblage.

CONCLUSIONS

Platform preparation comparable to the *en éperon* or spurring technique is evident on blades from the Upper Palaeolithic assemblage from Sungir'. We identified 17 artefacts with spurred butts, although more are presumably present in the unstudied part of the collection. The raw material profile of these artefacts differs from the overall profile of the assemblage, with the largest raw material group and preferred material represented by only one of the 17 identified examples. The technique was apparently reserved for the creation and maintenance of the blade debitage surface, and was not used during *plein débitage* blade production (although a more complete study is needed to demonstrate this definitively). In this regard Sungir' differs from other sites at which the *en éperon* technique has been described.

The observed patterns may relate to raw material constraints faced by the knapper(s) at Sungir', with particular care taken over core shaping and core shape maintenance. Furthermore, the use of the technique for robust core-edge blades helps to explain the comparatively large and wide spurs seen on spurred butts at Sungir' relative to those at some other sites.

Finally, we note a single example of a spurred butt in the small assemblage from nearby Rusanikha. As at Sungir', this artefact is a debitage surface modification removal rather than a *plein débitage* blade.

ACKNOWLEDGEMENTS

We are particularly thankful for the kindness of our hosts at the Vladimir-Suzdal Museum-Reserve. We thank several colleagues for discussions, without which this paper would not have been possible, including Nick Barton, Jean-Guillaume Bordes, Julia Kotthaus and particularly Evgeny Giria and Laurent Klaric. We also thank the reviewers for their constructive comments. RD thanks the Leverhulme Trust, NR the Fondation Fyssen and AB the Russian Foundation for Basic Research (grant 17-06-00319a) for enabling us to undertake this work. This paper is a contribution to the Leverhulme Trust-funded project RPG-2012-800.

ENDNOTES

[1] We use "*plein débitage* blades" to refer to non-cortical laminar pieces whose morphology and dorsal scar patterns indicate that they come

from dedicated blade cores, and which cannot be related to the maintenance of the core (e.g. those to clean the debitage face).

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