

Prehistoric archaeology. The site of Garba IV
The lithic industry of Level C.
Typological and technological study

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As has already been mentioned in the introduction to the excavations at Garba IV, Level C was initially considered, in particular during the first years of excavation in the ES (1973-1975), to be the most recent level in the Garba IV sequence (Figs. 1-3), and it was published as such in some preliminary papers (Chavaillon and Piperno 1975; Piperno and Bulgarelli-Piperno 1975; Piperno 1977a, b; 1986, 1996b). On the basis of the stratigraphic revision carried out between 2000 and 2003 during the activities of the Italian Archaeological Mission at Melka Kunture (Kieffer *et al.* 2002; Kieffer *et al.* and Raynal *et al.* in this volume), this level is now considered to be a complex of lithic and palaeontological materials affected by vertical dispersal within the sandy formation containing them.

In the ES, in fact, there is not always a clear distinction between materials belonging to Level D or Level C and the division was done mainly on the basis of the depth of each specimen rather than on the existence of a real paleosurface C.

Even at the beginning of the excavation in the WS in 1975, this distinction was abandoned and was not followed further during subsequent field seasons. During the study, carried out in different years, materials originally attributed to Level C were in any case kept separate from those of Level D.

In this chapter the presentation of the materials attributed to Level C has been limited to some data that, as we shall see, are almost the same as those described for the much more significant sample from Level D. Of the 628 lithic artefacts reported in the general catalogue, 210 (33.43%) have been studied in detail.

Typological classes

The typological structure of Level C is indicated in Tab. 1 and Fig. 4. The numbers presented under 'catalogue' refer to the total number of specimens attributed to Level C, with the exception of one indeterminate fragment, and the numbers presented under 'analyzed material' refers to those that have been ana-

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lyzed in more detail. They indicate clear uniformity in the two groups and allow the analyzed sample to be considered sufficiently representative of the total assemblage.

Type	Catalogue		Studied material	
	N	%	N	%
Flakes	342	54.45	114	54.29
Utilized flakes	14	2.22	14	6.67
Retouched flakes	30	4.77	19	9.05
Side-scrapers	6	0.95	6	2.86
End-scrapers	2	0.31	2	0.95
Borers	3	0.47	2	0.95
Notches	8	1.27	7	3.33
Denticulates	18	2.86	10	4.76
Fragments	59	9.39	7	3.33
Choppers	27	4.29	8	3.81
Polyhedrons	1	0.15		
Rabots	2	0.31		
Casually trimmed pebbles	13	2.07		
Handaxes and bifacial tools	1	0.15		
Cores	40	6.36	10	4.76
Broken pebbles	42	6.68	8	3.81
Battered pebbles	19	3.02	3	1.43
Hammerstones	1	0.15		
Total	628		210	

Tab. 1. Typological variability of Level C.

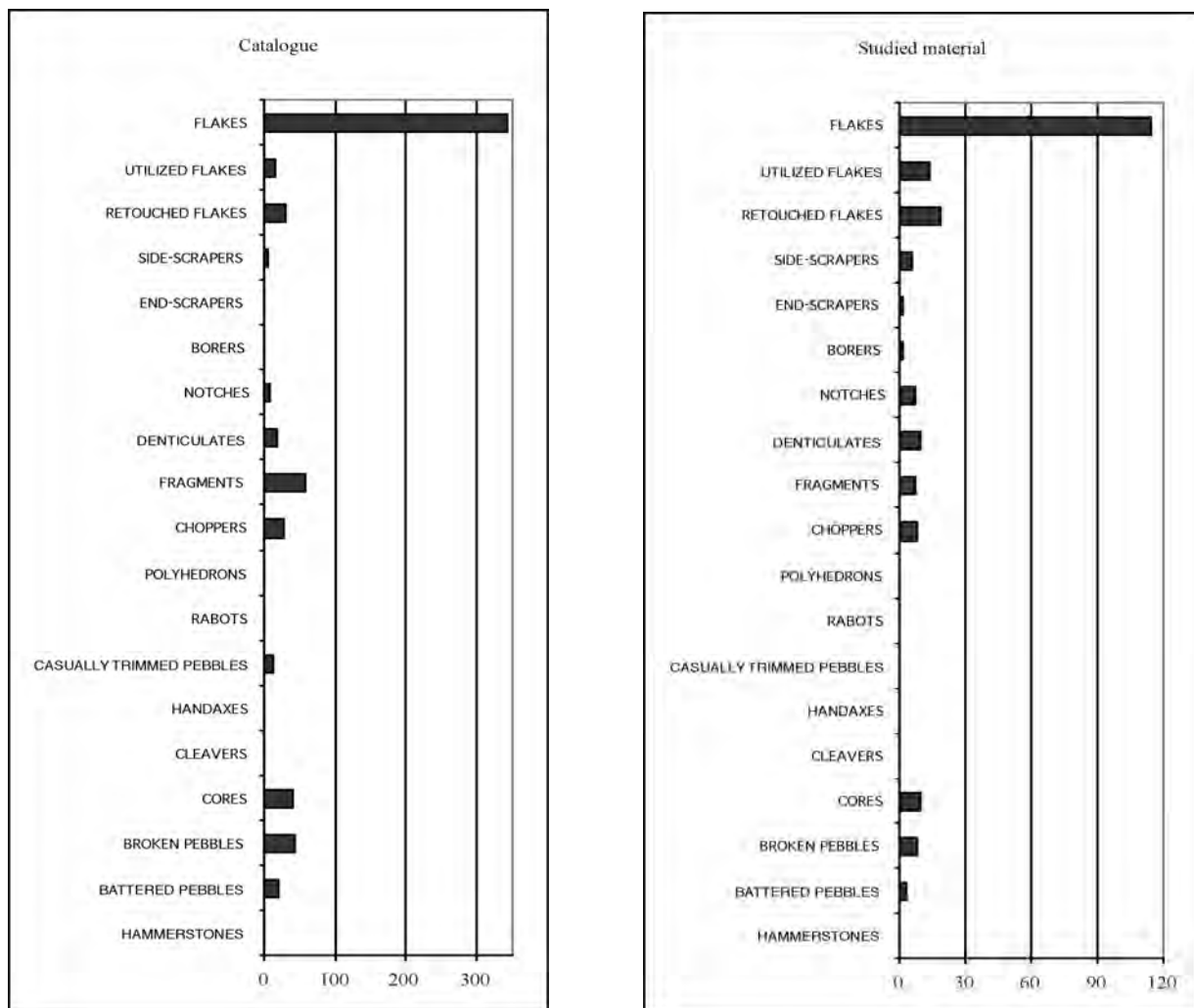
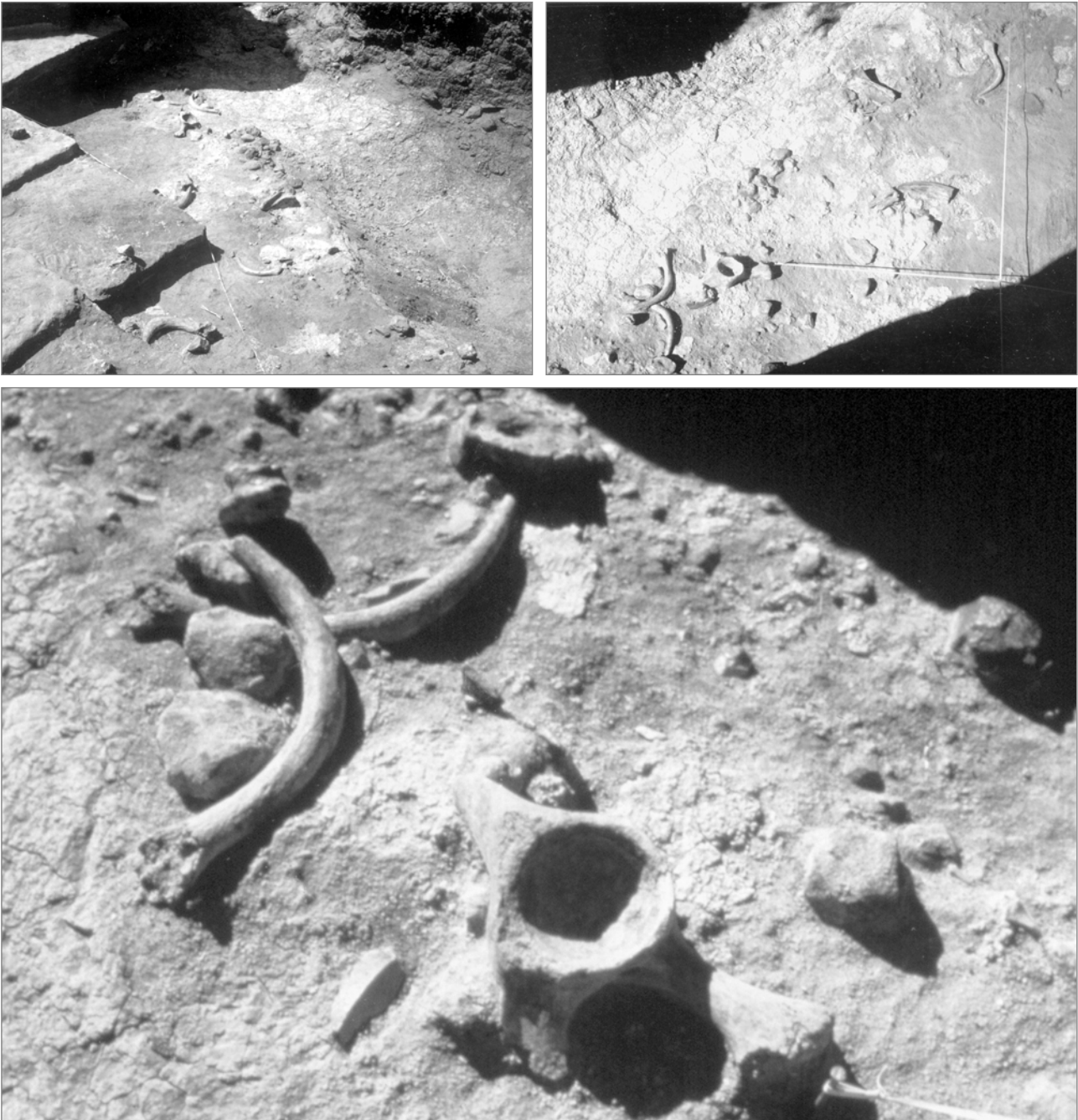


Fig. 4. Typological variability of Level C.



Figs. 1-3. Garba IV Level C. Details of the excavation in 1972-3.

Raw material

The higher frequency of obsidian (69.9%) compared to basalt (26.75%) appears to differ from what was observed in Level D (Tab. 2, Fig. 5). However, it should be remembered that, since the horizontal distribution mainly affected lighter and smaller pieces, it is clear in the sample from Level C that selection affected cores and tools on pebble so that they are statistically less common in Level C (23.38%) than in Level D (44.85%).

Raw material	Catalogue	
	N	%
Basalt	168	26.75
Trachybasalt	10	1.43
Trachyte	3	0.47
Rhyolite	2	0.31
Tuff	6	0.95
Obsidian	439	69.90
Others	1	0.15
Total	629	

Tab. 2. Frequency of different raw materials utilized in Level C.

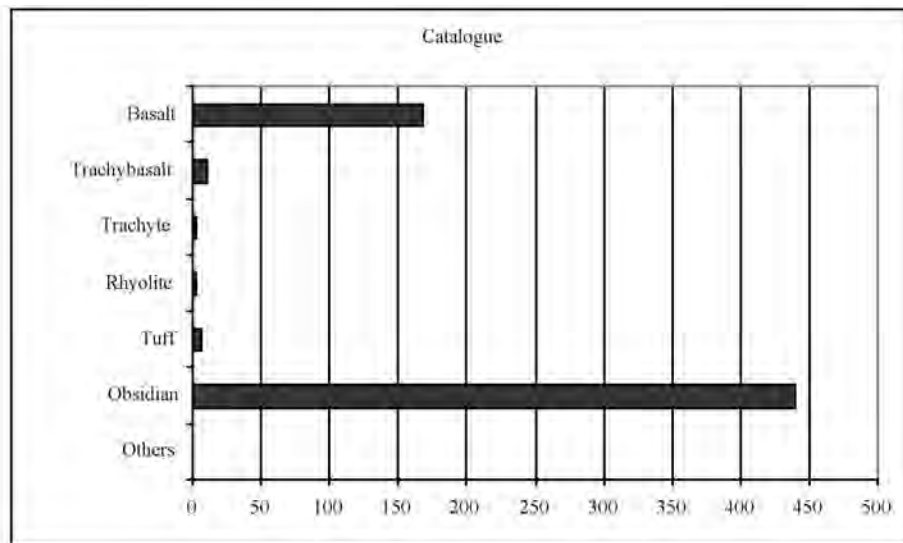


Fig. 5. Frequency of different raw materials utilized in Level C.

Fragments

There are 59 irregular fragments (19 of basalt, 40 of obsidian) that have been attributed to Level C. Seven of these (all obsidian) have been measured. Their dimensions and weight are reported in Tab. 3.

Length	Width	Thickness	Weight
32	30	14	11
58	28	17	20
27	23	16	8
37	26	14	13
38	24	11	10
50	38	13	24
30	22	11	5

Tab. 3. Dimensions and weight of some obsidian fragments.

Flakes

Out of 342 flakes, 114 (33.33%) have been analyzed. 94 of these are of obsidian, 17 of basalt, and three of trachybasalt. The typological data come only from the list of analyzed flakes, while the metrical data refer to the total number of flakes attributed to Level C.

Striking platform

Among the obsidian flakes, 15 are on the edge, 43 have a plain platform, 4 a plain platform with cortex. In 32 cases the platform is not recognizable.

Among the flakes made of other volcanic rocks, two are end-struck, eight have a plain platform; in one case the bulb has been removed, in seven cases it is not recognizable.

Typometry

Minimum and maximum values of length, width, thickness, and weight of the obsidian flakes are reported in table 4; those of the other volcanic rocks are indicated in Tab. 5.

	Length	Width	Thickness	Weight
Min	15	11	3	4
Max	88	79	30	117
Mean	37.5	32.78	12.45	21.49

Tab. 4. Minimum and maximum values of length, width, thickness, and weight of obsidian flakes.

	Length	Width	Thickness	Weight
Min	23	19	7	4
Max	113	103	43	450
Mean	48.5	44.11	17.54	71.15

Tab. 5. Minimum and maximum values of length, width, thickness, and weight of flakes on other volcanic rocks.

Utilized flakes

Of the 14 utilized flakes, 13 are of obsidian and one of basalt.

Striking platform

Nine of the utilized obsidian flakes have a plain platform, and in one case a plain platform with cortex. In three cases the bulb is not recognizable. The utilized basalt flake has a plain platform.

Typometry

The dimensions of the utilized basalt flake are: length: 34 mm; width: 36 mm; thickness: 11 mm. The weight is 10 g.

The dimensions and the weight of the utilized obsidian flakes are summarized in Tab. 6.

	Length	Width	Thickness	Weight
Min	53	43	18	3
Max	34	30	13	27
Mean	34.31	29.69	11.92	9.64

Tab. 6. Minimum and maximum values of length, width, thickness and weight of utilized obsidian flakes.

Retouched flakes

Among the 30 retouched flakes, three are of basalt and 27 of obsidian. Of the 14 retouched flakes analyzed two are of basalt and 17 of obsidian.

Striking platform

One retouched basalt flake has a plain platform. In the other two cases the bulb is not visible.

Among the retouched obsidian flakes, two do not have a bulb, one has a plain platform with cortex, and 14 have a plain platform.

Retouch

The basalt flakes are retouched on the left edge. In two cases the retouch is simple marginal with a rec-tilinear outline, in the other case it is simple invasive with a convex outline.

Four obsidian flakes are retouched on the right lateral edge and four on the left lateral edge with simple marginal direct retouch and. Three flakes are retouched on the distal transversal edge with a simple marginal retouch in two cases and a simple invasive direct retouch in one case. Two are retouched on the proximal transversal edge. In one case the retouch is simple marginal direct, in the other is simple invasive inverse.

Typometry

Two basalt flakes were measured and weighed. The dimensions and the weight are respectively: Length: 39, 33 mm; width: 47, 62 mm; thickness: 13, 11 mm; weight: 22, 25 g.

Minimum and maximum values of the dimensions and weight of the utilized obsidian flakes are reported in Tab. 7.

	Length	Width	Thickness	Weight
Min	17	17	5	2
Max	106	78	37	230
Mean	34.33	33.05	12.67	21.17

Tab. 7. Minimum and maximum values of length, width, thickness and weight of retouched obsidian flakes.

The dimensions and weight of the utilized basalt flakes are: length: 33, 39 mm; width: 62, 47 mm; thickness: 11, 13 mm; weight: 25, 22 g; thickness of the butt: 6, 15 mm; length of the platform: 10, 34 mm; angle of platform/ventral face: 120°, 115°.

Side-scrapers

All six side-scrapers are of obsidian. Four are simple side-scrapers, three of which are straight and one concave, and two are transversal concave side-scrapers.

One simple side-scraper is associated with a denticulate, another with a frontal end-scraper.

Striking platform

Among the simple side-scrapers, four have a plain platform, one on the edge, while in one case the bulb is not visible. The transversal side-scrapers have a plain platform.

Retouch

Among the simple side-scrapers, one has simple marginal direct retouch on the right lateral edge; three are retouched on the left lateral edge with simple marginal direct retouch.

Of the transversal side-scrapers, one is retouched on the proximal transversal edge, the other on the distal and the lateral edges. In the first case the retouch is simple invasive direct, in the second case it is simple marginal on the lateral edges and abrupt invasive on the transversal edge.

The dimensions and weights are reported in Tab. 8.

Length	Width	Thickness	Weight
32	33	9	8
28	24	16	8
26	25	12	10
30	52	13	20
29	43	14	13
34	20	7	5

Tab. 8. Dimensions and weight of side-scrapers.

End-scrapers

The two end-scrapers attributed to Level C are both of obsidian, with a well-defined front. Their dimensions and weight are respectively: length: 51, 33 mm; width: 26, 31 mm; thickness: 15, 15 mm; weight: 16, 12 g.

Borers

Two of the three obsidian borers attributed to Level C were measured. Their dimensions and weight are respectively: length: 27, 24 mm; width: 34, 30 mm; thickness: 10, 9 mm; weight: 8, 3 g.

Notched flakes

The eight notched flakes (one retouched and seven clactonian) are of obsidian. Seven (one retouched and six clactonian) have been analyzed and measured.

Retouch

In three cases the notch is localized on the right edge, in two cases on the left one, in one case on the distal transversal edge.

In the case of the retouched notch, it is localized on the left lateral edge and the retouch is simple marginal.

Typometry

Except for three fragmentary notched flakes, the dimensions and the weight are reported in Tab. 9.

Length	Width	Thickness	Weight
		12	8
	26	13	10
25	40	10	10
28	40	10	10
30	30	7	5
37	30	9	11
	31	12	11

Tab. 9. Dimensions and weight of notched flakes.

Denticulates

Eighteen denticulates (2 of basalt and 16 of obsidian) have been attributed to Level C. Of these, 10 of obsidian have been analyzed.

Retouch

Three denticulates are retouched on the right lateral edge, and one on both the right and the proximal transversal edges. The retouch is in one case simple invasive, in the other cases simple marginal. Its position in one case is inverse and in the other direct.

Five denticulates are retouched on the lateral left edge. The retouch is simple marginal in two cases, simple invasive in two cases, abrupt invasive in one case. The position of the retouch is direct in four cases, and alternating in one case.

One denticulate is retouched on the distal transversal edge with simple marginal direct retouch.

Typometry

The dimensions and the weight are reported in Tab. 10.

Length	Width	Thickness	Weight
56	35	18	27
29	23	7	3
33	62	11	25
53	45	9	16
45	23	13	12
30	28	11	8
106	119	64	760
52	46	13	29
47	36	10	18
26	51	13	12

Tab. 10. Dimensions and weight of denticulates.

Choppers

The data on the typology and morphology refer to 8 choppers out of the 27 attributed to Level C. The information on the utilization of the various raw materials is obtained from information recorded in the general catalogue.

Raw material

Seven choppers are of obsidian, 15 of basalt, 5 of trachybasalt. Among the choppers that were analyzed, only one is of obsidian, while the others are of basalt. The relative frequency of obsidian choppers is not easily interpretable and is at odds with what has been observed for the choppers of Level D where this raw material is only rarely used for this kind of tool.

Obsidian

The only analyzed obsidian chopper is a unifacial lateral chopper, relatively small (length: 35 mm; width: 47 mm; thickness: 18 mm; weight: 29 g), made with two removals. The vertical profile of the cutting edge is straight, the lateral one is sinuous. Cortex extends over the entire dorsal surface. The cutting edge is 45 mm long and has an angle of 70°.

Other volcanic rocks

Three choppers are lateral, three distal, one diverse.

The lateral choppers are all bifacial. One has three removals on face A and one removal on face B, two present more than three removals on face A and three removals on face B. The vertical profile of the cutting edge is in two cases sinuous, in two cases irregular. In one case the cortex is total, in two cases it is limited only to the base.

Measurements have been taken on two choppers and are respectively: length: 99, 104 mm; width: 110, 116 mm; thickness: 94, 74 mm; weight: 110, 600 g; angle of the cutting edge: 117°, 94°; length of the cutting edge: 95, 135 mm.

All the distal choppers are bifacial. One has one removal on face A and one on face B, one has more than three removals on face A and two on face B, one shows two removals on face A and one on face B.

The vertical profile of the cutting edge is always sinuous, while the lateral one is convex in two cases and sinuous in one.

In one case the cortex covers the entire dorsal surface, in two cases it is limited only to the base.

The dimensions are respectively: length: 84, 61, 102 mm; width: 67, 57, 85 mm; thickness: 55, 53, 78 mm; weight: 310, 92, 90 g; angle of the cutting edge: 80°, 92°, 90°; length of the cutting edge: 50, 70, 115 mm.

The only “diverse” chopper is unifacial with more than three removals on face A. The vertical profile of the cutting edge is straight, the lateral one is sinuous. The cortex covers the entire dorsal surface. The dimensions are: length: 168 mm; width: 136 mm; thickness: 105 mm; weight: 2480 g; angle of the cutting edge: 75°; length of the cutting edge: 130 mm.

Polyhedrons and rabots

A single polyhedron and two rabots of basalt have been attributed to Level C.

Casually trimmed pebbles

Four are of basalt and nine of obsidian.

Handaxes

A single obsidian archaic handaxe was recovered. The dimensions and weight are: length: 117 mm; width: 65 mm; thickness: 31 mm; weight: 260 g.

Cores

Forty cores (17 of basalt, 23 of obsidian) have been attributed to Level C. The only obsidian core tends towards a discoidal shape with more than three removals (length: 33 mm; width: 31 mm; thickness: 13 mm; weight: 13 g). Among the basalt cores, three are prismatic, one is globular, three have an irregular shape, two have sharp cutting edges, and one is discoid.

Broken pebbles

Of the 42 broken pebbles attributed to Level C (40 of basalt, one of trachyte, one of rhyolite), eight (seven of basalt, one of rhyolite) have been analyzed.

Three broken pebbles have one fracture, four have three fractures, one has more than three fractures. The orientation of the fractures in five cases is longitudinal to the axis, in one case transversal, and in two cases oblique.

In relation to the length/width plane, the fractures are perpendicular to the axis in four cases, in two cases parallel, and in one case oblique.

Seven broken pebbles were measured and weighed. Their dimensions and weights are indicated in Tab. 11.

Length	Width	Thickness	Weight
105	91	66	580
51	43	33	85
91	88	70	710
65	65	49	340
119	91	72	860
98	73	65	590
67	56	38	142

Tab. 11. Dimensions and weight of broken pebbles.

Battered pebbles

Of the 19 battered pebbles reported in the general catalogue (11 of basalt, 3 of obsidian, two of trachyte, one of trachybasalt, one of rhyolite, one of tuff), three (one of basalt, one of trachybasalt, one of rhyolite) have been analyzed.

Percussion is in all cases punctiform and localized at one end. Two pebbles are battered only in one zone, one in two zones. Their dimensions and weight are indicated in Tab. 12.

Length	Width	Thickness	Weight
110	110	90	1250
125	115	78	1140
87	78	67	470

Tab. 12. Dimensions and weight of battered pebbles.

Hammerstones

A single basalt hammerstone was attributed to Level C.