

УДК 930.1(T2-547)

## Methods of Making and Using Tools in Mesolithic Age on Territory of Middle Yenisey

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Received 05.08.2008, received in revised form 10.09.2008, accepted 17.09.2008

*The article presents archaeological data for the Mesolithic Age from the region of Middle Yenisey (Complex Ust-Shilka 2). Materials include series stone's, bone's and antler's artifacts from seventh cultural layer of site.*

*Keywords: Middle Yenisey, Ust-Shilka 2, tools for cutting meat, treatment hard matter, treatment soft matter, hide treatment, bone implements, stone implements.*

Complex Ust-Shilka 2 is arranged on 17-metre's terrace near estuary of Shilka river, right tributary of Yenisey, and belongs to group of sites, which have been concerned to deposits of 2<sup>nd</sup> and 3<sup>rd</sup> terraces to 20-25 meters in height. Under part of profile consist of sand's deposits with intensive carbonized and humoused cultural layers, which are dated Mesolithic epoch (10.5-9 thousands years ago) that is imagined the most possible by investigators (Mandryka and others, 2005: 109).

The brightest material, which includes series stone's, bone's and antler's articles, was got from seventh cultural layer of site. By this material some traceological definitions were made. Stone's stuffs are divided by functional sign on tools, which had been used for cutting meat, for treatment wood and bone, and also for processing hides.

**Tools for cutting meat.** Chalcedony blade with small one-sided edge retouch on distal end has typical burnish of working edge, which appears, when tool is used for cutting meat, and is distinguished by presence of "greasy brilliance" (Volkov, 1999: 32) (Fig. 1: 1). Cutting knife with similar burnish of working surface also had been tool, which had been made on massive flake-blade irregular trapezium shape (Fig. 1: 10). It has stretched retouch on both opposite edges on dorsal side, which is defined as retouch of rejuvenation of the working edge.

There were also tools, which had been used for **treatment hard matter**, in the layer. For example, push-planes. It is group of tools for treatment wood and bone by scraping. This operation intends steady working tool's position, when its edge is arranged across move direction

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Fig. 1. Stone tools of 7<sup>th</sup> cultural layer: 1, 15 – meat knives; 2, 12, 13 – burins without using traces; 3, 8, 10 – scrapers for soft matter; 4 – knife-burin for hard matter; 5 – whittling knife; 6, 7, 9, 14, 16 – push-planes; 11 – scraper for hides

of (one-sided) tool and almost vertically to processing surface. However angle of edge inclination can oscillate from 70 to 120°, and during tool's blunting because of work it can decrease to 40 – 50° (Shelinskiy, 1977: 184). Traces of using of these tools characterize bright uninterrupted burnish of working edge. The most intensively it forms on coming forward sections (Volkov, 1999: 31). As push-plane the tools had been used on site, one of them had been made on divergent blade with stretched retouch on dorsal side of its edges (Fig. 1: 16), the second one is chalcedony preform with smooth and straight front and square, one of ribs of which had been used for hard matter (Fig. 1: 6), and also tool, which by morphological signs can be concerned to burins, but one its edge characterizes brightly expressive working retouch (Fig. 1: 4).

For treatment hard matter small midmost multichipped burin on blade had been used (Fig. 1: 4). Meanwhile, having enough sharp working edge, with which to make removal and taking out formed crumbs very comfortable, it had fulfilled function just of knife-burin for bone. There were similar larger objects in the layer and even side burin (Fig. 1: 2, 12, 13), but traces of using on implements surfaces were not found. Also set of blades and micro blades with retouch characterizes burnish exclusively of coming forward sections, showing on work with hard matter (Fig. 1: 7, 9).

**Treatment soft matter** So, there was the tool, which had been made on divergent blade with stretched retouch on one edge of it on dorsal side (Fig. 1: 5), it characterizes not only intensive burnish of coming forward sections, but the polish penetrates to relief waves of working edge, that proves tool using as whittling knife for soft matter (including steamed antler and wood). Set of micro scrapers, which have similar use-wear traces, also can be defined as scrapers for soft matter (supposedly for fresh hides) (Fig. 1: 3, 8, 10).

**Hide treatment.** The functional significance of one of adzed tools is very interesting. It had been made of diabase river's pebble and has widened convex arc-shape and slanting in section blade. The tool had been mounted one-side beating. Opposite side had not been treated and saved pebble's peel. The traceological analysis allowed concerning this tool to scrapers for hide treatment with concerning middle use-wear degree (Fig. 1: 11).

**Bone and antler implements.** Presence of implements which had been made of bone and antler is wide in the layer.

Needle and fragment of needle with round aperture and accordingly with sub-square and ellipsoid shapes in section saved natural thickness and bend of tubular bone of bird (Fig. 1: 5, 6). The first implement is fully finished, though it has not cuts for fastening thread, aperture or traces of breaking aperture. The traces of lengthways polish by middle abrasive lay on traces of transverse surface polish, which had been fulfilled by turning the object. In the end of making the implement had been burnished by soft matter. As for the second implement, its aperture had been drilled in one side, supposedly mechanical borer (the traces of precession oscillation were not found on it) with big speed of rotation. The drill for the wide hole had been used for cutting the aperture on other side (about difference the terms "drill" and "drill for the wide hole" look Volkov, 1999: 22-23). The needle surface also had been burnished. Both objects have traces of using. Fragment of awl with traces of slanting cuts had been made of larger tubular bone (Fig. 2: 7).

Ellipsoid implement had been made of flat bone (scapula or pelvis bone) (Fig. 2: 8). Its working surface had been worked by push-plane with narrow working edge. It had been used as object for weaving utensil and baskets.

In this layer of the site methods of antler division and splitting are watched brightly, they

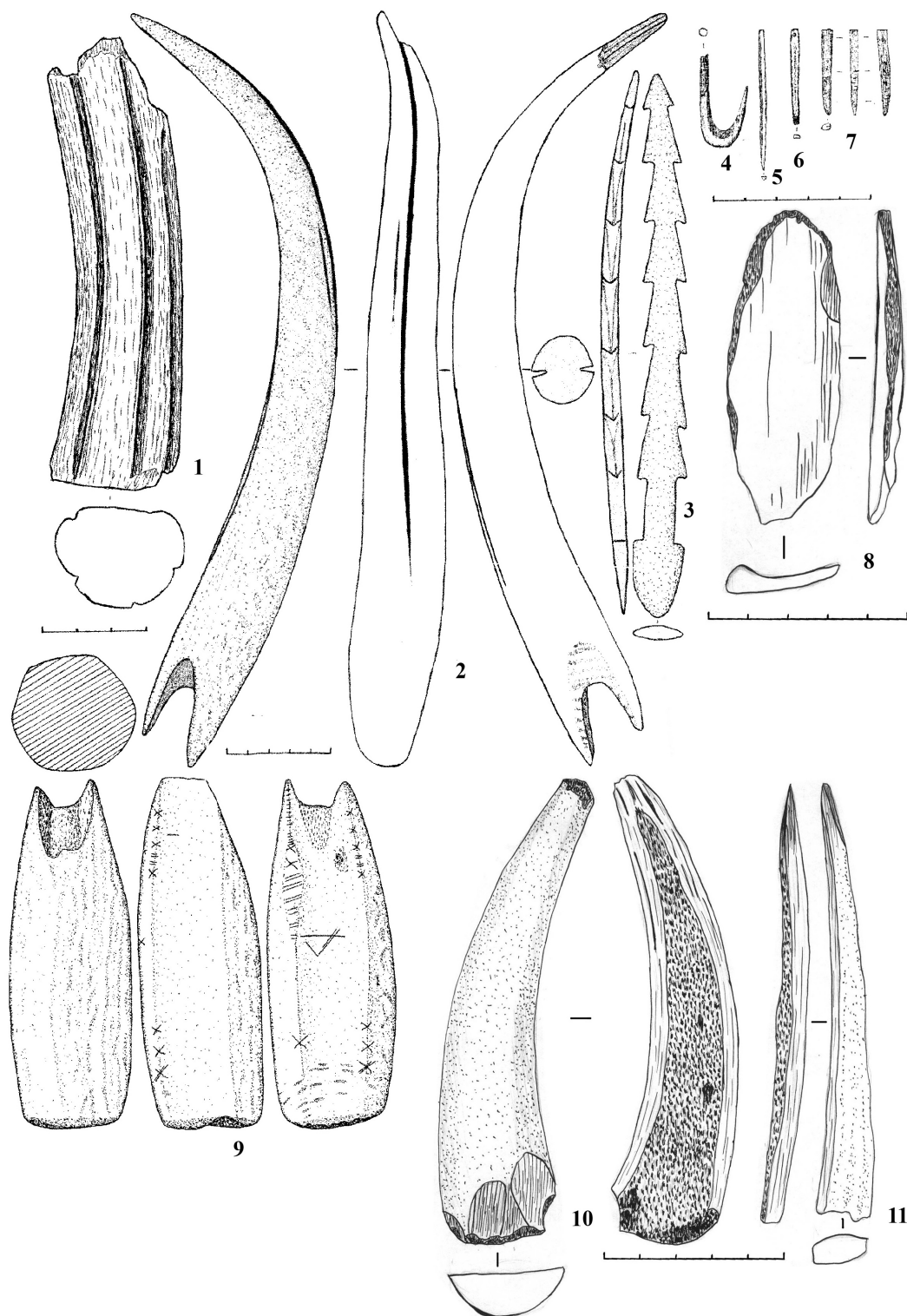


Fig. 2. Bone and antler implements: 1 – the part antler spoke with traces of splitting on five lengthways sectors; 2 – the fragment of stag's big antler with grooves-ditches; 3 - harpoon head; 4 – fishing hook; 5, 6 – needles, 7 – the fragment of awl; 8 – object for weaving utensil and baskets; 9 – the six-ribbed prismatic antler implement; 10 – half of antler tip; 11 – the awl.

present separated antler tips and spokes, different methods splitting tips on blanks and ready antler implements.

Clear traces of hewing for removing from spoke saved on antler tips and their fragments. Lengthways antler division had been made either on two same halves or smaller segments. A fragment of stag's big antler with grooves-ditches, a part antler spoke with traces of splitting on five lengthways sectors and fragments of cut on rectangular in section with length to 15 cm antler segments (Fig. 2: 1, 2) witness about it. Need to notice that cut canals foundation of these artifacts is conic, it talks about using for division just knife-burins for bone, but not burin (about difference such instruments look Volkov, 1999: 17-27). Uneven groove's wall (with "falls" and takings in matter) shows on using on different stages some knife-burins of different sizes, which had penetrated the matter differently. Moreover ditch edges are not absolutely straight because the division had been made on all length of tip not at once, but step by step: cutting had been begun on small section, then groove gradually lengthened to necessary sizes by some centimeters and later deepened.

One of similar halves of tips after the division had been worked with whittling knife and burnished. Its sharpening had been made with large grain abrasive. The traces of using this implement were not found (Fig. 2: 10).

One segment of tip had been used as awl. Its sharp end is burnished very much (Fig. 2: 11).

Harpoon head with two lines of cogs, shoulder shape part for implant and 27 cm a length had been made of central part of antler brunch (Fig. 2: 3). Traces of whittling are seen on implement surface very well. Small steps had been formed during cutting cogs on parts where knife had stopped. Almost ready implement had been polished, differently directed abrasive traces and then burnish traces saved on its surface.

Six-ribbed prismatic antler's implement with smoothed ribs and ellipsoid-conic in section is interesting (Fig. 2: 9). It has round, vertically cut and rubbed foundation. Horn mass had been pushed out in part in narrowed ellipsoid end. Triangle with turned to implement foundation top had been drawn by three strokes in the center of one the smoothest polished side. There are looked as slanting crosses and horizontal lines cuts on contacting ribs. The object had been fulfilled of brunches antler spoke. Traces of small grain abrasive and burnish are fixed on its surface. In the end of work but before using of implement the ornament had been made, it is covered by traces of "collection". The function of implement is not come out to definite.

Therefore according functional analysis the stone implements, which by character of burnish are concerned to meat and whittling knives, push-planes and knife-burins for hard matter, scrappers for hides, were presented in this layer of site. The working methods of bone conclude in hewing and then breaking of antler tips from spoke, in using of knife-burins with different stages of penetrating to material for lengthways antler division, using mechanical borer for making small aperture, and also active using abrasive working and burnish for practically ready implements.

Almost all these artifacts except some of them, which laids in distance (Fig. 1: 1-3), arranged in places with big material concentration, around hearth, among charcoal spots, that talks about enough energetic and wide activity of people group on this square. The presence of tools with different functions shows different kinds of activity, they are hunting, fishing, working bone, antler and hides, making clothes, utensils; these are activity sphere for complete provision of group with necessary life objects.

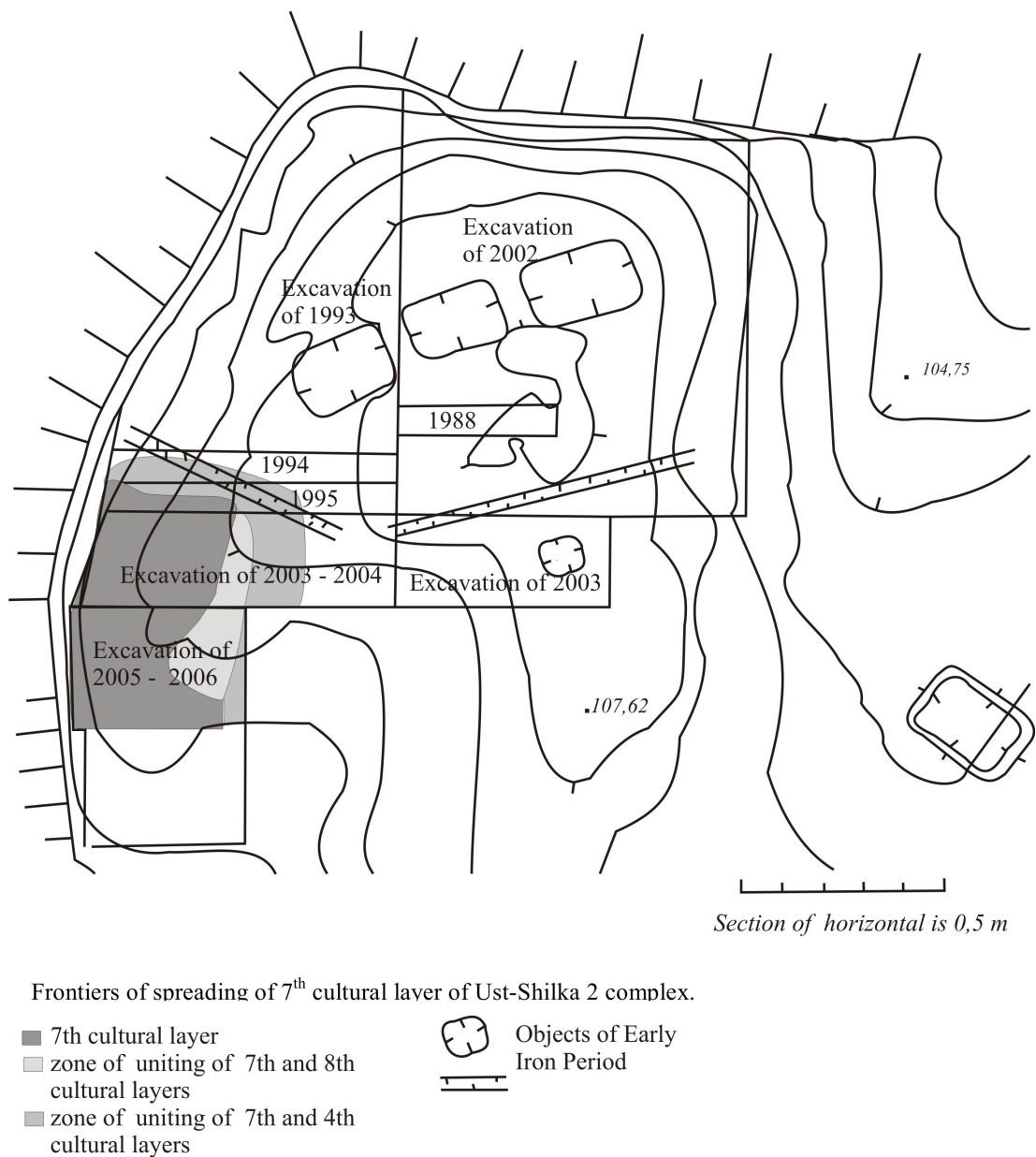


Fig. 3. Frontiers of spreading of 7<sup>th</sup> cultural layer of Ust-Shilka 2 complex

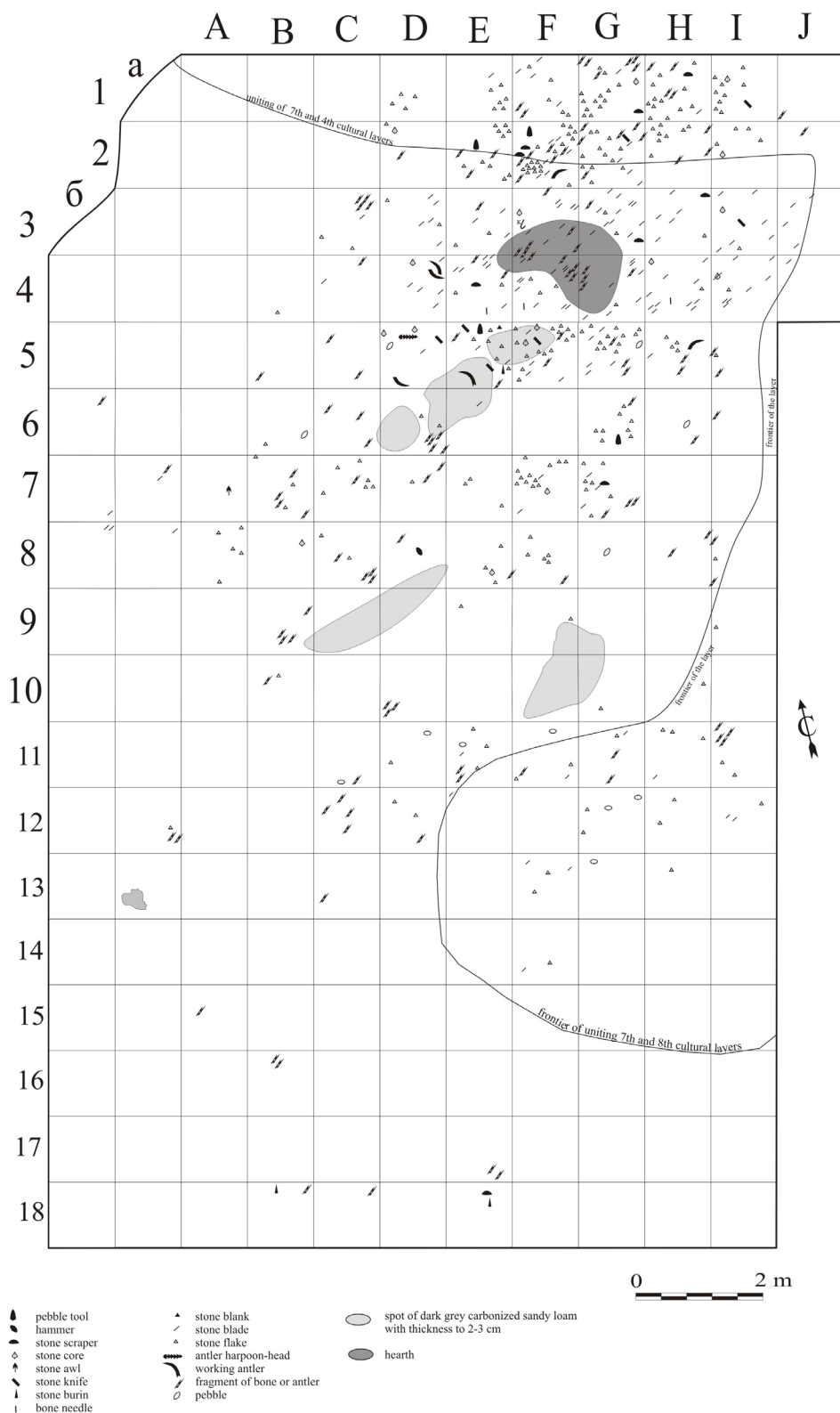


Fig. 4. Find's plan of 7<sup>th</sup> cultural layer of Ust-Shilka 2 complex

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