A PRELIMINARY REPORT ON THE CHIPPED STONE INDUSTRIES OF THE MID-HOLOCENE SHELL-MIDDEN COMMUNITIES OF RA'S AL-HAMRA 5, LAYER 1 (MUSCAT-SULTANATE OF OMAN)

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1. *Introduction and acknowledgements*

This first report on the chipped stone industries of Ra's al-Hamra 5 (RH5) concentrates on raw material exploitation, technology, and spatial distribution of artefacts in layer 1. Furthermore, it provides examples of the basic characteristics of the industries from the RH5 sequence as well as from those of some other Mid-Holocene Ra's al-Hamra sites.

The approach to the study of the chipped stone assemblages from these sites was not an easy task, as the industry, or rather "industries", proved to be atypical in the sense that standard typological methods could not be applied. In addition to that, the few diagnostic tool classes may represent activities rather than "periods".

We express our sincere gratitude for all the support enabling us to carry out this study to His Highness Said Faisal bin Ali al-Said, Minister of National Heritage and Culture. The director of the Department of Antiquities of the Ministry of National Heritage and Culture, Ali Ahmed Bakhit al-Shanfari, provided all logistic support for this study and so encouraged us to contribute to the knowledge of the pre-Bronze Age history of the Sultanate.

Our colleagues, Maurizio Tosi and Paolo Biagi, directors of the Italian Expedition to Oman, invited us to study the chipped stone industries of the RH shell-middens.

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2. *Field methods*

Layer 1 comprised an area of over 74 m^2[1] to a depth of 10/15 cms. The chipped stone artefacts were recovered through dry sieving (5 mm. mesh sieve) of all soil from the excavated 2x1 metre units and from the various structures (postholes, pits).

This study analyses all the materials from squares HWT, HWX, HXK, and KCC (16 m^2 out of 74 m^2 or ca 20%) as representative for the technological and metric aspects, as well as raw material proportions of the industry from layer 1. In order to analyse the technological aspects and spatial distribution, the retouched material from all the squares was measured and counted according to the tool classes. Materials from pits, postholes and other structures have not been taken into consideration. Furthermore, this study provides the results of a survey on mineral resources focussing on the siliceous ones in the catchments of Qurum and Wattayah (fig. 1).[2]

3. *The stratigraphy of RH5 (1983-85 excavations)*

The shell/fish-midden of RH5 is the largest prehistoric site so far discovered on the promontory of Ra's al-Hamra. The excavations carried out by the Italian Archaeological Mission from 1981 to 1985 revealed that the Southern part of the site had been exclusively used for settlement, while the cemetery was limited to the Northern side.[3]

The archaeological deposit of the settlement reached a maximum depth of 1.5 metres. Several layers related to human activity were recognised, separated by sandy levels.

The numbering of the strata proceeds from the top to the bottom. Layer 0 was almost completely eroded. Only pit bottoms and postholes were preserved in some areas. One of the pits from Level 0 yielded pieces of a fine bowl of black pottery, comparable to some Tepe Yahya and other Southwestern Asian materials.[4]

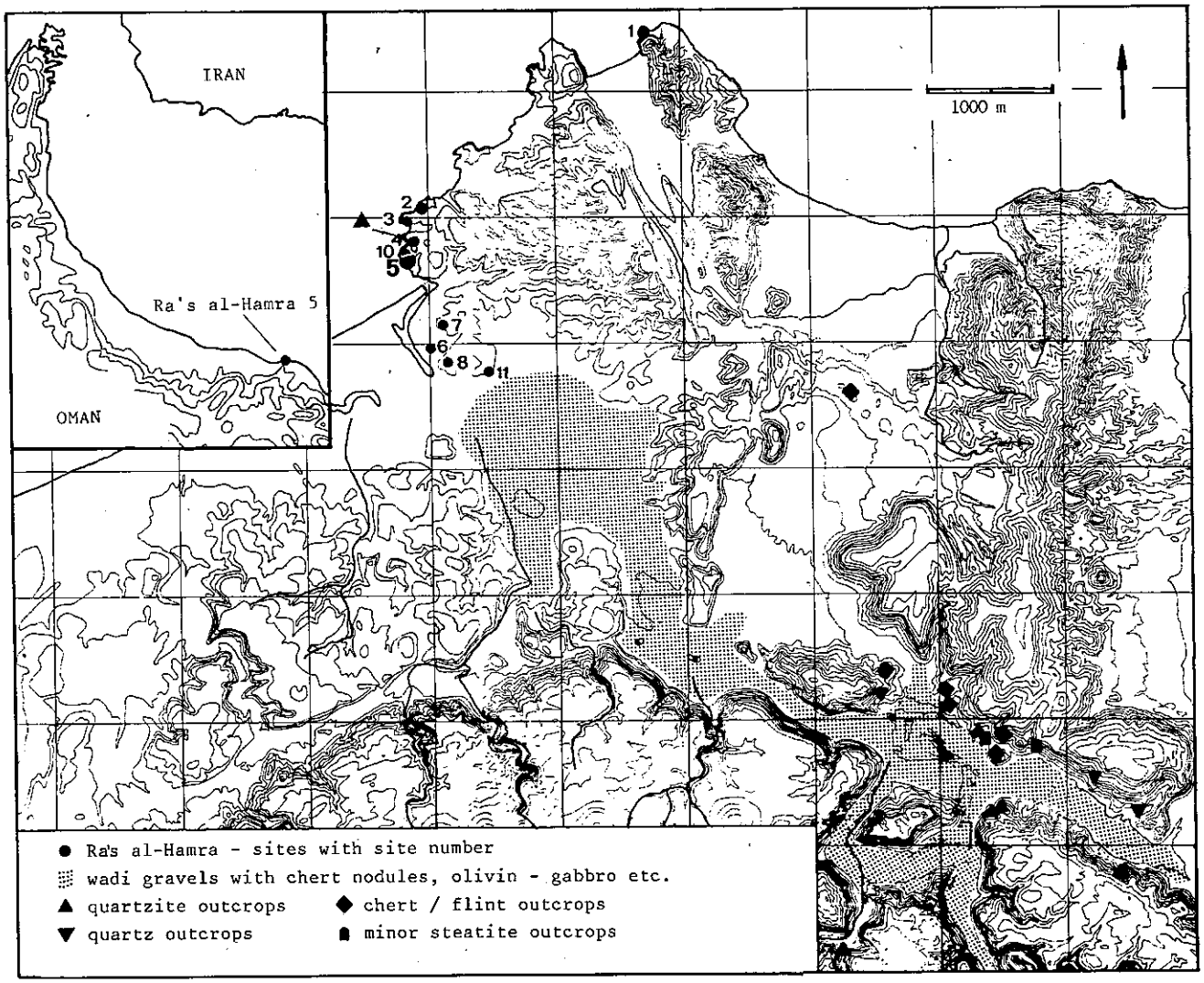


Fig. 1. - Qurum-Wadi Aday area: distribution of the Ra's al-Hamra sites and of the mineral resources.

The settlement sequence was described as follows:[5]

— Layer 5b : occupation phase I
— Layer 5a : occupation phase II
— Layer 5 : occupation phase III
— Layer 3d, 3c, 3b : occupation phase IV
— Layer 3a, 3 : occupation phase V
— Layer 1b, 1 : occupation phase VI
— Layer 0 : occupation phase VII

Radiocarbon dates[6] range from Bln-3149: 5480 ± 60 BP, layer 5b, to Bln-3140: 4760 ± 100 BP, layer 0. Layer 1 yielded a living floor with several features such as hearths, pits and postholes. Some of the latter are in a curvilinear alignment (fig. 2). Radiocarbon dates from layer 1 range from Bln-3141: 5030 ± 60 BP to Bln-3153: 4840 ± 60 BP (uncalibrated dates).

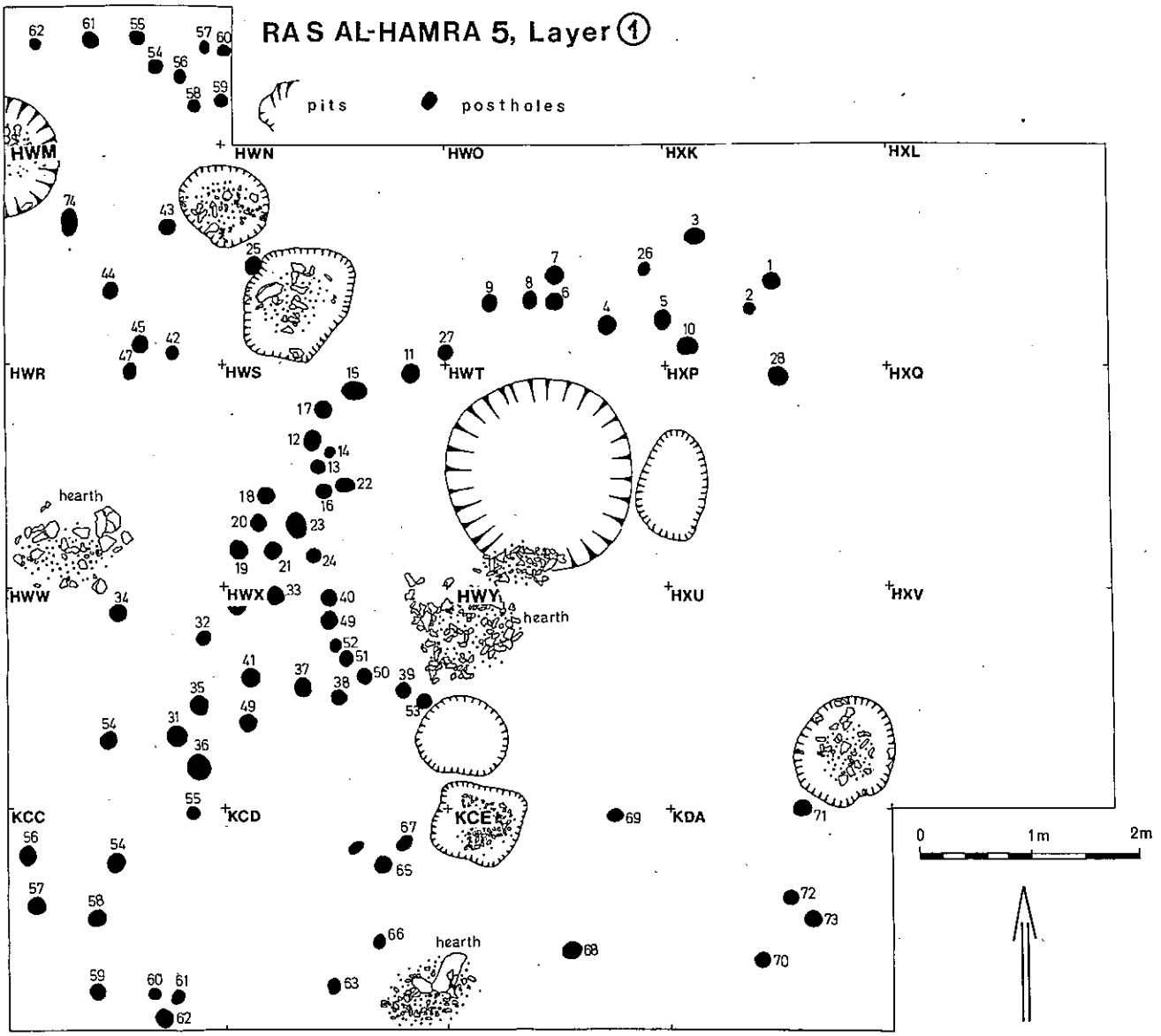


Fig. 2. - RH5: features from Layer 1 (after Biagi and Salvatori 1986).

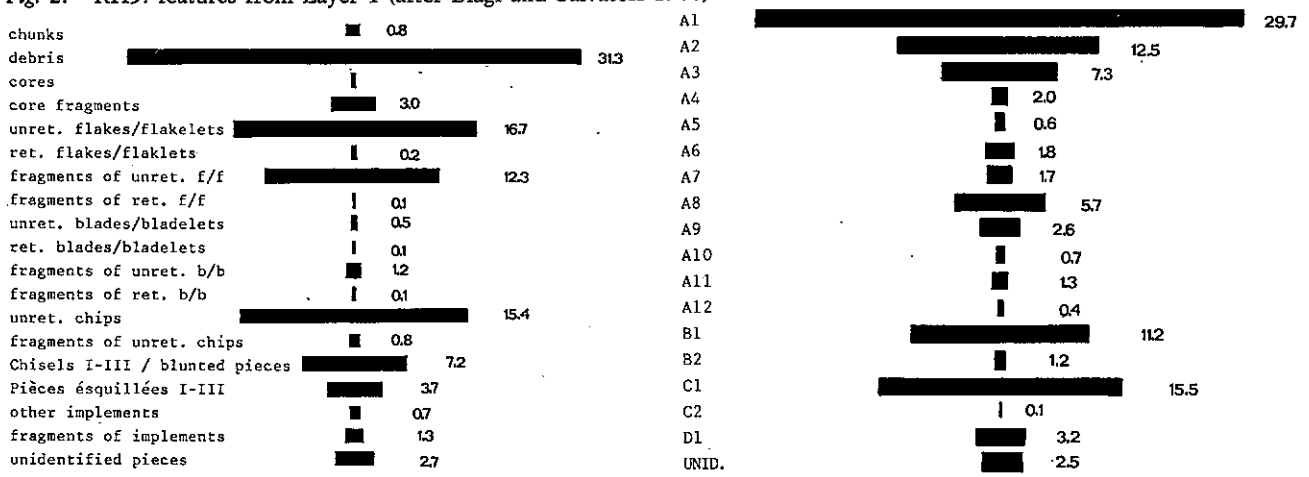


Fig. 3. - RH5, Layer 1: primary classification. Frequences of artefacts and raw materials from HWT-HWX-HXK-KCC: a) tool percentages of primary classes; b) weight percentages of raw material classes.

4. *Raw material exploitation*

4.1. *Raw material classes*

Eighteen raw material classes have been distinguished according to mineralogical groups and raw material qualities/flaking capacities:

— A1 Red Jasper/Radiolarite. It occurs as tabular, schisty jasper/radiolarite veins, as well as rolled wadi pebbles. Very good to very poor flaking capacity, depending on exposure and on vein structure. Considerable differences in quality have been observed. Often changing into — A2. Parts with transition to A2 qualities have in general excellent flaking capacities. A1 has been separated from A2 because was employed more frequently. This is the predominant resource of the area and tends to be in weathered/brittle conditions.

— A2 Green Jasper/Radiolarite. Similar to — A1, from which mainly differs because of the colour. Excellent flaking capacities.

— A3 Blackish varieties of Jasper. Randomly distributed as nodules with diametres up to 4-5 cms.

— A4 Yellow Flint of good quality. It is opaque, with homogeneous grain.

— A5 Brown to reddish Flint, fairly translucid. Good flaking capacities.

— A6 Grey Jasper.

— A7 Hazelnut to brown and other colours Jasper.

— A8 Variegated (mainly reddish) Jasper.

Flaking capacities of A6-A8 Jaspers are similar to A1.

— A9 Silicified pieces of Hematite, Ochre, Jasper, Chalcedony. Fairly poor to medium flaking capacities.

— A10 Ochre, silicified Ochre. Fairly poor to medium flaking capacities.

— A11 Various kinds of rare Flint. Good flaking capacities.

— B1 White Quartz. The flaking criteria are difficult to define, since the percussion bulbs are not visible.

— B2 Hyaline Quartz. Good flaking capacities.

— C1 Quartzite and silicified Sandstone. A quartzite source lies some two hundred metres North of the site, close to RH4 (fig. 1, n. 4), where it occurs as an agglomerate of pebbles of different size up to some 20 cms. max. Fairly poor flaking capacities.

— C2 Quartzite of fine-grained quality. Medium flaking capacities.

— D1 Limestone. Poor flaking capacities.

— X Unidentified.

4.2. *Distribution of raw material classes*

Fig. 8 shows the amounts of different classes of raw material used to produce the unretouched measurable flakes/blades. The histograms of fig. 8a represent the artefacts weight according to the different raw material classes. Fig. 8b is a cumulative histogram of the four squares (top), and a percentage histogram of the same data (centre) compared with a cumulative percentage histogram of the number of pieces. It is clear that more than a half (56.4%) of the artefacts is made of red/green jasper, while the largest pieces are obtained from A8 and quartzite. Thus, although flakes of red jasper are 39.4% of the total amount and only 15.2% of the weight, the few quartzite flakes (5.4%) are much heavier, representing 21% of the total weight.

5. *Description of the industry*

5,508 chipped stone artefacts were collected from the 74 square metres of layer 1 excavated so far (squares HWH, HWM-O, HWR-T, NWW-Y, HXK-L, HXP-Q, HXU, KCC-E, KDA. The artefacts from HXV were not analysed since layer 1 in this square had been eroded).

In order to analyse the technological aspects of the primary production, all the complete unretouched flakes/flakelets and blades/bladelets from squares KCC, HWX, HWT and HXK were measured. Maximum length, width, and thickness were taken as well as flaking angles, weights (above 0.5 g.), and raw material classes. All the retouched pieces from all the squares, with the exception of postholes, pits and hearths, were taken into account for the analysis of the secondary production.

The figures given for B1 Quartz artefacts might not be reliable, since only pieces with clear evidence of flaking were considered. In most cases flaking does not appear because of the quartz quality, so that such artefacts were labelled as debris.

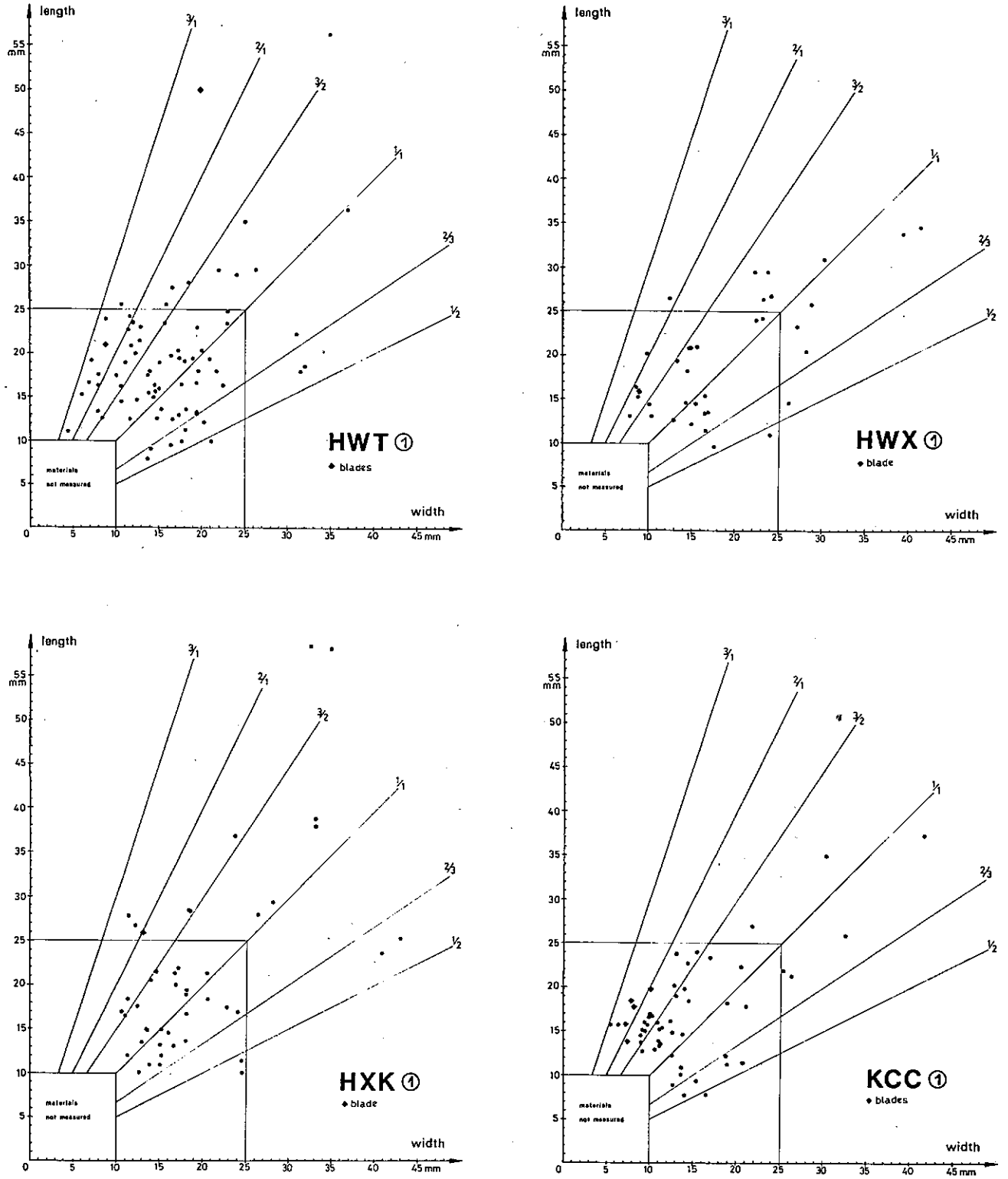


Fig. 4. - RH5, Layer 1, HWT-HWX-HXK-KCC: length/width diagram of unretouched flakes.

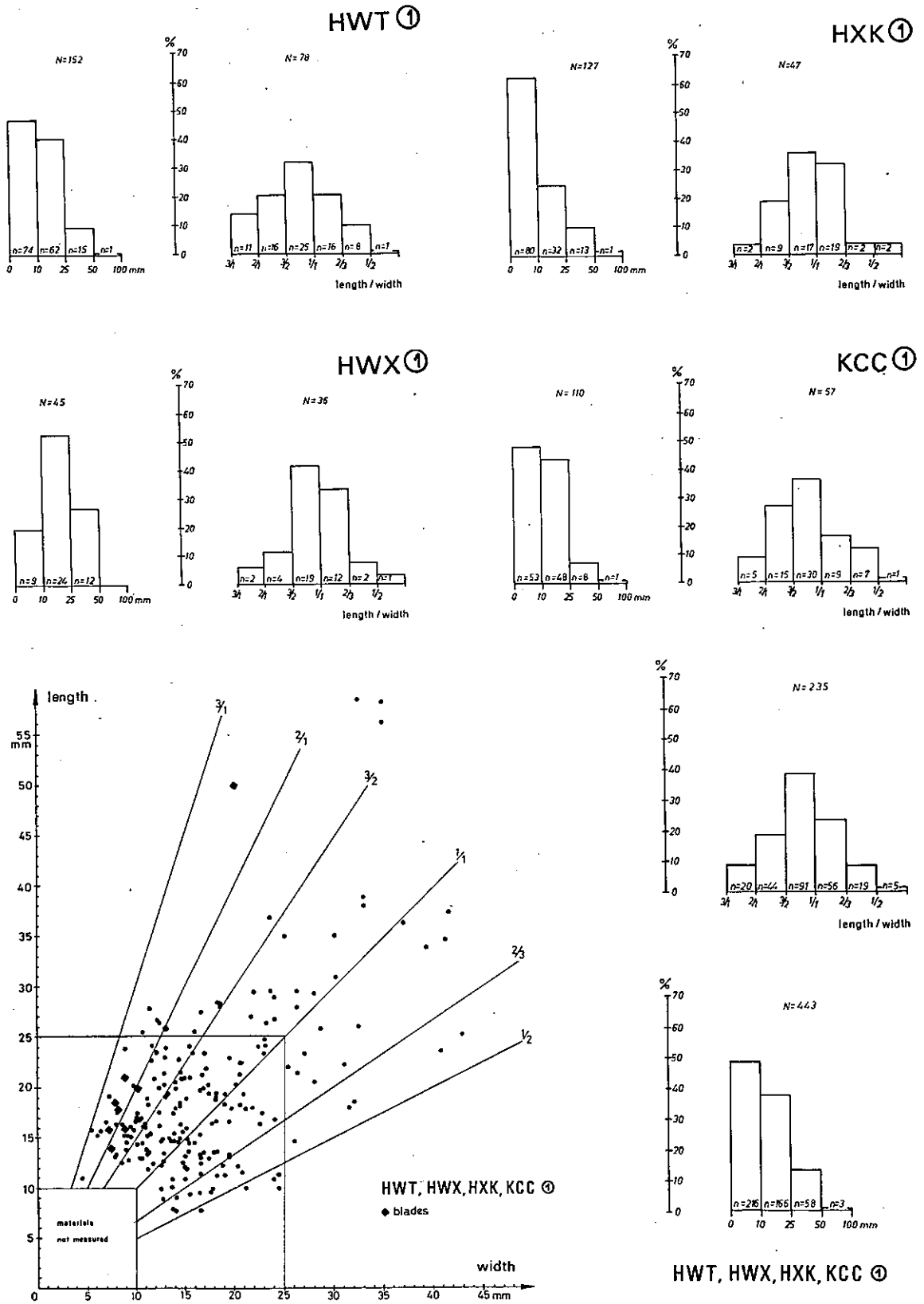


Fig. 5. - RH5, Layer 1, HWT-HWX-HXK-KCC: percentage diagrams of maximum dimensions (left) and length/width classes (right) of unretouched flakes. Length/width diagram and percentage diagrams of unretouched flakes from all squares.

5.1. *Typometric data*

Figs. 4 and 5 illustrate the metric data of the unretouched flakes, following Bagolini[7] with some modifications. Microliths are represented by artefacts less than 25 mm. long. The four diagrams of fig. 4 and the histograms of fig. 5 (top) show rather homogeneous figures for all the four squares examined. This should indicate that no specific working areas, such as those for the production of blades or macrolithic flakes, can be recognised.

The data show the predominance of "square" flakes. Blades (i.e., pieces two to three times longer than wide) are very scarce. They are less than 10% of the total, while Narrow Blades (pieces more than three times longer than wide) are completely absent.

Some 50% of the unbroken artefacts are less than 10 mm. long. This is probably to be related to the low quality material (which results in a high proportion of waste) as well as to the chipping technique (hard hammering, striking on an anvil).

Similiar informations can be obtained from the analysis of the platforms. 134 (61%) of the 219 unretouched flakes from squares HWT/HWX/HXK /KCC have a measurable platform, whose dimensions (fig. 6) often reach a considerable size. This suggests a hard hammering technique. 78 flakes (36%) have no measurable platforms. This is mainly due to the absence of platforms obtained by striking on an anvil. Only 7 pieces (3%) have platforms that can be related to more sophisticated chipping techniques.

Figures for length/width (figs. 4 and 5) platform dimensions and flaking angles (fig. 7) should reflect technical choises. These data might indicate that the raw material variety of RH5 could not always allow a strictly controlled flaking activity.

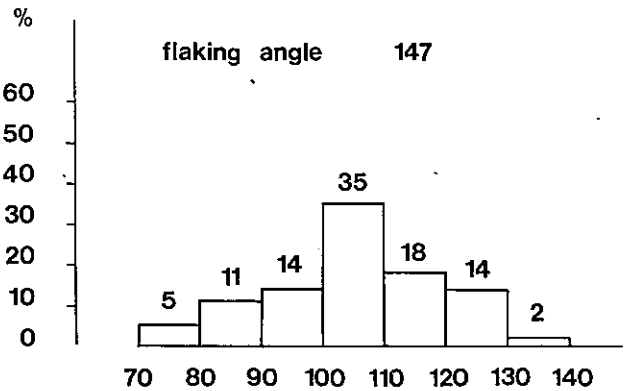


Fig. 6. - RH5, Layer 1, HWT-HWX-HXK-KCC: length/width diagram of measurable platform parts of unretouched flakes.

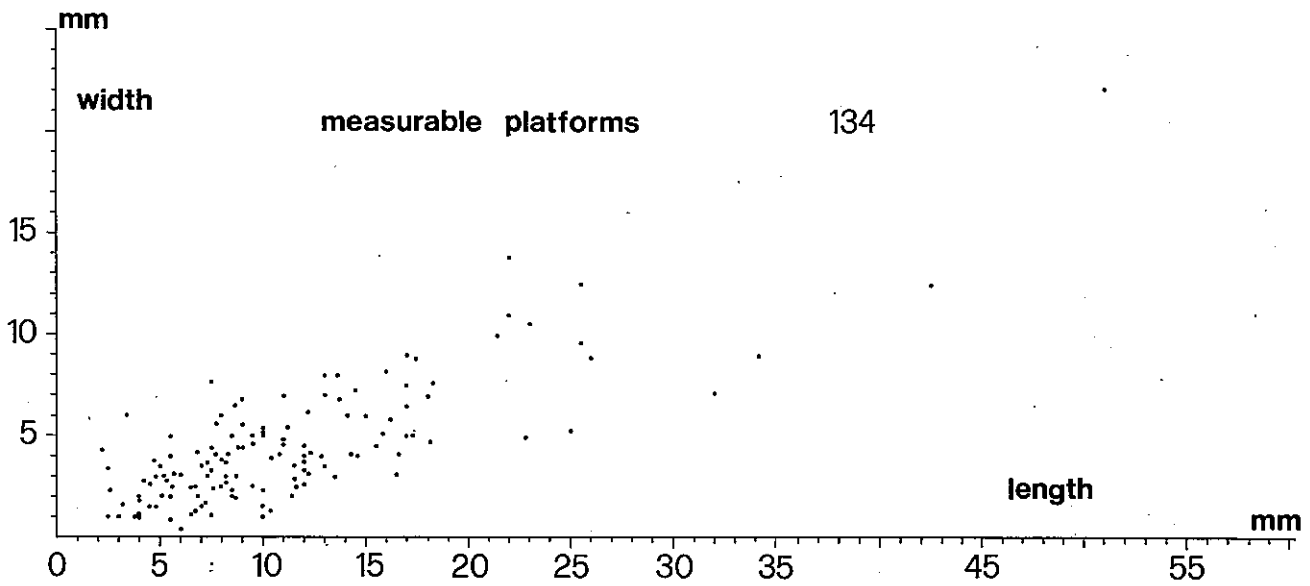
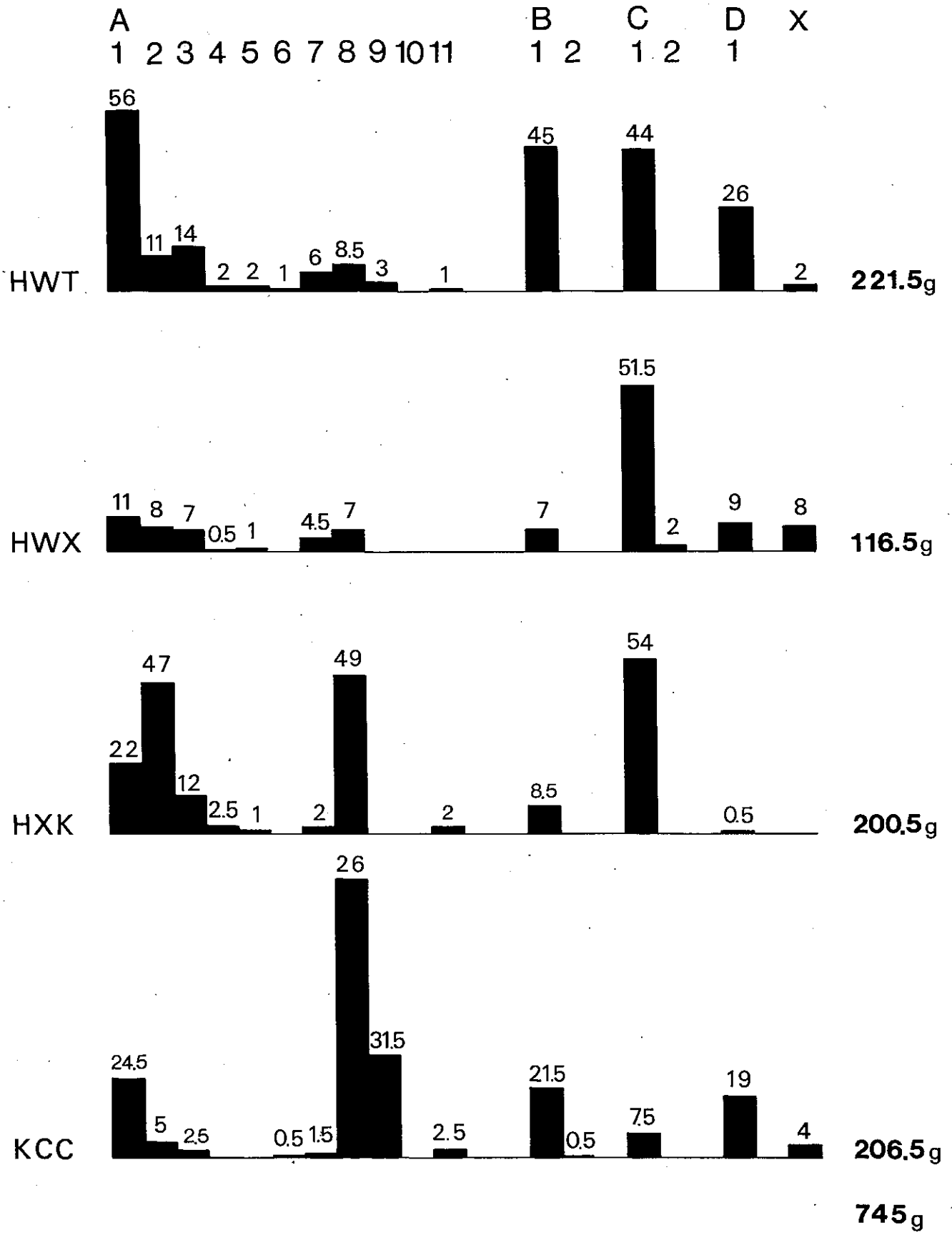


Fig. 7. - RH5, Layer 1, HWT-HWX-HXK-KCC: flaking angle classes of unretouched flakes.


A
1 2 3 4 5 6 7 8 9 10 11
B
1 2
C
1 2
D
1
X
HWT
56 11 14 2 2 1 6 8.5 3 1 45 44 26 2
221.5g
HWX
11 8 7 0.5 1 4.5 7 7 51.5 2 9 8
116.5g
HXK
22 47 12 2.5 1 2 49 2 8.5 54 0.5
200.5g
KCC
24.5 5 2.5 0.5 1.5 26 31.5 2.5 21.5 0.5 7.5 19 4
206.5g
745g

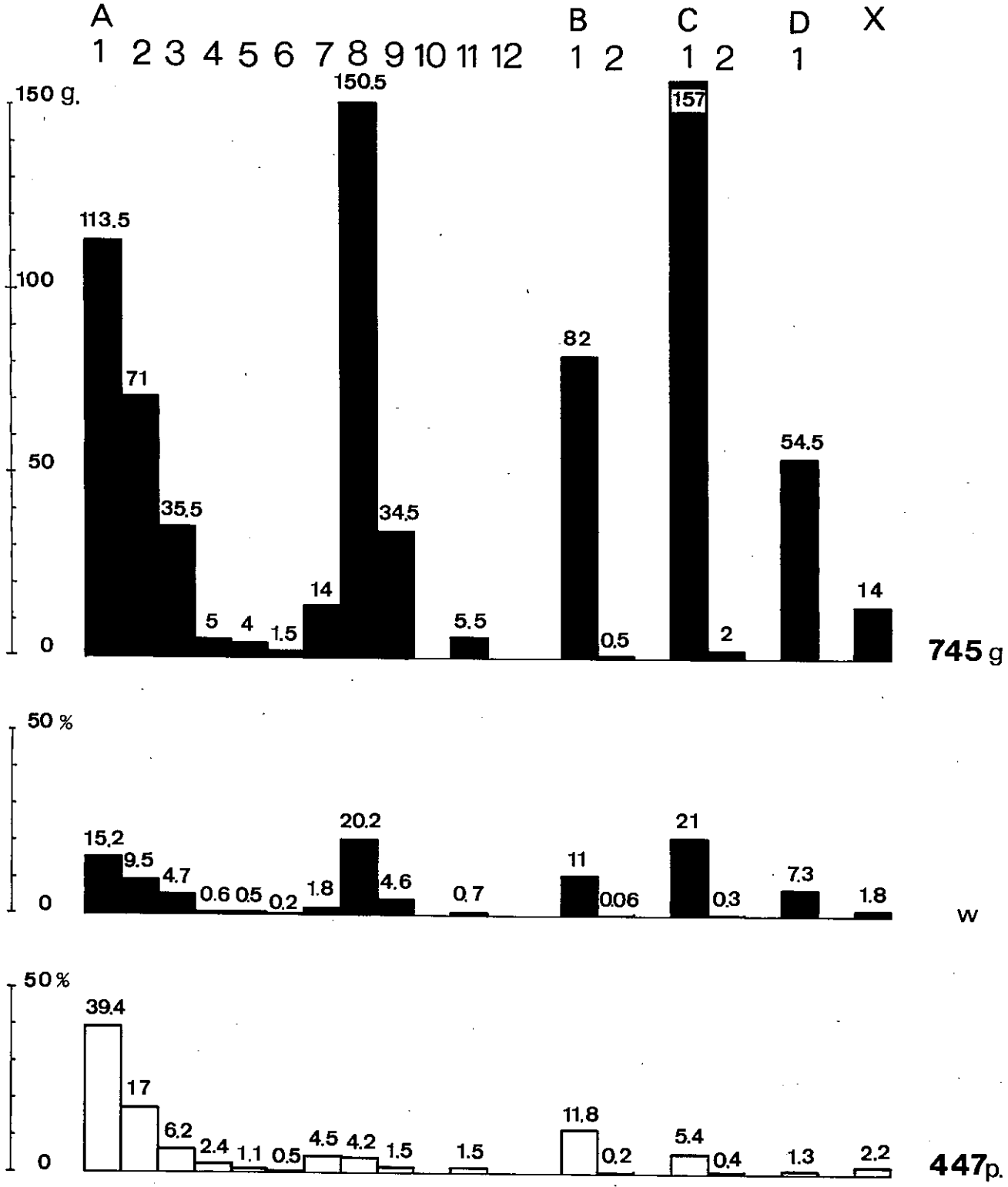


Fig. 8. - RH5, Layer 1, HWT-HWX-HXK-KCC: weights of raw material classes represented by unretouched flakes for each square evaluated (left). Weights of raw material classes, weight (w) and piece (p) percentages of raw material classes represented by unretouched flakes in all four squares evaluated (right).

5.2. *Primary classification*

The following description concerns only those primary product groups which need further definition.

— Chunks and Debris

The large number of flint debris contrasts with the low weight figures (figs. 3a and 3b). This is obviously due to the structure of the local jasper (particularly A1 and A8) which is easily affected by exposure. It becomes brittle and therefore has bad flaking capabilities. The number of debris might be somewhat higher than the real one, because all pieces without clear evidence of flaking fall into this group. This is especially true for A1 and A8. All the core-like pieces resulting from core crashing[8] were counted as debris. The quartzite is commonly shattered into large pieces, and therefore has different count/weight ratios. Even larger flakes are included into this raw material group.

— Cores (fig. 13, nn. 1-6)

Only 17 cores with identifiable striking platforms and core surfaces were recovered from all squares of Layer 1. The small number of recognisable cores can be explained by the lower raw material quality and by the use of anvil techniques which result into smashed products. Consequently, unrecognisable cores and — more likely — core fragments were counted with the debris. Futhermore exausted cores may have been re-used as blank for Chisel class tools.

Four core types mainly obtained from A1, A8 and B1 raw material classes, were recognised. There are: irregular flake cores (8 pieces), single-platform flake cores (4) (fig. 13, n. 1), double-platform flake cores (2) (fig. 13, nn. 5, 6), and "bipolar splintered cores" (3) (fig. 13, nn. 2-4).

Traces of heavy bifacial splintering have been observed on the pointed edges of several small and/or exhausted cores. Most likely, these traces are the evidence of splitting cores, by smashing them. Only a few rejuvenation flakes were recovered indicating that this technique was employed occasionally. This might be why regular cores are not represented in the tool inventory. Blade cores are absent from Layer 1, as well as from the other layers.

In most cases the shape of the "irregular flake cores" is influenced by cracks and inconsistency of the raw material, as shown by battered edges caused by unsuccessful attempts.

Like the irregular flake cores, the "single and double platform flake cores" vary considerably in size and weight. Due to the small number of pieces, no general picture can be worked out for this class. As shown by the examples of fig. 13, nn. 5, 6, large and small flakes, as well as bladelets, were usually removed from the flake cores at the same time. Also this fact indicates the unsystematic character of the primary production.

Regarding to the "bipolar splintered cores" the removal of narrow elongated pieces and the splinterings below the platform and its opposite edge are due to hard hammering on anvil, often producing splintered pieces representing a class of tools or primary production or both. This technique of core reduction gives microcores like those of fig. 13, nn. 2-4 which are sometimes difficult to distinguish from Chisels 1.

"Cortex-platform flake cores" are those on which cortex or surfaces of old fractures were used as platforms. Only three flake blows were often observed.

Other groups of primary products are:

— unretouched flakes/flakelets
— retouched flakes/flaketes
— fragments of retouched and unretouched flakes/flakelets
— unretouched blades/bladelets (including also the group of blades with non-parallel sides)
— retouched blades/bladelets
— fragments of retouched and unretouched blades/bladelets
— chips (including all unretouched flakelets to a maximum length of 10 mm. and all debris up to this dimension)
— fragments of retouched and unretouched chips
— retouched debris
— *Pièces écaillées* (Splintered pieces)
— implements
— fragments of implements
— core/core fragment implements
— unidentified material (broken and non attributable artefacts)

5.3. *Pièces écaillées (Splintered pieces) (fig. 14)*

Pièces écaillées. Are discussed separately from primary production (5.2) and tool classes (5.4), although the metric data (5.1) are illustrated together with those of the Chisels (figs. 9-12). The following classification is primarily morphological.

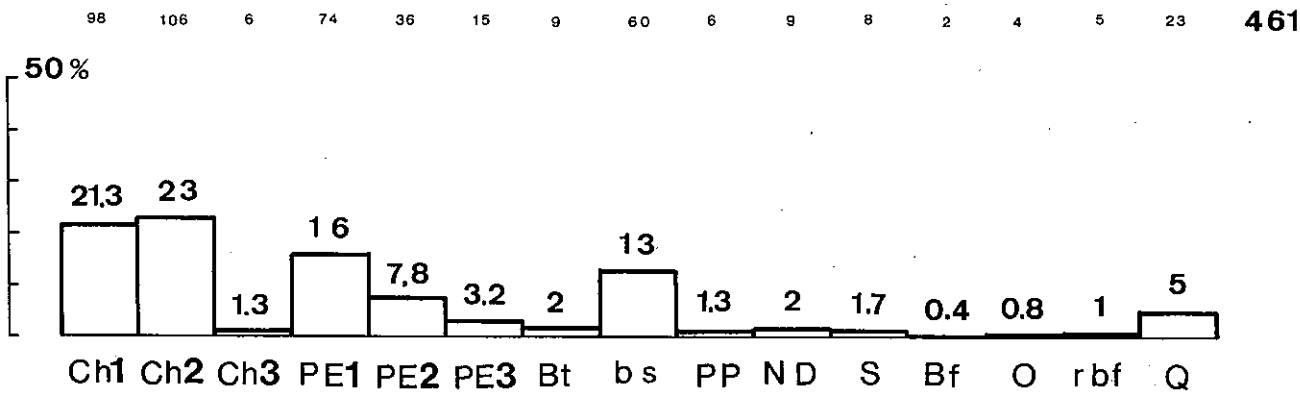


Fig. 9. - RH5, Layer 1 (all squares): percentage distribution of *Pièces écaillées* and tool classes (Ch, Chisels; PE, *Pièces écaillées*; Bt, lunates; bs, other blunted and splintered artefacts; PP, piercing points; ND, notched and denticulated tools; S, scraping tools; Bf, bifacially worked tools; O, others; rbf, retouched flakes and blades; Q, questionable tools).

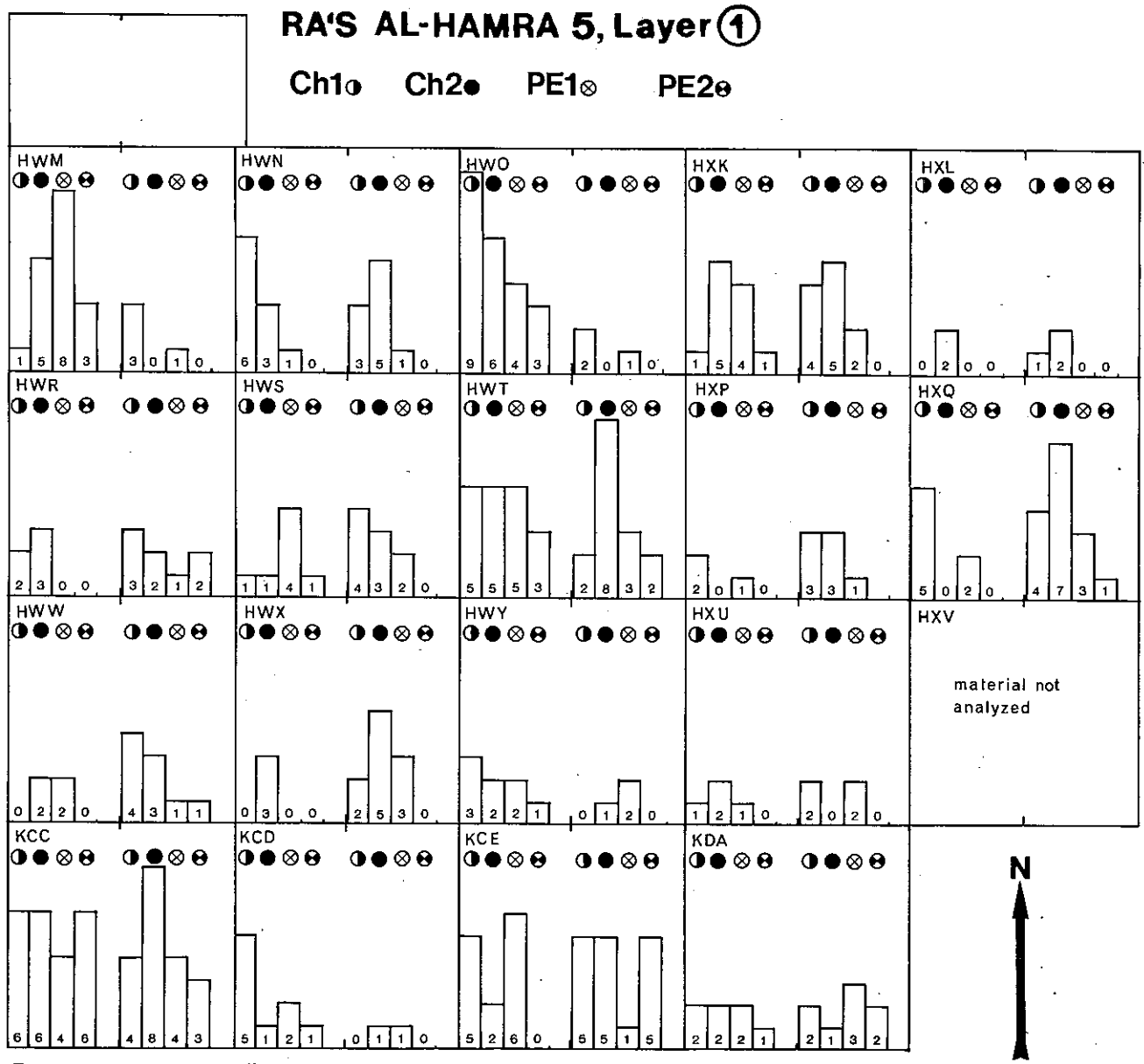


Fig. 10. - RH5, Layer 1 (all squares): distribution of piece frequencies for Chisels and *Pièces écaillées*.

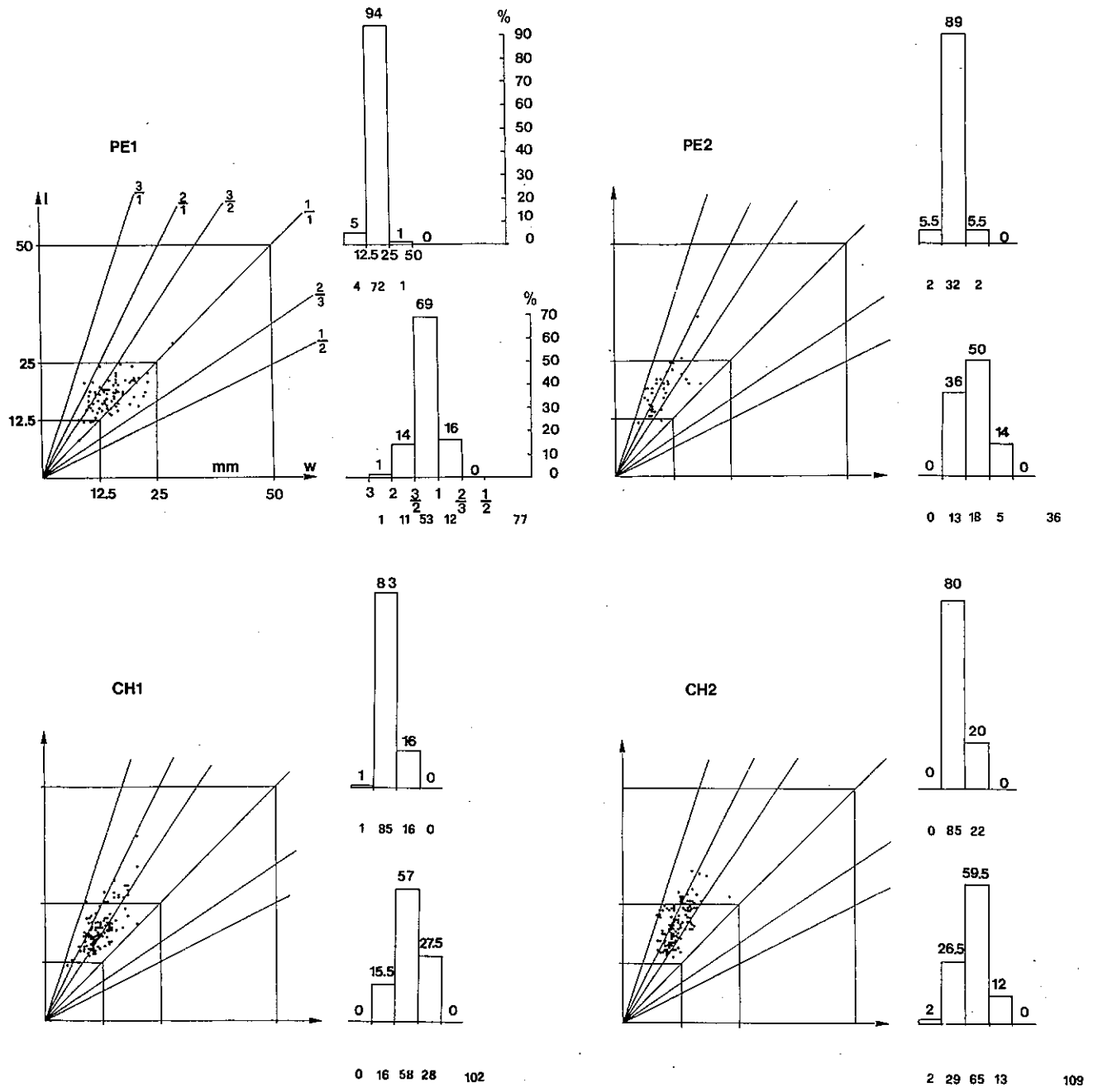


Fig. 11. - RH5, Layer 1 (all squares): length/width diagrams of Chisels 1, Chisels 2, *Pièces écaillées* 1 and 2.

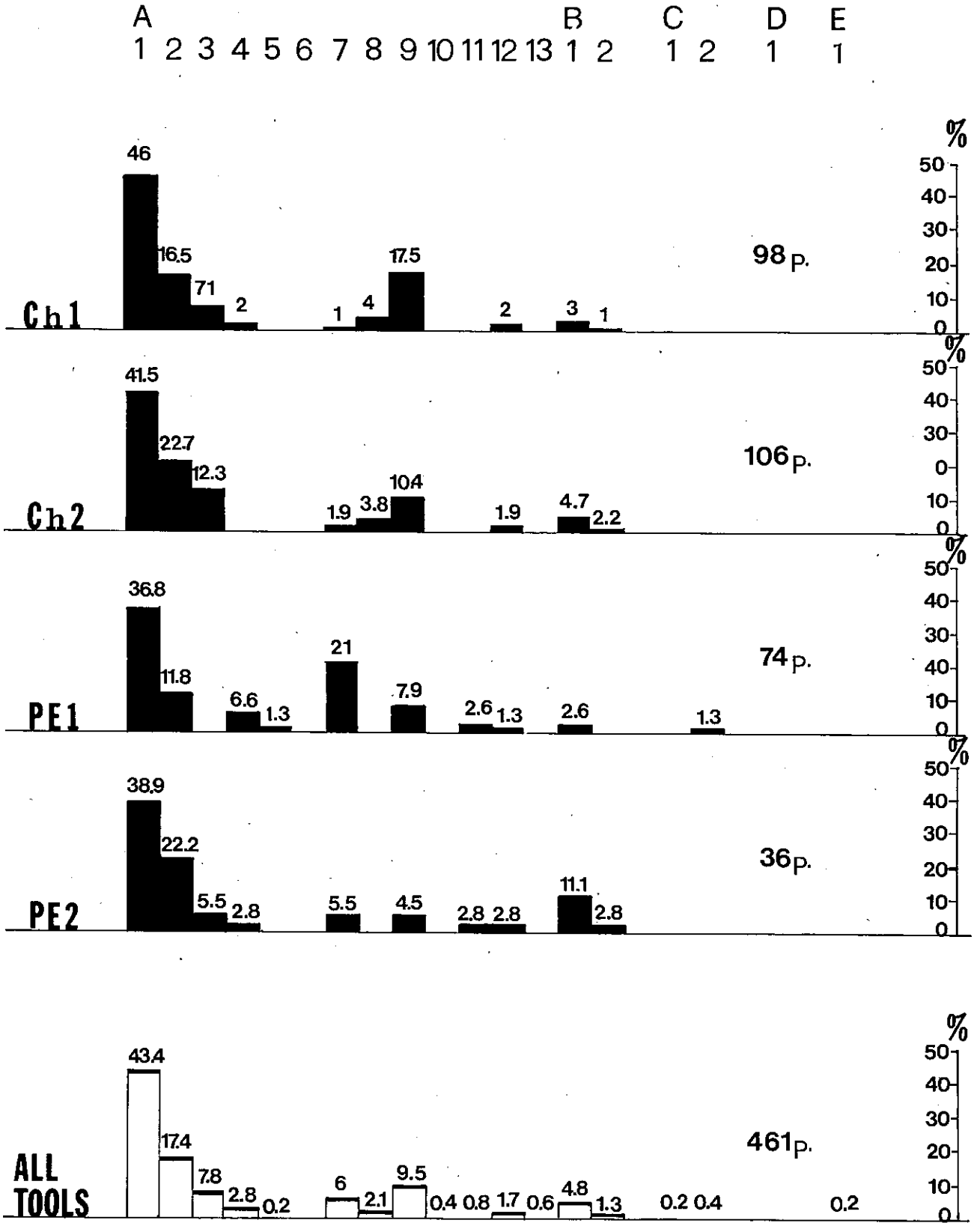


Fig. 12. - RH5, Layer 1 (all squares): piece percentages for raw material classes represented by Chisels 1, 2 and *Pièces écaillées* 1, 2 and by all tools.

Pièces écaillées 1 (fig. 14, nn. 1-15). Are of subrectangular, rectangular and trapezoidal shape with flat cross-sections. Their maximum thickness varies between 2.6 and 9.8 mm. More than 60% fall between 4 and 6.5 mm. There are also a few larger pieces whose thickness is between 12 and 16 mm. The narrow splintered edges are parallel or pointed. Variants include beaten edges, minor breakages, and smaller chippings, as well as removals across the the complete piece. These differences are due to the type of raw material, to the use of a soft or a hard hammer, as well as to the position of the piece in relation to the anvil and to the hammer.

Many of the *Pièces écaillées* 1 clearly show to have been intentionally chipped to obtain tools. In particular those with a *trançoir* at one or both sides, obtained by short strokes on one face, while the other has a wider splintered stroke.

Pièces écaillées 2 (fig. 14, nn. 16-21) are "compact" remains of reflected splintering on which the negatives often follow the whole length of the piece. The longitudinal cross section is biconvex, while the transversal is quadrangular to subquandrangular. Contrary to type 1, type 2 never have platforms. A clear separation from the "bipolar splintered cores" is not always possible.

Pièces écaillées 3 (fig. 14, nn. 22-24) are those which do not fall into the preceding groups.

5.4. *Tool classes*

As mentioned already,[9] the lithic assemblage of RH5 may be subdivided into two main groups: the "Conventional Instruments" which include tools falling into the european typologies; the so-called "Sommaire Instruments" — splintered artefacts characterised by a vertical *surélevé, sommaire* (blunted) retouch — which are by far the commonest tools from RH5.

This chapter will discuss the latter ("Hamrian") group, which is "typical" of many of the Ra's al-Hamra sites.

Conventional instruments

— retouched flakes/flakelets and fragments (including all unbroken flakes with traces of wear)
— retouched blades/bladelets and fragments
— retouched chips and fragments
— single or double backed piercing tools (made on blades, flakes and fragments of blades/flakes and debris) (fig. 16, nn. 20, 21)
— scraping tools (made on blades, flakes, and fragments of b/f) (fig. 16, nn. 17, 18)
— notched and denticulated tools (made on blades, flakes, and fragments of b/f) (fig. 16, nn. 13, 14)
— backed retouched end and side scrapers (fig. 13, nn. 7-10)
— backed retouched microliths (made on blades/flakes and fragments of b/f) (fig. 16, nn. 15, 19).

"Sommaire (Blunted) instruments"

One of the main reasons why the classification of the instruments from this industry was not easy, is the absence of well definited types, as well as the presence of several forms mid-way between Chisels and *Pièces écaillées* groups.

To include a tool into a class of instruments, we firstly considered the main attributes, even thought each piece might have fallen into more than one of our definitions.[10]

— Chisels

Chisels technically belong to the *Pièces écaillées* group, from which are separated because of their standard shape and a distinct function.[11] The main difference between the two groups is that Chisels have blunted[12] edges.

Previously defined as Punches[13] or Wedges,[14] these blunted tools[15] are biconvex or rhomboid or triangular or planoconvex and have one or two worn out, splintered points.

Three major types of Chisels can be distinguished:

Chisel 1 (fig. 15, nn. 1-10). Made on thick flake or, mainly, debris with triangular/subtriangular transversal sections. Their shape is elongated, triangular or rhomboid. At least one edge is pointed or worn out by wear splinterings. Their elongation index is 1.0-1.5. Their length between 15 and 25 mm. Single pointed tools with opposite flat edge have been included into this type. Blanks are difficult to determine because their the surfaces have been almost entirely retouched. Width and thickness have been distinguished on a pure morphological basis.

Chisel 2 (fig. 15, nn. 11-18). Similar to Chisel 1. Are on flake or blade with visible dorsal and ventral surfaces. Most of the specimens have biconvex or planoconvex shape and quadrangular or rectangular transversal section. Their elongation index is 1.5 to 2.0.

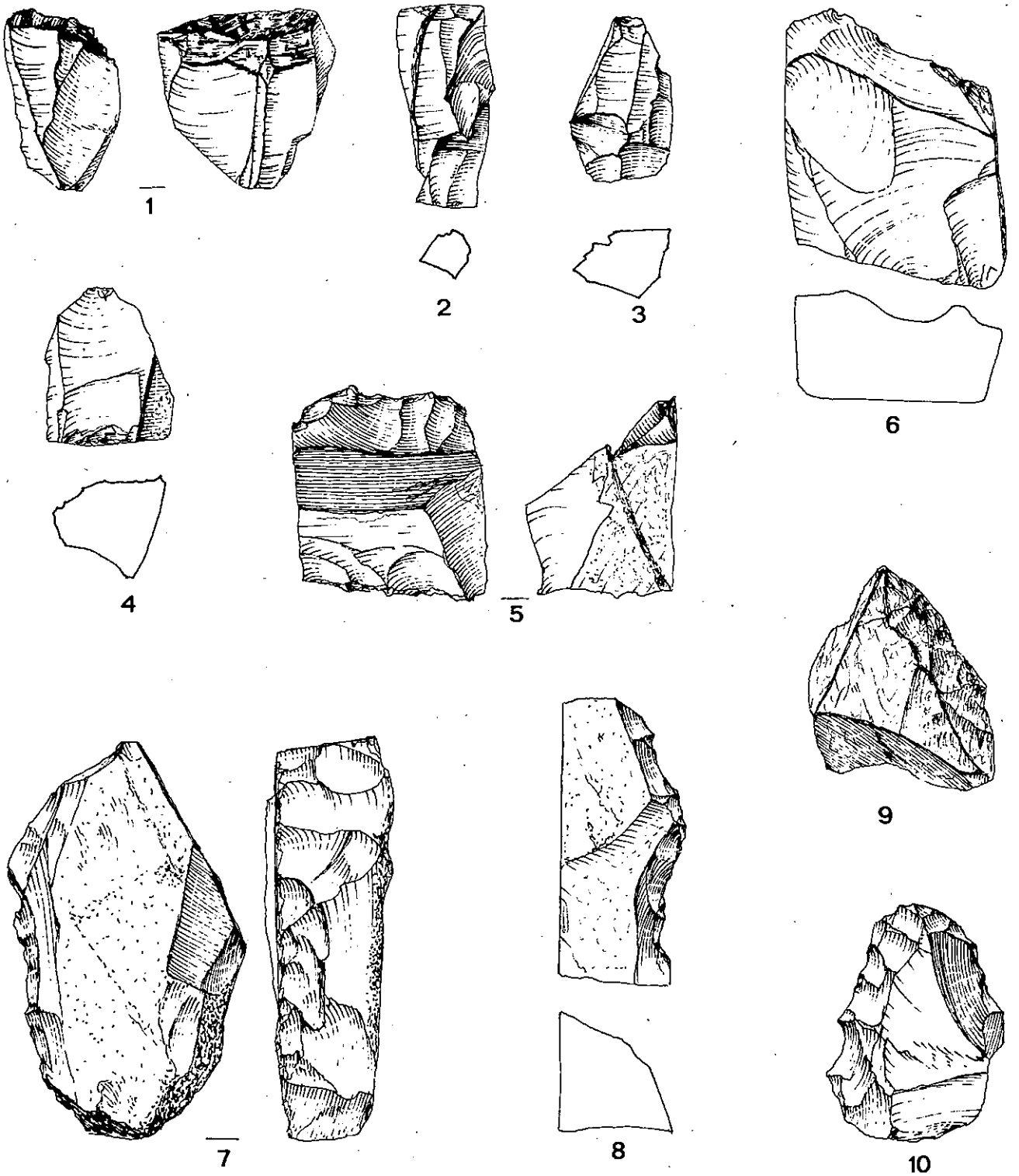


Fig. 13. - 1, Single platform core; 2-4, bipolar splintered cores; 5-6, cores with two striking platforms; 7-9, steep retouched side scrapers; 10, end scraper with steep retouch (9 from quartz) (1:1).

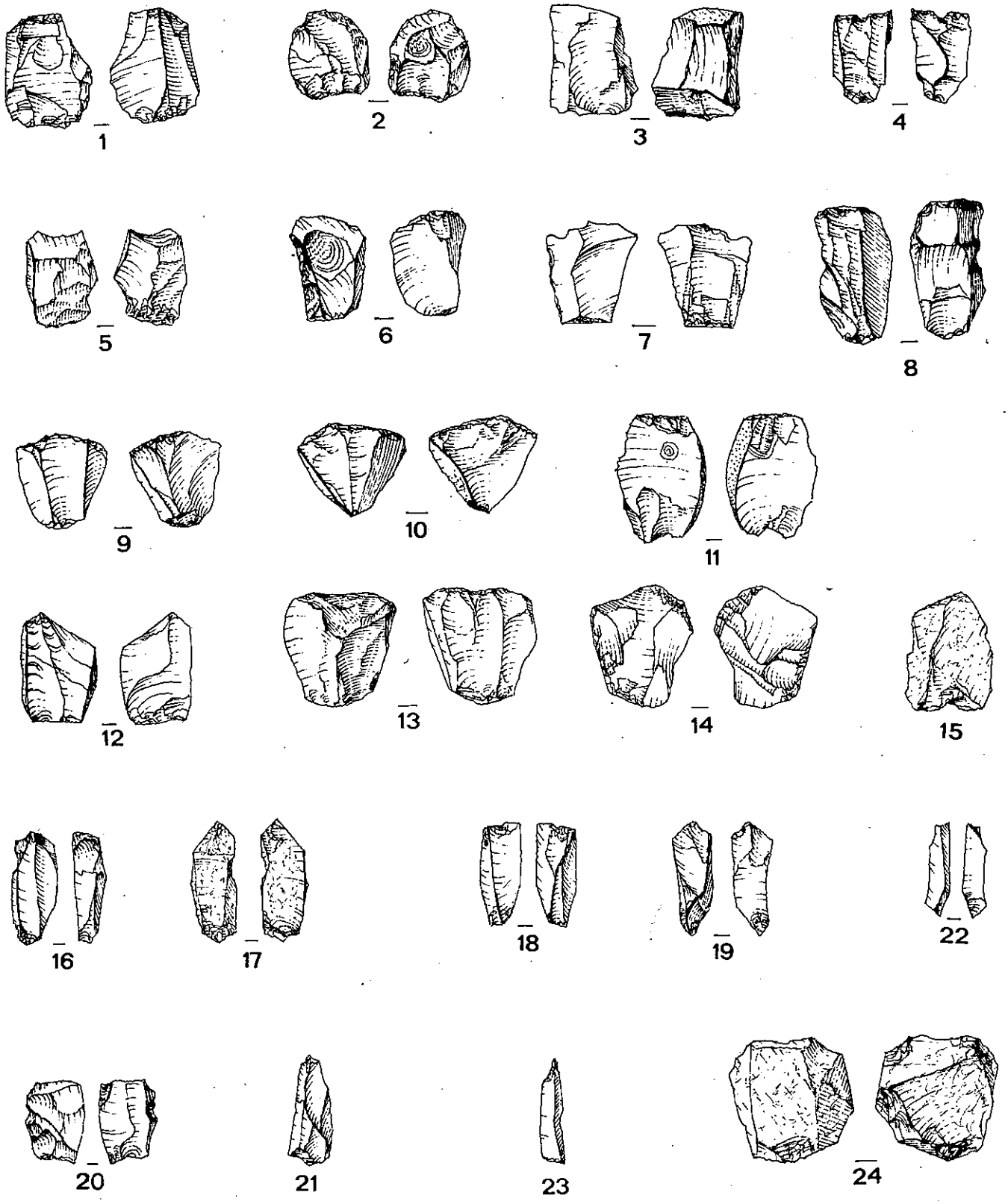


Fig. 14. - 1-15, *Pièces écaillées* 1; 16-21, *Pièces écaillées* 2; 22-24, *Pièces écaillées* 3 (15, 17, 24 from quartz) (1:1).

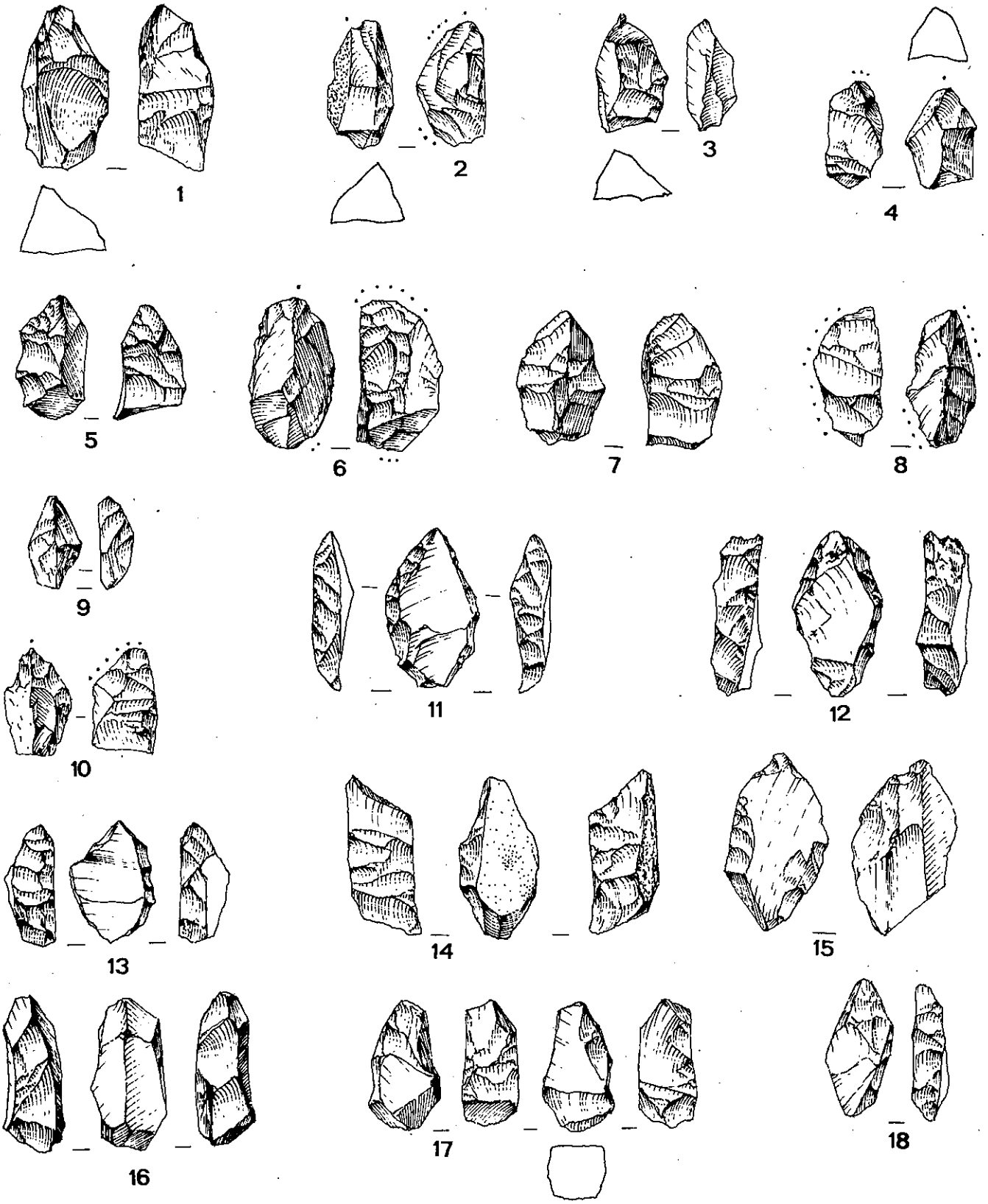


Fig. 15. - 1-10, Chisels 1; 11-18, Chisels 2 (1:1).

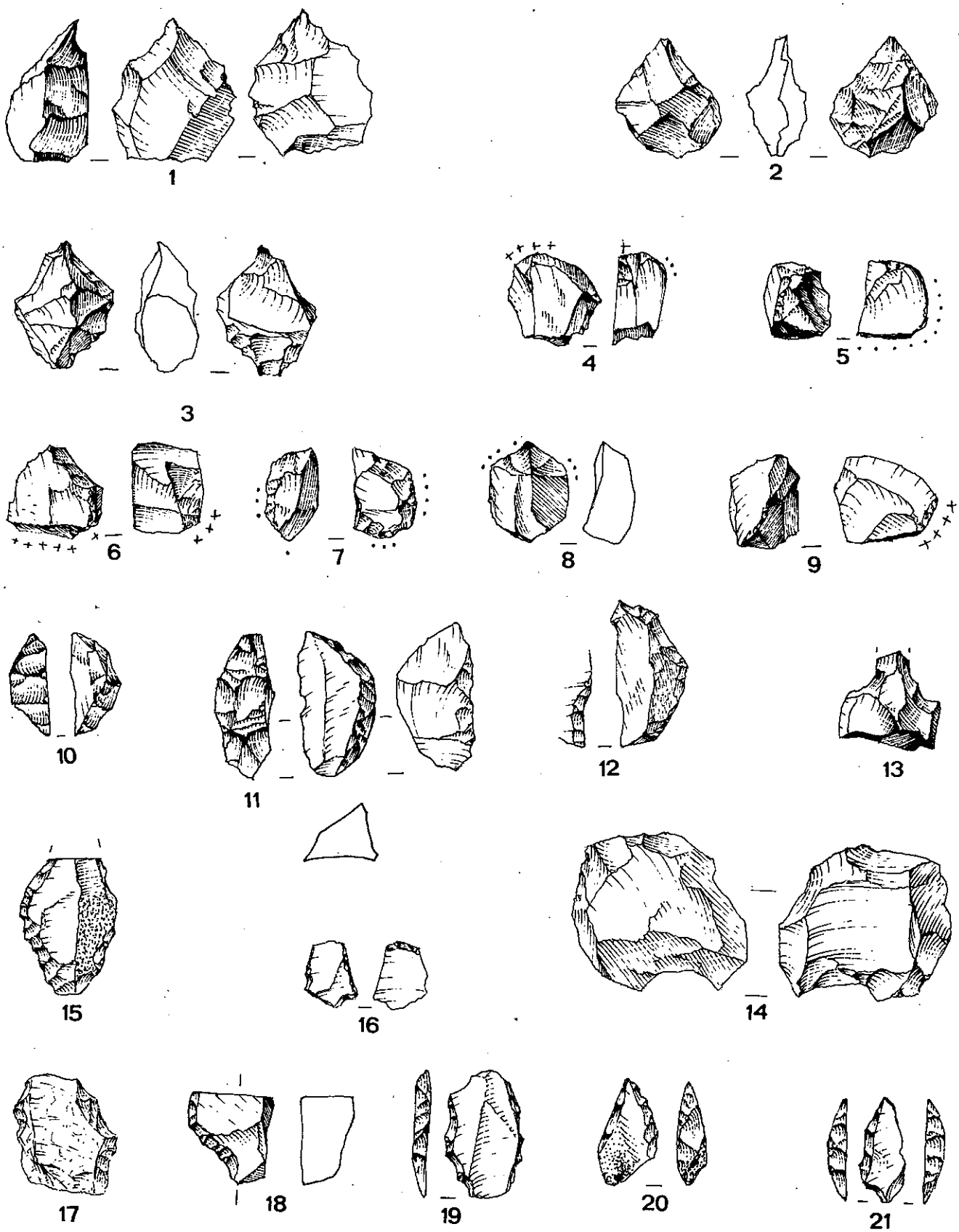


Fig. 16. - 1-2, Chisels 3; 3-9, prismatic Chisel-like instruments; 10-12, lunates; 13-14, notched pieces; 15, laterally steep retouched fragment with partial pressure-flaked surface; 16, marginally steep retouched flakelet; 17-18, side scrapers; 19, steep retouched blade fragment; 20-21, double backed piercing points (16 from hyaline quartz; 17 from quartz) (1:1).

Chisel 3 (fig. 16, nn. 1, 2). Are a subtype of Chisel 2, from which they differ bacause their sharp sides are not or partly blunted. They have a triangular to rhomboidal transversal sections.

— Prismatic (Chisel-like) Instruments (fig. 16, nn. 3-9)

Obtained from core-shaped flakes. Tend to have prismatic to spherical shapes. Have some of the characters of Ch 1 and 2 and of PE 2, but cannot be classified into these groups.

— Lunates (fig. 16, nn. 10-12)

Usually have triangular transversal sections and one blunted convex edge. Have been separated from Chisels because they have no splintered edges. They might be unused and/or unfinished Chisels. Some of the sharp sides are retouched.

5.5. *Tipometry of blunted tools*

The concentration of measurements in the diagrams of fig. 11 falls into the microlithic dimensions. The diagrams of Ch1 and Ch2 are very similar as the differences between the two types is mainly due to the blank.

Strong differences are visible in the diagram of PE1 and PE2, where the first has 36% of the pieces in the blade area and 50% in the narrow flake one, while PE1 has 69% of the pieces.

5.6. *Traces of wear*

Some tools, mainly Chisels of type 1 (fig. 15, nn. 2, 4, 6, 8, 10) and 3 (fig. 16, n. 4, 5, 6, 7, 8), show traces of wear on some edges or sides.

A preliminary microscopical analysis would suggest that the traces of wear are due to turning and pushing against hard material (B. Voytek pers. comm.)

5.7. *Intra-site activities*

Fig. 10 shows the spatial distribution of the main four classes of tools (Ch 1, Ch 2, PE 1, PE 2).

No particular concentration of the above-mentioned four classes is visible from the histograms of each unit recognised for any of the four classes. Thus it seems that Chisels and *Pièces écaillées* were manufactured and/or used randomly throughout the habitation floor of Level 1.

6. *Conclusions*

The chipped stone instruments from Layer 1 of site RH5 are composed of very simple types, subdivided into two main groups: "Blunted" and "Conventional" tools.

As shown by the histograms of fig. 9, the "Blunted" tools represent some 88% of the total number of instruments, while the "Conventional" ones slightly exceed 7%.

The "Blunted" (*Sommaire*) tools, which are characteristic of Layer 1, are also typical of all the archaeological sequence of RH5, as well as of most of the other Ra's al-Hamra shell-middens.[16]

It is difficult to understand whether the limited types of instruments represent a restricted number of activities carried out at the site. This could only be explained after a complete study of both archaeological and environmental finds.

As shown by the industries recovered during the survey carried out along the Southern coast of Oman between Ra's al-Hadd and Ra's Madrakah, the small artefacts are typical of those sites where jasper is the main raw material in use. Exactly the same fact is documented at RH5. It is also worth mentioning that the Chisels are almost completely absent from the southern coastal sites visited so far.[17]

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[1] Squares HWH, HWM-O, HWR-T, HWW-L, HXP-Q, HXU-V, KCC-E, KDA were excavated during the winter of 1984-1985.

[2] Cfr. H.-P. UERPMANN, in *Tübinger Atlas des Vorderen Orients*, 19, 1988, BI 8, 8.4.1.

[3] P. BIAGI, S. SALVATORI, Gli scavi nell'insediamento preistorico e nella necropoli di Ra's Al-Hamra 5 (Sultanato di Oman), in *RdA*, X, 1986, pp. 5-14.

[4] P. BIAGI, W. TORKE, M. TOSI, H.-P. UERPMANN, in *World Archaeology*, 16, 1, 1984, p. 53; C.C. LAMBERG-KARLOVSKI, M. TOSI, in *East and West*, 23, 1-2, 1973, p. 32; S. CLEUZIOU, M. TOSI, The Southeastern Frontier of the Ancient Near East, in *South Asian Archaeology 1985*, Scandinavian Institute of Asian Studies, Occasional Papers 4, London 1989, pp. 28-30.

[5] P. BIAGI, S. SALVATORI, Gli scavi... op. cit. note 3, p. 8.

[6] P. BIAGI, R. NISBET, R. MAGGI, Excavation at the RH5 Settlement, Qurm, Winter 1984-85, in *East and West*, N.S., 23, 4, 1984, p. 460.

[7] B. BAGOLINI, Ricerche sulle dimensioni dei manufatti litici preistorici non ritoccati, in *Annali dell'Università di Ferrara*, N.S., sez. XV, vol. I, n. 10, 1968, pp. 195-219.

[8] H.-P. UERPMANN, M. UERPMANN, Stone Age sites in the Capital Area of Oman, in *Stone Age Sites in the Capital Area of Oman and their Natural Environment*, Beihefte des Tübingen Atlas des Vorderen Orients, forthcoming.

[9] P. BIAGI, R. MAGGI, R. NISBET, Excavations at the aceramic coastal settlement of RH5 (Muscat, Sultanate of Oman), in *South Asian Archaeology 1985*, Scandinavian Institute of Asian Studies, Occasional Papers 4, London 1989, pp. 1-8.

[10] An alternative approach could be the statistical working out of the widest number of combinations of attributes. Such an approach is the subject of a forthcoming paper: H.G. GEBEL, The Hamriam Chisel. A replicative system analysis, *in prep.*

[11] *Ibid.*

[12] Blunting is here defined as a retouch obtained on an anvil with a sharp-edged stone. Such blunting does not necessarily produce such a bipolar retouch. The function of blunting is to give a tool a bi- or planoconvex shape and to remove the thin and sharp edges of the blank.

[13] H.G. GEBEL, Lithic resources of the Wattayah and Qurum area and their use in Mid-Holocene industries, in *Stone Age Sites...*, op. cit. See also note 2.

[14] H.-P. UERPANN, M. UERPMANN, Stone Age Sites..., op. cit. note 8.

[15] In naming this type of instrument priority was given to the technical aspect of its function. Although the term "Punch" is connected with a certain blade technology and therefore may cause confusion, its function is to punch, meaning to make a hole. The proposed term "Chisel" (M. UERPMANN, n.d.) would imply to widen a hole by wedging.

[16] P. BIAGI, R. MAGGI, R. NISBET, Excavations..., op. cit. note 9.

[17] P. BIAGI, Surveys along the Oman Coast. Preliminary report of the 1985-1988 campaigns, in *East and West*, N.S., 37, 1987, forthcoming; P. BIAGI, R. MAGGI, Archaeological Surveys along the Oman Coast. Preliminary Results of Five Years of Research (1983-1987), in *South Asian Archaeology 1987*, forthcoming.