THE MACROLITHIC INDUSTRY OF ÖKÜZİNİ CAVE

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Öküzini Cave is considered to be one of the most important sites in Anatolia in order to define the Epipaleolithic period in terms of the macrolithic tools of the lithic industry. In this paper we attempt to develop a typological approach to classify the macrolithic tools in the lithic industries of Öküzini Cave.

Microliths, which comprise almost half of all the tools that were found in the Near East, are commonly attributed to the Epipaleolithic period (Leroi-Gourhan 1992:546). Although this approach yielded much technological and typological data about microliths, it left many things to be desired in terms of macrolithic tools. Considering the quantity and the variety of macrolithic tools (e.g., varieties of endscrapers) in Epipaleolithic industries, this is a substantial lacuna. This lack, and the absence of proper systematic records for the Epipaleolithic period in Anatolia, we believe that macrolithic tools deserve a full fledged examination as much as their microlithic counterparts. In order to provide a typological method such research, 3054 macrolithic tools and retouched macrolithic pieces were selected from the Öküzini Cave excavations between 1990-1997. In terms of methodology, although based on earlier techniques and methodological approaches, unique definitions and terminology were required for the Öküzini macroliths, which have specific characteristics. Endscrapers, truncated pieces, backed blades can be given as examples for pieces that have special characteristics.

A type list was constructed as a result of the examination of 3054 macrolithic tools and pieces. This list is consisted of 143 types and sub-types under 16 categories as well as an undefined group (8.2% of the total) of retouched macrolithic tools (see Type List).

Before discussing the types and their definitions, it is first necessary to explain methodological definitions and concepts in detail. While this paper does not address morphometric research on the technological aspects of Öküzini lithic industry (but see Léotard and López Bayón, this volume), we can still refer to small-scale flaking reduction. This small-scale flaking phenomenon, which is evidently the result of employing local radiolarite as the main raw material, is indicated by the presence of abundant lithic production waste. Except for the crested blades, which have an average length of 7-8 centimeters, core measurements are generally quite small. Cores were generally prepared before detaching flaking products obtained from narrow and flat radiolarite blocks. There are also some pieces that cannot be classified, which are supposedly haphazardly broken during the prepapercentagen process. These are generally thin types that are morphologically between flake and blade forms. These products, which were also used as blanks of macrolithic tools, as reduction by-products.

On the other hand, the presence of blades that have an average length of around 3 centimeters, makes it difficult to differentiate them from bladelets. In order to separate blade and bladelet blanks, width has also been used: thin blanks that have a length of 30 mm and width less than 10 mm are considered to be bladelets. Blanks that have a length more than 30 mm and width more than 10 mm are considered to be blades.

CONCEPTS AND DESCRIPTIONS RELATING TO TYPES AND SUB-TYPES

A. ENDSCRAPERS

Endscrapers that were common in the Epipaleolithic period were defined, classified and named by many researchers (see Brézillon, 1971: 230; Bordes, 1961:31; Burkitt, 1963: 78; Gourhan, 1968: 276). We have used three main criteria in order to classify the endscrapers from Öküzini Cave into types and subtypes. These are:

-*Blank size* (micro endscraper, endscrapers on blade and flake, short end scrapers, small endscrapers, transversal endscrapers)

-*Blank type* (on blade, flake and core tablet, core or core like endscrapers)

-*Endscraper front form and other characteristics* (nosed, ogival, rounded or semi rounded endscrapers and end-

scrapers on lateral edge, proximal end and double endscrapers.

Using these main criteria, many subtypes were identified. Even though there are many tools that have multiple endscraper characteristics, we tried to classify them according to the most dominant.

While it is commonly believed that one should diagnose a few main morphological and functional groups in order to come up with a successful typology for tools (Otte, 1991:129), many different morphological variables exist. By following this method, we decided to develop new terminology in addition to the conventional one for endscrapers at Öküzini, to describe all of the morphological variability. The first one of these, without considepercentagen of the double endscrapers, is that some of the endscrapers have only one working edge on their blanks and their fronts are made on the proximal end of the blanks. Endscrapers termed "endscrapers on proximal end" can be confused with "caminade" endscrapers (see P.-Y. Demars, P. Laurent, 1989: 38-39). There are many important differences between these two types such as size, retouch form and type of blanks used.

The second type of endscrapers are those which have working edges on the left or right lateral edge of the blank. As in the example of "small endscraper on lateral edge", they were added to the other subtypes since they were fairly rare.

As stated above, some of the definitions, concepts and terminology which are used for Öküzini macrolithic tool types have different special and unique characteristics. Accordingly, for endscrapers, the following general definition has been adopted:

Endscrapers: The tools can be made on flakes, blades, waste products, cores and core tablets. They have a round or semi-round projecting front which is mostly formed by scaled, semi-abrupt and sometimes abrupt and/or continuous bladelet retouch on one of the ends of the blank, or both ends in the case of double endscrapers.

In this framework, the subtypes and terminology of Öküzini Cave endscrapers are as follows:

I. ENDSCRAPERS ON FLAKE (L*> 30mm)

1) *Endscraper on Flake*: Endscraper made on flakes longer than 30 mm (fig. 1, n°1).

2) *Endscraper on Retouched Flake*: Endscrapers on flakes which are longer than 30 mm and having their one or more edge, ventral or dorsal face, continuously or partly retouched. (fig. 1, n°2).

3) *Rounded or Semi-Rounded Endscraper on Flake*: Endscraper rounded or semi- rounded made on flakes. Their length is longer than 30 mm and often has a front formed by retouching all edges (fig. 1, n°3).

4) Fan-Shaped Endscraper on Flake: Endscrapers whether retouched or not, narrowing down from both edges are made significant fan- shaped front (fig. 1, n°4).

5) *Carinated Endscraper on Flake*: Endscrapers having length more than 30 mm, with form in profile like an inverted carinate, and with front often with bladelet retouch or sometimes surrounded by scaled retouch (fig. 1, n°5).

6) *Endscraper on Lateral Edge of Flake*: Endscrapers, having a blank length more than 30 mm made on flakes which have front part made on left or right edge (or both lateral edges) (fig. 1, n°6).

II. ENDSCRAPERS ON BLADE (L> 30 mm)

7) *Endscrapers on Distal End of Blade*: Endscrapers, having length more than 30 mm, made on distal end of blade, including crested or plunging blades (fig. 1, n°7).

8) *Endscraper on Distal End of Retouched Blade*: Endscrapers made on blades which have retouch on one or both lateral edges on the ventral or dorsal face (including crested and plunging blades) and their length is more than 30 mm (fig. 1, n°8).

9) *Ogival Endscraper on Distal End of Blade*: Endscrapers made on distal end of blade. Their front part has a " broken bow" form and their length is more than 30 mm (fig. 1, n°9).

10) *Carinated Endscraper on Distal End of Blade*: Endscrapers made on blades longer than 30 mm (including crested and plunging blades). Their front is often bladelet retouched, sometimes stepped scaled, formed by abrupt or semi-abrupt scaled retouch scaled. Their form resembles an inverted rostra-carinate from the profile and they have thick fronts (fig. 1, n°10).

III. SHORT ENDSCRAPERS (20<L 30 mm)

11) *Short Endscraper on Flake*: Endscrapers made on flakes which have a length between 20-30 mm (fig. 1, n°11).

L: Length

12) *Short Endscraper on Distal End of Blade*: Endscrapers made on distal end of blade (including crested or plunging blades), and have length between 20-30 mm (fig. 1, n°12).

13) *Short Endscraper on Core Tablet*: Endscrapers made on core tablets and have length between 20-30 mm (fig. 1, n°13).

14) *Carinated Short Endscraper*: Endscrapers (including crested or plunging blades) which are made on blade and flake. Their form in profile is like an inverted carinate (fig. 1, n°14).

15) *Short Endscraper with Denticulate Front*: Endscrapers made on flakes, which have a length between 20-30 mm Their front is projected as semi-circle with denticulate retouch (fig. 1, n°15).

16) *Short Endscraper on Lateral Edge*: Endscrapers with blank length between 20-30 mm. Their working edge is made on of the left or right lateral edge (fig. 2, n°1).

17) *Short Endscraper on Ventral Face*: Endscrapers, which have a working edge made on flake, blade or on ventral face of these pieces and having length between 20-30 mm (fig. 2, n°2). Where the front is made on one of the edges, the length is taken with respect to the axis of the tool.

18) *Handled Short Endscraper*: Endscrapers with length between 20-30 mm. The left or right lateral edge or bilateral edges are narrowed down with retouch to give a handle form (fig. 2, n°3).

19) *Rounded or Semi-Rounded Short Endscraper*: Endscrapers made on flakes and have length between 20-30 mm. They have a rounded or semi-rounded form and a front and their edge is almost entirely retouched (fig. 2, n°4).

IV. SMALL ENDSCRAPERS (10<L 20 mm.)

20) *Small Endscraper*: Length is between 10-20 mm. Often considered as a waste product sometimes made on broken pieces of a flake or a blade (fig. 2, n°5). Where the front is made on one of the lateral edges, length is measured with respect to the axis of the tool.

21) *Small Endscraper on Flake*: Endscrapers made on small flakes and have length between 10-20 mm. (fig. 2, n°6).

22) *Small Endscraper on Distal End of Blade*: Endscrapers made on distal end of blade and have length between 10-20 mm (fig. 2, n°7).

23) *Small Endscraper on Core Tablet*: Endscrapers made on core tablets and have length between 10-20 mm (fig. 2, n°8).

24) *Small Carinated Endscraper*: Small endscrapers having a length between 10-20 mm. Their form in profile is like a rostra-carinate (fig. 2, n°9).

25) *Small Endscraper on Lateral Edge*: Small endscrapers, which have a working edge on the left or right lateral edge of a flake, blade or waste product, having a blank length between 10-20 mm (fig. 2, n°10).

26) *Rounded or Semi-Rounded Small Endscraper*: Rounded or semi-rounded small endscrapers made on flakes with length between 10-20 mm. They have a front formed by retouch on almost all edges. (fig. 2, n°11).

V. MICRO ENDSCRAPERS (1<L 10 mm.)

27) *Micro Endscraper*: Very small endscrapers made on waste products, which have length between 1-10 mm (fig. 2, n°12).

28) *Micro Endscraper on Proximal End*: Very small endscrapers having a length between 1-10 mm. Their working edge is made on proximal end of thin blade (fig. 2, n°13).

29) *Rounded or Semi-Rounded Micro Endscraper*: Rounded or semi-rounded micro endscrapers having length between 1-10 mm. Retouching on almost all edges (fig. 2, n°14) forms their front.

VI. TRANSVERSAL ENDSCRAPERS (W*>L)

30) *Transversal Endscraper*: Transversal endscrapers, which have a length between 18-27 mm and a width between 30-33 mm (fig. 2, n°15).

VII. ENDSCRAPERS ON PROXIMAL END

31) *Endscraper on Proximal End of Flake*: Endscrapers having a working edge, which is made on proximal end of a flake (fig. 2, n°16).

32) *Endscraper on Proximal End of Blade*: Endscrapers having a working edge, which is made on proximal end of blade (covering crested and plunging blades as well) (fig. 2, n°17).

33) *Endscraper on Proximal End of Core Tablet*: Endscrapers, which have a working edge made on

* W: Width

proximal end of a core tablet (fig. 2, n°18).

34) *Carinated Endscraper on Proximal End*: Endscrapers having a working edge, which is made on proximal end of blank and seen like a over turned rostra-carinate from profile (fig. 2, n°19).

35) *Ogival Endscraper on Proximal End*: Endscrapers having a working edge made on proximal end of blank in a "broken bow" form (fig. 2, n°20).

36) *Endscraper on Proximal End*: Endscrapers having a working edge made on proximal end of broken pieces of flakes or blades, or waste products (fig. 2, n°21).

VIII. NOSED ENDSCRAPERS

37) *Thick Nosed Endscraper*: Thick endscrapers formed by projecting front with one or two notches made on left or right edges, or on both edges of front (fig. 2, n°22).

38) *Thick Nosed Endscraper on Lateral Edge*: Thick nosed endscrapers made on left edge of a flake. The definition for type 37 is valid here as well (fig. 2, n°23).

39) *Thin Nosed Endscraper*: Thin endscrapers formed by projecting front with one or two notches, made on left or right edges or on both edges of front (fig. 2, n°24).

IX. DOUBLE ENDSCRAPERS

40) *Double Endscraper*: Endscrapers made on blade, flake or waste product and core tablet which often have two opposite working edges (fig. 2, n°25).

41) *Carinated Double Endscraper*: Endscrapers always having two opposite working edges that are made on flake or blade which is like a over turned rostra carinate in profile (fig. 2, n°26).

X. CORE or CORE LIKE ENDSCRAPERS

42) *Core or Core-like Endscraper*: Probably, this is a bladelet core or a core fragment, which was used as a scraper. They are a core or core fragment in the form of thick endscrapers and edges of their striking platform are formed with scaled or bladelet retouch. They can be a core or core fragment used as an endscraper because of their proper forms (fig. 2, n°27).

XI. ATYPICAL ENDSCRAPERS

43) *Atypical Endscraper*: Endscrapers on flake, blade or waste product, which have a front retouched irregularly.

B. DENTICULATED TOOLS

Denticulated tools: These are made by retouched or unretouched serial notches on the edges of flakes, blades, waste products, cores, core pieces and debris. Denticulated tools that are generally found in Lower or Middle Paleolithic lithic industries (Bordes, 1961: 36) can also be observed in large quantities among the Öküzini macroliths.

In the classification of denticulates we considered:

-*Notch width*;

-*Location of denticulation* (ventral or dorsal face of blank).

With respect to measurement of notch width of small serial notches, we formed three subtypes: macro, micro and mixed. With respect to alternate and inverse retouch, two subtypes were determined: alternate and inversely denticulated tools. Therefore, we can identify subtypes of denticulate tools as follows:

44) *Micro Denticulated*: Denticulated tools with notch width less than 5mm. (fig. 2, n°28).

45) *Macro Denticulated*: Denticulated tools with notch width more than 5mm. (fig. 2, n°29).

46) *Mixed Denticulated*: Tools, which have notch width less or more than 5mm. They include both dimensional notches (fig. 2, n°30).

47) *Alternate Denticulated*: Tools, formed by making denticulates on one or more edges of both ventral and dorsal face of the same blank (fig. 2, n°31).

48) *Inverse Denticulated*: Denticulated tools, formed by making denticulates on one or more edges of ventral face (fig. 3, n°1).

C. NOTCHED TOOLS

Notched tools: They are made on one of the edges of the flake, blade, bladelet, waste product or debris often by retouch or sometimes by a strike. These tools have concave edges.

Most of the notch tools that we determined in Öküzini Cave is in convex form and made on one or more edges of a piece with continuously small retouch.

In classification of these we considered:

-*Notch width*;

-*Notch form*;

-*Location of notch* (ventral or dorsal face of blank).

Notch width is specified as the longest length between two edges at the largest angle level of the notch. Three subtypes were defined: micro, small and large notched.

Notch form creates additional sub-types: in addition to multi notched, alternate notched and inverse notched tools, there are also adjacent notched tools, which comes with this form difference. The identification of subtypes, which we defined with respect to the criteria mentioned above are as follows:

49) *Micro Notched*: Tools made on blade or bladelet, which have a notch width less than or equal to 5 mm (fig. 3, n°2).

50) *Small Notched*: Tools made on flake, blade, bladelet and debris, which have a notch width between 5-10 mm and the notch is often made with retouch or sometimes with one struck (fig. 3, n°3).

51) *Large Notched*: Tools made on flake, blade and debris, which have a notch large greater than or equal to 10 mm and the notch is often made with retouch or sometimes with one strike (fig. 3, n°4).

52) *Adjacent Notched*: Tools with adjacent notches formed by retouch on the same edge (fig. 3, n°5).

53) *Multiple Notched*: The tools in this category were formed by a series of isolated notches made on the same or different edges of the flake, blade or bladelet (fig. 3, n°6).

54) *Alternate Notched*: Tools formed by one or more notches on the edges of both ventral and dorsal face of a flake or a blade.

55) *Inverse Notched*: The notch, made on one of the edges of ventral face of a flake, blade, bladelet or a waste product often with retouch or sometimes by a single impact (fig. 3, n°7).

D. TRUNCATED PIECES

The truncated pieces that were found at Öküzini are classified under four headings, based on the truncated edge or edges. The form of the processed edge is also considered and tools are defined with respect to these two criteria as in the case of "convex truncation from distal end".

Some of these pieces differ from those which are truncated on the distal and proximal end or both, as they are abruptly retouched for narrowing, but not for shortening. These pieces are truncated from the left or right lateral edges of the blank or both distal ends and edges as could be seen in the example. Therefore *truncation* is defined as forms gained by shortening or narrowing down one or more edges of a flake, blade, bladelet or a waste product with abrupt retouch, often from distal or proximal ends and sometimes from a lateral edge. With this approach, the subtypes determined for truncated pieces and their definitions are as follows:

I. TRUNCATED PIECES ON DISTAL END

56) *Straight Truncated*: Forms that were gained by shortening the distal end of a flake, blade or bladelet with abrupt retouch to give a straight shape (fig. 3, n°8).

57) *Concave Truncated*: Forms that were gained by shortening the distal end of a flake, blade or a waste product with abrupt retouch to give a concave shape (fig. 3, n°9).

58) *Convex Truncated*: Forms that were gained by shortening the distal end of a blade with abrupt retouch to give a convex shape (fig. 3, n°11).

59) *Oblique-Concave Truncated*: Forms that were gained by shortening the distal end of a flake, or a blade with abrupt retouch and providing a slant to the left or right edge, to give a concave shape (fig. 3, n°12).

60) *Oblique-Straight Truncated*: Forms, that were gained by shortening the distal end of a flake, blade or a bladelet with abrupt retouch, to give a slanted and a straight shape with respect to the left or right edge (fig. 3, n°13).

II. TRUNCATED PIECES ON PROXIMAL END

61) *Straight Truncated*: Forms that were gained by shortening the proximal end of a blade or a bladelet where butt was found with abrupt retouch to give a straight shape.

62) *Concave Truncated*: Forms that were gained by shortening the proximal end of a flake or a blade with abrupt retouch to give a concave shape.

63) *Oblique-Concave Truncated*: Forms, that were gained by shortening the proximal end of a blade with abrupt retouch to give a shape which is concave and oblique towards the left or right edge (fig. 3, n°10).

64) *Oblique-Straight Truncated*: Forms, that were

gained by shortening the proximal end of a blade with abrupt retouch to give a shape, which is straight and oblique towards the left or right edge (fig. 3, n°14).

III. TRUNCATED PIECES ON LATERAL EDGE

65) *Straight Truncated*: The form, that was gained by narrowing down the left edge of a waste product with respect to butt, abruptly retouched to give a straight shape (fig. 3, n°15).

66) *Concave Truncated*: Forms that were gained by narrowing down the left or right edge of a flake with abrupt retouch to give a concave shape (fig. 3, n°16).

IV. MULTIPLE TRUNCATED PIECES ON DIFFERENT EDGES

67) *Double Concave Truncated*: Forms that were gained by shortening the distal and proximal ends of a blade with abrupt retouch to give a concave shape (fig. 3, n°17).

68) *Oblique-Straight Truncated*: Forms that were gained by shortening distal and proximal ends of a blade with semi-abrupt retouch to give an oblique and a straight shape.

69) *Straight-Concave Truncated*: The tools show a straight distal end and a concave lateral edge. Their form is achieved by abrupt retouch in order to reduce the width of the blank and shorten the length of the blank (fig. 3, n°18).

70) *Double Straight and Concave Truncated*: This is the form gained by narrowing down the right edge of a blade with abrupt retouch to give a concave shape and shortening the proximal and distal ends with abrupt retouch to give a straight shape (fig. 3, n°19).

E. RETOUCHED BLADES

Several retouched blades found among the macroliths of Öküzini Cave are classified according to the criteria given below:

-retouched edge (retouched on one edge, retouched on both edges);

-retouched on blank face (inversely retouched alternately retouched);

-form given by retouch (pointed, articulated).

Where the criteria are observed together on a piece, the tool is named to indicate the existing attributes (Such as pointed blade alternately retouched). Therefore we can identify the *retouched blades* as pointed or unpointed pieces which are straight, inversely or alternately retouched or one or more edge, often scaled, sometimes abrupt, semi-abrupt, parallel or semi-parallel shaped with partly or completely retouch.

The subtypes of retouched blades are identified as follows:

71) *Partly Retouched on One Edge*: Partly retouched blades, which are retouched often, scaled, sometimes abrupt or semi-abrupt on one of the edges (fig. 3, n°20).

72) *Completely Retouched Along on One Edge*: Completely retouched blades, which are retouched often, scaled, sometimes abrupt or semi-abrupt on one of the edges (fig. 3, n°21).

73) *Partly Retouched on Both Edges*: Blades partly retouched often as scaled sometimes abrupt or semi-abrupt on both edges (fig. 3, n°22).

74) *Completely Retouched on Both Edges*: Blade completely retouched, on both edges scaled retouch.

75) *Partly and Completely Retouched on Different Edges*: Retouched blades which are retouched partly on one edge, completely on the other as scaled or abrupt scaled (fig. 3, n°23).

76) *Inversely Retouched*: Retouched blades, which are retouched as scaled or semi-abrupt, completely or partly on ventral face of one of the edges or both of the edges (fig. 3, n°24).

77) *Alternately Retouched*: Retouched blades which are retouched partly or completely both on dorsal face of an edge and ventral face of the other as scaled, abrupt or semi-abrupt scaled or parallel (fig. 4, n°1).

78) *Retouched Pointed Blade*: Pointed blades, which are partly or completely scaled or abrupt on one of the edges or on both edges narrowing down the distal or proximal end (fig. 4, n°2).

79) *Alternately Retouched Pointed Blade*: Pointed blade which is retouched as scaled or abrupt scaled on ventral face of an edge and dorsal face of another edge, completely or partly, narrowing down projects distal end (fig. 4, n°3).

80) *Articulated Blade*: Tools formed by narrowing down the medial part of a blade with retouch scaled or abrupt scaled, on both edges, on ventral or dorsal faces, or alternately (fig. 4, n°4).

F. RETOUCHED FLAKES

Retouched flakes are identified differently from retouched blades, taking into account the retouched edge (on one edge, on both edges) and blank face (inversely retouched, alternately retouched).

Retouched flakes: The flakes are retouched often scaled, abrupt or semi-abrupt, inversely or alternately on dorsal, ventral or face of one or more edge. The subtypes determined and identified are given below as follows:

81) *Partly Retouched on One Edge*: The flakes, which are partly retouched often, scaled, sometimes abrupt on one of its edges.

82) *Completely Retouched Along on One Edge*: The flakes, which are completely retouched often scaled, sometimes abrupt scaled or semi-abrupt on one of its edges (fig. 4, n°5).

83) *Partly Retouched on Both Edges*: Partly retouched flakes often scaled, sometimes abrupt, on both edges.

84) *Completely Retouched Along on Both Edges*: Flakes completely retouched scaled on both edges.

85) *Alternately Retouched*: Partly or completely retouched flakes scaled, abrupt or semi-abrupt on dorsal face of one edge and ventral face of the other edge.

86) *Inversely Retouched*: Partly or completely retouched fakes scaled or semi-abrupt on ventral face of one edge or on both edges.

G. BACKED BLADES

Backed blade: The forms gained by abrupt retouch to give a back shape, often on one or more edge of thin blades. In classifying these blades, the form given by retouch is considered. In these case three subtypes are determined as given below:

87) *Backed Blade*: The pieces formed by partly or completely retouch on one or two edges of a blade to give a straight-backed shape (fig. 4, n°6).

88) *Curved Backed Pointed Blade*: The pieces formed by abrupt retouch projects the distal or proximal end of an edge of a blade to give curved back shape (fig. 4, n°7).

89) *"Lunate" Shaped Backed Blade*: The pieces formed by abrupt retouch projects both ends of an edge of a blade to give a "lunate" formed back (fig. 4, n°8).

H. BURINS

Burins are tools formed by the burin blow technique, often made by two opposite facets on flake, blade, core, core fragment or debris and they are described as facet tools.

In classification of Öküzini burins we considered the criteria given below:

-circumference line of truncation (oblique, concave, convex truncation on burin)

-position of facet with respect to longitudinal axis (on butt, double, ventral face, dihedral straight, offset dihedral burin)

In certain cases, there is a determinant notch, break or retouch (e.g., beaked, arched burin). In others, different attributes are found together (e.g., mixed multiple burin).

90) *Burin on Oblique Truncation*: Taking a blow from one of the edges of an oblique truncated blade, which is parallel to the longitudinal axis (fig. 4, n°9), forms the tool.

91) *Burin on Concave Truncation*: Taking a blow from one of the edges of a concave truncated blade, which is parallel to the longitudinal axis (fig. 4, n°10), forms the tool.

92) *Burin on Convex Truncation*: Taking a blow from one of the edges of a convex truncated blade, which is parallel to the longitudinal axis (fig. 4, n°11), forms the tool.

93) *Burin, Dihedral*: A burin made by opposite facets forming an angle, which can be divided into equal parts by the longitudinal axis of the artifact.

94) *Burin, Offset Dihedral*: A burin made by opposite facets which from an inclined edge from the longitudinal axis of the artifact (fig. 4, n°12).

95) *Beaked Burin*: Dihedral burin with rounded flaking on one side interrupted by retouch or a notch. The working edge is like a parrot beak (fig. 4, n°13).

96) *Arched Burin*: A dihedral burin, which is rounded flaking on one side, interrupted by retouch or a break (fig. 4, n°14).

97) *Burin, Core-Like*: A dihedral burin, which is made by joining several burin blow of on the strike platform or a natural pan of a core or a core fracture (fig. 4, n°15).

98) *Burin, Plan*: Burin made by one or more facets

on the ventral face of a flake or blade (fig. 4, n°16).

99) *Burin on Butt*: Burin made by joining one or more facets with utilizing the natural form of a blade or flake butt (fig. 5, n°1).

100) *Double Burin*: An angled burin made on flake or blade with more than one working edge (fig. 5, n°2).

101) *Mixed Multiple Burin*: The burin has two working edges, which are opposite to each other. One of the edges is dihedral and the other is on convex truncation (fig. 5, n°3).

I. BORERS

Borers: Tools found on a blank are pointed bilaterally often with abrupt or semi-abrupt or sometimes with alternately retouch as double or single shouldered, straight, oblique or short or long. Although there is a small amount of quantity of borers in hand they are different in variety.

In classification of borers the length of boring point, the position of boring point on a blank and form of the point is taken in considepercentagen. Tools are identified as follows:

102) *Typical Borer*: Double shouldered and pointed tools which are formed by narrowing bilaterally with abrupt retouch on distal or proximal end of a blade on the longitudinal axis (fig. 5, n°4).

103) *Micro Borer*: Very sharp and ting point formed by single or double shoulders (fig. 5, n°5). This tool is mostly formed by scaled or abrupt scaled and sometimes alternate retouch on one or both of the edges. The form of the projecting point can be oblique or straight.

104) *Double Borer*: Borers having two sharp points on blank (fig. 5, n°6).

105) *Angle Borer*: Borer that has point found along on one of the edges of blank (fig. 5, n°8).

106) *Slant Pointed Borer*: Double shouldered borer, found on distal end of a blade. Its edges are retouched scaled and abrupt form both sides to project the point, which is inclined with respect to longitudinal axis (fig. 5, n°9).

107) *Thorn Shaped Borer*: Borer has a form different from a typical one and looks like a rose thorn (fig. 5, n°7).

J. DOUBLE TOOLS

Double tools: Two different tool types are found on the same blank. Double tools are named according to the types present. For example, a tool having an endscraper and a burin on a blank is named as "endscraper-burin" (fig. 5, n°16). For this reason, it is unnecessary to define each item here.

K. TRIPLE TOOLS

Triple tools: Tools found on a blank as three different types together in combination. Triple tools are named according to the types found on them. For example a tool having an endscraper, a denticulate and a notch on a blank is named as "endscraper-denticulate-notched" (fig. 5, n°11). Again, specific definitions are not given here.

L. BEAKED TOOLS

130) *Beaked Tool*: Tools made on flakes or debris. They have a short, thick and sharp point, which is projected by two adjacent notches on the same edge (fig. 5, n°15).

M. RACLETTES

131) *Raclette*: Tools retouched scaled, abrupt or semi-abrupt sometimes alternately, on one or more edges found on thin flakes and waste products (fig. 5, n°13).

N. POINTS

132) *Point*: Retouched bilaterally with acute angle form the point of a blade, narrow, sharp, thin point is projected towards the distal end of a blank with abrupt or semi-abrupt retouch (fig. 5, n°12).

O. MIDDLE PALEOLITHIC TOOL TYPES

Most of the tools in this category display the typical characteristics of Middle Paleolithic tool kits. They are identical to Mousterian lithic assemblages of Karain Cave (fig. 5, n°14, 20). These observations suggest the following hypothesis: The inhabitants of Öküzini Cave may have visited the neighboring caves and brought back some of the abandoned Mousterian tools to Öküzini during the Epipaleolithic. The definition and description of these tools will not be given here (for this and identifications see Yalçınkaya, 1989: 29-36).

P. VARIED PIECES

141) *Retouched Plunging Piece*: A complete

plunging piece is taken from a core and its two lateral edges have scaled retouch (fig. 5, n°19).

142) *Retouched Cores or Core Fragments*: Cores or core fragments that one or the edges formed by continuous and regular scaled retouch (fig. 5, n°18).

143) *Endscraper Fronts*: They are broken endscraper fronts and therefore could not be placed in any of the sub-types (fig. 5, n°10).

144) *Unidentified Retouched Pieces*: Unidentifiable retouched pieces. Most are fractured patinated or burned pieces.

RESULTS

The aim of this study was to analyze the macrolithic tool industry of Öküzini Cave. At first, each single piece was assigned to a specific tool category and, therefore, primary classification was made and a type list was established. The next step was to calculate the proportion of each tool type among the entire industry. Next, existing material was revised and some of the tools were eliminated* and excluded from the sample in order to reduce the effects of biasing factors resulting from the archaeological context and recovery methods. The spatial distribution of the selected artifacts was done. In this section, analysis of the types and discussion of the results will be presented.

The cores and core pieces classified under "varied pieces" have only 16 examples among the macrolithic tools. Particular retouch type only used in production of these pieces is completely different than core prepapercentagen retouch and endscraper production retouch. Determination of the production strategy for these particular pieces can only be made by a detailed techno-typological study of the entire lithic industry (see Léotard and López Bayón, this volume).

In this study, "plunging pieces" are represented by a single specimen. Although there are plunging pieces chipped in the same way among the waste products, indicating technological features, the major characteristic discriminating this artifact is its form, which was produced by partial retouch on lateral edges.

Broken endscraper fronts are represented by 151 examples. Most of the pieces are broken from the medial part of their distal end. Therefore, they are not classified in any sub-type of endscrapers. Although they were classified as a separate group in the type list, they were analyzed together with endscrapers in the statistics.

In our study, the presence of rare Middle Paleolithic tools in Öküzini lithic assemblages is confirmed. The total number is 13 tools, including 12 sidescrapers and one point.

Some of the sidescrapers display the typical characteristics of Karain Cave Mousterien and are in their original forms. However, we were able to identify secondary utilization of Middle Paleolithic tools from neighboring sites near Öküzini Cave. Two of the specimens were made on blanks displaying the typical characteristics of Middle Paleolithic industries. A mixed-denticulated tool (fig. 5, n°17) and a notched-denticulated tool were both made on Levallois flakes and resharpened by secondary retouch. Thus, we assume that Öküzini inhabitants may have visited neighboring sites repeatedly, brought these tools back to the camp and re-used them as blanks or for other purposes as well.

Beaked tools (n=3), points (n=6), triple tools (n=12), backed blades (n=22), burins (n=23), raclettes (n=24) and borers (n=35) were found in very small quantities among the macrolithic tools of Öküzini Cave (see Graph. I). While the beaked tools, points and raclettes do not include any sub-types, the triple tools, backed blades, burins and borers show varieties and include subtypes.

Double tools constitute 10% (n=294) of all macroliths (see Graph. I). Most of the double tools, which are classified under 17 sub-types, were made on blades. The most dominant sub-type among these is denticulated-retouched blade (20.75%). Endscraper–denticulated (12.93%), notched–denticulated (12.59%) and truncated–retouched blades (11.90%) can also be mentioned.

Retouched flakes constitute 4% (n=109) of all macrolithic tools (see Graph. I) and are represented in 6 sub-types. Most of the tools have scaled retouch and have an average length of 29.9 mm, width of 24.3 mm and thickness of 7.3 mm*. Among these, there are other sub-types, such as flakes having partial retouch on one edge (n=21), having alternate retouch (n=19) and having retouch along the complete edge (n=17).

Truncated pieces constitute 4% of all macrolithic tools (see Graph. I). Although they are rare, they are diverse. There are 117 truncated pieces and 89% of these (n=104) were made on blades. Most of the pieces were truncated from distal and proximal ends.

Notched tools constitute 4% (n=111) of all macrolithic types and they have 7 sub-types (see Graph. I). Notched tools are further grouped

* Excavations were conducted by quarter squares (50x50 cm). Arbitrary horizontal archeological levels (AH), 10 cm in thickness, were excavated. Excavation in perfectly horizontal or planimetric spits in sloping stratigraphy created problems in keeping geological layers (GH) distinct. Physical barriers such as concreted surfaces, rock blocks, etc., also caused many problems. Therefore, it was inevitable that two or more geological levels were mixed in an AH. These mixed AHs were excluded to reduce the biasing factors in sampling the macroliths according to the excavation areas.

* Average dimensions of the tools are given only for complete pieces.

into three different categories according to their notch widths. Micro-notched tools have an average notch width of 4.5 mm; small-notched tools an average width of 6.75 mm and large-notched tools with a notch width of 12.5 mm. Notched tools were mostly made on blades (72%) and 60% of them are broken. Typological analysis have shown that the basic strategy in the notched-tool production was retouching since 86.49% (n=96) of the notches bear retouch.

Denticulated-tools constitute 12% (n=369) of all macroliths (see Graph. I). This type is one of the most common among Öküzini macroliths after endscrapers and retouched-blades. They are classified under 5 sub-types. However, 76 denticulated-tools (20.60%) were not classified as to sub-type as more then half of them are broken. The majority of denticulated-tools were made on blades (76%; n=280) and the degree of fragmentation among all denticulated-tools is quite high (54.74%). Micro-denticulated tool is the most frequent sub-type with a percentage of 43.63%. This sub-type is followed by mixed-denticulated tool (16.26%) and macro-denticulated tool (11.92%) respectively.

Retouched blades are another common tool type after endscrapers with a percentage of 17% (n=515). They are represented by 10 sub-types (see Graph. I). As in the case of denticulated-tools, a great number of the retouched blades (48.74%; n=251) could not be placed into any of the sub-types due to their being broken. The degree of fragmentation is relatively high among retouched blades as well (72.62%). The complete pieces have an average length of 42.2 mm, width of 15.2 mm and thickness of 5.7 mm. Retouched blades with partial retouch on one edge (17.28%) and with alternate retouch (13.40%) are the most common sub-types.

Endscrapers are the most significant tool class because of their high quantity and variety. Their percentage is the highest (37%; n=1127) of all macrolithic tools and retouched pieces (see Graph. I). Endscrapers are classified under 11 different groups and then branched into 43 sub-types. The cardinal criterion in their classification is "dimension". We obtained significant results after the spatial distribution of the 6 groups, which were previously classified by different criteria. Before discussing these results, some morphological features of the endscrapers and their subtypes will be presented.

Endscrapers on proximal end and endscrapers on lateral edge are defined on the basis of differences in their forms (i.e. endscraper on lateral edge of a flake, small endscraper on lateral edge, short endscraper on lateral edge and thick nosed endscraper on lateral edge) and they are quite clear. The form of the endscrapers on lateral edge (n=22) do not fit well with the general definition since they were made on the left or right lateral edge of a blank. Although their front part was not made on the edge opposing the butt of the blank, it is apparent that these tools are endscrapers.

Endscrapers on proximal end are represented by 140 tools and make up the fourth largest group among the 11 groups. Endscrapers on proximal end differ from **caminade (caroinated?)** endscrapers because of their blank types. In contrast to **caminade** endscrapers, which are exclusively made on blades, endscrapers on proximal end are also made on flakes, core tablets and waste products. There is no sign of any retouch such as denticulation or truncation retouch indicating the repeated usage of its edges, apart from the endscraper front. Although these tools are believed to be original types of Öküzini, they should be examined in detail and compared with other sites.

The average dimensions for these groups are given in Table 1. Short endscrapers occur with the highest percentage (24%; n=230) among all endscrapers. This group is followed by endscrapers on blades with a percentage of 23% (n=223) and small endscrapers with a percentage of 21% (n=207).

Front forms and retouch types of the endscrapers were analyzed in order to understand whether the type of retouch affects the form of the endscraper front. This analysis yielded the following results: 36% (n=284) of these tools are thin–asymmetric; 27.94% of them are thin–symmetric; 19.10% of them are thick–asymmetric and 16.53% of them are thick-symmetric. Endscrapers having thin-asymmetric and thin–symmetric fronts are of scaled retouch with a remarkably high percentage (85%). Also, given all the endscrapers, retouch type of the fronts were scaled with a percentage of 64.33%. However, thick–symmetric and thick–asymmetric endscrapers have fronts formed by other retouch types. The percentage of the abrupt, semi-abrupt, step scaled or bladelet retouch are relatively higher than the percentage of scaled retouch among these forms. This suggests that the type of retouch does not directly affect the form of the endscraper front. However, the type of blank is a very significant factor affecting the form and thickness of the endscraper front. Blades are the primary blank source for the endscrapers (39%; n=440). The degree of fragmentation is highest (n=243) among blades as blanks and the most commonly occurring breakage pattern is the proximal part (n=228). This pattern suggests that these tools might have been fixed in handles. Semenov points out that "...fixing in a handle was necessary probably only for very small examples made on short blades..."

(Semenov, 1964:88). Considering the dimensions of the blade blanks in our sample, blades having an average length of 27 mm can be considered to be short. Therefore, it is possible that these tools were hafted and used in this way.

The main goal of our study was to understand the general typological and technological aspects of the Epipaleolithic period in this particular area of south-west Anatolia through the analysis of the macrolithic industries of Öküzini Cave. Therefore, spatial distribution of the different types and sub-types is very significant in order to determine the possible cultural similarities and/or differences throughout the stratigraphic sequence of the cave. Selection of some units and elimination of some biased units has decreased the size of our sample. Our sample was originally comprised of 3054 artifacts and subsequently reduced to 2915 (4.76%) after this sampling strategy. However, this reduction does not affect the results and the general trend of our sample.

In order to observe the spatial distribution and the density of the tools, first, the distribution of all categories as a single unit according to archaeological horizons is presented. This is followed by the spatial distribution of all categories according to geological horizons (see Graphs II and III). Finally, we will present our results and interpretations in the frame of three arbitrary archaeological units that were created.

Archaeological Unit I. Between AH 8 and 0. This corresponds to GH II to 0. C^{14} dating for these levels are 10000 BP and 7900 BP.

All of the macrolithic tools are represented in this unit except for the beaked tool and plunging piece. The most frequent types are endscrapers, retouched blades, denticulated tools and double tools. Among these types, the most frequently represented sub-types are endscrapers on flakes, alternately retouched blades, micro denticulated tools and truncated–retouched blades. The average dimensions of all tool types will be given separately for each archaeological unit in order to examine the possible size differences in the industry through the sequence. Thus, we also expect to get information about the technological trend during the Epipaleolithic period in Öküzini Cave. The average dimensions of endscrapers and retouched blades for the archaeological unit I is as follows: For endscrapers average length is 21 mm, width is 18 mm and thickness is 7 mm; for retouched blades average length is 40 mm, width is 17 mm and thickness is 6 mm. On the horizontal plane, including archaeological and geological units, tools are concentrated in the excavation areas of "A" and "B" sections and "M" area (burial) (see Graphs II and III).

Archaeological Unit II. Between AH 22 and AH 9. It corresponds to GH VIII to II. According to C^{14} dating, it comprises a long period between 12000 BP and 14000–15000 BP.

Endscrapers are again the most frequent tool types in this unit. This tool type is followed by retouched blades, denticulated tools and double tools. Sub-types of these most frequent types are endscrapers on distal end of blades, partly retouched blades on one edge, micro denticulated and denticulated –retouched blades. Average dimensions of endscrapers and retouched blades are as follows: for endscrapers average length is 23 mm, average width is 18 mm and thickness is 7 mm; for retouched blades average length is 43 mm, average width is 15 mm and thickness is 5 mm. On the horizontal plane, tools are concentrated in the excavation areas of "A", "B", "N", "MK" and "D" sections (see Graphs II and III).

Archaeological Unit III. Between AH 23 and AH32. It corresponds to GH XII to VIII. According to C^{14} dating, it is dated between 14000 BP and 16500–17000 BP.

It is obviously seen that from AH 23 on, retouched blades are overwhelmingly more represented than the endscrapers. The most frequent tool types of this unit are retouched blades, endscrapers, denticulated tools and double tools. Blades having partial retouch on one edge, endscrapers on distal end of blades, micro denticulated and notched–denticulate tools are the dominant sub-types of these types. Beaked tools, triple tools, plunging pieces and Middle Paleolithic-type tools are not represented in this archaeological unit. Morphometric analysis indicates that the length of the endscrapers increases dramatically from 23 mm to 30 mm (7 mm difference) and the width increases from 18 mm to 20 mm (2 mm difference). However, the average dimensions of retouched blades remains unchanged. On the horizontal plane, macrolithic tools are concentrated in the excavation areas of "A" section and "sounding" (see Graphs II and III).

CONCLUSION

The most significant result obtained through the analysis of macrolithic tools of Öküzini Cave is that there is a clear technological shift between the upper and lower part of the stratigraphic sequence. This shift can be better understood given the C^{14} dates and variations of macrolithic tool types. In addition, the data collected through measurements of endscrapers and retouched blades, which are the most frequent tool types in the entire excavation area, clearly supports this idea. The gradual increase of the dimensions of endscrapers and

retouched blades through the sequence is another supporting factor. In archaeological unit II, the interrelations of short endscrapers, small endscrapers, endscrapers on flakes and endscrapers on blades, which are classified based on their lengths, show a typological shift from upper levels to lower levels. For example, short and small endscrapers found between AH 8 and AH 15 are more frequent than longer endscrapers on blades. However, in the same levels, the number of small endscrapers decreases as the number of short endscrapers increases. In other words, their relation is in the form of indirect percentage. If one looks at the levels between AH 15 and AH 23, while the number of endscrapers on distal end of blades increases sharply in the levels AH 15 on, the number of the small and short endscrapers decreases. As the decrease in the number of the small endscrapers continues up to AH 23, the number of endscrapers on distal end of blades and short endscrapers increases between AH 18 and AH 23 (see Graph. IV). On the other hand, while the sub-types of endscrapers on proximal end (which we have suggested could be special types of Öküzini Cave) are especially intensive in archaeological unit II, they completely disappear in archaeological unit III considering their proportional distribution. Diversity of the macrolithic tool types decrease, especially from AH 27 (GH IX–XIII); some of the types disappear completely. This increases the probability of the introduction of a new period with its own technological and morphological features from this level on.

As excavations of this site are ongoing, it is difficult to find out all the answers to these questions. Also, other sites must be found and excavated in order to understand the Epipaleolithic culture in this particular area.

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TYPE LIST FOR THE MACROLITHIC TOOL INDUSTRY OF THE ÖKÜZİNİ CAVE

endscrapers
denticulated tools
notched tools
truncated pieces
retouched blades
retouched flakes
backed blades
burins
borers
double tools
triple tools
beaked tools
raclettes
points
Middle Paleolithic tools
varied pieces

A. ENDSCRAPERS

I.ENDSCRAPERS ON FLAKE (L>30 mm)
1) Endscraper on flake
2) Endscraper on retouched blade
3) Rounded or semi-rounded endscraper on flake
4) Fan-shaped endscraper on flake
5) Carinated endscraper on flake
6) Endscraper on lateral edge of flake

II. END-SCRAPERS ON BLADE (L<30 mm)
7) Endscraper on distal end of blade
8) Endscraper on distal end of retouched blade
9) Ogival endscraper on distal end of blade
10) Carinated endscraper on distal end of blade

III. SHORT END-SCRAPERS (20<L 30 mm.)
11) Short endscraper on flake
12) Short endscraper on distal end of blade
13) Short endscraper on core tablet
14) Carinated short endscraper
15) Short endscraper with denticulate front
16) Short endscraper on lateral edge
17) Short endscraper on ventral face
18) Handled short endscraper
19) Rounded or semi-rounded short endscraper

IV. SMALL END-SCRAPERS (10<L 20 mm.)
20) Small endscraper
21) Small endscraper on flake
22) Small endscraper on distal end of blade
23) Small endscraper on core tablet
24) Carinated small endscraper
25) Small endscraper on lateral edge

25) Small endscraper on lateral edge
26) Rounded or semi-rounded small endscraper

V. MICRO END-SCRAPERS (1<L 10 mm.)
27) Micro endscraper
28) Micro endscraper on proximal end
29) Rounded or semi-rounded micro endscraper

VI. TRANSVERSAL END-SCRAPERS (W>U)
30) Transversal endscraper

VII. END-SCRAPERS ON PROXIMAL END
31) Endscraper on proximal end of flake
32) Endscraper on proximal end of blade
33) Endscraper on proximal end of core tablet
34) Carinated endscraper on proximal end
35) Ogival endscraper on proximal end
36) Endscraper on proximal end

VIII. NOSED END-SCRAPERS
37) Thick nosed endscraper
38) Thick nosed endscraper on lateral edge
39) Thin nosed endscraper

IX. DOUBLE END-SCRAPERS
40) Double endscraper
41) Carinated double endscraper

X. CORE OR CORE-LIKE END-SCRAPERS
42) Core or core-like endscraper

XI- ATYPICAL END-SCRAPERS
43) Atypical endscraper

B. DENTICULATED TOOLS
44) Micro denticulated
45) Macro denticulated
46) Mixed denticulated
47) Alternate denticulated
48) Inverse denticulated

C. NOTCHED TOOLS
49) Micro notched
50) Small notched
51) Macro notched
52) United notched
53) Multiple notched
54) Alternate notched
55) Inverse notched

D. TRUNCATED PIECES

I. TRUNCATED PIECES ON DISTAL END
56) Straight truncated
57) Concave truncated
58) Convex truncated
59) Oblique-concave truncated
60) Oblique-straight truncated

II. TRUNCATED PIECES ON PROXIMAL END
61) Straight truncated
62) Concave truncated
63) Oblique-concave truncated
64) Oblique-straight truncated

III. TRUNCATED PIECES ON LATERAL EDGE
65) Straight truncated
66) Concave truncated

IV. MULTIPLE TRUNCATED PIECES ON DIFFERENT EDGES
67) Double concave truncated
68) Oblique-straight truncated
69) Straight-concave truncated
70) Double straight and concave truncated

E. RETOUCHED BLADES
71) Partly retouched on one edge
72) Completely retouched along on one edge
73) Partly retouched on both edges
74) Completely retouched along on both edges
75) Partly and completely retouched on different edges
76) Inversely retouched blade
77) Alternately retouched blade
78) Retouched pointed blade
79) Alternately retouched, pointed blade
80) Articulated blade

F. RETOUCHED FLAKES
81) Partly retouched on one edge
82) Completely retouched along on one edge
83) Partly retouched on both edges
84) Completely retouched along on both edges
85) Alternately retouched
86) Inversely retouched

G. BACKED BLADES
87) Backed blade
88) Curved backed pointed blade
89) "Lunate" shaped backed blade

H. BURINS
90) Burin on oblique truncated
91) Burin on concave truncated
92) Burin on convex truncated
93) Burin, dihedral
94) Burin, offset dihedral
95) Beaked burin
96) Arched burin
97) Burin, core-like
98) Burin, plan
99) Burin on butt
100) Double burin
101) Mixed multiple burin

I. BORERS
- 102) Typical borer
- 103) Micro borer
- 104) Double borer
- 105) Angle borer
- 106) Slant pointed borer
- 107) Torn shaped borer

J. DOUBLE TOOLS
- 108) Endscrapers - truncated
- 109) Endscrapers - notched
- 110) Endscrapers - burin
- 111) Endscrapers - denticulated
- 112) Endscrapers – side-scraper
- 113) Endscrapers - borer
- 114) Truncated- notched
- 115) Truncated- denticulated
- 116) Truncated- retouched flake
- 117) Truncated- retouched blade
- 118) Denticulated- notched
- 119) Denticulated- retouched blade
- 120) Denticulated- retouched flake
- 121) Notched- burin
- 122) Notched-retouched flake
- 123) Notched- retouched blade
- 124) Burin- retouched blade

K. TRIPLE TOOLS
- 125) Endscraper – denticulated- notches
- 126) Endscraper – denticulated- borer
- 127) Endscraper – denticulated- truncated
- 128) denticulated- notched- truncated
- 129) Notched- denticulated- retouched blade

L. BEAKED TOOLS
- 130) Beaked tool

M. RACLETTES
- 131) Raclette

N. POINTS
- 132) Point

O. MIDDLE PALEOLITHIC TOOLS
- 133) Single straight side-scraper
- 134) Single convex side-scraper
- 135) Transverse convex side-scraper
- 136) Transverse straight side-scraper
- 137) Quina type transverse side-scraper
- 138) Offset side-scraper, right
- 139) Offset side-scraper, left
- 140) Mousterian point on Levallois flake

P. VARIED PIECES
- 141) Retouched plunging piece
- 142) Retouched core or core fragment
- 143) Endscraper fronts
- 144) Unidentified retouched pieces

Average Dimensions	Length (mm)	Width (mm)	Thickness (mm)
Endscraper on flake	36	29.1	9.7
Endscraper on blade	36.9	17.1	6.6
Short endscraper	24.8	20	6.8
Small endscraper	16.2	16	5.3
Micro endscraper	9.4	12.2	3.5
Transversal endscraper	20	29.4	6.6

Table 1. Average Dimensions of Endscrapers.

FIGURE-1

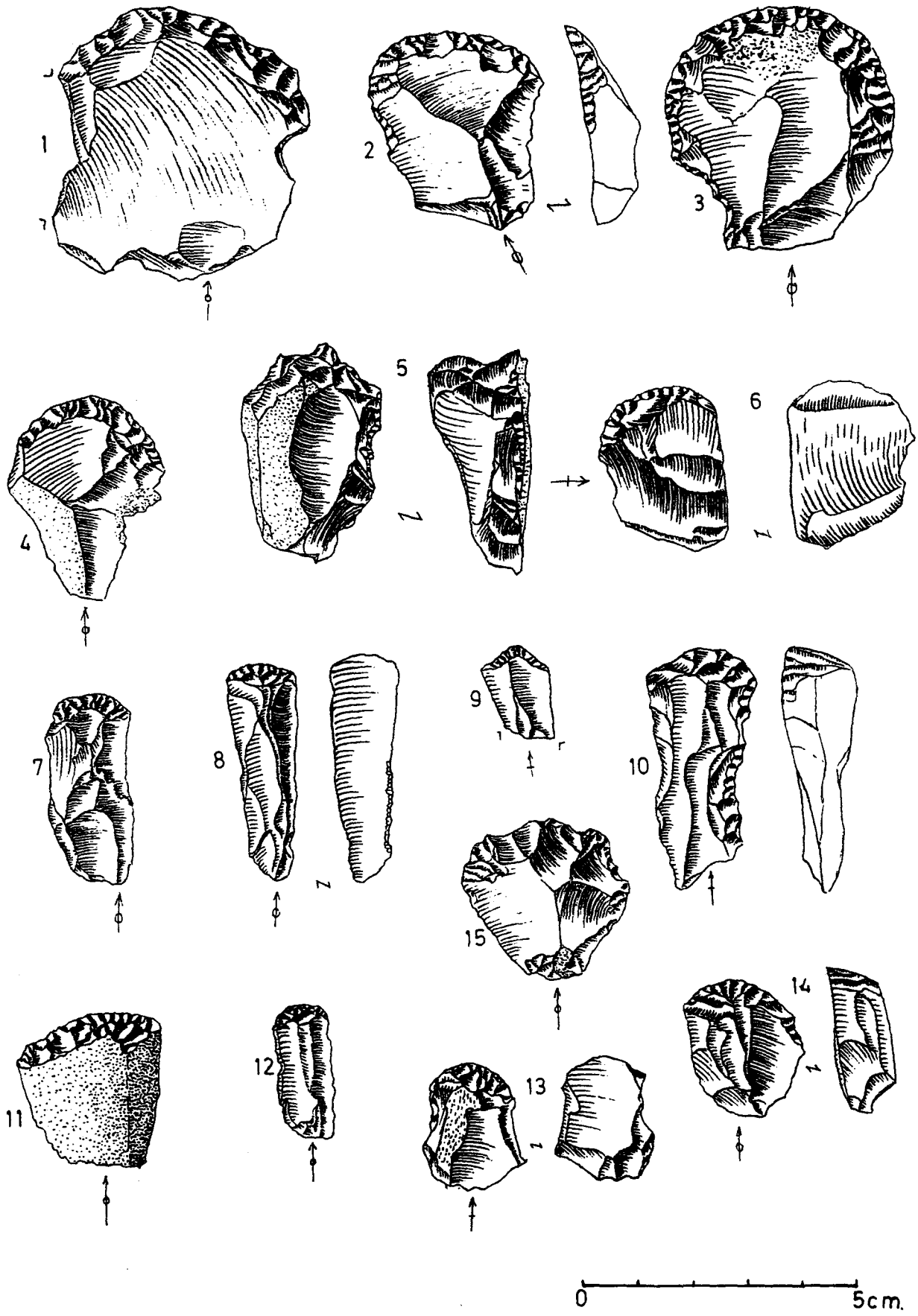
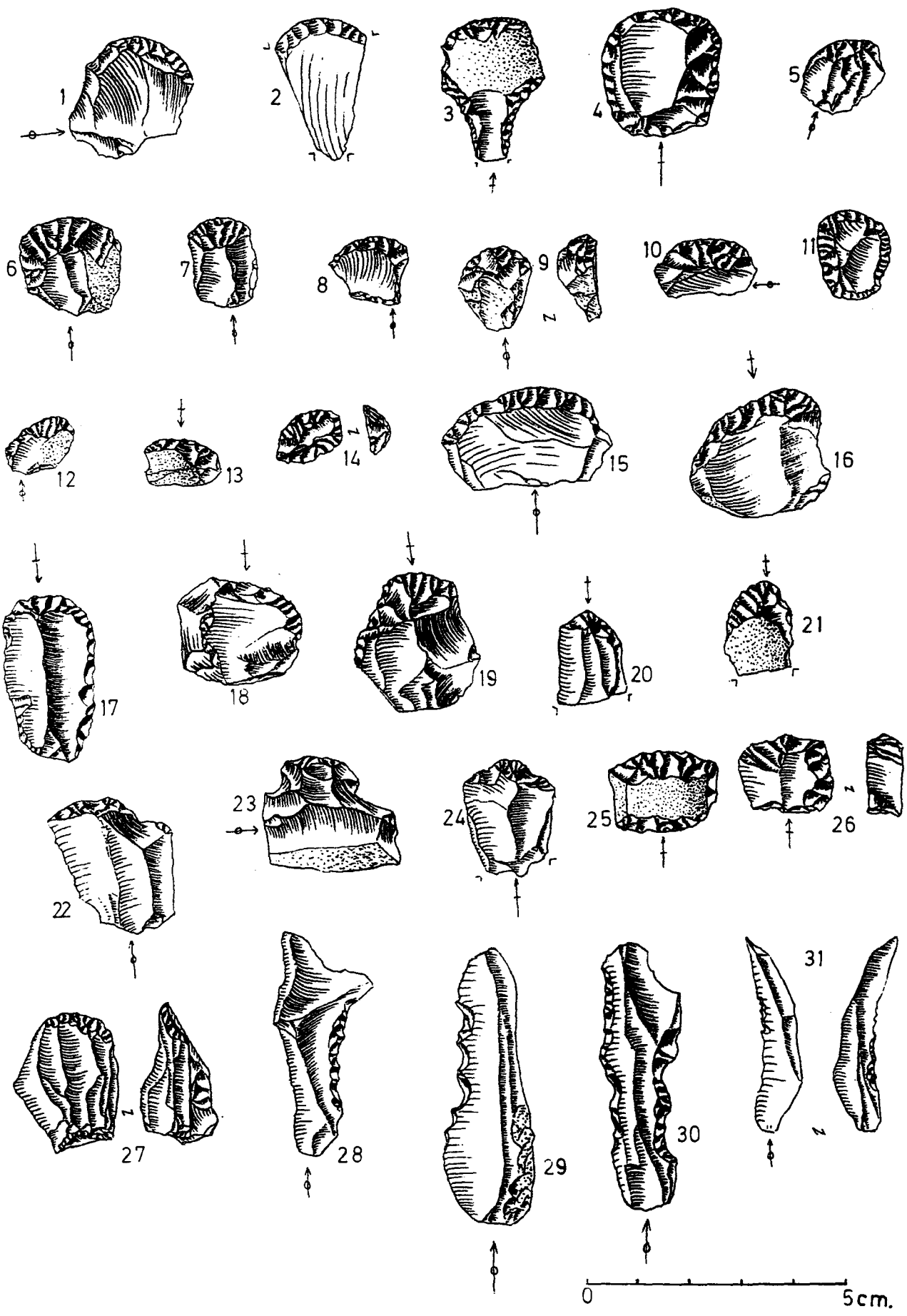


FIGURE-2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5cm.

FIGURE-3

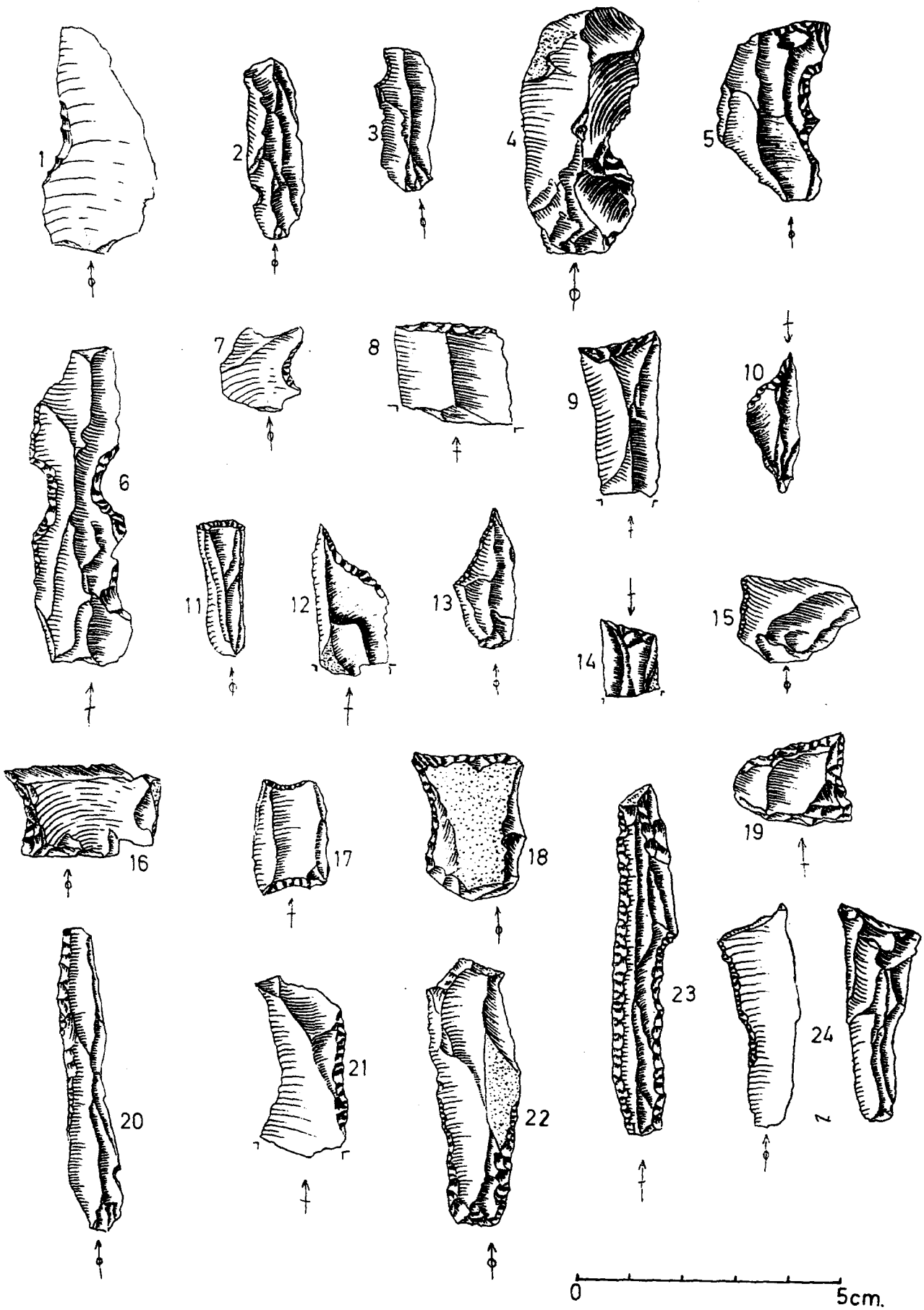


FIGURE-4

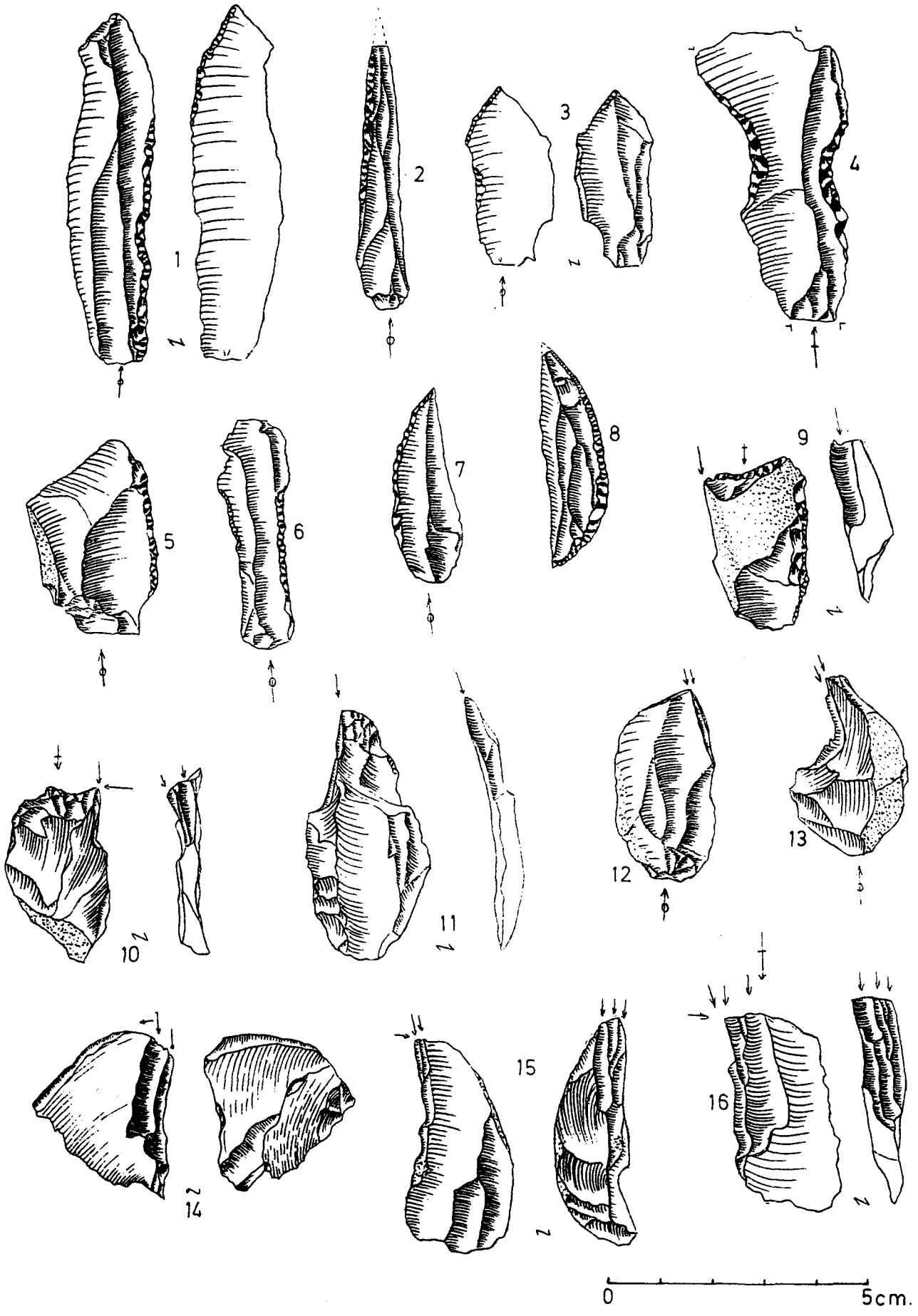
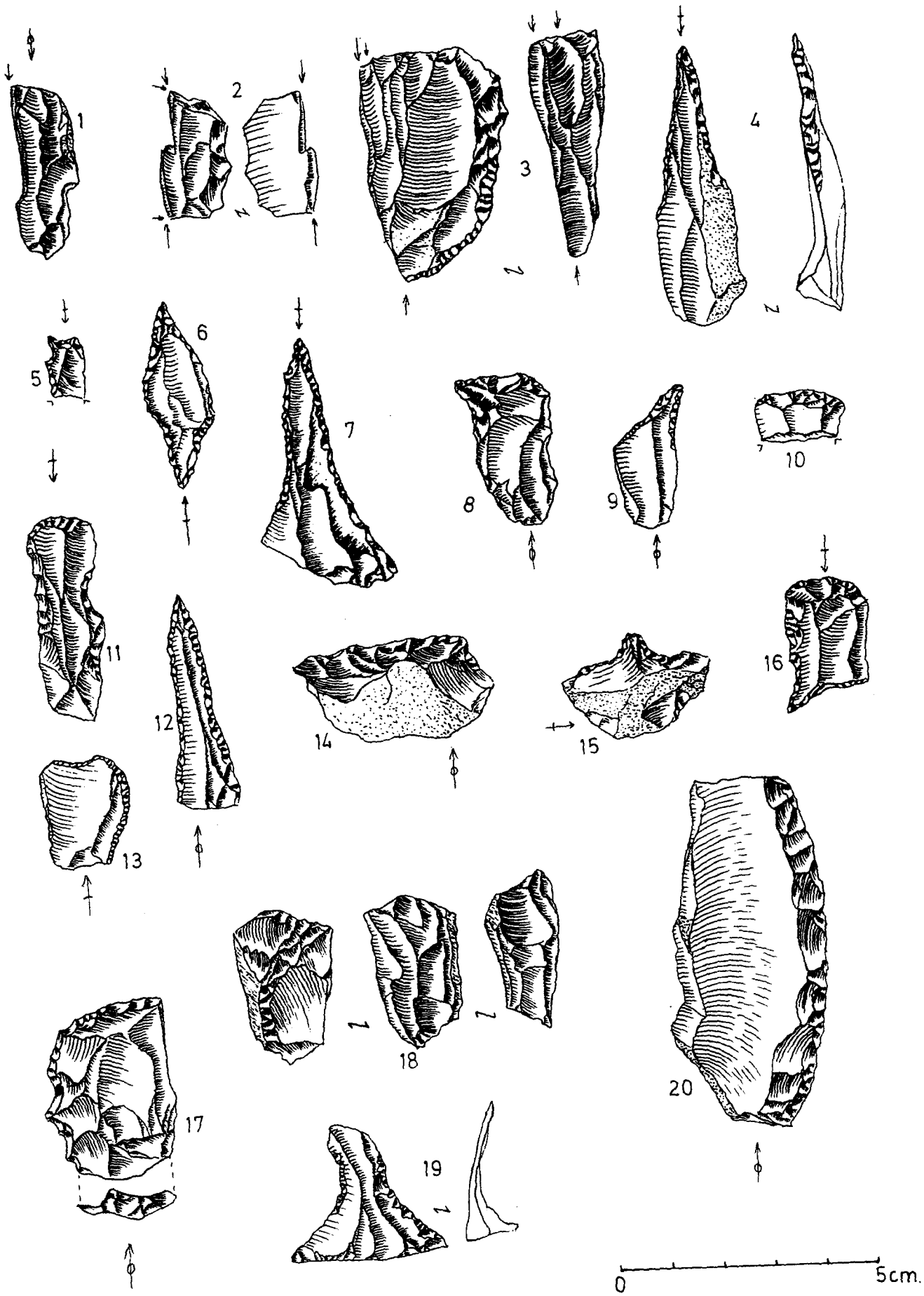
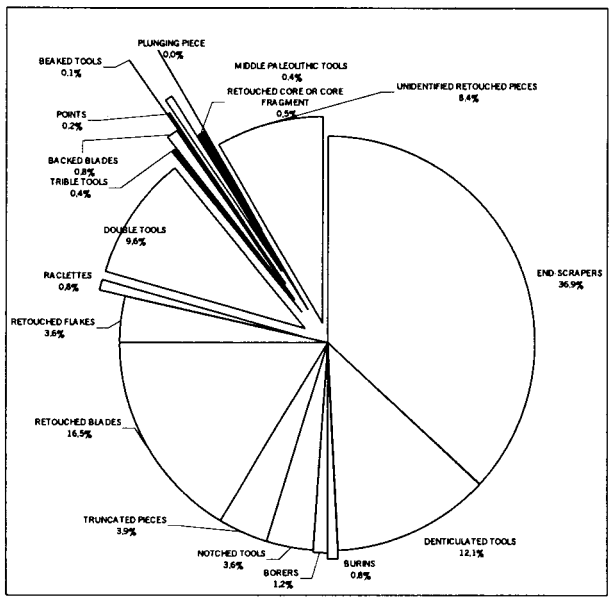
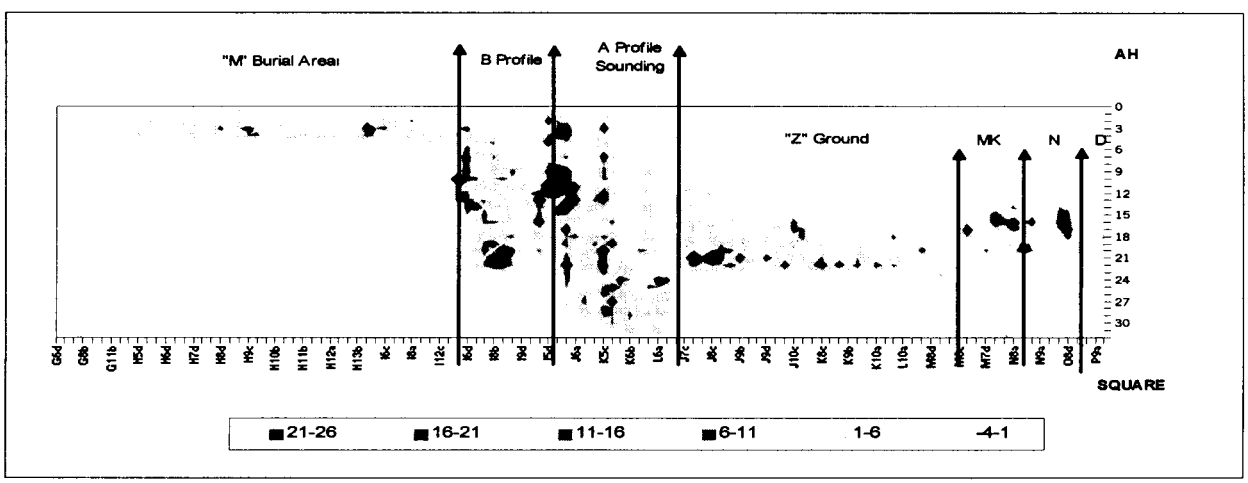


FIGURE-5

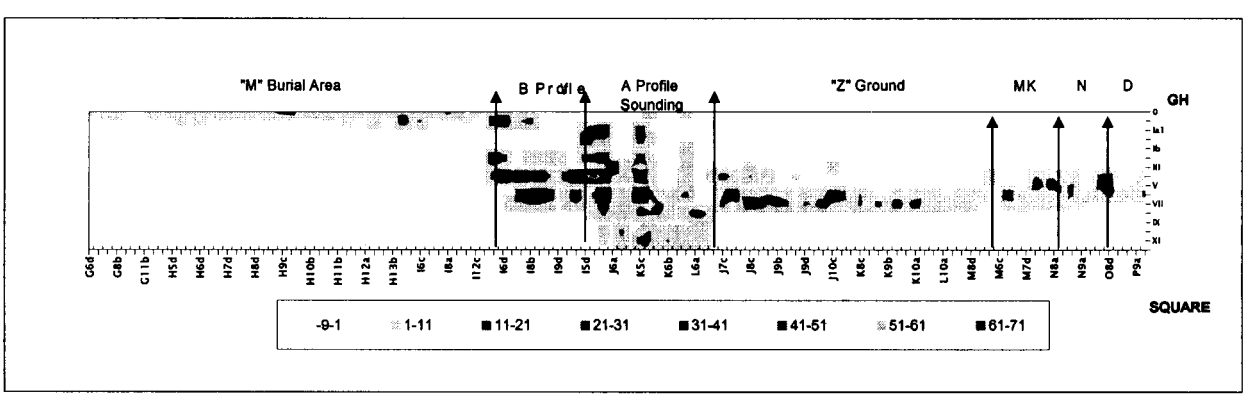




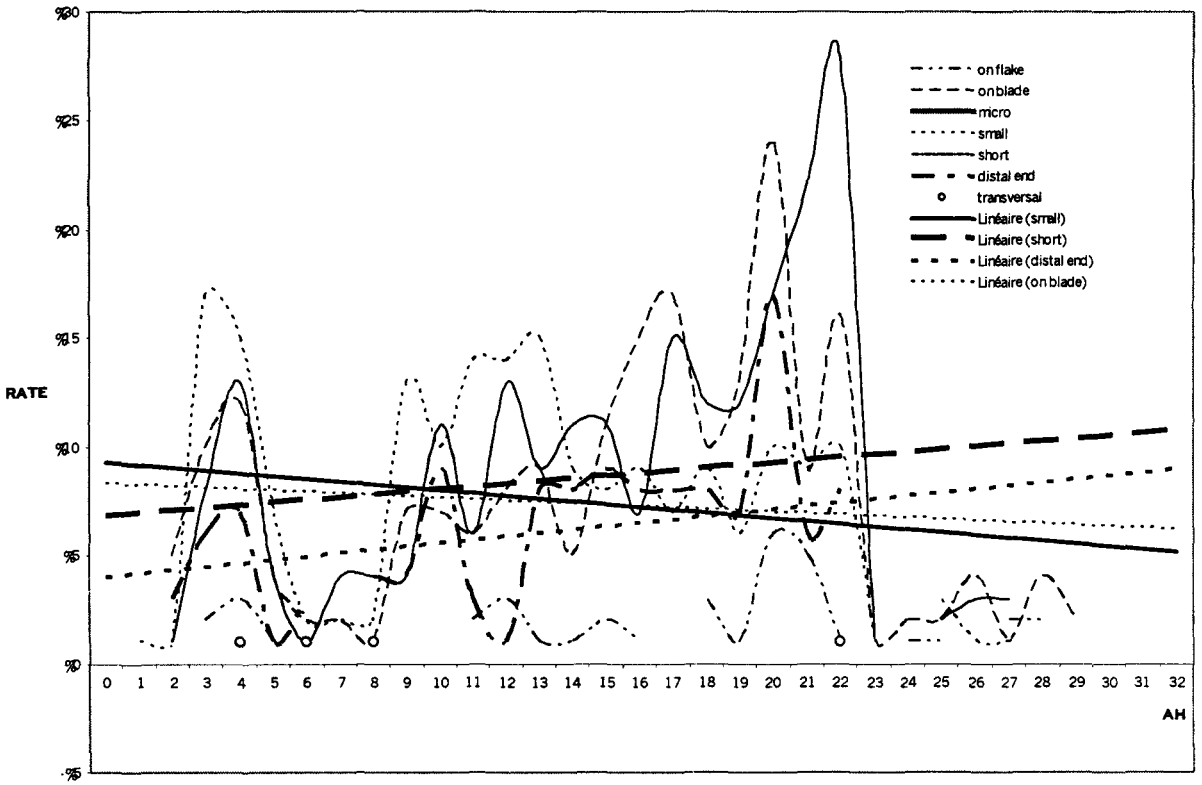
Graphic 1. Distribution ratio of the types.



Graphic 2. Spatial distribution of the macrolithic tools.



Graphic 3. Spatial distribution of the macrolithic tools.



*Peqportions are based on the total numbers of tools from each Archaeological Horizon (AH).

Graphic 4. Distribution trends of some of the sub-types end-scrapers*