Demidenko Y.E., Otte M. & Noiret P. (dir.) - *Siuren I rock-shelter. From Late Middle Paleolithic and Early Upper Paleolithic to Epi-Paleolithic in Crimea.*
Liège, ERAUL 129, 2012, p. 135-211.

11 - UNIT G: LITHIC ARTIFACTS

Yuri E. DEMIDENKO & Victor P. CHABAI

General artifact category representation

The four archaeological levels of Unit G excavated in the 1990s are characterized by variability in lithic artifact frequencies (stratigraphically from bottom to top): level Gd – 848 pieces, level Gc1-Gc2 – 2332 pieces, level Gb1-Gb2 – 1259 pieces, and level Ga – 270 pieces. The middle levels Gc1-Gc2 and Gb1-Gb2 are respectively composed of three and two sub-levels and exact counts of all artifacts and artifact categories from each sub-level is given in table 1. The number of finds from each Unit G level varies considerably; their relative proportions to the total number of lithics within the unit (n=4709) are as follows: level Gd – 18.0%, level Gc1-Gc2 – 49.5%, level Gb1-Gb2 – 26.7%, level Ga – 5.8%. The analyses below of the Unit G finds are mainly based on data from the most representative levels – Gd, Gc1-Gc2 and Gb1-Gb2 –, additionally set apart by the clear presence of hearths/fireplaces and/or ashy lenses, showing traces of human activities within the levels. On the other hand, level Ga lacks any hearths/fireplaces and/or ashy lenses, it is characterized by incomplete artifact categories (no core-like pieces, waste from production and rejuvenation of tools and Middle Paleolithic tool types) and its assemblage size is the lowest for Unit G. Taking these facts into consideration along with the stratigraphic position of level Ga directly above level Gb1-Gb2, we can presume that the artifacts in level Ga may actually represent the uppermost fraction of level Gb1-Gb2. Given this suggestion, the 1990s Unit G data with three hearths/fireplaces and/or ashy lenses would correspond well to the 1920s Lower layer which also contains three stratigraphically visible ashy lenses. The artifact data from level Ga is examined expediently to complete the artifact analysis of Unit G and to note separate indicative positions.

At the same time, representation of the different artifact categories in levels Gd, Gc1-Gc2 and Gb1-Gb2 breaks down as follows: core-like pieces – 0.5-0.6%, core maintenance products – 2.2-2.9%, debitage – 27.6-35.3%, tools – 5.6-9.1%, waste from production and rejuvenation of tools – 0.7-1.2%, debris – 51.6-63.0%. These show the comparable representation of core-like pieces and core maintenance products and minor differences for non-abundant waste from production and rejuvenation of tools, whereas debitage, tools and debris vary more significantly. The subsequent artifact analyses of Unit G enable the explanation of these similarities and differences by means of quite plausible explanations of real industrial uniformity in these artifacts with some changes in representation through the Upper Paleolithic component of the archaeological sequence.

Typological structure of artifacts

Core-like pieces

In total, this artifact category is represented in levels Gd, Gc1-Gc2 and Gb1-Gb2 by 23 items (see tabl. 2).

Level Gd

There are 4 cores and no pre-cores. By typological categories, the cores are as follows: a bladelet core, a bladelet carinated core and 2 blade/bladelet exhausted cores. For two cores colored flints were used: a plaquette for the bladelet core and a nodule/chunk for one blade/bladelet exhausted core. For the other two cores (bladelet carinated core and second blade/bladelet exhausted core) gray flint nodules were used.

Bladelet Regular Core (fig. 1:1) is a double-platform one with bidirectional-alternate two non-volumetric narrow flaked surfaces. The core's two flaking surfaces are disposed on two narrow edges of a plaquette and this original form may have led to the reduction of narrow surfaces. Moreover, technologically the core had two successive and identical bladelet reduction stages. When the first stage ended, the distal terminations of its flaking surface's removal negatives were rejuvenated by a removal preparing a second striking platform from which next the reduction stage took place. Thus, we have two independent bladelet production stages on the same core using single-platform reduction each on one of the two narrow edges of the plaquette. The following morphological features are found on this core. Platform types and angles: both plain and acute. Platform abrasion: present on both platforms. Platform morphology in plane and removal scars on flaking surfaces: 1st – offset with no twisted scars and 2nd – straight with no twisted scars. Condi-

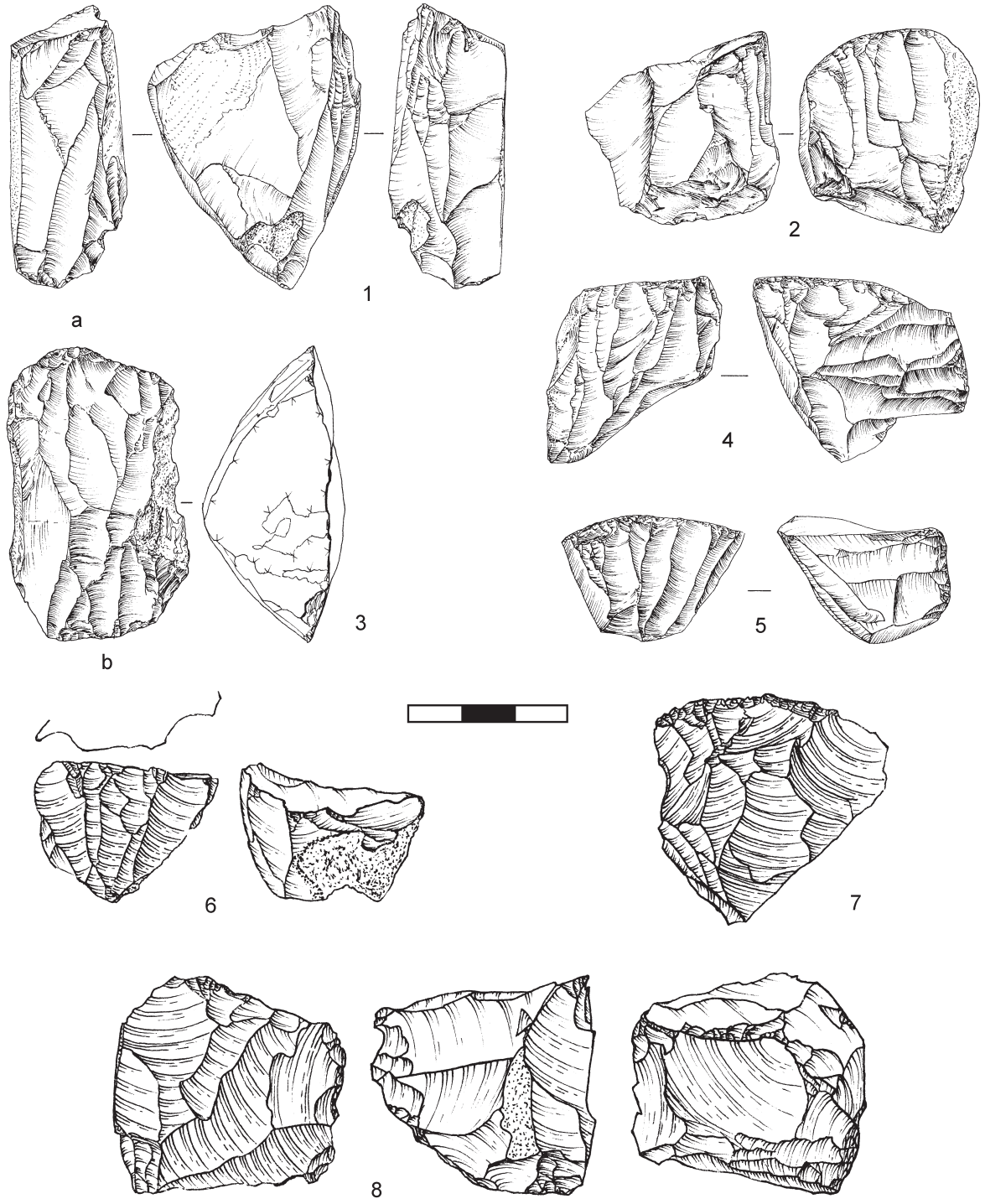

Figure 1 - Siuren I. Unit G, levels Gd and Gc1-Gc2. Flint Artifacts – Cores. 1, regular double-platform bidirectional-alternate with two narrow flaked surfaces bladelet core (level Gd); 2, "carinated" single-platform sub-cylindrical bladelet core (level Gd); 3, "carinated" double-platform bidirectional-perpendicular bladelet core (level Gc1-Gc2); 4-5, carinated double-platform orthogonal-adjacent bladelet cores (level Gc1-Gc2); 6, "carinated" single-platform sub-pyramidal bladelet core (level Gc1-Gc2); 7, single-platform sub-pyramidal flake/blade core (level Gc1-Gc2); 8, multiplatform exhausted flake/blade core (level Gc1-Gc2).

tion of flaking surfaces: both regular. Metrics: length - 5.3 cm, width - 2.1 cm, thickness - 3.7 cm. First platform width and thickness: 1.8 cm and 2.3 cm. Second platform width and thickness: 0.9 cm and 2.3 cm. Such size of both platforms indicates the use of core tablets with flake proportions for possible rejuvenation. Platform negatives maximum length: the same as the flaking surface length - 5.3 cm for the first and 4.8 cm for the second. Reason for core abandonment: no obvious reason.

The Bladelet Carinated Core (fig. 1:2) is a single-platform one of volumetric character with sub-cylindrical shape. Platform type and angle: plain and semi-acute. Platform abrasion: present. Platform morphology in plane and removal scars on flaking surface: semicircular with no twisted scars. Condition of flaking surface: regular. Metrics: length - 3.2 cm, width - 3.4 cm, thickness - 2.9 cm. Platform width and thickness: 2.5 cm and 2.3 cm. Such size of both platforms indicates the use of core tablets

	Level Gd			Level Gc1-Gc2						Level Gb1-Gb2					Level Ga		
	N	%	esse %	Gc2a	Gc2	Gc1	N	%	esse %	Gb2	Gb1	N	%	esse %	N	%	esse %
Core-Like Pieces	4	*0.5*	*1.0*	3		8	11	*0.5*	*1.0*	3	5	8	*0.6*	*1.7*			
Core Maintenance Products	24	*2.8*	*5.8*	13	10	45	68	*2.9*	*6.0*	7	21	28	*2.2*	*6.0*	4	1.5	*4.6*
D e b i t a g e :	299	*35.3*	*72.9*	125	101	582	808	*34.6*	*71.9*	130	218	348	*27.6*	*74.5*	65	24.1	*74.7*
Flakes	91	*10.7*	*22.2*	38	45	168	251	*10.7*	*22.3*	43	65	108	*8.6*	*23.1*	28	10.4	*32.2*
Blades	81	*9.6*	*19.7*	30	16	136	182	*7.8*	*16.2*	21	42	63	*5.0*	*13.5*	13	4.8	*14.9*
Bladelets	88	*10.4*	*21.5*	44	29	193	266	*11.4*	*23.7*	38	63	101	*8.0*	*21.6*	14	5.2	*16.1*
Microblades	39	*4.6*	*9.5*	13	11	85	109	*4.7*	*9.7*	28	48	76	*6.0*	*16.3*	10	3.7	*11.5*
Tools	77	*9.1*	*18.8*	19	36	155	210	*9.0*	*18.7*	29	42	71	*5.6*	*15.2*	18	6.7	*20.7*
Waste From Production & Rejuvenation of Tools	6	*0.7*	*1.5*	7	3	17	27	*1.2*	*2.4*	1	11	12	*1.0*	*2.6*			
D e b r i s :	438	*51.6*		228	62	918	1208	*51.8*		262	530	792	*63.0*		183	67.7	
Chips	317	*37.4*		173	42	683	898	*38.5*		202	453	655	*52.0*		135	50.0	
Uncharacteristic Debitage Pieces	56	*6.6*		18	11	86	115	*4.9*		18	22	40	*3.2*		9	3.3	
Chunks	10	*1.1*		19	4	53	76	*3.3*		5	11	16	*1.3*		17	6.3	
Heavily Burnt Pieces	55	*6.5*		18	5	96	119	*5.1*		37	44	81	*6.5*		22	8.1	
TOTAL	**848**	100.0	100.0	395	212	1725	**2332**	100.0	100.0	432	827	**1259**	100.0	100.0	**270**	**100.0**	100.0

Table 1 - Siuren-I. Unit G. General Artifacts Categories Representation by Level and Sub-Level.

with flake proportions for possible rejuvenation. Platform negatives maximum length: the same as the core length - 3.2 cm. Reason for core abandonment: no obvious reason.

The Blade/Bladelet Exhausted Cores are single-platform ones of volumetric character with sub-cylindrical shapes. These two cores were defined as exhausted because of "too radical" rejuvenation of the striking platforms by removal of a thick core tablet. These rejuvenations left deep concavities on the striking platforms, making further primary reduction of these cores impossible due to lost length on the flaking surfaces. Thus, we can assume regular achievement of the first stages of blade/bladelet reduction for these cores, which were not continued due to rapid and sudden exhaustion of unsuccessful attempts to rejuvenate the striking platforms. Metric data are not given as these cores have "broken characteristics".

Groups & Types	Level Gd	Level Gc1-Gc2	Level Gb1-Gb2	Level Ga	TOTAL
PRE-CORES			2		**2**
CORES	4	10	3		**17**
Blade Cores					**1**
- single-platform sub-cylindrical			1		
Blade / Bladelet Cores		1			**1**
- single-platform narrow flaked					
Blade / Bladelet Exhausted Cores					**2**
- single-platform sub-cylindrical	2				
Bladelet Regular Cores					**2**
- single-platform sub-cylindrical			1		
- double-platform bidirectional-alternate narrow flaked	1				
Bladelet Carinated Cores					**5**
- single-platform sub-cylindrical	1				
- single-platform sub-pyramidal		1			
- double-platform bidirectional-perpendicular		1			
- double-platform orthogonal-adjacent		2			
Flake-Blade Cores					**5**
- single-platform sub-pyramidal		1			
- *multiplatform exhausted*		4			
Flake Multiplatform Exhausted Cores			1		**1**
CORE FRAGMENTS		1	3		**4**
TOTAL	**4**	**11**	**8**	**0**	**23**

Table 2 - Siuren-I. Unit G. Core-like Pieces Classification.

Level Gc1-Gc2

Eleven core-like pieces were identified in level Gc1-Gc2. According to typological categories and raw material types, these core-like pieces are identified as follows: 1 blade/bladelet core (on a gray flint plaquette), 4 bladelet carinated cores (one on a black flint nodule/chunk, 2 on gray flint nodules/chunks and one on a colored flint nodule/chunk), 1 flake/blade single-platform core (on a gray flint nodule/chunk), 4 flake/blade multiplatform cores (one on a colored flint nodule/chunk and 3 on gray flint nodules/chunks) and 1 core fragment (on a gray flint nodule/chunk). No pre-core was found in level Gc1-Gc2.

The Blade/Bladelet Core is a single platform one of non-volumetric character with narrow flaked surface. Use of a plaquette as the original core form led to quite simple narrow flaked blade/bladelet primary reduction. Platform type and angle: crudely-faceted and semi-acute. Platform abrasion: partially present. Platform morphology in plane and removal scars on flaking surface: straight with twisted scars. Condition of flaking surface: regular. Metrics: length - 5.1 cm, width - 2.5 cm, thickness - 6.3 cm. Platform width and thickness: 2.2 cm and 4.7 cm. Platform negatives maximum length – the same as the core length - 5.1 cm. Reason for core abandonment: the crushed platform.

The Bladelet Carinated Cores number four specimens, subdivided into a double-platform bidirectional-perpendicular piece, 2 double-platform orthogonal-adjacent pieces and a single-platform piece.

The Bladelet Carinated Double-Platform Bidirectional-Perpendicular Core (fig. 1:3) is characterized by two opposed striking platforms and two weakly developed volumetric flaking surfaces which are connected by distal terminations of bladelet scars and in general profile are perpendicular to each other. The general shape of the core is conventionally sub-cylindrical. Platform types and angles: both plain and acute. Platform abrasion: present on both platforms. Platform morphology in plane and removal scars on flaking surfaces: both offset with no twisted scars. Condition of flaking surfaces: both regular. Metrics: length - 5.4 cm, width - 4.3 cm, thickness - 2.4 cm. First platform (fig. 1:3a) width is 2.9 cm. Second platform (fig. 1:3b) width is 2.4 cm. Platform thickness is the same for both – 5.4 cm, as it corresponds to the core's general length but on its back side. Such size of platforms indicates the use of core tablets with flake proportions for possible rejuvenation. The first platform negatives maximum length – 3.2 cm. The second platform negatives maximum length – 3.4 cm. Reason for core abandonment: no obvious reason.

Two Bladelet Carinated Double-Platform Orthogonal-Adjacent Cores (fig. 1:4-5) are practically identical in morphology, especially by the presence of two striking platforms on adjacent edges of the core (at a nearly right angle) and two flaking surfaces. Similar cores with such platforms disposition but with one flaking surface are also termed "orthogonal", "ninety-degree" and "change of orientation" in the archaeological literature. Reduction processes of each platform took place volumetrically with a general sub-cylindrical shape. The only differences between these two cores lie in their metrics, although their overall proportions are similar. Platform types and angles: all four plain and acute. Platform abrasion: present on all four platforms. Platform morphology in plane and removal scars on flaking surfaces: all semicircular with no twisted scars. Condition of flaking surfaces: all four regular. Metrics for the first core on gray flint (fig. 1:4): length - 4.1 cm, width - 4.0 cm, thickness - 2.5 cm. Metrics for the second core on colored flint (fig. 1:5): length - 3.3 cm, width - 3.1 cm, thickness - 1.9 cm. First core's platform width: 3.8 cm and 2.5 cm. Second core's platform width: 3.4 cm and 1.4 cm. First core's platform thickness: 2.4 cm and 1.9 cm. Second core's platform thickness: 2.8 cm and 3.3 cm. Such size of the four platforms indicates the use of core tablets with flake proportions for possible rejuvenation. First core's platform negatives maximum length – 4.1 cm and 3.1 cm. Second core's platform negatives maximum length – 2.9 cm and 2.8 cm. Reason for core abandonment: no obvious reason. We suggest that these particular bladelet carinated cores be called the *Siuren-I type* of Aurignacian bladelet carinated cores.

The Bladelet Carinated Single-Platform Core on a black flint nodule/chunk (fig. 1:6) shows volumetric reduction resulting in a sub-pyramidal shape. This core is an exceptional example of a carinated piece which was classified as a core with platform width longer than platform negatives maximum length (typical feature of carinated end-scrapers) due to irregular, denticulate-like platform edge with partial abrasion, not similar to regular retouch. Platform type and angle: plain and semi-acute. Platform abrasion: partially present. Platform morphology in plane and removal scars on flaking surface: semicircular with no twisted scars. Condition of flaking surface: regular. Metrics: length - 2.4 cm, width - 3.8 cm, thickness - 3.1 cm. Platform width and thickness: 3.6 cm and 3.0 cm. Such size of the platform indicates the use of a core tablet with flake proportions for possible rejuvenation. Platform negatives maximum length: the same as the core length - 2.4 cm. Reason for core abandonment: no obvious reason.

The Flake/Blade Single-Platform Core (fig. 1:7) shows volumetric reduction resulting in a sub-pyramidal shape. Platform type and angle: plain and semi-acute. Platform abrasion: present. Platform morphology in plane and removal scars on flaking surface: semicircular with no twisted scars. Condition of flaking surface: hinged. Metrics: length - 4.4 cm, width - 4.3 cm, thickness - 2.2 cm. Platform width and thickness: 3.7 cm and 2.4 cm. Such size of the platform indicates the use of a core tablet with flake proportions for possible rejuvenation. Platform negatives maximum length: the same as the core length – 4.4 cm. Reason for core abandonment: hinged flaking surface.

Four Flake/Blade Multiplatform Exhausted Cores (fig. 1:8) are unsystematic/amorphous with no special order to the striking platforms and flaking surfaces when flaking surfaces served as striking platforms and vice versa. These cores are highly exhausted and their abandonment was caused by the presence of hinged flaking surfaces. They are in the following metric intervals: length – 4.1-5.0 cm, width – 3.8-4.8 cm, thickness – 2.7-3.7 cm.

Level Gb1-Gb2

Eight core-like pieces were identified in level Gb1-Gb2. According to typological categories and raw material types, these

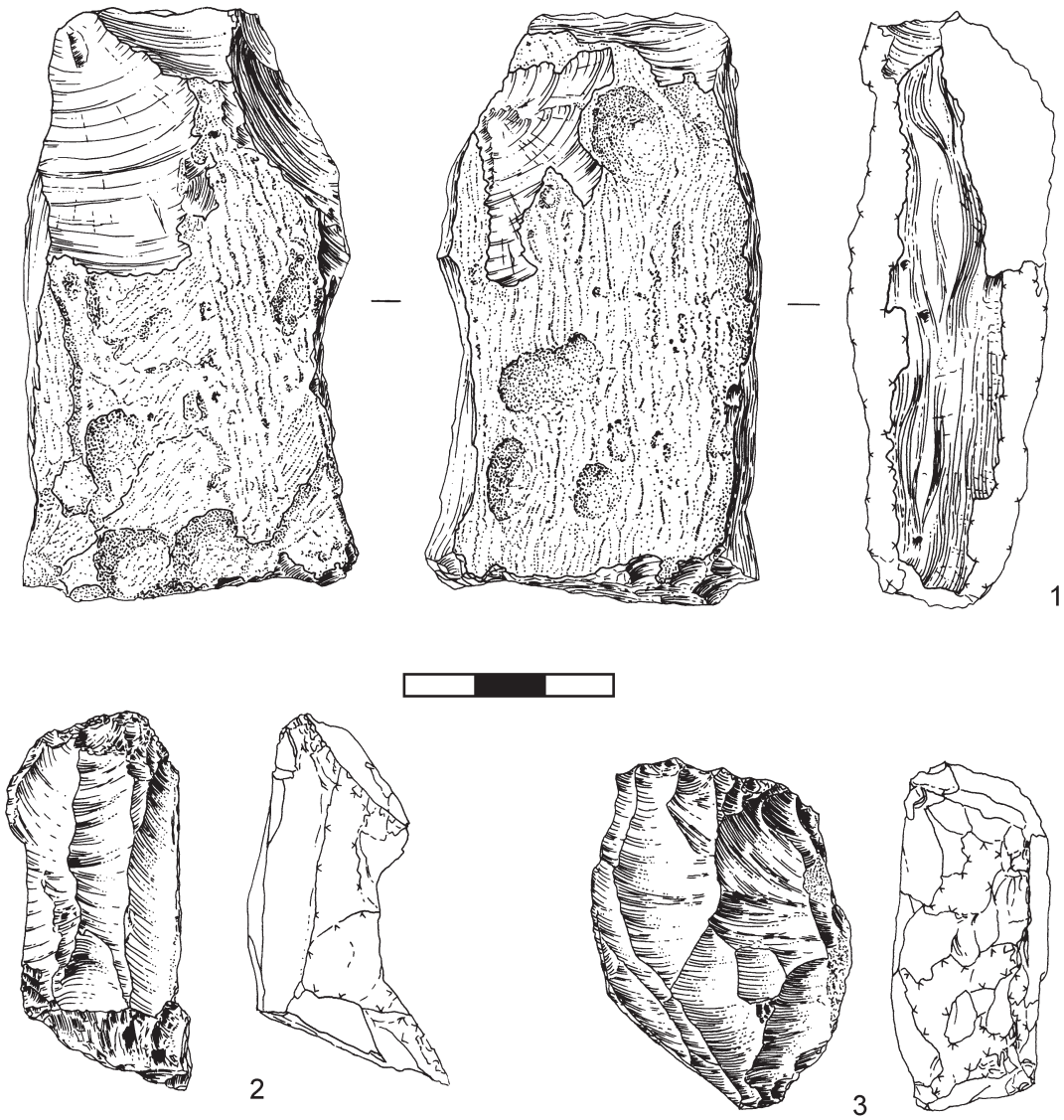

Figure 2 - Siuren I. Unit G, level Gb1-Gb2. Flint Artifacts – Cores. 1, pre-core – an initially tested piece; 2, blade single-platform sub-cylindrical core; 3, regular single-platform sub-cylindrical bladelet core.

core-like pieces are as follows. There are 2 pre-cores (one on a gray flint plaquette and one on a black flint nodule), 1 blade core (on a gray flint nodule/chunk), 1 bladelet core (on a colored flint blade), 1 flake multiplatform core (on a gray flint nodule/chunk) and 3 core fragments (all on gray flints).

The Pre-Cores are pieces with initial attempts at core-like primary reduction.

The First Pre-Core is simply an initially tested piece (fig. 2:1). Its morphological and metric data strongly support such a typological definition. It is a rather large plaquette (length - 8.6 cm, width - 4.8 cm, thickness - 2.7 cm) with no real striking platform, as one of the plaquette's short edges, from which was actually struck off only a single flake, is broken and, accordingly, plain with right angle, with no abrasion and no definite morphology in plane. The single flake was removed from the wide, not narrow, surface of the plaquette and its negative's length is only 3.6 cm. So, this removal did not even reach half of the plaquette's length and was heavily hinged. After this very initial core-like testing, the plaquette was discarded.

The Second Pre-Core is on a large rather flat nodule (length - 8.6 cm, width - 5.8 cm, thickness - 3.8 cm) with crudely-faceted striking platform (acute angle, no abrasion and no definite morphology in plane) from which a single flake was struck off its narrow edge. This removal was short (negative only 3.1 cm long), but not hinged. The reason for abandonment may be connected to the generally poor knapping quality of the black flint used.

A very important technological feature of both pre-cores is the absence of any striking platform abrasion, probably testifying to the use of abrasion only during regular core reduction and not for initial preparation and reduction of cores.

The Blade Core (fig. 2:2) is a single-platform one of weak volumetric character with sub-cylindrical shape. Its weak volumetric character is important as this is probably connected to the

core's rather exhausted nature after intensive blade production. Platform type and angle: crudely-faceted and semi-acute. Platform abrasion: very partially present. Platform morphology in plane and removal scars on flaking surface: semicircular with no twisted scars. Condition of flaking surface: hinged. Metrics: length - 4.8 cm, width - 3.6 cm, thickness - 2.0 cm. Platform width and thickness: 2.6 cm and 2.0 cm. Platform negatives maximum length: the same as the core length – 4.8 cm. Reason for core abandonment: hinged flaking surface.

The Bladelet Regular Core (fig. 2:3) is a single-platform one of volumetric character with sub-cylindrical shape. The particularity of this core is the use of a blade: the blade's proximal end was structured as the core's striking platform with subsequent bladelet detachment from the blade's dorsal surface. Platform type and angle: plain and acute. Platform abrasion: present, similar to retouch along the entire platform edge – use of the core as an end-scraper after core reduction? Platform morphology in plane and removal scars on flaking surface: semicircular with no twisted scars. Condition of flaking surface: regular. Metrics: length - 4.3 cm, width - 2.5 cm, thickness - 1.1 cm. Platform width and thickness: 1.8 cm and 2.2 cm. Such size of both platforms indicates the use of core tablets with flake proportions for possible rejuvenation. Platform negatives maximum length: the same as the core length – 4.3 cm. Reason for core abandonment: no obvious reason, although overall small thickness may have played a role.

The Flake Multiplatform Exhausted Core is classified as flake only because of the presence of flake scars, but this definition is very conventional as it should actually be considered an unsystematic/amorphous multiplatform core with no special order to the striking platforms and flaking surfaces. Moreover, flaking surfaces served as striking platforms and vice versa. This core is quite exhausted with a probable "long history" of multiple reduction phases that are no longer clear. Metrics (length - 4.4 cm, width - 3.7 cm, thickness - 3.9 cm) and hinged flaking surfaces were recorded.

To summarize the descriptions of these 23 core-like pieces from three levels of Unit G, the most notable feature is the absence of double-platform bidirectional cores with opposite striking platforms and a single flaking surface, which was also observed for the Unit H cores. Next, the presence of definite bladelet carinated cores in levels Gd (1 item) and Gc1-Gc2 (4 items) is the most prominent Aurignacian feature. At the same time, of these five cores, only two are single-platform ones, while the other three pieces are particular double-platform ones. The prevalence of bladelet carinated double-platform cores is an indicator of intensive bladelet production. This point is further strengthened by the presence of "regular" (non-carinated) bladelet cores in levels Gd (1 piece) and Gb1-Gb2 (1 piece). The dominance of bladelet reduction in Unit G is also evidenced by the rarity of blade cores proper, known here by only on a single-platform piece from level Gb1-Gb2. To this can be added mixed cores: a blade/bladelet single-platform core in level Gc1-Gc2 and 2 blade/bladelet exhausted single platform cores in level Gd. On the other hand, except for a single flake/blade single-platform core from level Gc1-Gc2, the other Unit G cores include four flake/blade multiplatform exhausted and unsystematic/amorphous cores from level Gc1-Gc2 and one flake multiplatform exhausted core from level Gb1-Gb2. These may be representative of primary flaking, given their high degree of exhaustion after likely multiple reduction phases. Finally, the availability of two pre-cores in level Gb1-Gb2 points to at least some initial core reduction at the site. Together these data support the focus of core reduction activity on bladelet production in Unit G; this is further support below by debitage and tool data with an abundant of unretouched and retouched bladelets *sensu lato*.

Core maintenance products (CMP)

This artifact category is well-represented in levels Gd, Gc1-Gc2 and Gb1-Gb2 with only a few in level Ga. In total, 124 core maintenance products are known for in the Unit G assemblage as a whole (see tabl. 3A).

Level Gd

The 24 core maintenance products here have been subdivided into crested pieces (17 items), core tablets (5 items) and core trimming elements (2 items).

Crested Pieces. These include crested flakes (1 piece/5.9%), crested blades (12 pieces/70.5%), crested bladelets (2 pieces/11.8%) and crested microblades (2 pieces /11.8%).

The Crested Flake is a re-crested non-cortical complete flake with unilateral partial crested preparation and lateral steep profile. Morphological features: unidirectional scar pattern, expanding shape, "off-axis" removal direction, incurvate distal general profile, feathering distal end and cortical 0.6 x 0.4 cm butt (semi-lipped, semi-acute angle, with no abrasion). On black flint, 2.7 cm long, 2.3 cm wide and 0.8 cm thick.

Crested Blades. There are 6 primary blades with preserved crested ridge and 6 truly secondary blades with no preserved crested ridge.

The six primary pieces have the following crested ridge attributes: unilateral (5)/bilateral (1) and wholly (3)/partially (3) crested preparation with only triangular profiles. Other morphological features: 2 complete, 1 proximal and 3 distal fragments; 1 cortical, 3 dorsal-plain, 1 crested and 1 bidirectional scar patterns; 1 expanding, 3 irregular and 2 unidentifiable shapes; 1 "on-axis", 3 "off-axis" and 2 unidentifiable removal directions; 2 incurvate medial and 4 twisted general profiles; 1 feathering, 1 overpassed and 4 unidentifiable distal ends; 2 non-cortical, 3 partially cortical with significant amount of lateral cortex and 1 partially cortical with insignificant lateral cortex; 1 plain 0.2 x 0.2 cm butt (semi-lipped, semi-acute angle, with no abrasion), 2 crushed and 3 missing butts. All six pieces are on gray flints. Their dimensions are in the following ranges: length – 3.6-6.6 cm (including broken pieces), width – 1.3-1.8 cm (for 5 pieces) and 3.0 cm for the sixth, thickness – 0.5-1.8 cm.

Six truly secondary pieces have the following morphological features: 2 complete, 2 proximal and 2 distal fragments; 5 unidirectional and 1 unidentifiable scar patterns; 1 converging, 1

	Level Gd	Level Gc1-Gc2	Level Gb1-Gb2	Level Ga	TOTAL
CRESTED PIECES	*17*	*56*	*19*	*4*	**96 / 77.4%**
- Crested Flakes	1	6	7		
- Crested Blades	12	31	10	1	
- Crested Bladelets	2	13	2	1	
- Crested Microblades	2	6		2	
CORE TABLETS	*5*	*5*	*6*		**16 / 12.9%**
- on Flakes	4	5	5		
- on Blades	1		1		
CORE TRIMMING ELEMETS	*2*	*7*	*3*		**12 / 9.7%**
TOTAL	**24 / 19.4%**	**68 / 54.8%**	**28 / 22.6%**	**4 / 3.2%**	**124 / 100.0%**

Table 3A - Siuren-I. Unit G. Core Maintenance Products Structure.

	Level Gd	Level Gc1-Gc2	Level Gb1-Gb2	Level Ga	TOTAL
FLAKES	91 / 30.5%	251 / 31.1%	108 / 31.1%	28 / 43.1%	**478 / 31.4%**
BLADES	81 / 27.1%	182 / 22.5%	63 / 18.1%	13 / 20.0%	**339 / 22.3%**
BLADELETS	88 / 29.4%	266 / 32.9%	101 / 29.0%	14 / 21.5%	**469 / 30.9%**
MICROBLADES	39 / 13.0%	109 / 13.5%	76 / 21.8%	10 / 15.4%	**234 / 15.4%**
TOTAL	**299 / 19.7%**	**808 / 53.1%**	**348 / 22.9%**	**65 / 4.3%**	**1520 / 100.0%**

Table 3B - Siuren-I. Unit G. Debitage Structure.

	Level Gd	Level Gc1-Gc2	Level Gb1-Gb2	Level Ga	TOTAL
BLADES	81 / 38.9%	182 / 32.6%	63 / 26.2%	13 / 35.1%	**339 / 32.5%**
BLADELETS	88 / 42.3%	266 / 47.8%	101 / 42.1%	14 / 37.8%	**469 / 45.0%**
MICROBLADES	39 / 18.8%	109 / 19.6%	76 / 31.7%	10 / 27.1%	**234 / 22.5%**
TOTAL	**208 / 100.0%**	**557 / 100.0%**	**240 / 100.0%**	**37 / 100.0%**	**1042 / 100.0%**

Table 3C - Siuren-I. Unit G. Blady Debitage Structure.

expanding, 2 irregular and 2 unidentifiable shapes; 1 "on-axis", 3 "off-axis" and 2 unidentifiable removal directions; 2 incurvate medial, 3 twisted and 1 unidentifiable general profiles; 2 feathering, 1 overpassed, 1 blunt and 2 unidentifiable distal ends; 3 triangular, 2 trapezoidal and 1 multifaceted profiles at midpoint; 3 non-cortical and 3 partially cortical with insignificant proximal (1), distal (1) and lateral (1) cortex; 2 plain 0.5 x 0.2 cm butts (semi-lipped, semi-acute angle, with abrasion), 2 linear 0.6 x 0.1 cm and 0.3 x 0.1 cm butts (semi-lipped, semi-acute angle, with abrasion) and 2 missing butts. There are four pieces on gray flints and two pieces on colored flints. Their dimensions are as follows: length – 5.3 and 5.9 cm for two complete pieces and 1.5-4.4 cm for four broken pieces; width – 1.3-2.6 cm and thickness – 0.4-0.9 cm.

Crested Bladelets are represented by a primary and a secondary piece with preserved crested ridges.

The primary piece has unilateral wholly crested preparation with triangular profile and is complete and partially cortical with a significant amount of lateral cortex. Other morphological features: dorsal-plain scar pattern, parallel shape, "on-axis" removal direction, convex general profile, hinged distal end and crushed butt. On gray flint, 2.9 cm long, 1.1 cm wide and 0.6 cm thick.

The secondary piece has unilateral partial crested preparation with triangular profile and is a distal non-cortical fragment. Morphologically, it is characterized only by irregular shape, "off-axis" removal direction and feathering distal end. On gray flint, 1.4 cm long, 0.7 cm wide and 0.2 cm thick.

Crested Microblades include 2 primary ones with unilateral wholly crested preparation, 1 triangular and 1 lateral steep profile. One is complete and the other is a distal fragment. The latter is morphologically described only by dorsal-plain scar pattern, parallel shape, "on-axis" removal direction and feathering distal end. On colored flint, 1.4 cm long, 0.5 cm wide and 0.2 cm thick. The complete piece has a dorsal-plain scar pattern, expanding shape, "off-axis" removal direction, twisted general profile, blunt distal end and punctiform butt (semi-lipped, semi-acute angle, with no abrasion). On gray flint, 1.2 cm long, 0.6 cm wide and 0.3 cm thick.

Core tablets

All 5 pieces are primary core tablets: 4 complete flakes and 1 complete blade.

Four pieces on flakes have remnants of core striking platforms, in two cases in the butt area only and two others in the butt area and also one lateral edge. Two are non-cortical, 1 partially cortical with significant amount of distal cortex and 1 partially cortical with insignificant distal cortex. They are on gray flints and have the following dimensions: length – 1.5-4.5 cm, width – 2.2-3.9 cm (only 1 piece with shortened, transversal proportions) and thickness – 0.6-2.1 cm.

One piece on a blade has the top part of a core on one lateral edge and is partially cortical with an insignificant distal cortex. On gray flint, 3.6 cm long, 1.2 cm wide and 1.3 cm thick.

Core trimming elements
Two of these pieces are complete partially cortical flakes with insignificant lateral cortex and transversal placement of crested ridges (unilateral partially treated). Both items are on gray flints with the following dimensions: length - 3.6 and 1.3 cm, width - 3.3 and 1.9 cm (one with shortened, transversal proportions), thickness - 1.3 and 0.6 cm. One item has a crushed butt and the second has a plain 0.6 x 0.2 cm butt (semi-lipped, semi-acute angle, with no abrasion).

Level Gc1-Gc2

There are 68 core maintenance products: crested pieces (56 items), core tablets (5 items) and core trimming elements (7 items).

Crested Pieces. These include crested flakes (6 pieces/10.7%), crested blades (31 pieces/55.4%), crested bladelets (13 pieces/23.2%) and crested microblades (6 pieces/10.7%).

Crested Flakes. These include 1 re-crested and 5 primary pieces with preserved crested ridge.

The five primary complete pieces have the following traits of crested ridges: unilateral (3)/bilateral (2) and only wholly crested preparation with 3 triangular and 2 lateral steep profiles. Morphology: 3 dorsal-plain and 2 crested scar patterns; 1 converging, 3 expanding and 1 ovoid shapes; 2 "on-axis" and 3 "off-axis" removal directions; 2 incurvate medial, 2 incurvate distal and 1 twisted general profiles; 5 feathering distal ends; 4 non-cortical and 1 partially cortical with insignificant lateral cortex; 2 plain 0.6 x 0.2 cm and 0.4 x 0.2 cm butts (1 lipped and 1 semi-lipped, 2 semi-acute angles, 2 with no abrasion), 1 punctiform butt with no abrasion and 2 crushed butts. Two are on gray flints and three others on colored flints, including one burnt. Dimensions: length – 2.0-3.7 cm, width – 1.8-2.4 cm (2 with shortened, transversal proportions), thickness – 0.5-1.1 cm.

One complete re-crested piece is non-cortical with a unilateral partial crested ridge and triangular profile. Morphologically, it has a unidirectional scar pattern, expanding shape, "on-axis" removal direction, flat general profile, blunt distal end and crushed butt. On gray flint, 4.5 cm long, 3.2 cm wide and 1.2 cm thick.

Crested Blades. These include 9 primary, 10 re-crested, 5 secondary pieces with preserved crested ridge and 7 truly secondary pieces with no preserved crested ridge.

Nine primary pieces have the following traits of crested ridges: unilateral (4)/bilateral (5) and wholly (8)/partially (1) crested preparation with 5 triangular and 4 lateral steep profiles. Other morphological features: 4 complete, 2 proximal and 3 distal fragments; 3 dorsal-plain, 5 crested and 1 unidentifiable scar patterns; 1 parallel, 4 converging and 4 unidentifiable shapes; 5 "on-axis", 1 "off-axis" and 3 unidentifiable removal directions; 2 incurvate medial, 1 incurvate distal, 3 twisted and 3 unidentifiable general profiles; 3 feathering, 1 hinged, 3 blunt and 2 unidentifiable distal ends; 6 non-cortical, 1 partially cortical with significant amount of proximal + lateral cortex and 2 partially cortical with insignificant lateral (1) and distal + lateral (1) cortex; 1 plain 0.3 x 0.3 cm butt (semi-lipped, semi-acute angle, with no abrasion), 1 punctiform butt with no abrasion, 4 crushed and 3 missing butts. There are eight pieces on gray flints and one on colored flint. Nine primary crested blades have the following dimensions: length – 2.6-6.4 cm for four complete pieces and 1.9-6.3 cm for five broken items, width – 1.2-3.1 cm, thickness – 0.3-1.9 cm.

Ten re-crested pieces have the following traits of crested ridges: unilateral (9)/bilateral (1) and wholly (4)/partially (6) crested preparation with 3 triangular and 7 lateral steep profiles. Morphologically, they have the following features: 5 complete, 1 medial and 4 distal fragments; 8 unidirectional, 1 unidirectional-crossed and 1 bidirectional scar patterns; 3 converging, 4 expanding, 1 irregular and 2 unidentifiable shapes; 3 "on-axis", 5 "off-axis" and 2 unidentifiable removal directions; 1 flat, 3 incurvate medial, 1 incurvate distal, 4 twisted and 1 unidentifiable general profiles; 3 feathering, 2 hinged, 4 blunt and 1 unidentifiable distal ends; 7 non-cortical and 3 partially cortical with insignificant distal (2) and lateral (1) cortex; 1 plain 0.4 x 0.2 cm butt (semi-lipped, semi-acute angle, with abrasion), 4 crushed and 5 missing butts. Seven are on gray flints and three on colored flints. Dimensions: length – 3.3-4.7 cm for five complete items and 2.9-5.1 cm for five broken items; width – 1.3-2.3 cm, thickness – 0.5-1.3 cm.

Five secondary pieces have the following traits of crested ridges: 5 unilateral and wholly (1)/partially (4) crested preparation with 3 triangular and 2 lateral steep profiles. Morphological features: 2 complete and 3 distal fragments; 5 unidirectional scar patterns; 3 converging, 1 irregular and 1 unidentifiable shapes; 4 "off-axis" and 1 unidentifiable removal directions; 3 incurvate medial, 1 incurvate distal and 1 twisted general profiles; 3 feathering and 2 blunt distal ends; 4 non-cortical and 1 partially cortical with insignificant lateral cortex; 1 punctiform butt with no abrasion, 1 crushed and 3 missing butts. All pieces are on gray flints, including one burnt. Metrics: length – 4.2 and 3.0 cm for two complete pieces and 1.8-6.1 cm for three broken pieces; width – 1.2-2.9 cm and thickness – 0.5-1.1 cm.

Seven truly secondary pieces with no preserved crested ridges have the following morphological features: 2 complete, 3 proximal and 2 distal fragments; 6 unidirectional and 1 bidirectional scar patterns; 1 converging, 1 expanding, 2 irregular and 3 unidentifiable shapes; 1 "on-axis", 3 "off-axis" and 3 unidentifiable removal directions; 4 incurvate medial and 3 twisted general profiles; 1 feathering, 3 blunt and 3 unidentifiable distal ends; 1 triangular, 2 trapezoidal and 4 multifaceted profiles at midpoint; 3 non-cortical and 4 partially cortical with insignificant lateral (3) and distal (1) cortex; 2 plain 0.6 x 0.2 cm and 0.2 x 0.2 cm butts (2 semi-lipped, 2 semi-acute angles, 1 with abrasion and 1 with no abrasion), 3 linear 0.4 - 0.3 - 0.2 x 0.1 cm butts (3 semi-lipped, 3 semi-acute angles, 3 with abrasion) and 2 missing butts. All seven pieces are on gray flints. They have the following metrics: length – 4.4 and 4.5 cm for two complete

pieces and 4.4-6.5 cm for five broken pieces; width – 1.4-2.5 cm and thickness – 0.6-0.9 cm.

Crested Bladelets. There are 6 primary, 3 re-crested, 1 secondary and 3 unidentifiable pieces with preserved crested ridge and a truly secondary item with no preserved crested ridge.

Six primary pieces have the following traits of crested ridges: unilateral (5)/bilateral (1) and only wholly crested preparation with 4 triangular and 2 lateral steep profiles. Morphologically, they are as follows: 3 complete and 3 distal fragments; 2 cortical, 2 dorsal-plain, 1 crested and 1 unidirectional scar patterns; 1 parallel, 1 converging, 1 expanding, 2 irregular and 1 unidentifiable shapes; 5 "off-axis" and 1 unidentifiable removal directions; 2 flat and 4 twisted general profiles; 4 feathering, 1 blunt and 1 unidentifiable distal ends; 4 non-cortical and 2 partially cortical with significant amount of lateral (2) cortex; 1 plain 0.5 x 0.2 cm butt (semi-lipped, semi-acute angle, with abrasion), 2 punctiform butts with no abrasion and 3 missing butts. All six pieces are on gray flints. They have such dimensions: length – 1.5-2.7 cm for three complete pieces and 1.5-2.4 cm for three broken pieces; width – 0.7-1.0 cm and thickness – 0.2-0.4 cm.

Three re-crested non-cortical pieces have the following traits of crested ridges: unilateral (2)/bilateral (1) and only partially crested preparation with 2 triangular and 1 lateral steep profiles. They have the following morphological features: 1 proximal and 2 distal fragments; 1 crested and 2 unidirectional scar patterns; 1 flat, 1 incurvate medial and 1 twisted general profiles; 1 feathering, 1 blunt and 1 unidentifiable distal ends; 1 linear 0.3 x 0.1 cm butt (semi-lipped, semi-acute angle, with abrasion). All 3 pieces are on colored flints. Dimensions: length – 2.4-3.6 cm, width – 0.8-1.1 cm and thickness – 0.3-0.6 cm.

One secondary piece has a unilateral wholly crested ridge with lateral steep profile and is a complete partially cortical item with insignificant distal cortex. It has a unidirectional scar pattern, parallel shape, "on-axis" removal direction, incurvate medial general profile, feathering distal end and crushed butt. On gray flint, 2.3 cm long, 1.0 cm wide and 0.4 cm thick.

Two unidentifiable items have unilateral (2) and wholly (1)/partially (1) crested ridges with 2 lateral steep profiles and are non-cortical medial and distal fragments. Morphologically, they are unidentifiable. They are on gray and colored flints. Metrics: length – 1.4 and 2.7 cm, width – 0.7 and 0.9 cm, thickness – 0.4 and 0.7 cm, respectively.

The single truly secondary item with no preserved crested ridge is a partially cortical distal fragment with insignificant lateral cortex. Identifiable morphology: unidirectional scar pattern, converging shape, "on-axis" removal direction, flat general profile, feathering distal end and triangular profile at midpoint. On a burnt gray flint, 2.2 cm long, 0.7 cm wide and 0.5 cm thick.

Crested Microblades. There are 5 primary pieces with preserved crested ridge and a truly secondary item with no preserved crested ridge. Five primary pieces have the following traits of crested ridges: unilateral (3)/bilateral (2) and wholly (4)/partially (1) crested preparation with 4 triangular and 1 lateral steep profiles. Morphological features: 2 complete, 1 medial and 2 distal fragments; 2 crested, 2 dorsal-plain and 1 unidirectional scar patterns; 1 parallel, 2 converging and 2 unidentifiable shapes; 2 "on-axis", 1 "off-axis" and 2 unidentifiable removal directions; 1 flat, 2 incurvate medial, 1 twisted and 1 unidentifiable general profiles; 1 feathering, 1 hinged, 1 blunt and 2 unidentifiable distal ends; 4 non-cortical and 1 partially cortical with insignificant distal cortex; 1 punctiform butt with no abrasion, 1 dihedral 0.4 x 0.2 cm butt (semi-lipped, right angle, with no abrasion) and 3 missing butts. All five pieces are on gray flints. Dimensions: length – 1.7 and 2.2 cm for two complete items and 1.0-1.4 cm for three broken items; width – 0.4-0.6 cm and thickness – 0.2-0.4 cm.

One truly secondary piece with no preserved crested ridge is a non-cortical medial fragment. Identifiable morphology: unidirectional scar pattern, incurvate medial general profile and multifaceted profile at midpoint. On colored flint, 2.2 cm long, 0.4 cm wide and 0.2 cm thick.

Core Tablets. All 5 pieces are primary core tablets on flakes. In terms of cortical characteristics, there are 2 non-cortical, 2 partially cortical with insignificant lateral cortex and 1 cortical pieces. Location of remnants of core striking platforms: on butt's area for 3 items, on butt's area and 1 lateral edge for 2 items. There are two pieces on gray flints and three pieces on colored flints. Metrics: length – 3.1-5.1 cm, width – 2.6-4.0 cm (1 with shortened, transversal proportions) and thickness – 0.4-1.2 cm.

Core Trimming Elements. There are 4 complete flakes and 3 distal flake fragments with the following cortex characteristics – 1 cortical, 1 partially cortical with insignificant distal cortex and 5 non-cortical pieces. All are characterized by transversal location of dorsal crested ridges: all 7 unilateral with 4 partial and 3 wholly crested preparation. There are six pieces on gray flints, including one burnt, and another piece is on black flint. Dimensions: length – 1.6-3.9 cm for four complete pieces and 1.5-2.8 cm for three broken pieces; width – 1.3-6.7 cm (two items with shortened, transversal proportions) and thickness – 0.6-2.1 cm. Butts: 2 plain 1.1 x 0.5 cm and 0.9 x 0.3 cm (semi-lipped, semi-acute angle, with no abrasion), 1 linear 0.5 x 0.1 cm (semi-lipped, semi-acute angle, with no abrasion), 1 crushed and 3 missing.

Level Gb1-Gb2

There are 28 core maintenance products which are subdivided into crested pieces (19 items), core tablets (6 items) and core trimming elements (3 items).

Crested Pieces. These include crested flakes (7 pieces/36.8%), crested blades (10 pieces/52.7%) and crested bladelets (2 pieces/10.5%).

Crested Flakes. There are 2 primary, 2 re-crested, 1 secondary and 1 unidentifiable pieces with preserved crested ridge and one more truly secondary item with no preserved crested ridge.

Two primary complete pieces have unilateral partial crested ridges with 1 triangular and 1 lateral steep profiles. They have

the following morphological features: 2 cortical dorsal surfaces, 1 parallel and 1 expanding shapes, 1 "on-axis" and 1 "off-axis" removal directions, 1 incurvate distal and 1 twisted general profiles, 1 feathering and 1 blunt distal ends, 2 partially cortical with significant amount of proximal + lateral cortex, 1 cortical 1.5 x 0.7 cm butt (not lipped, right angle, with no abrasion) and 1 crushed butt. One is on gray flint and another on colored flint. Metrics: length – 2.2 and 2.6 cm, width – 1.6 and 2.0 cm, thickness – 0.6 and 0.8 cm, respectively.

Two re-crested complete non-cortical pieces have unilateral partial crested ridges with 1 triangular and 1 lateral steep profiles. Morphology: 1 unidirectional and 1 unidirectional-crossed scar patterns, 1 converging and 1 irregular shapes, 2 "off-axis" removal direction, 1 flat and 1 incurvate distal general profiles, 2 feathering distal ends, 1 punctiform butt with no abrasion and 1 plain 0.5 x 0.2 cm butt (semi-lipped, semi-acute angle, with no abrasion). One is on gray flint and another one on colored flint. Dimensions: length – 2.7 and 2.9 cm, width – 1.5 and 1.6 cm, thickness – 0.7 and 0.5 cm, respectively.

A secondary complete non-cortical piece is characterized by unilateral partial crested ridge preparation with lateral steep profile and the following morphological features: unidirectional-crossed scar pattern, expanding shape, "off-axis" removal direction, convex general profile, hinged distal end and plain 1.8 x 0.2 cm butt (semi-lipped, semi-acute angle, with abrasion). On gray flint, 3.0 cm long, 2.2 cm wide and 0.9 cm thick.

An unidentifiable piece is a medial non-cortical fragment with unilateral wholly prepared crested ridge and lateral steep profile. Morphologically, a flat general profile is the only definable feature. On colored flint, 1.8 cm long, 1.6 cm wide and 0.2 cm thick.

A truly secondary crested flake with no preserved crested ridge is complete and non-cortical. Morphology: unidirectional-crossed scar pattern, converging shape, "off-axis" removal direction, incurvate medial general profile, hinged distal end, irregular profile at midpoint and linear 0.4 x 0.1 cm butt (semi-lipped, semi-acute angle, with abrasion). On gray flint, 3.3 cm long, 1.7 cm wide (almost blady proportions) and 0.4 cm thick.

Crested Blades. These include 4 primary, 4 re-crested, 1 secondary pieces with preserved crested ridge and 1 truly secondary piece with no preserved crested ridge.

Four primary pieces have the following traits of crested ridges: unilateral (2)/bilateral (2) and wholly (4) crested preparation with only lateral steep profiles. Morphology: 1 complete, 1 proximal, 1 medial and 1 distal fragments; 1 cortical, 1 dorsal-plain and 2 crested scar patterns; 1 parallel and 3 unidentifiable shapes; 1 "on-axis" and 3 unidentifiable removal directions; 2 twisted and 2 unidentifiable general profiles; 1 feathering, 1 hinged and 2 unidentifiable distal ends; 3 non-cortical and 1 partially cortical with insignificant lateral cortex; 1 cortical 1.2 x 0.2 cm butt (not lipped, right angle, with no abrasion), 1 crushed and 2 missing butts. Three are on gray flints and another is on colored flint. Metrics: length – 5.9 cm for one complete piece and 3.5-5.2 cm for 3 broken pieces; width – 2.0-2.6 cm, thickness – 0.6-1.3 cm.

Four re-crested pieces have the following traits of crested ridges: unilateral with partially (2)/wholly (2) crested preparation and 2 triangular and 2 lateral steep profiles. Morphology: 3 proximal and 1 medial fragments; 2 unidirectional, 1 3-directional and 1 unidentifiable scar patterns; 3 non-cortical and 1 partially cortical with insignificant distal cortex; 1 plain 0.2 x 0.2 cm butt (semi-lipped, semi-acute angle, with abrasion), 1 dihedral 0.8 x 0.3 cm butt (semi-lipped, semi-acute angle, with abrasion), 1 finely-faceted 1.0 x 0.4 cm butt (semi-lipped, semi-acute angle, with no abrasion) and 1 missing butt. One is on gray flint and three others on colored flints. Dimensions: length – 2.1-5.6 cm, width – 1.3-2.6 cm, thickness – 0.4-0.9 cm.

A secondary piece with preserved crested ridge is a non-cortical distal fragment (unilateral partial crested ridge with lateral steep profile). Morphology: unidirectional scar pattern, converging shape, "off-axis" removal direction, incurvate medial general profile, hinged distal end and missing butt. On colored flint, 3.4 cm long, 1.6 cm wide and 0.4 cm thick.

A truly secondary piece with no preserved crested ridge is a proximal non-cortical fragment with the following identifiable morphological features: unidirectional scar pattern, triangular profile at midpoint and punctiform butt with abrasion. On colored flint, 1.9 cm long, 1.3 cm wide and 0.3 cm thick.

Crested Bladelets are represented by 2 pieces: 1 primary and 1 re-crested.

The primary piece is a proximal non-cortical fragment with unilateral wholly crested preparation and lateral steep profile, and morphologically definable butt – dihedral 0.5 x 0.4 cm (semi-lipped, semi-acute angle, with no abrasion). On gray flint, 1.1 cm long, 0.7 cm wide and 0.4 cm thick.

A re-crested piece is a distal partially cortical fragment with insignificant lateral cortex. It has a unilateral crested ridge with lateral steep profile. Morphology: bidirectional scar pattern, converging shape, "off-axis" removal direction, twisted general profile and feathering distal end. On gray flint, 3.3 cm long, 1.1 cm wide and o.5 cm thick.

Core Tablets. All 6 pieces are primary core tablets: 5 complete flakes and 1 complete blade.

Five pieces on flakes have remnants of core striking platform on the butt area alone for two pieces and on the butt area and one lateral edge for three pieces. Four are partially cortical with insignificant distal (1), lateral (2) and central (1) cortex. Another piece is non-cortical. Three are on gray flints and two on colored flints. Metrics: length – 1.9-5.3 cm, width – 2.9-4.9 cm (3 with shortened, transversal proportions) and thickness – 0.8-1.5 cm. A core tablet on blade has the top part of a core on the butt area and one lateral edge and is partially cortical with insignificant lateral cortex. On gray flint, 3.8 cm long, 1.8 cm wide and 0.8 cm thick.

Core Trimming Elements. Three of these pieces (flakes) are complete with two non-cortical and another partially cortical with insignificant lateral cortex. All have transversal dorsal crested

ridges (2 unilateral and 1 bilateral partial). Two are on gray flints and one is on limestone. Their dimensions are as follows: length – 1.8-7.0 cm, width – 2.1-5.4 cm (2 with shortened, transversal proportions), thickness – 0.5-2.5 cm. Butts: 1 plain 1.3 x 0.3 cm (semi-lipped, acute angle, with no abrasion), 1 punctiform butt (semi-lipped, semi-acute angle, with no abrasion) and 1 crudely-faceted 3.9 x 1.6 cm (semi-lipped, semi-acute angle, with no abrasion).

Level Ga

Core maintenance products are represented by only 4 crested pieces. They are subdivided into 1 crested blade, 1 crested bladelet and 2 crested microblades.

The Crested Blade is a truly secondary complete non-cortical one with no preserved crested ridge. Morphological features: unidirectional scar pattern, expanding shape, "off-axis" removal direction, twisted general profile, feathering distal end, trapezoidal profile at midpoint and linear 0.5 x 0.1 cm butt with only identifiable abrasion. On gray flint, 4.0 cm long, 1.6 cm wide and 0.5 cm thick.

The Crested Bladelet is an unidentifiable non-cortical medial fragment with a unilateral partially treated crested ridge with triangular profile. Identifiable morphological features: unidirectional scar pattern and twisted general profile. On gray flint, 3.1 cm long, 0.6 cm wide and 0.4 cm thick.

Crested Microblades. There are 2 pieces: 1 re-crested and 1 secondary.

The re-crested item is a non-cortical proximal one and has unilateral wholly treated crested ridge with lateral steep profile. It has a unidirectional scar pattern, incurvate medial general profile and crushed butt. On gray flint, 1.4 cm long, 0.6 cm wide and 0.2 cm thick.

The secondary item is a non-cortical proximal truly secondary one with no preserved crested ridge. It has a unidirectional scar pattern, multifaceted profile at midpoint and plain 0.2 x 0.2 cm butt (semi-lipped, semi-acute angle, with no abrasion). On gray flint, 0.7 cm long, 0.6 cm wide and 0.2 cm thick.

The inner structure and characteristics of Unit G core maintenance products allow us to make the following conclusions. Cresting and re-cresting processes (the "*lame à crête technique*") are truly blady ones. Moreover, apart from some crested bladelets in all four levels, there are also several crested microblades in levels Gd, Gc1-Gc2 and Ga that once more strengthen the inference for general bladelet production in Unit G primary reduction processes. Crested bladelets and microblades are evidence of bladelet core reduction from the initiation stage; the presence of secondary crested and re-crested bladelets in levels Gd, Gc1-Gc2 and Gb1-Gb2, one secondary crested microblade in level Gc1-Gc2 and two secondary and re-crested microblades in level Ga also points to the recurrent application of crested processes during continuous bladelet core reduction. At the same time, the occurrence of single core tablets on blades in levels Gd and Gb1-Gb2 shows occasional bladelet production from the narrow sides of cores. Finally, the correlation of 120 core maintenance products to 21 cores (5.7:1) for levels Gd, Gc1-Gc2 and Gb1-Gb2 is also high enough to infer both multiple and intensive reduction processes taking place at the site.

Debitage

This category of artifacts from the four archaeological levels of Unit G has the following internal structure for each level artifact assemblage (see tabl. 3B).

Debitage of level Gd (total 299 pieces) is composed of 91 flakes (30.5%), 81 blades (27.1%), 88 bladelets (29.4%) and 39 microblades (13%).

Debitage of level Gc1-Gc2 (total 808 pieces) is composed of 251 flakes (31.1%), 182 blades (22.5%), 266 bladelets (32.9%) and 109 microblades (13.5%).

Debitage of level Gb1-Gb2 (total 348 pieces) is composed of 108 flakes (31.1%), 63 blades (18.1%), 101 bladelets (29%) and 76 microblades (21.8%).

Debitage of level Ga (total 65 pieces) is composed of 28 flakes (43.1%), 13 blades (20%), 14 bladelets (21.5%) and 10 microblades (15.4%).

Flakes

In terms of their condition, the flakes from Unit G are subdivided into complete and broken pieces, with further distribution of the latter into proximal, medial, distal and longitudinal fragments.

91 flakes of level Gd consist of 70 complete pieces (76.9%) and 21 broken pieces (23.1%) – 7 proximal (7.7%), no medial, 6 distal (6.6%) and 8 longitudinally fragmented (8.8%).

251 flakes of level Gc1-Gc2 consist of 183 complete pieces (72.8%) and 68 broken pieces (27.2%) – 29 proximal (11.6%), 4 medial (1.6%), 28 distal (11.2%) and 7 longitudinally fragmented (2.8%).

108 flakes of level Gb1-Gb2 consist of 87 complete pieces (80.6%) and 21 broken pieces (19.4%) – 8 proximal (7.4%), no medial, 8 distal (7.4%) and 5 longitudinally fragmented (4.6%).

28 flakes of level Ga consist of 17 complete pieces (60.8%) and 11 broken pieces (39.2%) – 3 proximal (10.7%), 5 medial (17.8%), 2 distal (7.1%) and one longitudinally fragmented (3.6%).

Dorsal Scar Pattern. All eight scar pattern types have been recognized on all 91flakes from level Gd, on 236 definable flakes from level Gc1-Gc2, on 101 definable flakes from level Gb1-Gb2, while only five scar pattern types are characteristic for the small sample of 28 flakes from level Ga. Separately, representation of scar pattern types for flakes from each level are as follows (see tabl. 4).

Flakes of level Gd: unidirectional - 52.7%, unidirectional-crossed - 16.5%, cortical - 14.3%, lateral - 7.7%, dorsal-plain - 3.3%, 3-directional and centripetal - 2.2% each, bidirectional - 1.1%.

Flakes of level Gc1-Gc2: unidirectional - 64.1%, unidirectional-crossed and cortical - 11% each, bidirectional - 4.7%, dorsal-plain - 4.2%, lateral - 3.8%, 3-directional - 0.8%, centripetal - 0.4%.

Flakes of level Gb1-Gb2: unidirectional - 60.3%, cortical - 14.8%, unidirectional-crossed - 12.9%, lateral - 4%, dorsal-plain - 3%, bidirectional and 3-directional - 2% each, centripetal - 1%.

Flakes of level Ga: unidirectional -35.8%, cortical - 32.1%, unidirectional-crossed - 21.4%, lateral - 7.1%, bidirectional - 3.6%.

Such structure for dorsal scar pattern types for the flake samples from levels Gd, Gc1-Gc2 and Gb1-Gb2 shows the dominant position of unidirectional type (52.7%-64.1%), subordinate role of unidirectional-crossed (11%-16.5%) and cortical (11%-14.8%) types, poor representation of the other five types (dorsal-plain, lateral, bidirectional, 3-directional, centripetal) which each do not usually exceed 5% apart from a single, but not very different case for lateral type in level Gd (7.7%).

On the other hand, the rare flakes from level Ga show some differences in comparison to flakes in the other three levels, shown by less representation of unidirectional type (35.8%) and a rather high proportion of cortical type (32.1%).

Comparison of scar pattern types with presence/absence of cortex on flakes shows the following representation for levels Gd, Gc1-Gc2 and Gb1-Gb2. Pieces with cortex among unidirectional flakes compose about a quarter in each level: 27.1% in level Gd, 26.5% in level Gc1-Gc2 and 27.9% in level Gb1-Gb2. The next most common pattern is the unidirectional-crossed scar pattern on pieces with cortex, which shows significant fluctuations between levels: 20% in level Gd, 53.8% in level Gc1-Gc2 and 38.5% in level Gb1-Gb2. Other scar pattern types do not show any systematic correlations with respect to dorsal cortex representation. Level Ga, on the other hand, shows that 70% of unidirectional flakes with cortex, 50% of unidirectional-crossed flakes with cortex and 100% of lateral flakes with cortex.

Surface Cortex Area and Location. All flakes from each level of Unit G were used for surface cortex area identification. Non-cortical flakes slightly prevail in the following levels: 59.3% in level Gd, 61.4% in level Gc1-Gc2 and 61.1% in level Gb1-Gb2. On the other hand, non-cortical pieces compose only 25% in level Ga. Wholly cortical flakes are represented by a rather moderate number in levels Gd, Gc1-Gc2 and Gb1-Gb2 (14.3%, 10.7%, 13.9%, respectively) and a significant number in level Ga (32.1%). Other flakes are partially cortical – 26.4% in level Gd, 27.9% in level Gc1-Gc2, 25% in level Gb1-Gb2 and 42.9% in level Ga. Only complete flakes show very similar cortex area: level Gd (70 pieces) – non-cortical - 58.5%, partially cortical - 27.2% and cortical - 14.3%; level Gc1-Gc2 (183 pieces) – non-cortical - 60.2%, partially cortical - 30% and cortical - 9.8%; level Gb1-Gb2 (87 pieces) – non-cortical - 64.4%, partially cortical - 23% and cortical - 12.6%; level Ga (17 pieces) – non-cortical - 29.4%, partially cortical - 47.1% and cortical - 23.5%. Complete partially cortical flakes have such internal cortex subdivision: pieces with significant amount of cortex – 31.6% (6 pieces) in level Gd, 36.4% (20 pieces) in level Gc1-Gc2, 20% (4 pieces) in level Gb1-Gb2 and 75% (6 pieces) in level Ga, and pieces with insignificant cortex – 68.4% (13 pieces) in level Gd, 63.6% (35 pieces) in level Gc1-Gc2, 80% (16 pieces) in level Gb1-Gb2 and 25% (2 pieces) in level Ga. Thus, aside from level Ga, flakes of levels Gd, Gc1-Gc2 and Gb1-Gb2 show a dominance of partially cortical flakes with insignificant cortex.

The same samples of complete partially cortical flakes also allow us to study surface cortex location: level Gd (19 pieces) – lateral cortex - 42.2%, distal cortex - 31.7%, distal + lateral cortex - 10.5%, proximal, central and proximal + central cortex - 5.2% each; level Gc1-Gc2 (55 pieces) – lateral cortex - 54.6%, distal cortex - 23.6%, distal + lateral cortex - 9.1%, central cortex - 7.3%, proximal cortex - 3.6%, distal + central cortex - 1.8%; level Gb1-Gb2 (20 pieces) – lateral cortex - 45%, distal cortex - 40%, distal + lateral cortex - 10% and proximal cortex - 5%; level Ga (8 pieces) – lateral and distal + lateral cortex - 37.5% each, distal and proximal cortex - 12.5% each. Thus, there is a prevalence of partially cortical pieces with lateral cortex over partially cortical pieces with distal cortex, while flakes with other cortex location (aside from distal + lateral) are represented by only a few pieces each.

Shape. 75 flakes with definable shapes from level Gd, 202 from level Gc1-Gc2, 95 from level Gb1-Gb2 and only 24 from level Ga were used to record shape (see tabl. 5).

Flakes of level Gd have the following shape types: expanding - 47.9%, parallel - 18.7%, irregular - 14.7%, converging - 12% and ovoid - 6.7%.

Flakes of level Gc1-Gc2 have the following shape types: expanding - 51%, irregular - 24.3%, converging - 10.9%, parallel and ovoid - 6.9% each.

Flakes of level Gb1-Gb2 have the following shape types: expanding - 52.6%, irregular - 27.4%, parallel - 9.5%, converging - 8.4% and ovoid - 2.1%.

Flakes of level Ga have the following such shape types: expanding - 37.5%, parallel - 25%, irregular - 16.7%, ovoid - 12.5% and converging - 8.3%.

It can be seen that there are two clusters for shape type. For the two most abundant flake samples for shape identification (levels Gc1-Gc2 and Gb1-Gb2), there is a dominance of expanding type (51% and 52.6%) and a moderate number of irregular type (24.3% and 27.4%) that together account for about three-fourths of all flakes from these two levels, while the other three types are much less represented; the quantity of parallel and converging types together does not reach 20% (17.8%-17.9%). For the other two less abundant flake samples for shape

Level Gd	flakes-tools	flakes-CMP	flakes-debitage	Flakes Total
cortical			13	13 / 13.4%
dorsal-plain			3	3 / 3.1%
lateral			7	7 / 7.2%
crested		3		3 / 3.1%
unidirectional	2		48	50 / 51.5%
unidirectional-crossed			15	15 / 15.4%
bidirectional	1		1	2 / 2.1%
3-directional			2	2 / 2.1%
centripetal			2	2 / 2.1%
core tablet		4		4
unidentifiable	1			1
N	4	7	91	102
Level Gc1-Gc2	**flakes-tools**	**flakes-CMP**	**flakes-debitage**	**Flakes Total**
cortical	2		26	28 / 10.4
dorsal-plain			10	10 / 3.7
lateral	1		9	10 / 3.7
crested		13		13 / 4.8
unidirectional	8		151	159 / 59.2
unidirectional-crossed	5		26	31 / 11.5
bidirectional	2		11	13 / 4.8
3-directional	2		2	4 / 1.5
centripetal			1	1 / 0.4
core tablet		5		5
unidentifiable	6		15	21
N	26	18	38	295
Level Gb1-Gb2	**flakes-tools**	**flakes-CMP**	**flakes-debitage**	**Flakes Total**
cortical	2		15	17 / 14.4%
dorsal-plain			3	3 / 2.5%
lateral	1		4	5 / 4.2%
crested		10		10 / 8.5%
unidirectional	1		61	62 / 52.6%
unidirectional-crossed	1		13	14 / 11.9%
bidirectional	1		2	3 / 2.5%
3-directional			2	2 / 1.7%
centripetal	1		1	2 / 1.7%
core tablet		5		5
unidentifiable	4		7	11
N	11	15	108	134
Level Ga	**flakes-tools**	**flakes-CMP**	**flakes-debitage**	**Flakes Total**
cortical			9	9 / 30.0%
dorsal-plain				
lateral			2	2 / 6.7%
crested				
unidirectional	1		10	11 / 36.7%
unidirectional-crossed	1		6	7 / 23.3%
bidirectional			1	1 / 3.3%
3-directional				
centripetal				
core tablet				
unidentifiable				
N	2	0	28	30

DEBITAGE TOTAL
(INCLUDING TOOLS & CMP)

	N	%
flakes	561	28.3
blades	471	23.7
bladelets	566	28.5
microblades	386	19.5
TOTAL	1984	100.0

Table 4 - Siuren-I. Unit G. Flake Dorsal Scar Patterns as Percentages of Each Type.

identification (levels Gd and Ga), there is again a dominance of expanding type (47.9% and 37.5%), although it is less than 50% and, accordingly, is not as pronounced as in levels Gc1-Gc2 and Gb1-Gb2 even together with irregular type (62.6% and 54.2%), and a moderate number of parallel and converging types (30.7%-33.3%).

Axis. 75 flakes with definable axis of removal directions from level Gd, 203 flakes from level Gc1-Gc2, 93 flakes from level Gb1-Gb2 and only 24 flakes from level Ga were used to record axis (see tabl. 6). As for shape identification, there are two clusters of axis types for flakes from the four levels in Unit G. The first show the clear dominance of "off-axis" type – 81.8%

for level Gc1-Gc2 and 79.6% for level Gb1-Gb2. The second is characterized by comparable representation of "on-axis" (49.3%) and "off-axis" (50.7%) types for level Gd and a prevalence of "on-axis" type (62.5%) over "off-axis" type (37.5%) for level Ga.

It is worth noting the good correspondence of the two clusters of axis types to the two clusters of shape types for the Unit G flakes in all four levels. Thus, the dominance of "off-axis" type for flakes in level Gc1-Gc2 (81.8%) and level Gb1-Gb2 (79.6%) corresponds to the high number of expanding and irregular shape types in these levels (Gc1-Gc2 - 75.3% and Gb1-Gb2 - 80%). On the other hand, similar representation of "on-axis" and "off-axis" types for flakes of level Gd corresponds to less representation of expanding and irregular shape types in this level (62.6%) in comparison to levels Gc1-Gc2 and Gb1-Gb2, while the dominance of "on-axis" type (62.5%) in level Ga is linked to the lowest representation of expanding shape type (37.5%) and the highest rate of parallel shape type (25%) in this level among all four levels.

General Profiles of Flakes. These data are based on separate analyses of all flakes and of complete flakes (see tabl. 7).

Level Gd. There are 84 flakes with the following general profile types: incurvate medial - 32.1%, twisted - 19%, flat and incurvate distal - 16.7% each, convex - 15.5%. For 69 complete definable flakes there are recognized 30.5% of incurvate medial type, 18.8% of flat type, 17.4% of incurvate distal and convex types each, 15.9% of twisted type.

Level Gc1-Gc2. There are 211 flakes with the following general profile types: twisted - 37.5%, incurvate medial - 28.9%, flat - 14.2%, incurvate distal - 12.3%, convex - 7.1%. For all 183 complete flakes there are recognized 34.9% of twisted type, 29% of incurvate medial type, 15.3% of flat type, 13.1% of incurvate distal type, 7.7% of convex type.

Level Gb1-Gb2. There are 102 flakes with the following general profile types: incurvate medial - 29.4%, flat - 28.4%, twisted 16.7%, convex - 13.7% and incurvate distal - 11.8%.For all 87 complete flakes there are recognized 33.4% of flat type, 28.7% of incurvate medial type, 13.8% of convex type,12.6% of twisted type and 11.5% of incurvate distal type.

Level Ga. There are 25 flakes with the following general profile types: incurvate distal - 28%, incurvate medial and twisted - 24% each, flat - 16% and convex - 8%. For all 17 complete flakes there are recognized 41.1% of incurvate distal type, 29.4% of incurvate medial type, 11.8% of flat and twisted types each, 5.9% of convex type.

Level Gd	**flakes-tools**	**flakes-CMP**	**flakes-debitage**	**Flakes Total**
parallel			14	14 / 17.7%
converging	1		9	10 / 12.7%
expanding	1	1	36	38 / 48.1%
ovoid			5	5 / 6.3%
irregular	1		11	12 / 15.2%
unidentifiable	1	6	16	23
N	4	7	91	102
Level Gc1-Gc2	**flakes-tools**	**flakes-CMP**	**flakes-debitage**	**Flakes Total**
parallel	1		14	15 / 6.5%
converging		1	22	23 / 10.1%
expanding	10	4	103	117 / 51.1%
ovoid		1	14	15 / 6.5%
irregular	10		49	59 / 25.8%
unidentifiable	5	12	49	66
N	26	18	251	295
Level Gb1-Gb2	**flakes-tools**	**flakes-CMP**	**flakes-debitage**	**Flakes Total**
parallel	1	1	9	11 / 10.5%
converging		2	8	10 / 9.5%
expanding		2	50	52 / 49.5%
ovoid	1		2	3 / 2.9%
irregular	2	1	26	29 / 27.6%
unidentifiable	7	9	13	29
N	11	15	108	134
Level Ga	**flakes-tools**	**flakes-CMP**	**flakes-debitage**	**Flakes Total**
parallel			6	6 / 24%
converging			2	2 / 8%
expanding	1		9	10 / 40%
ovoid			3	3 / 12%
irregular			4	4 / 16%
unidentifiable	1		4	5
N	2	0	28	30

Table 5 - Siuren-I. Unit G. Flake Shapes as Percentages of Each Type.

Level Gd	flakes-tools	flakes-CMP	flakes-debitage	Flakes Total
on-axis	1	1	37	39 / 49.4%
off-axis	2		38	40 / 50.6%
unidentifiable	1	6	16	23
N	4	7	91	102
Level Gc1-Gc2	**flakes-tools**	**flakes-CMP**	**flakes-debitage**	**Flakes Total**
on-axis	5	3	37	45 / 19.7%
off-axis	14	3	166	183 / 80.3%
unidentifiable	7	12	48	67
N	26	18	251	295
Level Gb1-Gb2	**flakes-tools**	**flakes-CMP**	**flakes-debitage**	**Flakes Total**
on-axis	3	1	19	23 / 22.3%
off-axis	1	5	74	80 / 77.7%
unidentifiable	7	9	15	31
N	11	15	108	134
Level Ga	**flakes-tools**	**flakes-CMP**	**flakes-debitage**	**Flakes Total**
on-axis			15	15 / 60%
off-axis	1		9	10 / 40%
unidentifiable	1		4	5
N	2	0	28	30

Table 6 - Siuren-I. Unit G. Flake Axis as Percentages of Each Type.

Level Gd	flakes-tools	flakes-CMP	flakes-debitage	Flakes Total
flat	2		14	16 / 18.0%
incurvate medial	1		27	28 / 31.5%
incurvate distal		1	14	15 / 16.8%
convex			13	13 / 14.6%
twisted	1		16	17 / 19.1%
unidentifiable		6	7	13
N	4	7	91	102
Level Gc1-Gc2	**flakes-tools**	**flakes-CMP**	**flakes-debitage**	**Flakes Total**
flat	6	1	30	37 / 15.4%
incurvate medial	10	2	61	73 / 30.4%
incurvate distal	2	2	26	30 / 12.5%
convex	1		15	16 / 6.7%
twisted	4	1	79	84 / 35.0%
unidentifiable	3	12	40	55
N	26	18	251	295
Level Gb1-Gb2	**flakes-tools**	**flakes-CMP**	**flakes-debitage**	**Flakes Total**
flat	2	2	29	33 / 28.2%
incurvate medial	2	1	30	33 / 28.2%
incurvate distal	1	2	12	15 / 12.8%
convex	2	1	14	17 / 14.5%
twisted	1	1	17	19 / 16.3%
unidentifiable	3	8	6	17
N	11	15	108	134
Level Ga	**flakes-tools**	**flakes-CMP**	**flakes-debitage**	**Flakes Total**
flat			4	4 / 14.8%
incurvate medial			6	6 / 22.2%
incurvate distal	2		7	9 / 33.4%
convex			2	2 / 7.4%
twisted			6	6 / 22.2%
unidentifiable			3	3
N	2	0	28	30

Table 7 - Siuren-I. Unit G. Flake General Profiles as Percentages of Each Type.

So, there are only minimal statistical differences between the data set of all flakes and the data set of complete flakes. Along with this, the represented data for all four levels in Unit G are similar in that the twisted type plays a subordinate role (reaching its maximum in 37.5% only in level Gc1-Gc2 and not exceeding 25% in the other levels), while "regular" types (flat, incurvate medial and incurvate distal) range between 55% and 70%.

Profiles at Distal End. Data for these analyses were based on 78 flakes from level Gd, 209 flakes from level Gc1-Gc2, 90 flakes from level Gb1-Gb2 and 20 flakes from level Ga (see tabl. 8).

Level Gd has the following representation: feathering - 56.5%, hinged - 26.9%, blunt - 11.5% and overpassed - 5.1%.

Level Gc1-Gc2 has the following representation: feathering - 68.9%, hinged - 24.4%, blunt - 4.8% and overpassed - 1.9%.

Level Gb1-Gb2 has the following representation: feathering - 61.1%, hinged - 26.7%, blunt - 10% and overpassed - 2.2%.

Level Ga has the following representation: feathering - 60%, blunt - 30%, hinged and overpassed - 5% each.

Thus, we see a similar dominance of feathering – 56.5%-68.9% for flakes from all four levels in Unit G. At the same time, for three flake samples (Gd, Gc1-Gc2 and Gb1-Gb2) we also have similar proportions of hinged (24.4%-26.9%), blunt (4.8%-11.5%) and overpassed (1.9%-5.1%) types, where the latter is quite rare, also true for level Ga (5%). It is worth noting here the rather high proportion of "not regular" types (hinged and overpassed) which make up almost one-third of all flakes in levels Gd, Gc1-Gc2 and Gb1-Gb2.

Profiles at Midpoint. Data for these analyses were recorded on 88 flakes from level Gd, from 227 flakes from level Gc1-Gc2, 100 flakes from level Gb1-Gb2 and 27 flakes from level Ga (see tabl. 9).

Level Gd shows the following variety of types: trapezoidal - 29.5%, triangular - 21.6%, irregular - 20.5%, lateral steep - 9.1%, multifaceted - 8%, crescent - 6.8% and flat - 4.5%.

Level Gc1-Gc2 shows the following variety of types: irregular - 30.3%, multifaceted - 19.4%, trapezoidal - 18.5%, triangular - 13.7%, crescent - 8.8%, flat 8.4% and lateral steep - 0.9%.

Level Gb1-Gb2 shows the following variety of types: irregular - 31%, trapezoidal - 19%, triangular - 17%, multifaceted and flat - 13% each, crescent - 7% and no lateral steep.

Level Ga shows the following variety of types: triangular - 51.9%, trapezoidal - 18.5%, flat - 11.1%, crescent - 7.4%, multifaceted, irregular and lateral steep - 3.7% each.

While the profiles at midpoint are fairly diverse, they can nonetheless be grouped given some similarities. So, for three flake samples (levels Gd, Gc1-Gc2 and Gb1-Gb2) there is a

Level Gd	**flakes-tools**	**flakes-CMP**	**flakes-debitage**	**Flakes Total**
feathering	2	1	44	47 / 58.1%
hinged			21	21 / 25.9%
overpassed			4	4 / 4.9%
blunt			9	9 / 11.1%
unidentifiable	2	6	13	21
N	4	7	91	102
Level Gc1-Gc2	**flakes-tools**	**flakes-CMP**	**flakes-debitage**	**Flakes Total**
feathering	8	5	144	157 / 67.7%
hinged	3		51	54 / 23.3%
overpassed	1		4	5 / 2.1%
blunt	5	1	10	16 / 6.9%
unidentifiable	9	12	42	63
N	26	18	251	295
Level Gb1-Gb2	**flakes-tools**	**flakes-CMP**	**flakes-debitage**	**Flakes Total**
feathering	2	3	55	60 / 59.4%
hinged	1	2	24	27 / 26.7%
overpassed			2	2 / 2.0%
blunt	2	1	9	12 / 11.9%
unidentifiable	6	9	18	33
N	11	15	108	134
Level Ga	**flakes-tools**	**flakes-CMP**	**flakes-debitage**	**Flakes Total**
feathering			12	12 / 57.1%
hinged	1		1	2 / 9.5%
overpassed			1	1 / 4.8%
blunt			6	6 / 28.6%
unidentifiable	1		8	9
N	2	0	28	30

Table 8 - Siuren-I. Unit G. Flake Profiles at Distal End as Percentages of Each Type.

similar dominance of three types – triangular, irregular and trapezoidal, with the addition of multifaceted type in level Gc1-Gc2 as well. All other types are relatively poorly represented. On the other hand, such characteristic types of intensive reduction (trapezoidal and multifaceted) make up from 32% to 37.9% in these three levels. At the same time, irregular type fluctuates from 20.5% to 31% in these levels, which is a rather high index for only a single type. The range of types in level Ga can be explained by small sample size for this analysis.

Butt Types. This analysis is based on 81 flakes with butts from level Gd, 219 from level Gc1-Gc2, 101 from level Gb1-Gb2 and only 20 from level Ga (see tabl. 10).

Butts of level Gd are as follows: plain - 24.7%, punctiform - 12.3%, linear and cortical - 11.1% each, dihedral - 9.9%, crudely-faceted - 2.5%, finely-faceted - 3.7% and crushed - 24.7%.

Butts of level Gc1-Gc2 are as follows: plain - 21.5%, punctiform - 9.1%, linear - 20.5%, cortical - 7.8%, dihedral - 4.1%, crudely-faceted - 3.6%, finely-faceted - 4.6% and crushed - 28.8%.

Butts of level Gb1-Gb2 are as follows: plain - 23.9%, punctiform - 10.9%, linear - 15.8%, cortical - 11.9%, dihedral - 6.9%, crudely-faceted - 3%, finely-faceted - 2% and crushed - 25.7%.

Butts of level Ga are as follows: plain - 25%, punctiform - 5%, linear - 10%, cortical - 5%, no dihedral, crudely-faceted - 10%, finely-faceted - 5% and crushed - 40%.

Thus, the most common group of butt types, comprising half of all butts, is "plain-punctiform-linear"– 48.1%-51.1% for levels Gd, Gc1-Gc2 and Gb1-Gb2 and 40% for level Ga. The lower percentage for the latter level may be explained by a very high proportion of crushed butts (40%) there. Nearly a quarter of the flakes have a damaged crushed butt in levels Gd, Gc1-

Level Gd	**flakes-tools**	**flakes-CMP**	**flakes-debitage**	**Flakes Total**
flat			4	4 / 4.3%
triangular			19	19 / 20.2%
trapezoidal	1		26	27 / 28.7%
multifaceted	1		7	8 / 8.5%
lateral steep		3	8	11 / 11.7%
crescent			6	6 / 6.4%
irregular	1		18	19 / 20.2%
unidentifiable	1	4	3	8
N	4	7	91	102
Level Gc1-Gc2	**flakes-tools**	**flakes-CMP**	**flakes-debitage**	**Flakes Total**
flat			19	19 / 7.5%
triangular	2	4	31	37 / 14.7%
trapezoidal	4		42	46 / 18.3%
multifaceted	4		44	48 / 19.0%
lateral steep	1	2	2	5 / 2.0%
crescent			20	20 / 7.9%
irregular	8		69	77 / 30.6%
unidentifiable	7	12	24	43
N	26	18	251	295
Level Gb1-Gb2	**flakes-tools**	**flakes-CMP**	**flakes-debitage**	**Flakes Total**
flat			13	13 / 11.6%
triangular		2	17	19 / 17.0%
trapezoidal	1		19	20 / 17.8%
multifaceted	1		13	14 / 12.5%
lateral steep		4		4 / 3.6%
crescent	1		7	8 / 7.1%
irregular	2	1	31	34 / 30.4%
unidentifiable	6	8	8	22
N	11	15	108	134
Level Ga	**flakes-tools**	**flakes-CMP**	**flakes-debitage**	**Flakes Total**
flat			3	3 / 10.3%
triangular			14	14 / 48.4%
trapezoidal			5	5 / 17.2%
multifaceted	1		1	2 / 6.9%
lateral steep			1	1 / 3.4%
crescent			2	2 / 6.9%
irregular	1		1	2 / 6.9%
unidentifiable			1	1
N	2		28	30

Table 9 - Siuren-I. Unit G. Flake Profiles at Midpoint as Percentages of Each Type.

Gc2 and Gb1-Gb2 – 24.7%-28.8%. At the same time, a tenth of the flakes have a cortical butt (7.8%-11.9%) in levels Gd, Gc1-Gc2 and Gb1-Gb2, and also similarly present in level Ga (5%). There are also comparable proportions of faceted and dihedral butts in levels Gd, Gc1-Gc2 and Gb1-Gb2 where neither alone exceeds 10%.

Lipping. There are 63 butts suitable for lipping identification from level Gd, 143 from level Gc1-Gc2, 63 from level Gb1-Gb2 and only 12 butts from level Ga (see tabl. 11).

Butts of level Gd have the following lipping characteristics: semi-lipped - 84.1%, lipped - 4.8% and not lipped - 11.1%.

Butts of level Gc1-Gc2 have the following lipping characteristics: semi-lipped - 94.4%, lipped and not lipped - 2.8%.

Butts of level Gb1-Gb2 have the following lipping characteristics: semi-lipped - 88.9%, lipped - 4.8% and not lipped - 6.3%.

Butts of level Ga have the following lipping characteristics: semi-lipped - 58.3%, lipped - 25% and not lipped - 16.7%.

It can be seen that level Ga is quite different in lipping characteristics from the other three levels in Unit G, likely due to the small sample size. On the other hand, levels Gd, Gc1-Gc2 and Gb1-Gb2 are all quite similar. Semi-lipped butts are the most

Level Gd	**flakes-tools**	**flakes-CMP**	**flakes-debitage**	**Flakes Total**
cortical		1	9	10 / 11.6%
plain	1	1	20	22 / 25.6%
punctiform			10	10 / 11.6%
linear			9	9 / 10.5%
dihedral			8	8 / 9.3%
crudly-faceted			2	2 / 2.3%
finely-faceted			3	3 / 3.5%
crushed	1	1	20	22 / 25.6%
missing	2	4	10	16
N	4	7	91	102
Level Gc1-Gc2	**flakes-tools**	**flakes-CMP**	**flakes-debitage**	**Flakes Total**
cortical			17	17 / 6.9%
plain	6	3	47	56 / 22.8%
punctiform		1	20	21 / 8.5%
linear	1	1	45	47 / 19.1%
dihedral			9	9 / 3.6%
crudly-faceted	3		8	11 / 4.5%
finely-faceted	3		10	13 / 5.3%
crushed	5	4	63	72 / 29.3%
missing	8	9	32	49
N	26	18	251	295
Level Gb1-Gb2	**flakes-tools**	**flakes-CMP**	**flakes-debitage**	**Flakes Total**
cortical		1	12	13 / 10.9%
plain	2	4	24	30 / 25.2%
punctiform		2	11	13 / 10.9%
linear		1	16	17 / 14.3%
dihedral			7	7 / 5.9%
crudly-faceted	1	1	3	5 / 4.2%
finely-faceted	2		2	4 / 3.4%
crushed	3	1	26	30 / 25.2%
missing	3	5	7	15
N	11	15	108	134
Level Ga	**flakes-tools**	**flakes-CMP**	**flakes-debitage**	**Flakes Total**
cortical			1	1 / 4.5%
plain	1		5	6 / 27.3%
punctiform			1	1 / 4.5%
linear	1		2	3 / 13.6%
dihedral				
crudly-faceted			2	2 / 9.1%
finely-faceted			1	1 / 4.5%
crushed			8	8 / 36.5%
missing			8	8
N	2	0	28	30

Table 10 - Siuren-I. Unit G. Flake Butt Types as Percentages of Each Type.

common type – 84.1%-94.4%. Lipped and not lipped butts are represented by only a few pieces each where their correlation is either 1:1 (level Gc1-Gc2) or with prevalence of not lipped over lipped butts - 2.3:1 (level Gd) and 1.3:1 (level Gb1-Gb2).

Butt Angle. There are 62 butts suitable for angle identification from level Gd, 141 from level Gc1-Gc2, 63 from level Gb1-Gb2 and only 12 from level Ga (see tabl. 12).

Butts of level Gd have the following angles: semi-acute - 64.6%, right - 30.6% and acute - 4.8%.

Butts of level Gc1-Gc2 have the following angles: semi-acute - 86.6%, right - 10.6% and acute - 2.8%.

Butts of level Gb1-Gb2 have the following angles: semi-acute - 90.5%, right - 7.9% and acute - 1.6%.

Butts of level Ga have the following angles: semi-acute - 58.3%, right - 25% and acute - 16.7%.

Butt angles are fairly similar for all four levels. There are only in significant differences in proportion of semi-acute angle which are, however, dominant in each level (58.3%-90.5%). Moreover, right angles are always more common than acute angle in the following correlations: 6.4:1 for level Gd, 3.8:1 for level Gc1-Gc2, 4.9:1 for level Gb1-Gb2 and 1.5:1 for level Ga.

Butt Abrasion. The number of identifiable flake butts for to record presence/absence of abrasion in the four levels of Unit G is as follows: 63 from level Gd, 150 from level Gc1-Gc2, 64 from level Gb1-Gb2 and only 16 from level Ga (see tabl. 13).

Butts of level Gd have the following abrasion identifications: present - 38.1% and absent - 61.9%.

Butts of level Gc1-Gc2 have the following abrasion identifications: present - 72% and absent - 28%.

Butts of level Gb1-Gb2 have the following abrasion identifications: present - 48.4% and absent - 51.6%.

Butts of level Ga have the following abrasion identifications: present - 31.3% and absent - 68.7%.

Thus, correlations of presence/absence is 1:1.6 for level Gd, 1:0.4 for level Gc1-Gc2, 1:1.1 for level Gb1-Gb2 and 1:2.2 for level Ga. These correlations show similarity in flakes from levels Gd, Gb1 - Gb2 and Ga where there is some dominance of butts with no abrasion over butts with abrasion. On the other hand, the flakes from level Gc1-Gc2 show a reverse correlation with a significant prevalence of butts with abrasion.

Metrics (Length, Width, Thickness) of Flakes. Metric data are mainly based on the analysis of complete flakes from each level, while additional comparable information was also obtained when possible from broken flakes.

Length. The most abundant group of complete flakes in terms of length is in the interval 1.6-2.5 cm - 53.1% for level Gd, 50.3% for level Gc1-Gc2, 50.8% for level Gb1-Gb2 and 52.8% for level Ga. In general, flakes with length in the interval 0.5-3.0 cm comprise 75.9% for level Gd, 79.3% for level Gc1-Gc2, 79.5% for level Gb1-Gb2 and 100% for level Ga. The remaining flakes have lengths of more than 3 cm but pieces with length more than

Level Gd	**flakes-tools**	**flakes-CMP**	**flakes-debitage**	**Flakes Total**
lipped	1		3	4 / 5.7%
semi-lipped		6	53	59 / 84.3%
not lipped			7	7 / 10.0%
unidentifiable	3	1	28	32
N	4	7	91	102
Level Gc1-Gc2	**flakes-tools**	**flakes-CMP**	**flakes-debitage**	**Flakes Total**
lipped	3	1	4	8 / 4.8%
semi-lipped	10	5	135	150 / 89.8%
not lipped	1	4	4	9 / 5.4%
unidentifiable	12	8	108	128
N	26	18	251	295
Level Gb1-Gb2	**flakes-tools**	**flakes-CMP**	**flakes-debitage**	**Flakes Total**
lipped			3	3 / 3.7%
semi-lipped	6	11	56	73 / 90.1%
not lipped		1	4	5 / 6.2%
unidentifiable	5	3	45	53
N	11	15	108	134
Level Ga	**flakes-tools**	**flakes-CMP**	**flakes-debitage**	**Flakes Total**
lipped			3	3 / 21.4%
semi-lipped	2		7	9 / 64.3%
not lipped			2	2 / 14.3%
unidentifiable			16	16
N	2	0	28	30

Table 11 - Siuren-I. Unit G. Flake Butt Lipping as Percentages of Each Type.

5 cm among them account for just a few pieces - 2.8% for level Gd, 0.5% for level Gc1-Gc2, 3.4% for level Gb1-Gb2 and none for level Ga. Moreover, no flake is longer than 6 cm. Mean length for complete flakes of each level is as follows: 2.4 cm for levels Gd and Gc1-Gc2, 2.3 cm for level Gb1-Gb2 and 1.9 cm for level Ga. So, complete flakes of all levels of Unit G are quite short.

The analysis of broken flakes shows that the majority are in the interval 0.5-3.0 cm – 76.1% for level Gd, 89.8% for level Gc1-Gc2, 76.2% for level Gb1-Gb2 and 72.7% for level Ga. Moreover, no broken flake in any of the four levels is longer than 5 cm.

Width. The most abundant group of complete flakes in terms of width is in the interval 1.6-2.5 cm – 54.4% for level Gd, 56.2% for level Gc1-Gc2, 53% for both levels Gb1-Gb2 and Ga. Complete flakes with width in the interval 0.5-3.0 cm comprise the vast majority: 84.4% for level Gd, 86.3% for level Gc1-Gc2, 84% for level Gb1-Gb2 and 76.5% for level Ga. The remaining pieces have widths more than 3 cm, but only a few more than 5 cm – 1.4% for level Gd, none for level Gc1-Gc2, 1.1% for level Gb1-Gb2 and none for level Ga. None of these few "large" flakes have a width more than 6 cm. Mean width for complete flakes of each level is as follows: 2.3 cm for level Gd and 2.2 cm for the three other levels Gc1-Gc2, Gb1-Gb2 and Ga together.

Analysis of broken flakes parallels the data on complete flakes. So, there are many broken flakes with width in the interval 0.5-3.0 cm – 76.9% for level Gd, 87% for level Gc1-Gc2, 93.8% for level Gb1-Gb2 and 70% for level Ga. No broken flake has a width of more than 5 cm.

We now look at the correlation of length and width of flakes from the four levels of Unit G. Strictly speaking, only level Ga has "an ideal complete flake" with shortened, transversal proportions (1.9 cm L <2.2 cm W). On the other hand, prevalence of mean length over mean width in levels Gd, Gc1-Gc2 and Gb1-Gb2 compose only 1 - 2 mm – 2.4 cm L > 2.3 cm W for level Gd, 2.4 cm L > 2.2 cm W for level Gc1-Gc2 and 2.3 cm L > 2.2 cm W for level Gb1-Gb2. Moreover, there is also a significant quantity of actual (not ideal) complete flakes with shortened, transversal proportions (L <W) in all four levels – 38 pieces/54.3% for level Gd, 84 pieces/45.9% for level Gc1-Gc2, 46 pieces/52.9% for level Gb1-Gb2 and 13 pieces/76.4% for level Ga. Along with this, the quantity of "elongated" flakes (L > 1.5 W) is not large at all – 14 pieces/20% for level Gd, 43 pieces/23.5% for level Gc1-Gc2, 15 pieces/17.2% for level Gb1-Gb2 and only 2 pieces /11.8% for level Ga. Thus, length and width of complete flakes of the levels of Unit G is very similar.

Thickness. Mean thickness for both complete and broken flakes from all four levels is 0.5 cm. Flakes in the interval 0.1-0.5 cm comprise 75.8% for complete and 76.2% for broken flakes in level Gd, 74.3% for complete and 69.1% for broken flakes in level Gc1-Gc2, 64.4% for complete and 66.6% for broken flakes in level Gb1-Gb2 and 75.8% for complete and 76.2% for broken flakes in level Ga. On the other hand, just a few flakes have thickness more than 1.0 cm: 2.8% for complete and none for broken flakes in level Gd, 2.7% for complete and 1.5% for broken flakes in level Gc1-Gc2, 3.3% for complete and 4.8% for broken flakes in level Gb1-Gb2 and none in level Ga, although even the minimal presence of rather thick flakes is notable. Thus, flakes of all four levels of Unit G are not thick.

Butt Sizes. Mean metric data for flake butts are similar for all four levels. They are as follows for butt width: 0.9 cm for both levels Gd (55 butts) and Gc1-Gc2 (129 butts), and 1.2 cm for both levels Gb1-Gb2 (59 butts) and Ga (12 butts). They are as follows for butt height: 0.3 cm for all four levels. Plain butts have mean width of 0.8 cm for both levels Gd (20 butts) and Gc1-Gc2 (47 butts), 1.1 cm for level Gb1-Gb2 (24 butts) and 1.2 cm for level Ga (5 butts) and have mean height of 0.3 cm for both levels Gd and Gc1-Gc2, and 0.4 cm for both levels Gb1-Gb2 and Ga.

In sum, then, the flakes of all four levels can be generally characterized by:

- a dominance of unidirectional scar pattern (52.7%-64.1%), a subordinate position of both unidirectional-crossed (11%-16.5%) and cortical (11%-14.8%) scar patterns, and a small number of other five scar pattern types (usually <5% each) for levels Gd, Gc1-Gc2 and Gb1-Gb2, while level Ga has a different representation of scar pattern types that is most likely due to the rather small sample of flakes;

- a presence of two clusters of flake samples based on surface cortex area and location: 1) there is a prevalence of non-cortical pieces (59.3%-61.4%) and a moderate number of wholly cortical pieces (10.7%-14.3%); lateral cortex location is the most typical for partially cortical flakes, which often (20%-36.4%) have a significant amount of cortex – levels Gd, Gc1-Gc2 and Gb1-Gb2; and 2) there is a dominance of partially cortical pieces (42.9%) and a significant number of wholly cortical pieces (32.1%); lateral cortex location is dominant for partially cortical flakes, of which the majority (75%) have a significant amount of cortex – level Ga;

- a presence of two clusters of flake samples based on their shape and axis: 1) a great number of expanding and irregular shape types (75.3%-80% together) correspond to a dominance of "off-axis" type of removal direction (79.6%-81.8%) in levels Gc1-Gc2 and Gb1-Gb2, while 2) level Gd is characterized a lower number of expanding and irregular shape types (62.6% together) that correspond to a near-equal representation of "on-axis" (49.3%) and "off-axis" (50.7%) types of removal direction, and, moreover, level Ga has the lowest representation of expanding shape (37.5%) and the highest rate of parallel shape (25%) in all four levels and, accordingly, "on-axis" removal direction (62.5%) is dominant;

-a dominance of "regular" (flat, incurvate medial and incurvate distal) types of general profiles, while twisted type plays a subordinate role, reaching its maximum of 37.5% only in level Gc1-Gc2 and not exceeding 25% for the other three levels;

- a dominance of feathering distal ends (56.5%-68.9%) and, at the same time, a rather high proportion of "not regular" hinged and overpassed types (26.3%-32% together);

Level Gd	flakes-tools	flakes-CMP	flakes-debitage	Flakes Total
right		3	19	22 / 31.9%
semi-acute		3	40	43 / 62.3%
acute	1		3	4 / 5.8%
unidentifiable	3	1	29	33
N	4	7	91	102
Level Gc1-Gc2	**flakes-tools**	**flakes-CMP**	**flakes-debitage**	**Flakes Total**
right	5	5	15	25 / 14.8%
semi-acute	8	5	122	135 / 80.4%
acute	4		4	8 / 4.8%
unidentifiable	9	8	110	127
N	26	18	251	295
Level Gb1-Gb2	**flakes-tools**	**flakes-CMP**	**flakes-debitage**	**Flakes Total**
right	2	5	5	12 / 14.8%
semi-acute	4	6	57	67 / 82.7%
acute		1	1	2 / 2.5%
unidentifiable	5	3	45	
N	11	15	108	134
Level Ga	**flakes-tools**	**flakes-CMP**	**flakes-debitage**	**Flakes Total**
right	1		3	4 / 28.6%
semi-acute	1		7	8 / 57.1%
acute			2	2 / 14.3%
unidentifiable			16	16
N	2	0	28	30

Table 12 - Siuren-I. Unit G. Flake Butt Angles as Percentages of Each Type.

Level Gd	flakes-tools	flakes-CMP	flakes-debitage	Flakes Total
present	1		24	25 / 35.7%
absent		6	39	45 / 64.3%
unidentifiable	3	1	28	32
N	4	7	91	102
Level Gc1-Gc2	**flakes-tools**	**flakes-CMP**	**flakes-debitage**	**Flakes Total**
present	5		108	113 / 67.7%
absent	5	7	42	54 / 32.3%
unidentifiable	16	11	101	128
N	26	18	251	295
Level Gb1-Gb2	**flakes-tools**	**flakes-CMP**	**flakes-debitage**	**Flakes Total**
present	2	2	31	35 / 42.7%
absent	3	11	33	47 / 57.3%
unidentifiable	6	2	44	52
N	11	15	108	134
Level Ga	**flakes-tools**	**flakes-CMP**	**flakes-debitage**	**Flakes Total**
present			5	5 / 31.3%
absent			11	11 / 68.7%
unidentifiable	2		12	14
N	2	0	28	30

Table 13 - Siuren-I. Unit G. Flake Butt Abrasion as Percentages of Each Type.

- a dominance of triangular, irregular and trapezoidal types of profiles at midpoint (62.5%-71.6%) with a significant number of irregular type among them (20.5%-31%), while trapezoidal and multifaceted types together make up only 32%-37.9% in levels Gd, Gc1-Gc2 and Gb1-Gb2, and a different structure of types in level Ga;

- a dominance of the "plain-punctiform-linear" group of butt types which comprise around half of all butts (48.1%-51.1%) in levels Gd, Gc1-Gc2 and Gb1-Gb2 (40% in level Ga), and a notable presence of the five other butt types;

- a dominance of semi-lipped butts with semi-acute angle with, at the same time, a rather small number of lipped butts with acute angle and a moderate representation of not lipped butts with mainly right angle in levels Gd, Gc1-Gc2 and Gb1-Gb2, and a different structure of butt types in level Ga;

- a presence of two clusters of flake samples based on presence/absence of butt abrasion: 1) a dominance of flakes with no butt abrasion (51.6%-68.7%) over flakes with butt abrasion (31.3%-48.4%) in levels Gd, Gb1-Gb2 and Ga; and 2) a signifi-

cant prevalence of flakes with butt abrasion (72%) over flakes with no butt abrasion (28%) in level Gc1-Gc2;

- a dominance of pieces with shortened, transversal metric proportions in level Ga (1.9 cm L <2.2 cm W in mean data) and a similar dominance of generally short pieces in the other three levels (2.4 cm L > 2.3 cm W in level Gd, 2.4 cm L > 2.2 cm W in level Gc1-Gc2 and 2.3 cm L > 2.2 cm W in level Gb1-Gb2 in mean data) and a mean thickness of 0.5 cm for flakes in all four levels;

- a considerable prevalence of gray flints for flakes of all four levels with a tendency to increase through the archaeological sequence (Gd – 60 pieces/65.9%; Gc1-Gc2 – 185 pieces/73.7%; Gb1-Gb2 – 85 pieces/78.7%; Ga – 23 pieces/82.2%), a variable moderate representation of colored flints with a respective decreasing tendency (Gd – 25 pieces/27.5%; Gc1-Gc2 – 57 pieces/22.7%; Gb1-Gb2 – 21 pieces/19.5%; Ga – 3 pieces/10.7%), and very low representation of black flints (Gd – 4 pieces/4.4%; Gc1-Gc2 – 9 pieces/3.6%; Gb1-Gb2 – 2 pieces/1.8%; Ga – 2 pieces/7.1%) and especially limestones (only known in level Gd – 2 pieces/2.2%).

Blades

In terms of condition, blades from the four archaeological levels of Unit G are subdivided into complete and broken pieces, with further distribution of the latter into proximal, medial, distal and longitudinal fragments.

81 blades of level Gd include 16 complete (19.8%) and 65 broken pieces (80.2%) – 26 proximal (32.1%), 21 medial (25.9%), 18 distal (22.2%) and none longitudinally fragmented.

182 blades of level Gc1-Gc2 include 34 complete (18.7%) and 148 broken pieces (81.3%) – 60 proximal (32.9%), 46 medial (25.3%), 40 distal (22%) and 2 longitudinally fragmented (1.1%).

63 blades of level Gb1-Gb2 include 13 complete (20.6%) and 50 broken pieces (79.4%) – 15 proximal (23.8%), 19 medial (30.2%), 16 distal (25.4%) and none longitudinally fragmented.

13 blades of level Ga include only broken pieces (100%) – 2 proximal (15.4%), 6 medial (46.1%), 5 distal (38.5%) and none longitudinally fragmented.

Dorsal Scar Pattern. Four scar pattern types have been identified on all 81 blades from level Gd, five scar pattern types on 180 blades from level Gc1-Gc2, three scar pattern types on 62 blades from level Gb1-Gb2 and only one scar pattern type for all 13 blades from level Ga (see tabl. 14). Thus, there is a kind of interconnection between the quantity of blades and the number of scar pattern types identified for them in each level. Separately, blades from each level have the following scar pattern type representation.

Blades of level Gd: unidirectional - 93.9%, bidirectional - 3.7%, unidirectional-crossed and 3-directional - 1.2% each.

Blades of level Gc1-Gc2: unidirectional - 76%, unidirectional-crossed - 15%, bidirectional - 6.7%, cortical - 1.7% and 3-directional - 0.6%.

Blades of level Gb1-Gb2: unidirectional - 85.5%, bidirectional - 9.7% and unidirectional-crossed - 4.8%.

Blades of level Ga are characterized by only unidirectional scar pattern.

Thus, there is a clear dominance of unidirectional scar pattern for blades (more than three-quarters), while other 3-5 defined scar pattern types are certainly more or less occasional and/or preparatory/re-preparatory ones.

Comparison of scar pattern types with presence/absence of cortex on blades revealed the following regularity. Specimens with cortex among unidirectional blades have a rather stable moderate proportion – 22.4% in level Gd, 29.9% in level Gc1-Gc2, 24.5% in level Gb1-Gb2 and 15.4% in level Ga where the latter level contains blades exclusively with unidirectional scar pattern. Other rare scar pattern types for blades, on the other hand, are represented by many more cortical pieces. Level Gd. A single blade with unidirectional-crossed scar pattern (100%) has cortex, as well as one of three bidirectional blades (33.3%). Level Gc1-Gc2. Nine of 27 unidirectional-crossed blades (33.3%), 7 of 18 bidirectional blades (38.9%) and a single blade with 3-directional scar pattern (100%) are cortical. Level Gb1-Gb2. Two of 3 unidirectional-crossed blades (66.6%) are cortical. This allows us to infer a non-systematic character for the removal of non-unidirectional blades, mainly during core preparation processes.

Surface Cortex Area and Location. All blades from each level of Unit G were used to record surface cortex area. Non-cortical blades prevail – 74.1% in level Gd, 68.1% in level Gc1-Gc2, 74.6% in level Gb1-Gb2 and 84.6% in level Ga. Wholly cortical blades are absent in levels Gd, Gb1-Gb2, Ga and account for only 1.1% (2 complete pieces) in level Gc1-Gc2. The remaining blades are partially cortical – 25.9% in level Gd, 30.8% in level Gc1-Gc2, 25.4% in level Gb1-Gb2 and 15.4% in level Ga. Taken separately, complete blades have the following cortex area data: level Gd (16 pieces) – non-cortical - 62.5% and partially cortical - 37.5%; level Gc1-Gc2 (34 pieces) – non-cortical - 70.6%, partially cortical - 23.5% and cortical - 5.9%; level Gb1-Gb2 (13 pieces) – non-cortical - 38.5% and partially cortical - 61.5%; level Ga has no complete blades. Complete partially cortical blades have the following internal cortex subdivision: pieces with a significant amount of cortex – none in level Gd, 75% (6 pieces) in level Gc1-Gc2 and 37.5% (3 pieces) in level Gb1-Gb2, and pieces with insignificant cortex – 100% (6 pieces) in level Gd, 25% (2 pieces) in level Gc1-Gc2 and 62.5% (5 pieces) in level Gb1-Gb2.

Surface cortex location was recorded on the same samples of complete partially cortical blades: distal cortex - 50% (3 pieces) in level Gd, 12.5% (1 piece) in level Gc1-Gc2 and 37.5% (3 pieces) in level Gb1-Gb2; lateral cortex - 50% (3 pieces) in level Gd, 62.5% (5 pieces) in level Gc1-Gc2 and 50% (4 pieces) in level Gb1-Gb2; distal + lateral cortex - none in level Gd, 25% (2

Level Gd	blades-tools	blades-CMP	blades-debitage	Blades Total
cortical		1		1 / 0.9%
dorsal-plain		3		3 / 2.8%
lateral				
crested		1		1 / 0.9%
unidirectional	14	5	76	95 / 89.8%
unidirectional-crossed			1	1 / 0.9%
bidirectional		1	3	4 / 3.8%
3-directional			1	1 / 0.9%
centripetal				
core tablet		1		1
unidentifiable		1		1
N	14	13	81	108
Level Gc1-Gc2	**blades-tools**	**blades-CMP**	**blades-debitage**	**Blades Total**
cortical			3	3 / 1.2%
dorsal-plain		3		3 / 1.2%
lateral	2			2 / 0.8%
crested		5		5 / 1.9%
unidirectional	38	19	137	194 / 75.8%
unidirectional-crossed		1	27	28 / 10.9%
bidirectional	6	2	12	20 / 7.8%
3-directional			1	1 / 0.4%
centripetal				
core tablet				
unidentifiable		1	2	3
N	46	31	182	259
Level Gb1-Gb2	**blades-tools**	**blades-CMP**	**blades-debitage**	**Blades Total**
cortical		1		1 / 1.2%
dorsal-plain		1		1 / 1.2%
lateral				
crested		2		2 / 2.5%
unidirectional	8	4	53	65 / 81.3%
unidirectional-crossed	1		3	4 / 5.0%
bidirectional			6	6 / 7.6%
3-directional		1		1 / 1.2%
centripetal				
core tablet		1		1
unidentifiable	1	1	1	3
N	10	11	63	84
Level Ga	**blades-tools**	**blades-CMP**	**blades-debitage**	**Blades Total**
cortical				
dorsal-plain				
lateral				
crested		1		1 / 5.0%
unidirectional	5		13	18 / 90.0%
unidirectional-crossed	1			1 / 5.0%
bidirectional				
3-directional				
centripetal				
core tablet				
unidentifiable				
N	6	1	13	20

Table 14 - Siuren-I. Unit G. Blade Dorsal Scar Patterns as Percentages of Each Type.

pieces) in level Gc1-Gc2 and 12.5% (1 piece) in level Gb1-Gb2. So, lateral cortex location is the most common for blades.

Shape. There were used 34 blades with definable shapes from level Gd, 77 from level Gc1-Gc2, 27 from level Gb1-Gb2 and just 4 from level Ga (see tabl. 15).

Blades from level Gd are characterized by the following shape types: converging - 35.4%, parallel and irregular - 23.5% each, expanding - 17.6%. Blades from level Gc1-Gc2 are characterized by the following shape types: parallel - 57.1%, expanding - 18.2%, converging - 14.3% and irregular - 10.4%. Blades from level Gb1-Gb2 are characterized by the following shape types:

Level Gd	blades-tools	blades-CMP	blades-debitage	Blades Total
parallel	2		8	10 / 20.4%
converging	2	1	12	15 / 30.6%
expanding		2	6	8 / 16.3%
ovoid				
irregular	2	6	8	16 / 32.7%
unidentifiable	8	4	47	59
N	14	13	81	108
Level Gc1-Gc2	**blades-tools**	**blades-CMP**	**blades-debitage**	**Blades Total**
parallel	10	1	44	55 / 45.1%
converging	6	11	11	28 / 22.9%
expanding	5	5	14	24 / 19.7%
ovoid				
irregular	3	4	8	15 / 12.3%
unidentifiable	22	10	105	137
N	46	31	182	259
Level Gb1-Gb2	**blades-tools**	**blades-CMP**	**blades-debitage**	**Blades Total**
parallel	2	1	9	12 / 38.7%
converging		1	7	8 / 25.8%
expanding			7	7 / 22.6%
ovoid				
irregular			4	4 / 12.9%
unidentifiable	8	9	36	53
N	10	11	63	84
Level Ga	**blades-tools**	**blades-CMP**	**blades-debitage**	**Blades Total**
parallel			1	1 / 14.3%
converging			1	1 / 14.3%
expanding	1	1	1	3 / 42.9%
ovoid				
irregular	1		1	2 / 28.5%
unidentifiable	4		9	13
N	6	1	13	20

Table 15 - Siuren-I. Unit G. Blade Shapes as Percentages of Each Type.

Level Gd	blades-tools	blades-CMP	blades-debitage	Blades Total
on-axis	3	2	9	14 / 29.2%
off-axis	3	6	25	34 / 70.8%
unidentifiable	8	5	47	59
N	14	13	81	108
Level Gc1-Gc2	**blades-tools**	**blades-CMP**	**blades-debitage**	**Blades Total**
on-axis	10	9	155	174 / 83.7%
off-axis	9	13	12	34 / 16.3%
unidentifiable	27	9	15	51
N	46	31	182	259
Level Gb1-Gb2	**blades-tools**	**blades-CMP**	**blades-debitage**	**Blades Total**
on-axis	2	1	9	12 / 40.0%
off-axis		1	17	18 / 60.0%
unidentifiable	8	9	37	54
N	10	11	63	84
Level Ga	**blades-tools**	**blades-CMP**	**blades-debitage**	**Blades Total**
on-axis	2		1	3 / 37.5%
off-axis	1	1	3	5 / 62.5%
unidentifiable	3		9	12
N	6	1	13	20

Table 16 - Siuren-I. Unit G. Blade Axis as Percentages of Each Type.

parallel - 33.4%, converging and expanding - 25.9% each, irregular - 14.8%. Blades from level Ga are characterized by the following shape types: parallel, converging, expanding and irregular - 25% each (by a single piece each).

Two clusters of blade shape types can be observed. One is represented by the level Gc1-Gc2 sample where parallel type is the most common (57.1%), while the other three types are about three times lower each. The second cluster is represented by the

levels Gd and Gb1-Gb2 samples where there is an insignificant prevalence of parallel and converging types (58.9% and 59.3%) over irregular and expanding types (41.1% and 40.7%), and by an unclear equality of all four types due to the too small sample size from level Ga.

Axis. 34 blades with definable axis of removal directions from level Gd, 167 from level Gc1-Gc2, 26 from level Gb1-Gb2 and just 4 from level Ga were used to record axis (see tabl. 16).

As in the case for shape identification, two clusters of axis types for blades can be observed among the four levels. The first has an almost exclusive dominance of "on-axis" type (92.8%) in level Gc1-Gc2. The second cluster is characterized by the reverse, with a majority of "off-axis" type: level Gd - 73.5%, level Gb1-Gb2 - 65.4% and level Ga - 75%.

Such clusters of axis types correspond to clusters of shape types. The first clusters (level Gc1-Gc2) show an interconnection between the great dominance of parallel and converging shape types (71.4% together) and the absolute majority of "on-axis" removal direction (92.8%). The second clusters (levels Gd, Gb1-Gb2 and Ga), on the other hand, represent an interconnection between the less significant dominance of parallel and converging shape types (50%-59% together) and prevalence of "off-axis" removal direction (65.4%-75%).

General Profiles of Blades. These data are based on separate analyses of all blades and of complete blades only (see tabl. 17).

Level Gd. There are 66 blades with the following general profile types: incurvate medial - 47%, twisted - 33.3%, flat - 15.2% and incurvate distal - 4.5%. For 16 complete blades: 62.5% of incurvate medial type, 25% of twisted type and 12.5% of incurvate distal type.

Level Gc1-Gc2. There are 169 blades with the following general profile types: twisted - 56.8%, incurvate medial - 27.8%, flat - 11.2%, incurvate distal - 3.6% and convex - 0.6%. For 34 complete blades: recognized 58.8% of twisted type, 35.4% of incurvate medial type, 2.9% of flat and convex types each.

Level Gb1-Gb2. There are 43 blades with the following general profile types: twisted - 44.2%, incurvate medial - 32.6%, flat - 20.9% and incurvate distal - 2.3%. For 13 complete blades: 53.8% of incurvate medial type, 38.5% of twisted type and 7.7% of flat type.

Level Gd	**blades-tools**	**blades-CMP**	**blades-debitage**	**Blades Total**
flat	2		10	12 / 13.6%
incurvate medial	4	4	31	39 / 44.4%
incurvate distal	3		3	6 / 6.8%
convex				
twisted	2	7	22	31 / 35.2%
unidentifiable	3	2	15	20
N	14	13	81	108
Level Gc1-Gc2	**blades-tools**	**blades-CMP**	**blades-debitage**	**Blades Total**
flat	8	1	19	28 / 12.0%
incurvate medial	10	12	47	69 / 29.5%
incurvate distal	2	3	6	11 / 4.7%
convex	1		1	2 / 0.8%
twisted	17	11	96	124 / 53.0%
unidentifiable	8	4	13	25
N	46	31	182	259
Level Gb1-Gb2	**blades-tools**	**blades-CMP**	**blades-debitage**	**Blades Total**
flat	2		9	11 / 21.2%
incurvate medial	3	1	14	18 / 34.6%
incurvate distal			1	1 / 1.9%
convex				
twisted	1	2	19	22 / 42.3%
unidentifiable	4	8	20	32
N	10	11	63	84
Level Ga	**blades-tools**	**blades-CMP**	**blades-debitage**	**Blades Total**
flat	1		3	4 / 30.8%
incurvate medial			2	2 / 15.4%
incurvate distal				
convex				
twisted	3	1	3	7 / 53.8%
unidentifiable	2		5	7
N	6	1	13	20

Table 17 - Siuren-I. Unit G. Blade General Profiles as Percentages of Each Type.

Level Ga. There are 8 blades with the following general profile types: twisted and flat - 37.5% each, incurvate medial - 25%. There are no complete blades in level Ga.

These data show a kind of "rough equality" of twisted and "regular" (flat, incurvate medial and incurvate distal) general profile types of blades which is seen in the minor prevalence of one type(s) over another type(s) in different levels.

Profiles at Distal End. Data for this analysis were based on 33 blades from level Gd, on 77 from level Gc1-Gc2, on 28 from level Gb1-Gb2 and only on 5 from level Ga (see tabl. 18).

Level Gd has the following type representation: feathering - 63.5%, hinged and blunt - 15.2%, overpassed - 6.1%.

Level Gc1-Gc2 has the following type representation: feathering - 61%, blunt - 29.9%, overpassed - 6.5% and hinged - 2.6%.

Level Gb1-Gb2 has the following type representation: feathering - 46.4%, hinged - 28.6%, blunt - 14.3% and overpassed - 10.7%.

Level Ga has the following type representation: feathering - 60%, hinged and blunt - 20% each.

A feathering profile type of the distal end is the most common for blades in all four levels of Unit G, with very similar percentages in levels Gd, Gc1-Gc2 and Ga – 60%-63.5%, while a little less than 50% in level Gb1-Gb2. There are some fluctuations for "not regular" types (hinged and overpassed) – from a minimal representation for level Gc1-Gc2 (9.1%) to a moderate number for levels Ga (20%) and Gd (21.3%) and to a significant quantity in level Gb1-Gb2 (39.3%).

Profiles at Midpoint. Data for this analysis are recorded on all 81 blades from level Gd, from 181 definable blades from level Gc1-Gc2, from 61 from level Gb1-Gb2 and from all 13 blades from level Ga (see tabl. 19).

Level Gd shows the following variety of types: triangular - 35.9%, trapezoidal - 33.3%, multifaceted - 24.7%, irregular - 4.9% and lateral steep - 1.2%.

Level Gc1-Gc2 shows the following variety of types: trapezoidal - 40.3%, triangular - 32.6%, multifaceted - 21%, lateral steep - 4.4% and crescent - 1.7%.

Level Gb1-Gb2 shows the following variety of types: trapezoidal - 39.3%, triangular - 34.4%, multifaceted - 23% and irregular - 3.3%.

Level Ga shows the following variety of types: trapezoidal - 53.8%, multifaceted and triangular - 23.1% each.

These data show the absolute dominance of three types (triangular, trapezoidal and multifaceted) – 93.9%-100% with, at the

Level Gd	**blades-tools**	**blades-CMP**	**blades-debitage**	**Blades Total**
feathering	1	3	21	25 / 59.5%
hinged	1		5	6 / 14.3%
overpassed		2	2	4 / 9.5%
blunt	1	1	5	7 / 16.7%
unidentifiable	11	7	48	66
N	14	13	81	108
Level Gc1-Gc2	**blades-tools**	**blades-CMP**	**blades-debitage**	**Blades Total**
feathering	9	10	47	66 / 56.9%
hinged		3	2	5 / 4.3%
overpassed			5	5 / 4.3%
blunt	5	12	23	40 / 34.5%
unidentifiable	32	6	105	143
N	46	31	182	259
Level Gb1-Gb2	**blades-tools**	**blades-CMP**	**blades-debitage**	**Blades Total**
feathering	1	1	13	15 / 46.9%
hinged		1	8	9 / 28.1%
overpassed			3	3 / 9.4%
blunt		1	4	5 / 15.6%
unidentifiable	9	8	35	52
N	10	11	63	84
Level Ga	**blades-tools**	**blades-CMP**	**blades-debitage**	**Blades Total**
feathering		1	3	4 / 50.0%
hinged	1		1	2 / 25.0%
overpassed				
blunt	1		1	2 / 25.0%
unidentifiable	4		8	12
N	6	1	13	20

Table 18 - Siuren-I. Unit G. Blade Profiles at Distal End as Percentages of Each Type.

Level Gd	blades-tools	blades-CMP	blades-debitage	Blades Total
flat				
triangular	5	9	29	43 / 40.2%
trapezoidal	6	2	27	35 / 32.7%
multifaceted	3	1	20	24 / 22.4%
lateral steep			1	1 / 1.0%
crescent				
irregular			4	4 / 3.7%
unidentifiable		1		1
N	14	13	81	108
Level Gc1-Gc2	**blades-tools**	**blades-CMP**	**blades-debitage**	**Blades Total**
flat				
triangular	13	12	59	84 / 32.5%
trapezoidal	16	2	73	91 / 35.3%
multifaceted	16	4	38	58 / 22.5%
lateral steep		13	8	21 / 8.1%
crescent			3	3 / 1.2%
irregular	1			1 / 0.4%
unidentifiable			1	1
N	46	31	182	259
Level Gb1-Gb2	**blades-tools**	**blades-CMP**	**blades-debitage**	**Blades Total**
flat				
triangular	2	3	21	26 / 32.5%
trapezoidal	4		24	28 / 35.0%
multifaceted	3		14	17 / 21.3%
lateral steep		7		7 / 8.7%
crescent				
irregular			2	2 / 2.5%
unidentifiable	1	1	2	4
N	10	11	63	84
Level Ga	**blades-tools**	**blades-c.pr.**	**blades-debitage**	**Blades Total**
flat				
triangular	2		3	5 / 25.0%
trapezoidal	2	1	7	10 / 50.0%
multifaceted	1		3	4 / 20.0%
lateral steep				
crescent				
irregular	1			1 / 5.0%
unidentifiable				
N	6	1	13	20

Table 19 - Siuren-I. Unit G. Blade Profiles at Midpoint as Percentages of Each Type.

same time, the extreme rarity of the irregular type – 0%-4.9%. Moreover, such characteristic types of reduction as trapezoidal and multifaceted make up together 58%-62.3% for levels Gd, Gc1-Gc2 and Gb1-Gb2 and even 76.9% for level Ga with a very stable index of the multifaceted type alone for all four levels – 21%-24.7%.

Butt Types. This analysis is based on 42 blade butts from level Gd, 93 from level Gc1-Gc2, 28 from level Gb1-Gb2 and only 2 from level Ga (see tabl. 20).

Butts of level Gd are as follows: plain - 7.1%, punctiform - 33.3%, linear - 38.1%, dihedral - 4.8%, finely-faceted - 2.4% and crushed - 14.3%. Butts of level Gc1-Gc2 are as follows: plain - 34.4%, punctiform - 5.4%, linear - 37.6%, cortical - 2.2%, dihedral - 5.4%, crudely-faceted and finely-faceted - 1.1% each, crushed - 12.8%. Butts of level Gb1-Gb2 are as follows: plain - 21.4%, punctiform - 35.7%, linear - 17.9%, dihedral - 7.1% and crushed - 17.9%. Two butts of level Ga are punctiform and dihedral.

The "plain-punctiform-linear" group of butt types reaches three-quarters of all types in levels Gd, Gc1-Gc2 and Gb1-Gb2 – 75%-78.5%. Crushed butts comprise only 12.8%-17.9% for levels Gd, Gc1-Gc2 and Gb1-Gb2. Dihedral, crudely-faceted and finely-faceted types are poorly represented and do not exceed 10% together, while a few cortical butts are only noted as an exception in level Gc1-Gc2.

Lipping. There are 28 butts suitable for lipping identification from level Gd, 82 from level Gc1-Gc2, 19 from level Gb1-Gb2 and just one from level Ga (see tabl. 21).

Butts of level Gd have the following lipping characteristics: semi-lipped - 85.7%, lipped - 14.3% and no one not lipped. Butts of level Gc1-Gc2 have the following lipping characteristics: semi-lipped - 84.2%, lipped - 14.6% and not lipped - 1.2%. Butts of level Gb1-Gb2 have the following lipping characteristics: semi-lipped - 94.7%, lipped - 5.3% and no one not lipped.

Level Gd	blades-tools	blades-CMP	blades-debitage	Blades Total
cortical				
plain	1	3	3	7 / 13.2%
punctiform	2		14	16 / 30.2%
linear	1	2	16	19 / 35.8%
dihedral			2	2 / 3.8%
crudly-faceted				
finely-faceted			1	1 / 1.9%
crushed		2	6	8 / 15.1%
missing	10	6	39	55
N	14	13	81	108
Level Gc1-Gc2	**blades-tools**	**blades-CMP**	**blades-debitage**	**Blades Total**
cortical			2	2 / 1.5%
plain	10	4	32	46 / 33.7%
punctiform	1	2	5	8 / 5.8%
linear	6	3	35	44 / 32.1%
dihedral			5	5 / 3.6%
crudly-faceted			1	1 / 0.7%
finely-faceted	2		1	3 / 2.2%
crushed	7	9	12	28 / 20.4%
missing	20	13	89	122
N	46	31	182	259
Level Gb1-Gb2	**blades-tools**	**blades-CMP**	**blades-debitage**	**Blades Total**
cortical		1		1 / 2.6%
plain	1	1	6	8 / 20.5%
punctiform	1	1	10	12 / 30.7%
linear			5	5 / 12.8%
dihedral		1	2	3 / 7.7%
crudly-faceted				
finely-faceted		1		1 / 2.6%
crushed	3	1	5	9 / 23.1%
missing	5	5	35	45
N	10	11	63	84
Level Ga	**blades-tools**	**blades-CMP**	**blades-debitage**	**Blades Total**
cortical				
plain				
punctiform	1		1	2 / 33.3%
linear		1		1 / 16.6%
dihedral	1		1	2 / 33.3%
crudly-faceted				
finely-faceted				
crushed	1			1 / 16.6%
missing	3		11	14
N	6	1	13	20

Table 20 - Siuren-I. Unit G. Blade Butt Types as Percentages of Each Type.

The single definable butt of level Ga is semi-lipped.

Thus, a majority of butts are semi-lipped – 84.2%-94.7%. The remaining butts are lipped, as not lipped butts in level Gc1-Gc2 are represented by only a single piece.

Butt Angle. There are 28 butts suitable for angle identification from level Gd, 81 butts from level Gc1-Gc2, 19 from level Gb1-Gb2 and just one definable butt from level Ga (see tabl. 22).

Butts of level Gd have the following angles: semi-acute - 75%, acute - 14.3% and right - 10.7%. Butts of level Gc1-Gc2 have the following angles: semi-acute - 75.3%, acute - 16.1% and right - 8.6%. Butts of level Gb1-Gb2 have the following angles: semi-acute - 94.7%, acute - 5.3% and no right.

The single definable butt of level Ga has a semi-acute angle.

There is a significant dominance of blade butts with semi-acute angle – about three –quarters for levels Gd and Gc1-Gc2 and even more for level Gb1-Gb2 – 94.7%. There is also a clear prevalence of acute angle over right angle in level Gd (correlation 1.3:1) and in level Gc1-Gc2 (correlation 1.9:1) with no butts with right angle in level Gb1-Gb2.

Butt Abrasion. Identifiable blade butts to record presence/absence of abrasion identification in the four levels of Unit G number 33 from level Gd, 96 from level Gc1-Gc2, 22 from level Gb1-Gb2 and only 2 from level Ga (see tabl. 23). Butts of level Gd have the following abrasion identification: present - 93.9% and absent - 6.1%. Butts of level Gc1-Gc2 have the

Level Gd	blades-tools	blades-CMP	blades-debitage	Blades Total
lipped			4	4 / 10.8%
semi-lipped	4	5	24	33 / 89.2%
not lipped				
unidentifiable	10	8	53	71
N	14	13	81	108
Level Gc1-Gc2	**blades-tools**	**blades-CMP**	**blades-debitage**	**Blades Total**
lipped	3		12	15 / 13.9%
semi-lipped	16	7	69	92 / 85.2%
not lipped			1	1 / 0.9%
unidentifiable	27	24	100	151
N	46	31	182	259
Level Gb1-Gb2	**blades-tools**	**blades-CMP**	**blades-debitage**	**Blades Total**
lipped			1	1 / 4.0%
semi-lipped	2	3	18	23 / 92.0%
not lipped		1		1 / 4.0%
unidentifiable	8	7	44	59
N	10	11	63	84
Level Ga	**blades-tools**	**blades-CMP**	**blades-debitage**	**Blades Total**
lipped				
semi-lipped	2		1	3 / 100%
not lipped				
unidentifiable	4	1	12	17
N	6		13	20

Table 21 - Siuren-I. Unit G. Blade Butt Lipping as Percentages of Each Type.

Level Gd	blades-tools	blades-CMP	blades-debitage	Blades Total
right			3	3 / 8.1%
semi-acute	4	5	21	30 / 81.1%
acute			4	4 / 10.8%
unidentifiable	10	8	53	71
N	14	13	81	108
Level Gc1-Gc2	**blades-tools**	**blades-CMP**	**blades-debitage**	**Blades Total**
right	3		7	10 / 9.3%
semi-acute	14	7	61	82 / 76.7%
acute	2		13	15 / 14.0%
unidentifiable	27	24	101	152
N	46	31	182	259
Level Gb1-Gb2	**blades-tools**	**blades-CMP**	**blades-debitage**	**Blades Total**
right		1		1 / 4.0%
semi-acute	2	3	18	23 / 92.0%
acute			1	1 / 4.0%
unidentifiable	8	7	44	59
N	10	11	63	84
Level Ga	**blades-tools**	**blades-CMP**	**blades-debitage**	**Blades Total**
right				
semi-acute	2		1	3 / 100.0%
acute				
unidentifiable	4	1	12	17
N	6	1	13	20

Table 22 - Siuren-I. Unit G. Blade Butt Angles as Percentages of Each Type.

following abrasion identification: present - 83.3% and absent - 16.7%. Butts of level Gb1-Gb2 have the following abrasion identification: present - 95.5% and absent - 4.5%. Two definable butts of level Ga have abrasion.

There is a common majority of abrasion for blade butts for levels Gd and Gb1-Gb2 (93.9%-95.5%) and about 10% less dominant in level Gc1-Gc2 (83.3%). Blade butts with no abrasion are represented by 1-2 examples in levels Gd and Gb1-Gb2, and 16 examples in level Gc1-Gc2 in actual numbers (not percentage).

Metrics (Length, Width, Thickness) of Blades. Metric data are mainly based on the analysis of complete blades from each level, with

Level Gd	blades-tools	blades-CMP	blades-debitage	Blades Total
present	3	4	31	38 / 92.7%
absent		1	2	4 / 7.3%
unidentifiable	11	8	48	67
N	14	13	81	108
Level Gc1-Gc2	**blades-tools**	**blades-CMP**	**blades-debitage**	**Blades Total**
present	18	5	80	103 / 83.1%
absent	1	4	16	21 / 16.9%
unidentifiable	27	22	86	135
N	46	31	182	259
Level Gb1-Gb2	**blades-tools**	**blades-CMP**	**blades-debitage**	**Blades Total**
present	3	3	21	27 / 90.0%
absent		2	1	3 / 10.0%
unidentifiable	7	6	41	54
N	10	11	63	84
Level Ga	**blades-tools**	**blades-CMP**	**blades-debitage**	**Blades Total**
present	2	1	2	5 / 100.0%
absent				
unidentifiable	4		11	15
N	6	1	13	20

Table 23 - Siuren-I. Unit G. Blade Butt Abrasion as Percentages of Each Type.

some additional comparable information also obtained when possible from broken blades.

Length. Level Gd. There are three clusters of 16 complete blades in terms of length intervals: the first is 2.1-4.0 cm – 43.7%, the second is 4.6-6.0 cm – 43.8% and the third is 6.6-7.0 cm – 12.5% with "metric gaps" at 4.1-4.5 cm and 6.1-6.5 cm with no blade presence, as well as no presence of complete blades with length more than 7 cm. Mean length of complete blades is 4.5 cm. For 65 broken blades, 72.4% are in the interval 1.1-3.0 cm and none is longer than 7 cm.

Level Gc1-Gc2. There are three characteristic clusters of 34 complete blades in terms of length intervals: the first is 2.1-5.0 cm – 85.4%, the second is 5.1-6.0 cm – 8.8% and the third is 6.1-7.0 cm – 5.8%. No complete blade has a length of more than 7 cm. Mean length of complete blades is 4.1 cm. 66.9% of 148 broken blades are in the interval 1.1-3.0 cm and no broken blade is longer than 7 cm.

Level Gb1-Gb2. There are two clusters of complete 13 blades in terms of their length intervals: the first is 2.6-5.0 cm – 84.6% and the second is > 6.1 cm – 15.4% (2 pieces – 6.1-7.0 cm and another piece 7.6 cm long). Mean length of complete blades is 4.3 cm. 72% of 50 broken blades are in the interval 1.1-3.0 cm and no broken blade is longer than 5 cm.

Level Ga. Because of the absence of complete blades, only data on 13 broken blades was recorded. 76.9% have length in the interval 1.1-3.0 cm. No broken blade is longer than 5 cm.

Blade length for all four levels is quite similar. The average length of blades is from 4.1 to 4.5 cm. No complete blade is longer than 7 cm in levels Gd and Gc1-Gc2, and there is just a single longer complete blade (7.6 cm) in level Gb1-Gb2. Thus, blades are generally not long, but rather "medium" in length.

Width. The following width distribution of complete blades is observed for levels Gd, Gc1-Gc2 and Gb1-Gb2: 1.2-1.5 cm - 68.8% for level Gd, 53% for level Gc1-Gc2 and 61.5% for level Gb1-Gb2; 1.6-2.0 cm - 31.2% for level Gd, 35.3% for level Gc1-Gc2 and 30.8% for level Gb1-Gb2; 2.1-2.5 cm - none for level Gd, 8.8% for level Gc1-Gc2 and 7.7% for level Gb1-Gb2, > 2.5 cm - just a single piece (2.9%) in level Gc1-Gc2. Mean widths for complete blades are as follows: 1.4 cm for level Gd, 1.6 cm for level Gc1-Gc2 and 1.5 cm for level Gb1-Gb2.

Width of broken blades for all four levels is similar to complete blades, but with a somewhat higher frequency of wider specimens: 1.2-1.5 cm - 55.4% for level Gd, 52.1% for level Gc1-Gc2, 58% for level Gb1-Gb2 and 53.9% for level Ga; 1.6-2.0 cm - 35.4% for level Gd, 31.8% for level Gc1-Gc2, 26% for level Gb1-Gb2 and 46.1% for level Ga; 2.1-2.5 cm - 7.7% for level Gd, 10.8% for level Gc1-Gc2, 14% for level Gb1-Gb2 and none for level Ga; > 2.5 cm - 1.5% (a single piece with width 3.0 cm) for level Gd, 5.3% (6 pieces with the largest width of 3.1 cm) for level Gc1-Gc2, 2% (a single piece with width 3.8cm) for level Gb1-Gb2 and none for level Ga. Mean widths for broken blades are as follows: 1.6 cm for levels Gd, Gc1-Gc2 and Gb1-Gb2, and 1.5 cm for level Ga.

Overall, width data for all complete and broken blades together for levels Gd, Gc1-Gc2 and Gb1-Gb2 are as follows: 1.2-1.5 cm - 58% for level Gd, 52.3% for level Gc1-Gc2 and 58.7% for level Gb1-Gb2; 1.6-2.0 cm - 34.6% for level Gd, 32.4% for level Gc1-Gc2 and 27% for level Gb1-Gb2; 2.1-2.5 cm - 6.2% for level Gd, 10.4% for level Gc1-Gc2 and 12.7% for level Gb1-Gb2; > 2.5 cm - 1.2% for level Gd, 4.9% for level Gc1-Gc2 and 1.6% for level Gb1-Gb2. Mean widths are as follows: 1.5 cm for level Gd and 1.6 cm for both levels Gc1-Gc2 and Gb1-Gb2.

In sum, there is a dominance of quite narrow blades with width 1.2-1.5 cm (52.3%-58.7%) in all four levels of Unit G, while blades with width more than 2.5 cm width are rare exceptions

(<5%). Mean widths of 1.5-1.6 cm clearly confirm these conclusions.

Thickness. These data are also given separately for complete and broken blades and then for all blades from levels Gd, Gc1-Gc2 and Gb1-Gb2, and only on the set of broken blades from level Ga.

Complete blades have the following mean thickness: 0.4 cm for level Gd, 0.3 cm for level Gc1-Gc2 and 0.5 cm for level Gb1-Gb2. Broken blades have the following mean thicknesses: 0.4 cm for levels Gd, Gc1-Gc2 and Gb1-Gb2, and 0.3 cm for level Ga. Together, all blades from levels Gd, Gc1-Gc2 and Gb1-Gb2 have mean thickness of 0.4 cm. Based on mean thickness, the most common thickness interval is 0.1-0.5 cm - 76.9% for complete and 86% for broken blades in level Gd, 91.2% for complete and 89.9% for broken blades in level Gc1-Gc2, 87.5% for complete and 89.2% for broken blades in level Gb1-Gb2 and 100% for broken blades only in level Ga. All but 4% (only 2 pieces with thickness 1.1 and 1.3 cm) for the interval 1.1-1.5 cm in level Gd, other complete and broken blades from levels Gd, Gc1-Gc2 and Gb1-Gb2 have thickness in the interval 0.6-1.0 cm.

In sum, then, blades are rather thin in all four levels of Unit G.

Butt Sizes. Average metric data for blade butts are similar for levels Gd, Gc1-Gc2 and Gb1-Gb2. They are as follows for butt width: 0.6 cm for level Gd (22 butts) and 0.5 cm for both levels Gc1-Gc2 (77 butts) and Gb1-Gb2 (13 butts). They are as follows for butt height: 0.1 cm for level Gd and 0.2 cm for both levels Gc1-Gc2 and Gb1-Gb2. Plain butts have widths of 0.7 cm for level Gd (3 butts), 0.6 cm for level Gc1-Gc2 (32 butts) and 0.5 cm for level Gb1-Gb2 (6 butts) and have heights of 0.3 cm for both levels Gd and Gc1-Gc2, and 0.2 cm for level Gb1-Gb2. A single butt (a dihedral one) from level Ga has width 0.9 cm and height 0.4 cm.

Thus, the blades of the four levels of Unit G can be generally characterized by:

- a clear dominance of unidirectional scar pattern (76%-93.9%) in levels Gd, Gc1-Gc2 and Gb1-Gb2 and 100% in level Ga, while the 3-5 other scar pattern types do not show any regularity in their small representation;

- a significant prevalence of non-cortical pieces (68.1%-84.6%) over partially cortical pieces with no real representation of wholly cortical pieces, as well as dominance of lateral cortex for partially cortical pieces which, at the same time, have very different cortex areas in each level of Unit G;

- a presence of two clusters of blade samples based on shape and axis: 1) an association of an insignificant dominance of parallel and converging shape types (50%-59% together) and prevalence of "off-axis" removal direction (65%-75%) in levels Gd, Gb1-Gb2 and Ga; and 2) an association of a great dominance of parallel and converging shape types (71.4% together) and an absolute majority of "on-axis" removal direction (92.8%) in level Gc1-Gc2;

- a "rough equality" of twisted and "regular" (flat, incurvate medial and incurvate distal) types of general profiles which is seen in some minor prevalence of one type(s) over another type(s) in each of the four levels;

- a dominance of feathering distal ends (60%-63.5% in levels Gd, Gc1-Gc2 and Ga and only 46.4% in level Gb1-Gb2) and a very different representation of "not regular" (hinged and overpassed) types in all four levels – 9.1%-39.3%;

- a dominance of trapezoidal and multifaceted types of profiles at midpoint (58%-62.3% in levels Gd, Gc1-Gc2 and Gb1-Gb2, and even 76.9% in level Ga) which with the addition of triangular type make up 93.9%-100% of all levels;

- a dominance of the "plain-punctiform-linear" group of butt types (75%-78.5% in levels Gd, Gc1-Gc2 and Gb1-Gb2), while other butt types are poorly represented;

- a great dominance of semi-lipped butts (84.2%-94.7%) with mainly semi-acute angle (75%-94.7%) and some right angle (8.6%-10.7%), a low number of lipped butts (5.3%-14.6%) with acute angle (5.3%-16.1%) and actual absence of not lipped butts (a single example in level Gc1-Gc2 is an exception);

- a characteristic presence of nearly all butts with abrasion in levels Gd and Gb1-Gb2 (93.9%-95.5%) and a dominance in level Gc1-Gc2 (83.3%);

- a dominance of "medium length" (mean range 4.1-4.5 cm), narrow width (mean range 1.5-1.6 cm) and overall thin (0.4 cm for thickness);

- a stable dominance of gray flints in the three representative levels (Gd – 49 pieces/60.5%; Gc1-Gc2 – 115 pieces/63.2%; Gb1-Gb2 – 38 pieces/60.3%) with lower occurrence in level Ga (7 pieces/53.8%), again a stable but moderate number of colored flints in all four levels (Gd – 29 pieces/35.8%; Gc1-Gc2 – 67 pieces/36.8%; Gb1-Gb2 – 23 pieces/36.5%, Ga - 5 pieces/38.5%), and, finally, a couple of black flints with a notable complete absence in the most abundant blade sample in level Gc1-Gc2 (Gd – 3 pieces/3.7%; Gb1-Gb2 – 2 pieces/3.2%, Ga – 1 piece/7.7%).

Bladelets

In terms of their condition, bladelets from the four levels of Unit G are subdivided into complete and broken pieces, with further distribution of the latter into proximal, medial and distal.

88 bladelets of level Gd consist of 14 complete pieces (15.9%) and 74 broken pieces (84.1%) – 31 proximal (35.3%), 23 medial (26.1%) and 20 distal (22.7%).

266 bladelets of level Gc1-Gc2 consist of 31 complete pieces (11.7%) and 235 broken pieces (88.3%) – 107 proximal (40.1%), 89 medial (33.5%) and 39 distal (14.7%).

101 bladelets of level Gb1-Gb2 consist of 17 complete pieces (16.8%) and 84 broken pieces (83.2%) – 39 proximal (38.7%), 29 medial (28.7%) and 16 distal (15.8%).

14 bladelets of level Ga consist of only broken pieces (100%) – 6 proximal (42.9%), 6 medial (42.9%) and 2 distal (14.2%).

Dorsal Scar Pattern. Four scar pattern types are identified on 87 definable bladelets from level Gd, three on all 266 bladelets from level Gc1-Gc2, four on all 101 bladelets from level Gb1-Gb2 and only two on all 14 bladelets from level Ga (see tabl. 24).

Separately, bladelets from each level have the following scar pattern type representation.

Bladelets of level Gd: unidirectional - 79.4%, unidirectional-crossed - 16.1%, bidirectional - 3.4% and cortical - 1.1%.

Bladelets of level Gc1-Gc2: unidirectional - 94.7%, bidirectional - 3% and unidirectional-crossed - 2.3%.

Level Gd	**bladelets-tools**	**bladelets-CMP**	**bladelets-debitage**	**Bladelets Total**
cortical			1	1 / 1.0%
dorsal-plain		1		1 / 1.0%
lateral				
crested				
unidirectional	15		69	84 / 81.5%
unidirectional-crossed			14	14 / 13.6%
bidirectional			3	3 / 2.9%
3-directional				
centripetal				
core tablet				
unidentifiable	1	1	1	3
N	16	2	88	106
Level Gc1-Gc2	**bladelets-tools**	**bladelets-CMP**	**bladelets-debitage**	**Bladelets Total**
cortical		2		2 / 0.6%
dorsal-plain		2		2 / 0.6%
lateral				
crested		2		2 / 0.6%
unidirectional	45	5	252	302 / 93.8%
unidirectional-crossed			6	6 / 1.9%
bidirectional			8	8 / 2.5%
3-directional				
centripetal				
core tablet				
unidentifiable	1	2		3
N	46	13	266	325
Level Gb1-Gb2	**bladelets-tools**	**bladelets-CMP**	**bladelets-debitage**	**Bladelets Total**
cortical			1	1 / 0.9%
dorsal-plain				
lateral				
crested		1		1 / 0.9%
unidirectional	11		89	100 / 87.0%
unidirectional-crossed			8	8 / 6.9%
bidirectional	1	1	3	5 / 4.3%
3-directional				
centripetal				
core tablet				
unidentifiable	1			1
N	13	2	101	116
Level Ga	**bladelets-tools**	**bladelets-CMP**	**bladelets-debitage**	**Bladelets Total**
cortical				
dorsal-plain				
lateral				
crested				
unidirectional	2	1	12	15 / 78.9%
unidirectional-crossed	1			1 / 5.3%
bidirectional	1		2	3 / 15.8%
3-directional				
centripetal				
core tablet				
unidentifiable				
N	4	1	14	19

Table 24 - Siuren-I. Unit G. Bladelet Dorsal Scar Patterns as Percentages of Each Type.

Level Gd	bladelets-tools	bladelets-CMP	bladelets-debitage	Bladelets Total
parallel	3	1	14	18 / 45.0%
converging	1		10	11 / 27.5%
expanding			4	4 / 10.0%
ovoid				
irregular	1	1	5	7 / 17.5%
unidentifiable	11		55	66
N	16	2	88	106
Level Gc1-Gc2	**bladelets-tools**	**bladelets-CMP**	**bladelets-debitage**	**Bladelets Total**
parallel	3	2	28	33 / 41.8%
converging	1	2	28	31 / 39.2%
expanding		1	2	3 / 3.8%
ovoid			8	8 / 10.1%
irregular		2	2	4 / 5.1%
unidentifiable	42	6	198	246
N	46	13	266	325
Level Gb1-Gb2	**bladelets-tools**	**bladelets-CMP**	**bladelets-debitage**	**Bladelets Total**
parallel	4		23	27 / 67.5%
converging		1	4	5 / 12.5%
expanding	2		4	6 / 15.0%
ovoid				
irregular			2	2 / 5.0%
unidentifiable	7	1	68	76
N	13	2	101	116
Level Ga	**bladelets-tools**	**bladelets-CMP**	**bladelets-debitage**	**Bladelets Total**
parallel	1		2	3 / 75.0%
converging	1			1 / 25.0%
expanding				
ovoid				
irregular				
unidentifiable	2	1	12	15
N	4	1	14	19

Table 25 - Siuren-I. Unit G. Bladelet Shapes as Percentages of Each Type.

Bladelets of level Gb1-Gb2: unidirectional - 88.1%, unidirectional-crossed - 7.9%, bidirectional - 3% and cortical - 1%.

Bladelets of level Ga: unidirectional - 85.7% and bidirectional - 14.3%.

Thus, there is a clear dominance of unidirectional scar pattern for bladelets, a minor role for unidirectional-crossed and bidirectional scar patterns, while cortical scar pattern is quite rare, represented only by single pieces in levels Gd and Gb1-Gb2.

Comparison of scar pattern types with presence/absence of cortex on bladelets has revealed a specific feature. Bladelets with unidirectional scar pattern have cortex in a quite stable moderate quantity: 14.5% in level Gd, 10.7% in level Gc1-Gc2, 12.4% in level Gb1-Gb2 and 16.7% in level Ga. On the other hand, rarely represented scar pattern types for bladelets have cortex only on single pieces in the following levels: one of 14 unidirectional-crossed (7.1%) in level Gd; one of 6 unidirectional-crossed (16.7%) and one of 8 bidirectional (12.5%) in level Gc1-Gc2 and one of 3 bidirectional (33.3%) in level Gb1-Gb2. By this feature, bladelets from the three levels of Unit G are highly similar to bladelets in Unit H, with regular and continuous unidirectional reduction of bladelet cores, while non-unidirectional bladelets are result of re-preparation of bladelet core flaking surfaces.

Surface Cortex Area and Location. All bladelets were used from each level of Unit G to record surface cortex area. Non-cortical bladelets comprise more than four-fifths of all bladelets: 86.4% in level Gd, 89.1% in level Gc1-Gc2, 84.1% in level Gb1-Gb2 and 85.7% in level Ga. Wholly cortical bladelets account for just a few specimens in levels Gd (1.1%/1 broken piece) and Gb1-Gb2 (4%/2 complete and 2 broken pieces) and none in levels Gc1-Gc2 and Ga. Accordingly, partially cortical bladelets have the following percentages: 12.5% in level Gd, 10.9% in level Gc1-Gc2, 11.9% in level Gb1-Gb2 and 14.3% in level Ga. Taking complete bladelets separately, these have the following cortex data: level Gd (14 pieces) – non-cortical - 78.6% and partially cortical - 21.4%; level Gc1-Gc2 (31 pieces) – non-cortical - 83.8% and partially cortical - 16.2%; level Gb1-Gb2 (17 pieces) – non-cortical - 70.5%, partially cortical - 17.7% and cortical - 11.8%. Level Ga does not contain any complete bladelets. Complete partially cortical bladelets also demonstrate an internal subdivision into pieces with significant amount of cortex – none in level Gd, 60% (3 pieces) in level Gc1-Gc2 and 66.6% (2 pieces) in level Gb1-Gb2, and pieces with insignificant cortex – 100% (3 pieces) in level Gd, 40% (2 pieces) in level Gc1-Gc2 and 33.3% (1 piece) in level Gb1-Gb2.

The following data on surface cortex location identification for complete partially cortical bladelets are obtained: distal cortex – 66.6% (2 pieces) in level Gd, 40% (2 pieces) in level Gc1-

Level Gd	bladelets-tools	bladelets-CMP	bladelets-debitage	Bladelets Total
on-axis	13	1	75	89 / 90.8%
off-axis		1	8	9 / 9.2%
unidentifiable	3		5	8
N	16	2	88	106
Level Gc1-Gc2	**bladelets-tools**	**bladelets-CMP**	**bladelets-debitage**	**Bladelets Total**
on-axis	35	2	215	252 / 89.7%
off-axis	1	5	23	29 / 10.3%
unidentifiable	10	6	28	44
N	46	13	266	325
Level Gb1-Gb2	**bladelets-tools**	**bladelets-CMP**	**bladelets-debitage**	**Bladelets Total**
on-axis	10		91	101 / 96.2%
off-axis	1	1	2	4 / 3.8%
unidentifiable	2	1	8	11
N	13	2	101	116
Level Ga	**bladelets-tools**	**bladelets-CMP**	**bladelets-debitage**	**Bladelets Total**
on-axis	4		13	17 / 94.4%
off-axis			1	1 / 5.6%
unidentifiable		1		1
N	4	1	14	19

Table 26 - Siuren-I. Unit G. Bladelet Axis as Percentages of Each Type.

Gc2 and 33.3% (1 piece) in level Gb1-Gb2, and lateral cortex – 33.3% (1 piece) in level Gd, 60% (3 pieces) in level Gc1-Gc2 and 66.6% (2 pieces) in level Gb1-Gb2.

The data on surface cortex area and location on complete partially cortical bladelets are based, however, upon too few pieces and, therefore, they serve only as suggestive without being significant.

Shape. 33 bladelets with definable shapes from level Gd, 68 bladelets from level Gc1-Gc2, 33 from level Gb1-Gb2 and just 2 from level Ga were used to record shape (see tabl. 25).

Bladelets of level Gd are characterized by the following shape types: parallel - 42.4%, converging - 30.3%, irregular - 15.2% and expanding - 12.1%.

Bladelets of level Gc1-Gc2 are characterized by the following shape types: parallel and converging - 41.2% each, ovoid - 11.8%, expanding and irregular - 2.9% each.

Bladelets of level Gb1-Gb2 are characterized by the following shape types: parallel - 69.7%, converging and expanding - 12.1% each, irregular - 6.1%.

Two bladelets of level Ga have parallel shape.

So, there is a common dominance of parallel shape for bladelets – 41.2%-69.7%-100%. Moreover, parallel and converging shape types together consist of about three-quarters of all shape types – 72.7%-81.8% for levels Gd, Gc1-Gc2 and Gb1-Gb2. It is worth noting the minor presence of both irregular and expanding shape types.

Axis. 83 bladelets with definable axis of removal directions from level Gd, 238 from level Gc1-Gc2, 93 from level Gb1-Gb2 and all 14 bladelets from level Ga were used to record axis of removal direction (see tabl. 26).

There is an clear and absolute dominance of "on-axis" type for bladelets from all four levels of Unit G: 90.4% for level Gd, 90.3% for level Gc1-Gc2, 97.8% for level Gb1-Gb2 and 92.9% for level Ga. Accordingly, "off-axis" type accounts for less than 10% of bladelets in any level of Unit G: 9.6% for level Gd, 9.7% for level Gc1-Gc2, 2.2% for level Gb1-Gb2 and 7.1% for level Ga.

Such characteristic "on-axis" removal direction for bladelets is in good correspondence to the observed dominance of parallel and converging shape types for bladelets.

General Profiles of Bladelets. These data are based on separate analysis of all definable bladelets and only complete bladelets (see tabl. 27).

Level Gd. There are 78 definable bladelets with the following general profile types: twisted - 59%, incurvate medial - 25.6%, flat - 9%, incurvate distal - 3.8% and convex - 2.6%. For 14 complete bladelets: 64.2% of twisted type, 12.5% of incurvate medial and incurvate distal types each, 6.3% of flat type.

Level Gc1-Gc2. There are 247 definable bladelets with the following general profile types: twisted - 54.7%, incurvate medial - 26.7%, flat - 15.4%, incurvate distal - 2.4% and convex - 0.8%. For 31 complete bladelets: 54.8% of twisted type, 38.7% of incurvate medial type and 6.5% of flat type.

Level Gb1-Gb2. There are 93 definable bladelets with the following general profile types: twisted - 67.6%, incurvate medial - 19.4%, flat - 10.8% and incurvate distal - 2.2%. For 17 complete bladelets: 70.6% of twisted type, 23.5% of incurvate medial type and 5.9% of flat type.

Level Ga. There are 14 definable broken bladelets with such general profile types: twisted - 42.8%, incurvate medial and flat - 28.6% each, while there are no complete bladelets.

Level Gd	bladelets-tools	bladelets-CMP	bladelets-debitage	Bladelets Total
flat	3		7	10 / 10.9%
incurvate medial	6		20	26 / 28.3%
incurvate distal			3	3 / 3.3%
convex		1	2	3 / 3.3%
twisted	4		46	50 / 54.2%
unidentifiable	3	1	10	14
N	16	2	88	106
Level Gc1-Gc2	**bladelets-tools**	**bladelets-CMP**	**bladelets-debitage**	**Bladelets Total**
flat	6	3	38	47 / 15.8%
incurvate medial	9	2	66	77 / 25.9%
incurvate distal			6	6 / 2.0%
convex			2	2 / 0.7%
twisted	25	5	135	165 / 55.6%
unidentifiable	6	3	19	28
N	46	13	266	325
Level Gb1-Gb2	**bladelets-tools**	**bladelets-CMP**	**bladelets-debitage**	**Bladelets Total**
flat	3		10	13 / 12.4%
incurvate medial	3		18	21 / 20.0%
incurvate distal			2	2 / 1.9%
convex				
twisted	5	1	63	69 / 65.7%
unidentifiable	2	1	8	11
N	13	2	101	116
Level Ga	**bladelets-tools**	**bladelets-CMP**	**bladelets-debitage**	**Bladelets Total**
flat	2		4	6 / 31.6%
incurvate medial	1		4	5 / 26.3%
incurvate distal				
convex				
twisted	1	1	6	8 / 42.1%
unidentifiable				
N	4	1	14	19

Table 27 - Siuren-I. Unit G. Bladelet General Profiles as Percentages of Each Type.

These data show the dominance of twisted type over "regular" (flat, incurvate medial and incurvate distal) types of general bladelet profile, which is more evident for the samples of complete bladelets in levels Gd, Gc1-Gc2 and Gb1-Gb2 – reaching about 70% in levels Gd and Gb1-Gb2.

Profiles at Distal End. Data for such analyses were based on 34 definable bladelets from level Gd, 69 from level Gc1-Gc2, 33 from level Gb1-Gb2 and only 2 from level Ga (see tabl. 28).

There is a common dominance of feathering type – 70.6% for level Gd, 68.2% for level Gc1-Gc2, 60.6% for level Gb1-Gb2 and 100% for level Ga. There is also a stable moderate number of blunt type – 20.6% for level Gd, 15.9% for level Gc1-Gc2 and 21.2% for level Gb1-Gb2. Hinged (2.9% for level Gd, 15.9% for level Gc1-Gc2 and 18.2% for level Gb1-Gb2) and overpassed (5.9% for level Gd, none for the most representative levels Gc1-Gc2 and Gb1-Gb2) show some significant fluctuations and even together these two "not regular" types do not reach 20% of all types.

Profiles at Midpoint. Data for this analysis were recorded on 87 bladelets from level Gd, all 266 bladelets from level Gc1-Gc2, 98 bladelets from level Gb1-Gb2 and from all 14 bladelets from level Ga (see tabl. 29).

Level Gd shows the following variety of types: triangular - 41.5%, trapezoidal - 33.3%, multifaceted - 20.7%, lateral steep - 3.4% and crescent - 1.1%.

Level Gc1-Gc2 shows the following variety of types: triangular - 45.9%, trapezoidal 40.2%, multifaceted - 10.9%, lateral steep - 2.6% and flat - 0.4%.

Level Gb1-Gb2 shows the following variety of types: trapezoidal - 48%, triangular - 41.8%, multifaceted - 8.2% and lateral steep - 2%.

Level Ga shows the following variety of types: triangular - 57.2%, trapezoidal - 28.6%, multifaceted and lateral steep - 7.1% each.

These data show an absolute dominance of three types (triangular, trapezoidal and multifaceted) – 92.9%-98%. Other types are either poorly represented or do not occur at all. Among the missing ones is the especially notable absence of any pieces with irregular type of profile at midpoint. There is a slight dominance of trapezoidal and multifaceted types (51.1%-58.9%) over triangular type (41.5%-45.9%) in levels Gd, Gc1-Gc2 and Gb1-Gb2, while there is a reverse dominance of triangular type (57.2%) over trapezoidal and multifaceted types (35.7%) in level Ga.

Level Gd	bladelets-tools	bladelets-CMP	bladelets-debitage	Bladelets Total
feathering	3	1	24	28 / 68.3%
hinged	1	1	1	3 / 7.3%
overpassed			2	2 / 4.9%
blunt	1		7	8 / 19.5%
unidentifiable	11		54	65
N	16	2	88	106
Level Gc1-Gc2	**bladelets-tools**	**bladelets-CMP**	**bladelets-debitage**	**Bladelets Total**
feathering	3	7	47	57 / 70.4%
hinged			11	11 / 13.6%
overpassed				
blunt		2	11	13 / 16.0%
unidentifiable	43	4	197	244
N	46	13	266	325
Level Gb1-Gb2	**bladelets-tools**	**bladelets-CMP**	**bladelets-debitage**	**Bladelets Total**
feathering	2	1	20	23 / 57.5%
hinged			6	6 / 15.0%
overpassed				
blunt	4		7	11 / 27.5%
unidentifiable	7	1	68	76
N	13	2	101	116
Level Ga	**bladelets-tools**	**bladelets-CMP**	**bladelets-debitage**	**Bladelets Total**
feathering			2	2 / 66.7%
hinged				
overpassed				
blunt	1			1 / 33.3%
unidentifiable	3	1	12	16
N	4	1	14	19

Table 28 - Siuren-I. Unit G. Profiles at Distal End as Percentages of Each Type.

Butt Types. This analysis is based on 45 bladelet butts from level Gd, 139 from level Gc1-Gc2, 56 from level Gb1-Gb2 and just 6 from level Ga (see tabl. 30).

Butts of level Gd are as follows: linear - 51.1%, plain - 28.9%, punctiform – 11.1% and crushed - 8.9%.

Butts of level Gc1-Gc2 are as follows: linear - 56.9%, plain - 7.9%, punctiform - 5%, dihedral - 3.6%, cortical - 0.7% and crushed - 25.9%.

Butts of level Gb1-Gb2 are as follows: linear - 37.4%, plain - 28.6%, punctiform - 12.5%, crudely-faceted, finely-faceted and cortical - 1.8% each, and crushed - 16.1%.

Butts of level Ga are as follows: plain - 50%, linear - 33.3% and crushed - 16.7%.

There is a clear prevalence of the "plain-punctiform-linear" group of butt types (69.8%-91.1%) over other types. It is worth noting a stable internal subdivision of this group for levels Gd, Gc1-Gc2 and Gb1-Gb2 where there is a dominance of linear type (reaching up even somewhat more than 50% in levels Gd and Gc1-Gc2) and prevalence of plain over punctiform. On the other hand, the presence of cortical type in level Gc1-Gc2 and cortical, crudely-faceted and finely-faceted types in level Gb1-Gb2 should be considered as insignificant and rather occasional as they are represented in these two levels by only a single piece each. Differing data on level Ga should be regarded as insignificant due to the presence of only a few identifiable butts.

Lipping. There are 39 butts suitable for lipping identification from level Gd, 103 from level Gc1-Gc2, 48 from level Gb1-Gb2 and just 5 butts from level Ga (see tabl. 31).

Butts of level Gd have the following lipping characteristics: semi-lipped - 82.1% and lipped - 17.9%.

Butts of level Gc1-Gc2 have the following lipping characteristics: semi-lipped - 68.9%, lipped - 30.1% and not lipped - 1%.

Butts of level Gb1-Gb2 have the following lipping characteristics: semi-lipped - 89.6%, lipped - 8.3% and not lipped - 2.1%.

All 5 bladelets' butts of level Ga are semi-lipped.

Thus, there are in reality only semi-lipped and lipped bladelets' butts with varying degrees of dominance of the former, while not lipped type is extremely rare as it is represented by a single piece in both levels Gc1-Gc2 and Gb1-Gb2.

Butt Angle. There are 41 butts suitable for angle identification from level Gd, 103 from level Gc1-Gc2, 47 from level Gb1-Gb2 and just 5 butts from level Ga (see tabl. 32).

Butts of level Gd have the following angles: semi-acute - 92.7%, acute - 4.9% and right - 2.4%.

Butts of level Gc1-Gc2 have the following angles: semi-acute - 87.4%, acute - 8.7% and right - 3.9%.

Level Gd	bladelets-tools	bladelets-CMP	bladelets-debitage	Bladelets Total
flat				
triangular	9	1	36	46 / 44.2%
trapezoidal	2		29	31 / 29.8%
multifaceted	3		18	21 / 20.2%
lateral steep	1		3	4 / 3.8%
crescent			1	1 / 1.0%
irregular		1		1 / 1.0%
unidentifiable	1		1	2
N	16	2	88	106
Level Gc1-Gc2	**bladelets-tools**	**bladelets-CMP**	**bladelets-debitage**	**Bladelets Total**
flat			1	1 / 0.3%
triangular	15	7	122	144 / 44.4%
trapezoidal	27		107	134 / 41.2%
multifaceted	2		29	31 / 9.5%
lateral steep	2	6	7	15 / 4.6%
crescent				
irregular				
unidentifiable				
N	46	13	266	325
Level Gb1-Gb2	**bladelets-tools**	**bladelets-CMP**	**bladelets-debitage**	**Bladelets Total**
flat				
triangular	3		41	44 / 39.6%
trapezoidal	7		47	54 / 48.7%
multifaceted	1		8	9 / 8.1%
lateral steep		2	2	4 / 3.6%
crescent				
irregular				
unidentifiable	2		3	5
N	13	2	101	116
Level Ga	**bladelets-tools**	**bladelets-CMP**	**bladelets-debitage**	**Bladelets Total**
flat				
triangular	2	1	8	11 / 57.9%
trapezoidal	1		4	5 / 26.3%
multifaceted	1		1	2 / 10.5%
lateral steep			1	1 / 5.3%
crescent				
irregular				
unidentifiable				
N	4	1	14	19

Table 29 - Siuren-I. Unit G. Bladelet Profiles at Midpoint as Percentages of Each Type.

Butts of level Gb1-Gb2 have the following angles: semi-acute - 87.2%, right - 8.5% and acute 4.3%.

All 5 bladelets' butts of level Ga have semi-acute angles.

There is a common great dominance of semi-acute angles with just a small presence of both acute and right angles. Nonetheless, we note that there is a prevalence of acute angle over right angle in levels Gd (2:1) and Gc1-Gc2 (2.2:1), while there is a reverse proportion in level Gb1-Gb2 – 1:2.

Butt Abrasion. To record presence/absence of abrasion, the following butt frequencies were used for the four levels of Unit G: 44 from level Gd, 136 from level Gc1-Gc2, 54 from level Gb1-Gb2 and 6 from level Ga (see tabl. 33).

There is a common prevalence of butts with abrasion: 93.2% for level Gd, 94.1% for level Gc1-Gc2, 79.6% for level Gb1-Gb2 and 100% for level Ga. Butts with no abrasion are poorly represented for both levels Gd (6.8%) and Gc1-Gc2, and present in moderate number in level Gb1-Gb2 (20.4%).

Metrics (Length, Width, Thickness) of Bladelets. Metric data are mainly based on the analysis of complete bladelets from each level with additional comparable information from broken bladelets as well when possible.

Length. There is a dominance among complete bladelets of "short" pieces with length no more than 3 cm – 10 pieces/71.5% for level Gd, 23 pieces/74.1% for level Gc1-Gc2 and 12 pieces/70.6% for level Gb1-Gb2. "Long" bladelets (with length more than 3 cm) are more less than twice as common – 4 pieces/28.5% for level Gd, 8 pieces/25.9% for level Gc1-Gc2 and 5 pieces/29.4% for level Gb1-Gb2. There are no complete bladelets with length more than 5 cm. The longest bladelets for each level are: 4.1 cm in level Gd, 5.0 cm in level Gc1-Gc2 and

Level Gd	bladelets-tools	bladelets-CMP	bladelets-debitage	Bladelets Total
cortical				
plain			13	13 / 25.5%
punctiform			5	5 / 9.8%
linear	4		23	27 / 52.9%
dihedral				
crudly-faceted				
finely-faceted				
crushed	1	1	4	6 / 11.8%
missing	11	1	43	55
N	16	2	88	106
Level Gc1-Gc2	**bladelets-tools**	**bladelets-CMP**	**bladelets-debitage**	**Bladelets Total**
cortical			1	1 / 0.6%
plain	2	1	11	14 / 8.6%
punctiform	2	2	7	11 / 6.8%
linear	12	1	79	92 / 56.8%
dihedral	1		5	6 / 3.7%
crudly-faceted				
finely-faceted				
crushed	1	1	36	38 / 23.5%
missing	28	8	127	163
N	46	13	266	325
Level Gb1-Gb2	**bladelets-tools**	**bladelets-CMP**	**bladelets-debitage**	**Bladelets Total**
cortical			1	1 / 1.7%
plain			16	16 / 26.6%
punctiform	1		7	8 / 13.3%
linear	1		21	22 / 36.7%
dihedral		1		1 / 1.7%
crudly-faceted			1	1 / 1.7%
finely-faceted			1	1 / 1.7%
crushed	1		9	10 / 16.6%
missing	10	1	45	56
N	13	2	101	116
Level Ga	**bladelets-tools**	**bladelets-CMP**	**bladelets-debitage**	**Bladelets Total**
cortical				
plain			3	3 / 42.8%
punctiform				
linear	1		2	3 / 42.8%
dihedral				
crudly-faceted				
finely-faceted				
crushed			1	1 / 14.3%
missing	3	1	8	12
N	4	1	14	19

Table 30 - Siuren-I. Unit G. Bladelet Butt Types as Percentages of Each Type.

4.6 cm in level Gb1-Gb2. The shortest bladelets are: 1.9 cm in level Gd, 1.6 cm in both levels Gc1-Gc2 and Gb1-Gb2. Mean length for complete bladelets: 2.7 cm for level Gd, 2.6 cm for level Gc1-Gc2 and 2.8 cm for level Gb1-Gb2. Broken bladelets with length more than 3 cm: 5 pieces/6.8% in level Gd, 8 pieces/3.4% in level Gc1-Gc2, 1 piece/1.2% in level Gb1-Gb2 and none in level Ga. The longest broken bladelets: 3.7 cm in level Gd, 6.3 cm in level Gc1-Gc2, 3.2 cm in level Gb1-Gb2 and 2.8 cm in level Ga. At the same time, there are also a moderate number of broken bladelets in the length interval 2.1-3.0 cm - 18 pieces/24.3% in level Gd, 37 pieces/15.7% in level Gc1-Gc2, 7 pieces/8.3% in level Gb1-Gb2 and 2 pieces/14.3% in level Ga.

Overall, bladelet length in the four levels of Unit G are quite similar and characteristic of "medium" means with twice as many "short" pieces over "long" pieces for complete bladelets.

Width. The following width distribution of complete bladelets is observed for levels Gd, Gc1-Gc2 and Gb1-Gb2: 0.7-0.9 cm - 8 pieces/57.1% in level Gd, 18 pieces/58.1% in level Gc1-Gc2, 12 pieces/70.6% in level Gb1-Gb2, and 1.0-1.1 cm - 6 pieces/42.9% in level Gd, 13 pieces/41.9% in level Gc1-Gc2 and 5 pieces/29.4% in level Gb1-Gb2. Width of broken bladelets is similar to complete bladelets for levels Gd and Gc1-Gc2 and shows a higher proportion of "wide" bladelets for level Gb1-Gb2. These data are as follows: 0.7-0.9 cm - 42 pieces/56.8% in

Level Gd	bladelets-tools	bladelets-CMP	bladelets-debitage	Bladelets Total
lipped			7	7 / 16.3%
semi-lipped	4		32	36 / 83.7%
not lipped				
unidentifiable	12	2	49	63
N	16	2	88	106
Level Gc1-Gc2	**bladelets-tools**	**bladelets-CMP**	**bladelets-debitage**	**Bladelets Total**
lipped	1		31	32 / 26.2%
semi-lipped	16	2	71	89 / 73.0%
not lipped			1	1 / 0.8%
unidentifiable	29	11	163	203
N	46	13	266	325
Level Gb1-Gb2	**bladelets-tools**	**bladelets-CMP**	**bladelets-debitage**	**Bladelets Total**
lipped			4	4 / 7.8%
semi-lipped	2	1	43	46 / 90.2%
not lipped			1	1 / 2.0%
unidentifiable	11	1	53	65
N	13	2	101	116
Level Ga	**bladelets-tools**	**bladelets-CMP**	**bladelets-debitage**	**Bladelets Total**
lipped				
semi-lipped	1		5	6 / 100.0%
not lipped				
unidentifiable	3	1	9	13
N	4	1	14	19

Table 31 - Siuren-I. Unit G. Bladelet Butt Lipping as Percentages of Each Type.

Level Gd	bladelets-tools	bladelets-CMP	bladelets-debitage	Bladelets Total
right			1	1 / 2.2%
semi-acute	4		38	42 / 93.4%
acute			2	2 / 4.4%
unidentifiable	12	2	47	61
N	16	2	88	106
Level Gc1-Gc2	**bladelets-tools**	**bladelets-CMP**	**bladelets-debitage**	**Bladelets Total**
right			4	4 / 3.3%
semi-acute	16	2	90	108 / 88.5%
acute	1		9	10 / 8.2%
unidentifiable	29	11	163	203
N	46	13	266	325
Level Gb1-Gb2	**bladelets-tools**	**bladelets-CMP**	**bladelets-debitage**	**Bladelets Total**
right			4	4 / 8.0%
semi-acute	2	1	41	44 / 88.0%
acute			2	2 / 4.0%
unidentifiable	11	1	54	66
N	13	2	101	116
Level Ga	**bladelets-tools**	**bladelets-CMP**	**bladelets-debitage**	**Bladelets Total**
right				
semi-acute	1		5	6 / 100.0%
acute				
unidentifiable	3	1	9	13
N	4	1	14	19

Table 32 - Siuren-I. Unit G. Bladelet Butt Angles as Percentages of Each Type.

level Gd, 123 pieces/52.3% in level Gc1-Gc2, 39 pieces/46.4% in level Gb1-Gb2, 11 pieces/78.6% in level Ga, and 1.0-1.1 cm - 32 pieces/43.2% in level Gd, 112 pieces/47.7% in level Gc1-Gc2, 45 pieces/53.6% in level Gb1-Gb2, 3 pieces/21.4% in level Ga. Mean width for complete and broken bladelets, as well as means for all bladelets from each level of Unit G is the same – 0.9 cm, apart from a single exception of 1.0 cm for the sample of broken bladelets in level Gb1-Gb2. Thus, there is a general dominance of "medium" width for bladelets.

Thickness. Mean thickness is 0.2 cm for all bladelet categories of all four levels of Unit G: for complete bladelets only, for broken ones only and for all items together, aside from a single exception of 0.3 cm for the sample of complete bladelets in level

Level Gd	bladelets-tools	bladelets-CMP	bladelets-debitage	Bladelets Total
present	5		41	46 / 93.9%
absent			3	3 / 6.1%
unidentifiable	11	2	44	57
N	16	2	88	106
Level Gc1-Gc2	**bladelets-tools**	**bladelets-CMP**	**bladelets-debitage**	**Bladelets Total**
present	18	3	128	149 / 93.7%
absent		2	8	10 / 6.3%
unidentifiable	28	8	130	166
N	46	13	266	325
Level Gb1-Gb2	**bladelets-tools**	**bladelets-CMP**	**bladelets-debitage**	**Bladelets Total**
present	3		43	46 / 79.3%
absent		1	11	12 / 20.7%
unidentifiable	10	1	47	58
N	13	2	101	116
Level Ga	**bladelets-tools**	**bladelets-CMP**	**bladelets-debitage**	**Bladelets Total**
present	1		6	7 / 100.0%
absent				
unidentifiable	3	1	8	12
N	4	1	14	19

Table 33 - Siuren-I. Unit G. Bladelet Butt Abrasion as Percentages of Each Type.

Gb1-Gb2. Along with this, we also note that the thickest bladelet is 0.8 cm thick in level Gb1-Gb2, while all other bladelets from all four levels have thickness in the interval 0.1-0.4 cm.

Thus, bladelets are really thin.

Butt Sizes. Mean data for bladelet butts are similar for all four levels. They are as follows for butt width: 0.3 cm for levels Gd (36 butts), Gc1-Gc2 (95 butts) and Ga (5 butts), and 0.4 cm for level Gb1-Gb2 (39 butts). They are as follows for butt height: 0.1 cm for both levels Gd and Gc1-Gc2, and 0.2 cm for both levels Gb1-Gb2 and Ga. Plain butts have width of 0.4 cm for both levels Gd (13 butts) and Gc1-Gc2 (11 butts), 0.5 cm for level Gb1-Gb2 (16 butts) and 0.3 cm for level Ga (3 butts), and have mean height of 0.2 cm for levels Gd, Gc1-Gc2 and Ga, and 0.3 cm for level Gb1-Gb2.

Thus, the bladelets of the four levels of Unit G can be generally characterized by:

- a great dominance of unidirectional scar pattern (79.4%-94.7%), a minor varying representation of unidirectional-crossed and bidirectional scar patterns, and very rare presence of cortical scar pattern (single pieces in levels Gd and Gb1-Gb2);

- a low number (10.9%-15.9%) of partially cortical pieces with no real representation of wholly cortical items;

- a dominance of parallel and converging shape types (72.7%-81.8% together) in association with "on-axis" removal direction (90.3%-97.8%);

- a prevalence of twisted type over "regular" (flat, incurvate medial and incurvate distal) types of general profiles;

- a dominance of feathering distal ends (60.6%-70.6% in levels Gd, Gc1-Gc2 and Gb1-Gb2, and 100%/2 pieces in level Ga) with less than 20% for any of four levels representation of "not regular" (hinged and overpassed) types;

- a slight dominance of trapezoidal and multifaceted types of profiles at midpoint (51.1%-56.2% in levels Gd, Gc1-Gc2 and Gb1-Gb2 and only 35.8% in level Ga) which with the addition of triangular type make up 92.9%-98% in all four levels;

- a dominance of the "plain-punctiform-linear" group of butt types (69.8%-91.1%) and a rare and minimal presence of cortical and faceted butts;

- a significant dominance of semi-lipped butts (68.9%-89.6% in levels Gd, Gc1-Gc2 and Gb1-Gb2 and 100%/5 pieces in level Ga) with semi-acute (87.2%-92.7%) and some right (2.4%-8.5%) angles, a moderate number of lipped butts (8.3%-30.1%) with acute (4.3%-8.7%) and some semi-acute angles and extremely rare not lipped butts (single pieces in levels Gc1-Gc2 and Gb1-Gb2);

- a characteristic presence of nearly only butts with abrasion in levels Gd and Gc1-Gc2 (93.2%-94.1%), and level Ga (100%) and a significant dominance in level Gb1-Gb2 (79.6%);

- a dominance of "medium length" (mean range 2.6-2.8 cm), medium width (mean 0.9 cm) and overall thinness (mean 0.2 cm);

- the highest and stable dominance of gray flints for bladelets among all levels of Unit G debitage categories (Gd – 63 pieces/71.6%; Gc1-Gc2 – 189 pieces/71.0%; Gb1-Gb2 – 77 pieces/76.2%; Ga – 10 pieces/71.4%), a moderate but with decreasing pattern of occurrence of colored flints through the three representative levels (Gd – 24 pieces/27.3%; Gc1-Gc2 – 76 pieces/28.6%; Gb1-Gb2 – 23 pieces/22.8%) and just 4 colored bladelets (28.6%) in level Ga, whereas black flints are only known from single bladelets in the three levels (Gd – 1 piece/1.1%; Gc1-Gc2 – 1 piece/0.4%; Gb1-Gb2 – 1 piece/1.0%).

Microblades

In terms of their condition, microblades from the four levels of Unit G are subdivided into complete and broken pieces, with further distribution of the latter specimens into proximal, medial and distal. 39 microblades of level Gd consist of 2 complete pieces (5.1%) and 37 broken pieces (94.9%) – 17 proximal (43.6%), 16 medial (41%) and 4 distal (10.3%). 109 microblades of level Gc1-Gc2 consist of 8 complete pieces (7.3%) and 101 broken pieces (92.7%) – 35 proximal (32.1%), 43 medial (39.5%) and 23 distal (21.1%). 76 microblades of level Gb1-Gb2 consist of 7 complete pieces (9.2%) and 69 broken pieces (90.8%) – 23 proximal (30.3%), 30 medial (39.4%) and 16 distal (21.1%). 10 microblades of level Ga consist of one complete piece (10%) and 9 broken pieces (90%) – no proximal, 6 medial (60%) and 3 distal (30%).

Level Gd	**microblades-tools**	**microblades-CMP**	**microblades-debitage**	**Microblades Total**
cortical				
dorsal-plain		1		1 / 1.4%
lateral				
crested				
unidirectional	33		37	70 / 95.9%
unidirectional-crossed			2	2 / 2.7%
bidirectional				
3-directional				
centripetal				
core tablet				
unidentifiable		1		1
N	33	2	39	74
Level Gc1-Gc2	**microblades-tools**	**microblades-CMP**	**microblades-debitage**	**Microblades Total**
cortical				
dorsal-plain	1	2		3 / 1.6%
lateral				
crested		2		2 / 1.1%
unidirectional	67	2	103	172 / 93.5%
unidirectional-crossed	1		6	7 / 3.8%
bidirectional				
3-directional				
centripetal				
core tablet				
unidentifiable	2			2
N	71	6	109	186
Level Gb1-Gb2	**microblades-tools**	**microblades-CMP**	**microblades-debitage**	**Microblades Total**
cortical				
dorsal-plain			1	1 / 0.9%
lateral				
crested				
unidirectional	32		70	102 / 93.6%
unidirectional-crossed	1		5	6 / 5.5%
bidirectional				
3-directional				
centripetal				
core tablet				
unidentifiable				
N	33	0	76	109
Level Ga	**microblades-tools**	**microblades-CMP**	**microblades-debitage**	**Microblades Total**
cortical				
dorsal-plain				
lateral				
crested				
unidirectional	5	2	8	15 / 88.2%
unidirectional-crossed			2	2 / 11.8%
bidirectional				
3-directional				
centripetal				
core tablet				
unidentifiable				
N	5	2	10	17

Table 34 - Siuren-I. Unit G. Microblade Dorsal Scar Patterns as Percentages of Each Type.

Dorsal Scar Pattern. Two scar pattern types were identified on all 39 microblades from level Gd, on all 109 microblades from level Gc1-Gc2, on all 10 microblades from level Ga and three scar pattern types on all 76 microblades from level Gb1-Gb2 (see tabl. 34).

This uniformity of scar pattern types is even more evident by the fact that two scar pattern types (unidirectional and unidirectional-crossed) are characteristic for microblades in all four levels of Unit G and a third pattern is represented by only a single microblade with dorsal-plain scar pattern in level Gb1-Gb2.

Thus, there is a great dominance of microblades with unidirectional scar pattern (94.9% for level Gd, 94.5% for level Gc1-Gc2, 92.1% for level Gb1-Gb2 and 80% for level Ga), a small number of microblades with unidirectional-crossed scar pattern (5.1% for level Gd, 5.5% for level Gc1-Gc2, 6.6% for level Gb1-Gb2 and 20% for level Ga) and a single microblade with dorsal-plain scar pattern in level Gb1-Gb2 (1.3%).

Some differences in proportional representation of unidirectional and unidirectional-crossed scar pattern types in levels Gd, Gc1-Gc2 and Gb1-Gb2, on one hand, and in level Ga, on the other hand, can be explained by a sample size too small for this analysis in level Ga.

The 5 partially cortical microblades in level Gc1-Gc2 (4.9%) and 5 partially cortical microblades in level Gb1-Gb2 (7.1%) have only unidirectional scar pattern.

Surface Cortex Area and Location. All microblades from each level of Unit G were used to record surface cortex area. The quantity of microblades with cortex, however, is very small. They are completely absent in levels Gd and Ga, and account for just a few pieces in levels Gc1-Gc2 and Gb1-Gb2. So, non-cortical microblades compose the following percentages: 100% in levels Gd and Ga, 95.4% in level Gc1-Gc2 and 93.4% in level Gb1-Gb2. No microblade is wholly covered by cortex and, accordingly, partially cortical items are only represented in levels Gc1-Gc2 and Gb1-Gb2. Level Gc1-Gc2 has 5 partially cortical microblades (4.6%) of which only a single example is complete with a significant amount of distal cortex. Level Gb1-Gb2 also has 5 partially cortical microblades which are broken and not suitable for identification of cortex area location.

Thus, these data allow us to consider microblades as a non-cortical debitage category because the few specimens with cortex are extremely rare.

Shape. Five microblades with definable shapes from level Gd, 31 from level Gc1-Gc2, 29 from level Gb1-Gb2 and 4 from level Ga were used to record shape (see tabl. 35).

Level Gd	**microblades-tools**	**microblades-CMP**	**microblades-debitage**	**Microblades Total**
parallel	9	1	4	14 / 77.8%
converging	2		1	3 / 16.7%
expanding		1		1 / 5.5%
ovoid				
irregular				
unidentifiable	22		34	56
N	33	2	39	74
Level Gc1-Gc2	**microblade-tools**	**microblades-CMP**	**microblades-debitage**	**Microblades Total**
parallel	16	1	13	30 / 54.6%
converging	5	2	15	22 / 40.0%
expanding			2	2 / 3.6%
ovoid			1	1 / 1.8%
irregular				
unidentifiable	50	3	78	131
N	71	6	109	186
Level Gb1-Gb2	**microblades-tools**	**microblades-CMP**	**microblades-debitage**	**Microblades Total**
parallel	5		14	19 / 55.9%
converging			11	11 / 32.4%
expanding			1	1 / 2.9%
ovoid			1	1 / 2.9%
irregular			2	2 / 5.9%
unidentifiable	28		47	75
N	33	0	76	109
Level Ga	**microblades-tools**	**microblades-CMP**	**microblades-debitage**	**Microblades Total**
parallel	1		2	3 / 50.0%
converging	1		2	3 / 50.0%
expanding				
ovoid				
irregular				
unidentifiable	3	2	6	11
N	5	2	10	17

Table 35 - Siuren-I. Unit G. Microblade Shapes as Percentages of Each Type.

Microblades of level Gd are characterized by the following shape types: parallel - 80% and converging - 20%.

Microblades of level Gc1-Gc2 are characterized by the following shape types: converging - 48.4%, parallel - 41.9%, expanding - 6.5% and ovoid - 3.2%.

Microblades of level Gb1-Gb2 are characterized by the following shape types: parallel - 48.4%, converging - 37.9%, irregular - 6.9%, expanding and ovoid - 3.4% each.

Microblades of level Ga are characterized by the following shape types: parallel and converging - 50% each.

These shape data show a great dominance of parallel and converging types for microblades with the following pattern: when sample size is small (levels Gd and Ga) parallel and converging types are only represented, while when sample size is larger (levels Gc1-Gc2 and Gb1-Gb2), these 2 types (90.3% and 86.3%, accordingly) are complemented by other types which are represented only by one or two pieces.

Axis. 35 microblades with definable axis of removal directions from level Gd, 109 from level Gc1-Gc2, 54 from level Gb1-Gb2 and all 10 from level Ga were used to record axis of removal direction (see tabl. 36).

There is an absolute dominance of "on-axis" type for microblades: 88.6% for level Gd, 93.6% for level Gc1-Gc2, 83.3% for level Gb1-Gb2 and 90% for level Ga. Accordingly, "off-axis" type has a subordinate position: 11.4% for level Gd, 6.4% for level Gc1-Gc2, 16.7% for level Gb1-Gb2 and 10% for level Ga.

The quantity of microblades with "on-axis" type of removal direction corresponds to the number of microblades with parallel and converging shapes.

General Profiles of Microblades. These data are based on analysis of all microblades and of complete microblades only (see tabl. 37).

Level Gd. There are 33 definable microblades with the following general profile types: twisted - 72.7%, incurvate medial - 15.2%, flat - 9.1% and convex - 3%. Two complete microblades have flat general profiles.

Level Gc1-Gc2. There are 109 definable microblades with the following general profile types: twisted - 58.7%, incurvate medial - 19.3%, flat - 17.4%, incurvate distal - 2.8% and convex - 1.8%. For 8 complete microblades there are recognized 87.5% of twisted type and 12.5% of incurvate medial type.

Level Gb1-Gb2. There are 72 definable microblades with the following general profile types: twisted - 52.8%, incurvate medial - 26.4%, flat - 16.7%, convex - 2.7% and incurvate distal - 1.4%. For 7 complete microblades there are recognized 57.1% of twisted type, 28.6% of incurvate medial type and 14.3% of incurvate distal type.

Level Ga. All 10 microblades have twisted type of general profile and there are no complete microblades in this level.

These data show a dominance of twisted type over "regular" (flat, incurvate medial and incurvate distal) types of microblade general profile which is clearer for the samples of complete microblades in levels Gc1-Gc2 and Gb1-Gb2, while only two complete microblades from level Gd have, however, a flat general profile.

Profiles at Distal End. Data for this analysis were based on 8 microblades from level Gd, 31 from level Gc1-Gc2, 27 from level Gb1-Gb2 and only 4 from level Ga (see tabl. 38).

There is a common dominance of a feathering type with no less than three-quarters for any of the four levels – 75% for both levels Gd and Ga, 83.8% for level Gc1-Gc2 and 77.8% for

Level Gd	**microblades-tools**	**microblades-CMP**	**microblades-debitage**	**Microblades Total**
on-axis	33	1	31	65 / 92.9%
off-axis		1	4	5 / 7.1%
unidentifiable			4	4
N	33	2	39	74
Level Gc1-Gc2	**microblades-tools**	**microblades-CMP**	**microblades-debitage**	**Microblades Total**
on-axis	68	2	102	172 / 95.0%
off-axis	1	1	7	9 / 5.0%
unidentifiable	2	3		5
N	71	6	109	186
Level Gb1-Gb2	**microblades-tools**	**microblades-CMP**	**microblades-debitage**	**Microblades Total**
on-axis	32		45	77 / 89.5%
off-axis			9	9 / 10.5%
unidentifiable	1		22	23
N	33	0	76	109
Level Ga	**microblades-tools**	**microblades-CMP**	**microblades-debitage**	**Microblades Total**
on-axis	4		9	13 / 86.7%
off-axis	1		1	2 / 13.3%
unidentifiable		2		2
N	5	2	10	17

Table 36 - Siuren-I. Unit G. Microblade Axis as Percentages of Each Type.

Level Gd	microblades-tools	microblades-CMP	microblades-debitage	Microblades Total
flat	4		3	7 / 10.5%
incurvate medial	8		5	13 / 19.4%
incurvate distal				
convex			1	1 / 1.5%
twisted	21	1	24	46 / 68.6%
unidentifiable		1	6	7
N	33	2	39	74
Level Gc1-Gc2	**microblades-tools**	**microblades-CMP**	**microblades-debitage**	**Microblades Total**
flat	12	1	19	32 / 17.5%
incurvate medial	28	3	21	52 / 28.4%
incurvate distal			3	3 / 1.6%
convex			2	2 / 1.1%
twisted	29	1	64	94 / 51.4%
unidentifiable	2	1		3
N	71	6	109	186
Level Gb1-Gb2	**microblades-tools**	**microblades-CMP**	**microblades-debitage**	**Microblades Total**
flat	7		12	19 / 18.4%
incurvate medial	9		19	28 / 27.2%
incurvate distal			1	1 / 1.0%
convex			2	2 / 1.9%
twisted	15		38	53 / 51.5%
unidentifiable	2		4	6
N	33	0	76	109
Level Ga	**microblades-tools**	**microblades-CMP**	**microblades-debitage**	**Microblades Total**
flat	1			1 / 6.7%
incurvate medial	1	1		2 / 13.3%
incurvate distal				
convex				
twisted	2		10	12 / 80.0%
unidentifiable	1	1		
N	5	2	10	

Table 37 - Siuren-I. Unit G. Microblade General Profiles as Percentages of Each Type.

level Gb1-Gb2. Other types are as follows: level Gd – hinged and overpassed - 12.5% each; level Gc1-Gc2 – blunt - 9.7% and hinged - 6.5%; level Gb1-Gb2 – hinged - 18.5% and blunt - 3.7%; level Ga – hinged - 25%. Among these other types, it is only possible to note a rather high proportion of hinged type in levels Gd, Gb1-Gb2 and Ga, while representation of overpassed and blunt types do not show any pattern.

Profiles at Midpoint. Data for this analysis were recorded for all microblades in each level of Unit G, as all are definable through this feature (see tabl. 39).

Level Gd shows the following variety of types: triangular - 56.4%, trapezoidal - 33.3%, multifaceted - 5.1%, flat and lateral steep - 2.6% each.

Level Gc1-Gc2 shows the following variety of types: triangular - 61.4%, trapezoidal - 32.1%, lateral steep - 3.7% and multifaceted - 2.8%.

Level Gb1-Gb2 shows the following variety of types: triangular - 64.6%, trapezoidal - 28.9%, multifaceted and lateral steep - 2.6% each, flat - 1.3%.

Level Ga shows the following variety of types: triangular - 70%, lateral steep - 20% and trapezoidal - 10%.

These data show an absolute dominance of three types (triangular, trapezoidal and multifaceted) in levels Gd, Gc1-Gc2 and Gb1-Gb2 – 94.8%-96.1%. Data on level Ga are based only on 10 pieces and are not representative of all types. Nonetheless, it is worth noting a common dominance of triangular type in all four levels, typical of more than half of all microblades in each level. At the same time, no microblade with irregular profile at midpoint was noted.

Butt Types. This analysis is based on 19 microblade butts from level Gd, 43 from level Gc1-Gc2, 30 from level Gb1-Gb2 and only a single butt from level Ga (see tabl. 40). Butts of level Gd are as follows: linear - 42%, plain - 21.1%, punctiform - 10.5%, dihedral - 5.3% and crushed - 21.1%. Butts of level Gc1-Gc2 are as follows: linear - 55.8%, punctiform - 11.6%, plain - 4.7% and crushed - 27.9%. Butts of level Gb1-Gb2 are as follows: punctiform - 43.3%, linear - 16.7%, plain - 3.3% and crushed - 36.7%.

A single definable microblade butt from level Ga is a dihedral one.

Thus, aside from crushed butts and two dihedral butts in levels Gd and Ga, all other butts are representatives of the "plain-punctiform-linear" group of types. Levels Gd and Gc1-Gc2 are characterized by a dominance of linear butts, while punctiform type is dominant in level Gb1-Gb2.

Level Gd	microblades-tools	microblades-CMP	microblades-debitage	Microblades Total
feathering	9	1	6	16 / 76.2%
hinged	1		1	2 / 9.5%
overpassed	1		1	2 / 9.5%
blunt		1		1 / 4.8%
unidentifiable	22		31	53
N	33	2	39	74
Level Gc1-Gc2	**microblades-tools**	**microblades-CMP**	**microblades-debitage**	**Microblades Total**
feathering	8	1	26	35 / 79.5%
hinged	1	1	2	4 / 9.1%
overpassed				
blunt	1	1	3	5 / 11.4%
unidentifiable	61	3	78	142
N	71	6	109	186
Level Gb1-Gb2	**microblades-tools**	**microblades-CMP**	**microblades-debitage**	**Microblades Total**
feathering	4		21	25 / 80.7%
hinged			5	5 / 16.1%
overpassed				
blunt			1	1 / 3.2%
unidentifiable	29		49	78
N	33	0	76	109
Level Ga	**microblades-tools**	**microblades-CMP**	**microblades-debitage**	**Microblades Total**
feathering	2		3	5 / 83.3%
hinged			1	1 / 16.7%
overpassed				
blunt				
unidentifiable	3	2	6	11
N	5	2	10	17

Table 38 - Siuren-I. Unit G. Microblade Profiles at Distal End as Percentages of Each Type.

Lipping. There are 15 butts suitable for lipping identification from level Gd, 31 from level Gc1-Gc2, 16 from level Gb1-Gb2 and only a single identifiable butt from level Ga (see tabl. 41).

Butts of level Gd have the following lipping characteristics: semi-lipped - 80% and lipped - 20%.

Butts of level Gc1-Gc2 have the following lipping characteristics: semi-lipped - 67.8% and lipped - 32.2%.

Butts of level Gb1-Gb2 have the following lipping characteristics: semi-lipped - 87.6%, lipped and not lipped - 6.2% each.

A single definable microblade butt of level Ga is not lipped.

Thus, there is a common dominance of semi-lipped butts, a subordinate position of lipped butts and an occasional presence of not lipped butts, with just single pieces in levels Gb1-Gb2 and Ga.

Butt Angle. There are 15 butts suitable for angle identification from level Gd, 31 from level Gc1-Gc2, 16 from level Gb1-Gb2 and only a single definable microblade butt from level Ga (see tabl. 42).

Butts of level Gd have the following angles: semi-acute - 80%, acute - 13.3% and right - 6.7%.

Butts of level Gc1-Gc2 have the following angles: semi-acute - 71%, acute - 22.6% and right - 6.4%.

Butts of level Gb1-Gb2 have the following angles: semi-acute - 81.3% and acute - 18.7%.

A single definable microblade butt from level Ga has a semi-acute angle.

So, there is a common dominance of semi-acute angles of microblade butts - 71%-81.3% in levels Gd, Gc1-Gc2 and Gb1-Gb2. Microblade butts of level Gb1-Gb2 have additionally only acute angles with no representation of right angles at all. Microblade butts of levels Gd and Gc1-Gc2 have both acute and right angles with prevalence of acute over right – 2:1 in level Gd and 3.5:1 in level Gc1-Gc2.

Butt Abrasion. To record presence/absence of abrasion, the following microblade butt frequencies were used for the four levels of Unit G: 18 from level Gd, 43 from level Gc1-Gc2, 25 from level Gb1-Gb2 and only a single butt from level Ga (see tabl. 43).

There is a common prevalence of butts with abrasion (94.5% in level Gd, 93% in level Gc1-Gc2, 92% in level Gb1-Gb2) over butts with no abrasion (5.5% in level Gd, 7% in level Gc1-Gc2 and 8% in level Gb1-Gb2) in 3 levels of Unit G. A single microblade butt in level Ga has abrasion.

Metrics (Length, Width, Thickness) of Microblades. Metric data are based on analysis of both complete and broken microblades from each level of Unit G with, unfortunately, a very small number of complete pieces.

Level Gd	microblades-tools	microblades-CMP	microblades-debitage	Microblades Total
flat			1	1 / 1.4%
triangular	19	1	22	42 / 57.5%
trapezoidal	12		13	25 / 34.3%
multifaceted	1		2	3 / 4.1%
lateral steep		1	1	2 / 2.7%
crescent				
irregular				
unidentifiable	1			1
N	33	2	39	74
Level Gc1-Gc2	**microblades-tools**	**microblades-CMP**	**microblades-debitage**	**Microblades Total**
flat	1			1 / 0.5%
triangular	47	4	67	118 / 63.4%
trapezoidal	23		35	58 / 31.2%
multifaceted		1	3	4 / 2.2%
lateral steep		1	4	5 / 2.7%
crescent				
irregular				
unidentifiable				
N	71	6	109	186
Level Gb1-Gb2	**microblades-tools**	**microblades-CMP**	**microblades-debitage**	**Microblades Total**
flat			1	1 / 0.9%
triangular	21		49	70 / 64.8%
trapezoidal	10		22	32 / 29.6%
multifaceted	1		2	3 / 2.8%
lateral steep			2	2 / 1.9%
crescent				
irregular				
unidentifiable	1			1
N	33	0	76	109
Level Ga	**microblades-tools**	**microblades-CMP**	**microblades-debitage**	**Microblades Total**
flat				
triangular	3		7	10 / 58.8%
trapezoidal	2		1	3 / 17.7%
multifaceted		1		1 / 5.9%
lateral steep		1	2	3 / 17.6%
crescent				
irregular				
unidentifiable				
N	5	2	10	17

Table 39 - Siuren-I. Unit G. Microblade Profiles at Midpoint as Percentages of Each Type.

Length. Taking into consideration the overall short length of microblades (none longer than 3 cm), these were subdivided into two groups: less than or equal to 1.5 cm and greater than 1.5 cm.

Level Gd. Two complete microblades have length less than 1.5 cm – 1.1 and 1.2 cm. Broken microblades with length less than or equal to 1.5 cm number 33 pieces/89.2%, while only 4 pieces/10.8% have length more than 1.5 cm.

Level Gc1-Gc2. There are 6 pieces/75% with length less than or equal to 1.5 cm and 2 pieces/25% (1.8 and 2.8 cm) with length more than 1.5 cm among complete microblades. Mean length is 1.6 cm. Broken microblades with length less than or equal to 1.5 cm number 85 pieces/84.2% and 16 pieces/15.8% are in the interval 1.6-3.0 cm with the longest example 2.6 cm.

Level Gb1-Gb2. There are 3 pieces/42.8% with length less than or equal to 1.5 cm and 4 pieces/57.2% with length more than 1.5 cm among complete microblades. The longest example is 2.5 cm long. Mean length is 1.6 cm. Broken microblades with length less than or equal to 1.5 cm number 66 pieces/95.7% and only 3 pieces/4.3% have length more than 1.5 cm with the longest one 2.7 cm.

Level Ga. The single complete microblade is 1.7 cm long. There are also 7 pieces/77.7% with length less than or equal to 1.5 cm and 2 pieces/ 22.2% with length more than 1.5 cm with the longest one 1.9 cm.

Thus, microblades generally have a "short" length but, at the same time, the presence of even a few fragmented microblades with length more than 2 cm could serve as evidence for the possible existence of some "long" (> 3 cm) microblades in Unit G.

Width. The following width distribution of complete microblades is observed: 0.6 cm - none for level Gd, 4 pieces/50% for

Level Gd	microblades-tools	microblade-CMP	microblade-debitage	Microblades Total
cortical				
plain	1		4	5 / 15.6%
punctiform	1	1	2	4 / 12.5%
linear	8		8	16 / 50.0%
dihedral	1		1	2 / 6.3%
crudly-faceted				
finely-faceted				
crushed	1		4	5 / 15.6%
missing	21	1	20	42
N	33	2	39	74
Level Gc1-Gc2	**microblades-tools**	**microblades-CMP**	**microblades-debitage**	**Microblades Total**
cortical				
plain	1		2	3 / 4.1%
punctiform	9	1	5	15 / 20.5%
linear	13		24	37 / 50.7%
dihedral		1		1 / 1.4%
crudly-faceted				
finely-faceted				
crushed	5		12	17 / 23.3%
missing	43	4	66	113
N	71	6	109	186
Level Gb1-Gb2	**microblades-tools**	**microblades-CMP**	**microblades-debitage**	**Microblades Total**
cortical				
plain	1		1	2 / 5.0%
punctiform	2		13	15 / 37.5%
linear	6		5	11 / 27.5%
dihedral				
crudly-faceted				
finely-faceted				
crushed	1		11	12 / 30.0%
missing	23		46	69
N	33	0	76	109
Level Ga	**microblades-tools**	**microblades-CMP**	**microblades-debitage**	**Microblades Total**
cortical				
plain		1		1 / 33.3%
punctiform				
linear				
dihedral			1	1 / 33.3%
crudly-faceted				
finely-faceted				
crushed		1		1 / 33.3%
missing	5		9	14
N	5	2	10	17

Table 40 - Siuren-I. Unit G. Microblade Butt Types as Percentages of Each Type.

level Gc1-Gc2, 4 pieces/57.1% for level Gb1-Gb2 and a single piece/100% for level Ga; 0.5 cm - 1 piece/50% for level Gd, 3 pieces/37.5% for level Gc1-Gc2 and 2 pieces/28.6% for level Gb1-Gb2; 0.4 cm - 1 piece/50% for level Gd, 1 piece/12.5% for level Gc1-Gc2, 1 piece/14.3% for level Gb1-Gb2. Mean width for complete microblades are as follows: 0.5 cm for levels Gc1-Gc2 and Gb1-Gb2 as for levels with more than 1 or 2 pieces as is typical for levels Gd and Ga. It is also worth noting an absence of any complete microblade with width less than 0.4 cm.

Width for broken microblades is as follows: 0.6 cm - 26 pieces/70.3% for level Gd, 59 pieces/58.4% for level Gc1-Gc2, 38 pieces/55.1% for level Gb1-Gb2 and 5 pieces/55.5% for level Ga; 0.5 cm - 9 pieces/23.1% for level Gd, 29 pieces/28.7% for level Gc1-Gc2, 14 pieces/20.3% for level Gb1-Gb2 and none for level Ga; 0.4 cm - 3 pieces/7.7% for level Gd, 11 pieces/10.9% for level Gc1-Gc2, 14 pieces/20.3% for level Gb1-Gb2 and 4 pieces/44.4% for level Ga; 0.3 cm - 1 piece/2.7% for level Gd, 2 pieces/2% for level Gc1-Gc2, 3 pieces/4.3% for level Gb1-Gb2 and none for level Ga. Mean width for broken microblades are as follows: 0.6 cm for level Gd and 0.5 cm for levels Gc1-Gc2, Gb1-Gb2 and Ga.

Overall, mean width for all microblades from each level is identical – 0.5 cm. Moreover, the majority of microblades have width 0.6-0.5 cm – 89.7% for level Gd, 87.2% for level Gc1-Gc2, 76.4% for level Gb1-Gb2 and 60% for level Ga. At the same time, "truly narrow" microblades (0.3 cm wide) are quite rare: 2.6% for level Gd, 1.8% for level Gc1-Gc2, 3.9% for level Gb1-Gb2 and absent in level Ga.

Level Gd	microblades-tools	microblades-CMP	microblades-debitage	Microblades Total
lipped	1		3	4 / 14.3%
semi-lipped	11	1	12	24 / 85.7%
not lipped				
unidentifiable	21	1	24	46
N	33	2	39	74
Level Gc1-Gc2	**microblades-tools**	**microblades-CMP**	**microblades-debitage**	**Microblades Total**
lipped	2		10	12 / 21.8%
semi-lipped	21	1	21	43 / 78.2%
not lipped				
unidentifiable	48	5	78	131
N	71	6	109	186
Level Gb1-Gb2	**microblades-tools**	**microblades-CMP**	**microblades-debitage**	**Microblades Total**
lipped			1	1 / 4.0%
semi-lipped	9		14	23 / 92.0%
not lipped			1	1 / 4.0%
unidentifiable	24		60	84
N	33	0	76	109
Level Ga	**microblades-tools**	**microblades-CMP**	**microblades-debitage**	**Microblades Total**
lipped				
semi-lipped		1		1 / 50.0%
not lipped			1	1 / 50.0%
unidentifiable	5	1	9	15
N	5	2	10	17

Table 41 - Siuren-I. Unit G. Microblade Butt Lipping as Percentages of Each Type.

Level Gd	microblades-tools	microblades-CMP	microblades-debitage	Microblades Total
right			1	1 / 3.7%
semi-acute	10	1	12	23 / 85.2%
acute	1		2	3 / 11.1%
unidentifiable	22	1	24	47
N	33	2	39	74
Level Gc1-Gc2	**microblades-tools**	**microblades-CMP**	**microblades-debitage**	**Microblades Total**
right			2	2 / 3.6%
semi-acute	23	1	22	46 / 83.7%
acute			7	7 / 12.7%
unidentifiable	48	5	78	131
N	71	6	109	186
Level Gb1-Gb2	**microblades-tools**	**microblades-CMP**	**microblades-debitage**	**Microblades Total**
right				
semi-acute	9		13	22 / 88.0%
acute			3	3 / 12.0%
unidentifiable	24		60	84
N	33	0	76	109
Level Ga	**microblades-tools**	**microblades-CMP**	**microblades-debitage**	**Microblades Total**
right				
semi-acute		1	1	2 / 100.0%
acute				
unidentifiable	5	1	9	15
N	5	2	10	17

Table 42 - Siuren-I. Unit G. Microblade Butt Angles as Percentages of Each Type.

Thus, microblades of all four levels of Unit G are rather close to the "width border" in 0.7 cm separating microblades and bladelets.

Thickness. Mean thickness for all microblades from each level of Unit G are as follows: 0.1 cm for both levels Gd and Gc1-Gc2, and 0.2 cm for both levels Gb1-Gb2 and Ga. It is worth noting that the great majority of microblades are 0.1-0.2 cm thick, while thicker pieces are exceptionally rare: 1 piece/2.6% (0.3 cm) for level Gd, 4 pieces/3.7% (0.3 cm) for level Gc1-Gc2, 8 pieces/11.6% (0.3 - 0.4 cm) for level Gb1-Gb2 and 1 piece/10% (0.4 cm) for level Ga. No piece has a thickness of more than 0.4 cm.

Such data clear indicate the high degree of microblade thinness.

Level Gd	microblades-tools	microblades-CMP	microblades-debitage	Microblades Total
present	11		17	28 / 90.3%
absent	1	1	1	3 / 9.7%
unidentifiable	21	1	21	43
N	33	2	39	74
Level Gc1-Gc2	**microblades-tools**	**microblades-CMP**	**microblades-debitage**	**Microblades Total**
present	25		40	65 / 90.3%
absent	2	2	3	7 / 9.7%
unidentifiable	44	4	66	114
N	71	6	109	186
Level Gb1-Gb2	**microblades-tools**	**microblades-CMP**	**microblades-debitage**	**Microblades Total**
present	9		23	32 / 94.1%
absent			2	2 / 5.9%
unidentifiable	24		51	75
N	33	0	76	109
Level Ga	**microblades-tools**	**microblades-CMP**	**microblades-debitage**	**Microblades Total**
present			1	1 / 50.0%
absent		1		1 / 50.0%
questionable				
unidentifiable	5	1	9	15
N	5	2	10	17

Table 43 - Siuren-I. Unit G. Microblade Butt Abrasion as Percentages of Each Type.

Butt Sizes. Mean data for microblade butts are the same for levels Gd (13 butts), Gc1-Gc2 (26 butts) and Gb1-Gb2 (6 butts): butt width - 0.3 cm and butt height - 0.1 cm. A single butt from level Ga (dihedral) is 0.5 wide and height 0.3 cm. Plain butts have a mean width of 0.3 cm for level Gd (4 butts), 0.5 cm for level Gc1-Gc2 (2 butts) and 0.2 cm for level Gb1-Gb2 (one butt) and have mean height of 0.2 cm for these three levels.

Thus, the microblades of the four levels of Unit G are generally characterized by:

- an almost exclusive representation of unidirectional scar pattern (92.1%-94.9% in levels Gd, Gc1-Gc2 and Gb1-Gb2, and 80% in level Ga);

- a presence of very few pieces with some cortex only in levels Gc1-Gc2 and Gb1-Gb2;

- a great dominance of parallel and converging shape types (86.3%-100%) in association with "on-axis" removal direction (83.3%-93.6%);

- a prevalence of twisted type over "regular" (flat, incurvate medial and incurvate distal) types of general profiles;

- a great dominance of feathering distal ends (75%-83.8%) and a generally varying but insignificant representation by level of "not regular"(hinged and overpassed) types (6.5%-25%);

- a dominance of triangular type of profile at midpoint (56.4%-70%) and insignificant representation of trapezoidal and multifaceted types (31.5%-38.1% in levels Gd, Gc1-Gc2 and Gb1-Gb2, and only 10% (only trapezoidal type) in level Ga);

- an exclusive representation of "plain-punctiform-linear" group of butt types (63.3%-73.6% in levels Gd, Gc1-Gc2 and Gb1-Gb2) excluding crushed butts (21.1%-36.7%) and single dihedral butts in levels Gd and Ga;

- a significant dominance of semi-lipped butts (67.8%-87.6% in levels Gd, Gc1-Gc2 and Gb1-Gb2) with semi-acute (71%-81.3%) and some right (6.4%-6.7%) angles, as well as a generally moderate number of lipped butts (6.2%-32.2%) with acute (13.3%-22.6%) and some semi-acute angles, and absence of not lipped butts (only a single piece in level Gb1-Gb2);

- a characteristic presence of abrasion for butts (92%-94.5% in levels Gd, Gc1-Gc2 and Gb1-Gb2 and 100%/1 piece in level Ga);

- a dominance of "short length" (mean range 1.2-1.7 cm), medium width (mean 0.5 cm) and overall thinness (mean range 0.1 - 0.2 cm);

- a dominance of gray flints with a growing tendency in three levels (Gd – 24 pieces/61.5%; Gc1-Gc2 – 71 pieces/65.1%; Gb1-Gb2 – 54 pieces/71.0%) with 6 gray microblades (60%) in level Ga, a moderate number of colored flints decreasing through this sequence (Gd – 15 pieces/38.5%; Gc1-Gc2 – 37 pieces/34.0%; Gb1-Gb2 – 22 pieces/29.0%) with 4 colored microblades (40%) in level Ga, while a single microblade on black flint is known from level Gc1-Gc2 (0.9%).

Summarizing data on the debitage

A very short summary of the debitage can be done as follows (see also tabl. 3B-3C, 4-43). Excluding the limited sample of just 65 items from level Ga, the representations of flakes, blades, bladelets and microblades for the other three levels in Unit G are consistent for flakes and bladelets, but show some clear differences between levels for blades and microblades. Excluding flakes given their identical percentages in all three

levels (30.5-31.1%) and considering only the blady debitage categories, we obtain the following percentages for levels Gd – Gc1-Gc2 – Gb1-Gb2: blades – 38.9%-32.6%-26.2%; bladelets – 42.3%-47.8%-42.1%; microblades – 18.8%-19.6%-31.7% (tabl. 3C). These percentages show a threefold structure. Blades show a decreasing pattern in the archaeological sequence from 38.9 to 26.2%, and it becomes more comparable to the respective blade index for Unit H (34.3%). Bladelets, on the other hand, are quite stable in the 47.8-42.1% range and the respective bladelet percentage in Unit H is 46.8%. But microblades are characterized a sharply increasing pattern from 18.8-19.6% in levels Gd and Gc1-Gc2 (18.9% for Unit H as well) to 31.7% for level Gb1-Gb2. Thus, we see that at the expense of decreasing blades, microblades increase throughout the archaeological sequence. At the same time, recall the very stable flake indices for the three levels of Unit G. All of these observations require explanation; along with data from the other artifact categories, solutions should be found.

Tools

Tool data are first presented below by level and then analyzed both jointly and through the archaeological sequence to establish possible common and different features . In total, there are 376 pieces with secondary treatment (i.e., retouch) and/or use-wear in the four assemblages of Unit G (see tabl. 44 – 46, 47 – 49).

Level Gd

Tools are represented by 77 specimens subdivided into 7 groups: 1) Indicative Upper Paleolithic types – 7 pieces/9.1%; 2) Non-Geometric Microliths – 49 pieces/63.6%; 3) "Neutral" types – 2 pieces/2.6%; 4) Retouched Pieces – 9 pieces/11.7%; 5) Unidentifiable Tool Fragments – 7 pieces/9.1%; 6) Non-Flint Tools – 2 pieces/2.6%; 7) Middle Paleolithic types – 1 piece/1.3%.

Indicative Upper Paleolithic tool types
These tools include 2 end-scrapers, 3 burins, 1 truncation and 1 retouched blade.

End-scrapers are represented by one item on a retouched piece, while the second is carinated.

The first end-scraper is on a retouched piece (fig. 3:1). It is made on a complete flake with bilateral dorsal light scalar retouch. The front is convex, formed on the distal dorsal surface by non-convergent sub-parallel retouch. The flake, as a blank, is non-cortical ne with a unidirectional scar pattern, expanding shape, "on-axis" removal direction, flat general profile, unidentifiable as retouched distal end, trapezoidal profile at midpoint, small 0.7 x 0.2 cm plain butt (lipped, acute angle, with abrasion). On gray flint, 4.6 cm long, 2.6 cm wide and 0.6 cm thick.

The second end-scraper is carinated on a thick chunk (fig. 3:2). The front is rather narrow (2.7 cm wide) and convex, formed by convergent sub-parallel lamellar (microblade negatives) retouch with maximum length 2.7 cm. The chunk, as a blank, is a piece of gray flint, 5.7 cm long, 4.3 cm wide and 4.2 cm thick.

Burins. These include one angle, one double mixed and one is a broken specimen.

The first is an angle burin on a natural surface, made on a broken blade (fig. 3:3). The burin termination is on the blade's distal end, has two flat burin facets on the ventral surface, struck from the blade's heavily hinged distal end. The blade, as a blank, is a non-cortical burnt distal fragment with unidirectional scar pattern, irregular shape, incurvate medial general profile, hinged distal end and trapezoidal profile at midpoint. On gray flint, 3.9 cm long, 2.1 cm wide and 0.9 cm thick.

The second is a double mixed burin (on truncation and angle) with lateral dorsal irregular discontinuous retouch, made on a broken blade (fig. 3:4). Two opposite burin terminations are on the distal end and the medial break of the blade. The truncated burin termination on the distal end is a concave truncation with two flat burin facets on the ventral surface. The angle burin termination on the medial break has one flat burin facet on the dorsal surface. The blade, as a blank, is a partially cortical distal fragment with insignificant central cortex and is only characterized by unidirectional scar pattern, "on-axis" removal direction, incurvate distal general profile and multifaceted profile at midpoint. On gray flint, 4.1 cm long, 2.2 cm wide, and 0.8 cm thick.

The third burin is broken given the lack of the burin termination from which two burin spalls were struck off. the location of burin facets along one of the blade's lateral edges and no signs of burin-like treatment or preparation on the other lateral edge suggest that this burin could be either angle or on truncation. The blade, as a blank, is a non-cortical medial fragment with unidirectional scar pattern, flat general profile and multifaceted profile at midpoint. On colored flint, 4.9 cm long, 1.5 cm wide, 0.5 cm thick.

The single *truncation* is concave, made on a broken blade. The truncated edge is formed by scalar dorsal retouch at the distal end. The blade, as a blank, is a non-cortical distal fragment with unidirectional scar pattern, "on-axis" removal direction, incurvate distal general profile and triangular profile at midpoint. On gray flint, 2.5 cm long, 1.4 cm wide and 0.4 cm thick.

A single *retouched blade* is a bilateral dorsal broken specimen with light scalar continuous retouch on both lateral edges. The blade, as a blank, is a non-cortical burnt distal fragment with unidirectional scar pattern, convergent shape, "off-axis" removal direction, incurvate distal general profile, blunt distal end and trapezoidal profile at midpoint. On colored flint, 3.6 cm long, 2.1 cm wide, 0.7 cm thick.

Non-Geometric Microliths
These include three types: Dufour bladelets– 35 pieces (71.4%), pseudo-Dufour bladelets– 13 pieces (26.5%) and a single backed microblade (2.1%).

The Dufour bladelet type, on bladelets with alternate retouch (fig. 3:7-12) is composed of 7 pieces, or 14.3% of all microliths. In all cases, the left edges of these microliths have dorsal retouch, while the right edges have ventral retouch. Seven microliths are

Groups & Types	Ga	Gb1-Gb2	Gc1-Gc2	Gd	TOTAL	
	N	N	N	N	N	%
INDICATIVE UPPER PALEOLITHIC TOOL TYPES	**5** / *27.8%*	**8** / *11.3%*	**22** / *10.5%*	**7** / *9.1%*	**42**	11.2
END-SCRAPERS	*3*	*2*	*5*	*2*	*12*	*3.2*
Simple flat on blades	1		3		4	
Atypical	1				1	
Double on retouched flakes			1		1	
On retouched flake				1	1	
Unilateral / Flake	1				1	
Carinated			1	1	2	
Carinated atypical		1			1	
Thick shouldered		1			1	
BURINS	*2*	*4*	*7*	*3*	*16*	*4.3*
Dihedral symmetrical	1				1	
Dihedral asymmetrical		1			1	
Dihedral angle	1				1	
Angle			2	1	3	
Angle Double		1	1		2	
On oblique straight truncation			1		1	
Transverse on lateral preparation		1			1	
Transverse on natural surface		1			1	
Double Mixed (on concave truncation + angle)				1	1	
Broken (unidentifiable)			3	1	4	
COMPOSITE TOOLS		*1*	*2*		*3*	*0.8*
End-scraper on retouched flake / Burin broken			1		1	
Perforator / Burin angle			1		1	
Scaled Tool / Burin on concave truncation		1			1	
TRUNCATIONS			*2*	*1*	*3*	*0.8*
RETOUCHED BLADES		*1*	*3*	*1*	*5*	*1.3*
RETOUCHED BLADES with Aurignacian-like retouch			*1*		*1*	*0.3*
SCALED TOOLS			*2*		*2*	*0.5*
NON-GEOMETRIC MICROLITHS	**9** / *50%*	**46** / *64.8%*	**117** / 55.7%	**49** / *63.6%*	**221**	58.8
"NEUTRAL" TOOL TYPES (*NOTCHED PIECES*)		**2** / *2.8%*	**5** / *2.4%*	**2** / *2.6%*	**9**	2.4
RETOUCHED PIECES (with marginal and/or irregular retouch)	**3** / *16.7%*	**9** / *12.7%*	**39** / *18.6%*	**9** / *11.7%*	**60**	15.9
UNIDENTIFIABLE TOOL FRAGMENTS	**1** / *5.5%*	**3** / *4.2%*	**12** / *5.7%*	**7** / *9.1%*	**23**	6.1
NON-FLINT TOOLS			**2** / *0.9%*	**2** / *2.6%*	**4**	1.1
CHOPPERS / GRINDING TOOLS			*1*	*1*	*2*	*0.5*
BATTERED PIECES / GRINDING TOOLS				*1*	*1*	*0.3*
GRINDING TOOLS			*1*		*1*	*0.3*
MIDDLE PALEOLITHIC TOOL TYPES		**3** / *4.2%*	**13** / *6.2%*	**1** / *1.3%*	**17**	4.5
TOTAL	**18** / *100%*	**71** / *100%*	**210** / *100%*	**77** / *100%*	**376**	100.0

Table 44 - Siuren-I. Unit G. Tools General Structure & Classification.

represented by 14 retouched edges. Continuous retouch predominates (11 edges), that is followed by partially retouched (2 items) and discontinuously retouched (1 item) edges. Semi-abrupt retouch was defined on 11 edges. Three more edges have flat retouch. Micro-scalar and micro-stepped retouch are represented in similar numbers of edges: 8 and 6 edges, respectively. Thus, bladelets with alternate retouch were mostly retouched by continuous semi-abrupt micro-scalar retouch (5 edges) and continuous semi-abrupt micro-stepped retouch (4 edges). The other retouch combinations (continuous flat micro-scalar – 2 edges, discontinuous semi-abrupt micro-stepped – 1 edge, partial semi-abrupt micro-stepped – 1 edge, partial flat micro-scalar – 1 edge) are represented by insignificant numbers of items.

The Dufour bladelet type, on microblades with alternate retouch (fig. 3:13-18) are the most common type of the microliths – about half (24 pieces/48.9 %) of all microliths. Twenty-four microliths are represented by 48 retouched edges. As on bladelets, dorsal retouch is found on the left edges, while the right edges have ventral retouch. Continuous retouch significantly predominates – 33 edges. Discontinuous (7 edges) and partial (8 edges) retouch are represented in similar numbers. Semi-abrupt retouch was employed on 42 edges. The rest 6 edges were elaborated by flat retouch. Micro-scalar retouch was used for 34 edges. Twelve edges were elaborated by micro-stepped and two more edges by marginal retouch. So, the majority of edges on microblades with alternate retouch were produced by continuous semi-abrupt micro-scalar retouch – 19 edges. This amount could be easily increased by the inclusion of 11 edges with continuous semi abrupt micro-stepped retouch. The difference between micro-scalar and micro-stepped retouch on microblades is quite relative, because of the size of the initial blanks selected for this type of microlith production. Other retouch combinations are

Groups & Types	Ga	Gb1-Gb2	Gc1-Gc2	Gd	TOTAL
Pieces with flat and/or semi-abrupt retouch	**9 / 100%**	**46 / 100.0%**	**116 / 99.2%**	**48 / 98.0%**	**219 / 99.1%**
Dufour, *bladelets with alternate retouch*	2	3	26	7	38
Dufour, *microblades with alternate retouch*	2	28	57	24	111
Dufour, *bladelets with alternating retouch*		1			1
Dufour, *bladelets with bilateral ventral retouch*		1			1
Dufour, *bladelets with ventral retouch*		2	3	3	8
Dufour, *microblades with ventral retouch*	1	1	5	1	8
TOTAL:	5 / 55.6%	36 / 78.3%	91 / 77.8%	35 / 71.4%	167 / 75.6%
Pseudo-Dufour, *bladelets with dorsal retouch*	2	4	2	3	11
Pseudo-Dufour, *microblades with dorsal retouch*		3	3	4	10
Pseudo-Dufour, *bladelets with bilateral dorsal retouch*			4	3	7
Pseudo-Dufour, *microblades with bilateral dorsal retouch*	1	1	2	3	7
TOTAL:	3 / 33.3%	8 / 17.4%	11 / 9.4%	13 / 26.5%	35 / 15.8%
Krems Point, *bladelets with alternate retouch*			1		1
Krems Point, *microblades with bilateral dorsal retouch*	1		2		3
TOTAL:	1 / 11.1%		3 / 2.6%		4 / 1.8%
Bladelets *with dorsal retouch at distal end*		2	1		3
Bladelets *with lateral dorsal micro-notch*			3		3
Bladelets *with lateral ventral micro-notch*			3		3
Truncated Bladelets			2		2
Bitruncated Bladelets			1		1
Microblade *with micro-denticulated edge*			1		1
TOTAL:		2 / 4.3%	11 / 9.4%		13 / 5.9%
Pieces with backed lateral retouch			**1 / 0.8%**	**1 / 2.1%**	**2 / 0.9%**
Microblades *with bilateral abrupt dorsal retouch*			1	1	2
TOTAL	**9**	**46**	**117**	**49**	**221**

Table 45 - Siuren-I. Unit G. Non-Geometric Microliths Classification.

represented by insignificant numbers of edges: continuous flat micro-scalar – 3 items; discontinuous semi-abrupt micro-scalar – 5 items; discontinuous semi-abrupt marginal – 1 item; discontinuous flat micro-scalar – 1 item; partial semi-abrupt micro-scalar – 5 items; partial flat marginal – 1 item; partial flat micro-scalar – 1 item; partial semi-abrupt micro-stepped – 1 item.

The Dufour bladelet type, on bladelets with ventral retouch is represented by 3 pieces, which comprise 6.1% of all microliths. All have ventral retouch on the right edges. Two kinds of retouch combinations were used: continuous semi-abrupt micro-scalar (2 pieces) and continuous semi-abrupt micro-stepped (1 piece).

The Dufour bladelet type, on microblade with ventral retouch is represented by a sole broken piece (2.1%). The right edge of this microlith was elaborated by partial semi-abrupt micro-scalar retouch.

The Pseudo-Dufour bladelet type, on bladelets with dorsal retouch is represented by 3 pieces (6.1%). Two have retouch on the left edge (partial flat micro-scalar and continuous flat micro-scalar), while the third piece is retouched on the right edge (partial flat micro-scalar).

The Pseudo-Dufour bladelet type, on microblades with dorsal retouch is represented by 4 pieces (8.2%). Two have retouch on the left edge (discontinuous flat micro-scalar and partial semi-abrupt micro-scalar) and two on the right edge (partial semi-abrupt marginal and discontinuous semi-abrupt marginal). The piece with discontinuous retouch on the left edge is also basally thinned.

The Pseudo-Dufour bladelet type, on bladelets with bilateral dorsal retouch is represented by 3 pieces (6.1%). All edges of all these pieces have the same retouch combination: partial flat micro-scalar.

The Pseudo-Dufour bladelet type, on microblades with bilateral dorsal retouch (fig. 3:5) is represented by 3 pieces (6.1%). Five of six edges show the combination of continuous semi-abrupt micro-scalar retouch. One piece has continuous semi-abrupt marginal retouch on the right edge.

Bilaterally backed microblade. The only piece of this type (fig. 3:6) shows the combination of continuous abrupt micro-scalar retouch on the left edge and continuous semi-abrupt marginal retouch on the right edge. At the same time, the abruptly retouched part of the left edge is not very pronounced and could equally be identified as semi-abruptly retouched. If so, this microlith would be identified as a pseudo-Dufour bladelet on microblade with bilateral dorsal retouch.

Sixteen bladelets and 33 microblades were selected for non-geometric microlith production. Overall, the selected blanks selected were removed "on-axis": 46 items. The others (3 pieces) are too small to identify "axis" removal direction. The majority of blanks have twisted profiles – 25 pieces. The other types of profiles are represented by: flat – 7 pieces; incurvate medial – 14 pieces; and, unidentifiable – 3 pieces.

Only 3 microliths are represented by complete pieces: Dufour bladelet on bladelet with alternate retouch (length – 3.6 cm); Dufour bladelet on microblade with alternate retouch (length – 3.7 cm); and, pseudo-Dufour bladelet on bladelet with bilateral

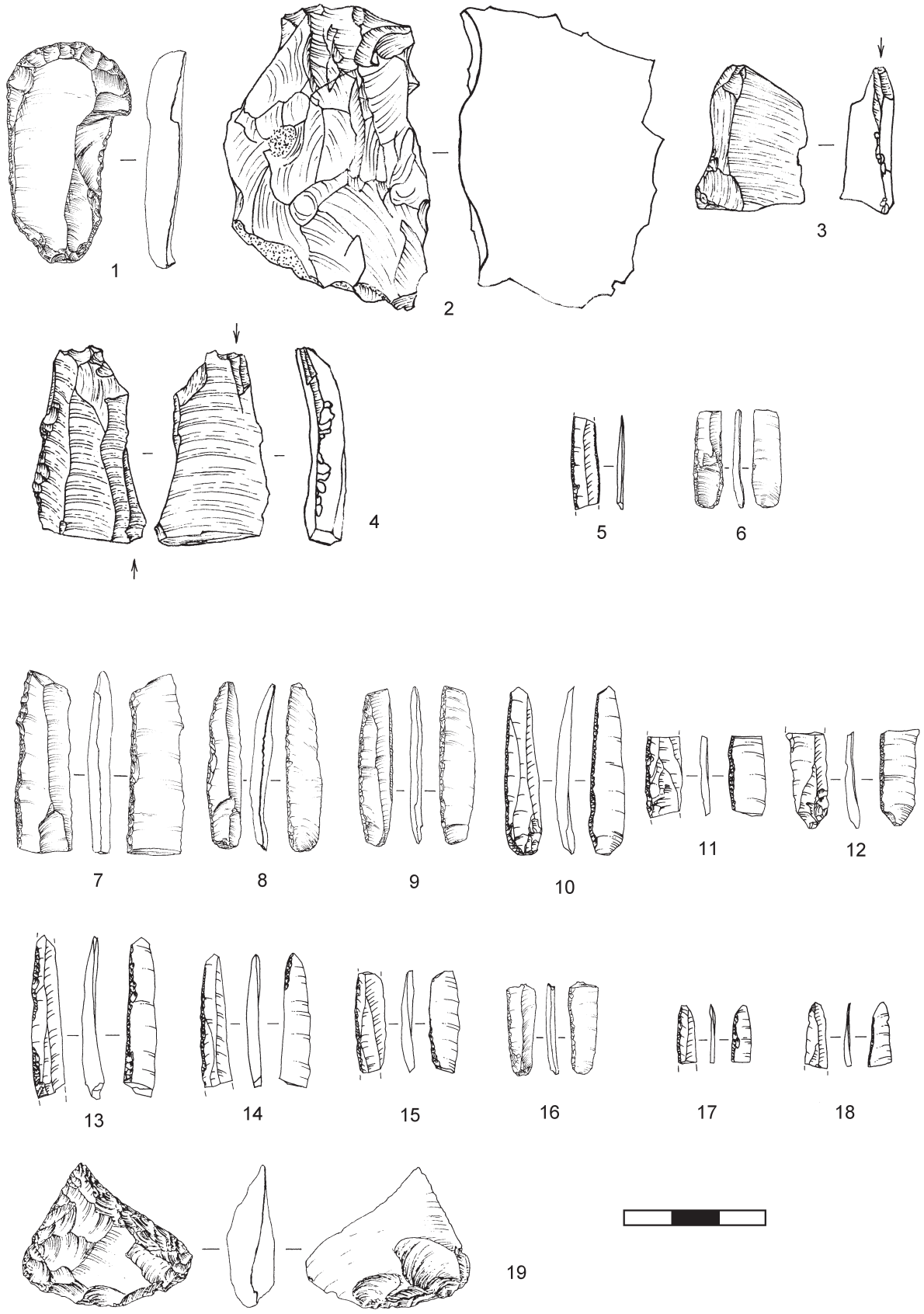

Figure 3 - Siuren I. Unit G, level Gd. Flint Artifacts – Tools. 1, end-scraper on a retouched piece (a flake); 2, carinated end-scraper; 3, angle burin; 4, double mixed (on truncation and angle) burin; 5, pseudo-Dufour type bladelet, on microblade with bilateral dorsal retouch; 6, bilaterally backed microblade; 7-12, Dufour type bladelet, on bladelets with alternate retouch; 13-18, Dufour type bladelet, on microblades with alternate retouch; 19, Middle Paleolithic sub-triangular dorsal point with basal ventral thinning (complete).

Groups & Types	Ga	Gb1-Gb2	Gc1-Gc2	Gd	TOTAL
BIFACIAL TOOLS			**3**		**3**
Point semi-leaf / triangular with a concave base			1		1
(pseudo "bi-convex" - multiple "plano-convex")					
Scraper single edged straight ("plano-convex")			1		1
Unidentifiable foliate piece - medial part ("plano-convex")			1		1
UNIFACIAL TOOLS		**3**	**10**	**1**	**14**
Points			3		4
- sub-triangular dorsal *with basal ventral thinning*				1	
- sub-leaf dorsal *with distal and basal ventral thinnings*			1		
- unidentifiable - distal tips			2		
Scrapers		2	7		9
Complete:			*4*		
- elongated semi-trapezoidal dorsal scraper			1		
with basal ventral and lateral dorsal thinnings					
- semi-trapezoidal dorsal			1		
- semi-trapezoidal ventral			1		
- semi-crescent dorsal			1		
Fragmented:		*2*	*3*		
- simple straight dorsal (*longitudinally fragmented*			1		
proximal part of a flake)					
- double straight-convex dorsal *with truncated-faceted*			1		
base (*proximal part of a flake*)					
- double convex dorsal *with basal ventral thinning*		1			
(*proximal part of a flake*)					
- semi-trapezoidal dorsal (*longitudinally fragmented flake*)		1			
- unidentifiable (*heavily burnt flint fragment*)			1		
Denticulated Pieces		1			1
- transversal convex dorsal *with basal dorsal and ventral*		1			
thinnings (*unidentifiable broken flake*)					
TOTAL		**3**	**13**	**1**	**17**

Table 46 - Siuren-I. Middle Paleolithic Tool Types Classification.

dorsal retouch (length – 3.3 cm). Three more broken microliths have the lengths more than 3.5 cm: 2 Dufour bladelet on bladelets with alternate retouch and 1 Dufour bladelet on microblade with alternate retouch.

Of 87 retouched edges, presented on 49 microliths, about 70 % were retouched by micro-scalar retouch. In addition, a relatively significant percentage of edges was produced by micro-stepped retouch – ca. 22 %. Among the latter, right edges clearly dominate. That is, micro-stepped retouch was mainly used on ventrally retouched edges of Dufour bladelets. Marginally retouched edges are represented by a few pieces. Semi-abruptly retouched edges comprise about 77 % of all modified edges on microliths. The percentage of semi-abrupt edges is slightly higher for right edges, while flat retouch is more common for left edges. About two-thirds of microlith edges have continuous retouch, although partially retouched edges are also important. At the same time, discontinuously retouched edges are represented by a very small number of pieces. In sum, non-geometric microliths are mainly represented by pieces with continuous semi-abrupt micro-scalar retouch and the total variability in retouch typology for microliths is similar, as described for alternatively retouched Dufour bladelet, which are the most common type of microliths in level Gd.

All 49 non-geometric microliths are made on gray flints (37 pieces) and colored flints (12 pieces).

"Neutral" tool types

These tools are represented only by two notched pieces.

Notched Pieces. Both are lateral dorsal with single notches formed by scalar steep retouch and made on broken blanks: a blade and a flake.

The blade of the first notched piece, as a blank, is a non-cortical distal fragment with unidirectional scar pattern, irregular shape, "on-axis" removal direction, twisted general profile, feathering distal end and triangular profile at midpoint. On gray flint, 2.7 cm long, 1.3 wide and 0.4 thick.

The flake of the second notched piece, as a blank, is a partially cortical distal fragment with insignificant lateral cortex and is only characterized by bidirectional scar pattern, converging shape, incurvate medial general profile, feathering distal end and multifaceted profile at midpoint. On gray flint, 5.0 cm long, 3.1 cm wide and 0.9 cm thick.

Retouched pieces

These include 8 blades (7 with marginal and one more with irregular retouch) and a flake with irregular retouch.

The single retouched flake has lateral dorsal irregular continuous retouch. The flake, as a blank, is a non-cortical complete one with unidirectional scar pattern, irregular shape, "off-axis"

		Dufour	Pseudo-Dufour	Krems points	N	%
LEVEL Ga						
	MARGINAL	1			1	6,67
LEFT EDGE	SCALAR	2	1	1	4	26,66
	STEPPED	1			1	6,67
	MARGINAL					
RIGHT EDGE	SCALAR	4	1	1	6	40
	STEPPED	3			3	20
TOTAL		**11**	**2**	**2**	**15**	**100**
LEVEL Gb1-Gb2						
	MARGINAL	6	1		7	9,1
LEFT EDGE	SCALAR	19	5		24	31,17
	STEPPED	8	1		9	11,69
	MARGINAL	5	1		6	7,79
RIGHT EDGE	SCALAR	16			16	20,78
	STEPPED	14	1		15	19,48
TOTAL		**68**	**9**		**77**	**100**
LEVEL Gc1-Gc2						
	MARGINAL	8	2	1	11	5,82
LEFT EDGE	SCALAR	49	3		52	27,51
	STEPPED	26	1	2	29	15,34
	MARGINAL	2	1	1	4	2,12
RIGHT EDGE	SCALAR	38	1		39	20,64
	STEPPED	51	1	2	54	28,57
TOTAL		**174**	**9**	**6**	**189**	**100**
LEVEL Gd						
	MARGINAL	2			2	2,29
LEFT EDGE	SCALAR	24	11		35	40,23
	STEPPED	5			5	5,75
	MARGINAL		4		4	4,59
RIGHT EDGE	SCALAR	21	6		27	31,03
	STEPPED	14			14	16,1
TOTAL		**66**	**21**		**87**	**100**

Table 47 - Siuren-I. Unit G. Non-Geometric Microliths: Retouch Types.

removal direction, twisted general profile, feathering distal end, irregular profile at midpoint and crushed butt. On gray flint, 2.3 cm long, 2.4 cm wide (shortened transversal proportions), 0.3 cm thick.

Seven blades with marginal continuous and/or discontinuous retouch are subdivided by retouch placement: 3 lateral dorsal pieces, 1 lateral and distal end dorsal piece and 3 bilateral dorsal pieces. These blades, as blanks, are 1 complete, 2 proximal fragments, 3 distal fragments and 1 distal fragment; all, except for one proximal fragment with insignificant lateral cortex, are non-cortical ones with only unidirectional scar pattern; 1 parallel, 1 convergent and 4 unidentifiable shapes; 2 "off-axis" and 4 unidentifiable removal directions; 1 flat, 2 incurvate medial, 1 twisted and 3 unidentifiable general profiles; only unidentifiable distal ends; 3 triangular, 2 trapezoidal and 2 multifaceted profiles at midpoints; 1 plain 0.7 x 0.2 cm butt (semi-lipped, semi acute angle, questionable abrasion), 1 punctiform butt (semi-lipped, semi-acute angle, with abrasion), 1 linear 0.4 x 0.1 cm butt (semi-lipped, semi-acute angle, with abrasion) and 3 unidentifiable missing butts. Six of these blades are on gray flints and only one blade is on colored flint. One complete blade is 4.1 cm long, 1.3 cm wide and 0.4 cm thick. The remaining six broken blades have the following ranges: length 1.5-2.9 cm, width 1.4-1.8 cm, thickness 0.2-0.6 cm.

One blade with irregular retouch is a lateral ventral broken one with partial retouch. The blade, as a blank, is a non-cortical proximal fragment with identifiable unidirectional scar pattern, incurvate medial general profile, trapezoidal profile at midpoint and punctiform butt (semi-lipped, semi-acute angle, with abrasion). On gray flint, 2.7 cm long, 1.6 cm wide and 0.4 cm thick.

Unidentifiable Tool Fragments

These include 5 non-cortical pieces and 2 pieces with some cortex. In terms of raw material types, there are 4 pieces of gray flints and 3 on colored flints. It is also possible to note that there are two non-cortical specimens on gray flints with stepped

		Dufour	Pseudo-Dufour	Krems points	N	%
LEVEL Ga						
LEFT EDGE	FLAT	2			2	13,33
	SEMI-ABRUPT	2	1	1	4	26,67
	ABRUPT					
RIGHT EDGE	FLAT					
	SEMI-ABRUPT	7	1	1	9	60
	ABRUPT					
TOTAL		**11**	**2**	**2**	**15**	**100**
LEVEL Gb1-Gb2						
LEFT EDGE	FLAT	7	3		10	12,99
	SEMI-ABRUPT	26	4		30	38,96
	ABRUPT					
RIGHT EDGE	FLAT	4			4	5,19
	SEMI-ABRUPT	31	2		33	42,86
	ABRUPT					
TOTAL		**68**	**9**		**77**	**100**
LEVEL Gc1-Gc2						
LEFT EDGE	FLAT	37	2		39	20,63
	SEMI-ABRUPT	46	4	3	53	28,05
	ABRUPT					
RIGHT EDGE	FLAT	17	2		19	10,05
	SEMI-ABRUPT	74	1	3	78	41,27
	ABRUPT					
TOTAL		**174**	**9**	**6**	**189**	**100**
LEVEL Gd						
LEFT EDGE	FLAT	6	6		12	13,79
	SEMI-ABRUPT	25	5		30	34,48
	ABRUPT					
RIGHT EDGE	FLAT	3	4		7	8,05
	SEMI-ABRUPT	32	6		38	43,68
	ABRUPT					
TOTAL		**66**	**21**		**87**	**100**

Table 48 - Siuren-I. Unit G. Non-Geometric Microliths: Retouch Angle.

semi-steep retouch, which could be conventionally interpreted as lateral fragments either of Middle Paleolithic type unifacial scrapers or Upper Paleolithic type heavily retouched blades.

Non-Flint Tools

These include a battered piece (*pièce à mâchures*)-grinding tool on a limestone pebble fragment and a chopper-grinding tool on a limestone pebble.

The first tool is on a large longitudinally fragmented half of a limestone pebble (length – 10.9 cm, width – 8.1 cm, thickness – 3.0 cm) with battering bifacial wear around all edges, leading to its identification as a battered piece, as well as a series of long and shallow striations, and numerous traces of ochre on the natural primary surface of the pebble, suggesting possible use as a color grinding tool as well.

The second tool is on a large limestone pebble with transversal proportion (length – 7.7 cm, width – 11.5 cm, thickness – 5.4 cm). It has both chopper-like unifacial rough treatment on the wide transversal edge and evidence of its function in color grinding given the presence of long and shallow striations, numerous traces of ochre and battering traces on the natural primary surface of the pebble.

Thus, both of these non-flint tools appear to be multifunctional tools with specific uses that are not usually typical of "regular" flint tools.

Middle Paleolithic tool types

The Middle Paleolithic only tool (fig. 3:19) is a unifacial subtriangular dorsal point with basal ventral thinning on a complete flake. A sharp tip of the point was created by the convergence of two heavily retouched edges. Both of these edges have stepped retouch, one with semi-steep angle and the other with steep angle. The stepped steep edge is slightly concave, but does not create a hook-like shape for the point, as the stepped

		Dufour	Pseudo-Dufour	Krems points	N	%
LEVEL Ga						
LEFT EDGE	CONTINUOUS	4	1	1	6	40
	DISCONTINUOUS					
	PARTIAL					
RIGHT EDGE	CONTINUOUS	4	1	1	6	40
	DISCONTINUOUS					
	PARTIAL	3			3	20
TOTAL		**11**	**2**	**2**	**15**	**100**
LEVEL Gb1-Gb2						
LEFT EDGE	CONTINUOUS	24	5		29	37,66
	DISCONTINUOUS		1		1	1,3
	PARTIAL	9	1		10	12,99
RIGHT EDGE	CONTINUOUS	26	1		27	35,07
	DISCONTINUOUS	2			2	2,59
	PARTIAL	7	1		8	10,39
TOTAL		**68**	**9**		**77**	**100**
LEVEL Gc1-Gc2						
LEFT EDGE	CONTINUOUS	57	6	1	64	33,86
	DISCONTINUOUS	8		1	9	4,76
	PARTIAL	18		1	19	10,05
RIGHT EDGE	CONTINUOUS	63	3	3	69	36,51
	DISCONTINUOUS	5			5	2,65
	PARTIAL	23			23	12,17
TOTAL		**174**	**9**	**6**	**189**	**100**
LEVEL Gd						
LEFT EDGE	CONTINUOUS	21	5		26	29,89
	DISCONTINUOUS	5	1		6	6,89
	PARTIAL	5	5		10	11,49
RIGHT EDGE	CONTINUOUS	26	4		30	34,48
	DISCONTINUOUS	3	1		4	4,61
	PARTIAL	6	5		11	12,64
TOTAL		**66**	**21**		**87**	**100**

Table 49 - Siuren-I. Unit G. Non-Geometric Microliths: Retouch Features.

semi-steep edge is straight, not convex. The flake, as a blank, is a non-cortical one of converging shape, "off-axis" removal direction and flat general profile. On gray flint, 2.5 cm long, 3.2 cm wide (shortened, transversal proportions), 0.9 cm thick. In F. Bordes' terminology, this tool would be most likely defined as an "atypical" Mousterian point.

Level Gc1-Gc2

Tools are represented by 210 artifacts with distribution into seven groups: 1) Indicative Upper Paleolithic types – 22 pieces/10.5%; 2) Non-Geometric Microliths – 117 pieces/55.7%; 3) "Neutral" types – 5 pieces/2.4%; 4) Retouched Pieces – 39 pieces/18.6%; 5) Unidentifiable Tool Fragments – 12 pieces/5.7%; 6) Non-Flint Tools – 2 pieces/0.9%; 7) Middle Paleolithic types – 13 piece/6.2%.

Indicative Upper Paleolithic tool types

These include 5 end-scrapers, 7 burins, 2 composite tools, 2 truncations, 4 retouched blades and 2 scaled tools.

End-scrapers. These are represented by 3 simple, 1 double and 1 carinated.

All simple end-scrapers are on complete blades with lateral and/or bilateral dorsal irregular partial retouch (fig. 4:1-3). The three fronts are convex, located on the dorsal distal surface and in two cases were formed by convergent scalar semi-steep and steep retouch and the third by convergent sub-parallel steep retouch. The blades, as blanks, are partially cortical ones with insignificant lateral cortex and are morphologically characterized by the following features: 3 unidirectional scar patterns; 2 parallel and 1 expanding shapes; 3 "on-axis" removal directions; 2 incurvate medial and 1 twisted general profiles; 3 unidentifiable as retouched distal ends; 2 trapezoidal and 1 multifaceted profiles at midpoint; 2 linear (0.2 x 0.1 cm and 0.5 x 0.1 cm) butts (semi-lipped, semi-acute angles, with abrasion) and 1 crushed butt. All these 3 simple end-scrapers are on colored flints and have the following metrics: length – 6.1 cm, 4.9 cm, 4.0 cm; width – 2.1 cm, 1.6 cm, 1.3 cm; thickness – 0.5 cm, 0.6 cm, 0.6 cm, respectively.

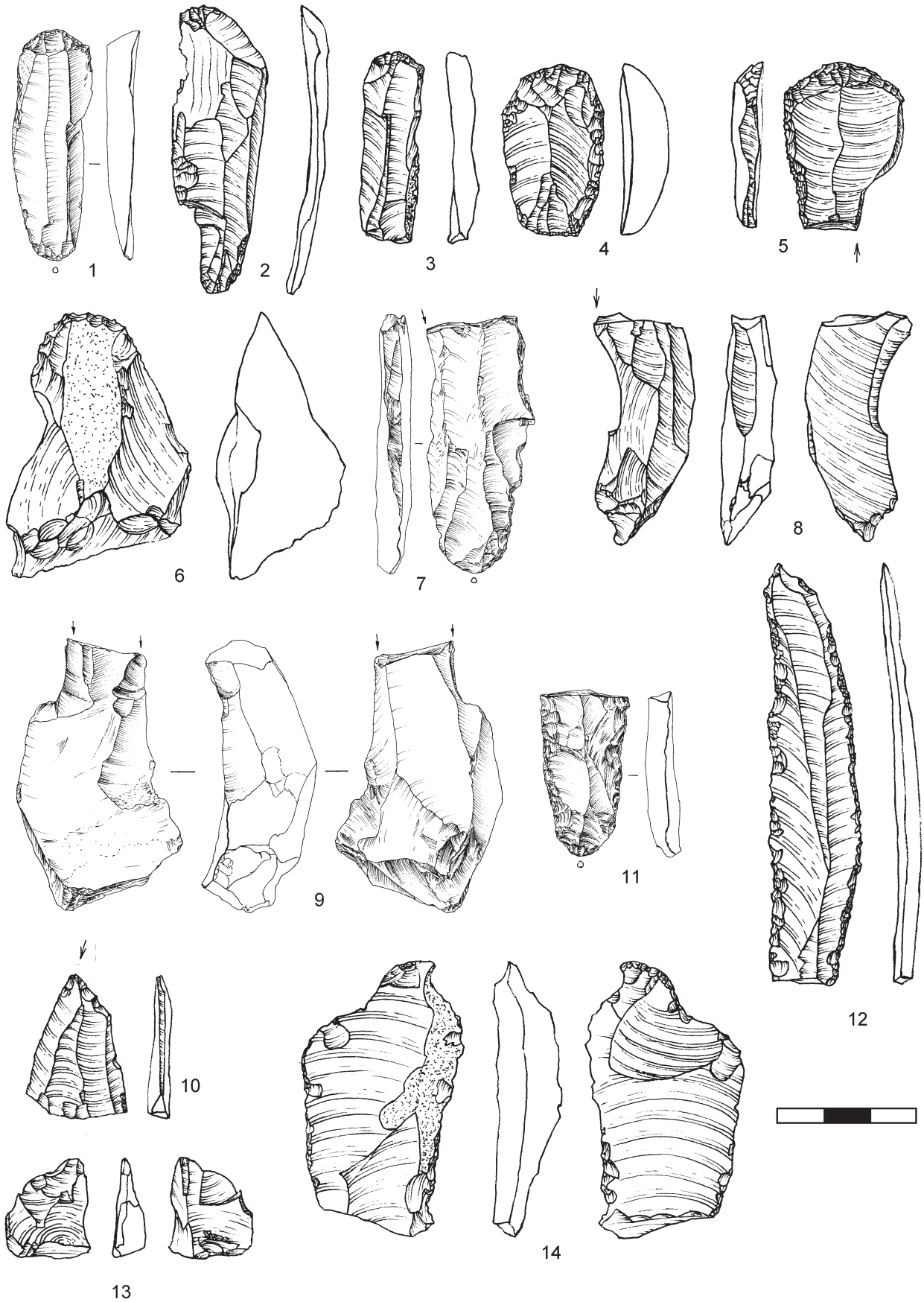

Figure 4 - Siuren I. Unit G, level Gc1-Gc2. Flint Artifacts – Tools. 1-3, flat simple end-scrapers on blades; 4, double end-scraper; 5, end-scraper/burin; 6, carinated end-scraper; 7, angle burin; 8, perforator/burin; 9, double angle burin; 10, burin on truncation; 11, retouched blade with bilateral dorsal Aurignacian-like retouch; 12, retouched blade with bilateral dorsal marginal continuous and discontinuous retouch; 13-14, scaled tools.

The double end-scraper (fig. 4:4) is on a complete flake with lateral dorsal scalar semi-steep retouch. The two fronts (one convex and one straight) are located opposite one another at the proximal and distal ends of the flake's dorsal surface and both have convergent sub-parallel steep retouch. The flake, as a blank, is non-cortical with unidirectional scar pattern, expanding shape, "on-axis" removal direction, twisted general profile, distal end and butt unidentifiable as retouched, triangular profile at midpoint. On colored flint, 3.6 cm long, 2.2 cm wide and 1.0 cm thick.

The carinated end-scraper (fig. 4:6) is on a thick partially cortical chunk. The front is convex, formed by non-convergent sub-parallel steep lamellar retouch (microblade negatives). Secondary treatment of the tool is clearly unfinished, due to longitudinal breakage during the retouch phase (the broken parts were refitted). The chunk, as a blank, is on gray flint and 5.6 cm long, 3.5 cm wide, 2.5 cm thick.

Burins. These include 2 angle, 1 on truncation, 1 double angle and 3 broken specimens.

The first angle burin (fig. 4:7) is on a broken blade with lateral dorsal marginal continuous retouch. The burin termination is on the blade's distal break from which two burin blows were made along one retouched lateral edge. The blade, as a blank, is a non-cortical proximal fragment of a re-crested blade with unilateral partial crested ridge. It also has the following identifiable morphological features: unidirectional scar pattern, twisted general profile, multifaceted profile at midpoint and plain (0.6 x 0.2 cm) butt (semi-lipped, semi-acute angle, with abrasion). On gray flint, length – 5.4 cm, width – 2.2 cm, thickness – 0.6 cm.

The second angle burin is on a complete blade. The burin termination is on the proximal end (crushed butt) of a blade from which a single burin blow was made. The blade, as a blank, is non-cortical with bidirectional scar pattern, irregular shape, "on-axis" removal direction, flat general profile, unidentifiable distal end, trapezoidal profile at midpoint and crushed butt. On gray flint, 3.2 cm long, 1.3 cm wide, 0.5 cm thick.

The burin on truncation (fig. 4:10) is on a broken blade with lateral dorsal marginal partial retouch. The burin termination is a straight oblique truncation on the blade's distal end and has a single burin facet struck off the blade's unretouched lateral edge. The burin termination is also interesting as it was probably initially a pointed blade, by scalar semi-steep retouch, on which the burin was made. It is necessary to note that the case under discussion is not "a burin-like damage" of a pointed blade with projectile function. The blade, as a blank, is a non-cortical distal fragment with unidirectional scar pattern, convergent shape and multifaceted profile at midpoint. On slightly burnt colored flint, 3.1 cm long, 2.1 cm wide and 0.4 cm thick.

The double angle burin (fig. 4:9) is on a broken flake. The burin termination is on the flake's proximal break from which two burin blows each were made along both lateral edges. One of the detached burin spalls was refitted to the burin and it has all of the typical morphological features of a burin spall. The flake, as a blank, is a non-cortical distal fragment with unidirectional-crossed scar pattern, irregular shape, "off-axis" removal direction, incurvate medial general profile, blunt distal end and trapezoidal profile at midpoint. On gray flint, 5.4 cm long, 3.1 cm wide and 1.7 cm thick.

Three broken burins are characterized as such by the absence of burin terminations for two and the heavily burnt unidentifiable nature of the third piece. It is thus not possible to identify specific burin types for these broken burins. The blank of the third burin is a heavily burnt unidentifiable piece on colored flint. The blanks of the other two burins are partially cortical blades: medial and distal fragments. The medial fragment has insignificant lateral cortex and is characterized by unidirectional scar pattern, flat general profile and trapezoidal profile at midpoint. On gray flint, 3.9 cm long, 1.9 cm wide, 1.1 cm thick. The distal fragment has insignificant lateral/distal cortex and is characterized by bidirectional scar pattern, irregular shape, "on-axis" removal direction, incurvate medial general profile, blunt distal end and multifaceted profile at midpoint. On gray flint, 4.3 cm long, 1.9 cm wide, 1.6 cm thick.

Composite Tools are represented by an end-scraper/burin and a perforator/burin.

The *end-scraper/burin* (fig. 4:5) is on a broken flake. The end-scraper's front is convex, formed on the flake's dorsal surface proximal end by non-convergent scalar steep retouch. One lateral edge has a clear burin facet that evidences burin manufacture from the distal end of the flake. Unfortunately, the burin termination is missing due to breakage either during production or use and, therefore, this burin could only be identified as broken. The tool's other lateral edge (with no burin facet) has dorsal scalar steep continuous retouch that is probably necessary to consider along with the end-scraper part of this composite tool. If so, the end-scraper should be classified as an end-scraper on retouched piece. The flake, as a blank, is a non-cortical proximal part and is only morphologically characterized by unidirectional scar pattern and triangular profile at midpoint, as the proximal end (butt) is retouched. On colored flint, 3.6 cm long, 2.6 cm wide, 0.7 cm thick.

The *perforator/burin* (fig. 4:8) is on a broken blade. The retouch forming the perforator's tip is alternative scalar semi-steep and converges from both lateral edges at the distal end of the blade. The burin termination is on the blade's proximal break from which one burin blow was made. Thus, this is an angle type. The blade, as a blank, is a non-cortical truly secondary crested (with no preserved crested ridge) distal fragment with unidirectional scar pattern, converging shape, "off-axis" removal direction, twisted general profile, blunt distal end and multifaceted profile at midpoint. On gray flint, 5.0 cm long, 1.8 cm wide, 1.0 cm thick.

Truncations are represented by 2 pieces.

Both the tools have an oblique truncated termination formed by scalar steep retouch at the proximal end of a broken blade and the distal end of a complete flake. The blade, as a blank, is a non-cortical proximal fragment with only identifiable unidirectional scar pattern, flat general profile at midpoint. It is a

gray flint, 2.1 cm long, 1.5 cm wide, 0.2 cm thick. The flake, as a blank, is partially cortical with significant lateral cortex and is morphologically characterized by unidirectional scar pattern, irregular shape, "on-axis" removal direction, incurvate distal profile at midpoint and punctiform (0.3 x 0.1 cm) butt (semi-lipped, semi-acute angle, with abrasion). On gray flint, 2.7 cm long, 1.9 cm wide, 0.5 cm thick.

Retouched Blades include 4 broken pieces with bilateral dorsal scalar semi-steep retouch.

One (fig. 4:11) can be defined as an Aurignacian-like retouched blade due to its regular continuous and invasive scalar semi-steep retouch. The blade, as a blank, is a non-cortical proximal fragment with unidirectional scar pattern, twisted general profile, triangular profile at midpoint and plain (0.5 x 0.2 cm) butt (lipped, semi-acute angle, with abrasion). On gray flint, 3.5 cm long, 1.9 cm wide and 0.6 cm thick.

Two more retouched blades, as blanks, are non-cortical and partially cortical with insignificant lateral cortex medial fragments. They have the following morphological features: 2 unidirectional scar pattern, 2 flat general profile, 1 triangular and 1 multifaceted profiles at midpoint. They are on colored flints, 1.5 cm long, 1.8 cm wide, 0.4 cm thick and 5.2 cm long, 2.4 cm wide, 0.6 cm thick.

Another retouched blade, as a blank, is a non-cortical distal fragment with the following morphological features: unidirectional scar pattern, twisted general profile and triangular profile at midpoint. On colored flint, 3.8 cm long, 1.6 cm wide, 0.3 cm thick.

Scaled Tools include 2 items differing in preservation.

One piece (fig. 4:13) is a typical example with two opposing extremities/poles at the proximal (near the butt) and distal ends of a small complete flake with pronounced bifacial scaling. The flake, as a blank, is non-cortical with, due to the heavy scaling, the following characteristics: irregular shape, "on-axis" removal direction, flat general profile and plain (1.3 x 0.6 cm) butt (semi-lipped, semi-acute angle, with no abrasion). On gray flint, 2.1 cm long, 1.7 cm wide, 0.6 cm thick.

The second piece (fig. 4:14) is on a large broken blade with missing proximal end. Nevertheless, the distal end has clear heavy bifacial scaling extremity/pole that points to its definite identification as a scaled tool type. The missing proximal part of the tool could be with caution explained by breakage during tool use. The blade, as a blank, is a partially cortical distal fragment with insignificant lateral cortex and has the following definable morphological features: unidirectional scar pattern, parallel shape, "on-axis" removal direction, incurvate medial general profile and triangular profile at midpoint. On colored flint: 6.0 cm long, 3.3 cm wide, 1.3 cm thick.

Non-Geometric Microliths

The assemblage of non-geometric microliths from level Gc1-Gc2 is the most abundant collection of microliths recovered during the 1990s excavations at Siuren I. They are represented by 117 items, or by 55.7% of all tools from level Gc1-Gc2. These are subdivided into Dufour bladelets – 91 pieces (77.8%); pseudo-Dufour bladelets – 11 pieces (9.4%); Krems points – 3 pieces (2.6%); bladelet with dorsal retouch at distal end – 1 (0.8%); bladelets with micro-notch – 6 pieces (5.1%); truncated bladelets – 2 pieces (1.7%); bitruncated bladelet – 1 piece (0.8%); microblade with micro-denticulated edge – 1 piece (0.8%); microblade with bilateral abrupt retouch – 1 piece (0.8%).

The Dufour bladelet type, on bladelets with alternate retouch (fig. 5:1-12) is composed of 26 pieces (22.2% of all microliths). All have dorsally retouched left edges and ventrally retouched right edges. Continuously retouched edges dominate – 31 edges of 52 available. Partially and discontinuously retouched edges are represented by 14 and 7 edges, respectively. Semi-abrupt retouch was identified on 30 edges, while flat retouch was used on 22 edges. Mainly flat retouch was employed for dorsally retouched left edges – 16 of 26 edges, while semi-abrupt retouch is more typical of ventrally retouched right edges – 20 of 26 edges. Micro-scalar and micro-stepped retouch were found in similar numbers of edges: 22 and 28 edges, respectively. In addition, two marginally retouched edges were identified.

In sum, edges with continuous semi-abrupt micro-stepped retouch combination (18 edges) are the most common for this microlith type. Other retouch combinations are represented by insignificant numbers of edges: continuous semi-abrupt micro-scalar – 2; continuous flat micro-stepped – 2; continuous flat micro-scalar – 9; continuous flat marginal –1; discontinuous semi-abrupt micro-scalar – 2; discontinuous flat micro-scalar – 2; discontinuous semi-abrupt micro-stepped – 2; discontinuous flat micro-stepped – 1; partial semi-abrupt micro-stepped – 4; partial flat micro-stepped – 3; partial flat marginal – 1; partial semi-abrupt micro-scalar – 2; partial flat micro-scalar – 3.

The Dufour bladelet type, on microblades with alternate retouch (fig. 5:13-29) is represented by 57 items. This includes about half of all non-geometric microliths – 48.7%. Except for one piece, Dufour bladelet on microblades have dorsally retouched left edges and ventrally retouched right edges. The exception is a piece with ventral retouch on both left (partial semi-abrupt micro-stepped) and right (partial semi-abrupt micro-scalar) edges. Its right edge was also dorsally treated by partial flat micro-scalar retouch. So, this tool appears to be a very unique combination of alternate and alternating methods of edge preparation. The other 56 microliths comprise 112 retouched edges. They are dominated by continuously retouched edges – 87 items. Discontinuously and partly retouched edges are represented by insignificant numbers: 6 and 19 edges. Also, semi-abrupt edges are dominant (84 items), while edges with flat retouch angle are relatively less common (28 items). Stepped and micro-scalar retouch were used in similar numbers of edges: 47 and 59. Marginal retouch was used in only 6 cases. So, there are two dominant combinations of retouch: continuous semi-abrupt stepped – 42 edges and continuous semi-abrupt micro-scalar – 28 edges. The other retouch combinations are rare: continuous flat micro-scalar – 14 edges; continuous flat marginal – 3; continuous semi-abrupt marginal – 1; discontinuous flat micro-scalar – 6; partial semi-abrupt micro-scalar – 8; partial semi-abrupt stepped – 5; partial flat micro-scalar – 4; and, partial flat marginal – 2.

Figure 5 - Siuren I. Unit G, level Gc1-Gc2. Flint Artifacts – Tools ("Non-Geometric Microliths"). 1-12, Dufour type bladelet, on bladelets with alternate retouch; 13-29, Dufour type bladelet, on microblades with alternate retouch; 30, Dufour type bladelet, on microblade with ventral retouch; 31, pseudo-Dufour type bladelet, on microblade with dorsal retouch; 32, pseudo-Dufour type bladelet, on microblade with bilateral dorsal retouch; 33, Krems point, on bladelet with alternate retouch; 34, Krems point, on microblade with bilateral dorsal retouch; 35, bladelet with micro-notch; 36, truncated bladelet; 37, bitruncated bladelet.

The Dufour bladelet type, on bladelets with ventral retouch is represented by 3 pieces (2.6% of all microliths). All have retouch on right edge. Two edges are retouched by partial flat micro-scalar, and one more edge – by partial semi-abrupt micro-scalar retouch.

The Dufour bladelet type, on microblades with ventral retouch (fig. 5:30) is characterized 5 pieces (4.3% of all microliths). Left ventrally retouched edges demonstrate 5 different combinations of retouch types: continuous semi-abrupt micro-scalar; continuous semi-abrupt marginal; continuous flat micro-stepped; partial semi-abrupt micro-stepped; partial flat micro-scalar.

The Pseudo-Dufour bladelet type, on bladelets with dorsal retouch is composed of 2 pieces (1.7% of all microliths). These bladelets show both different placement and different combinations of retouch. One has continuous semi-abrupt marginal retouch on the left edge, while the other has continuous flat micro-scalar on the right edge.

The Pseudo-Dufour bladelet type, on microblades with dorsal retouch (fig. 5:31) is represented by 3 pieces (2.6% of all microliths). All have retouch on the left edge. Two microliths were made by continuous semi-abrupt micro-scalar retouch and the third microblade has continuous flat micro-scalar retouch.

The Pseudo-Dufour bladelet type, on bladelets with bilateral dorsal retouch is known through 4 pieces (3.4% of all microliths). All 8 edges of the four microliths are continuously retouched. Five edges have semi-abrupt retouch; one edge is abruptly retouched and two other edges have flat retouch. Micro-stepped (3 edges) and micro-scalar (3 edges) retouched edges are represented by the same number of items. Two other edges have by flat retouch. The following retouch combinations are identified: continuous semi-abrupt micro-stepped – 1 edge; continuous abrupt micro-scalar – 1 edge; continuous semi-abrupt micro-scalar – 2 edges; continuous semi-abrupt marginal – 2 edges; continuous flat micro-stepped – 2 edges.

The Pseudo-Dufour bladelet type, on microblades with bilateral dorsal retouch (fig. 5:32) is represented by 2 pieces (1.7% of all microliths). One of these microliths has partial flat micro-scalar retouch on both edges, while the other has continuous semi-abrupt micro-stepped retouch on both edges.

The Krems point type, on bladelet with alternate retouch (fig. 5:33) is represented by 1 piece (0.8% of all microliths). The left edge of the point is dorsally retouched by discontinuous abrupt micro-stepped retouch, while the right edge is inversely retouched by continuous semi-abrupt micro-stepped retouch.

The Krems point type, on microblades with bilateral dorsal retouch (fig. 5:34) is composed of 2 pieces (1.7 % of all microliths). Both edges of the first point have continuous semi-abrupt micro-stepped retouch. The left edge of the second point has partial semi-abrupt micro-stepped retouch, while the right edge has continuous semi-abrupt micro-stepped retouch.

Bladelets with dorsal retouch at distal end are represented by 1 piece. The distal end of this bladelet has continuous flat micro-scalar retouch.

Bladelets with micro-notch (fig. 5:35) are represented by 6 pieces. Three of these microliths have retouched notches on the dorsal side of their left edges. The other three have retouched notches on the ventral side of their right edges. Dorsal notches were produced by semi-abrupt micro-scalar (2 pieces) and flat micro-scalar (1 piece) retouch combinations. All of the ventral notches were made by a semi-abrupt micro-scalar combination of retouch.

Truncated bladelets (fig. 5:36) are represented by 2 pieces. Distal ends of these bladelets were truncated by abrupt micro-stepped retouch.

Bitruncated bladelet – 1 piece (fig. 5:37). Both its distal and proximal ends are truncated by abrupt micro-stepped retouch.

Microblade with micro-denticulated edge – 1 piece. The piece's left lateral edge has continuous semi-abrupt stepped wavy retouch.

Microblade with bilateral abrupt dorsal retouch – 1 item. Both lateral edges have a partial abrupt micro-scalar retouch combination.

Forty six bladelets and 71 microblades were used for non-geometric microlith production. The majority of selected blanks were removed "on-axis" – 103 pieces. Two blanks were removed "off-axis". For twelve other pieces, "axis" removal direction cannot be identified. Blanks with twisted general profile dominate – 54 pieces. In addition, there is an important number of bladelets and microblades with incurvate medial general profile – 37 pieces. Both flat and unidentifiable blanks' general profiles are rare and represented by 18 and 8 pieces.

Two microliths are represented by complete pieces. Both are Dufour bladelets on microblades with alternate retouch (lengths – 2.2 and 2.5 cm). The longest microlith is a broken Dufour bladelet on bladelet with alternate retouch (length is > 4.0 cm). Very few fragmented microliths are longer 3.0 cm, but include Dufour bladelets on bladelets with alternate retouch – 4 pieces and a Dufour bladelet on microblade with alternate retouch – 1 piece. The remaining broken microliths range from 0.5 cm to 2.9 cm long.

Of 204 retouched edges, represented by 114 microliths (excluding 3 truncated pieces), about 48% have micro-scalar retouch. Micro-stepped retouched edges are also important – about 44% of all edges. Marginal retouch was employed on 12 edges. The semi-abrupt retouch angles (138 items) clearly dominate among the retouch angles. Flat retouched edges (62 items) are also relatively common. On the other hand, abrupt retouch was identified on only 4 edges. About 70 % of edges (142 edges) are continuously retouched. Discontinuous and partial retouch are represented by 14 and 48 edges.

Overall, 18 retouch combinations were identified for 204 microlith edges. The most common is continuous semi-abrupt micro-stepped retouch – 67 edges. Next, we see continuous semi-abrupt micro-scalar retouched edges (35) and continuous flat marginal retouched edges (25). Also, partial semi-abrupt micro-scalar, partial semi-abrupt micro-stepped and partial flat micro-scalar retouched edges relatively numerous – 16, 11

and 13, respectively. The remaining retouch combinations are represented by insignificant numbers of edges: continuous flat marginal – 4; continuous semi-abrupt marginal – 5; continuous flat micro-stepped – 5; continuous abrupt micro-scalar – 1; discontinuous flat micro-scalar – 8; discontinuous semi-abrupt micro-stepped – 2; discontinuous flat micro-stepped – 1; discontinuous semi-abrupt micro-scalar – 2; discontinuous abrupt micro-stepped – 1; partial flat marginal – 3; partial flat micro-stepped – 3; partial abrupt micro-scalar – 2.

All 117 non-geometric microliths are made on the following raw material types: gray flints (82 pieces), colored flints (34 pieces), black flints (1 piece).

"Neutral" tool types
These tools are represented only by notched pieces (5 items).

Notched Pieces. There are 3 notched pieces on blades and 2 on flakes with scalar semi-steep retouch.

Three notched pieces on blades are represented by two types: 2 lateral dorsal and 1 lateral ventral. The blades, as blanks, are all non-cortical pieces but two are complete and one is a distal fragment. They have the following morphological features: 3 unidirectional scar patterns; 2 parallel and 1 irregular shapes; 3 "on-axis" removal directions; 1 incurvate medial, 1 incurvate distal and 1 convex general profiles; 2 feathering and 1 blunt distal ends; 2 triangular and 1 multifaceted profiles at midpoint; 2 finely faceted (0.8 x 0.3 and 0.6 x 0.2 cm) butts (2 semi-lipped, 2 right angles, 2 with abrasion) and 1 missing butt. All 3 pieces are on colored flints with the following metrics: 4.3 x 1.6 x 0.8 cm, 3.2 x 1.5 x 0.6 cm, 2.6 x 1.4 x 0.4 cm.

Two notched pieces on flakes differ by placement of retouch notches: distal dorsal and lateral ventral. The flakes, as blanks, are complete: a non-cortical item and a partially cortical item with insignificant lateral cortex. Morphologically, they have 1 unidirectional and 1 3-directional scar patterns; 1 parallel and 1 expanding shapes; 2 "on-axis" removal directions; 1 incurvate distal and 1 convex general profiles; 1 feathering and 1 hinged distal ends; 1 multifaceted and 1 irregular profiles at midpoint; 1 crushed and 1 finely faceted (1.7 x 0.5 cm) butt (semi-lipped, right angle, with abrasion). Both pieces are on gray flint with following dimensions: 2.5 x 1.5 x 0.4 cm and 3.3 x 3.7 x 0.9 cm.

Retouched pieces
There are 27 retouched blades, 11 retouched flakes and 1 retouched chunk. Taking into account such a large sample, the retouched pieces will be described by the three groups represented.

The retouched chunk has irregular partial retouch. On gray flint with insignificant cortex.

The retouched flakes are subdivided by retouch and placement. Four flakes have marginal continuous and/or partial retouch with only lateral dorsal placement. Seven other flakes have irregular continuous and/or partial retouch with the following placement: lateral dorsal – 4 pieces, bilateral dorsal – 1 piece, distal dorsal – 1 piece, distal + lateral ventral – 1 piece. Morphologically, all 11 retouched flakes are characterized by the following features: 9 complete and 2 distal fragments; 2 cortical, 5 partially cortical with only insignificant distal (3), lateral (1) and central (1) cortex, and 4 non-cortical pieces; 2 unidirectional, 3 unidirectional-crossed; 2 bidirectional, 1 lateral and 3 unidentifiable scar pattern; 5 expanding, 5 irregular and 1 unidentifiable shapes; 9 "off-axis" and 2 unidentifiable removal directions; 3 flat, 5 incurvate medial, 2 incurvate distal and 1 unidentifiable general profiles; 4 feathering, 2 hinged, 3 blunt, 1 overpassed and 1 unidentifiable distal ends; 5 irregular, 3 multifaceted, 1 triangular, 1 lateral steep and 1 unidentifiable profiles at midpoint; 2 plain (1.0 x 0.4 cm and 0.4 x 0.3 cm) butts (semi-lipped, semi-acute angle, with no abrasion), 1 crudely-faceted (4.0 x 1.0 cm) butt (semi-lipped, right angle, with no abrasion), 4 crushed butts, 3 missing butts and 1 core tablet. These 11 retouched flakes are on 10 gray flints and on 1 colored flint (the core tablet). Their dimensions have the following ranges: length – 2.3-6.5 cm, width – 2.5-5.5 cm (3 with shortened, transversal proportions) and thickness – 0.6-1.6 cm.

The retouched blades are typologically subdivided into 22 pieces with marginal continuous, discontinuous and partial retouch, 3 pieces with irregular partial retouch and 2 pieces with marginal and irregular partial retouch. Placement of these retouch types on the retouched blades is as follows: lateral dorsal – 15 pieces, lateral ventral – 5 pieces, bilateral dorsal – 4 pieces, distal dorsal – 2 pieces, proximal dorsal – 1 piece. Morphologically, all 27 retouched blades are characterized by the following features: 7 complete, 12 proximal fragments, 4 medial fragments and 4 distal fragments; 19 non-cortical pieces, 4 partially cortical pieces with significant amount of lateral (2) and proximal + lateral (2) cortex and 4 partially cortical pieces with insignificant proximal (1) and lateral (3) cortex; 21 unidirectional, 4 bidirectional and 2 lateral scar patterns; 5 parallel, 4 converging, 4 expanding and 14 unidentifiable shapes; 1 "on-axis", 8 "off-axis" and 18 unidentifiable removal directions; 2 flat, 5 incurvate medial, 1 incurvate distal, 12 twisted and 7 unidentifiable general profiles; 7 feathering, 2 blunt and 18 unidentifiable distal ends; 5 triangular, 13 trapezoidal, 8 multifaceted and 1 irregular profiles at midpoint; 8 plain butts (6 semi-lipped and 2 lipped; 5 semi-acute, 2 acute and one right angles; 7 with abrasion and one with no abrasion) with dimensions in the ranges – 0.7-0.3 x 0.4-0.2 cm; 1 punctiform butt (semi-lipped, semi-acute angle, with abrasion); 4 linear butts (only – semi-lipped, semi-acute angle, with abrasion) with dimensions 0.7-0.2 x 0.1 cm, 5 crushed and 9 missing butts. Fifteen retouched blades are on gray flints and other 12 retouched blades are on colored flints, including 2 burnt. Six complete blades have such sizes ranges: length – 3.1-5.2 cm, width – 1.5-1.8 cm and thickness – 0.3-0.6 cm, while one more non-complete non-cortical blade is significantly larger: length – 6.4 cm, width – 2.8 cm and thickness – 0.8 cm. Eighteen fragmented retouched blades have the following ranges: length – 1.2-5.7 cm, width – 1.2-1.9 cm for 16 blades, and 2.7 cm for two other blades, thickness – 0.3-0.6 cm for 16 blades, and 0.7 cm and 1.0 cm for two other blades. The remaining two fragmented retouched blades deserve some special comments due to their size that clearly stands apart from the others. One proximal fragment is 6.4 cm long, 3.3 cm wide (!) and 0.8 cm thick. One distal fragment with bilateral dorsal marginal continuous and discontinuous retouch is 9.1 cm long (!), 1.9 cm wide and 0.4 cm thick (fig. 4:12).

Unidentifiable Tool Fragments
They are represented by 12 items of which 8 are non-cortical and 4 have some cortex; nine are on gray flints, including one burnt, and three others are on burnt colored flints.

Non-Flint Tools
These include a limestone cortical flake from a grinding tool and a chopper/grinding tool on a limestone pebble. The first tool is identified as a small flake (length – 3.2 cm, width – 3.9 cm, thickness – 0.9 cm) from a limestone pebble which has a series of long and deep striations on its natural primary surface: evidence of its function as a grinding tool. The second tool is very similar to the chopper/grinding tool described in level Gd. So, on a large limestone pebble with transversal proportions (length – 7.9 cm, width – 8.7 cm, thickness – 3.5 cm) where the wide transversal edge is roughly prepared by unifacial treatment as a chopper and the natural pebble primary surface has a series of long and shallow striations, numerous marks of ochre and battering wear that evidence its additional function as a color grinding tool.

Middle Paleolithic tool types
There are 10 unifacial and 3 bifacial tools.

Unifacial tools include 3 points and 7 scrapers.

The unifacial points are represented by 1 complete piece and 2 distal tips.

The complete unifacial point (fig. 6:1) is a sub-leaf dorsal point with distal and basal ventral thinning on a shortened, transversal flake. This tool has heavy invasive scalar and stepped semi-steep retouch around the perimeter of the dorsal surface. The flake, as a blank, is non-cortical with only flat general profile identifiable, due to heavy retouch. On gray flint and 3.5 x 6.6 x 1.3 cm, although the flake's initial size was certainly reduced during retouching processes.

Both distal tips of unifacial points (fig. 6:2-3) could only be described by the presence of pointed termination formed by invasive scalar semi-steep dorsal retouch. They are on gray flints with length 2.6 and 1.9 cm.

The unifacial scrapers are represented by 4 complete pieces (all of *déjeté* type according to F. Bordes terminology), 2 fragmented pieces and 1 identifiable item. Taking into consideration clear differences in either shape or secondary treatment, all scrapers are described individually.

A semi-trapezoidal dorsal scraper (fig. 6:4) is on a complete bifacial shaping flake. This scraper has two retouched edges which are connected in a pointed but thick tip. One retouched edge (the blank's left lateral) bears a stepped semi-steep retouch, while another retouched edge (the blank's transversal edge) has a stepped steep retouch. The flake, as a blank, is a non-cortical one with 3-directional scar pattern, expanding (trapezoidal) shape, "off-axis" removal direction, incurvate medial general profile, unidentifiable because of retouch distal end, irregular profile at midpoint, finely faceted (2.7 x 0.7 cm) butt (lipped, acute angle, with no abrasion). Presence of finely faceted lipped butt with acute angle allow us to define this flake as bifacial treatment one and absence of the butt abrasion additionally points on its initial shaping characteristics of a bifacial tool production. On gray flint, 2.8 cm long, 4.0 cm wide (shortened, transversal proportions) and 1.0 cm thick.

An elongated semi-trapezoidal dorsal scraper with basal ventral and lateral dorsal thinning (fig. 6:5) is on a complete flake. The scraper's two retouched edges (left lateral and transversal) have the same kind of stepped semi-steep retouch. Additionally, the right lateral edge has dorsal thinning, and the basal end has ventral thinning. The flake, as a blank, is non-cortical with only morphologically identifiable expanding (elongated trapezoidal) shape and incurvate medial general profile, due to heavy invasive retouch and thinning. On gray flint, 4.6 cm long, 2.8 cm wide, 0.9 cm thick.

A semi-crescent dorsal scraper (fig. 6:7) is on a complete flake. The semi-crescent shape of this scraper is created by theconvergence of a more or less straight retouched edge (right lateral edge with a steep retouch) and a convex retouched edge (continuous stepped flat retouch the length of the left lateral edge and transversal edge). The flake, as a blank, is non-cortical with, because of heavy invasive retouch, only morphologically identifiable flat general profile and crudely faceted (2.1 x 0.9 cm) butt (not lipped, right angle, with no abrasion). On gray flint, 3.2 cm long, 3.4 cm wide (shortened, transversal proportions) and 1.2 cm thick.

The last *déjeté* scraper is a semi-trapezoidal ventral one (fig. 6:8) on a complete flake. This scraper has scalar flat retouch on the transversal edge and scalar semi-steep retouch on a lateral edge, both on the ventral surface of the blank. The flake, as a blank, is non-cortical with unidirectional scar pattern, expanding (trapezoidal) shape, "off-axis" removal direction, incurvate medial general profile, feathering distal end, trapezoidal profile at midpoint and finely faceted (1.5 x 0.3 cm) butt (semi-lipped, right angle, with no abrasion. On colored flint and measuring 3.0 x 2.8 x 0.4 cm.

Two fragmented unifacial tools are conventionally classified as simple and double scrapers, although taking into account their fragmented nature, it is equally possible that they were originally points and/or convergent scrapers and then broken.

The simple straight dorsal scraper (fig. 6:6) is on the proximal part of a flake which is alsolongitudinally broken. The only preserved edge of the flake is the left lateral edge which has scalar flat retouch. The flake, as a blank, is fragmented and non-cortical with unidirectional dorsal scar pattern and crudely faceted (2.4 x 0.8 cm) butt (semi-lipped, right angle, with no abrasion). On gray flint and measuring 3.6 x 2.4 x 0.5 cm.

The double straight-convex dorsal scraper (fig. 6:9) has a truncated-faceted base and is on the proximal part of a flake. It has heavy secondary treatment. Two lateral edges have invasive scalar retouch which is semi-steep convex on the left lateral edge and flat straight on the right lateral edge. The base is truncated-faceted. The flake, as a blank, is a fragmented non-cortical one with no objectively identifiable morphological features. On gray flint and measuring 2.9 x 2.6 x 0.8 cm.

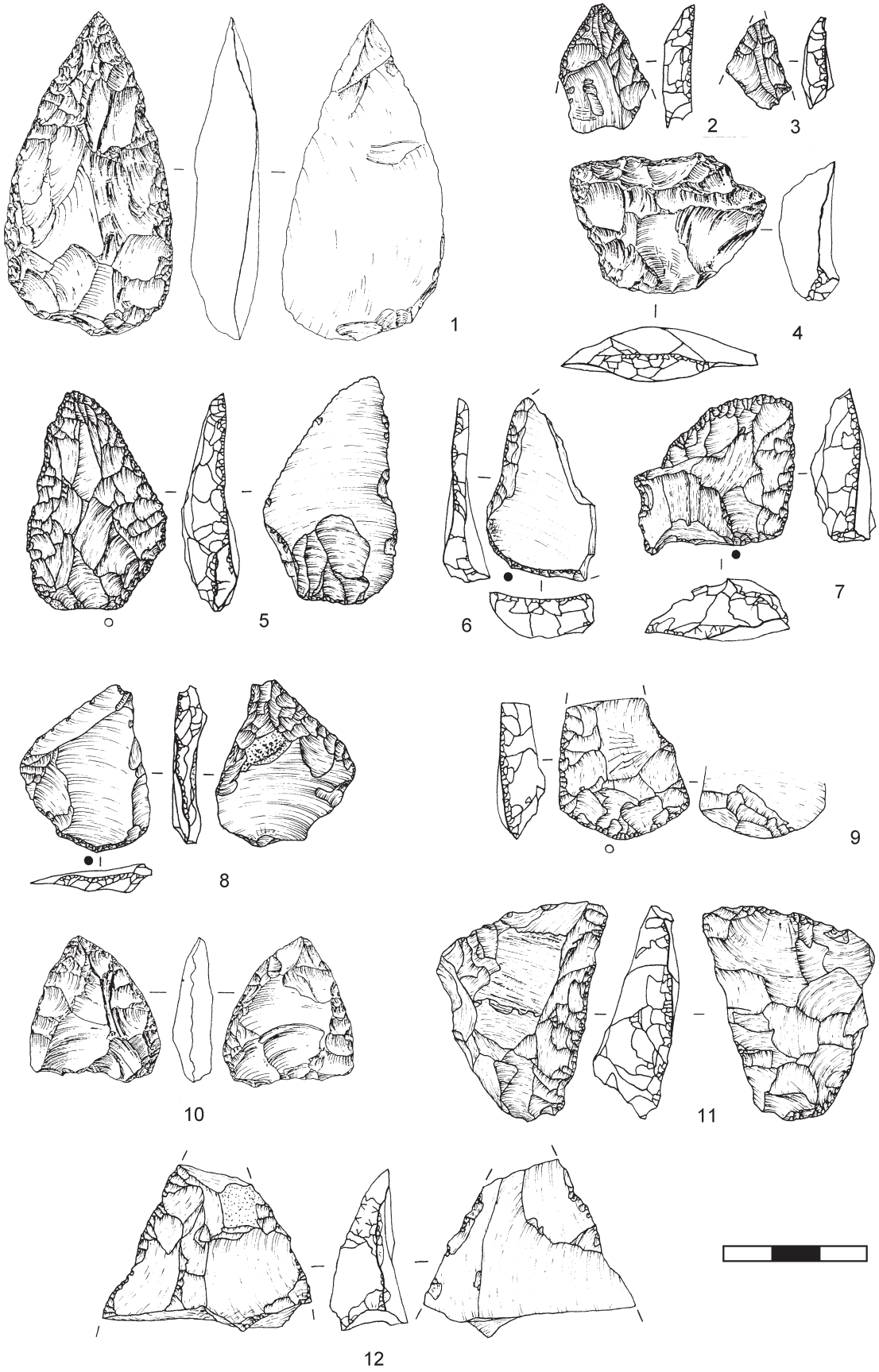

Figure 6 - Siuren I. Unit G, level Gc1-Gc2. Flint Artifacts – Tools (Middle Paleolithic types). 1, sub-leaf dorsal point with distal and basal ventral thinning (complete); 2-3, unifacial points (distal tips); 4, semi-trapezoidal dorsal scraper (complete); 5, elongated semi-trapezoidal dorsal scraper with basal ventral and lateral dorsal thinning (complete); 6, simple straight dorsal scraper (fragmented); 7, semi-crescent dorsal scraper (complete); 8, semi-trapezoidal ventral scraper (complete); 9, double straight-convex dorsal scraper (fragmented); 10, bifacial semi-leaf/triangular point with a concave base (complete); 11, bifacial single edged straight scraper (complete); 12, bifacial foliate tool (fragmented).

The unidentifiable unifacial scraper is a heavily burnt flint fragment with two connected retouched edges. One edge has stepped steep retouch. Flint type is not definable.

The sample of three bifacial tools consists of two complete pieces and one fragmented piece. All are quite unique, differing from one another.

One complete bifacial tool is a semi-leaf/triangular point with a concave base (fig. 6:10). At first sight, the point appears to have been treated using a bi-convex technique. This is not the case, however, when we look at the piece more closely. This shows that the tool was first shaped using the traditional Micoquian "plano-convex" technique and only after multiple reshaping and rejuvenation of the two sides does the point obtain a bi-convex form. The blank's (flake?) morphological features are unidentifiable apart from the absence of cortex, also due to complete bifacial treatment of the initial blank. On gray flint, 2.9 cm long, 2.6 cm wide, 0.6 cm thick.

Another bifacial complete tool is classified as a single edged straight scraper (fig. 6:11). This tool underwent intensive bifacial treatment which could be identified either as an exhausted core with one edge then retouched or, more likely, a piece which was heavily treated using the plano-convex technique with one edge retouched. The presence of only one retouched edge led to classification of the tool as a single-edged scraper and not as a complex tool with identification according to general shape. Retouch is stepped steep. The blank is a non-cortical piece (flake?) with unidentifiable morphological features, due to heavy secondary treatment. On gray flint and measuring 4.7 x 3.6 x 1.4 cm.

The fragmented bifacial tool is the medial part of a foliate piece made using the "plano-convex" technique (fig. 6:12). The tool was probably broken during initial bifacial shaping by rough treatment as no edge has regular retouch, and part of the ventral surface of the blank (a flake) remains on the plane side – additional evidence that bifacial treatment was incomplete. The flake, as a blank, has very minor presence of cortex on the convex side and was probably of shortened, transversal proportions, taking into considerations its removal direction and general supposed foliate shape of the tool. On gray flint and measuring 3.4 x 4.4 x 1.2 cm.

Level Gb1-Gb2

Here tools include 71 specimens subdivided into six groups (no Non-Flint Tools): 1) Indicative Upper Paleolithic types – 8 pieces/11.3%; 2) Non-Geometric Microliths – 46 pieces/64.8%; 3) "Neutral" types – 2 pieces/2.8%; 4) Retouched Pieces – 9 pieces/12.7%; 5) Unidentifiable Tool Fragments – 3 pieces/4.2%; 6) Middle Paleolithic types – 3 piece/4.2%.

Indicative Upper Paleolithic tool types
There are 2 end-scrapers, 4 burins, 1 composite tool and 1 retouched blade.

End-Scrapers include thick shouldered and carinated atypical pieces.

The thick shouldered end-scraper is on a chunk (fig. 7:1). The front is convex with a one-sided notch giving it a general shouldered shape – similar to the morphology of offset cores in plane, and wide (3.6 cm), formed by convergent sub-parallel lamellar (bladelet and microblade negatives with maximum length 3.0 cm) retouch. The chunk, as a blank, is a partially cortical one with insignificant lateral cortex on black flint, 3.9 cm long, 4.7 cm wide, 2.3 cm thick.

The carinated atypical end-scraper is on a broken flake (fig. 7:2). The front is quite convex, nearly ogival, formed on the flake's dorsal distal end by convergent stepped steep retouch. The absence of lamellar retouch is the basis for its classification as atypical. The flake, as a blank, is a partially cortical, partially longitudinally fragmented one with insignificant lateral cortex, unidirectional scar pattern, twisted general profile and blunt distal end. On colored flint and measuring 4.1 x 3.0 x 1.7 cm.

Burins are represented by 1 dihedral asymmetric, 1 double angle, 1 transverse and 1 on lateral preparation.

The dihedral asymmetric burin (fig. 7:3) is on a very unusual piece. This piece is in fact a secondary burin spall that, due to its removal being heavily overpassed, includes the entire distal end of the piece. This distal end has two burin facets (two facets on each verge) creating a dihedral burin. In this case, it would be important to determine which occurred first – the dihedral burin and then the opposite end of the blank treated as a new burin or *vice versa* –, but unfortunately, this cannot be determined. We have decided to identify this piece as a dihedral asymmetric burin on a secondary burin spall. Crushed butt of the burin spall makes identification of the burin from which it was detached impossible. Nevertheless, it is worth noting the multiple burin treatment of this piece. On colored flint and measuring 4.8 x 1.2 x 0.7 cm.

The double angle burin is on a broken medial blade fragment (fig. 7:4). Two burin terminations are on two opposite blade breaks. From each of these burin terminations two burin blows were made along one lateral edge toward one another. The blade, as a blank, is a non-cortical medial fragment with only identifiable unidirectional scar pattern and triangular profile at midpoint. On colored flint and measuring 2.7 x 2.1 x 0.5 cm.

The transverse burin on natural surface is on a blade with lateral dorsal marginal continuous retouch (fig. 7:5). The burin termination is on the distal end and was formed by a series of three transverse narrow burin blows (total width 0.4 cm) made from natural breakage on the blade's lateral edge. This burin is additionally multifaceted, but cannot be considered a carinated burin as it is not a dihedral burin type. The blade, as a blank, is a non-cortical one with probably significantly reduced length due to burin treatment; only identifiable unidirectional scar pattern, incurvate medial general profile, multifaceted profile at midpoint and crushed butt. On gray flint, 3.3 cm long, 1.9 cm wide, 0.4 cm thick.

The burin on a lateral preparation is on broken blade's distal fragment with lateral dorsal marginal continuous retouch (fig. 7:6). The burin termination has two burin facets removed trans-

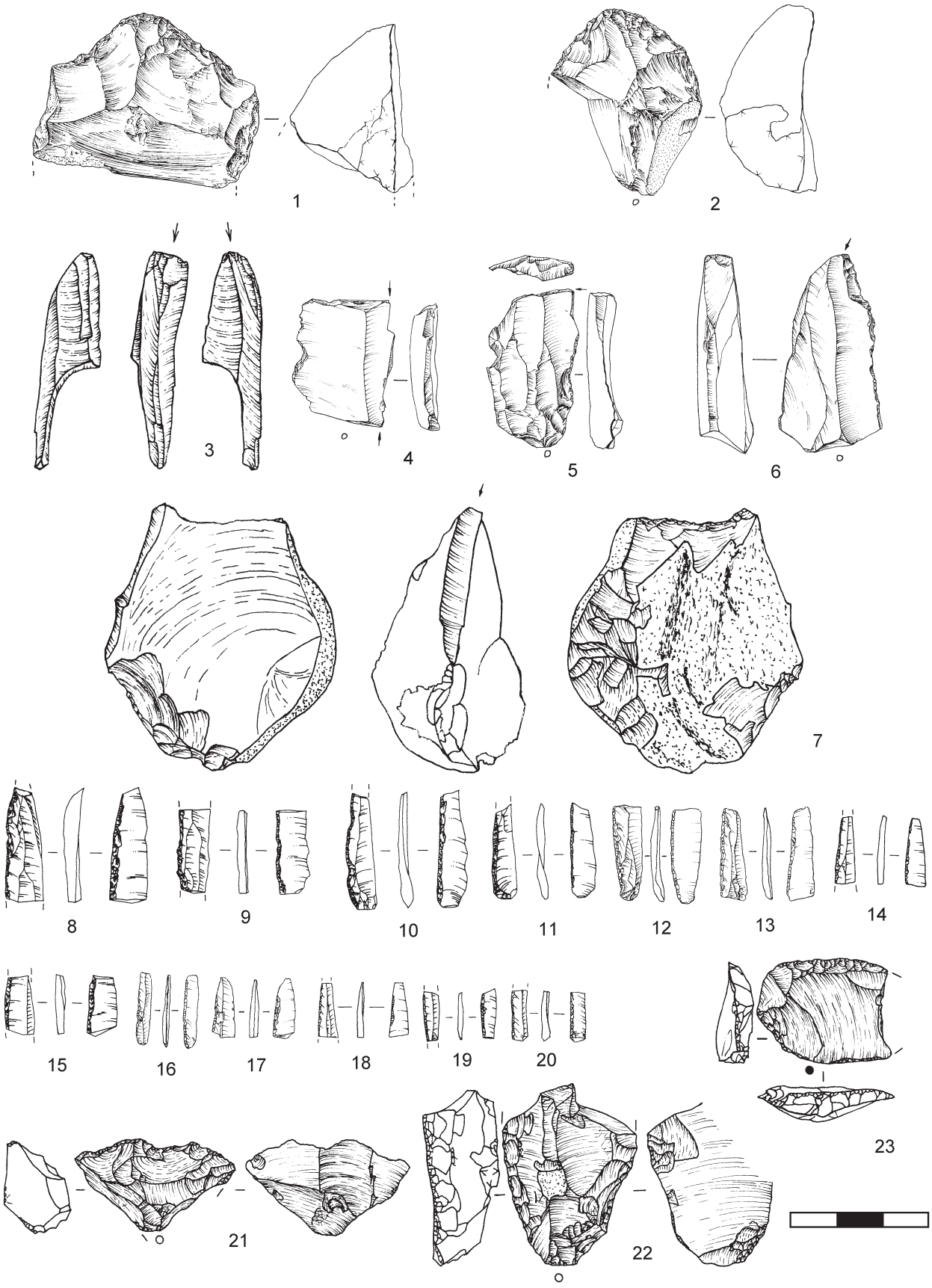

Figure 7 - Siuren I. Unit G, level Gb1-Gb2. Flint Artifacts – Tools. 1, thick shouldered end-scraper; 2, carinated atypical end-scraper; 3, dihedral asymmetrical burin; 4, double angle burin; 5, transverse burin on natural surface; 6, burin on a lateral preparation; 7, burin/scaled tool; 8-9, Dufour type bladelet, on bladelets with alternate retouch; 10-20, Dufour type bladelet, on microblades with alternate retouch; 21, Middle Paleolithic transversal convex dorsal denticulated piece (fragmented); 22, Middle Paleolithic double convex dorsal scraper with basal ventral thinning (fragmented); 23, Middle Paleolithic semi-trapezoidal dorsal scraper (fragmented).

versal to the axis of the blank sequentially from the distal limited lateral preparation formed by scalar steep retouch. Such limited lateral preparation is related to the lateral marginal retouch. The blade, as a blank, is a non-cortical distal fragment with only identifiable unidirectional scar pattern, flat general profile and trapezoidal profile at midpoint. On colored flint and measuring 4.1 x 2.2 x 1.1 cm.

The Composite Tool is quite unusual as it is a combination of a burin on concave truncation and a scaled tool (*pièce esquillée*). Such a composite tool, as well as the combination of any tool type with a scaled tool is not noted in type-lists for Upper Paleolithic assemblages (e.g. Sonneville-Bordes & Perrot 1953-1956; Hours 1974). Let us see how these two tool types fit together on one blank, which is a complete large cortical flake (fig. 7:7). The burin termination on concave truncation formed by scalar semi-steep retouch is on the flake's dorsal surface distal end and a single burin spall was struck from it. The scaled tool is identified based on the two extremities/poles. The first pole is a typical one with bifacial scaling on the right lateral edge near the proximal end. The second pole is located opposite the first on the left lateral edge on the convex cortical dorsal surface ridge and is not at all typical as it only shows the heavy battering traces similar to those typical of hammerstones. Thus, use of the distal end for the burin and both lateral edges for the scaled tool made manufacture and use of such an unusual composite tool possible. The cortical flake, as a blank, is only characterized by ovoid shape, "on-axis" removal direction, incurvate general profile, crescent profile at midpoint and crushed butt. On colored flint, 6.0 cm long, 4.8 cm wide, 2.5 cm thick.

The Retouched Blade is a broken specimen with bilateral dorsal retouch which is light scalar flat continuous on one lateral edge and scalar semi-steep partial on the other lateral edge. The blade, as a blank, is a non-cortical proximal fragment with only identifiable unidirectional scar pattern, flat general profile, trapezoidal profile at midpoint and plain (0.4 x 0.2 cm) butt (semi-lipped, semi-acute angle, with abrasion). On colored flint and measuring 2.9 x 1.9 x 0.5 cm.

Non-Geometric Microliths

These are subdivided into three types: *Dufour bladelets* – 36 items (78.3%), *pseudo-Dufour bladelets* – 8 items (17.4%) and bladelets with dorsally retouched distal end – 2 items (4.3%).

The Dufour bladelet type, on bladelets with alternate retouch (fig. 7:8-9) is represented by 3 pieces (6.5 % of all microliths). The right edges of these microliths have a combination of continuous semi-abrupt stepped retouch. Three different retouch combinations have been defined at dorsally retouched left edges – continuous semi-abrupt micro-stepped, continuous flat micro-scalar and continuous semi-abrupt micro-scalar.

The Dufour bladelet type, on microblades with alternate retouch (fig. 7:10-20) is the dominant type of non-geometric microliths – 28 items (50.0% of all microliths). All 28 left edges were dorsally retouched, while all 28 right edges were ventrally retouched. For both left and right edge preparation, continuous retouch was employed in 43 cases. A single right edge has discontinuous retouch. Twelve more edges have partial retouch. Semi-abrupt retouch was employed for 49 edges. Flat retouch is known for 7 edges. Also, the majority of edges were retouched by micro-scalar and micro-stepped retouch: 30 and 18 edges, respectively. Marginal retouch is noted for 8 edges. Thus, the dominant retouch combinations are continuous semi-abrupt micro-scalar and continuous semi-abrupt micro-stepped. These were employed for 20 and 17 edges, respectively. Other possible retouch combinations are represented by a few pieces each: continuous semi-abrupt marginal – 4 edges; continuous flat marginal – 2 edges; discontinuous semi-abrupt micro-scalar – 1 edge; partial semi-abrupt marginal – 1 edge; partial flat marginal – 1 edge; partial flat micro-scalar – 3; partial semi-abrupt micro-scalar – 6 edges; partial semi-abrupt micro-stepped – 1 edge.

The Dufour bladelet type, on bladelet with alternating retouch is represented by a single item – (2.2% of all microliths). The left edge of the bladelet is both dorsally and ventrally retouched. The retouch combination on the ventral surface is partial semi-abrupt micro-stepped, while the dorsal surface has partial semi-abrupt micro-scalar retouch.

The Dufour bladelet type, on bladelet with bilateral ventral retouch – 1 piece (2.2% of all microliths). Both left and right edges of the bladelet were ventrally treated by two retouch combinations – partial semi-abrupt micro-scalar and discontinuous flat marginal, respectively.

The Dufour bladelet type, on bladelets with ventral retouch is represented by 2 pieces (4.3% of all microliths). The left edges of these microliths have combinations of partial semi-abrupt marginal and continuous flat micro-scalar retouch.

The Dufour bladelet type, on microblade with ventral retouch – 1 item (2.2% of all microliths). The left edge of the microblade has partial semi-abrupt marginal retouch.

The Pseudo-Dufour bladelet type, on bladelets with dorsal retouch is represented by 4 pieces (8.7% of all microliths). Three of the four bladelets have retouch on the left edge. The retouch combinations are as follows: partial semi-abrupt micro-scalar, discontinuous flat micro-scalar and continuous semi-abrupt micro-scalar. The only piece with retouch on right edge was produced by partial semi-abrupt marginal retouch.

The Pseudo-Dufour bladelet type, on microblades with dorsal retouch is represented by 3 pieces (6.5% of all microliths). All three microblades have retouch on the left edge. They have the following retouch combinations: continuous flat micro-scalar (2 items) and continuous semi-abrupt micro-stepped.

The Pseudo-Dufour bladelet type, on microblade with bilateral dorsal retouch – 1 item (2.2%). The left edge of the microlith has continuous semi-abrupt marginal retouch, while the right edge has continuous semi-abrupt micro-stepped retouch.

Bladelets with dorsal retouch at distal end – 2 pieces. The distal end of one bladelet is partially treated by flat micro-scalar retouch. The second piece is more similar to truncated pieces due to rather abrupt micro-scalar retouch at the distal end.

Thirteen bladelets and 33 microblades were selected for the production of non-geometric microliths. A single blank was removed "off-axis", three others are unidentifiable for this attribute, while the others were removed "on-axis". The dominant type of general profile is twisted, identified for 20 blanks. The other general profile types are flat (10 items), incurvate medial (12 items) and unidentifiable – 4 items.

The only microlith on a complete pieceis a *pseudo-Dufour bladelet* with dorsal retouch (length – 2.4 cm). The longest microlith is on a broken piece with the length 4.1 cm. It is a *Dufour bladelet* with alternate retouch. Eight other microliths on broken blanks have length more than 2.0 cm.

Overall, 77 edges of 46 microliths were retouched. More than 50% of edges have micro-scalar retouch, around 30% have micro-stepped retouch and around 17% have marginal retouch. More than 80% of edges have semi-abrupt retouch. The others are represented by flat retouched edges. Also, about 73% of edges were produced by continuous retouch, while partially and discontinuously retouched edges are represented by ca. 23% and 4%, respectively.

In sum, the dominant retouch combinations are continuous semi-abrupt micro-stepped and continuous semi-abrupt micro-scalar: 24 edges (31.2%) and 21edges (27.3%). The other retouch combinations are represented by insignificant numbers of edges: continuous flat micro-scalar, 5 (6.5%); continuous semi-abrupt marginal, 5 (6.5%); continuous flat marginal, 2 (2.6%); discontinuous flat micro-scalar, 1 (1.3%); discontinuous flat marginal, 1 (1.3%); partial semi-abrupt micro-scalar, 9 (11.7%); partial semi-abrupt micro-stepped, 2 (2.6%); partial flat micro-scalar, 2 (2.6%); partial semi-abrupt marginal, 4 (5.1%); partial flat marginal, 1 (1.3%).

By raw material types, the 46 non-geometric microliths were produced on gray (34 items) and colored (12) flints.

"Neutral" tool types
This tool group includes only 2 notched pieces.

Nothced Pieces. Both have single lateral dorsal notches formed by scalar semi-steep retouch, made on a complete flake and broken blade.

The flake of the first notched piece, as a blank, is a partially cortical one with insignificant lateral cortex and is characterized by bidirectional scar pattern, irregular shape, "on-axis" removal direction, convex general profile, blunt distal end, trapezoidal profile at midpoint and plain (1.7 x 0.2 cm) butt (semi-lipped, semi-acute angle, with abrasion). On gray flint and measuring 4.1 x 2.6 x 1.0 cm.

The blade of the second notched piece, as a blank, is a non-cortical medial fragment with only identifiable unidirectional-crossed scar pattern and triangular profile at midpoint. On colored flint, 2.0 cm long, 1.7 cm wide and 0.5 cm thick.

Retouched Pieces
These include 4 blades with marginal retouch, 2 flakes with marginal retouch and 3 flakes with irregular retouch.

All four blades have lateral dorsal marginal retouch which is continuous for three blades and discontinuous for the fourth. Two are complete with insignificant lateral cortex. They have the following morphological features: 2 unidirectional scar patterns, 2 parallel shapes, 2 "on-axis" removal directions, 2 incurvate medial general profiles, 1 feathering and 1 unidentifiable distal ends, 1 trapezoidal and 1 multifaceted profiles at midpoint, 1 crushed with abrasion butt and 1 punctiform (semi-lipped, semi-acute angle, with abrasion) butt. Both of these blades are on colored flints and measure as follows: length – 6.1 and 9.2 cm; width – 2.5 and 1,6 cm; thickness – 0.5 and 0.8 cm, respectively. The other two blades are broken and non-cortical: proximal and medial fragments on gray flints. The medial fragment is only characterized by multifaceted profile at midpoint and measures 1.8 x 2.6 x 0.5 cm. The proximal fragment has a unidirectional scar pattern, twisted general profile, trapezoidal profile at midpoint and crushed butt. It is 2.9 cm long, 1.8 cm wide and 0.4 cm thick.

Two flakes with marginal retouch are lateral dorsal, one with partial and the other with continuous retouch. Both are broken non-cortical items: distal and longitudinally fragmented pieces on gray flints. The longitudinally fragmented flake is only morphologically characterized by unidirectional scar pattern, flat general profile, multifaceted profile at midpoint and crushed butt. It is 2.2 cm long, 1.4 cm wide and 0.6 cm thick. The distal fragment has a feathering distal end and is 1.4 cm long, 2.1 cm wide and 0.6 cm thick.

Three flakes with irregular retouch include 1 lateral alternating, 1 bilateral dorsal and 1 bilateral alternate with only partial retouch. The flake with lateral alternating retouch is a longitudinally fragmented cortical piece with convex general profile, hinged distal end and plain damaged butt (semi-lipped, semi-acute angle, with no abrasion). On gray flint and measuring 3.2 x 2.4 x 1.3 cm. The other two flakes are complete: non-cortical and partially cortical with insignificant central cortex specimens on gray flints. Morphologically, they have unidirectional crossed and centripetal dorsal scar patterns, parallel and irregular shapes, "on-axis" and "off-axis" removal directions, flat and incurvate medial general profiles, feathering and unidentifiable distal ends, 2 irregular profiles at midpoint, 1 crudely faceted (2.0 x 1.9 cm) butt (semi-lipped, semi-acute angle, with abrasion) and 1 finely faceted (2.3 x 0.7 cm) butt (semi-lipped, right angle, with no abrasion). Metrics: 4.9 x 3.3 x 1.8 cm and 4.3 x 2.6 x 1.0 cm.

Unidentifiable Tool Fragments
These are represented by only 3 items on gray flints, including 1 burnt specimen. Two are non-cortical and one has some cortex.

Middle Paleolithic tool types
These include 1 denticulated piece and 2 scrapers with unifacial secondary treatment.

The denticulated piece is a transversal convex dorsal one on a flake broken during secondary treatment (fig. 7:21). The denticulated convex edge is formed by heavy scalar semi-steep dorsal retouch on the flake's transversal edge. This denticulated piece also has basal dorsal and ventral thinning which caused some

damage to the tool's basal end. The presence of heavy (invasive) scalar retouch, as well as basal dorsal and ventral thinning allow us to consider this denticulated piece not as a "neutral" tool type but as one with Middle Paleolithic characteristics. The flake, as a blank, is non-cortical with only metrics identifiable, due to heavy retouch and basal damage – 2.1 x 3.5 (shortened, transversal proportions) x 1.3 cm and raw material type – on gray flint.

The scraper is a double convex dorsal one with basal ventral thinning on a broken flake (fig. 7:22). Both convex lateral retouched edges are formed by stepped steep retouch and these edges are connected at the proximal end by basal ventral thinning. The distal part of the scraper is missing – either the scraper was made on a broken flake or it was broken during the scraper's retouching process. The flake, as a blank, is a partially cortical proximal fragment with insignificant central cortex and no other morphological features identifiable due to heavy retouch, basal ventral thinning and distal breakage. On gray flint and measuring 4.0 x 3.0 x 1.5 cm.

The other scraper is a semi-trapezoidal dorsal one on a broken, longitudinally fragmented flake (fig. 7:23). It has retouched left lateral and transversal edge, while the right lateral edge is completely broken, quite likely during retouching. The transversal edge is convex and with scalar semi-steep retouch. The left lateral edge is slightly concave and has scalar flat retouch. The connection of these two retouched edges gives this tool its semi-trapezoidal shape. In Bordes's terminology, this scraper would be classified as a *racloir déjeté*. The flake, as a blank, is a non-cortical longitudinally fragmented one with only identifiable, due to transversal retouch and lateral breakage, lateral scar pattern, expanding (trapezoidal) shape, incurvate distal general profile, irregular profile at midpoint and finely faceted (2.4 x 0.6 cm) butt (semi-lipped, right angle, with no abrasion).On gray flint and of shortened transversal proportions by its metrics: 2.3 x 2.8 x 0.6 cm.

Level Ga

Tools (18 items) are subdivided into four groups (no "Neutral" tool types, Non-Flint Tools and Middle Paleolithic tool types): 1) Indicative Upper Paleolithic types – 5 pieces/27.8%; 2) Non-Geometric Microliths – 9 pieces/50%; 3) Retouched Pieces – 3 pieces/16.7%; 4) Unidentifiable Tool Fragments – 1 piece/5.5.

Indicative Upper Paleolithic tool types
These include 3 end-scrapers and 2 burins.

End-Scrapers. These include 1 simple, 1 unilateral/flake and 1 atypical. The simple end-scraper is on a broken blade with lateral dorsal irregular retouch (fig. 8A:1). The front is convex, formed on the blade's dorsal surface proximal end by convergent sub-parallel semi-steep retouch. The blade, as a blank, is a non-cortical proximal fragment with unidirectional scar pattern, flat general profile and triangular profile at midpoint. On gray flint and measuring 3.5 x 2.4 x 0.7 cm.

The unilateral/flake end-scraper is a very typical *grattoir sur éclat* of the de Sonneville-Bordes and Perrot type-list (1954: 330) on a complete flake (fig. 8A:2). The front is convex, formed on the flake's dorsal surface distal end and left lateral edge by non-convergent stepped steep retouch. The flake, as a blank, is a non-cortical one with only identifiable, due to heavy retouch, unidirectional scar pattern, incurvate distal general profile, multifaceted profile at midpoint and linear 1.2 x 0.1 cm butt (semi-lipped, semi-acute angle, with questionable abrasion). On gray flint, 2.9 cm long, 2.9 cm wide, 1.0 cm thick.

The atypical flat end-scraper is on a broken blade. The weakly developed front is convex, formed on the blade's dorsal surface distal end by partial non-convergent sub-parallel steep retouch. The blade, as a blank, is a partially cortical distal fragment with significant amount of lateral cortex and characterized by unidirectional scar pattern, "on-axis" removal direction, blunt distal end and trapezoidal profile at midpoint. On gray flint and measuring 2.7 x 1.6 x 0.8 cm.

Burins are represented by 1 dihedral symmetric and 1 dihedral angle.

The dihedral symmetric burin is on a complete blade. The burin termination is on the blade's distal end with two burin facets on each burin's verge. The blade, as a blank, is partially cortical, with insignificant lateral cortex and is characterized by unidirectional scar pattern, irregular shape, "on-axis" removal direction, twisted general profile, trapezoidal profile at midpoint and dihedral (1.3 x 1.0 cm) butt (semi-lipped, semi-acute angle, with questionable abrasion). On gray flint, 5.4 cm long, 2.4 cm wide and 1.1 cm thick.

The dihedral angle burin is on a complete blade (fig. 8A:3). The burin termination is on the blade's proximal end (butt) which was formed by one transversal burin facet from which was then struck off another burin facet along one of the lateral edges. The blade, as a blank, is a partially cortical one with significant amount of lateral cortex and is characterized by unidirectional-crossed scar pattern, irregular shape, "on-axis" removal direction, twisted general profile, hinged distal end and irregular profile at midpoint. On gray flint and measuring 3.3 x 1.2 x 0.5 cm.

Non-Geometric Microliths
These are represented by *Dufour bladelets* (5 pieces/55.6%), *pseudo-Dufour bladelets* (3 pieces/33.3%) and a single Krems point (11.1%).

Dufour bladelet type, on bladelets with alternate retouch – 2 items (fig. 8A:4). All have dorsal retouch on the left edges, while the right edges have ventral retouch. Three of four edges have continuous retouch. A single edge was partially retouched. All bladelets have semi-abrupt retouch. Two edges have micro-scalar retouch, one edge with micro-stepped retouch and another with marginal retouch. So, bladelets with alternate retouch were retouched using four different retouch combinations: continuous semi-abrupt micro-stepped, continuous semi-abrupt marginal, continuous semi-abrupt micro-scalar and partial semi-abrupt micro-scalar.

Dufour bladelet type, on microblades with alternate retouch – 2 items (fig. 8A:5). Three of four edges have continuous retouch. In a single

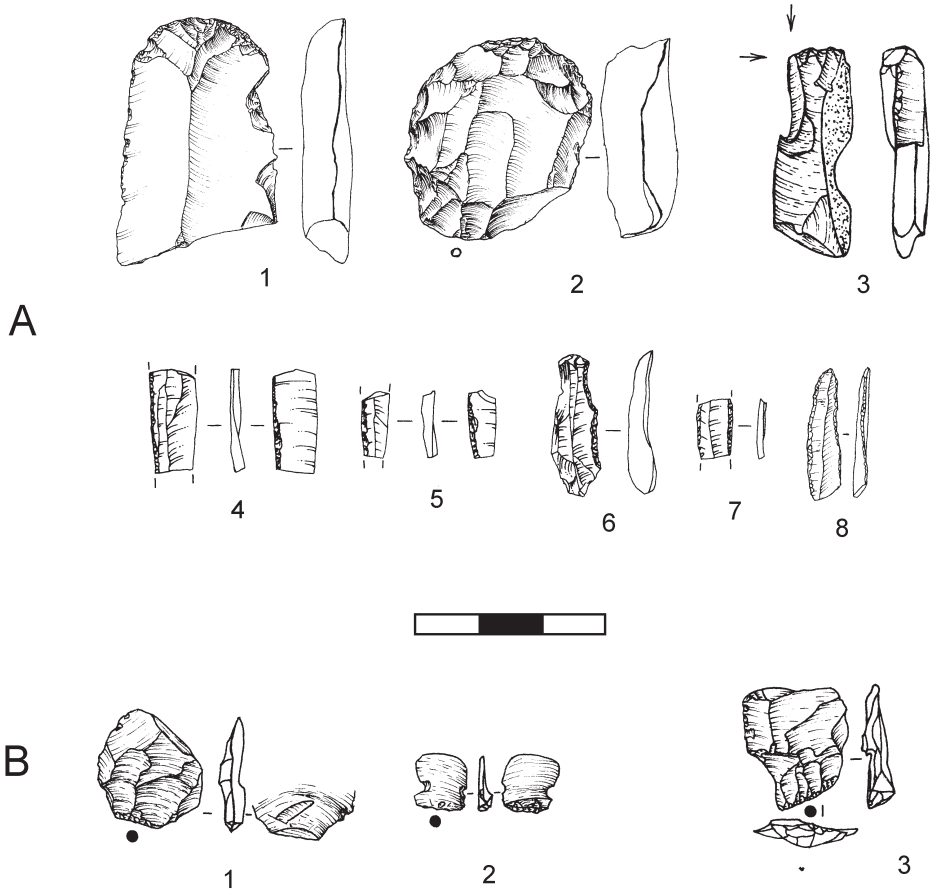

Figure 8 - Siuren I. Unit G, level Gb1-Gb2. Flint Artifacts. A: level Ga. Tools. 1, simple end-scraper; 2, unilateral/flake end-scraper; 3, dihedral angle burin; 4, Dufour type bladelet, on bladelet with alternate retouch; 5, Dufour type bladelet, on microblade with alternate retouch; 6, pseudo-Dufour type bladelet, on bladelet with dorsal retouch; 7, pseudo-Dufour type bladelet, on microblade with bilateral dorsal retouch; 8, Krems point, on microblade with bilateral dorsal retouch. B: levels Gd and Gc1-Gc2. Retouch flakes and chip from Middle Paleolithic tool types. 1, simple retouch flake (level Gd); 2, "Janus/Kombewa" chip (level Gd); 3, bifacial thinning flake (level Gc1-Gc2).

case partial retouch was also used. Flat and semi-abrupt retouch were used twice each. Three edges have micro-scalar retouch and one edge has micro-stepped retouch. In sum, the left edges have dorsal continuous flat micro-scalar retouch. Two different models of retouch combinations were used for the right edges: ventral partial semi-abrupt micro-scalar and ventral continuous semi-abrupt micro-stepped.

Dufour bladelet type, on microblade with ventral retouch – 1 item on which the right edge has ventral partial semi-abrupt micro-scalar retouch.

Pseudo-Dufour bladelet type, on bladelets with dorsal retouch – 2 pieces (fig. 8A:6). The right edges of both bladelets have a combination of continuous semi-abrupt micro-stepped retouch.

Pseudo-Dufour bladelet type, on microblade with bilateral dorsal retouch – 1 item (fig. 8A:7). Both edges of the microblade have continuous semi-abrupt micro-scalar retouch.

Krems point type, on microblade with bilateral dorsal retouch (1 piece) has continuous semi-abrupt micro-scalar retouch on both edges (fig. 8A:8).

Overall, 4 bladelets and 5 microblades were selected for non-geometric microlith production. The only microblade (Krems point) was removed "off-axis", while the rest bladelets and microblades were removed "on-axis". The majority of blanks have twisted profile (6 pieces). Blanks with flat and convex profiles are represented by 3 items: 2 microblades and 1 bladelet. The only complete microlith is a *pseudo-Dufour bladelet* with dorsal retouch (length – 2.2 cm). The other microliths are represented by medial (6 pieces) and distal (2 pieces) fragments. The longest broken microlith is the Krems point – the length of this distal fragment is 2.0 cm.

Of 15 retouched edges, represented by 9 microliths, one edge was retouched by marginal retouch, while the remaining 14 edges have micro-scalar (10) and micro-stepped (4) retouch. In four cases, micro-scalar retouch was used for ventral retouching of *Dufour bladelets'* right edges. Four additional edges were dorsally retouched by micro-scalar retouch, on the Krems point and a *pseudo-Dufour bladelet* on microblade with bilateral retouch. Micro-scalar retouch was also used for dorsal elaboration of the left edges of *Dufour bladelets* on microblades. Micro-stepped retouch was used for dorsal and ventral retouching of left and right edges of both *Dufour bladelets* and *pseudo-Dufour bladelets*.

A single case of marginal retouch was identified for the left dorsally retouched edge of a *Dufour bladelet* on bladelet. Semi-abrupt retouch is found on 13 cases of 15. Two other edges have flat retouch. The latter were identified on the dorsally retouched left edges of *Dufour bladelets* on microblades. Twelve of 15 edges are continuously retouched. Three more edges exhibit partial retouch – all are ventrally retouched right edges of *Dufour bladelets*.

Thus, two dominant combinations of retouch are observed: continuous semi-abrupt micro-scalar (5 edges) and continuous semi-abrupt micro-stepped (4 edges).

Of all 9 microliths, 1 is made on black flint, 3 on colored flints and 5 on gray flints.

Retouched Pieces
These include 2 blades with irregular and marginal retouch and 1 flake with irregular retouch.

Both blades have lateral dorsal partial retouch, but retouch is irregular for one and marginal for the other. Both are proximal fragments. One is non-cortical and the other one partially cortical with insignificant lateral cortex. Blades, as blanks, have the following identifiable morphological features: 2 unidirectional scar patterns; 1 triangular and 1 multifaceted profiles at midpoint; 1 crushed and 1 punctiform (semi-lipped, semi-acute angle, with abrasion) butt. Metrics: 1.1 x 1.6 x 0.2 cm and 1.8 x 1.2 x 0.3 cm. One blade is on gray flint and the other on colored flint.

The retouched flake also has lateral irregular partial retouch, but on the ventral surface. The flake, as a blank, is a non-cortical complete piece with unidirectional-crossed scar pattern, expanding shape, "off-axis" removal direction, incurvate distal general profile, hinged distal end, irregular profile at midpoint and small 0.5 x 0.3 cm plain butt (semi-lipped, acute angle, with questionable abrasion). On colored flint and measuring 2.4 x 3.7 x 0.5 cm.

Unidentifiable Tool Fragments
The single item is a non-cortical piece on gray flint.

Summarizing data for the Unit G tool-kit

These brief comments notes are presented as was done for the Unit H tools.

By raw material types representation, there are no significant differences for tool production processes between the four levels for use of two basic flint types – gray and colored flints (tabl. 50). Gray flints for tools are in the 66.7-74.0% range and colored flints 23.4-30.9%, with no clear increasing or decreasing patterns through the sequence from level Gd to levels Gb1-Gb2 and Ga. The only notable observation is that the occurrence of colored flints for tools is highest in level Gc1-Gc2, which also has the most abundant tool sample (30.9%), although it is still less than in Unit H – 37.7%. At the same time, colored flint tool percentages within the Unit G levels assemblages are higher than for average percentages for all pieces – 20.5-23.9% for levels Gd – Gc1-Gc2 – Gb1-Gb2 and 12.5% for level Ga. Accordingly, despite the lesser use of colored flints for tool production in Unit G in comparison to Unit H, we should note the same pattern of preference for colored flints for tool production.

At the same time, we should not forget that colored flints were used for production of both Indicative Upper Paleolithic tool types and Middle Paleolithic tool types. This raw material aspect will be further discussed during the analysis of the role of these two typological components found in the same layer.

The structure of tool blanks is as follows. First, we examine the blanks of Indicative Upper Paleolithic tool types and Middle Paleolithic tool types. The situation is the most clear for the latter because flakes are exceptionally characteristic for all Middle Paleolithic tools. The situation with Indicative Upper Paleolithic tools is not as uniform since flakes, blades and chunks were used as blanks. We thus need to take a closer look at blank types for each group and type within these tools. End-scrapers (12 items), by tool types and blanks, are distributed as follows: all 4 simple end-scrapers – on 4 blades; the single atypical end-scraper – on a blade; all 3 proper carinated types (2 carinated end-scrapers and 1 thick shouldered end-scraper) – on 3 chunks; the other 4 end-scrapers – on flakes (1 carinated atypical, 1 double, 1 on retouched piece and 1 unilateral – *grattoir sur éclat*). These data clearly evidence the strong dependence of the blank types used for the different end-scraper types and they are in good correspondence with the typical structure of blank type for end-scrapers in Aurignacian assemblages. Correspondingly, end-scrapers cannot be used to elucidate blade-flake preference. Burins (16 items), however, do show clear selection of blades – 14 blades, 1 heavily burnt piece and 1 flake (the double angle burin from level Gc1-Gc2). Composite tools (3 items) are on 2 flakes (a scaled tool/burin on truncation from level Gb1-Gb2 and an end-scraper/burin from level Gc1-Gc2) and 1 blade (a perforator/burin from level Gc1-Gc2) that shows use of both flakes and blades for different tool combinations on one debitage blank. Truncations (3 items) have a reverse order of blanks in comparison to composite tools – 2 blades and 1 flake that again does not point out any clear preference. Finally, the 2 scaled tools were produced on 1 flake and 1 blade, while, of course, all 6 retouched blades are on blades. Thus, the 42 Indicative Upper Paleolithic tool types were made on 29 blades (70.7%), 9 flakes (22.0%), 3 chunks (7.3%), and 1 unidentifiable heavily burnt piece. Such percentages allow us to conclude that despite the important presence of flake blanks, there is a clear dominance of blade blanks and flake occurrence is typical for Upper Paleolithic tool-kits. But now let us count all flake, blade, bladelet and microblade blanks for Indicative Upper Paleolithic tool types (38 items), Notched pieces (9 items), Retouched pieces (60 items) and Non-Geometric Microliths (221 items). For these together, there are 31 flakes (9.5%), 75 blades (22.9%), 79 bladelets (24.2%) and 142 microblades (43.4%), while they are as follows for only pieces with blady metric proportions: blades – 25.3%, bladelets – 26.7% and microblades – 48.0% with joint percentages for bladelets *sensu lato* to 74.7%. The latter indices are very similar to those for Unit H blady blanks for tools. This again points to the special preference of the Unit G Aurignacian inhabitants for bladelets *sensu lato* and especially

Level Gd							
	gray flints%	**colored flints%**	**black flints%**	**limestones%**	**TOTAL #**	**%**	**esse %**
Core-Like Pieces	2 / 50.0	2/50.0	0	0	4	0.5	1.0
Core Maintenance Products	20 / 83.3	3 / 12.5	1 / 4.2	0	24	2.8	5.8
Flakes	60 / 65.9	25 / 27.5	4 / 4.4	2 / 2.2	91	10.7	22.2
Blades	49 / 60.5	29 / 35.8	3 / 3.7	0	81	9.6	19.7
Bladelets	63 / 71.6	24 / 27.3	1 / 1.1	0	88	10.4	21.5
Microblades	24 / 61.5	15 / 38.5	0	0	39	4.6	9.5
Tools	57 / 74.0	18 / 23.4	0	2 / 2.6	77	9.1	18.8
Waste From Production & Rejuvenation of Tools	5 / 83.3	1 / 16.7	0	0	6	0.7	1.5
Chips	269 / 84.9	42 / 13.2	6 / 1.9	0	317	37.4	
Uncharacteristic Debitage Pieces	45 / 80.4	11 / 19.6	0	0	56	6.6	
Chunks	10 / 100.0	0	0	0	10	1.1	
Heavily Burnt Pieces					55	6.5	
TOTAL	**604 / 76.2**	**170 / 21.4**	**15 / 1.9**	**4 / 0.5**	**848**	**100.0**	**100.0**
Level Gc1-Gc2							
	gray flints%	**colored flints%**	**black flints%**	**limestones%**	**TOTAL #**	**%**	**esse %**
Core-Like Pieces	8 / 72.7	2 / 18.2	1 / 9.1	0	11	0.5	1.0
Core Maintenance Products	52 / 76.4	15 / 22.1	1 / 1.5	0	68	2.9	6.0
Flakes	185 / 73.7	57 / 22.7	9 / 3.6	0	251	10.7	22.3
Blades	115 / 63.2	67 / 36.8	0	0	182	7.8	16.2
Bladelets	189 / 71.0	76 / 28.6	1 / 0.4	0	266	11.4	23.7
Microblades	71 / 65.1	37 / 34.0	1 / 0.9	0	109	4.7	9.7
Tools	142 / 67.6	65 / 30.9	1 / 0.5	2 / 1.0	210	9.0	18.7
Waste From Production & Rejuvenation of Tools	20 / 74.1	7 / 25.9	0	0	27	1.2	2.4
Chips	712 / 79.3	173 / 19.3	13 / 1.4	0	898	38.5	
Uncharacteristic Debitage Pieces	86 / 74.8	26 / 22.6	3 / 2.6	0	115	4.9	
Chunks	71 / 93.5	3 / 3.9	2 / 2.6	0	76	3.3	
Heavily Burnt Pieces					119	5.1	
TOTAL	**1651 / 74.6**	**528 / 23.9**	**32 / 1.4**	**2 / 0.1**	**2332**	**100.0**	**100.0**
Level Gb1-Gb2							
	gray flints%	**colored flints%**	**black flints%**	**limestones%**	**TOTAL #**	**%**	**esse %**
Core-Like Pieces	6 / 75.0	1 / 12.5	1 / 12.5	0	8	0.6	1.7
Core Maintenance Products	16 / 57.1	11 / 39.3	0	1 / 3.6	28	2.2	6.0
Flakes	85 / 78.7	21 / 19.5	2 / 1.8	0	108	8.6	23.1
Blades	38 / 60.3	23 / 36.5	2 / 3.2	0	63	5.0	13.5
Bladelets	77 / 76.2	23 / 22.8	1 / 1.0	0	101	8.0	21.6
Microblades	54 / 71.0	22 / 29.0	0	0	76	6.0	16.3
Tools	49 / 69.0	21 / 29.6	1 / 1.4	0	71	5.6	15.2
Waste From Production & Rejuvenation of Tools	11 / 91.7	1 / 8.3	0	0	12	1.0	2.6
Chips	537 / 82.0	107 / 16.3	11 / 1.7	0	655	52.0	
Uncharacteristic Debitage Pieces	29 / 72.5	10 / 25.0	1 / 2.5	0	40	3.2	
Chunks	15 / 93.8	1 / 6.2	0	0	16	1.3	
Heavily Burnt Pieces					81	6.5	
TOTAL	**917 / 77.8**	**241 / 20.5**	**19 / 1.6**	**1 / 0.1**	**1259**	**100.0**	**100.0**
Level Ga							
	gray flints%	**colored flints%**	**black flints%**	**limestones%**	**TOTAL #**	**%**	**esse %**
Core-Like Pieces	0	0	0	0	0		
Core Maintenance Products	4 / 100.0	0	0	0	4	1.5	4.6
Flakes	23 / 82.2	3 / 10.7	2 / 7.1	0	28	10.4	32.2
Blades	7 / 53.8	5 / 38.5	1 / 7.7	0	13	4.8	14.9
Bladelets	10 / 71.4	4 / 28.6	0	0	14	5.2	16.1
Microblades	6 / 60.0	4 / 40.0	0	0	10	3.7	11.5
Tools	12 / 66.7	5 / 27.8	1 / 5.5	0	18	6.7	20.7
Waste From Production & Rejuvenation of Tools	0	0	0	0	0		
Chips	122 / 90.4	10 / 7.4	3 / 2.2	0	135	50.0	
Uncharacteristic Debitage Pieces	8 / 88.9	0	1 / 11.1	0	9	3.3	
Chunks	17 / 100.0	0	0	0	17	6.3	
Heavily Burnt Pieces					22	8.1	
TOTAL	**209 / 84.3**	**31 / 12.5**	**8 / 3.2**	**0**	**270**	**100.0**	**100.0**

Table 50 - Siuren-I. Unit G. Artifacts Totals by Raw Material Types as Percentages of Each Type.

microblades to produce non-geometric microliths. Adding here blades as the dominant blanks for the other tools, excluding the Middle Paleolithic tools, we have a clear bladelet *sensu lato*/blade technological base for both debitage and tool production for Siuren-I Unit G Early/Ancient Aurignacian of Krems-Dufour type assemblage, as was already estimated for Unit H. Flake role is of the following twofold character within the Aurignacian assemblage. First, flakes were produced as technological waste during bladelet and blade reduction processes, and, second, some were selected for tool manufacture. At the same time, regarding the Unit G Middle Paleolithic typological component, flakes were the only blank type used for tool production. All of these considerations are confirmed by the selection rates of different blanks for tool production: 43 possible flake-tools of all 561 flakes (7.7% of selection), 76 blade-tools of all 471 blades (16.1% of selection), 79 bladelet-tools of all 566 bladelets (14.0% of selection) and 142 microblade-tools of all 386 microblades (36.8% of selection).

Further data on blanks

Here we discuss some aspects based on comparisons between all pieces of debitage including tool-blanks and core maintenance products, and strictly debitage items (see tabl. 4-43), to highlight possible differences. Surprisingly, it is difficult to find such actual differences. Pieces with flake and bladelet metric proportions do not show any real statistical deviations for the two samples (see tabl. 4-13, 24-33), usually in the range of 5%. Pieces with blade metric proportions (see tabl. 14-23) show one notable distinction and this is because of the amount of core maintenance product features. It relates to shape (tabl. 15), where for level Gd the irregular type is the dominant one for the most complete sample, while it shares is in second-third position for debitage only. All the other attributes are again, as for the flakes and bladelets, in basic agreement – differences do not exceed 5-10%. The most surprising, however, is the fact that after adding to microblades-debitage the many tools on microblades, we do not find any radical differences between the two samples (see tabl. 34-43). The only attribute that can be mentioned is shape for level Gc1-Gc2: there is a dominance of parallel type over converging one, while there is a reverse order for these types for the debitage only sample (tabl. 35).

Thus, this comparison clearly shows that in Unit G, both samples of flakes, blades, bladelets and microblades can be equally used for different interpretative analyses and they correspond well to one another.

Waste from Production and Rejuvenation of Tools

This artifact category was recognized among flints of levels Gd, Gc1-Gc2 and Gb1-Gb2 and consists of two groups: 1) burin spalls and 2) retouch chips and flakes. As done above, waste from tool production will be analyzed after representing all from each level.

Level Gd

This level includes only one burin spall and 5 retouch chips and flakes.

The Burin Spall is a complete primary (simple unretouched) one on colored flint. It has twisted general profile and punctiform butt. The presence of such a butt makes it impossible to identify the burin type from which it was struck off. It is 1.8 cm long, 0.2 cm wide and 0.5 cm thick.

Retouch Flakes and Chips. There are 3 retouch flakes from Middle Paleolithic unifacial tool types (points and scrapers), 1 retouch chip of either a Middle Paleolithic or Upper Paleolithic unifacial tool and 1 retouch chip from basal ventral thinning of a Middle Paleolithic tool type. All are on gray flints.

Retouch Flakes
All 3 are simple complete non-cortical pieces with the following morphological features: 3 unidirectional scar patterns; 1 parallel and 2 expanding shapes; 1 "on-axis" and 2 "off-axis" removal directions; 3 incurvate medial general profiles; 2 feathering and 1 hinged distal ends; 1 trapezoidal and 2 multifaceted profiles at midpoint; 3 plain (0.8 x 0.2 cm, 0.4 x 0.2 cm, 0.2 x 0.2 cm) butts (1 lipped and 2 semi-lipped; 3 acute angles; 3 with abrasion). Metrics: length – 1.6-2.5-2.8 cm, width – 1.6-2.0-2.0 cm and thickness – 0.3-0.4-0.3 cm, respectively (fig. 8B:1).

Retouch Chips
The first retouch chip is a non-cortical complete one with linear butt (lipped, acute angle, with abrasion).

The second retouch ship (fig. 8B:2) is a very unusual piece and deserves a more detailed description. Morphologically, it is a "Janus/Kombewa" chip. It is a non-cortical complete piece with dorsal-plain scar pattern, ovoid shape, "on-axis" removal direction, flat general profile, feathering distal end, flat profile at midpoint with the following metrics: length and width – 0.8 cm each, thickness – 0.1 cm. A butt is not visible, but the piece has the remains of a faceted butt on the dorsal surface. With such features, especially the dorsal scar pattern and overall small size, this piece should be considered a retouch chip from the basal ventral thinning of a tool. Moreover, the presence of the remains of a faceted butt on the piece's dorsal surface and characteristic of basal ventral thinning for only Middle Paleolithic unifacial tool types, additionally evidences removal of this chip from the basal part of a Middle Paleolithic unifacial tool.

Level Gc1-Gc2

This level contains 14 burin spalls and 13 retouch chips and flakes.

Burin Spalls. There are 9 complete burin spalls (7 on gray flints and 2 on colored flints) and 5 broken burin spalls (2 on gray flints and 3 on colored flints). Nine complete burin spalls are subdivided into 7 primary and 2 secondary. Five complete primary burin spalls are simple unretouched. Three have plain butts, suggesting an origin from angle burins. Such an assumption is confirmed by the refitting of one spall to a double angle burin (fig. 4:9). Two complete primary simple unretouched burin spalls have crushed butts and, accordingly, unidentifiable origin. These 5 burin spalls are also characterized by 3 incurvate medial and 2 twisted general profiles, and the following metrics: length – 1.6 - 3.2 cm, width – 0.3 - 1.8 cm and thickness – 0.6 - 1.0 cm. Two complete primary burin spalls have partial

lateral retouch: fine and irregular. Both have crushed butts that make burin type origin unclear. These 2 burin spalls are also characterized by twisted and convex general profiles, and the following dimensions: length – 1.3 and 2.4 cm, width – 0.3 and 0.4 cm, thickness 0.3 and 0.8 cm, respectively. Two complete secondary burin spalls have negatives of previously struck burin spalls, crushed butts (unclear origin), twisted general profiles and the following metrics: length – 2.8 and 3.5 cm, width – 0.8 and 1.3 cm, thickness – 1.1 and 1.8 cm, respectively. Broken burin spalls are represented only by distal fragments. Two are primary and 3 secondary. Two broken primary burin spalls have on their dorsal surfaces simple unretouched features for one and lateral irregular partial retouch for the other. They also have twisted and incurvate medial general profiles and the following metrics: length – 1.3 and 4.0 cm, width – 0.3 and 1.1 cm, thickness – 0.3 and 1.8 cm, respectively. Three broken secondary burin spalls are characterized by negatives of previously removed burin spalls, twisted general profiles and the following dimensions: length – 2.2, 2.3 and 2.8 cm; width – 0.2, 0.2 and 0.8 cm; thickness – 0.5, 0.4 and 1.1 cm, respectively.

Retouch Flakes and chips. There are 8 retouch flakes and 5 retouch chips.

Retouch Flakes. These are subdivided into 1 bifacial thinning flake and 7 simple retouch flakes.

Bifacial Thinning Flake (fig. 8B:3) is a non-cortical complete item with unidirectional scar pattern, expanding shape, "on-axis" removal direction, twisted general profile, hinged distal end, multifaceted profile at midpoint and finely faceted (1.2 x 0.4 cm) butt (lipped, acute angle, with abrasion). On gray flint and measuring 1.9 x 1.6 x 0.3 cm. The presence of a finely-faceted butt with pronounced abrasion and lack of dorsal cortex allow us to identify this piece as a thinning flake from a Middle Paleolithic type bifacial tool.

Seven simple retouch flakes are complete and have the following morphological features: 4 unidirectional and 3 unidirectional crossed scar patterns; 2 parallel, 2 expanding, 1 ovoid and 2 irregular shapes; 4 "on-axis" and 3 "off-axis" removal directions; 1 flat, 3 incurvate medial, 1 incurvate distal and 2 twisted general profiles; 7 feathering distal ends; 1 triangular, 2 trapezoidal, 1 multifaceted and 3 irregular profiles at midpoint; 2 linear (0.5 x 0.1 cm and 0.4 x 0.1 cm) butts (semi-lipped, acute angles, with abrasion) and 5 plain (0.7 x 0.2 cm, 0.8 x 0.3 cm, 1.3 x 0.2 cm, 0.8 x 0.3 cm, 2.4 x 0.6 cm) butts (3 semi-lipped and 2 lipped, 5 acute angles, 5 with abrasion). They have the following dimension ranges: length – 1.3-3.0 cm; width – 1.0-2.4 cm; thickness – 0.3-0.6 cm. Four retouched flakes have shortened, transversal proportions. Six pieces are on gray flints and 1 is on colored flint. Size and morphological features of these 7 retouched flakes (6 non-cortical and 1 partially cortical with insignificant lateral cortex) have in general the characteristics of simple retouch flakes from Middle Paleolithic unifacial tool types (points and scrapers).

Retouch Chips. Five retouch chips are non-cortical and complete. Four are on gray flints and one on colored flint. All have plain butts with lipping, acute angle and abrasion. Such butt features are typical of retouch chips originating from secondary treatment processes of either Middle Paleolithic or Upper Paleolithic tool types.

Level Gb1-Gb2

Waste from tool production and rejuvenation consists of 8 burin spalls and 4 simple retouch flakes.

Burin Spalls. There are 3 complete and 5 broken burin spalls on gray flint.

Two complete burin spalls are primary simple unretouched ones. The first has incurvate medial general profile and crushed butt that makes original burin type identification impossible. Dimensions: 0.6 x 0.2 x 0.3 cm. The second has incurvate distal general profile and plain butt, suggesting removal from an angle burin. It is 2.4 cm long, 0.8 cm wide and 0.9 cm thick. The third complete burin spall is a secondary one with both previously removed burin spall negatives and some lateral fine partial retouch at the distal ridge. It has twisted general profile and dihedral butt (unclear origin). It is 1.7 cm long, 0.3 cm wide and 0.6 cm thick. Five broken burin spalls are subdivided into 3 primary and 2 secondary. All are either distal or medial fragments that make identifications of their profiles and butt characteristics impossible, and thus the original burin types from which they were detached. Three primary broken burins spalls are 2 simple unretouched and 1 retouched (lateral fine partial). Metrics: 0.9 x 0.2 x 0.2 cm; 1.1 x 0.3 x 0.2 cm; 1.6 x 0.4 x 0.6 cm. Two secondary broken burin spalls have the following metrics: 2.0 x 0.5 x 0.6 cm and 2.1 x 1.0 x 1.2 cm.

Retouch Flakes. Three are on gray flints and another on colored flint. All four are defined as simple retouch flakes from secondary treatment processes of Middle Paleolithic unifacial tool types (points and scrapers). Three are non-cortical and one is partially cortical with insignificant distal cortex. Morphologically, they have the following features: 3 unidirectional and 1 unidirectional-crossed scar patterns; 3 expanding and 1 irregular shapes; 4 "off-axis" removal directions; 2 incurvate medial and 2 incurvate distal general profiles; 3 feathering and 1 hinged distal ends; 1 triangular, 1 trapezoidal and 2 multifaceted profiles at midpoint, 3 plain (1.1 x 0.3 cm, 0.7 x 0.2 cm, 0.4 x 0.2 cm) butts (1 lipped and 2 semi-lipped, 1 semi-acute and 2 acute angles, all 3 with abrasion) and 1 linear (1.0 x 0.1 cm) butt (semi-lipped, semi-acute angle, with abrasion). Metrics: 1.7 x 1.6 x 0.4 cm; 1.7 x 1.4 x 0.3 cm; 2.0 x 1.8 x 0.2 cm; 3.6 x 2.1 x 0.6 cm.

Summarizing data on tool waste

Level Gd. The single primary burin spall (original burin type unknown) serves as weak evidence for on-site burin manufacture in this level, taking into consideration of the presence three burins, of which is double. This allows us to speculate on the possible importation of finished burins to the rock-shelter and no evidence of burin rejuvenation at the site.

On the other hand, technological waste from Middle Paleolithic tools (four items, as one chip could have been removed from an end-scraper or a retouched blade) is very important. The pre-

sence of three simple retouch flakes clearly points to tool manufacture and/or rejuvenation. At the same time, the "Janus/Kombewa" chip is in good correspondence to the appearance of a sub-triangular dorsal point with basal ventral thinning (the sole Middle Paleolithic tool found in level Gd) from which such a chip could have been flaked, although our attempt to refit the chip onto the tool was unsuccessful.

In sum, we can conclude more intensive secondary treatment processes for Middle Paleolithic tools than for Upper Paleolithic burins.

Level Gc1-Gc2.
The situation differs for burin treatment in level Gc1-Gc2. Here we have 14 burin spalls and 7 burins. Moreover, the burin spall classification shows the presence of both primary (9 items) and secondary (5 items) examples. By the spalls' butt features and refitting, removal of three primary complete burin spalls from angle burins is evident. This is confirmed by the availability of three angle burins present in the assemblage where the one other identifiable burin is on truncation. Thus, we can indicate both the manufacture of angle burins at the site and general burin rejuvenation as well, given the occurrence of secondary burin spalls.

A series of 8 retouch flakes and 5 retouch chips allows us to discuss tool treatment processes for other tools. Seven simple retouch flakes are connected to general on-site treatment of Middle Paleolithic unifacial points and scrapers. The bifacial thinning flake is also a very indicative piece supporting Middle Paleolithic "deep treatment and/or re-treatment" processes at the site. All 8 retouch flakes correspond to the presence of 3 bifacial and 10 unifacial Middle Paleolithic tools in the Gc1-Gc2 assemblage. More than that, 5 simple retouch chips are evidence of production of both Indicative Upper Paleolithic tool types (end-scrapers and retouched blades) and Middle Paleolithic unifacial tool types (scrapers and points) on-site.

Level Gb1-Gb2.
Tool waste structure from this level is quite similar to level Gc1-Gc2.

Of 8 burin spalls, 5 are primary and 3 secondary. One is identified as struck from an angle burin that is in correspondence to presence of a double angle burin in the assemblage.

At the same time, identification of 4 simple retouch flakes from Middle Paleolithic unifacial tools is in accordance with 2 unifacial scrapers and 1 denticulated piece present in the tool-kit, again an illustration of treatment of Middle Paleolithic tools on-site.

In total, these tool waste products from three levels of Unit G mainly evidence different tool production and rejuvenation processes on-site and do not allow us to see direct evidence of tool transportation from the rock-shelter as is the case for Unit H.

Debris (see also table 1, 50)

Chips, Uncharacteristic debitage pieces and Chunks have been described only by presence/absence of cortex and raw material types, while Heavily burnt pieces are only counted.

Chips

Frequencies of chips in each level of Unit G are as follows: 317 pieces in level Gd; 898 pieces in level Gc1-Gc2; 655 pieces in level Gb1-Gb2; 135 pieces in level Ga.

Chips with some cortex: 41 pieces (12.9%) in level Gd; 130 pieces (14.5%) in level Gc1-Gc2; 67 pieces (10.2%) in level Gb1-Gb2; 21 pieces (15.6%) in level Ga.

Raw material types for chips are as follows.

Gray Flints: 269 pieces (84.9%) and 31 (11.5%) bear some cortex in level Gd; 712 pieces (79.3%) and 81 (11.4%) bear some cortex in level Gc1-Gc2; 537 pieces (82%) and 44 (8.2%) bear some cortex in level Gb1-Gb2; 122 pieces (90.4%) and 17 (13.9%) bear some cortex in level Ga.

Colored flints: 42 pieces (13.2%) and 6 (14.3%) bear some cortex in level Gd; 173 pieces (19.3%) and 43 (24.9%) bear some cortex in level Gc1-Gc2; 107 pieces (16.3%) and 15 (14%) bear some cortex in level Gb1-Gb2; 10 pieces (7.4%) and 1 (10%) bear some cortex in level Ga.

Black Flints: 6 pieces (1.9%) and 4 (66.6%) bear some cortex in level Gd; 13 pieces (1.4%) and 6 (46.2%) bear some cortex in level Gc1-Gc2; 11 pieces (1.7%) and 8 (72.7%) bear some cortex in level Gb1-Gb2; 3 pieces (2.2%) and all 3 (100%) bear some cortex in level Ga.

Uncharacteristic Debitage Pieces

Frequencies of uncharacteristic debitage pieces in each level of Unit G: 56 pieces in level Gd and 17 (30.4%) have some cortex; 115 pieces in level Gc1-Gc2 and 32 (27.8%) have some cortex; 40 pieces in level Gb1-Gb2 and 15 (37.5%) have some cortex; 9 pieces in level Ga and 3 (33.3%) have some cortex.

This artifact category is characterized by the following raw material types.

Gray Flint: 45 pieces (80.4%) and 14 (31.1%) have some cortex in level Gd; 86 pieces (74.8%) and 19 (22.1%) have some cortex in level Gc1-Gc2; 29 pieces (72.5%) and 8 (27.6%) have some cortex in level Gb1-Gb2; 8 pieces (88.9%) and 2 (25%) have some cortex in level Ga.

Colored flints: 11 pieces (19.6%) and 3 (27.3%) have some cortex in level Gd; 26 pieces (22.6%) and 11 (42.3%) have some cortex in level Gc1-Gc2; 10 pieces (25%) and 6 (60%) have some cortex in level Gb1-Gb2; none in level Ga.

Black Flints: none in level Gd; 3 pieces (2.6%) and 2 (66.6%) have some cortex in level Gc1-Gc2; 1 piece (2.5%) and it has some cortex (100%) in level Gb1-Gb2; 1 piece (11.1%) and it has some cortex (100%) in level Ga.

Chunks

Frequencies of chunks in each level of Unit G: 10 pieces in

level Gd and 6 (60%) have some cortex; 76 pieces in level Gc1-Gc2 and 30 (39.5%) have some cortex; 16 pieces in level Gb1-Gb2 and 5 (31.3%) have some cortex; 17 pieces in level Ga and 6 (35.3%) have some cortex.

Chunks are also characterized according to raw material types.

Gray Flints: all 10 pieces (100%) in level Gd; 71 pieces (93.5%) and 26 (36.6%) have some cortex in level Gc1-Gc2; 15 pieces (93.8%) and 5 (33.3%) have some cortex in level Gb1-Gb2; all 17 pieces (100%) in level Ga.

Colored flints: 3 pieces (3.9%) and 2 (66.6%) have some cortex in level Gc1-Gc2; 1 non-cortical piece (6.2%) in level Gb1-Gb2.

Black Flints: 2 pieces (2.6%) with some cortex (100%) in level Gc1-Gc2.

Heavily Burnt Pieces are represented by the following number in each level of Unit G: 55 pieces in level Gd; 119 pieces in level Gc1 - Gc2; 81 pieces in level Gb1 - Gb2; 22 pieces in level Ga.