LATE MIDDLE PALAEOLITHIC NEANDERTHAL NETWORKS AND ASSEMBLAGE VARIABILITY IN ARMENIA: LITHIC EVIDENCE FROM LUSARKET I ROCKSHELTER

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ABSTRACT

Until recently the region presently encompassed by the Republic of Armenia has been overlooked by researchers investigating Middle Palaeolithic Neanderthal activity in favour of surrounding areas. Exploration over the last decade has identified a number of new sites bolstering the previously limited data. In support of the new fieldwork re-analysis of previously studied Palaeolithic artefact assemblages is aiding development of the Middle Palaeolithic record within Armenia and wider Southern Caucasus. Recent reassessment of a stone tool industry recovered in the mid-1970s from Unit D at Lusarket I rockshelter in Central Armenia has examined a Middle Palaeolithic industry with a complex taphonomic history. Although there remains a question mark over the contextual validity of the material, typological analysis reveals affinities with Mousterian assemblages from the Tsutskhviati Cave System in Georgia, reinforcing notions that late Middle Palaeolithic Neanderthals were itinerant. In addition to the new work on Lusarket I the authors comment on the available artefactual evidence from other Mousterian assemblages in the Caucasus while highlighting typological relationships between late Middle Palaeolithic sites in Armenia and those in neighbouring regions.


Keywords: Late Middle Palaeolithic, Southern Caucasian Neanderthals, Lusarket, non-Levallois denticulated Mousterian, truncated faceted technique, retouch patterns, stone tool variability.

INTRODUCTION

Middle Palaeolithic models of Neanderthal movement patterns and assemblage variability in the Southern Caucasus highlight extensive cultural networks encompassing neighbouring regions such as the Zagros/Taurus and Northern Caucasus mountain ranges (Beliaeva & Liubin 1998; Golovanova & Doronichev 2003). Until recently the Armenian Middle Palaeolithic had been overlooked, and contributed little towards the chronological framework of the Middle Palaeolithic in these areas. Early reports identified a mixture of Levallois and non-Levallois industries, produced on a variety of raw materials, displaying variations in their typology (Baiburtian 1937 & 1938; Dzhafarov 1983; Formozov 1977; Liubin 1977 & 1984; Mansurov 1990; Yeritsyan 1970a; 1970b & 1975; Yeritsyan & Ghazarian 1978). However the typological variability has yet to be fully understood in terms of the broader context of Neanderthal mobility across the region.

The Middle Palaeolithic record in Armenia is limited to a handful of sites and find spots (Figure 1), including; Yerevan Cave (Yeritsyan 1970a & 1970b), Lusarket I and II (Yeritsyan 1975; Yeritsyan & Ghazarian 1978; Foulbuey et al. 2003), Hovk in Northern Armenia (Pinhasi et al. 2006 & 2008), and a series of open air locales on the periphery of ancient paleolakes in the Aparan region, identified during survey work in 2003 (Gaspery et al. 2004; Jaubert & Ollivier 2003). Recent work has provided stimulus for long-term research projects in the area to investigate behaviour and mobility patterns among late Middle Palaeolithic (LMP) Neanderthal communities. Through the continuing discovery of new sites (Liagre et al. 2007) and reappraisal of sediments and lithics from previously known archaeological sequences (Birtwistle 2008; Wilkinson 2008 & 2009), the Middle Palaeolithic record in Armenia is expanding.

This paper reports on lithic assemblages recovered from excavations of Unit D at Lusarket I in the Hrazdan gorge, Central Armenia, between 1970 and 1981. Poor storage of archive material from these excavations rendered the extant archive difficult to interpret. Re-excavation of the site was therefore initiated during the 2008 and
2009 field seasons. New stratigraphic analysis reveals that the archaeology has been profoundly affected by a number of taphonomic processes, compromising its analytical value. Following a summary of the Middle Palaeolithic record of Armenia, we analyse the assemblage from Unit D, making typological comparisons with dated examples in Georgia. On this basis we advance some inferences concerning the cultural networks of local Neanderthal groups. We conclude with an overview exploring the range of variability between Mousterian assemblages within Armenia and those situated across the Southern Caucasus and beyond, and in particular, identifying notable typological relationships.

THE MIDDLE PALAEOLITHIC RECORD IN ARMENIA

Armenia’s landscape presents a rich archaeological environment that has been exploited by hominin species for the last 1.5 my (Gabunia et al. 2000). In some locations stone artefacts are observed eroding out of ancient deposits, and although surface finds have been frequently recorded since the 1930s (Baiburtian 1937 & 1938), no comprehensive examination of the archaeological sediments has yet been undertaken. Regional Palaeolithic sequences thus remain poorly understood.

The earliest Middle Palaeolithic activity probably occurred c.200 KYA at Metsavvan (Figure 1) where Acheulean and Levallois industries co-existed for some time (Dolukhanov et al. 2004; Golovanova & Doronichev 2003). This pattern is recurrent at Jraber (Figure 1), where both bifaces and Levallois levels are interstratified (Fourloubey et al. 2003; Dolukhanov et al. 2004). These examples would appear to represent the earliest Middle Palaeolithic sites in Armenia. The Mousterian evidence begins at the Pechka rockshelter (Figure 1) where an exhausted core, two blades, a single flake, four points, a side and end scraper made on a combination of andesite and dacite blanks reflect hominins working a range of raw materials. Furthermore, at Pagakhpyur and Atkalich, cores producing Mousterian flakes and flaked tools were collected from the banks of the Atka Lake, located west of the Khurda-Jalal Mountain (Dolukhanov et al. 2004).

Figure 1. Middle Palaeolithic sites of Armenia.
In northwest Armenia investigations around a series of cave, open-air and rockshelter sites represent the first modern archaeological excavations of stratified Middle-Upper Palaeolithic deposits in the country (Pinhasi et al. 2008). Situated in a forested area of the Lesser Caucasus mountain range, the Hovk sites (Figure 1) contain chronological evidence spanning the Middle, and possibly Upper, Palaeolithic (Hovk 1, Unit 5; Hovk 2 and 3). The sequence at the Hovk 1 cave consists of 11 archaeological horizons (Pinhasi et al. 2008); Unit 8 interestingly produced several Levallois points and blades, while similar elongated forms were recovered from Unit 7 (Pinhasi et al. 2006 & 2008). Pinhasi et al. postulate that the laminar material from Units 7 and 8 corresponds with the Levantine Mousterian from Tabun level D, which features numerous elongated Levallois points and blades. South of Hovk, the site of Kalavan 2 (Figure 1) (currently being examined by Christine Chataigner) has recently been dated to c.34,200 ± 360 14C BP (POZ-20366) or 39,643 ± 886 cal BPHuLu based on Accelerator Mass Spectrometry (AMS) 14C analysis (Pinhasi et al. 2008) and has yielded hundreds of tools including typical Mousterian points, side scrapers, borers and burins produced by radial Levallois techniques on obsidian, flint and local limestone blanks.

Following surveys at Angeghakot (Figure 1) in the valley of Vorotan in 2003, numerous obsidian “Yerevan” points were identified displaying presence of the cultural phenomenon first recognised at Yerevan Cave (Figure 1) by Yeritsyan (1970a) as the truncated-faceted technique (Liagre et al. 2007). The Mousterian assemblage recovered from Yerevan Cave in the Hrazdan Valley is characterised by Levallois flakes, side scrapers and retouched “Yerevan” points (Golovanova & Doronichev 2003). Liubin (1984 & 1989) originally assigned the lower levels of Yerevan Cave to Würm II and the upper levels to the Middle Würm based on the faunal record. However since then layers 3, 4 and 7 have been repeatedly dated using AMS 14C analysis based on various charcoal and bone fragments providing a range of dates from 49–27 ka 14C BP (Pinhasi et al. 2008; Table 3). If these dates prove robust, these deposits would tentatively represent some of the latest Neanderthal phases in Europe.

Figure 2. Archaeologists working at Lusarket I during summer 2008 with Lusarket II rockshelter on the right.
The Caucasus Mountains were formed by extensive folding of the pre-existing layered sedimentary rocks sometime between 28–23mya (Mikhailov et al. 1999). With Armenia geographically located within an active and volatile tectonic zone many varieties of igneous, as well as sedimentary rocks (namely basalt, flint and limestone) were widely exploited (Chataigner et al. 2003). Lusarket I is a basalt rockshelter (Figure 2) positioned along the Hrazdan valley approximately 25km north of Yerevan, at an altitude of 1433m above sea level. From its origin in Lake Sevan, the valley runs along a north-east to south-west course and is predominantly layered with basalts and a number of obsidian outcrops, and contains the sites of Lusarket I and II and Yerevan Cave. The post-excavation problems at Lusarket I prior to 2000 limited detailed analysis beyond that of basic description. As a result, the sample is unlikely to accurately reflect activity at the site. No micro-debitage or knapping debris has survived, suggesting that sieving was not undertaken, and since excavation, the unit D material has been stored in small containers. This suggests that larger pieces, such as cores, were simply ignored. No records exist documenting where the artefacts were recovered from within the stratigraphy, and thus the contextual validity of the sample is questionable.

Recent investigations has established the full stratigraphic sequence, and reappraised the deposits formerly described as Units A to H (Figure 3) (Fourthlouby et al. 2003). The sequence has been grouped according to mode of formation into two major stratigraphic units (Table 1); an upper stratum comprised of Units A and B and a lower stratum represented by Units C, D1 and D2 (Wilkinson pers. comm. 2009). Additional work inside the cave has identified a slightly different set of deposits which contain in situ lithics, fauna, macrobotanical remains and even evidence of hearth activity (Adler pers. comm. 2011), whilst the sediments outside the cave have experienced a completely different taphonomic history. Taphonomic and environmental analyses suggests that Unit D accumulated in a floodplain setting, resulting in the mixed condition of the assemblage (rolled and fresh artefacts co-occur). The majority of the assemblage exhibits damage resulting from movement (Adler pers. comm. 2011). The rearrangement of the material clearly impacts upon its integrity and limits the conclusions that can be drawn from it.

Figure 3. Section through Lusarket I following Yeritsyan’s early excavations (Fourthloubey et al. 2003).
**Table 1. Revised stratigraphy and lithic data from Lusarket I.**

<table>
<thead>
<tr>
<th>Stratigraphy</th>
<th>Unit</th>
<th>Matrix</th>
<th>Assemblage</th>
<th>Dating</th>
</tr>
</thead>
<tbody>
<tr>
<td>UPPER STRATUM</td>
<td>A</td>
<td>Dark greyish brown clay/silt containing frequent herbaceous plant roots and limestone boulders. Fine sub-angular basalt clasts. Affected by pedogenesis.</td>
<td>Floral remains</td>
<td></td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>Poorly sorted yellowish brown silty clay containing randomly disturbed moderate sub-angular basalt clasts</td>
<td>Upper Palaeolithic style assemblage containing large numbers of denticulates, scrapers and burins</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UNCONFORMITY</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LOWER STRATUM</td>
<td>C</td>
<td>Greater quantity of basalt gravel in finer matrix. Yellowish brown clay. Gravels poorly sorted. Top of Unit modified by pedogenesis</td>
<td>Lower industry = non-Levallois denticulates, points and backed knives. Upper industry = faceted Levallois. 50% scrapers, 25% points</td>
<td>26,920 ± 220 14C BP</td>
</tr>
<tr>
<td></td>
<td>D1</td>
<td>(Same as C) With rare sub-angular basalt clasts. Carbonate probably a post-depositional feature</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>D2</td>
<td>Light yellowish brown fine sandy silt, containing frequent sub-angular basalt pebbles and fine cobbles. Granular-sized carbonate present throughout the stratum</td>
<td>Denticulated Mousterian produced by faceted non-Levallois techniques</td>
<td></td>
</tr>
</tbody>
</table>

The latest Middle Palaeolithic deposits are found in the upper part of Unit C (formerly C1) where Yeritsyan (1975) identified a laminar Levallois blade industry which displayed the truncated faceted technique; including numerous Levallois “Yerevan” points (Figure 4), side-scrapers and backed knives. The lower level of Unit C (formerly C2) displays none of these characteristics; the assemblage is rich in denticulates (notches and saws), points and backed knives produced by non-Levallois techniques (Fourlouby et al. 2003). The Unit D material was recovered from beneath this unit, and was reported to show the same characteristics, supposedly containing high numbers of denticulates and points (Yeritsyan 1975; Fourlouby et al. 2003). The reliability of the current dating evidence is suspect as bone samples from the lower part of Unit C (formerly C2) were tested by AMS, producing a very late date for suspected Neanderthal occupation of 26,920 ± 220 14C BP (Fourlouby et al. 2003). Moreover, seasonal silting would have quickly and repeatedly reworked deposits, including the bone samples contained therein.

**THE UNIT D MOUSTERIAN FROM LUSARKET I**

Recent analysis of the limited Unit D material recovered in the mid-1970s has identified an obsidian assemblage totalling 2132 pieces collected between depths of 130–216cm (Unit D1 and D2) (Birtwistle 2008). The sample selected for study is thought to only represent a fraction of the recovered material, as the survival of the entire assemblage has been heavily affected during post-excavation.
Therefore the sample presented in this study is all that remains from the original excavations (Birtwistle 2008). Consequently only 366 flaked tools exist within the sample, although the fresh and rolled appearance of the material supports the sedimentary evidence that Unit D formed under the changeable conditions of a floodplain environment.

Table 2 provides a summary of the findings indicating higher frequencies of notched and scraper-like pieces than any other tool. The occurrence of 24 backed knives (probably fashioned on rounded obsidian blanks retrieved from the banks of the Hrazdan River) challenges previous observations by Fourloubey et al. (2003) who noted their absence. Broken flakes and debitage account for 61% of the material; however, only limited evidence of reduction can be read from the small, shapeless and exhausted cores. The dorsal scar patterns among the flake and flaked tools indicate non-Levallois discoidal and conical forms of flaking, (see Birtwistle 2008), as flakes appear to have been removed from cores by unipolar parallel techniques from a fixed platform. The presence of pseudo-Levallois points would support this. An examination of the flake butts identifies preparation of the striking platform as 35% of the flake and flaked tool butts display faceting. In addition two radial-Levallois cores and a small selection of Levallois preparation flakes identified through refitting, suggest a limited presence of Levallois technology which produced at least 17 Levallois pieces (Table 2). Interestingly, one partially retouched Levallois point presents fascinating evidence for impact damage presumably sustained during hunting. Finally large flakes are under-represented: only 3.1% of the flakes exceeded 100mm in length, whereas 51.4% ranged between 50–99mm and 45.5% less than 49mm long (Birtwistle 2008).

<table>
<thead>
<tr>
<th>Flaked Tool</th>
<th>D1</th>
<th>D2</th>
<th>Unit D</th>
<th>D%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Notch</td>
<td>12</td>
<td>187</td>
<td>199</td>
<td>54.4</td>
</tr>
<tr>
<td>Scraper</td>
<td>6</td>
<td>85</td>
<td>91</td>
<td>24.9</td>
</tr>
<tr>
<td>Denticulate (saw)</td>
<td>0</td>
<td>7</td>
<td>7</td>
<td>1.9</td>
</tr>
<tr>
<td>Backed Knife</td>
<td>4</td>
<td>20</td>
<td>24</td>
<td>6.6</td>
</tr>
<tr>
<td>Burin</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>0.5</td>
</tr>
<tr>
<td>Pseudo-Lev. Point</td>
<td>0</td>
<td>4</td>
<td>4</td>
<td>1.1</td>
</tr>
<tr>
<td>Multiple Tool</td>
<td>1</td>
<td>6</td>
<td>7</td>
<td>1.9</td>
</tr>
<tr>
<td>Piercer</td>
<td>0</td>
<td>3</td>
<td>3</td>
<td>0.8</td>
</tr>
<tr>
<td>Non-Levallois Blade</td>
<td>2</td>
<td>10</td>
<td>12</td>
<td>3.3</td>
</tr>
<tr>
<td>Levallois Flake</td>
<td>0</td>
<td>4</td>
<td>4</td>
<td>1.1</td>
</tr>
<tr>
<td>Levallois Point</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>0.5</td>
</tr>
<tr>
<td>Levallois Blade</td>
<td>0</td>
<td>11</td>
<td>11</td>
<td>3.0</td>
</tr>
<tr>
<td>Total</td>
<td>26</td>
<td>340</td>
<td>366</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 2. Flaked tool and percentage frequencies recorded from the Unit D excavations between 1970–1981.

<table>
<thead>
<tr>
<th>Scraper</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Straight</td>
<td>41</td>
<td>45.0</td>
</tr>
<tr>
<td>Single Side</td>
<td>5</td>
<td>5.5</td>
</tr>
<tr>
<td>Double Side</td>
<td>14</td>
<td>15.4</td>
</tr>
<tr>
<td>Concave</td>
<td>22</td>
<td>24.2</td>
</tr>
<tr>
<td>Convex</td>
<td>1</td>
<td>1.1</td>
</tr>
<tr>
<td>Convergent</td>
<td>6</td>
<td>6.6</td>
</tr>
<tr>
<td>Core</td>
<td>2</td>
<td>2.2</td>
</tr>
<tr>
<td>Déjeté</td>
<td>91</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 3. Typology and frequency of scrapers identified in Unit D assemblage.
The sample (Table 2) contains numerous “processing implements” (e.g. notches and scrapers) rather than elements related to hunting. The notches in particular vary in size and may have been used in a variety of ways. This variation in size could relate to function, level of curation, or the quality of available obsidian; in the absence of microwear it is difficult to distinguish between these possibilities. A lack of heavy duty chopping tools and the recovery of only two small bifaces was noted by Yeritsyan (1975) and Yeritsyan & Ghazarian (1978) who labelled the material as Mousterian of Acheulean Tradition (MTA). However, Unit D, although a heavily selected sample, appears to be characterised entirely by flaked tools. The low number of pseudo-Levallois points and true Levallois points could reflect behavioural differences between the Unit D hominins and those associated with Yerevan Cave, Angeghakot and later periods at Lusarket I although such conclusions cannot currently be sustained, as the assemblage is mixed and incomplete.

The scraper assemblage is dominated by single side-scrapers, together with basic convex and concave scrapers (Table 3). Interestingly none of the 22 convex scrapers were transversely retouched, and, with exception of both déjeté examples and a single convergent piece, most scrapers were only lightly and irregularly retouched. The retouched implements are grouped together based on four typotechnological observations: the morphology, extent, distribution and position of retouch (Birtwistle 2008). The retouch patterns for scrapers falls within the range apparent for the retouched assemblage as a whole (Birtwistle 2008). Most retouch is irregular; 85.6% of pieces were lightly retouched, although the distribution of retouch varied throughout the assemblage. This variability probably relates to function. Most artefacts were retouched on the dorsal face, with other positions (inverse, alternative, bifacial and crossed) accounting for the remaining 33.3% (Birtwistle 2008). On the whole, the finely retouched examples common across Middle Palaeolithic Europe are lacking, perhaps representing a cultural facies or the expedient use of technology (Binford 1973; Ebert 1979).

DISCUSSION
Re-investigation of sedimentary and lithic data has refined the previous work by Fourloubey et al (2003) but is disappointing, as the material seems contextually insecure. Irrespective of this, the assemblage still has merit; certain elements can still contribute toward the developing Middle Palaeolithic record of Armenia; although full comprehension of hominin behaviour at the site during this period will never be forthcoming.

Both the Levallois and non-Levallois elements of the assemblage from the overlying archaeological deposit (Unit C) differs typologically from Unit D; Unit C also produced greater quantities of material (Gasparyan pers. comm. 2008). The Unit D industry is comprised entirely of obsidian, in contrast to Unit C where a variety of raw materials were exploited, behaviour that is recognised at other Middle Palaeolithic sites in Armenia. This implies a shift in the economic preference of the hominins towards collecting and transporting materials from a variety of sources. Binford (1980) has suggested that typological differences between deposits occur when stable conditions are disturbed by environmental and biological factors. The Unit D material appears to remain typologically consistent, which might indicate relatively stable conditions preceding the accumulation of Unit C.

It has been suggested that in the Caucasus higher elevations were occupied during the summer months while populations migrated to lower altitudes during colder periods (Adler et al. 2006). At Lusarket resting 1433m above sea level, occupation was probably determined by annual temperature fluctuations and resource availability. Studies conducted elsewhere emphasise the importance of hunting as the main source of meat procurement for Middle Palaeolithic hunters (Bocherens 2011; Speth 2010); occupation may thus have been dependent on migratory behaviour of animals like the native Caucasian Tur (Capra caucasica) (Adler et al. 2006, 2008). However recent work has highlighted the potential versatility of Neanderthal subsistence (Hardy & Moncel 2011). The Levallois point displaying impact damage
recovered from Unit D2 could have been the result of hunting; although Shea (1988a & 1988b) suggests that not all points may have had the same function.

The Lusarket material appears to share technotypological similarities with the Tsutskhvatitype Mousterian found at the Bronze and Tsutskhvat cave systems in Georgia. Therefore we can infer that Neanderthals were highly mobile across this part of the region during the late Middle Palaeolithic. Both sites located around 12km north of Kutaisi in Western Georgia; typify classic non-Levallois flaking methods producing large quantities of side-scrapers and notches. Moreover retouch is only lightly applied as pieces exclusively display irregular and stepped morphologies with short applications (Tushabramishvili 1978). These similarities extend to the two déjeté scrapers which are alike to examples from Il’Skaya 1 and Mezmaiskaya Cave in Russia (Stepanchuk 1998) and many European specimens.

Late Middle Palaeolithic assemblages in Armenia exhibit a range of flaked industries produced by distinctive Levallois and non-Levallois techniques. Typological studies underline cultural relationships linking the material from these sites with examples from the Levant, Zagros and wider Caucasus. For instance, Liagre et al. (2007) recognise that the Mousterian found at Gazma and Zar in Karabakh (Mansurov 1990), Lusarket II and in Unit C at Lusarket I are typologically comparable to the Zagros-Taurus Mousterian. Similarly, at Taglar Cave, Karabakh, the truncated facetted technique has been recognised on various Levallois pieces, and a link suggested between this material and the use of the technique in Armenia (Dzhafarov 1983).

Techno-typological assessment of lithic data from the Georgian Republic has identified similarities between numerous assemblages (Tushabramishvili et al. 1999), such as the Kudaro group in South Ossetia which includes Kudaro (1 and 3) and the Tsona caves (Golovanova & Doronichev 2003), and the cave at Djurchula (Meignen & Tushabramishvili 2006). The assemblages all, with the exception of Kudaro 1, consist of numerous laminar flakes and elongated points, a technology which is considered to be comparable with material from Hovk 1 (Units 7 and 8), Taglar Cave, Dashsalakhli Cave in Western Azerbaijan and the Tabun D Levantine assemblages (Golovanova & Doronichev 2003). Deposits in the Tskhinvali group (located along the Bolshaya River valley) display Levallois technology produced on local andesite with high quantities of blades, denticulates and side-scrapers similar to examples from the Tabun B Levantine Mousterian (Beliaeva & Liubin 1998).

Figure 4. Middle Palaeolithic artefacts from Lusarket I: a) notch, b) denticulate, c) single side-scraper, d) convergent scraper, e) true Levallois point, f) Yerevan point (drawings by Rob Sherwood).
Moreover, at Karkustakau and Tamarasheni the Mousterian end-scrapers, leaf-like bifaces and Quina-type side scrapers are characteristic of invasively and bifacially worked pieces from the Northern Caucasus (Golovanova and Doronichev 2003). Given these strong typotechnological differences in lithic toolkits, it seems likely that Armenia was occupied at various times by culturally distinct groups of Neanderthals.

Furthermore, excavations at the Ortvale Klde rockshelter have shown that laminar-Levallois techniques also dominated this industry. The faunal assemblage reflects reliance upon Caucasian Tur, a pattern which may indicate seasonal migration (Adler et al. 2006 & 2008; Bar-Oz & Adler 2005; Bar-Yosef et al. 2006). The frequency of Caucasian Tur has parallels with the faunal recorded at Hovk 1 (Unit 5) and Kalavan 2 (Pinhasi et al. 2008), suggesting that this species was consistently targeted by LMP Neanderthal communities.

At present, AMS ¹⁴C measurements from relatively few sites suggest that some of the latest Middle Palaeolithic sequences in Europe are located in Armenia. Material from Unit 5 and Hovk 1 has been assigned to the Middle Palaeolithic on typological grounds, and is currently dated to 33,800 ± 500 ¹⁴C BP; similarly, dates from nearby Kalavan 2 suggest that the Middle Palaeolithic ended around 34 kya in this corner of Armenia. The earliest Aurigacian dates from the region suggest that it began around 38–34 k BP across north and south Armenia, as evidenced by dates from Warwasi Cave (Olszewski & Dibble 1994) and Yafteh Cave (Otte et al. 2007) in the Zagros, as well as Ortval Klde (layers 4d and 4c) (Adler et al. 2008). If AMS ¹⁴C determinations from Lusarket I (Units C & D) and Yeravan Cave (Layer 7) are reliable, then the Hrazdan valley may have offered one of the final refugia for late Neanderthal groups in the region.

CONCLUSION

Analysis of the lithic and sedimentary data recovered from Unit D four decades ago has yielded disappointing results. The substandard excavating and recording techniques employed, combined with extensive rearrangement and disturbance of the assemblage, have limited the inferences that can now be made based on this assemblage. Nevertheless, some useful observations can be made based on the extant material; the surviving assemblage is discoidal in character; faceting and denticulation were commonly employed, and Levallois flaking was occasionally practiced. The retouched tools are dominated by scrapers and denticulates, predominantly worked on one edge of the dorsal face using short, irregular removals. On the whole, the Unit D assemblage is similar to industries from the Tsutskhvati Mousterian in Georgia. However, the assemblage from the overlying unit (Unit C) shares similarities with other Armenian sites, including Angeghakot.
and Yerevan Cave. Particular aspects of the Unit D assemblage are also typical of other Armenian sites, notably the occasional use of the truncated-faceted techniques and the presence of some Levallois elements. This may, however, reflect the fact that the boundary between Units C and D was subject to seasonal reworking, resulting in the intermixing of the assemblages. Although lithic assemblages from sites in the Caucasus are immensely varied, many share close typological affinities and can be considered as discrete entities. The existence of many discrete typo-technological entities within the same geographic region is interpreted here as reflecting repeated movement of Neanderthal populations across the region during the climatic instability of MIS 3.

Earlier Middle Palaeolithic (EMP) assemblages in Armenia share similarities with assemblages of “Tabun D-type” in the Levant. This might suggest an exogamous source for the EMP of the region between c.200–100 kys, rather than indigenous local development of similar techniques. The Caucasus acted as a geographic and cultural crossroads in the Middle Palaeolithic, movement through and within the region resulting in notable variability. New dating evidence suggests rapid replacement of Neanderthal communities as Aurignacian groups moved in from neighbouring regions. The possibility remains that Neanderthals may have survived into MIS 2 along the Hrazdan gorge, although this possibility remains unlikely. Further research, and especially tighter chronological resolution, may shed light upon late Neanderthal social and economic behaviour in the region before they were finally replaced by Homo sapiens c.28–39ka 14C BP.

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