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On the Mesolithic Quartz Industry in Finland

Introduction

The study presents a model of mesolithic quartz production. It defines technocomplexes and chronological artefact horizons by analyzing and comparing basic production and postproductive modification of quartz inventories. Although it is based on only five early mesolithic sites and, as comparative material, four Comb Ceramic inventories, the appearance of complex technological features and concentrations of different morphological artefact groups in different sites allow conclusions, which lead to a typochronological model. The presentation of the younger mesolithic period is based on earlier publications (Matiskainen 1986, 1987b) and oral information from collegues.

Of the over 300 mesolithic sites known from Finland about 75 have been excavated (Huurre 1981, Matiskainen 1987a, b, Siiriäinen 1981, top. archive of the prehistoric bureau). In the last 20 years, since V. Luho's publications (Luho 1956, 1967), no complete inventory of mesolithic sites has been published. Chronological systems based on shore displacement and on the presence of stone artefacts on coastal sites have been presented by Äyräpää (1950), Luho (1967), Siiriäinen (1981) and Matiskainen (1983, 1985, 1987). These systems work with stone and slate artefact types. Only one quartz artefact type, the oblique point, has been taken into consideration.

The question occurs, is it possible and useful to build a chronological model solely on quartz material, especially as comparative studies with flint assemblages do not seem to be possible, due to poor raw material quality. The artefact types defined below appear in higher frequency in sites and form chronological horizons and also correlate with stone or slate chronotypes presented in earlier systems (see fig. 5).

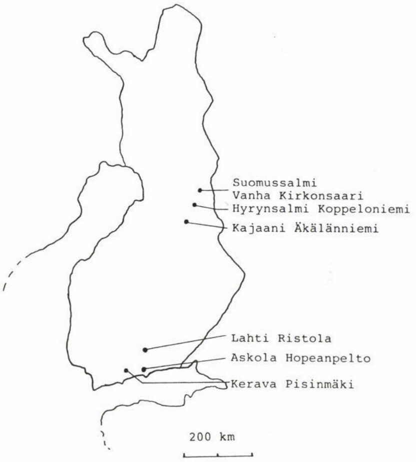


Fig. 1. The Finnish sites mentioned in the text.

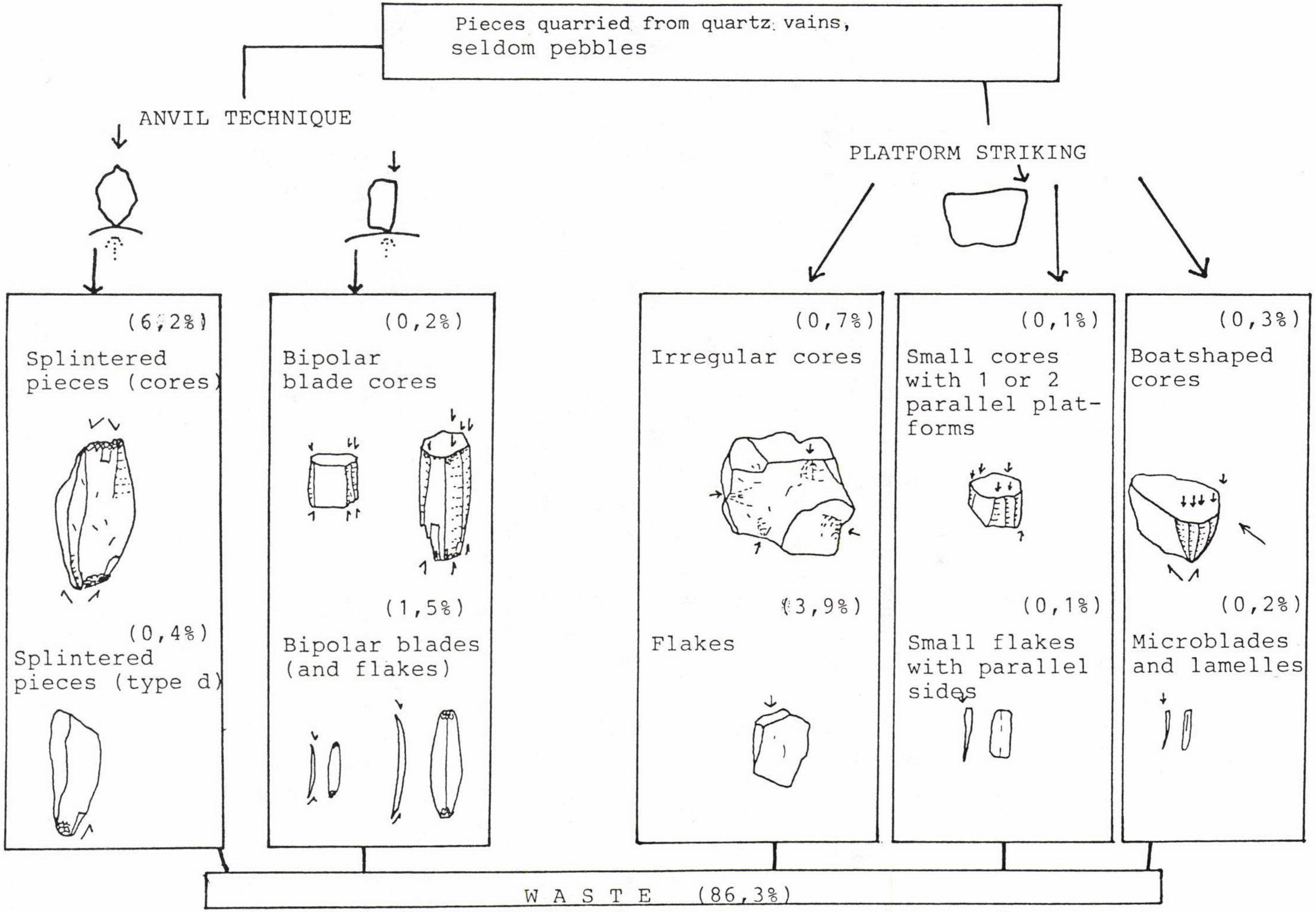


Fig. 2. Basic production.

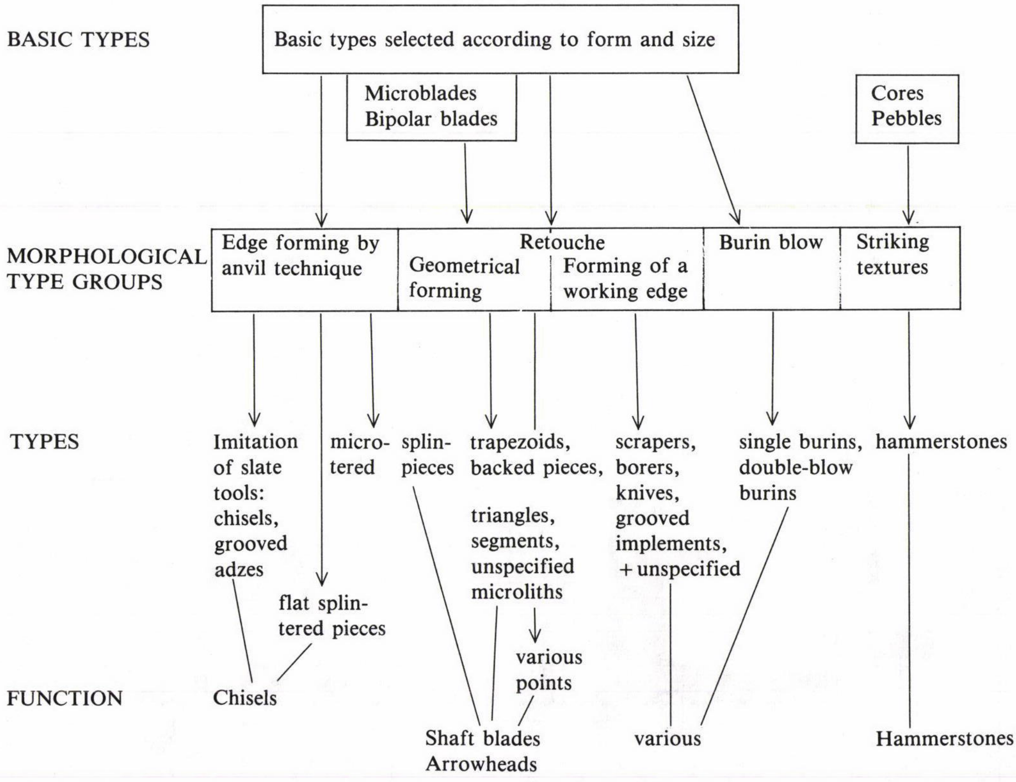


Fig. 3. Postproductive modification.

The sites (see fig. 1)

Lahti Ristola (Excavation M. Schauman 1970—71, flint material published by T. Edgren 1984), coastal site with few dwelling structures but very high find density. Probably several mesolithic and a younger occupation (battle axe culture). Lithic material mostly quartz, some flint and slate. Dated by shore displacement on 9400—9200 BP. (Matiskainen 1987, fig. 4).

Askola Hopeanpelto (Excavation V. Luho 1952, published by Luho 1956), coastal site. No clear dwelling structures, finds confined to a small area. Lithic material nearly all quartz. Dated by shore displacement to ca. 8800 BP. (Nunez 1978, fig. 6, Matiskainen 1987b, fig. 4).

Kerava Pisinmäki (Excavation J. Sarkamo 1962—63, published by V. Luho 1967), group of several coastal sites with clear dwelling structures (groups of fire places with oval find patterns). One younger occupation (battle axe culture). Lithic material 90 % quartz, 10 % slate and stone, 12 leaf formed slate points. Dated by shore displacement to ca. 8500 BP. (Matiskainen 1987b, fig. 4).

Hyrynsalmi Koppeloniemi (Excavation M. Perkko 1979), inland lake site. Probably only one mesolithic occupation with clear dwelling structures (2 units with fire place and oval find patterns and anthropogenic coloured soil, one possible stone ring). High

Fig. 4. Frequency of basic types and modificated types.

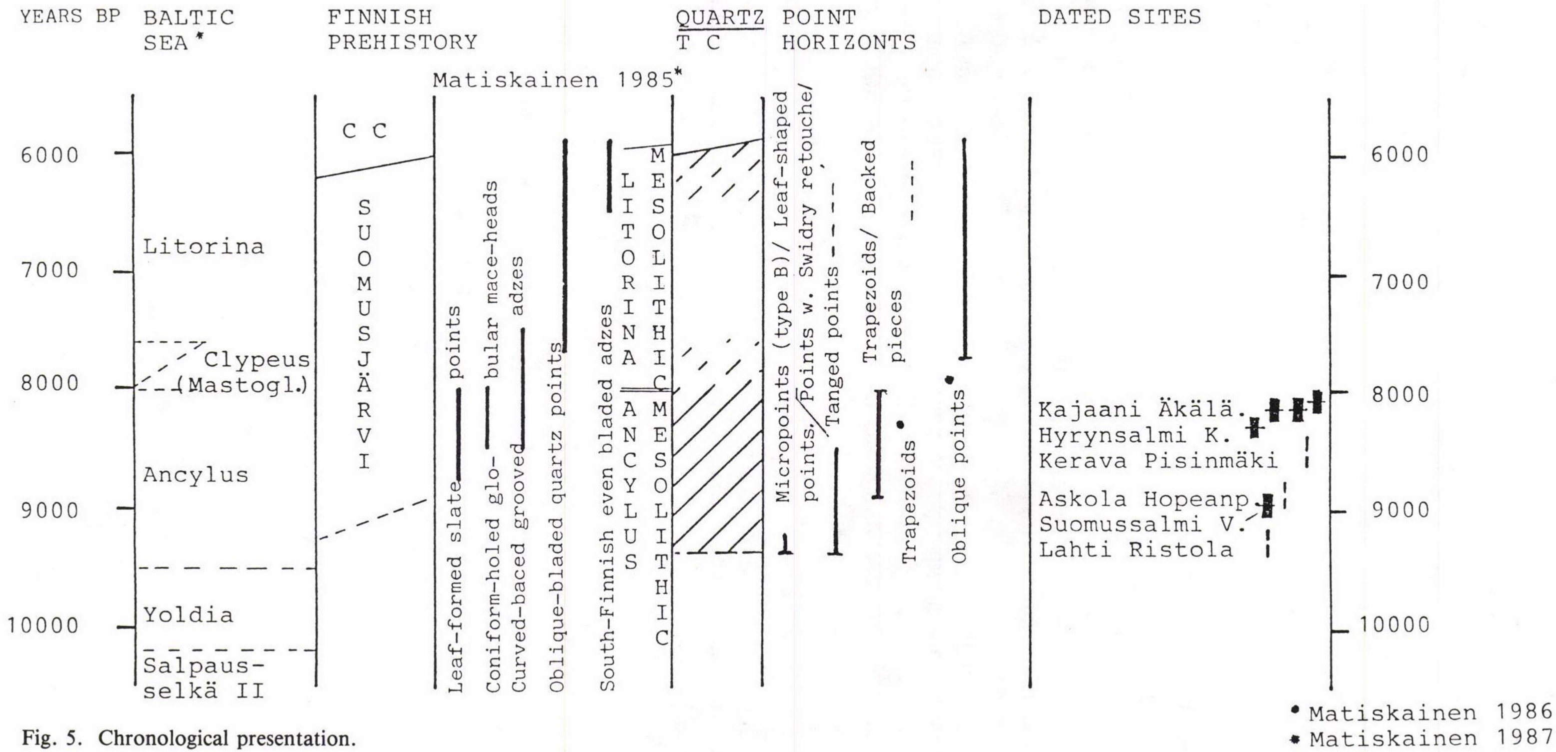


Fig. 5. Chronological presentation.

find density. In a part of the excavation area several neolithic occupations. Lithic material mainly quartz, little slate. C-14 dated: Hel-1425 8260 ± 120.

Kajaani Äkälänniemi (Excavations M. Perkko 1981, E.-L. Nieminen 1982—83) inland lake site, probably several mesolithic and an iron age occupation. A few dwelling structures, one burial, high find density. Lithic material ca. 93 % quartz, 7 % slate. C-14 dated: Hel-2097 8150 ± 110 Hel-2099 8150 ± 110, Hel-2100 8070 ± 110 (E.-L. Schulz 1986).

To be mentioned is *Suomussalmi Vanha Kirkonsaari,* an inland site found by trial excavations (H. Taskinen 1986) with mesolithic quartz artefacts. A hearth produced the up to now oldest C-14 date of a Finnish dwelling site: Hel-2313 8950 ± 120.

Basic production (see fig. 2)

All sites show a very similar system of basic production. Material quarried from quartz veins was selected prior to being brought to the dwelling site. The waste does not contain bigger chunks of unusable raw material. The quartz was reduced by two different techniques, bipolar hammering with a hard or soft implement, where by the piece is placed on an anvil stone (''anvil technique''), and striking from platforms.

Due to the fracturing qualities of quartz, the anvil technique seems to be the most effective reduction technique (H.-P. Schulz 1986, p. 66—68). Hard hammering on an edge produces splintered pieces, rectangular, spindle-shaped or trapezoid cores with often straight or concave ridges (average frequency 6,2 %), and pieces with splintering only on the dorsal surface (Ø 0,4 %). (see fig. 7 i-k)

A new but typical element in the Finnish quartz mesolithic is bipolar blade production. Cylindrical cores probably with prepared platform and core foot were placed on a stone anvil and blades were removed by soft striking on the platform. This technique produces bipolar blade cores with blade negatives that show Wallner lines running from both ends (Ø 0,2 %; fig. 8 a-f), and convex bipolar blades (or flakes) with dorsal splintering on both ends but without platform rests (Ø 1,5 %; fig. 7 c-h). The technique was used only on high quality vein quartz or mountain crystal.

Platform striking is indicated by irregular cores (Ø 0,7 %; fig. 6 a) and flakes with striking marks (Ø 3,9 %, H.-P. Schulz 1986, p. 22), by small cores with one or two parallel platforms (Ø 0,1 %; fig. 6 b-d) and small flakes with parallel sides (Ø 0,1 %), and by boat shaped cores (Ø 0,3 %) and microblades and lamelles (Ø 0,2 %). Boat shaped cores show platform preparation and core foot preparation (see fig. 6, e-h). Not taken into the diagram are prismatic microblade cores as there are only two pieces known. The biggest part (Ø 86,3 %) of the material is waste.

Postproductive modification (see fig. 3)

The various modification techniques generally use basic types selected according to form and size. In two cases modification needs special basic types: microblades or bipolar blades for geometrical forming; cores or pebbles for use as hammerstones.

According to modification technique five morphological type groups may be defined: Edge forming by anvil technique, geometrical forming by retouche, forming of a working edge by retouche, burin blow and striking textures.

The possibility of edge forming by anvil technique has already been discussed earlier (H.-P. Schulz 1986, p. 31, 54, 71). It appears to be a typical element of the quartz mesolithic. This technique produces regular stabile edges without reducing the pieces. Three types may be defined: slate tool imitations (chisels, grooved adzes), flat splintered pieces (see fig. 9) and micro-splintered pieces (fig. 10).

Blades used for geometrical forming were reduced mostly by breaking, sometimes by microburin technique (among the whole material four pieces have been recognized). The following microlith types can be defined: trapezoids and backed pieces (the most frequent types), triangles, segments and unspecified microliths (see fig. 11). The inventories of two sites contained various points: tanged points, points with ventral base retouche (Swidry technique), leaf shaped points and micropoints (Kozlowski's type B). (see fig. 13).

The forming of a working edge by retouche lead to four types: scrapers, borers, knives, grooved implements and unspecified pieces (fig. 12).

Modification by burin blow produced two types: single burins and double-blow burins (fig. 8 g-j).

Striking textures were caused by using a piece as a hammerstone.

The question of technocomplexes

The frequency of basic types (see fig. 4) shows the same tendency in all five sites. The only bigger range appears within the splintered pieces. The same basic types have been observed in younger mesolithic sites; and they exist with a similar frequency still in one early Comb Ceramic I site (oral information by L. Ruonavaara). The Comb Ceramic II inventories presented here have only four of ten mesolithic basic types with an opposite tendency in the frequency of these types. These observations indicate a typical mesolithic basic production, which runs into the early Comb Ceramic period. Within this period a radical change seems to happen.

The modificated types (fig. 4) give nearly the same picture: similar frequency in all inventories. In one site, Askola Hopeanpelto, the tendency of scrapers and micro splintered pieces is opposite to that of other sites. The actual difference occures in microlith types (not visible in the diagram) and points. The Comb Ceramic inventories contain only burins, scrapers, borers, grooved implements, knives and unspecified (retouched flakes), with about the same frequency as in the mesolithic inventories. All other modificated types are mesolithic.

The results lead to following hypothesis: the Finnish quartz mesolithis is one closed technocomplex, which exists from at least 9400/9200 BP. to the beginning of the Comb Ceramic I period about 6000 BP. (fig. 5). it shows no difference in basic production and in the general postproductive modification. The changing shaft blade technology forms at least three different chronological point horizons:

— micropoint/leaf shaped point horizon before 9000 BP. (1 site)
— trapezoid/backed piece horizon about 8900—8000 BP. (3 sites), correlates with the leaf formed slate points (Matiskainen 1987b).
— oblique point horizon, ca. 7800—6000 BP: (after Matiskainen 1986, 1987).

Tanged points and points with ventral base retouche do not form a chronological horizon. They seem to exist over a long time in the mesolithic (see Matiskainen 1986). According to present observations, the presence of tanged points and points with ventral base retouche and the presence of trapezoids and backed pieces exclude each other. Matiskainen (1986) mentiones a few trapezes from younger mesolithic, but this phenomena has not yet been controlled.

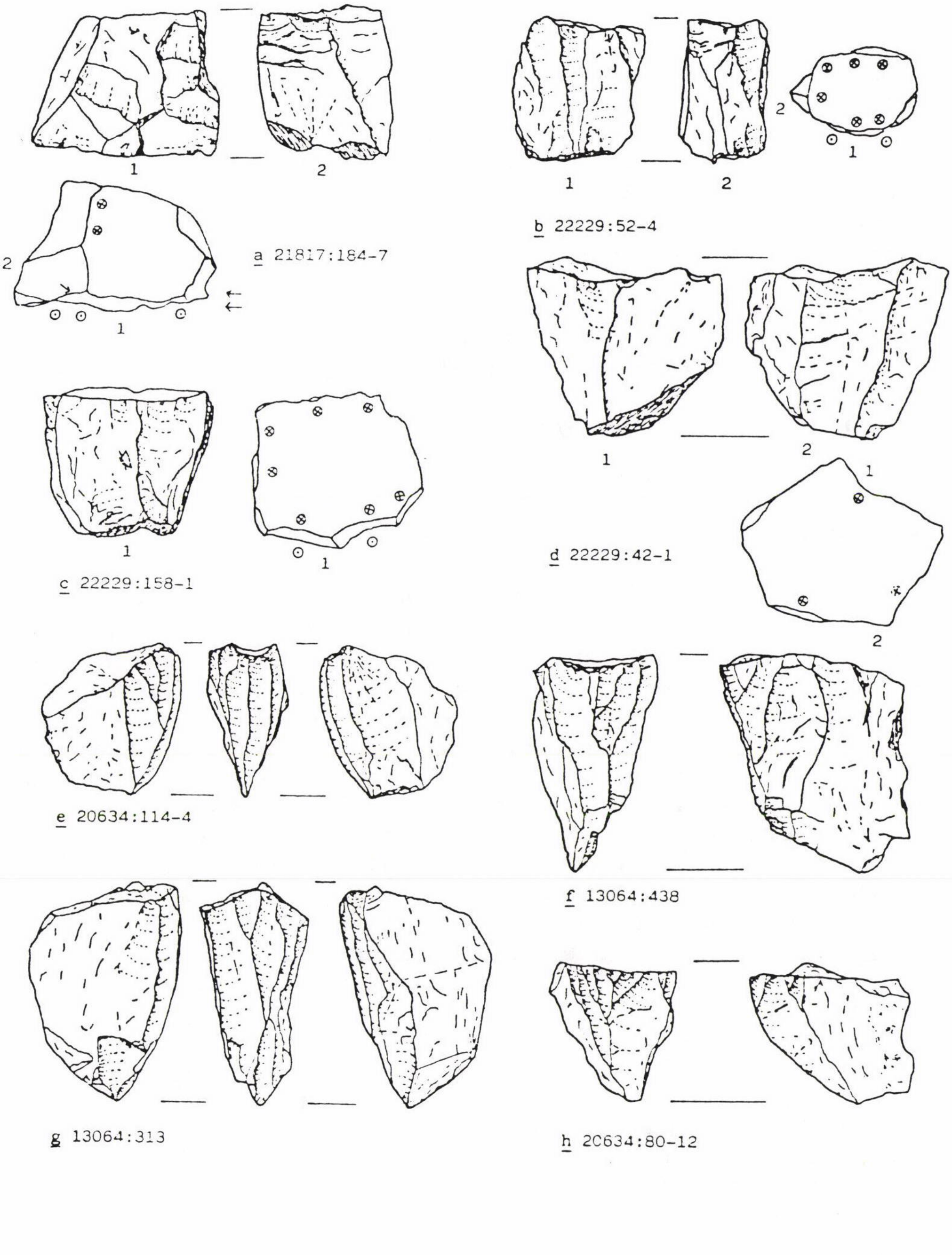


Fig. 6. a irregular core, b-d small cores with 1 or 2 parallel platforms, e-h boat shaped cores (h keeled scraper?).

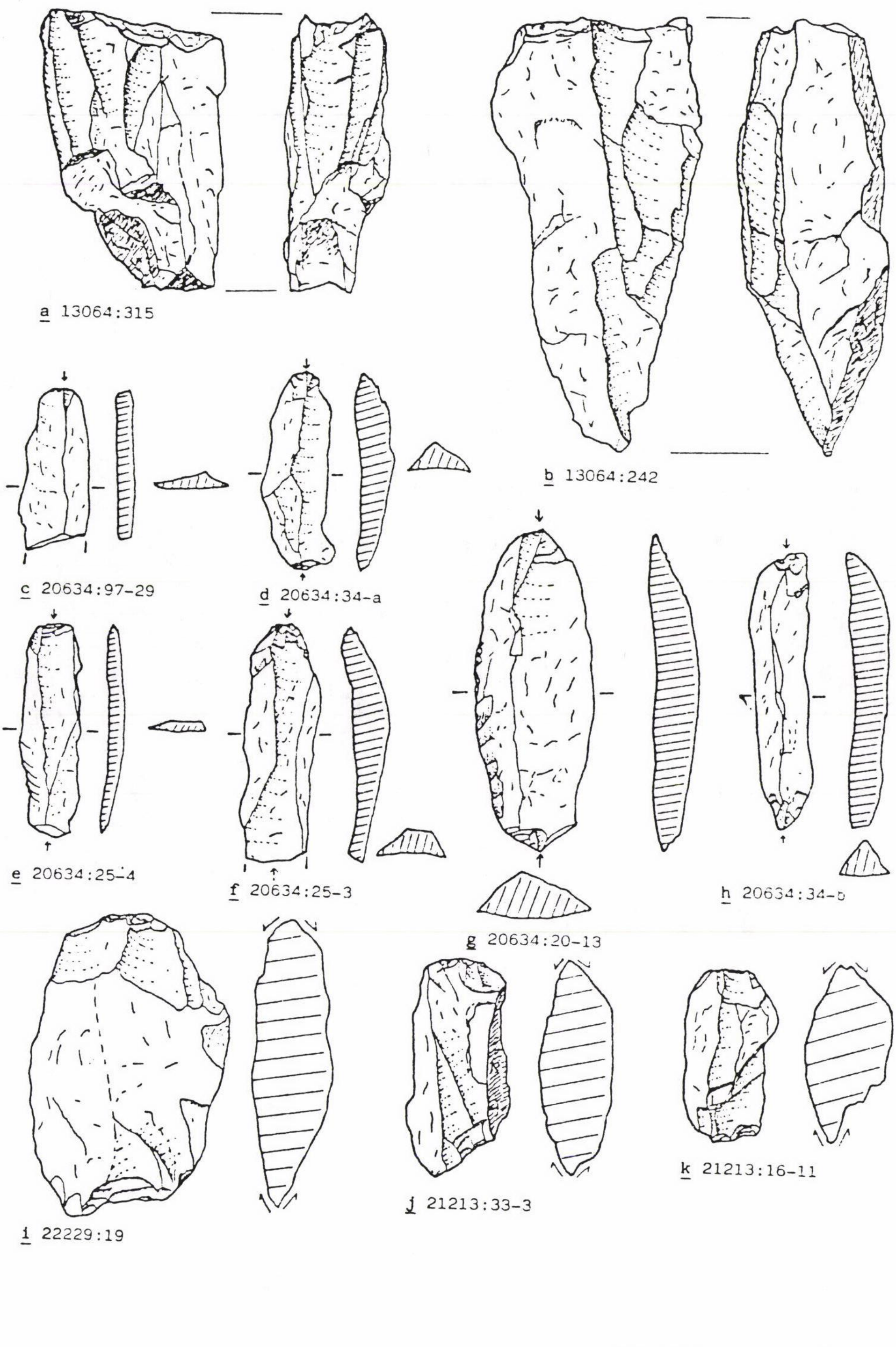


Fig. 7. a-b microblade cores, c microblade, d-h bipolar blades, i-k splintered pieces (''cores'').

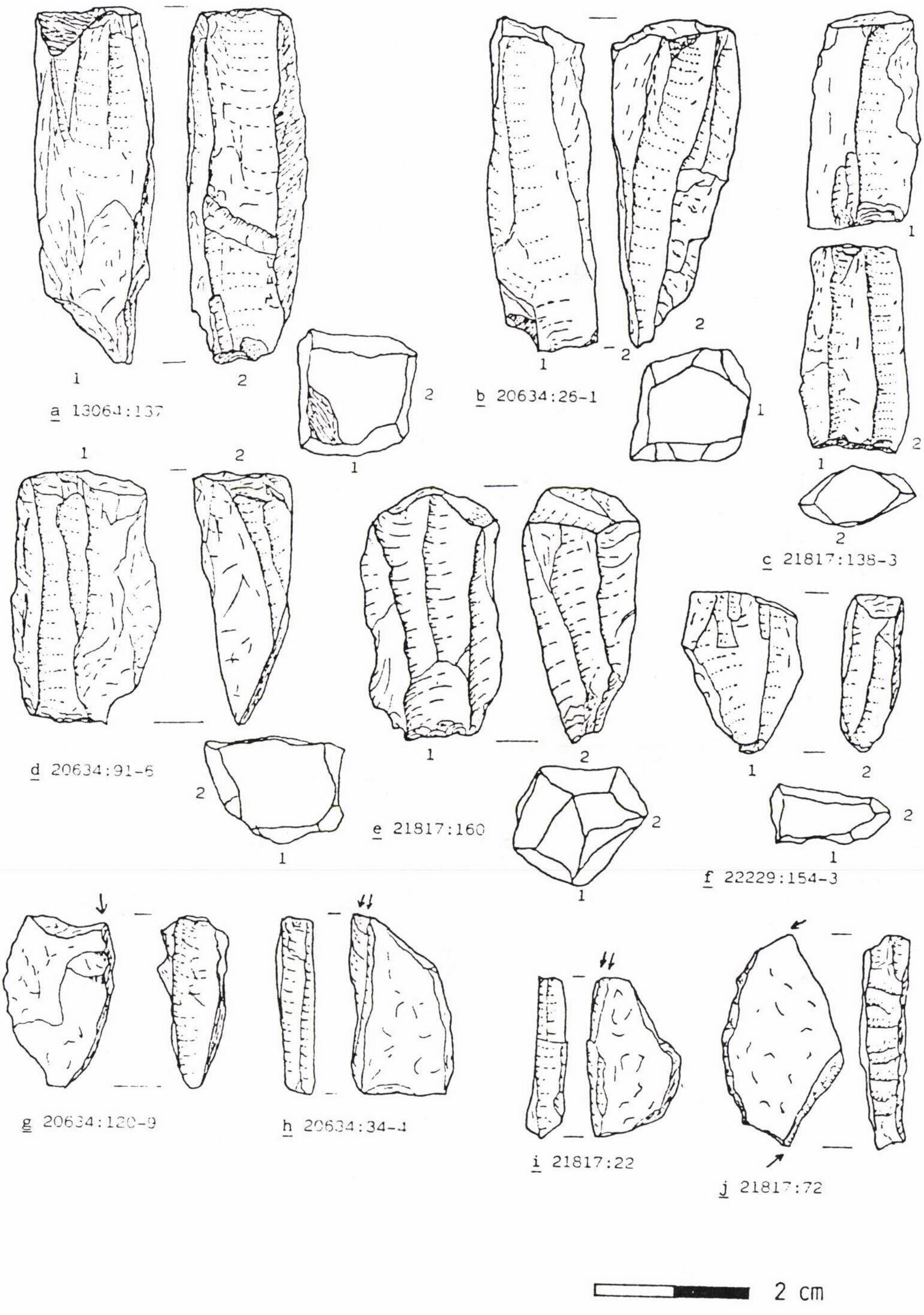


Fig. 8. a-f bipolar blade cores, g-j burins.

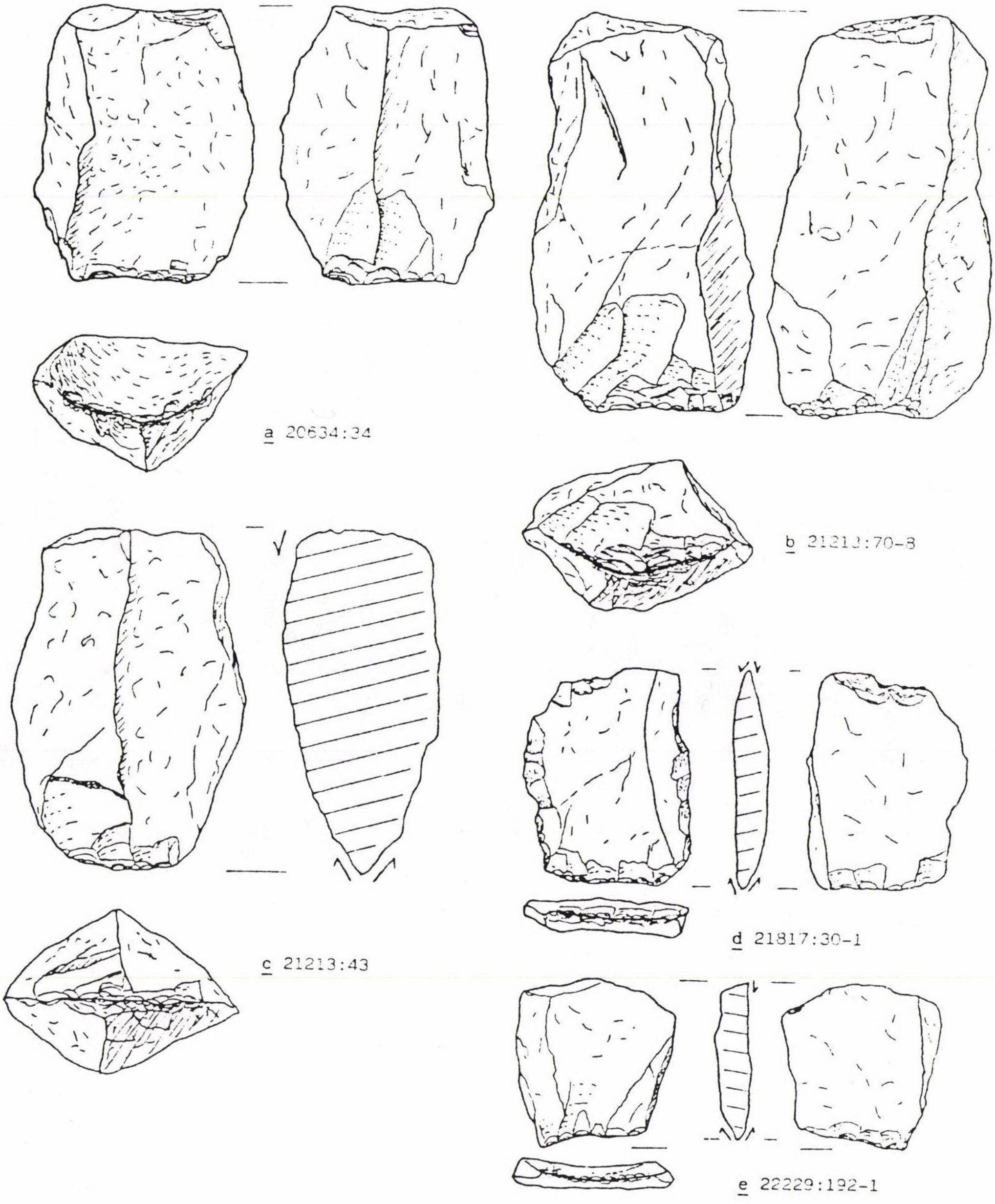


Fig. 9. Edge forming by anvil technique: a-b "grooved adzes", c-e "chisels".

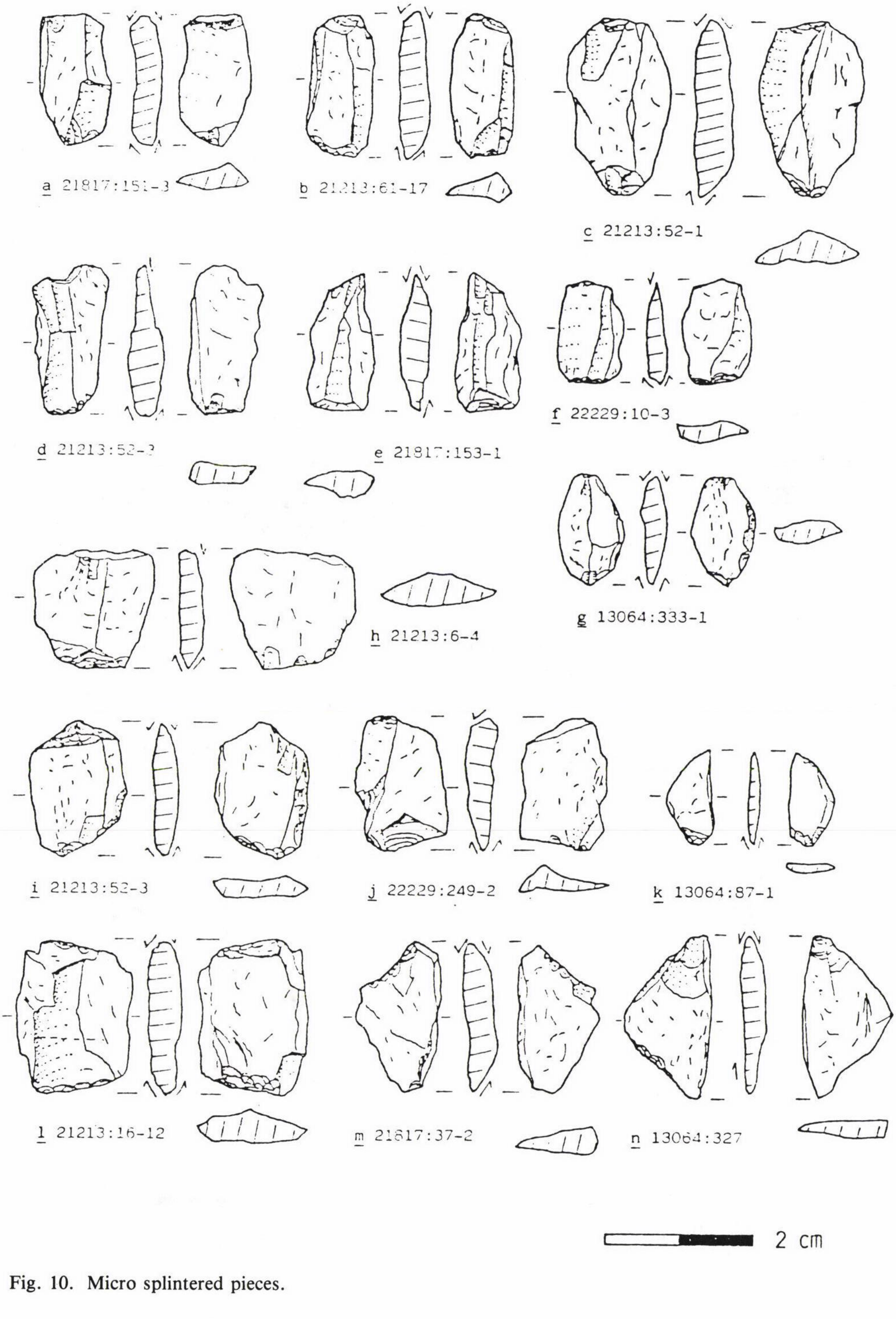


Fig. 10. Micro splintered pieces.

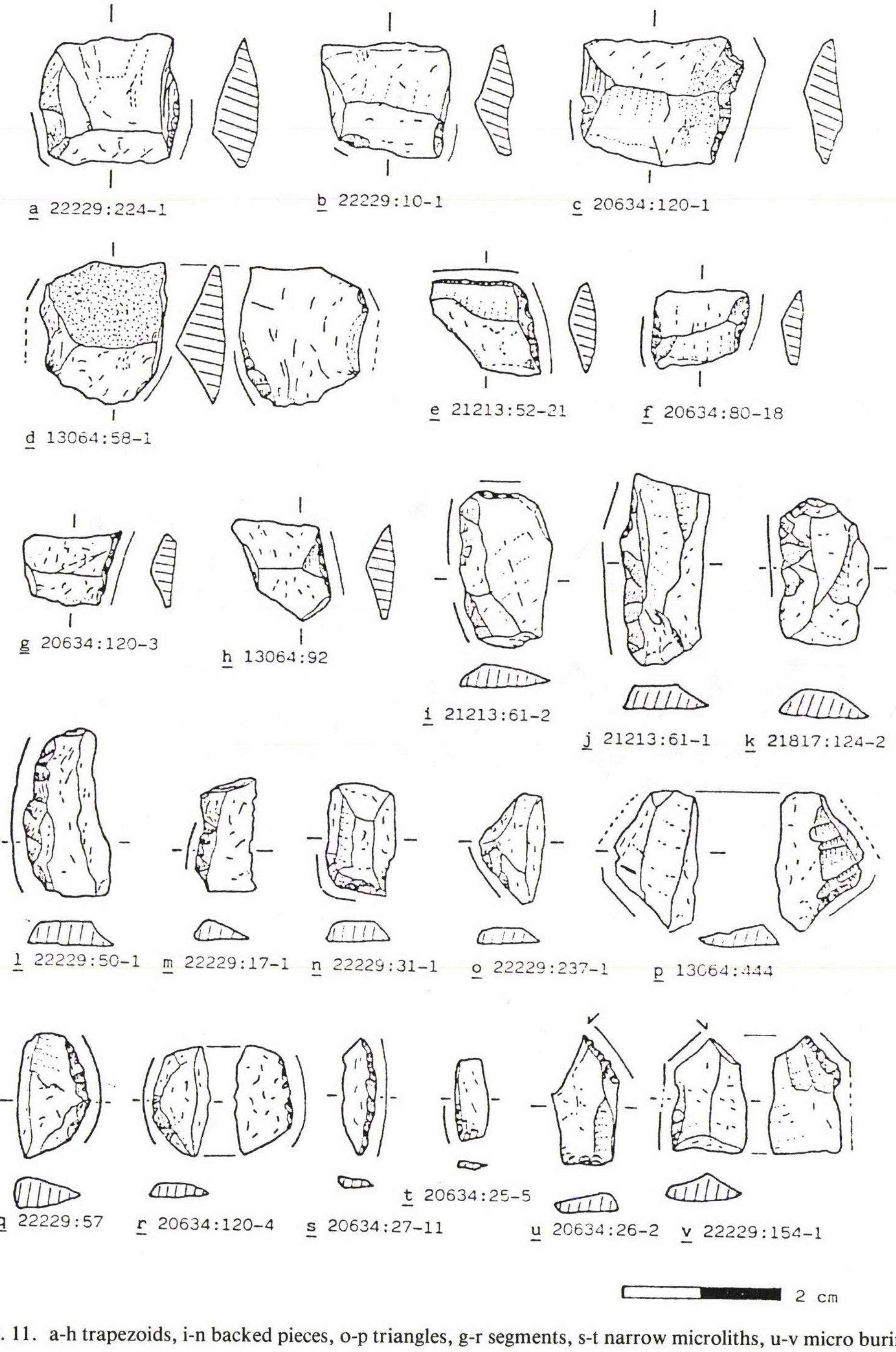


Fig. 11. a-h trapezoids, i-n backed pieces, o-p triangles, g-r segments, s-t narrow microliths, u-v micro burins.

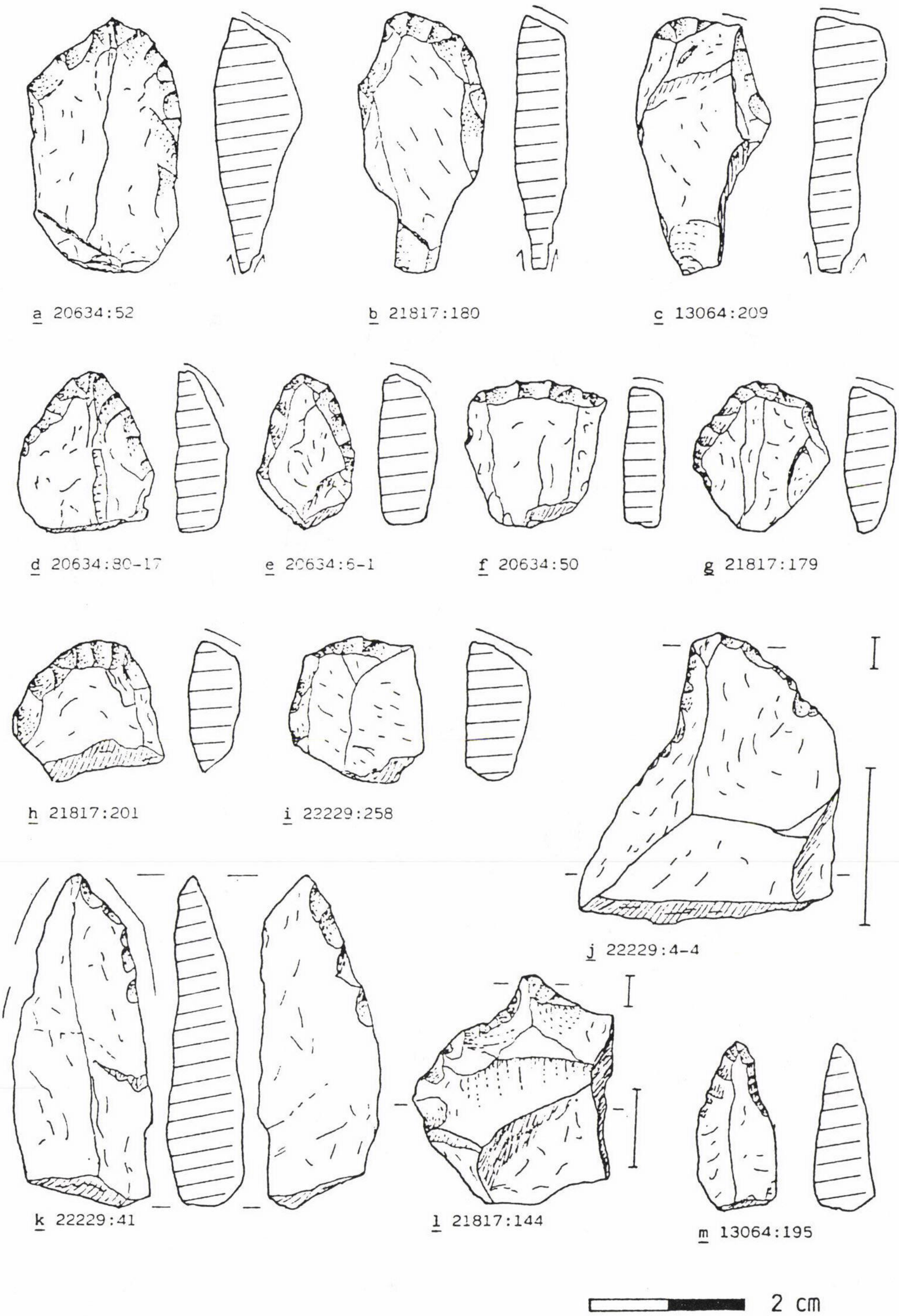
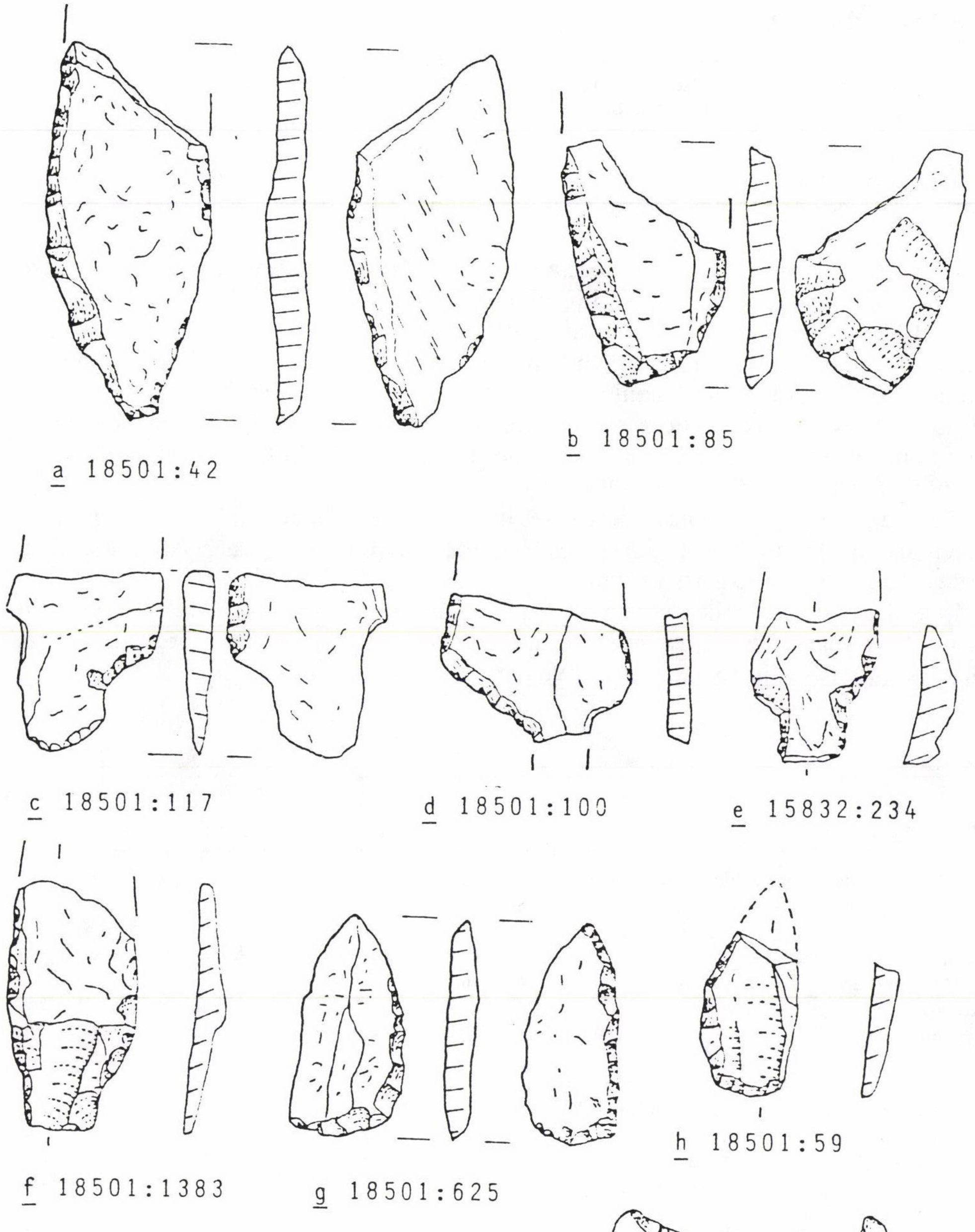


Fig. 12. a-i scrapers, j-m borers.



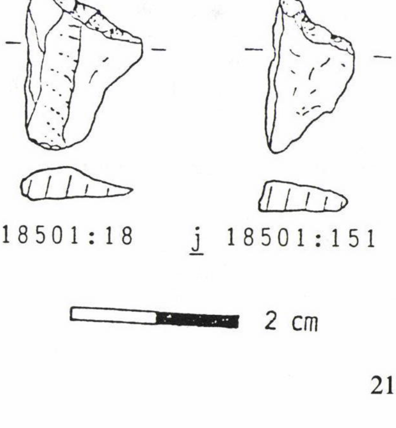


Fig. 13. a-b points with ventral base retouche, c-f tanged points, g-h leaf shaped points, i-j micro points (Kozlowskis type B).

Final remarks

The quartz mesolithic contains some traditional elements of flint technocomplexes (e.g. microburin technique). The basic production adapted to the raw material quality, as shown by the high amount of splintered pieces and by the bipolar blade production.

The presence of the boat shaped core in all investigated sites is remarkable. It is a typical artefact of the paleoarctic tradition (Bandi 1965, p. 38—42, Powers 1973, p. 93—99).

Among the modificated types especially points indicate a relationship to the flint complexes. Tanged points and points with ventral base retouche are types of the Kunda complex. T. Edgren compared the flint material from Lahti Ristola with the material from the Pulli site in Estonia (Edgren 1984, p. 22). Leafshaped points are known from the Siimusaare site in Estonia (Jaanits 1978, Abb. 4; 3, 4). The micropoints are a foreign element. They are an early holocene type and belong to Kozlowski's western technocomplex, but appear for example in the Komornica culture in Poland. (Kozlowski 1975, p. 39—64, fig. 11, 24, 25, 36—40).

The trapezoids seem to have developed in the quartz technocomplex. They are dated older (see fig 5) than the broad trapezes from the late Maglemose (early Atlantic), which are the earliest in northern Europe (Larsson 1978, p. 174).

Investigations of further, especially younger mesolithic sites, will be carried out within the next years. The morphological and statistican analysis of the present material shall be published in the spring of 1989.

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