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"Square tools" from the Siwaliks of North-western India: flat choppers, axes, adzes ?

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Abstract

Number of Early Soanian sites in the Siwalik Frontal Range yield particular tool types provisionally named "square tools". These tools compare well with some of the Hoabinhian specimens, characterising the Late Pleistocene of South-East Asia. They support the suspicion that the Early Soanian has nothing to do with the Lower Palaeolithic of North-western India.

Key words: Siwaliks, North-western India, Early Soanian, Hoabinhian, Late Pleistocene

1. Introduction

At some of the localities yielding Early Soanian industries, sorts of "square axes/adzes" occur besides the common choppers. These particular squared or rectangular tools are usually made on split cobbles or on flakes, with 2 to 4 edges trimmed by unifacial or bifacial flaking. A few triangular axes/adzes have also been included in this group, as they seem to belong to the same techno-cultural stage. In the Hoabinhian assemblages from South-East Asia, especially Vietnam and Thailand, the oval shapes ("sumatraliths") are the most typical, but some triangular "primitive axes" and rectangular tools are also mentioned in the very first descriptions (Colani 1927, 1929). Rectangular or square shapes also occur in the Hoabinhian from North Vietnam, especially from the Xom Trai cave, dated by ^{14}C to between 18.000 and 17.000 years B.P. (Ha Van Tan 1997).

Similarities between stone tools from the Siwaliks and the Hoabinhian assemblages were first noticed by G. Corvinus, when she found, in Eastern Nepal, a heavy duty Mesolithic assemblage named the "Patu industry" and dating back to 7000 ka (Corvinus 1987, 1989, 2007). It is characterised by large steep scrapers and adzes among which some compare well to the "square tools" of the Western Siwaliks. Moreover, on the southern slopes of the Siwalik hills, at Chabeni in Central Nepal, she found a series of unifacial oval tools, typical of the Hoabinhian (Corvinus 2007). Worth mentioning too, in the Srinagar valley of Kashmir, large round or square tools occur on the surface at a few sites where usually some "a-ceramic Neolithic" artefacts do occur (Pant et al. 1982).

In the Siwalik Frontal Range, especially during the recent field work between the Beas and Ghaggar Rivers, a significant number (88) of these "square tools" has been discovered (fig. 1).

2. Raw materials

These tools are all in quartzite, since this siliceous rock is available almost everywhere. However the darker colours have been selected (grey, reddish, black and brown) and actually the field observations show that these types of quartzite are more metamorphosed and more homogenous than the whitish quartzites.

3. Supports

More than one third of the "square tools" are made on flakes (table 1) and in the large majority of the cases, on side struck flakes. The other ones are made on flat cobbles (20%) or on split cobbles (17%). In a number of cases (18%) it is not possible to distinguish whether the blank was a flake or a split cobble because the trimming has removed the possible platform and bulb (usually almost flat). All these tools have at least one cortical face which is slightly convex. Those made on flat cobbles have two cortical, almost parallel faces and they have obviously been selected for their shape (fig 5-1).

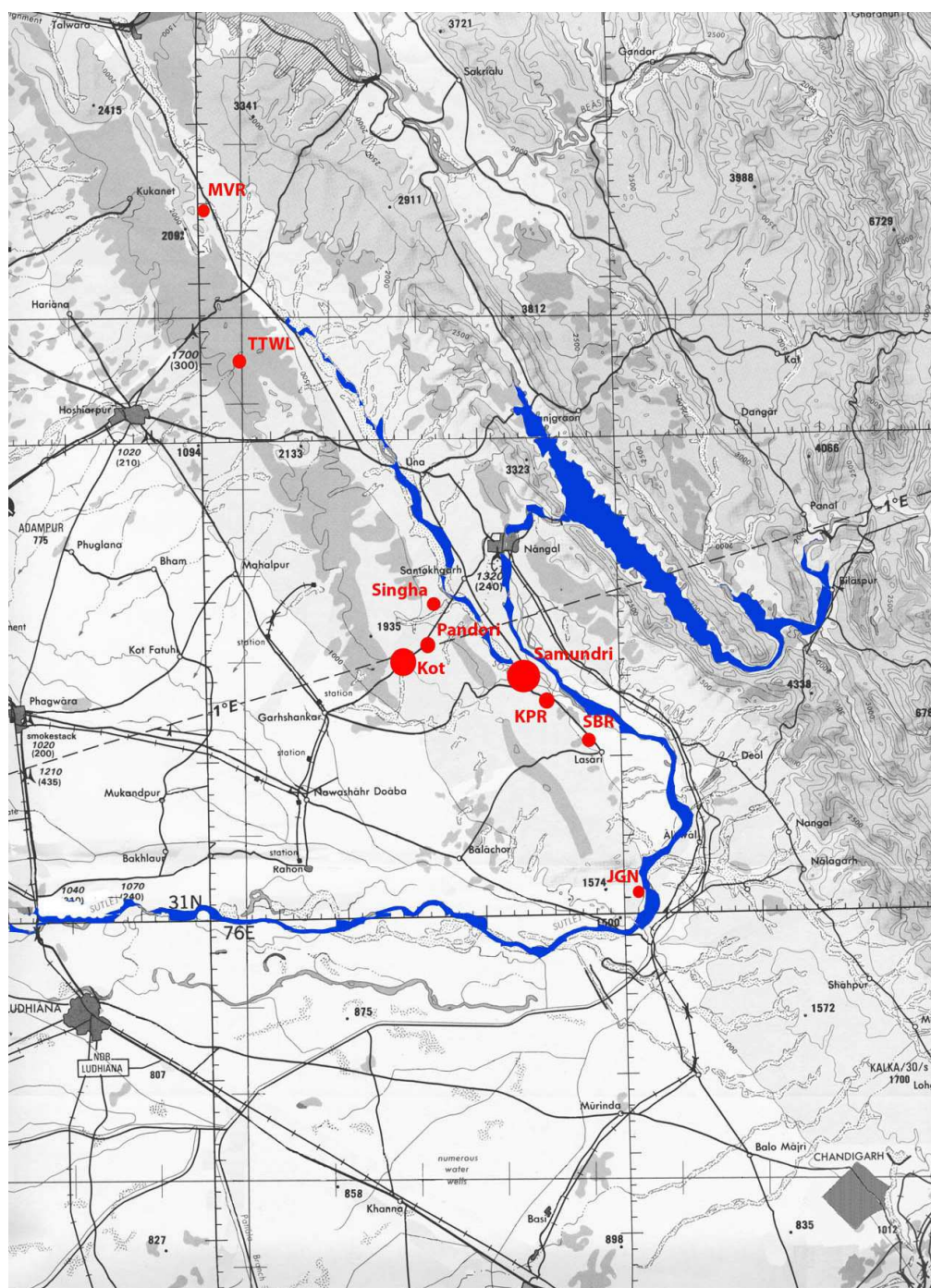


Figure 1 – Location of the main sites in the Siwalik Frontal Range where “square tools” have been found

Table 1. Distribution of the different types of support among the "square tools"

SUPPORT	n	%
undetermined flake	4	4,6
side struck flake	24	27,3
end struck flake	4	4,6
flake or split cobble	16	18,2
split cobble	15	17
broken cobble	6	6,8
broken split cobble	1	1,1
flat cobble	18	20,5
Total	88	100

Considering the flakes only (n=32) their dorsal face indicates that they were obtained by a rather simple procedure. One third of them are fully cortical and another third of them show unidirectional earlier removals, resulting from the use of one striking platform only on the core. The other ones attest some more complex core reduction sequences, with 2 or 3 different platforms. Nearly all the flakes, except 3, bear remnants of cortex on their dorsal face, suggesting that they correspond to the beginnings of the production, from large cobbles or from boulders.

4. Trimming

Most of the tools (36%) are trimmed by flaking on their 4 sides; but many are trimmed on 3 or 2 sides only. Those having only one trimmed side are a minority (table 2). For the latter, the trimmed edge is usually in the transversal position (shorter side, in the end), but in a few cases, the trimming took place on a lateral side.

Table 2. Distributions of the "square tools" according to their number of trimmed sides

NB. OF TRIMMED SIDES	n	%
1	11	12,5
2	21	23,9
3	24	27,3
4	32	36,4
Total number of tools	88	100

The edges are trimmed mostly by unifacial flaking, rather direct but also inverse, especially in the lateral left position (table 3). Bifacial trimming is usually irregular (mixture of direct and inverse scars), except on the transversal edge where it is more strictly bifacial, suggesting more care in its shaping and supporting the hypothesis as per these tools were used as axes or adzes.

The edges are mainly shaped by one generation or series of flaking, but 2 series (the second one regularising the first) are common, especially on the upper, most convex face (more than 1/3 of the edges against less than 1/4 on the lower, flattest face). Three series are rare and indicate a more refined shaping (table 4; fig. 2-2). Although the transversal distal edge is supposed to be the more active edge, it is not more regularised than the other ones.

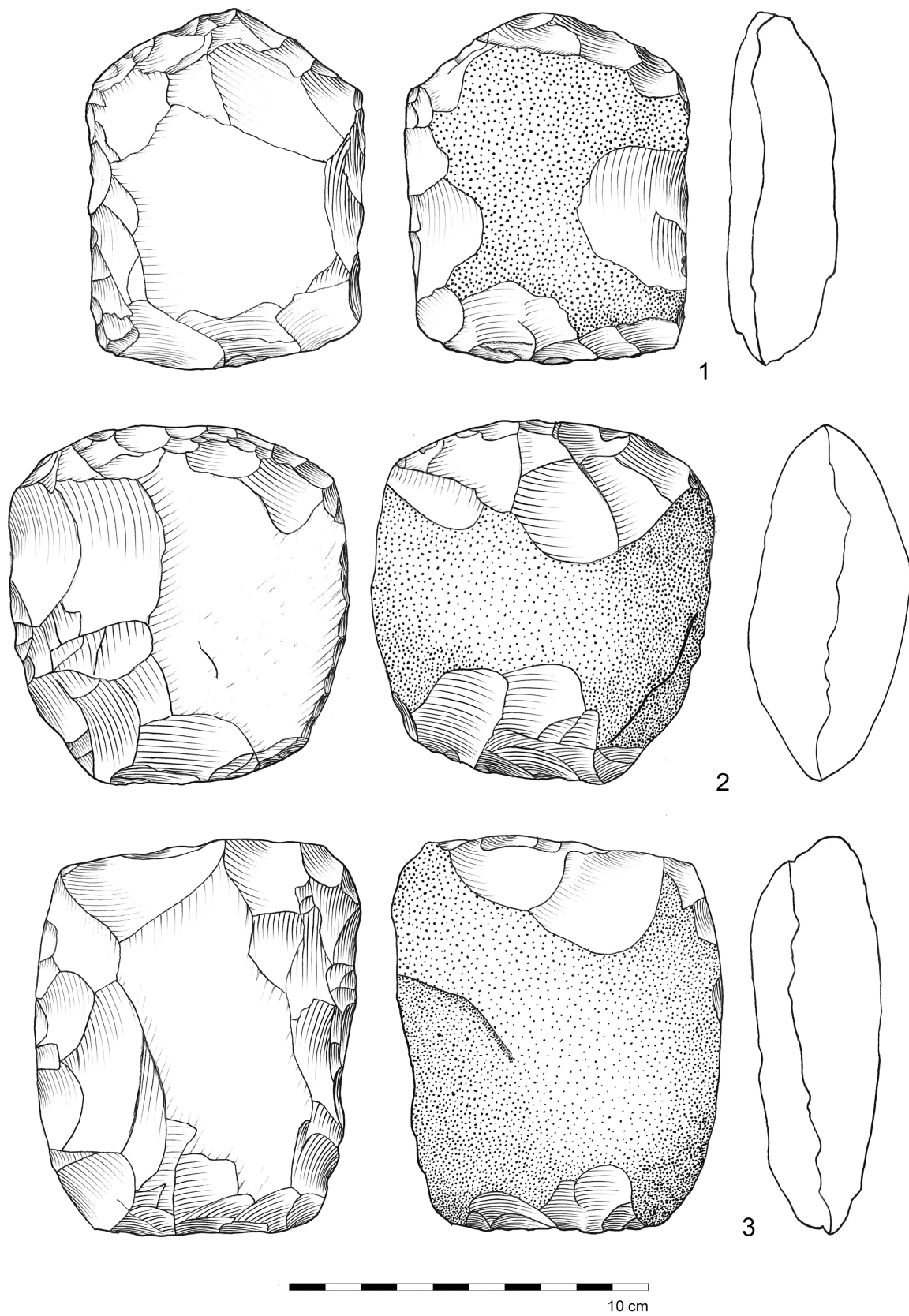


Figure 2. "Square tools" from the Siwaliks.

Table 3. Direction of flaking on each of the 4 sides (number of tools = 88)

	left side		right side		distal side		proximal side		all trimmed sides
DIRECTION	n	%	n	%	n	%	n	%	
bifacial	6	10,7	6	9,8	15	18,6	13	22,4	40
irregularly bifacial (mixt)	14	25	15	24,6	24	30	14	24,1	67
direct (upwards)	16	28,6	25	41	29	36,6	19	32,8	89
inverse (downwards)	20	35,7	15	24,6	12	15	12	20,7	59
Total	56		61		80		58		

Table 4. Number of series/steps of flakes trimming the edges of the "square tools"

	All the trimmed sides		Only the distal sides	
nb of series	face A			
1	109	56%	36	55%
2	69	36%	25	38%
3	16	8%	5	8%
	194		66	
	face B			
1	118	71%	40	78%
2	40	24%	9	18%
3	8	5%	2	4%
	166		51	

The trimming results from flake scars which usually cover 25% to 75% of the faces, but they are more invasive on the upper face (1/3 between 50% and 75%). Flaking covering more than 75% on either face is rare (table 5).

Table 5. Invasiveness of the shaping flake scars on each face of the "square tools"

	face A	face B
absent	3	16
< 25%	15	16
25% to 50%	28	27
50% to 75%	33	21
> 75%	6	7
whole surface	3	1
Total	88	88

5. Overall morphology

It is difficult to evaluate how the shapes of the finished tools are different from those of the blank. Only a few fractures can be observed (7 lateral, 5 transversal); they are not accidental and have probably been made for shaping the tools. Apart from them, the shaping never hides the original shape of the blank, whose selection or initial production (by splitting or flaking) therefore strongly determines the final tool morphology.

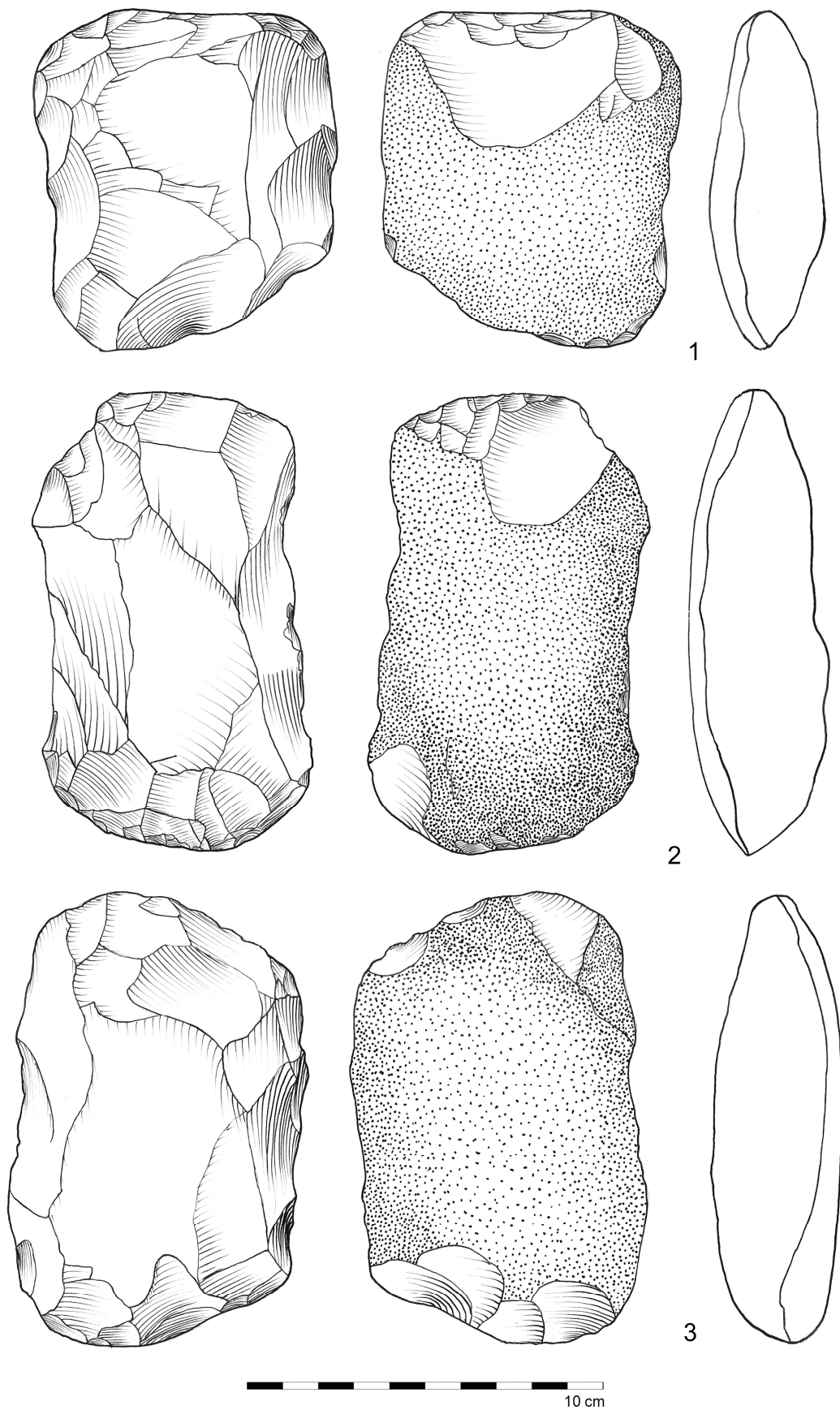


Figure 3. "Square tools" from the Siwaliks.

Most of the so called "square tools" in this presentation actually are trapezoidal (35%; fig. 3) or trapezoidal-oval (with rounded corners). Squared contours (fig. 2-2) represent 15%, hardly more than the rectangular (fig. 2-3) or the pentagonal tools (table 6). This latter shape (fig. 2-1) results from one of the trimmed edge making an angle instead of being convex or straight as in most of the cases. The only 3 triangular tools (fig. 5-2), along with some of the trapezoidal ones, clearly resemble the "primitive axe/adze" identified by Colani (1929) in North Vietnam and the "axes/adzes" found by Corvinus (1987, 1989, 2007) in Eastern Nepal.

Table 6. Contour of the "square tools"

CONTOUR	n	%
trapezoidal	31	35,2
trapezoidal-oval	16	18,2
square	13	14,8
pentagonal	11	12,5
rectangular	10	11,4
triangular	3	3,4
others	4	4,5
Total	88	

The "square tools" vary within a large range of dimensions (table 7). If referred to the dispersion graph of length x breadth (fig. 4) they seem to form a homogenous group in which 2 subgroups may be distinguished. One scatter, comprising the large majority of the specimens, is concentrated along the diagonal, indicating that length and breadth are nearly equal, while a smaller group of points corresponds to longer and narrower tools.

Table 7. Dimensions of the "square tools" (n = 88)

	length	breadth	thickness
mean	102	83	37
SD	17,8	12,8	8,74
minimum	62	55	19
maximum	149	110	65

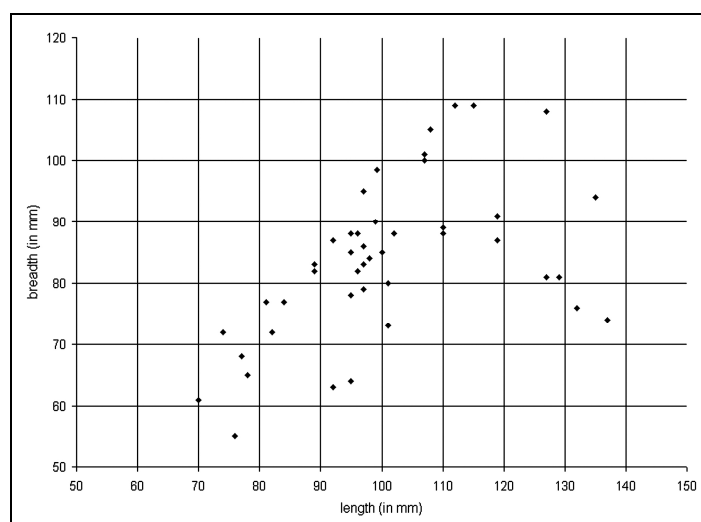


Figure 4. Scatter diagram length x breadth of the "square tools" from the Siwaliks.

6. Morphology of the sides

The sides of these tools are mainly shaped into open angled cutting edges, sharp cutting edges being much less frequent (table 7). Worth noting the transversal distal sides show the highest rate of shaping with a slightly larger proportion of sharp edges, however not conspicuously different from the lateral edges. There are a few natural untrimmed edges, open angled or sharp, but most of the untrimmed sides are steep, either cortical and usually rounded, or not cortical. They can be suspected to serve as grips, as far as the use of the tool is concerned, but surely not exclusively: while the sharp edges may not be comfortable as grips, the open angled edges can well serve this purpose. Besides the question of handling, that of whether

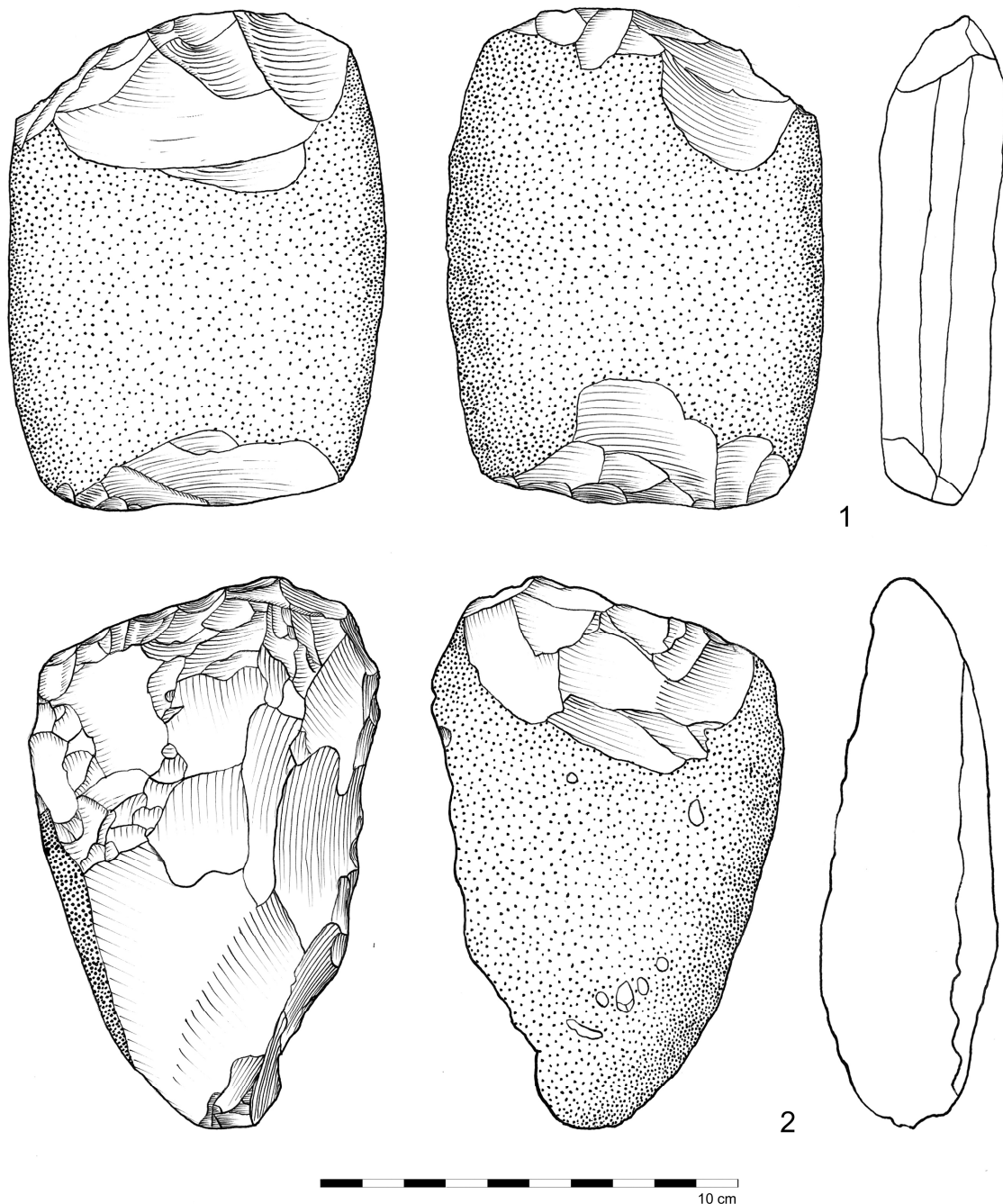


Figure 5. "Square tools" from the Siwaliks. 1: on a flat cobble, with a polished facet all along on side. 2: triangular shape

Table 8. Morphology of each of the 4 sides (untrimmed and trimmed) of the "square tools" (n = 88)

morphology of the untrimmed sides	left side	right side	distal side	proximal side
steep side/back, cortex	3		1	6
rounded cobble edge, cortex	15	14	4	15
steep side/back, no cortex	11	9		8
open angled edge, cortex	1		1	
open angled edge, no cortex	2	1		
sharp/cutting edge, no cortex		3		
point			2	
rounded point				1
Total untrimmed sides	32	27	8	30
morphology of the trimmed sides	left side	right side	distal side	proximal side
steep side/back, cortex	2	1	1	1
rounded cobble edge, cortex			1	
steep side/back, no cortex	3		1	3
open angled edge, cortex				1
open angled edge, no cortex	38	47	53	39
sharp/cutting edge, no cortex	13	13	23	13
point				1
rounded point			1	
Total trimmed/retouched sides	56	61	80	58

these tools were hafted or not is raised. Actually the traces of gloss observed on some of the faces (6 on upper faces, 10 on lower, flattest faces) may result from rubbing on a haft or binding. Tree tools made on flat cobbles show marks of polish, on one or both lateral sides (fig. 5-1: on one side).

7. Conclusion

This study provides a better knowledge of a group of tools, found along with the Early Soanian cobble tools. These, provisionally called "square tools" show specific typological features that recall the Hoabinhian assemblages. In Northern Vietnam, the Hoabinhian is dating back to 23.000 to 13.000 years B.P. (Ha Van Tan 1997). At places, it appears even earlier, around 30.000 years B.P. (Yi et al. 2008). It is preceded by the Sonvian characterised by a majority of choppers. Further South, in the rich province of Kanchanaburi of Thailand, the Hoabinhian covers the time range about 30,000 to 7,000 years (Shoocongdej 2000); in South Thailand, it starts around 25,000 years as at Moh Khiew (Pokajorn 2001) but at Lang Rongrien it goes back to 35,000 years (Anderson 1990). In most of the Hoabinhian sites, lithic assemblages of the first cultural stage, corresponding to the Late Pleistocene, are characterised by a large proportion of cobble tools and core tools.

These data lead to two main clues:

- the Early Soanian occurring along with the "square tools" may be correlated to the early phase of the Hoabinhian or to the Sonvian;
- there are preferential cultural links between East and West during the Late Pleistocene and Early Holocene; they appear stronger than between North and South, since the contemporaneous industries of peninsular India are radically different.

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