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CHAPTER 3

The Acheulean Assemblages of Konso: A Site by Site Analysis

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3.1 INTRODUCTION

We present below an attribute analysis of 11 artifact assemblages that we recovered from the Konso Formation. One assemblage from KGA6, comes from the stratigraphically lower ~1.75 Ma time horizon, and another from KGA4 comes from the ~1.6 Ma level. The ~1.45 to ~1.25 Ma time period is represented by seven assemblages from the artifact-rich KGA7, KGA8, KGA10, and KGA12 localities. At localities KGA18 and KGA20 assemblages were collected from the uppermost ~0.85 Ma horizons.

Representative artifacts of the Acheulean assemblages that we analyzed are figured in Plates 1–66. Brief descriptions of these artifacts are individually given after the attribute analysis presentation.

We considered an assemblage to represent the early Acheulean technological complex based on the production of large flake blanks (>10 cm and frequently exceeding ~20 cm) and modification of these large blanks and similar-sized cobbles into handaxes, cleavers, and picks (Beyene et al., 2013). Most of these large tools are categorized as some form of Large Cutting Tool (LCT, mostly hand axes and cleavers) or Heavy Duty Tool (HDT, mostly picks and core axes).

3.2 ATTRIBUTE ANALYSIS

Technological attribute analysis: methodology

The methodology adopted in the technological analysis of the present report is outlined below. It consists of a coding system developed by Y.B., the senior author of this chapter. This was done in conjunction with the late J. Desmond Clarke through collaborative work during the early to middle 1990s. The attribute coding system is based on terminology and definitions outlined in Clark and Schick (2000) and Kleindeinst (1962).

The full coding system is presented in the Appendix 1, and includes the following technological attribute categories:

- Raw Material (9 categories)
- Physical Condition (5 categories)

- Specific Tool Type (Large Cutting Tools/Heavy Duty Tools) (27 categories)
- Cortex (6 categories)
- Primary Form (Flake/Cobble/Indeterminate/Block)
- Flake Type (End struck/Side struck/Kombewa/Indeterminate)
- Unifacial/Bifacial (5 categories)
- Dimension (Length/Breadth/Thickness)
- Cross-section Shape (8 categories)
- Sinuosity (Wavy/Sinuous/Straight)
- Edge Angle
- Biface Butt Plan (8 categories)
- Invasiveness (Marginal/Semi-invasive/Invasive)
- Flake Scar Number
- Maximum Dimension of Flake Scars
- Cleaver Edge Plan (6 categories)
- Cleaver Bit Angle
- Cleaver Bit Dimension

The results of the site by site attribute analysis are summarized in Tables A2.1–A2.21 presented in the Appendix 2.

KGA6-A1 (Plates 1–8)

Overview

General presentation of artifacts

A total of 116 artifacts were collected at KGA6-A1, comprising 61 large cutting tools and heavy duty tools (hereafter LCTs/HDTs) (52.6%), 35 flakes (30.2%), 12 chunks (10.3%), four core/choppers (3.4%), one core (0.9%), and three cobbles (2.6%).

General presentation of raw materials

The most frequent rock type is local basalt (n=112, 96.6%) and quartzite, quartz, siliceous rock, and indeterminate rock are used on one piece each.

General presentation of physical conditions

Most of the artifacts are moderately weathered (n=68, 58.6%) or weathered (n=27, 23.3%). Twenty-one items (18.1%) show a fresh condition. The weathered pieces are made on basalt.

Large Cutting Tools & Heavy Duty Tools

Typology

A total of 61 LCTs/HDTs were recovered from KGA6-A1, including eight handaxes (13.1%), five cleavers (8.2%), 15 picks (24.6%), two large scrapers (3.3%), four part bifaces (6.6%), 21 modified pieces/blanks (34.4%), and six broken LCTs/HDTs (9.8%).

Raw material

All the 61 LCTs/HDTs at KGA6-A1 are made on basalt.

Physical condition

Most of the LCTs/HDTs are either moderately weathered (n=37, 60.7%) or weathered (n=11, 18.0%). Thirteen artifacts (21.3%) show a fresh condition.

Presence of cortex

Half of the LCTs/HDTs (n=26, 47.3%) exhibit no cortex. Seven artifacts (12.7%) have "small amount" (<25% of the surface) of cortex, five artifacts (9.1%) have "modest amount"(25–50% of the surface) of cortex, and 13 artifacts (23.6%) retain "much" cortex (>50% of the surface). The remaining four items (7.3%) are indeterminate owing to weathering.

Primary form

While two handaxes (3.5%) are made on cobble and two pieces (3.5%) allow no determination, the remaining LCTs/HDTs (n=53, 93.0%) are made on flake. It would be worth noting that no blocks were selected as blanks for producing LCTs/HDTs at KGA6-A1.

Flake type

Out of the 53 LCTs/HDTs made on flake, 34 pieces (64.2%) are made on an end struck flake, and 11 (20.8%) are made on a side struck flake. The remaining eight pieces (15.1%) do not allow determination of flake type due to flaking on the ventral surface. While most of the handaxes and picks are made on either an end struck flake or are indeterminate, almost half of the cleavers are made on a side struck flake, probably because of preferential form of the flakes.

Unifacial/bifacial

Most of the LCTs/HDTs are unifacially modified. A total of 35 pieces (74.5%) are unifacial and nine tools (19.1%) are just partly bifacial. Only two pieces (4.3%) are fully bifacial and one specimen (2.1%) is thrihedrally shaped. All the handaxes are unifacial, and most of the cleavers and picks are also unifacially made.

Dimension

The dimension of the total LCTs/HDTs at KGA6-A1 is summarized as follows:

Max.	241 × 136 × 90 mm,
Min.	74 × 46 × 19 mm,
Mean	146.5 × 97.9 × 48.8 mm,
SD	38.3 × 18.5 × 14.5 mm.

The different groups of the LCTs/HDTs show the following dimensions:

Handaxes;

Max.	214 × 133 × 81 mm,
Min.	74 × 46 × 19 mm,
Mean	139.3 × 93.0 × 41.5 mm,
SD	54.2 × 29.4 × 19.3 mm,

Cleavers;

Max.	195 × 124 × 61 mm,
Min.	133 × 85 × 38 mm,
Mean	156.0 × 111.0 × 50.8 mm,
SD	24.6 × 14.7 × 9.8 mm,

Picks;

Max.	241 × 136 × 90 mm,
Min.	95 × 65 × 31 mm,
Mean	175.7 × 93.1 × 60.0 mm,
SD	46.6 × 19.7 × 17.4 mm.

Cross-section

Most of the bifacial tools show trapezoidal or triangular cross-sections. Out of the 55 analyzed specimens, 22 artifacts (40.0%) show a trapezoidal cross-section and 19 pieces (34.5%) exhibit a triangular cross-section. The cross-sections of six artifacts (10.9%) are parallelogram, five (9.1%) plano-convex, two (3.6%) lenticular, and one (1.8%) double convex.

Sinuosity

The KGA6-A1 artifacts mostly show straight edges, due to the high frequency of unifacially worked materials. A total of 35 LCTs/HDTs (67.3%) have straight edges, 12 pieces (23.1%) exhibit sinuous edges, and five items (9.6%) show wavy edges. Except for one pick, all other instances of

wavy edges are observed on unfinished and broken handaxes or blanks.

Edge angle

The edge angle values of the total LCTs/HDTs are summarized as follows:

Max. = 88°, Min. = 35°, Mean = 61.2°, and SD = 12.3°.

The different groups of the LCTs/HDTs show the following edge angle values:

Handaxes;

Max. = 68°, Min. = 45°, Mean = 56.3°, and SD = 8.0°,

Cleavers;

Max. = 84°, Min. = 45°, Mean = 67.8°, and SD = 16.7°,

Picks;

Max. = 88°, Min. = 43°, Mean = 67.4°, and SD = 12.7°.

Biface butt plan

Out of the 44 analyzed tools, 13 artifacts (29.5%) exhibit a straight butt, another 13 pieces (29.5%) a V-shaped butt, and nine items (20.5%) a U-shaped butt. Three specimens (6.8%) retain cortex on their butt and one piece (2.3%) shows an irregular butt plan. Two biface butts (4.5%) are modified into tool and three biface butts (6.8%) are indeterminate.

Invasiveness

The artifacts at KGA6-A1 are modified by large flake scars, and thus the flake scars cover the tool surfaces invasively. While only three LCTs/HDTs (5.9%) show marginal retouch, 37 tools (72.5%) are invasively retouched, and 11 items (21.6%) exhibit semi-invasively retouched surfaces.

Flake scar number

The flake scar count for the total LCTs/HDTs is summarized as follows:

Max. = 20, Min. = 2, Mean = 7.9, and SD = 4.2.

The different groups of the LCTs/HDTs show the following flake scar count:

Handaxes;

Max. = 20, Min. = 7, Mean = 10.5, and SD = 4.4,

Cleavers;

Max. = 14, Min. = 3, Mean = 7.8, and SD = 4.1,

Picks;

Max. = 18, Min. = 5, Mean = 10.4, and SD = 3.5.

Maximum dimension of flake scars

The maximum dimension of the LCT/HDT flake scars is summarized as follows:

Max. = 100 mm, Min. = 13 mm, Mean = 51.9 mm, and SD = 19.6 mm.

The different groups of the LCTs/HDTs exhibit the following maximum dimensions of the flake scars:

Handaxes;

Max. = 76 mm, Min. = 24 mm, Mean = 50.6 mm, and SD = 21.6 mm,

Cleavers;

Max. = 100 mm, Min. = 38 mm, Mean = 63.8 mm, and SD = 24.9 mm,

Picks;

Max. = 80 mm, Min. = 37 mm, Mean = 55.3 mm, and SD = 13.2 mm.

Cleaver edge plan, bit angle, bit dimension

Out of the five analyzed cleavers, three cleavers (60.0%) show a straight edge plan, one cleaver (20.0%) exhibits an oblique end and another one (20.0%) has a convex edge plan.

The cleavers recovered at KGA6-A1 show the following cleaver bit angle values:

Max. = 54°, Min. = 42°, Mean = 47.6°, and SD = 5.9°.

The cleaver bit dimensions are summarized as:

Max. = 108 mm, Min. = 55 mm, Mean = 81.0 mm, and SD = 20.9 mm.

KGA4-A2 (Plates 9–14)

Overview

General presentation of artifacts

The surface collection at KGA4-A2 is represented by 159 lithic artifacts, including 72 LCTs/HDTs (45.3%), 64 flakes (40.3%), nine chunks (5.7%), and 14 cores (8.8%).

General presentation of raw materials

The raw material used at KGA4-A2 is almost exclusively basalt (n=153, 96.2%), except for a few other raw materials, such as quartz (n=4, 2.5%) and siliceous rock (n=2, 1.3%).

General presentation of physical conditions

The majority of the lithic artifacts are moderately weathered (n=137, 86.2%). Out of 159 pieces, 18 lithics (11.3%) are weathered and only four lithics (2.5%) show a fresh appearance.

Large Cutting Tools & Heavy Duty Tools

Typology

A total of 72 LCTs/HDTs were recovered from KGA4-A2, including 20 handaxes (27.8%), 13 cleavers (18.1%), 26 picks (36.1%), one knife (1.4%), four large scrapers (5.6%), one core axe (1.4%), two part bifaces (2.8%), four modified pieces/blanks (5.6%), and one broken LCTs/HDTs (1.4%).

Raw material

All the 72 LCTs/HDTs at KG4-A2 are made on basalt, which we consider an easily accessible local raw material at the KGA4-A2 site.

Physical condition

All the LCTs/HDTs show a moderately weathered appearance, because they are all made on basalt and passed through more or less the same post-depositional processes.

Presence of cortex

The LCTs/HDTs recovered from the KGA4-A2 show different degree of the cortex preservation. Out of 72 pieces, 33 LCTs/HDTs (45.8%) have no cortex, 21 items (29.2%) exhibit cortex on less than 25% of their surface ("small amount"), 10 tools (13.9%) show "modest amount" (25–50% of the surface) of cortex, and six artifacts (8.3%) have "much" cortex (>50% of the surface). The remaining two pieces (2.8%) are indeterminate owing to weathering.

Primary form

Most of the primary forms are flake (n=45, 63.4%) and two LCTs/HDTs (2.8%) are made on cobble. The primary forms of the remaining 24 pieces (33.8%) are indeterminate due to either invasive retouch or weathering.

Flake type

Out of the 45 analyzed LCTs/HDTs made on flake, 18 tools (40.0%) are made on an end struck flake, and 13 (28.9%) are made on a side struck flake. The remaining 14 pieces (31.1%) are indeterminate owing to flaking on the ventral surface.

Unifacial/bifacial

The number of bifacial tools increases from KGA6-A2 to KGA4-A2. While 30 LCTs/HDTs (41.7%) are still unifacially produced, 16 tools (22.2%) are partly bifacial and 19 tools (26.4%) are fully bifacial. Seven pieces (9.7%) take a quadrilateral form.

Dimension

The dimension of the total LCTs/HDTs at KGA4-A2 is summarized as follows:

Max. 255 × 130 × 100 mm,

Min. 89 × 40 × 25 mm,
Mean 166.1 × 92.5 × 52.3 mm,
SD 35.4 × 17.7 × 15.8 mm.

The different groups of the LCTs/HDTs show the following dimensions:

Handaxes (excluding broken handaxes);
Max. 211 × 116 × 78 mm,
Min. 89 × 64 × 27 mm,
Mean 153.6 × 92.4 × 46.8 mm,
SD 30.3 × 15.3 × 13.1 mm,

Cleavers;
Max. 203 × 118 × 100 mm,
Min. 133 × 78 × 30 mm,
Mean 163.5 × 96.5 × 52.9 mm,
SD 24.3 × 12.6 × 17.0 mm,

Picks;
Max. 255 × 125 × 90 mm,
Min. 116 × 40 × 31 mm,
Mean 180.2 × 87.4 × 59.5 mm,
SD 41.6 × 20.8 × 16.6 mm.

Cross-section

The KGA4-A2 LCTs/HDTs show a variety of cross-sections and do not exhibit a specific tendency. A total of 16 tools (22.2%) have a trapezoidal cross-section. The cross-sections of 14 pieces (19.4%) are parallelogram, another 14 pieces (19.4%) triangular, and 13 pieces (18.1%) plano-convex. A biconical cross-section was observed on six tools (8.3%), double convex on five tools (6.9%), and lenticular on four pieces (5.6%).

Sinuosity

A large number of the LCTs/HDTs exhibit wavy edges. Out of 72 LCTs/HDTs, 35 specimens (48.6%) exhibit wavy edges, 21 pieces (29.2%) are sinuous, and 16 items (22.2%) are straight.

Edge angle

The edge angle values of the total LCTs/HDTs are summarized as follows:

Max. = 110°, Min. = 40°, Mean = 64.4°, and SD = 12.4°.

The different groups of the LCTs/HDTs show the following edge angle values:

Handaxes (excluding broken handaxes);
Max. = 75°, Min. = 40°, Mean = 60.8°, and SD = 11.3°,

Cleavers;
Max. = 80°, Min. = 45°, Mean = 62.5°, and SD = 10.0°,

Picks;
Max. = 110°, Min. = 54°, Mean = 72.5°, and SD = 11.7°.

Biface butt plan

Out of the 68 analyzed tools, 23 artifacts (33.8%) exhibit a V-shaped butt, 20 pieces (29.4%) a U-shaped butt, and 11 items (16.2%) a straight butt. Nine specimens (13.2%) have a cortical butt, three biface butts (4.4%) are modified into tool, and two items (2.9%) show an irregular biface butt.

Invasiveness

As with the KGA6-A1 assemblage, the LCTs/HDTs at KGA4-A2 are modified by large flake scars which invasively cover their surfaces. Most of the LCTs/HDTs bear invasive flaking (n=49, 68.1%), 13 tools (18.1%) show semi-invasive flaking, and 10 pieces (13.9%) are modified by

marginal retouch.

Flake scar number

The flake scar count for the total LCTs/HDTs is summarized as follows:

Max. = 34, Min. = 3, Mean = 12.7, and SD = 6.8.

The different groups of the LCTs/HDTs show the following flake scar counts:

Handaxes (excluding broken handaxes);

Max. = 34, Min. = 3, Mean = 11.9, and SD = 7.4,

Cleavers;

Max. = 18, Min. = 6, Mean = 10.4, and SD = 4.1,

Picks;

Max. = 33, Min. = 7, Mean = 16.5, and SD = 6.3.

Maximum dimension of flake scars

The maximum dimension of the LCT/HDT flake scars is summarized as follows:

Max. = 122 mm, Min. = 21 mm, Mean = 55.3 mm, and SD = 17.5 mm.

The different groups of the LCTs/HDTs exhibit the following maximum dimensions of the flake scars:

Handaxes (excluding broken handaxes);

Max. = 81 mm, Min. = 30 mm, Mean = 52.4 mm, and SD = 14.5 mm,

Cleavers;

Max. = 95 mm, Min. = 32 mm, Mean = 57.8 mm, and SD = 19.1 mm,

Picks;

Max. = 91 mm, Min. = 21 mm, Mean = 53.3 mm, and SD = 15.5 mm.

Cleaver edge plan, bit angle, bit dimension

Out of the 12 analyzed cleavers, five pieces (41.7%) exhibit a convex edge plan, four pieces (33.3%) show an oblique end, and three (25.0%) have a straight edge plan.

The cleavers of KGA4-A2 show the following cleaver bit angle values:

Max. = 58°, Min. = 32°, Mean = 43.2°, and SD = 9.8°.

The cleaver bit dimension is summarized as:

Max. = 112 mm, Min. = 42 mm, Mean = 65.8 mm, and SD = 23.9 mm.

KGA10-A11 (Plates 15–21)

Overview

General presentation of artifacts

A total of 175 lithic artifacts were collected at KGA10-A11, including 54 LCTs/HDTs (30.9%), 61 flakes (34.9%), 21 chunks (12.0%), seven retouched/modified angular fragments (4.0%), two polyhedrons (1.1%), five core/choppers (2.9%), eight cores (4.6%), three split cobbles (1.7%), and 14 cobbles (8.0%).

General presentation of raw materials

As KGA10-A11 is located close to the quartz outcrops, a considerable number of quartz artifacts were recovered. Although the most frequent raw material is basalt (n=83, 49.7%), almost the same number of quartz tools were collected (n=72, 43.1%). The other lithics comprise seven ignimbrite specimens (4.2%), four on siliceous rocks (2.4%), and one on quartzite (0.6%).

General presentation of physical conditions

A large number of the lithics (n=88, 51.2%) exhibit a fresh condition, since all the quartz pieces retain the fresh condition. Out of the 172 analyzed specimens, 57 pieces (33.1%) are moderately

weathered, 23 pieces (13.4%) are completely weathered, and four pieces (2.3%) are patinated.

Large Cutting Tools & Heavy Duty Tools

Typology

A total of 54 LCTs/HDTs were recovered from KGA10-A11, comprising 17 handaxes (31.5%), seven cleavers (13.0%), 13 picks (24.1%), one knife (1.9%), three large scrapers (5.6%), four core axes (7.4%), three part bifaces (5.6%), two modified pieces/blanks (3.7%), and four broken LCTs/HDTs (7.4%).

Raw material

Although numerous flakes, chunks and cores are made on quartz, only eight LCTs/HDTs (14.8%) are made on quartz, while the majority of the LCTs/HDTs (n=40, 74.1%) are made on basalt. This suggests that quartz tool production was undertaken at KGA10-A11. Besides basalt and quartz tools, five ignimbrite (9.3%) and one quartzite (1.9%) artifacts were collected.

Physical condition

More than half of the LCTs/HDTs (n=30, 55.6%) are moderately weathered and eight tools (14.8%) are weathered. Sixteen LCTs/HDTs (29.6%) show a fresh appearance.

Presence of cortex

Out of the 48 analyzed LCTs/HDTs, 22 items (45.8%) retain no cortex, 13 tools (27.1%) show "small amount" (<25% of the surface) of cortex, six specimens (12.5%) exhibit "modest amount" (25–50% of the surface) of cortex, four artifacts (8.3%) have "much" cortex (>50% of the surface), and three pieces (6.3%) are indeterminate owing to weathering.

Primary form

A total of 27 tools (56.3%) are made on flake, six pieces (12.5%) are made on cobble, and one tool (2.1%) is made on block. Fourteen specimens (29.2%) are indeterminate due to either invasive retouch or weathering.

Flake type

Out of the 30 analyzed LCTs/HDTs made on flake, 11 tools (36.7%) are made on a side struck flake, and 10 (33.3%) are made on an end struck flake. One piece (3.3%) exhibits a positive surface on the dorsal side too, which may suggest removal by the Kombewa method. The remaining eight pieces (26.7%) are indeterminate owing to flaking on the ventral surface.

Unifacial/bifacial

While a significant number of LCTs/HDTs are either fully bifacial (n=13, 27.1%) or partly bifacial (n=18, 37.5%), considerable numbers of tools (n=16, 33.3%) are still unifacial. One pick (2.1%) is quadrilaterally worked.

Dimension

The dimension of the total LCTs/HDTs at KGA10-A11 is summarized as follows:

Max.	304 × 143 × 91 mm,
Min.	81 × 54 × 16 mm,
Mean	164.7 × 100.2 × 54.2 mm,
SD	41.3 × 19.4 × 15.4 mm.

The different groups of the LCTs/HDTs show the following dimensions:

Handaxes (excluding broken handaxes);

Max.	267 × 135 × 75 mm,
Min.	114 × 70 × 30 mm,
Mean	169.3 × 104.7 × 52.6 mm,
SD	45.8 × 18.5 × 12.3 mm,

Cleavers;

Max. 304 × 143 × 91 mm,
Min. 132 × 96 × 24 mm,
Mean 185.1 × 114.9 × 47.6 mm,
SD 58.5 × 15.9 × 23.5 mm,

Picks;

Max. 184 × 120 × 80 mm,
Min. 85 × 54 × 37 mm,
Mean 149.1 × 91.6 × 61.7 mm,
SD 31.8 × 16.9 × 12.4 mm.

Cross-section

The most frequent cross-section type at KGA10-A11 is trapezoidal (n=15, 31.9%) and then parallelogram (n=10, 21.3%). Six LCTs/HDTs (12.8%) have a double convex cross-section. The cross-sections of five pieces (10.6%) are plano-convex, five pieces (10.6%) lenticular, five pieces (10.6%) triangular, and one piece (2.1%) irregular.

Sinuosity

Out of 48 analyzed LCTs/HDTs, 20 tools (41.7%) show wavy edges, 21 pieces (43.8%) show sinuous edges. The remaining seven artifacts (14.6%) exhibit straight edges.

Edge angle

The edge angle values of the total LCTs/HDTs are summarized as follows:

Max. = 92°, Min. = 31°, Mean = 61.6°, and SD = 13.0°.

The different groups of the LCTs/HDTs show the following edge angle values:

Handaxes (excluding broken handaxes);

Max. = 75°, Min. = 42°, Mean = 59.7°, and SD = 8.7°,

Cleavers;

Max. = 75°, Min. = 31°, Mean = 55.6°, and SD = 15.7°,

Picks;

Max. = 92°, Min. = 57°, Mean = 73.3°, and SD = 10.4°.

Biface butt plan

Out of the 46 analyzed tools, 17 artifacts (37.0%) exhibit a V-shaped butt, 11 pieces (23.9%) a cortical butt, eight items (17.4%) a U-shaped butt, and five specimens (10.9%) a straight butt. Four biface butts (8.7%) are modified into tool, and one item (2.2%) shows an irregular biface butt.

Invasiveness

The surfaces of the most of the LCTs/HDTs are covered by invasive flaking (n=39, 83.0%). Eight tools (17.0%) show semi-invasive flaking and no pieces bear marginal retouch.

Flake scar number

The flake scar count for the total LCTs/HDTs is summarized as follows:

Max. = 27, Min. = 4, Mean = 11.3, and SD = 4.8.

The different groups of the LCTs/HDTs show the following flake scar count:

Handaxes (excluding broken handaxes);

Max. = 27, Min. = 4, Mean = 10.8, and SD = 5.6,

Cleavers;

Max. = 12, Min. = 7, Mean = 9.3, and SD = 2.0,

Picks;

Max. = 20, Min. = 7, Mean = 13.3, and SD = 4.0.

Maximum dimension of flake scars

The maximum dimension of the LCT/HDT flake scars is summarized as follows:

Max. = 104 mm, Min. = 18 mm, Mean = 57.0 mm, and SD = 17.8 mm.

The different groups of the LCTs/HDTs exhibit the following maximum dimensions of the flake scars:

Handaxes (excluding broken handaxes);

Max. = 86 mm, Min. = 38 mm, Mean = 54.5 mm, and SD = 14.5 mm,

Cleavers;

Max. = 92 mm, Min. = 33 mm, Mean = 63.9 mm, and SD = 22.1 mm,

Picks;

Max. = 104 mm, Min. = 28 mm, Mean = 56.1 mm, and SD = 18.4 mm.

Cleaver edge plan, bit angle, bit dimension

Out of the seven analyzed cleavers, three pieces (42.9%) exhibit an oblique end edge plan, two pieces (28.6%) show a straight edge plan, one (14.3%) a convex, and another one (14.3%) an oblique side edge plan.

The cleavers of KGA10-A11 show the following cleaver bit angle values:

Max. = 50°, Min. = 25°, Mean = 38.0°, and SD = 9.5°.

The cleaver bit dimension is summarized as:

Max. = 125 mm, Min. = 52 mm, Mean = 83.4 mm, and SD = 23.6 mm.

KGA10-A6 (Plates 22–23)

A selective surface collection (all LCTs and HDTs) was undertaken at KGA10-A6 and a total of 20 LCTs/HDTs were recovered.

Large Cutting Tools & Heavy Duty Tools

Typology

The collected LCTs/HDTs consist of two handaxes (10.0%), 14 picks (70.0%), one core axe (5.0%), two part bifaces (10.0%), and one modified piece/blank (5.0%). No cleaver was found at this site. Picks and pointed handaxes are frequent at this site.

Raw material

KGA10-A6 is located adjacent to a small quartz outcrop. Therefore, the proportion of the quartz artifacts (n=9, 45.0%) is much higher than that at the other sites. Nevertheless, the most common raw material used is basalt (n=11, 55.0%), probably reflecting their preference of raw material selection.

Physical condition

While all the quartz artifacts show a fresh appearance (n=9, 45.0%), almost all the basalt pieces are weathered (n=10, 50.0%), except one moderately weathered specimen (5.0%).

Presence of cortex

Most of the tools more or less retain cortex, as the quartz artifacts were produced at the outcrops. Ten tools (58.8%) exhibit "small amount" (<25% of the surface) of cortex, and three artifacts (17.6%) have "modest amount" (25–50% of the surface) of cortex. The cortex of the remaining four tools (23.5%) was completely removed.

Primary form

Out of the 17 analyzed LCTs/HDTs, six tools (35.3%) are made on flake, four (23.5%) are on cobble, another four (23.5%) are on block, and three (17.6%) are indeterminate.

Flake type

Out of the four analyzed LCTs/HDTs on flake, three pieces (75.0%) are made on an end struck flake and one (25.0%) is made on a side struck flake.

Unifacial/bifacial

Interestingly, no unifacial tools were recovered at KGA10-A6. The two handaxes and six picks are fully bifacial (n=8, 47.1%). Four picks (23.5%) are thrihedrally made, and four picks and one core axe (n=5, 29.4%) are quadrilateral.

Dimension

The dimension of the total LCTs/HDTs at KGA10-A6 is summarized as follows:

Max.	209 × 93 × 95 mm,
Min.	88 × 53 × 138 mm,
Mean	156.8 × 68.8 × 58.9 mm,
SD	33.2 × 12.8 × 14.4 mm.

The different groups of the LCTs/HDTs show the following dimensions:

Handaxes (excluding broken handaxes);

Max.	183 × 83 × 53 mm,
Min.	110 × 71 × 43 mm,
Mean	146.5 × 77.0 × 48.0 mm,
SD	51.6 × 8.5 × 7.1 mm,

Picks;

Max.	209 × 93 × 95 mm,
Min.	88 × 53 × 38 mm,
Mean	163.6 × 67.7 × 59.2 mm,
SD	31.4 × 13.5 × 13.6 mm.

Cross-section

As the majority of the recovered LCTs/HDTs at KGA10-A6 are picks, the most frequent cross-section type is parallelogram (n=6, 35.3%). Biconical and trapezoidal cross-sections are also observed on four LCTs/HDTs (23.5%) each. The remaining three tools comprise one plano-convex (5.9%), one triangular (5.9%), and one irregular (5.9%) cross-sections.

Sinuosity

All the analyzed LCTs/HDTs exhibit sinuous edges. There are no LCTs/HDTs with straight edges, probably because no pieces are unifacially produced and almost half of the tools are made on quartz.

Edge angle

The edge angle values of the total LCTs/HDTs are summarized as the follows:

Max. = 95˚, Min. = 70˚, Mean = 82.5˚, and SD = 8.2˚.

The different groups of LCTs/HDTs show the following edge angle values:

Handaxes (excluding broken handaxes);

Max. = 72˚, Min. = 70˚, Mean = 71.0˚, and SD = 1.4˚,

Picks;

Max. = 95˚, Min. = 71˚, Mean = 84.1˚, and SD = 7.7˚.

Biface butt plan

Out of the 19 analyzed tools, seven artifacts (36.8%) exhibit a V-shaped butt and four pieces (21.1%) a straight butt. U-shaped, irregular, and square butts are represented by two tools (10.5%) each.

Invasiveness

Most of the KGA10-A6 artifacts are invasively retouched. A total of 15 tools (88.2%) show invasive flake scars, one (5.9%) exhibits semi-invasive flaking, and another (5.9%) has marginal retouch.

Flake scar number

The flake scar count for the total LCTs/HDTs is summarized as follows:

Max. = 26, Min. = 7, Mean = 15.9, and SD = 4.5.

The different groups of the LCTs/HDTs show the following flake scar count:

Handaxes (excluding broken handaxes);

Max. = 15, Min. = 14, Mean = 14.5, and SD = 0.7,

Picks;

Max. = 26, Min. = 7, Mean = 16.2, and SD = 4.9.

Maximum dimension of flake scars

The maximum dimension of the LCT/HDT flake scars is summarized as follows:

Max. = 88 mm, Min. = 32 mm, Mean = 49.4 mm, and SD = 13.6 mm.

The different groups of the LCTs/HDTs exhibit the following maximum dimensions of the flake scars:

Handaxes (excluding broken handaxes);

Max. = 55 mm, Min. = 34 mm, Mean = 44.5 mm, and SD = 14.9 mm,

Picks;

Max. = 88 mm, Min. = 32 mm, Mean = 49.9 mm, and SD = 14.4mm.

KGA7-A1 and A3 (Plates 24–28)

Overview

General presentation of artifacts

At KGA7-A1, a selective surface collection was undertaken and a total of 19 LCTs/HDTs were recovered. On the other hand, all lithic artifacts found at KGA7-A3 were recovered, and this resulted in a collection of 108 lithics. Thus, a total of 171 lithic specimens were collected at KGA7-A1 and A3, comprising 63 LCTs/HDTs (36.8%), 65 flakes (38.0%), 10 core/choppers (5.8%), 27 cores (15.8%), and six cobbles (3.5%).

General presentation of raw materials

The lithic raw material component at KGA7-A1 and A3 comprises 112 tools on basalt (65.9%), 45 on quartz (26.5%), 10 on quartzite (5.9%), and one each on metamorphic rock (0.6%), rhyolite (0.6%), and siliceous rock (0.6%).

General presentation of physical conditions

A total of 72 pieces (43.1%) show a moderately weathered appearance, 47 specimens (28.1%) show fresh condition, and 34 pieces (20.4%) are fully weathered. Thirteen specimens (7.8%) are patinated and one piece (0.6%) is eolised.

Large Cutting Tools & Heavy Duty Tools

Typology

A total of 63 LCTs/HDTs were recovered from KGA7-A1 and A3, including 15 handaxes (23.8%), four cleavers (6.3%), 33 picks (52.4%), one core axe (1.6%), four part bifaces (6.3%), three modified pieces/blanks (4.8%), and three broken LCTs/HDTs (4.8%).

Raw material

Despite the significant number of quartz flakes and cores, only two LCTs/HDTs (3.2%) are made on quartz. Most of the LCTs/HDTs (n=59, 93.7%) are made on basalt. One metamorphic rock (1.6%) and one rhyolite (1.6%) material are also used for LCTs/HDTs.

Physical condition

More than half of the LCTs/HDTs (n=37, 58.7%) are moderately weathered and 19 tools (30.2%) are weathered. Only six pieces (9.5%) show a fresh condition and one specimen (1.6%) is eolised.

Presence of cortex

Out of the 59 analyzed LCTs/HDTs, 19 items (32.2%) retain no cortex, 19 tools (32.2%) show "small amount" (<25% of the surface) of cortex, five specimens (8.5%) exhibit "modest amount" (25–50% of the surface) of cortex, seven artifacts (11.9%) have "much" cortex (>50% of the surface), and nine pieces (15.3%) are indeterminate owing to weathering.

Primary form

Unlike the other KGA sites, the largest number of LCTs/HDTs are made on cobble (n=29, 49.2%). Fourteen tools (23.7%) are made on flake and 16 specimens (27.1%) are indeterminate due to either invasive flaking or weathering.

Flake type

Out of the 13 analyzed LCTs/HDTs made on flake, six tools (46.2%) are made on an end struck flake, and one (7.7%) is made on a side struck flake. Six pieces (46.2%) are indeterminate owing to flaking on the ventral surface.

Unifacial/bifacial

Most of the LCTs/HDTs (n=38, 64.4%) at KGA7-A1 and A3 are fully bifacial and nine tools (15.3%) are partly bifacial. Only three specimens (5.1%) are unifacial, five tools (8.5%) are trihedral, and four items (6.8%) are quadrilateral.

Dimension

The dimension of the total LCTs/HDTs at KGA7-A1 and A3 is summarized as follows:

Max.	270 × 130 × 86 mm,
Min.	70 × 47 × 23 mm,
Mean	132.4 × 78.6 × 52.2 mm,
SD	34.3 × 17.8 × 15.2 mm.

The different groups of the LCTs/HDTs show the following dimensions:

Handaxes (excluding broken handaxes);

Max.	168 × 108 × 70 mm,
Min.	80 × 50 × 23 mm,
Mean	130.5 × 79.7 × 44.3 mm,
SD	24.6 × 18.3 × 13.6 mm,

Cleavers;

Max.	188 × 104 × 68 mm,
Min.	137 × 78 × 45 mm,
Mean	154.8 × 90.0 × 57.5 mm,
SD 2	2.7 × 12.1 × 10.8 mm,

Picks;

Max.	270 × 113 × 86 mm,
Min.	84 × 50 × 26 mm,
Mean	136.7 × 78.1 × 57.4 mm,
SD	37.7 × 16.1 × 13.4 mm.

Cross-section

The LCTs/HDTs at the KGA7-A1 and A3 show a variety of cross-section types. A total of 13 tools (22.0%) exhibit a biconical cross-section. The cross-sections of 12 pieces (20.3%) are trapezoidal, 10 specimens (16.9%) triangular, nine pieces (15.3%) plano-convex, seven artifacts (11.9%) double convex, five tools (8.5%) parallelogram, two tools (3.4%) lenticular, and one (1.7%) irregular.

Sinuosity

Out of the 57 analyzed LCTs/HDTs, 17 tools (29.8%) show wavy edges, 34 pieces (59.6%) show sinuous edges, and six artifacts (10.5%) exhibit straight edges.

Edge angle

The edge angle values of the total LCTs/HDTs are summarized as follows:

Max. = 100°, Min. = 43°, Mean = 75.3°, and SD = 13.8°.

The different groups of the LCTs/HDTs show the following edge angle values:

Handaxes (excluding broken handaxes);

Max. = 93°, Min. = 43°, Mean = 67.1°, and SD = 12.9°,

Cleavers;

Max. = 70°, Min. = 48°, Mean = 63.0°, and SD = 10.4°,

Picks;

Max. = 100°, Min. = 55°, Mean = 81.6°, and SD = 11.4°.

Biface butt plan

Out of the 59 analyzed tools, 20 artifacts (33.9%) exhibit a cortical butt, 18 pieces (30.5%) a U-shaped butt, 11 items (18.6%) a V-shaped butt, six tools (10.2%) a straight butt, and two specimens (3.4%) an irregular butt. One biface butt (1.7%) is modified into tool and one biface butt (1.7%) is indeterminate.

Invasiveness

Most of the LCTs/HDTs exhibit invasive flaking (n=48, 81.4%). Seven tools (11.9%) show semi-invasive flaking and four pieces (6.8%) exhibit marginal retouch.

Flake scar number

The flake scar count for the total LCTs/HDTs is summarized as follows:

Max. = 37, Min. = 6, Mean = 17.3, and SD = 6.7.

The different groups of the LCTs/HDTs show the following flake scar count:

Handaxes (excluding broken handaxes);

Max. = 30, Min. = 9, Mean = 19.0, and SD = 5.7,

Cleavers;

Max. = 28, Min. = 9, Mean = 18.3, and SD = 7.9,

Picks;

Max. = 37, Min. = 8, Mean = 17.6, and SD = 7.1.

Maximum dimension of flake scars

The maximum dimension of the LCT/HDT flake scars is summarized as follows:

Max. = 77 mm, Min. = 20 mm, Mean = 44.2 mm, and SD = 11.7 mm.

The different groups of the LCTs/HDTs exhibit the following maximum dimensions of the flake scars:

Handaxes (excluding broken handaxes);

Max. = 61 mm, Min. = 25 mm, Mean = 42.5 mm, and SD = 10.2 mm,

Cleavers;

Max. = 64 mm, Min. = 40 mm, Mean = 47.3 mm, and SD = 11.4 mm,

Picks;

Max. = 77 mm, Min. = 20 mm, Mean = 45.9 mm, and SD = 12.4 mm.

Cleaver edge plan, bit angle, bit dimension

Out of the four analyzed cleavers, three pieces (75.0%) have an oblique end edge plan and one piece (25.0%) shows a convex edge plan.

The cleavers of KGA7-A1 and A3 show the following cleaver bit angle values:

Max. = 50°, Min. = 25°, Mean = 35.8°, and SD = 10.5°.

The cleaver bit dimension is summarized as:

Max. = 93 mm, Min. = 28 mm, Mean = 52.3 mm, and SD = 35.4 mm.

KGA7-A2 (Plates 29–32)

A controlled surface collection was undertaken at KGA7-A2 and a total of 17 artifacts were recovered.

Large Cutting Tools & Heavy Duty Tools

Typology

The collected LCTs/HDTs consist of four handaxes (23.5%), eight cleavers (47.1%), one knife (5.9%), one modified piece/blank (5.9%), and three broken LCTs/HDTs (17.6%). No picks were found at this site.

Raw material

In contrast to the other KGA sites, the most common raw material used at KGA7-A2 is quartzite (n=12, 70.6%). Three LCTs/HDTs (17.6%) are made on basalt and two are made on quartz (11.8%).

Physical condition

As quartzite and quartz weather much slower than basalt, all the quartzite and quartz tools (n=14, 82.4%) show a fresh appearance. One basalt item (5.9%) is moderately weathered and two basalt artifacts (11.8%) are fully weathered.

Presence of cortex

Out of the 13 analyzed LCTs/HDTs, most of the LCTs/HDTs (n=11, 84.6%) retain no cortex. One tool (7.7%) has "small amount" (<25% of the surface) of cortex, and the remaining artifact (7.7%) shows "modest amount" (25–50% of the surface) of cortex.

Primary form

Except for one indeterminate piece (7.7%), all the analyzed LCTs/HDTs (n=12, 92.3%) at KGA7-A2 are made on flake.

Flake type

Out of the 12 analyzed LCTs/HDTs on flake, five pieces (41.7%) are made on a Kombewa flake and four of them are modified into cleavers. Four pieces (33.3%) are made on an end struck flake, two (16.7%) are made on a side struck flake, and one (8.3%) is indeterminate.

Unifacial/bifacial

Out of the 12 analyzed LCTs/HDTs, seven tools are unifacial (58.3%), one piece is partly bifacial (8.3%), and four artifacts (33.3%) are fully bifacial.

Dimension

The dimension of the total LCTs/HDTs at KGA7-A2 is summarized as follows:

Max.	218 × 129 × 70 mm,
Min.	66 × 58 × 25 mm,
Mean	149.2 × 95.7 × 46.5 mm,
SD	44.1 × 19.8 × 12.4 mm.

The different groups of the LCTs/HDTs show the following dimensions:

Handaxes (excluding broken handaxes);

Max.	198 × 117 × 60 mm,
Min.	141 × 74 × 38 mm,
Mean	172.5 × 97.3 × 50.3 mm,
SD	23.6 × 18.0 × 11.0 mm,

Cleavers;

Max.	218 × 129 × 63 mm,
Min.	116 × 58 × 37 mm,
Mean	161.9 × 100.1 × 46.6 mm,
SD	41.6 × 24.9 × 10.1 mm.

Cross-section

A large number of the LCTs/HDTs (n=6, 46.2%) show a triangular cross-section. The lenticular, parallelogram, and trapezoidal cross-sections are observed on two tools (15.4%) each. The remaining piece (7.7%) exhibits a double convex cross-section.

Sinuosity

Most of the LCTs/HDTs (n=10, 76.9%) show a straight edge, probably because they were unifacially worked. Two tools (15.4%) have a sinuous edge, and one piece (7.7%) exhibits a wavy edge.

Edge angle

The edge angle values of the total LCTs/HDTs are summarized as follows:

Max. = 68°, Min. = 34°, Mean = 49.5°, and SD = 9.7°.

The different groups of the LCTs/HDTs show the following edge angle values:

Handaxes (excluding broken handaxes);

Max. = 68°, Min. = 41°, Mean = 53.3°, and SD = 12.9°,

Cleavers;

Max. = 60°, Min. = 34°, Mean = 48.1°, and SD = 8.7°.

Biface butt plan

Six artifacts (46.2%) exhibit a V-shaped butt, five pieces (38.5%) show a straight butt, and two items (15.4%) have a U-shaped butt.

Invasiveness

Nine LCTs/HDTs (69.2%) have invasive flake scars, one piece (7.7%) shows semi-invasive flaking, and three artifacts (23.1%) exhibit marginal retouch.

Flake scar number

The flake scar count for the total LCTs/HDTs is summarized as follows:

Max. = 22, Min. = 3, Mean = 9.9, and SD = 5.2.

The different groups of the LCTs/HDTs show the following flake scar count:

Handaxes (excluding broken handaxes);

Max. = 22, Min. = 12, Mean = 14.8, and SD = 4.9,

Cleavers;

Max. = 14, Min. = 3, Mean = 8.1, and SD = 3.9.

Maximum dimension of flake scars

The maximum dimension of the LCT/HDT flake scars is summarized as follows:

Max. = 74 mm, Min. = 37 mm, Mean = 52.3 mm, and SD = 11.6 mm.

The different groups of the LCTs/HDTs exhibit the following maximum dimensions of the flake scars:

Handaxes (excluding broken handaxes);

Max. = 61 mm, Min. = 42 mm, Mean = 51.5 mm, and SD = 9.4 mm,

Cleavers;

Max. = 74 mm, Min. = 37 mm, Mean = 52.8 mm, and SD = 13.1 mm.

Cleaver edge plan, bit angle, bit dimension

Out of the eight analyzed cleavers, six pieces (75.0%) exhibit an oblique edge plan and two pieces (25.0%) have a straight edge plan.

The cleavers of KGA7-A2 show the following cleaver bit angle values:
Max. = 50°, Min. = 38°, Mean = 44.9°, and SD = 4.8°.
The cleaver bit dimension is summarized as:
Max. = 108 mm, Min. = 41 mm, Mean = 73.5 mm, and SD = 24.8 mm.

KGA8-A1 (Plates 33–42)

Overview

General presentation of artifacts

A total of 354 lithic artifacts were collected at KGA8-A1, comprising 201 LCTs/HDTs (56.8%), 31 flakes (8.8%), 50 chunks (14.1%), two retouched/modified angular fragments (0.6%), 11 polyhedrons (3.1%), 12 core/choppers (3.4%), 29 cores (8.2%), one split cobble (0.3%), 11 cobbles (3.1%), and six unidentified weathered pieces (1.7%).

General presentation of raw materials

Next to the basalt pieces, a substantial number of quartzite artifacts were collected at KGA8-A1. Out of the 354 pieces, 222 (62.7%) are on basalt, 64 pieces (18.1%) are on quartzite, and 58 (16.4%) are on quartz. In addition to these main raw materials, eight specimens on metamorphic rock (2.3%), one on rhyolite (0.3%), and one on siliceous rock (0.3%) were recovered.

General presentation of physical conditions

Almost half of the pieces (n=189, 53.4%) are weathered, 69 pieces (19.5%) are moderately weathered, and 93 pieces (26.3%) show a fresh surface. One lithic (0.3%) is eolised and two specimens (0.6%) are patinated.

Large Cutting Tools & Heavy Duty Tools

Typology

The collected 201 LCTs/HDTs at KGA8-A1 comprise 64 handaxes (31.8%), 48 cleavers (23.9%), 14 picks (7.0%), four knives (2.0%), 18 large scrapers (9.0%), one core axe (0.5%), 19 part bifaces (9.5%), 14 modified pieces/blanks (7.0%), and 19 broken LCTs/HDTs (9.5%).

Raw material

Out of the 201 LCTs/HDTs, 133 artifacts (66.2%) are made on basalt, 51 tools (25.4%) on quartzite, and 15 items (7.5%) on quartz. Besides, one LCT/HDT (0.5%) is made on rhyolite and another tool (0.5%) is made on siliceous rock.

Physical condition

Although more than half of the LCTs/HDTs are weathered (n=91, 45.3%) or moderately weathered (n=42, 20.9%), a large quantity of tools (n=68, 33.8%) show a fresh condition and most of them are made on either quartzite or quartz.

Presence of cortex

A total of 68 LCTs/HDTs (52.7%) show no cortex, whereas almost half of the tools retain some cortex: 42 pieces (32.6%) have "small amount" (<25% of the surface) of cortex, 12 pieces (9.3%) exhibit "modest amount" (25–50% of the surface) of cortex, and five artifacts (3.9%) have "much" cortex (>50% of the surface). Two pieces (1.6%) are indeterminate owing to weathering.

Primary form

Out of the 130 analyzed LCTs/HDTs, the majority of the tools (n=101, 77.7%) at KGA8-A1 are made on flake. Seven specimens (5.4%) are made on cobble and one piece (0.8%) is made on block. A total of 21 tools (16.2%) are indeterminate due to either invasive flaking or weathering.

Flake type

Out of the 101 analyzed LCTs/HDTs made on flake, 41 tools (40.6%) are made on an end struck flake, and 30 (29.7%) are made on a side struck flake. Two tools (2.0%), one cleaver and one

large scraper, are made on a Kombewa flake. A total of 28 pieces (27.7%) are indeterminate owing to flaking on the ventral surface.

Unifacial/bifacial

Out of the 129 analyzed LCTs/HDTs, 52 tools (40.3%) are unifacially made, 22 items (17.1%) are partly bifacial, and 47 artifacts (36.4%) are fully bifacial. Eight picks (6.2%) are quadrilaterally worked.

Dimension

The dimension of the total LCTs/HDTs at KGA8-A1 is summarized as follows:

Max.	280 × 164 × 101 mm,
Min.	88 × 48 × 20 mm,
Mean	160.2 × 97.4 × 48.5 mm,
SD	33.8 × 18.1 × 13.4 mm.

The different groups of the LCTs/HDTs show the following dimensions:

Handaxes (excluding broken handaxes);

Max.	280 × 164 × 101 mm,
Min.	88 × 48 × 23 mm,
Mean	168.0 × 98.5 × 51.9 mm,
SD	38.2 × 19.4 × 13.6 mm,

Cleavers;

Max.	260 × 148 × 80 mm,
Min.	102 × 68 × 27 mm,
Mean	167.5 × 104.5 × 48.4 mm,
SD	28.2 × 15.6 × 11.2 mm,

Picks;

Max.	243 × 123 × 91 mm,
Min.	103 × 56 × 23 mm,
Mean	167.1 × 88.0 × 58.1 mm,
SD	36.1 × 19.2 × 18.8 mm.

Cross-section

The KGA8-A1 LCTs/HDTs show a variety of cross-section types. Thirty-six pieces (27.9%) show a trapezoidal cross-section. The cross-sections of 30 pieces (23.3%) are biconical, 22 pieces (17.1%) triangular, 17 pieces (13.2%) parallelogram, 10 pieces (7.8%) double convex, 10 pieces (7.8%) plano-convex, three pieces (2.3%) irregular, and one piece (0.8%) lenticular.

Sinuosity

While more than half of the LCTs/HDTs (n=68, 52.7%) show straight edges, only six tools (4.7%) exhibit a wavy edge. A total of 55 pieces (42.6%) show sinuous edge.

Edge angle

The edge angle values of the total LCTs/HDTs are summarized as follows:

Max. = 105°, Min. = 35°, Mean = 64.4°, and SD = 14.1°.

The different groups of the LCTs/HDTs show the following edge angle values:

Handaxes (excluding broken handaxes);

Max. = 100°, Min. = 40°, Mean = 66.0°, and SD = 13.7°,

Cleavers;

Max. = 78°, Min. = 35°, Mean = 58.0°, and SD = 10.7°,

Picks;

Max. = 105°, Min. = 60°, Mean = 81.1°, and SD = 10.7°.

Biface butt plan

Out of the 127 analyzed tools, 42 artifacts (33.1%) exhibit a U-shaped butt, 37 pieces (29.1%) a V-shaped butt, 13 pieces (10.2%) an irregular butt, nine pieces (7.1%) a straight butt, and eight pieces (6.3%) are modified into tool. The remaining are six pieces (4.7%) each of cortex, square, and indeterminate butts.

Invasiveness

The surfaces of most of the LCTs/HDTs (n=106, 83.5%) are invasively covered by flake scars. Thirteen tools (10.2%) show semi-invasive flaking and eight pieces (6.3%) exhibit marginal retouch.

Flake scar number

The flake scar count for the total LCTs/HDTs is summarized as follows:

Max. = 30, Min. = 2, Mean = 12.0, and SD = 5.4.

The different groups of the LCTs/HDTs show the following flake scar count:

Handaxes (excluding broken handaxes);

Max. = 30, Min. = 5, Mean = 13.7, and SD = 5.4,

Cleavers;

Max. = 18, Min. = 2, Mean = 8.8, and SD = 4.2,

Picks;

Max. = 23, Min. = 10, Mean = 14.5, and SD = 4.4.

Maximum dimension of flake scars

The maximum dimension of the LCT/HDT flake scars is summarized as follows:

Max. = 108 mm, Min. = 5 mm, Mean = 51.4 mm, and SD = 16.3 mm.

The different groups of the LCTs/HDTs exhibit the following maximum dimensions of the flake scars:

Handaxes (excluding broken handaxes);

Max. = 108 mm, Min. = 20 mm, Mean = 49.3 mm, and SD = 15.2 mm,

Cleavers;

Max. = 99 mm, Min. = 5 mm, Mean = 56.0 mm, and SD = 18.1 mm,

Picks;

Max. = 71 mm, Min. = 28 mm, Mean = 46.8 mm, and SD = 12.0 mm.

Cleaver edge plan, bit angle, bit dimension

Out of the 48 analyzed cleavers, 32 pieces (66.7%) are oblique end, seven pieces (14.6%) are straight, another seven pieces (14.6%) exhibit convex, one piece (2.1%) is concave, and another piece (2.1%) is irregular.

The cleavers of KGA8-A1 show the following cleaver bit angle values:

Max. = 65°, Min. = 28°, Mean = 44.2°, and SD = 7.9°.

The cleaver bit dimension is summarized as:

Max. = 110 mm, Min. = 30 mm, Mean = 67.1 mm, and SD = 17.9 mm.

KGA12-A1 (Plates 43–55)

Overview

General presentation of artifacts

A total of 744 lithic artifacts were collected at KGA12-A1, including 137 LCTs/HDTs (18.4%), 165 flakes (22.2%), 119 chunks (16.0%), three polyhedrons (0.4%), nine core/choppers (1.2%), 38 cores (5.1%), two split cobbles (0.3%), 26 cobbles (3.5%), and 245 unidentified weathered pieces (32.9%).

General presentation of raw materials

The lithic raw material at KGA12-A1 is mostly basalt (n=560, 75.5%), quartzite (n=73, 9.8%), and quartz (n=61, 8.2%). Eleven artifacts are on metamorphic rocks (1.5%), another 11 on ignimbrites (1.5%), 23 on rhyolites (3.1%), two on siliceous rocks (0.3%), and one piece is indeterminate (0.1%).

General presentation of physical conditions

Most of the lithics recovered from KGA12-A1 are either weathered (n=359, 48.3%) or moderately weathered (n=224, 30.1%). Only a limited number of lithics exhibit a fresh surface (n=126, 16.9%), mostly on quartzite or quartz. One piece (0.1%) is eolised and 34 pieces (4.6%) show patina.

Large Cutting Tools & Heavy Duty Tools

Typology

A total of 137 LCTs/HDTs were recovered from KGA12-A1, comprising 38 handaxes (27.7%), 31 cleavers (22.6%), 25 picks (18.2%), 11 knives (8.0%), two large scrapers (1.5%), six core axes (4.4%), seven part bifaces (5.1%), four modified pieces/blanks, (2.9%), and 13 broken LCTs/HDTs (9.5%).

Raw material

As for the general raw material component, most of the LCTs/HDTs are made on basalt (n=88, 64.2%). Succeeding the basalt artifacts, 24 tools (17.5%) are made on quartzite and 12 items (8.8%) are made on rhyolite, and eight pieces (5.8%) are made on ignimbrite. The remainder of the LCTs/HDTs are made on quartz (n=5, 3.6%).

Physical condition

A half of the LCTs/HDTs (n=68, 49.6%) are moderately weathered, and 18 tools (13.1%) are weathered, and 49 items (35.8%) show a fresh appearance.

Presence of cortex

Out of the 111 analyzed LCTs/HDTs, 54 items (48.6%) retain no cortex, 33 tools (29.7%) show "small amount" (<25% of the surface) of cortex, 14 specimens (12.6%) exhibit "modest amount" (25–50% of the surface) of cortex, seven artifacts (6.3%) have "much" cortex (>50% of the surface), and three pieces (2.7%) are indeterminate owing to weathering.

Primary form

Out of 108 analyzed LCTs/HDTs, 61 tools (56.5%) are made on flake, 15 pieces (13.9%) are made on cobble, and three tools (2.8%) are made on block. A total of 29 specimens (26.9%) are indeterminate due to either invasive flaking or weathering.

Flake type

Out of the 55 analyzed LCTs/HDTs made on flake, 24 tools (43.6%) are made on an end struck flake, and 27 (49.1%) are made on a side struck flake. One piece (1.8%) is probably made on a Kombewa flake, and the remaining three pieces (5.5%) are indeterminate owing to flaking on the ventral surface.

Unifacial/bifacial

The majority of the LCTs/HDTs are either fully bifacial (n=40, 36.0%) or partly bifacial (n=35, 31.5%). A total of 31 tools (27.9%) are unifacial and five picks (4.5%) take trihedral form.

Dimension

The dimension of the total LCTs/HDTs at KGA12-A1 is summarized as follows:

Max.	230 × 139 × 102 mm,
Min.	72 × 36 × 25 mm,
Mean	160.3 × 97.3 × 54.9 mm,
SD	30.4 × 17.7 × 16.2 mm.

The different groups of the LCTs/HDTs show the following dimensions:

Handaxes (excluding broken handaxes);

Max.	230 × 139 × 98 mm,
Min.	72 × 36 × 26 mm,
Mean	174.4 × 104.1 × 58.1 mm,
SD	31.3 × 18.3 × 16.3 mm,

Cleavers;

Max.	204 × 129 × 88 mm,
Min.	91 × 78 × 26 mm,
Mean	156.5 × 101.3 × 47.6 mm,
SD	27.5 × 13.3 × 13.4 mm,

Picks;

Max.	211 × 130 × 102 mm,
Min.	89 × 48 × 33 mm,
Mean	166.1 × 88.4 × 65.8 mm,
SD	28.1 × 16.6 × 15.8 mm.

Cross-section

The LCTs/HDTs from KGA12-A1 show a variety of cross-section types, comprising 20 plano-convex (18.3%), 19 (17.4%) biconical, 18 (16.5%) triangular, 17 (15.6%) double convex, 14 (12.8%) trapezoidal, 12 (11.0%) parallelogram, 8 (7.3%) lenticular, and one (0.9%) irregular.

Sinuosity

Out of the 112 analyzed LCTs/HDTs, considerable numbers of the LCTs/HDTs show straight edges (n=41, 36.6%). Forty tools (35.7%) show sinuous edges and 31 (27.7%) pieces exhibit wavy edges.

Edge angle

The edge angle values of the total LCTs/HDTs are summarized as follows:

Max. = 96°, Min. = 25°, Mean = 63.6°, and SD = 13.6°.

The different groups of the LCTs/HDTs show the following edge angle values:

Handaxes (excluding broken handaxes);

Max. = 95°, Min. = 25°, Mean = 66.1°, and SD = 13.5°,

Cleavers;

Max. = 85°, Min. = 37°, Mean = 61.1°, and SD = 12.1°,

Picks;

Max. = 96°, Min. = 40°, Mean = 68.2°, and SD = 15.6°.

Biface butt plan

Out of the 107 analyzed tools, 37 artifacts (34.6%) exhibit a V-shaped butt, 21 pieces (19.6%) a U-shaped butt, 21 items (19.6%) a cortex butt, and 15 tools (14.0%) a straight butt. Four biface butts (3.7%) are modified into tool, and another four items (3.7%) show an irregular biface butt. Five pieces (4.7%) are indeterminate.

Invasiveness

The surfaces of the most of the LCTs/HDTs are covered by invasive flake scars (n=87, 79.1%). Out of the 110 analyzed LCTS/HDTS, 16 tools (14.5%) show semi-invasive flake scars and seven pieces (6.4%) bear marginal retouch.

Flake scar number

The flake scar count for the total LCTs/HDTs is summarized as follows:

Max. = 34, Min. = 2, Mean = 15.3, and SD = 7.1.

The different groups of the LCTs/HDTs show the following flake scar count:

Handaxes (excluding broken handaxes);

Max. = 34, Min. = 7, Mean = 19.0, and SD = 7.2,

Cleavers;

Max. = 20, Min. = 2, Mean = 10.4, and SD = 4.9,

Picks;

Max. = 32, Min. = 8, Mean = 16.6, and SD = 5.6.

Maximum dimension of flake scars

The maximum dimension of the LCT/HDT flake scars is summarized as follows:

Max. = 94 mm, Min. = 20 mm, Mean = 55.6 mm, and SD = 16.0 mm.

The different groups of the LCTs/HDTs exhibit the following maximum dimensions of the flake scars:

Handaxes (excluding broken handaxes);

Max. = 85 mm, Min. = 28 mm, Mean = 55.4 mm, and SD = 13.9 mm,

Cleavers;

Max. = 94 mm, Min. = 20 mm, Mean = 54.7 mm, and SD = 20.2 mm,

Picks;

Max. = 80 mm, Min. = 30 mm, Mean = 58.7 mm, and SD = 15.4 mm.

Cleaver edge plan, bit angle, bit dimension

Out of the 30 analyzed cleavers, 17 pieces (56.7%) exhibit an oblique end edge plan, seven pieces (23.3%) have a convex, three (10.0%) a straight, and one (3.3%) an oblique side edge plan. The remaining two pieces (6.7%) show an irregular cleaver edge plan.

The cleavers of KGA12-A1 show the following cleaver bit angle values:

Max. = 93°, Min. = 25°, Mean = 44.4°, and SD = 12.3°.

The cleaver bit dimension is summarized as:

Max. = 101 mm, Min. = 28 mm, Mean = 61.8 mm, and SD = 18.2 mm.

KGA18-A1 (Plates 56–60)

A selective surface collection (100% collection of LCTs/HDTs) was undertaken at KGA18-A1a and b. A total of 58 LCTs/HDTs were found and collected.

Large Cutting Tools & Heavy Duty Tools

Typology

The collected 58 LCTs/HDTs at KGA18-A1 comprise 39 handaxes (67.2%), nine cleavers (15.5%), one knife (1.7%), four large scrapers (6.9%), two part bifaces (3.4%), one modified piece/blank (1.7%), and two broken LCTs/HDTs (3.4%).

Raw material

Except for one quartz tool (1.7%), all the LCTs/HDTs (n=57, 98.3%) are made on basalt.

Physical condition

Most of the LCTs/HDTs (n=46, 79.3%) from KGA18-A1 are fully weathered, because basalt weathers fast. Eleven pieces (19.0%) show moderately weathered surfaces and only one specimen (1.7%) exhibits a fresh condition.

Presence of cortex

Out of the 48 analyzed LCTs/HDTs, most of the tools (n=37, 77.1%) show no cortex. Seven items (14.6%) have "small amount" (<25% of the surface) of cortex, one piece (2.1%) exhibits "modest amount" (25–50% of the surface) of cortex, and another one (2.1%) has "much" cortex (>50% of the surface). Two pieces (4.2%) are indeterminate owing to weathering.

Primary form

All the LCTs/HDTs (n=37, 77.1%) which primary forms are determinable are made on flake. The remaining 11 items (22.9%) are indeterminate due to invasive flaking.

Flake type

Out of the 37 analyzed LCTs/HDTs made on flake, 13 tools (35.1%) are made on an end struck flake, and three (8.1%) are made on a side struck flake. More than half of the analyzed LCTs/HDTs (n=21, 56.8%) are indeterminate owing to flaking on the ventral surface.

Unifacial/bifacial

While the majority of the LCTs/HDTs are fully bifacial (n=35, 72.9%) or partly bifacial (n=11, 22.9%), only two pieces (4.2%) are unifacially made.

Dimension

The dimension of the total LCTs/HDTs at KGA18-A1 is summarized as follows:

Max.	243 × 117 × 53 mm,
Min.	82 × 43 × 18 mm,
Mean	155.8 × 85.7 × 38.2 mm,
SD	41.3 × 18.9 × 8.2 mm.

The different groups of the LCTs/HDTs show the following dimensions:

Handaxes (excluding broken handaxes);

Max.	243 × 117 × 53 mm,
Min.	82 × 43 × 22 mm,
Mean	154.0 × 83.0 × 39.4 mm,
SD	44.7 × 19.4 × 8.1 mm,

Cleavers;

Max.	241 × 115 × 46 mm,
Min.	122 × 80 × 33 mm,
Mean	171.2 × 96.3 × 39.4 mm,
SD	38.2 × 11.7 × 4.5 mm.

Cross-section

More than half of the LCTs/HDTs (n=25, 52.1%) show a double convex cross-section. The cross-section of seven pieces (14.6%) are biconical, another seven pieces (14.6%) parallelogram, five pieces (10.4%) plano-convex, three pieces (6.3%) trapezoidal, and one piece (2.1%) triangular.

Sinuosity

A large number of the LCTs/HDTs from KGA18-A1 (n=32, 65.3%) show straight edges and 16 tools (32.7%) exhibit sinuous edges. Only one item (2.0%) retains a wavy edge.

Edge angle

The edge angle values of the total LCTs/HDTs are summarized as follows:

Max. = 82°, Min. = 30°, Mean = 59.3°, and SD = 13.3°.

The different groups of the LCTs/HDTs show the following edge angle values:

Handaxes (excluding broken handaxes);

Max. = 82°, Min. = 30°, Mean = 61.0°, and SD = 13.6°,

Cleavers;

Max. = 65°, Min. = 40°, Mean = 52.1°, and SD = 9.0°.

Biface butt plan

Out of the 48 analyzed tools, 29 artifacts (60.4%) exhibit a U-shaped butt, 11 pieces (22.9%) a V-shaped butt, three tools (6.3%) a straight butt, and one specimen (2.1%) a square butt. The biface butts of three LCTs/HDTs (6.3%) are modified into tool and one piece (2.1%) is indeterminate.

Invasiveness

The majority of the LCTs/HDTs (n=42, 87.5%) show invasive flake scars on the ventral and dorsal surfaces. Only four tools (8.3%) show semi-invasive flaking and two pieces (4.2%) exhibit marginal retouch.

Flake scar number

The flake scar count for the total LCTs/HDTs is summarized as follows:

Max. = 31, Min. = 8, Mean = 18.3, and SD = 5.4.

The different groups of the LCTs/HDTs show the following flake scar count:

Handaxes (excluding broken handaxes);

Max. = 28, Min. = 8, Mean = 18.8, and SD = 4.9,

Cleavers;

Max. = 31, Min. = 8, Mean = 16.0, and SD = 7.2.

Maximum dimension of flake scars

The maximum dimension of the LCT/HDT flake scars is summarized as follows:

Max. = 86 mm, Min. = 20 mm, Mean = 46.2 mm, and SD = 13.7 mm.

The different groups of the LCTs/HDTs exhibit the following maximum dimensions of the flake scars:

Handaxes (excluding broken handaxes);

Max. = 86 mm, Min. = 20 mm, Mean = 45.1 mm, and SD = 14.5 mm,

Cleavers;

Max. = 67 mm, Min. = 41 mm, Mean = 50.9 mm, and SD = 8.3 mm.

Cleaver edge plan, bit angle, bit dimension

Out of the 9 analyzed cleavers, the five pieces (55.6%) exhibit an oblique end edge plan, two pieces (22.2%) show a straight edge plan, and another two pieces (22.2%) have a convex edge plan.

The cleavers of KGA18-A1 show the following cleaver bit angle values:

Max. = 55°, Min. = 25°, Mean = 38.2°, and SD = 8.7°.

The cleaver bit dimension is summarized as:

Max. = 69 mm, Min. = 38 mm, Mean = 52.9 mm, and SD = 11.5 mm.

KGA20-A1 and A2 (Plates 61–66)

Overview

General presentation of artifacts

The surface collection at KGA20-A1 and A2 is represented by 46 lithic artifacts, including 28 LCTs/HDTs (60.9%) and 18 flakes (39.1%).

General presentation of raw materials

The most common raw material used at KGA20-A1 and A2 is basalt (n=40, 87.0%) and the other raw materials are rarer: three on quartzite (6.5%), one on metamorphic rock (2.2%), and two on rhyolites (4.3%).

General presentation of physical conditions

In contrast to the other KGA sites, no lithics from KGA20-A1 and A2 are categorized as weathered. A large number of the lithics are considered moderately weathered (n=34, 73.9%) and 12 lithics (26.1%) exhibit a fresh appearance.

Large Cutting Tools & Heavy Duty Tools

Typology

A total of 28 LCTs/HDTs were recovered from KGA20-A1 and A2, including 16 handaxes (57.1%), eight cleavers (28.6%), and four picks (14.3%).

Raw material

Most of the LCTs/HDTs at KGA20-A1 and A2 (n=25, 89.3%) are made on basalt. Only one tool (3.6%) is made on quartzite, and two pieces (7.1%) are made on rhyolite.

Physical condition

Substantial LCTs/HDTs (n=23, 82.1%) show a moderately weathered appearance and the remaining five tools (17.9%) exhibit fresh surfaces.

Presence of cortex

Out of the 28 analyzed LCTs/HDTs, 16 pieces (57.1%) have no cortex, five items (17.9%) exhibit "small amount" (<25% of the surface) of cortex, three pieces (10.7%) show "modest amount" (25–50% of the surface) of cortex, and another three artifacts (10.7%) have "much" cortex (>50% of the surface). One piece (3.6%) is indeterminate owing to weathering.

Primary form

Almost half of the LCTs/HDTs (n=13, 46.4%) from KGA20-A1 and A2 do not allow determination of primary form due to invasive flaking. Eleven LCTs/HDTs (39.3%) are made on flake and four tools (14.3%) are made on cobble.

Flake type

Out of the 11 analyzed LCTs/HDTs made on flake, four tools (36.4%) are made on an end struck flake, and one (9.1%) is made on a side struck flake. More than half of the analyzed pieces (n=6, 54.5%) are indeterminate owing to flaking on the ventral surface.

Unifacial/bifacial

The number of the fully bifacial tools at KGA20-A1 and A2 is much larger than at the other sites. While 24 LCTs/HDTs (85.7%) are fully bifacial, only four tools are partly bifacial (n=2, 7.1%) or unifacial (n=2, 7.1%).

Dimension

The dimension of the total LCTs/HDTs at KGA20-A1 and A2 is summarized as follows:

Max.	280 × 156 × 65 mm,
Min.	100 × 57 × 24 mm,
Mean	167.3 × 99.4 × 46.3 mm,
SD	43.8 × 23.1 × 10.1 mm.

The different groups of the LCTs/HDTs show the following dimensions:

<u>Handaxes (excluding broken handaxes);</u>

Max.	203 × 133 × 60 mm,
Min.	115 × 74 × 28 mm,
Mean	153.0 × 94.4 × 45.5 mm,
SD	26.8 × 14.6 × 8.6 mm,

<u>Cleavers;</u>

Max.	280 × 156 × 61 mm,
Min.	100 × 57 × 24 mm,
Mean	205.8 × 112.6 × 46.0 mm,
SD	58.5 × 34.8 × 11.7 mm,

<u>Picks;</u>

Max.	160 × 109 × 65 mm,
Min.	134 × 78 × 36 mm,
Mean	147.8 × 92.5 × 50.3 mm,
SD	11.6 × 15.3 × 14.4 mm.

Cross-section

The majority of the LCTs/HDTs from KGA20-A1 and A2 show well-proportioned cross-sections, including double convex (n=11, 39.3%), plano-convex (n=6, 21.4%), and lenticular (n=7, 25.0%). The other cross-section types are rare: one biconical (3.6%), two parallelogram (7.1%), and one triangular (3.6%).

Sinuosity

More than half of the LCTs/HDTs (n=16, 57.1%) exhibit straight edges, nine tools (32.1%) show sinuous edges, and three pieces (10.7%) have wavy edges.

Edge angle

The edge angle values of the total LCTs/HDTs are summarized as follows:

Max. = 95°, Min. = 40°, Mean = 60.0°, and SD = 12.9°.

The different groups of the LCTs/HDTs show the following edge angle values:

Handaxes (excluding broken handaxes);

Max. = 80°, Min. = 45°, Mean = 59.6°, and SD = 8.6°,

Cleavers;

Max. = 80°, Min. = 40°, Mean = 53.8°, and SD = 14.1°,

Picks;

Max. = 95°, Min. = 55°, Mean = 74.0°, and SD = 17.6°.

Biface butt plan

Out of the 25 analyzed tools, nine artifacts (36.0%) exhibit a U-shaped butt, six pieces (24.0%) a straight butt, four items (16.0%) a cortex butt, and three specimens (12.0%) a V-shaped butt. One piece (4.0%) is modified into tool, and the remaining two specimens are either irregular (4.0%) or indeterminate (4.0%).

Invasiveness

Most of the LCTs/HDTs at KGA20-A1 and A2 bear invasive flake scars (n=22, 78.6%). Only four tools (14.3%) show semi-invasive flaking and two pieces (7.1%) are modified by marginal retouch.

Flake scar number

The flake scar count for the total LCTs/HDTs is summarized as follows:

Max. = 60, Min. = 5, Mean = 26.4, and SD = 11.5.

The different groups of the LCTs/HDTs show the following flake scar count:

Handaxes (excluding broken handaxes);

Max. = 60, Min. = 16, Mean = 30.0, and SD = 10.5,

Cleavers;

Max. = 48, Min. = 5, Mean = 24.1, and SD = 13.2,

Picks;

Max. = 21, Min. = 11, Mean = 16.3, and SD = 4.6.

Maximum dimension of flake scars

The maximum dimension of the LCT/HDT flake scars is summarized as follows:

Max. = 83 mm, Min. = 28 mm, Mean = 51.2 mm, and SD = 12.8 mm.

The different groups of the LCTs/HDTs exhibit the following maximum dimensions of the flake scars:

Handaxes (excluding broken handaxes);

Max. = 65 mm, Min. = 28 mm, Mean = 48.9 mm, and SD = 9.5 mm,

Cleavers;

Max. = 83 mm, Min. = 35 mm, Mean = 58.3 mm, and SD = 17.7 mm,

Picks;

Max. = 55 mm, Min. = 35 mm, Mean = 46.3 mm, and SD = 9.8 mm.

Cleaver edge plan, bit angle, bit dimension

Out of the eight analyzed cleavers, three pieces (37.5%) exhibit a straight edge plan, another three pieces (37.5%) show a convex end, and two (25.0%) show an oblique end edge plan.

The cleavers of KGA20-A1 and A2 show the following cleaver bit angle values:

Max. = 38°, Min. = 20°, Mean = 30.4°, and SD = 6.8°.

The cleaver bit dimension is summarized as:

Max. = 73 mm, Min. = 32 mm, Mean = 45.3 mm, and SD = 12.7 mm.

3.3 SELECTED ARTIFACT DESCRIPTIONS

KGA6-A1 (12 artifacts)

Handaxes

KGA6-A1 O100 (Plate 1)

This is a bifacially made thick handaxe on basalt, classified as an irregular elongate ovate handaxe. The flaking is exhaustive and the flake scars are invasive and deep. The piece is fully bifacial. It was found on surface adjacent to the KGA6-A1 excavation.

KGA6-A1 2013-02 (Plate 2)

This is a unifacial handaxe made on a large end struck basalt flake. The platform is reduced by a dorsal flake scar located at the left corner of the distal edge. The dorsal face shows large invasive flake scars and is fully worked. The proximal end forms a point.

KGA6-A1 Loc. C E11-13 (Plate 3)

This is one of the few *in situ* excavated handaxes. It is a unifacially worked handaxe on an end struck basalt flake. It has an elongate double pointed plan form. The dorsal face shows large invasive flake scars covering the total surface. The artifact has straight edges and a plano-convex cross-section. The invasive flaking on the dorsal surface removed most of the striking platform. The lateral sides show continuous small, inverse retouch. The retouch covers all of the dorsal right side edge and the proximal to middle part of the left side edge.

Cleavers

KGA6-A1 Loc. C O3 (Plate 3)

This is a divergent cleaver on a side struck basalt flake. The flake scar that creates the cleaver bit is very invasive and covers ~½ of the surface. This scar may suggest preparation of the core before detaching the cleaver blank flake. There are no flake scars on the ventral face. The left side of the dorsal face was regularized by removal of large flake scars. This piece was surface collected in the 2003 field season just at the KGA6-A1 locus C excavation. It was not observed two years earlier, and must have eroded out in the time-interval. An encrusted patch of carbonated sediment occurs on its ventral surface.

KGA6-A1 2013-05 (Plate 4)

This is a large and heavy obliquely convergent cleaver on an end struck basalt flake. The dorsal face shows few large invasive flake scars. The whole dorsal face is worked. The ventral face has two flake scars at its proximal end. The cleaver bit shows few dorsal and ventral secondary irregular retouch which might have resulted from use. These retouch extend all over the dorsal right lateral edge.

Picks

KGA6-A1 7 (Plate 4)

This piece is classified as a beaked pick. It is made on a basalt flake with few dorsal and ventral flake scars. The ventral face shows a large invasive flake scar that was made before the piece was trimmed to be a pick. The bit is trimmed by two or three small secondary retouch flake scars, whereas the butt is left unworked (retains cortex). This piece is crudely worked but the notch in its mid-distal part makes it a pick.

KGA6-A1 2013-01 (Plate 5)

This is a thick and large double pointed, notched pick made on a basalt flake. The dorsal face retains more than 50% of cortex. The edges are worked with few large, deep and abrupt flake scars on the dorsal face The bit (pick tip) is well made. It looks a little "twisted" to the dorsal left side, made by a notch like abrupt flake scar. The dorsal right side has also received a huge blow which resulted in a semi-abrupt large flake scar. The butt is also pointed, shaped by a large semi-abrupt flake scar on one lateral side and inversely applied shallow and invasive flake scar on the other lateral side.

KGA6-A1 O96 (Plate 6)

This is a large and thick trihedral pick on a large end struck basalt flake. The flake blank was knocked off from a large angular block. The cortical edge of the original block is preserved and forms the central dorsal ridge. The dorsal left side is more exhaustively worked with abrupt and deep flake scars. The distal tip is a little twisted to the dorsal right side. The platform is plain. The ventral face is left unworked. It was found on the surface adjacent to the locus C excavation area.

KGA6-A1 O98 (Plate 7)

This is a large trihedral pick on a basalt flake. It has a triangular cross-section. The ventral face is left unworked except for a single large flake at its proximal edge. It is thick and pointed with a slight "twist" to the dorsal right side. The flake scars are deep and abrupt. It was a surface collection from the lag adjacent to the locus C excavation area.

KGA6-A1 1 (Plate 7)

This is a high backed pick made on a large end struck basalt flake. The piece has cortex on 75% of its dorsal face. The distal part (1/3 of the piece) has been worked by abrupt flake scars on the dorsal face creating the pick point (bit) which shows a trihedral cross-section. Both lateral sides of the worked part show some secondary flake scars (possibly from use). Its dorsal right middle/proximal part has one large and deep flake scar which created a sharp edge. This part also shows some inversely flaked irregular retouch.

KGA6-A1 2013-03 (Plate 8)

This is a large and heavy high backed double ended pointed pick on a basalt flake. The middle/proximal dorsal face retains cortex. Both lateral sides are made by abrupt large flake scars on the dorsal face. The distal end is made using two large flake scars. This piece shows that a large boulder was split open and a part of it was shaped into the pick.

KGA6-A1 Loc. C G14-S3 (Plate 8)

This is a unifacially made pick made on a basalt flake. The ventral face is left unworked, whereas the dorsal face shows intensive flaking (>18 flake scars of >1 cm). The distal end shows that this part was deliberately shaped into a pointed tip. Two dorsal deep flake scars were applied on both lateral sides to create the tip. The proximal end has been exhaustively worked by dorsal flake scars which are sometimes invasive and less abrupt.

KGA4-A2 (9 artifacts)

Handaxes

KGA4-A2 2 (Plate 9)

This is a thick elongate ovate handaxe on basalt. Like the other handaxes, it is made by large, invasive and semi-abrupt flake scars. There are 17 flake scars each on the dorsal and ventral faces. It is fully bifacially worked. The edges are sinuous because of exhaustive flaking on both faces. It shows a relatively better plan form symmetry when compared with other handaxes from the same site. It has a bi-conical cross-section.

KGA4-A2 29 (Plate 10)

This is a small elongate ovate handaxe on an end struck basalt flake. It is made by large, deep and invasive flake scars. The edges are sinuous. The butt is worked and U-shaped. Plan form symmetry is not yet fully attained.

Cleavers

KGA4-A2 23 (Plate 10)

This is a convergent cleaver on an end struck basalt flake. The cleaver bit is straight. The piece retains a small area of cortical surface. The dorsal left side and the platform (proximal) area have been modified by flake scars.

KGA4-A2 4 (Plate 11)

This is a double ended/bitted cleaver made on an end struck large basalt flake. It has two convex cleaver bits (at the distal and proximal ends). The cleaver bit flake scars were removed during core preparation stage (before detachment of the cleaver blank from the core). This is indicative of a technique whereby the cleaver form (the end product) was already determined prior to the detachment of the blank. The platform shows some modification and the proximal cleaver bit shows some shaping retouch. The left side (viewed dorsally) is worked by alternate flake scars (on both faces). The cleaver shows divergent plan form when oriented with the large cleaver bit to the distal end.

Picks

KGA4-A2 35 (Plate 12)

This is a large, thick trihedral pick made on basalt. Its dorsal face is made by large, deep and abrupt flake scars, whereas the ventral face is made by large and invasive and semi-abrupt flake scars. The edges are sinuous. The butt is V-shaped and fully flaked.

KGA4-A2 20 (Plate 13)

This is a large trihedral pick made on basalt. It preserves cortex on the proximal dorsal face. The dorsal face shows large and deep flake scars. The butt is left unworked. The ventral face shows invasive flake scars. The bit is pointed with some secondary flaking.

KGA4-A2 56 (Plate 13)

This is a unifacially worked pick on basalt. The platform is located at the proximal angle and is plain. Its butt is unworked. This is a beaked pick with a slight "twist" of its point (to the dorsal right side) made by a notch. Several abrupt flake scars have created the edges. The mid-dorsal face and the proximal part show cortex.

KGA4-A2 36 (Plate 14)

This is a pick made on basalt. It is trihedrally worked. Flake scars are very large, abrupt, deep and invasive covering almost half of the surface on both faces. The butt is worked on both faces and the bit is very pointed. The edges are sinuous. The cross-section is sort of irregular. One lateral edge (left in dorsal view) shows a large denticulation (bec) made by deep notches. This pick has a central dorsal ridge running from bit to proximal end.

KGA4-A2 59A (Plate 14)

This is a bifacially worked beaked pick made on a side struck basalt flake. The beak is made by a large notch on the dorsal left side of the distal part. The dorsal flake scars are abrupt and semi-

abrupt. The ventral flake scars are shallow and invasive. The central part of dorsal face retains some cortex. The butt is worked by dorsal flake scars. Some edge shaping flake scars are present in the middle/proximal area.

KGA10-A11 (8 artifacts)

Handaxes

KGA10-A11a 73 (Plate 15)

This is a double pointed handaxe on a large basalt flake. Proximal and distal ends are shaped to make points. The distal bit is better worked with shallower and invasive flake scars. The proximal end is worked with notch like deep flake scars. The edges are sinuous. Minimal flaking is applied to make the handaxe. The cross-section is an irregular double convex.

KGA10-A11a 182 (Plate 16)

This is a large pointed ovate handaxe made on a side struck basalt flake. The dorsal face retains more than 75% cortex. The flaking is peripheral and semi-abrupt or abrupt. The proximal dorsal part is left unworked. It is flattish piece with one edge which is straight and the other sinuous. Where it is worked on the ventral face, the platform is removed by two large flake scars. The plan form is almost symmetrical. The edges show denticulation on both lateral sides. The butt is an open U-shape.

KGA10-A11a 187 (Plate 17)

This is a thick elongate biseau-bitted handaxe on a large basalt flake. The dorsal face is worked by large deep semi-abrupt and invasive flake scars. The butt shows a small area of cortex (<25%). Both lateral sides have sinuous edges. The point (distal end) is a little constricted by deep notches made by dorsal flake scars on both sides. The distal end also shows a narrow cleaver like bit. The ventral face is worked only at the side where the platform was situated.

Cleavers

KGA10-A11a 181 (Plate 18)

This is a large parallel sided cleaver on a side struck quartzite flake. The flake scars are very large and this could make the piece pass as a core-cleaver or core axe. Its dorsal face shows at least seven large flake scars and the ventral has four flake scars of which two are large. The platform is cut ventrally by large flake scars. The cleaver bit is transversally convex and the butt is V-shaped. The edges are sinuous. This is an exceptional unique piece, very heavy and among the largest in the KGA collection.

KGA10-A11a 66 (Plate 19)

This is a thick parallel-sided cleaver on an end struck quartz flake. This piece has two platforms and two bulbs (or ventral flake faces) and is a Kombewa flake. The cleaver bit is oblique, and shows some secondary retouch which might have resulted from use. The butt has an open V-shape and retains the original surface of the block that has been used. The lateral sides are worked bifacially, with flakes detached to regularize both edges. The dorsal face shows some battering, and the flake scars are large, deep, and abrupt or semi-abrupt all along the edges. The ventral flake scars are shallower and semi-invasive.

Pick

KGA10-A11a 68 (Plate 20)

This is a core/trihedral pick on an ignimbrite flake. The piece retains some cortex at its middle proximal area (~25%). The pick has straight edges and a triangular cross-section. Large flake scars occur on its dorsal face. The butt is V-shaped. The point exhibits a burin-like oblique blow on both its ventral and dorsal faces. A notch occurs close to the bit on the dorsal right side.

Knife

KGA10-A11a 184 (Plate 20)

This is a knife made on a side struck basalt flake. The dorsal face is worked from the proximal end to the left mid-lateral side by six flake scars which created a denticulated edge. The mid-lateral to distal tip of the same side is unworked and sharp. The ventral face shows three marginal semi-abrupt flake scars that removed the platform.

Part biface

KGA10-A11a 26 (Plate 21)

This is a large biface made on a quartzite flake. Its peripheries show bifacial flake removals on the left side edge (seen dorsally) and mostly dorsally on the opposite side. The mid to distal edge of one side shows a continuous scraper-like retouch, whereas the opposite side edge shows denticulation by larger flaking. The distal end (bit) is fully worked on the ventral face with invasive flaking. It has a little "twist" to the dorsal left side with a small truncated bit. The dorsal face preserves some cortex around the mid to proximal area. This artifact can also be regarded as a large scraper.

KGA10-A6 (4 artifacts)

Handaxe

KGA10-A6 1 (Plate 22)

This is a pointed handaxe on an end struck quartz flake. It is made by large semi-abrupt flake scars on both dorsal and ventral faces. One lateral side shows a sinuous edge, whereas the edge of the other side is wavy. The butt is fully worked and has a V-shape. Its cross-section is parallelogram.

Picks

KGA10-A6 7 (Plate 22)

This is a bifacial pick on a quartz block. It is made by large semi-abrupt flake scars on dorsal and ventral faces. The butt preserves some cortex on both faces and is V-shaped. The cross-section is thick and bi-conical. One lateral side shows a sinuous edge, whereas the edge of the other side is wavy.

KGA10-A6 20 (Plate 23)

This is a bifacial pick made on basalt. The flake scars are semi-abrupt and invasive on both faces. The piece has a thick cortical butt, worked ventrally. The bit is pointed and shaped by both dorsal and ventral flake scars. The edges are sinuous.

KGA10-A6 21 (Plate 23)

This is a bifacial pick made on basalt. Both dorsal and ventral faces are exhaustively worked by invasive and semi-abrupt flake scars. The dorsal right side edge shows some secondary shaping flake scars. The edges are sinuous on one side and denticulate on the other.

KGA7-A1, A3 (10 artifacts)

Handaxes

KGA7-A1 10 (Plate 24)

This is a crudely made small ovate elongate handaxe on a basalt flake. The butt is trimmed with bifacial flake scars. The distal end is also worked by flake scars on both faces to give it a flattish and slightly round nosed shape as in most handaxes from this site.

KGA7-A1 17 (Plate 24)

This is a small pointed handaxe on basalt. It is made by semi-abrupt flake scars. Both dorsal and ventral faces are worked.

KGA7-A3b 19 (Plate 24)

This is an ovate elongate handaxe on an end struck basalt flake. The edges are sinuous on one side and straight on the other. The butt is U-shaped and the tip is a rounded point. Plan form symmetry is somewhat advanced. The section is triangular. Flake scars are semi-abrupt on both dorsal and ventral faces. The tip area is thinned by invasive flake scars.

Cleavers

KGA7-A1 15 (Plate 25)

This is an ultra-convergent cleaver made on a basalt cobble. The butt is not worked; the natural surface of the rounded cobble is left untouched and shows moderate weathering. The dorsal and ventral faces exhibit large flake scars.

KGA7-A3a 6 (Plate 25)

This is a convergent cleaver on a large basalt flake. The dorsal face is made by large and abrupt flake scars with some trimming at its proximal end. The ventral face also shows large semi-abrupt flake scars around its periphery. The lateral edges are sinuous.

Picks

KGA7-A1 1 (Plate 26)

This is a long trihedral pick on an oblong basalt cobble. It has a triangular cross-section. It becomes thinner continuously from the butt towards the bit. The butt has some cortex and shows abrupt flake scars. It has battering which might have resulted from use (perhaps as a hammer). Flake scars are abrupt, large and deep. This piece is comparable with the KGA7-A1 9 specimen.

KGA7-A1 9 (Plate 27)

This is a trihedral pick made on an oblong basalt cobble/block. The piece is long and pointed at its bit, and wider and thicker at its butt. The heavy butt is cortical and rounded. It shows battering marks. The flake scars are deep and abrupt on all three faces. They are detached in all directions. The pointed bit shows that it was carefully shaped by two shallow notches on two sides and few semi-invasive flaking on the dorsal and the ventral faces. The pick may have been used, its proximal end for crushing and battering and its distal end for digging or cutting.

KGA7-A3b 4 (Plate 27)

This is a medium sized pick made on a basalt cobble/block. It is thick at its mid-proximal part, with a triangular cross-section. The bit is shaped by deep and large flake scars. The butt is a thick U-shape and preserves cortex. It has a ridge on the dorsal face giving this piece an additional platform from which flakes are removed on the dorsal face.

KGA7-A3a 7 (Plate 28)

This is a small trihedral pick on basalt. The flake scars are abrupt, deep and invasive. Both dorsal and ventral faces are fully worked by large flake scars. The dorsal face has 10 flake scars, whereas ventral face shows six flake scars. The bit is pointed with a large flake scar. The butt is U-shaped. It has a parallelogram cross-section. The lateral sides have sinuous edges.

Core axe

KGA7-A1 3 (Plate 28)

This is a core axe made on basalt. It has a trihedral cross-section, and shows three directional flaking. Both the bit and the butt are pointed. Flake scars are large and deep.

KGA7-A2 (5 artifacts)

Handaxe

KGA7-A2 19 (Plate 29)

This is an elongate ovate handaxe made on a quartzite flake. The flake morphology is pointed

at the tip. It is a Kombewa flake but exhaustively worked on both faces. The proximal end and left lateral side (viewed dorsally) are exhaustively flaked but the opposite lateral edge middle to distal area is left unworked.

Cleavers

KGA7-A2 1 (Plate 29)

This is a side cleaver/knife on a quartzite Kombewa flake. It has a bulb on both positive faces. The platforms are plain and located at the proximal end. The butt is thick. The dorsal right edge is worked with four semi-abrupt and invasive flake scars, whereas the left side is bifacially worked and shows a denticulated edge at its mid-proximal area.

KGA7-A2 12 (Plate 30)

This is a side cleaver made on a large quartzite Kombewa flake. Its middle to proximal edge is trimmed with invasive flake scars. The platform is cut by large flake scars on both faces giving the proximal end a V-shape. The middle to distal edge is left intact and unworked. It shows a natural sharp cutting edge made in the process of core preparation.

KGA7-A2 18 (Plate 31)

This is a large side cleaver made on a quartzite Kombewa flake. Two platforms are present at its proximal end. The left lateral edge (viewed dorsally) is worked by bifacial marginally made flake scars. The other lateral edge is worked by marginal continuous flaking, creating a denticulate side scraper-like shape.

KGA7-A2 13 (Plate 32)

This is a thick parallel-sided cleaver made on a quartzite Kombewa flake. The cleaver bit is straight. The butt is thick and angular/irregular V-shaped. Its dorsal right side shows three large semi-abrupt flake scars. The edge of the other side shows a ventrally applied blow. The proximal end shows a large abrupt flake scar which removed part of the butt.

KGA8-A1 (13 artifacts)

Handaxes

KGA8-A1c 34 (Plate 33)

This is so far the largest handaxe (elongate ovate) at KGA (280 mm in length). It is made on an end struck basalt flake. Both faces are fully worked with large and invasive flake scars. The plan form exhibits advanced symmetry. The edges are straight at its mid to distal part, and gets slightly sinuous at its mid to proximal portion where the handaxe tends to be thicker. The mid-proximal lateral edge shows secondary retouch which might be result of use. The distal part shows thinning. The right lateral side on the ventral face shows shallow, invasive flake scars which suggest soft hammer use. However, it is indeterminate whether they were made by organic or soft stone hammers. The butt (proximal) is worked and has a U-shape. The striking platform is removed.

KGA8-A1c 53 (Plate 34)

This is a large, thick elongate ovate handaxe made on basalt. It is worked on a thick flake. The edges are sinuous and cross-section is bi-conical. It is fully bifacially worked. The butt is trimmed and is U-shaped. Its distal 1/3 part has been worked more finely, whereas the remaining 2/3 is thick. Similar tip thinning technique is observed on other handaxes from the same site and at KGA12-A1.

KGA8-A1 68 (Plate 35)

This is a large bifacially worked elongate ovate handaxe made on a basalt flake. The flake scars are invasive on both faces. Both lateral sides have straight edges and is finely retouched and thinned on both faces. It shows advanced plan form symmetry. The butt is U-shaped. The cross-section is

double convex. On both faces, the distal shows probable use of the soft hammer technique.

KGA8-A1b 36 (Plate 36)

This is a pointed handaxe made on a basalt flake. The dorsal face retains cortex on the mid-proximal part, whereas the ventral face is fully worked by invasive flake scars on the mid-distal part and by abrupt flake scars on the proximal area. The dorsal face shows large and semi-abrupt flakes scars. The edges are sinuous. Its plan form symmetry is advanced and its butt is U-shaped.

Cleavers

KGA8-A1c 26 (Plate 36)

This is a divergent cleaver with an oblique bit on an end struck quartzite flake. The cleaver bit was made during the blank preparation stage. The main flake scars on the dorsal face indicate that the core was prepared centripetally before the detachment of the cleaver blank from the core. The lateral sides show semi-abrupt large and medium sized flake scars. Some secondary retouch, 1–2 cm long, are present on both lateral sides. The platform is plain and reduced by flaking before the blank was detached from the core. There are no flake scars on the ventral face.

KGA8-A1c 2 (Plate 37)

This is a divergent cleaver on a quartzite Kombewa flake. It is end struck. The cleaver bit is convex shape. Large and abrupt to semi-abrupt flake scars are present on the dorsal face of both lateral edges and proximal end. The ventral face is not worked. The sharp cleaver bit shows some retouch that might have resulted from use.

KGA8-A1c 43 (Plate 38)

This is a divergent cleaver on a side struck basalt flake. The cleaver bit is oblique end. The dorsal right side is worked by abrupt flake scars. The ventral face remains unworked except for two large semi-abrupt flake scars that cut the platform. There are some secondary retouch at the proximal left side on the ventral face. The butt is V-shaped. Note the reduction of the striking platform, which is characteristic of side struck cleavers.

KGA8-A1b 59 (Plate 39)

This is a large parallel-sided cleaver on a side struck quartzite flake. The cleaver bit is convex shape. The dorsal face is worked by centripetal invasive and semi-abrupt flake scars. The flake scar that created the cleaver bit was removed at preparation stage, before detaching the cleaver blank from the core. The dorsal face shows some secondary flake scars. The ventral face has semi-invasive flake scars on both sides. The edges are sinuous by alternate flaking on both faces.

KGA8-A1 21 (Plate 40)

This is a double ended cleaver on a side struck quartzite flake. The distal cleaver bit is oblique. The dorsal face shows large and invasive flake scars. The ventral face shows two flake scars used to remove the platform. The V-shaped proximal cleaver bit has some retouch.

KGA8-A1b 61 (Plate 40)

This is an ultra convergent cleaver on a basalt flake. The cleaver bit shows convex shape. Both dorsal and ventral faces are made by large invasive and semi-abrupt flake scars. Both lateral edges show tendency towards a straight edge.

Pick

KGA8-A1b 25 (Plate 41)

This is a large trihedral pick made on basalt. It is worked by large and abrupt flake scars on all the three faces. The bit shows a "twist" made by deep flake scars.

Large scrapers

KGA8-A1c 18 (Plate 41)

This is a large scraper on an end struck quartzite flake. The piece preserves cortex on the

proximal area of its dorsal face. The dorsal face is worked by large semi-abrupt and invasive flake scars on its middle to distal area and by large abrupt flake scars on its proximal edge. The proximal end is modified into a large end scraper edge.

KGA8-A1b 23 (Plate 42)

This is a large side scraper (peripherally worked unifacial handaxe) on a large flake detached from a quartzite block. This scraper shows a large flake scar on its dorsal face, which was also detached from the same platform. The platform is plain. There are no flake scars on the ventral face. The bit is shaped by few small and semi-abrupt flake scars.

KGA12-A1 (17 artifacts)

Handaxes

KGA12-A1a 1 (Plate 43)

This is a large handaxe on a side struck basalt flake. The dorsal face is fully worked with semi-abrupt invasive flake scars. The distal end (bit) is well shaped. The piece has an elongate ovate plan form. The platform is trimmed by large flake scars that cover the lateral edge. The cross-section is plano-convex, with dorsal flake scars that left a small area with cortex at the proximal end. The ventral right side edge is straight (unworked side) and the opposite side edge is sinuous (ventrally worked side). Secondary shaping flake scars are present but not many.

KGA12-A1a 60 (Plate 44)

This is a large pointed handaxe make on basalt. It is fully bifacially worked with the butt trimmed with large, deep, semi abrupt and invasive flake scars. The plan form symmetry is moderately advanced. The edges are sinuous. This handaxe shows the decisive and controlled blows applied in its making.

KGA12-A1a 50 (Plate 45)

This is a medium sized pointed ovate handaxe on basalt. This piece is fully bifacially worked. The edges are sinuous, but plan form symmetry is advanced. Although thick, the piece also shows some symmetry in its section (tending towards 3-dimensional symmetry). The butt is trimmed. The cross-section is bi-conical.

KGA12-A1b N9 (Plate 45)

This is a pointed handaxe on rhyolite. The piece is fully bifacially worked. The dorsal face is worked by semi-abrupt and invasive flake scars. The ventral face shows abrupt flaking on the proximal 2/3, but more refined treatment distally, with fine flake scars, secondary retouch and edge/tip shaping. In particular, the distal lateral part of the ventral face shows carefully removed shallow invasive flake scars, characteristic of soft hammer retouch. This part is finely made, although the entire piece retains a thick cross-section.

KGA12-A1a 3 (Plate 46)

This is a finely made elongate ovate handaxe on a side struck rhyolite flake. The edges are sinuous. The ventral face has few semi-abrupt flake scars. The dorsal face is worked with invasive and semi-invasive flake scars. The butt shows weathering of the core from which it was detached. The cross-section is double convex. This piece was shaped by flaking to some degree of plan form symmetry.

KGA12-A1a 63 (Plate 47)

This is a thick elongate ovate handaxe made on a side struck quartzite flake. The piece is fully worked on its dorsal face by semi-abrupt invasive flake scars. The dorsal face retains a middle ridge that runs longitudinally from its distal to proximal end. The ventral face shows trimming of the platform at the proximal end. The plan form has advanced symmetry. The right side of the dorsal

face is little worked giving it a straight edge. The opposite side edge is sinuous. This handaxe is a good example of a near-unifacial handaxe that retains a straight edge. When partially bifacially worked, handaxes show a sinuous edge on the bifacially worked edge and a straight edge on the unworked (or less worked) side.

KGA12-A1c 9 (Plate 47)

This piece is a pointed handaxe made on basalt. It is fully bifacially worked by semi-abrupt invasive flake scars. The edges are sinuous. Both faces are worked exhaustively. The butt is trimmed. The bit shows shaping retouch. It seems that the original form was a large flake. It has no cortex.

KGA12-A1a 17 (Plate 48)

This is a large partly bifacial ovate handaxe made on an end struck quartzite flake. The butt has been removed by dorsal successive flake scars on the proximal end. The left lateral edge shows few invasive flake scars, whereas the right edge shows alternate semi-invasive and semi-abrupt flake scars on both dorsal and ventral faces.

KGA12-A1a 8 (Plate 49)

This is a large unifacial ovate handaxe made on a side struck basalt flake. The platform is ventrally reduced. Large semi-abrupt flake scars cover the dorsal face. It is made on a large side struck flake with faceted platform. The edges are straight. The handaxe shows, relative to its size, few but large flake scars. There is also a large flake scar at the center of the dorsal face which may be indicative of core preparation.

KGA12-A1b N15 (Plate 50)

This is a unifacial handaxe made on a side struck basalt flake. Its platform is removed by ventral flaking. Its dorsal face shows semi-abrupt, large invasive flake scars. One large triangular flake scar struck from its proximal end toward its center cuts all previous flake scars which were struck from both lateral sides. Its platform is broken. This large flake scar mimics characteristics of a preconceived flaking technique analogous to the proto-Levallois. This flake scar measures 80 × 85 mm. This and the previous specimen are examples at KGA12 that suggests a certain degree of preparation in defining the shape of large flakes.

Cleavers

KGA12-A1a 52 (Plate 51)

This is a convergent oblique bitted cleaver on a side struck quartzite flake. The dorsal face shows few large and invasive flake scars. The ventral face shows few invasive flake scars at its proximal area. The platform has been reduced by few abrupt inversely made flake scars. The butt is reduced by large flake scars and is V-shaped.

KGA12-A1a 37 (Plate 52)

This is an oblique bitted cleaver on a side struck basalt flake. The striking platform is reduced by two large flake scars on the ventral face and one on the dorsal face. The dorsal face shows large and invasive flake scars mostly on the right side. The proximal end has a U-shape and was worked with semi-abrupt continuous retouch which makes it denticulate. The proximal end and dorsal right side shows some secondary retouch which might have resulted from use. Note the reduction of the striking platform characteristic of sides struck cleavers.

Picks

KGA12-A1b N14 (Plate 53)

This is a trihedral pick on a quartzite flake. It has a high back with a ridge that runs from its butt to distal bit. The flake scars are large, abrupt and invasive. Flakes were also removed on both sides of the central ridge. The bit shows some secondary retouch from all faces to give it a very pointed shape.

KGA12-A1c 2 (Plate 53)

This is a trihedral pick on rhyolite. It is worked on all three faces. Its butt retains cortex. This is a typical pick with deep and abrupt flake scars. The tip/bit shows some trimming/shaping.

Cleaver biface

KGA12-A1a 21 (Plate 54)

This is partially bifacially worked cleaver biface made on ignimbrite. Its dorsal face retains 50% cortex on its left lateral and proximal surface. On the dorsal face, the distal and right sides are made with few invasive flake scars. On the ventral face, the distal and middle lateral edges are worked by large and invasive flake scars.

Knife

KGA12-A1a 41 (Plate 54)

This is a large knife made on an end struck flake. Dorsally, the left lateral edge shows continuous retouch, whereas the right side remains unworked. It can be considered a large side scraper. The dorsal proximal part shows a large flake scar that shows a flake removed from the same platform from which the knife blank was detached.

Part biface

KGA12-A1a 39 (Plate 55)

This is a part biface with a thick butt made on basalt. The ventral face was worked from both sides by large, semi-abrupt invasive flake scars which attain 70 mm in length. Five large flake scars cover the whole ventral face. The dorsal face shows a large flake scar and edge trimming on only one side.

KGA18-A1 (8 artifacts)

Handaxes

KGA18-A1b 1 (Plate 56)

This is a large elongate ovate handaxe made on a basalt end struck flake. It is made by invasive flake scars. Both dorsal and ventral faces are fully worked. The tip is pointed while the butt is V-shaped. The plan form has advanced symmetry. The edges are straight. The piece shows a flattish double convex cross-section. The distal area is very thinly made. Few secondary retouch are present.

KGA18-A1b 2 (Plate 57)

This is a finely made elongate ovate handaxe on a basalt flake. It is fully bifacially worked by invasive flake scars. It shows straight edges and finely thinned butt which is an open U-shape. This piece has an advanced symmetric plan form with a thin double convex cross-section.

KGA18-A1b 6 (Plate 57)

This is an elongate ovate handaxe made on a basalt flake. The piece is fully bifacially worked by large invasive and semi-abrupt flake scars. The edges are sinuous. The cross-section is double convex. The plan form has advanced symmetry. The proximal and distal parts are well made.

KGA18-A1b 10 (Plate 58)

This is a finely made elongate ovate handaxe on a basalt flake. It is fully bifacially worked with a pointed tip and an open U-shaped butt. The flake scars are invasive. The edges are straight. The cross-section is double convex. This piece shows an advanced symmetric plan form. Some secondary retouch are present. The distal part is finely worked. The straight edges and shallow flake scars suggest use of soft hammer technique.

KGA18-A1b 15 (Plate 58)

This is a small pointed handaxe on a basalt flake. The handaxe is made fully bifacially with abrupt and semi-abrupt flake scars. The butt is U-shaped. There is some edge thinning.

Cleavers

KGA18-A1b 5 (Plate 59)

This is a large parallel sided cleaver on an end struck basalt flake. The cleaver bit is oblique. The butt shows flake removal and is V-shaped. The left edge (viewed dorsally) is straight, whereas the right edge is sinuous. The dorsal face is fully worked by invasive flake scars. The proximal and middle lateral sides of the ventral face are fully worked, making the butt pointed.

KGA18-A1b 12 (Plate 60)

This is a parallel sided cleaver on an end struck basalt flake. The platform is plain. The cleaver bit (distal) is straight. The edges and the butt contour are straight. The lateral sides show flake scars, one side bifacially and the other ventrally. The flake scars are shallow so that they did not affect the straightness of the edges. Some of the flake scars suggest soft hammer flaking.

Cleaver biface

KGA18-A1b 3 (Plate 60)

This is a cleaver biface on a side struck basalt flake. The dorsal face has been fully worked by invasive flake scars, whereas only six shallow and marginal flake scars are seen ventrally. One edge is straight, whereas the other edge is sinuous because of the ventral flake scars. This biface has received some edge shaping retouch. The distal cleaver end also shows secondary retouch. Its cross-section is thin double convex. The proximal end also shows a cleaver bit which is oblique with some secondary retouch. It is possible to consider this piece a double ended cleaver with an ovate plan form. Because this borders on cleaver and biface, we call it a cleaver biface.

KGA20-A1, A2 (8 artifacts)

Handaxes

KGA20-A2b 1 (Plate 61)

This is a finely made ovate handaxe made on an end struck quartzite flake. This piece is very finely made with straight edges and an ovate plan form that is symmetric. Three-dimensional symmetry is approximated by a double convex cross-section. The flake scars are invasive and shallow. Edge shaping flaking is intensively done. The piece shows soft hammer use. Thirty-seven flake scars are present on the dorsal and 23 on the ventral face. The butt is an open U-shape.

KGA20-A2b 2 (Plate 62)

This is an ovate elongate handaxe on a basalt flake. It was made using very few but fully invasive flake scars on the ventral face and with a greater number of flake scars on its dorsal face. The edges are straight. The plan form has advanced symmetry. The cross-section is double convex. The butt is worked and U-shaped. The flake scars are invasive on both faces. There is an indication of possible reuse of this handaxe. The dorsal bit area shows four flake scars that show a different patina from the remainder of the piece.

KGA20-A1 1 (Plate 63)

This is a medium sized double pointed/bitted handaxe on a basalt flake. It is fully bifacially worked with a double pointed elongate ovate plan form. The piece is worked with invasive flake scars. The cross-section is double convex. One edge is sinuous, whereas the other edge is straight with slight sinuosity due to the continuous small edge shaping flake scars. The bit/distal end is well thinned. Both ends show soft hammer retouch.

KGA20-A2a 20 (Plate 63)

This is an ovate handaxe made on a basalt flake. The piece is partially bifacially worked by invasive semi-abrupt flake scars on the dorsal face. The dorsal face retains a small amount of cortex at its proximal left side. The ventral face is made by semi-invasive and marginal flake scars on both

lateral sides and proximal end. The lateral edges are straight on one side and sinuous on the other side.

KGA20-A2a 41 (Plate 64)

This is an elongate ovate handaxe on a siliceous rock. It is made on an end struck flake. The edges are straight and the plan form has advanced symmetry. The butt exhibits some thinning flake scars. The bulb on the ventral face is left intact and only peripheral flake scars are present on both lateral edges of the ventral face. The cross-section is double convex. A similar technique is observed at KGA12-A1.

KGA20-A2a 13 (Plate 64)

This is an elongate ovate handaxe made on an end struck basalt flake. It retains a cortical striking platform. The piece is made by invasive flake scars on both dorsal and ventral faces. The edges are straight and show some edge shaping flake scars. The cross-section is double convex. The piece shows advanced plan form symmetry.

Cleavers

KGA20-A1 2 (Plate 65)

This is a large ultra convergent cleaver made on an end struck flake. It is made with large invasive flake scars on both faces. The large flake scars show that they were made at blank preparation stage prior to the detachment of the piece from its core. The edges are regularized by secondary flaking which resulted in shallow flaking suggestive of soft hammer techniques. The butt is worked and U-shape. The middle distal part of the piece is well thinned relative to the middle proximal part. The edges are straight. The cross-section is lenticular. The plan form shows advanced symmetry.

KGA20-A1 3 (Plate 66)

This is a large ultra convergent cleaver with a convex cleaver bit. It is made on an end struck basalt flake. The piece is very thin relative to its length and breadth. It exhibits shallow and invasive flake scars. The middle distal part of the edges is thinner and straight. The piece shows advanced symmetry in plan form. It preserves cortex on its mid to proximal part. It has a thin lenticular cross-section.

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