

## The Prehistory of the Sirsa Valley, Punjab, India

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(with 3 Plates V—VII and 8 text Figures)

### Introduction

The following pages deal with the partial results of the second expedition to the hilly tracts of Nalagarh and Patiala, and more specifically to the Sirsa Valley, carried out in 1953. This is to the author's knowledge the first attempt at an exploration of the Pleistocene fans and terraces of the Siwaliks on this side of India's post-partition border. The main aim of this expedition was to establish the context of certain Palaeolithic finds made in the course of the previous year's work and to determine the density of prehistoric occupation in this area.

It should be pointed out, however, that further field work, mainly of a geological nature, is necessary before any but very tentative conclusions can be reached on the final correlation of terraces and sites. It is worth mentioning here that no Palaeolithic sites have been suspected in this region heretofore. The nearest Old Stone Age sites are more than 300 miles distant from the Sirsa Valley. Hence the importance of the present discoveries cannot be overestimated, either in terms of Indian Palaeolithic research or in terms of the overall picture of Southeast Asian Stone Age investigation.

### Geography

The Sirsa River has its source just below Kasauli, whence it flows some two miles in a southwesterly direction. Near the village Basawal it turns northwest and follows this course for some twenty-four miles until it reaches the Sutlej near Ghanauli in Ambala District of the Punjab (I). Its left bank is largely composed of the steep and picturesque formations of the Upper Siwaliks, whilst its right bank consists of a system of terraces leaning against the Middle and Lower Siwalik stages. The whole forms a well defined river valley up to the latitude of Nalagarh town, whence it opens up into the great Sutlej Valley.

Near the above-mentioned village of Basawal, also below Kasauli, another river, the Jhajra Naddi, has its headwaters. The Jhajra, however turns southeast, there being a watershed between the headwaters of the two rivers. This watershed is of importance, since no traces of Palaeolithic man were found on the Jhajra side. The whole terrace system, in fact, comes to an abrupt end at this point and reappears only several miles further southeast. This area, however, is beyond the scope of the present work.

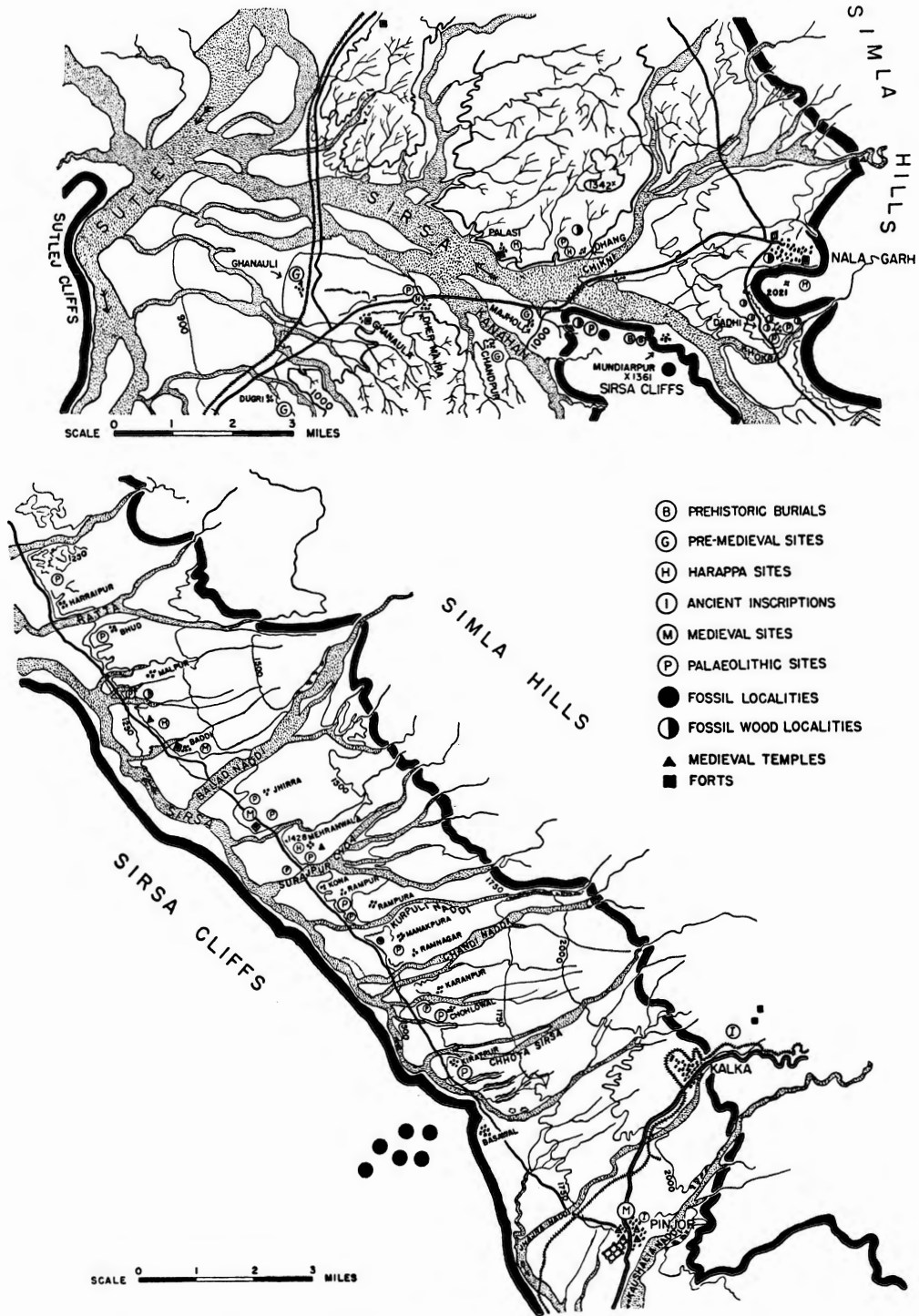


Fig. 1. Maps of the Sirsa Valley.

The Sirsa River is joined on its right bank by numerous smaller Choas and Nullahs which drain the various higher mountain valleys. These rivulets cut through the terrace system, thus exposing interesting cross sections through these formations.

The general level between Nalagarh and Kalka, at the other end of the valley, rises towards the latter place. The level at Nalagarh is + 1250 feet above the sea, whilst Kalka, in a similar geographic position, is located at a height of + 2070 feet. The level thus rises more than 900 feet over a stretch of roughly twenty-five miles. At the watershed near Basawal the altitude is + 1686 feet, whilst at the Sirsa-Sutlej confluence the height is somewhat below + 980 feet above sea level.

This report will be divided in three sections, namely a discussion of the sites and their geological context within the actual Sirsa Valley, the sites located along the terraces outside the valley near the confluence, and a discussion of the artifactual materials. All attempts to link local geological features with De Terra's terrace system in the West Punjab are strictly tentative, though sooner or later a correlation of the two areas should be undertaken.

Khokra-ka-Choa I & II.

The first site within the actual Sirsa Valley is the Khokra-ka-Choa double site. Here implements occur on two terraces, T3 and T2. The sites are located partly within the valley of the tributary stream Khokra and partly within the main Sirsa Valley. The terrace sequence is as follows:

- T4 = Recent alluvium.
- T3 = Loose unconsolidated gravels.
- T2 = Somewhat better consolidated gravels.
- T1 = Absent.

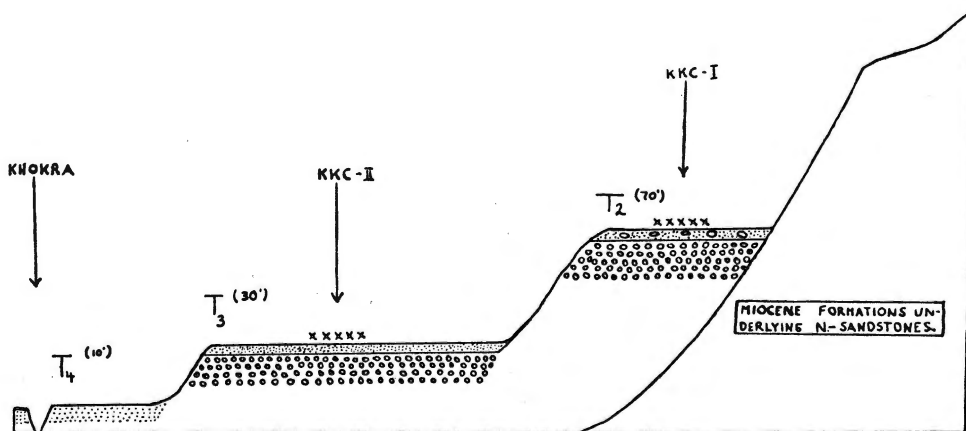


Fig. 2. Section through the Terraces at Khokra-ka-Choa.

Implements are more common on T 2. T 3 yields essentially crude Chopping-Tools and a few Choppers made on pebbles, whilst on T 2 these types are comparatively rare, flakes with plain and prepared striking-platforms being in the majority. This is a curious feature that has been observed repeatedly at sites on these terraces. T 3, which should be younger on geological grounds, apparently yields more primitive tools than T 2, which is an older formation.

The Khokra sites are at a distance of less than two miles from the town of Nalagarh on the road to Pinjor/Kalka. The road itself runs on T 3, thus cutting through parts of the site. The main site, which is located on T 2, is just on the lower end of the Khokra Valley about two furlongs northeast of the village of Dadi. The T 3 site, thinly strewn with artifacts, stretches along the mountain spurs to about the first milestone from Nalagarh, on both sides of the road.

There are two features of special interest. The more important one is the occurrence of implements fashioned from fossil wood. Fossil wood occurs imbedded in the Nalagarh Sandstones, a subdivision of the Nahar formation, which forms the first range just behind the town of Nalagarh. Actual implements are extremely rare. The author's attention was first drawn to the possibility of fossil wood tools occurring here by the presence of large numbers of fossil wood fragments, which evidently were not in situ at this site. The grain of this material does not lend itself to the manufacture of implements. Nevertheless Palaeolithic man has made attempts to utilize it for this purpose. The type illustrated on Pl. VII is a typical specimen. Other forms, notably small points, also occur. All other tools are made of quartzite, which is exotic to the area.

The other interesting feature is the presence of certain large, rolled sandstone boulders, partly on the surface and partly imbedded in the yellow loam forming the topsoil of T 2. These bear marks which at first sight appear to be glacial striations. But since this is not possible, the glaciers having never reached this region, it seems justified to assume that these stones have been used by Palaeolithic man as anvil stones, on which he manufactured his tools. The striations on this soft sandstone are probably the marks and remnants of man's tool making activities. It is interesting to note that such stones were only found on Palaeolithic sites which, because of the great abundance of tools and waste flakes have been called workshops, such as Khokra-ka-Choa I, Malpur-da-Choa, and Mehranwala I.

The gravels on both sites are covered with layers of a yellow, loamy topsoil. On T 2, implements are imbedded in this deposit. At places the original surface of the gravels is exposed, and here implements and waste flakes are exposed in large quantities. All artifacts from T 3 were collected from the surface. The T 2 site, in view of the vast quantities of waste flakes, appears to be a workshop. Among these waste flakes, a particularly thin type of flake with an obtuse striking-angle and well developed bulb of percussion is very common. Also fairly common are discoidal cores, massive flake tools with crude retouch, and a class of well executed, somewhat symmetrically flaked, rather small Chopping-Tools made on pebbles (Fig. 7 ; 1). The

latter, however, should not be confused with typical Sohan forms, which are much cruder, and which also occur on T 2, but in comparatively small quantities.

On the T 3 site, very crude, thick butted pebble Choppers and Chopping-Tools are in the majority (Fig. 3 ; 5, 9). Flakes of the T 2 type do occur, but they are rare — at any rate rare enough to be quite conspicuous by their scarcity.

The T 2 site is very compact, being located on a small and limited area, while the T 3 site is very extensive, but thinly strewn with artifacts.

#### H a r r a i p u r

An inspection was carried out of the rather eroded terrace about two furlongs west of Harraipur, a village on the Nalagarh—Pinjor/Kalka road, about six miles distant from the former town. This terrace appears to correspond to T 2. A few large flakes with plain striking platforms and some doubtful crude pebble tools were picked up here. They appear to be stray implements and flakes. Due to the advanced erosion of the site, it appears that these specimens were not found in situ. Further investigations seem advisable to locate the origin of the artifacts.

#### B h u d

Less than two miles from Harraipur, across the Ratta Naddi, the same terrace system observed at Khokra reappears in a well defined shape. The road here runs on the recent alluvial deposits of T 4. An investigation was carried out on T 3 and T 2. T 3 is not extensive at this point, but it yielded a number of pebble tools similar to the types found on T 3 at Khokra. No artifacts were recovered from T 2. The site was named after the village of Bhud, which is situated on T 2, about half a mile from the site.

From this site onwards the Nalagarh—Pinjor/Kalka road runs immediately below the great T 2, which flanks its left side.

#### M a l p u r - d a - C h o a

The great T 2 along the Nalagarh—Pinjor/Kalka road was examined at several points between Bhud and the Malpur-da-Choa site. The road gradually climbs up to T 3. If T 3 is implementiferous here, this has been covered up by a thick topsoil deposit, which at present is under cultivation. No artifacts were recovered from either T 3 or T 2 between the two sites mentioned above.

The Malpur-da-Choa site is located on top of T 2, about one and a half miles from Bhud. It was named after the seasonal rivulet Malpur.

The site is almost as extensive as the Khokra-ka-Choa T 2 workshop. Here too, the gravels are covered with a topsoil deposit which, however, is somewhat thinner than that at Khokra-ka-Choa I. Exposed gravel patches, thickly strewn with implements and waste flakes are very common and even where the topsoil covers the gravels,

artifacts occur in profusion. At such places they have been churned up by constant ploughing in modern times. Other locations where artifacts can be found in great numbers are the boundary lines or ridges between fields, where peasants usually throw all stones and boulders they find in their fields. Thus many a palaeolithic tool has been deposited on these narrow strips of land.

Similar to the evidence from Khokra-ka-Choa I, flakes with plain and prepared striking-platforms are extremely common. Large flake tools and various other implements such as points, discoidal cores and the same type of symmetrically flaked pebble Chopping-Tools encountered at Khokra-ka-Choa I are common as well. True Sohanian Choppers and Chopping-Tools made on pebbles are very rare, but they do occur. An interesting find was a huge yellow quartzite core about a foot and a half long, with very distinctive flake scars. This as well as the numerous waste flakes, suggests a workshop. Few specimens are rolled or patinated; most of them are absolutely fresh. Also, a disc was found here (Fig. 7 ; 10). Striated anvils occur as well.

Two miles further towards Kalka the Balād River, a tributary of the Sirsa, forms the boundary between Nalagarh and Patiala Territories. Here the well defined terrace system is interrupted by the Balād Khad. On the opposite bank the road climbs up on T 2. Here, in the neighbourhood of the village Jhirra a stray Chopping-Tool was found. A little further, near Fort Gorakhnath, a pebble Chopper was picked up just next to the road.

#### Mehranwala I & II

At a distance of two miles from the Balād River, on Patiala Territory, the road bypasses on the right the village of Mehranwala. The road here appears to run on T 3; the level thence rises up to T 2 in the direction of Mehranwala. The two terraces at this point are not very well defined. It is certain, however, that T 1 does not exist in this area either. Palaeolithic tools were first discovered just beside the road at the point where the foot path to Mehranwala branches off the Nalagarh — Pinjor/Kalka road.

This site represents the typical T 3 features, i. e. mainly crude rather large Choppers and Chopping-Tools made on pebbles. Altogether implements are none too thickly strewn. On T 2, however, a workshop was found. On the whole it displays the same general features as Khokra-ka-Choa I and Malpur-da-Choa. This site has the additional advantage of being largely devoid of the topsoil deposits which on the other sites have covered up the implimentiferous gravel surface.

The distribution of types, though on the whole the same as that at the other T 2 workshops, differs in detail. In the first place Choppers and Chopping-Tools made on pebbles are more common. The same applies to the discoidal cores. There are also numerous blade-like flake tools which, however, should not be mistaken for Upper Palaeolithic types (Fig. 8 ; 6, 8, 9). The large majority of all artifacts and flakes collected is unrolled and unpatinated. Some of the Chopping-Tools show signs of much wear.

The Mehranwala I site is more extensive than the corresponding Malpur-da-Choa and Khokra-ka-Choa I sites. To the northeast it is bound by the village of Mehranwala (although a few stray implements have been found near the toppled down medieval temple about one furlong behind the village); to the northwest by the elevation marked on the one-inch map as 1428; and to the southeast by the Surajpur Choa. The T 3 site is very extensive, but its exact size was not determined except to the southeast, where it is also bound by the Surajpur Choa.

It may be mentioned here in passing, that the centre of the Mehranwala I site is crowned by a mound belonging to the Harappa Culture.

#### R a m p u r

Across the Surajpur Choa the road bypasses the village of Kona on the right side and again runs below an abrupt and well defined terrace which has been identified as T2. On top of this terrace, less than half a mile from Kona, the village of Rampur, not mentioned on the one-inch map, and not to be mistaken with the village of Rampura nearby, forms the northeastern boundary of another site. Thence the site stretches up to the edge of the terrace just above the road. On the remaining two side, it is bound by two ravines cutting through the terrace. Comparatively few artifacts have been recovered from this site, mainly because the main concentration of implements seems to be at the spot, where-the ruins of an abandoned village are located near the edge of the terrace. Also the gravels are covered with a thick layer of topsoil, which is under cultivation. On the day of exploration time was running very short, and thus only a superficial exploration could be carried out. Nevertheless, one thing was obvious at Rampur. By far the majority of all artifacts are Choppers and Chopping-Tools made on pebbles, though the former are distinctly in the minority. Flakes of any kind are very rare. The Choppers and Chopping-Tools are fairly large and crude. The only implement of a finer type is a flat-based disc with steep peripheral flaking around the dorsal side. A similar disc, as will be recalled, was found at Malpur.

#### R a m p u r a

On this same terrace, rather less than a mile from the Rampur site, across two deep ravines, a few artifacts were picked up. They are all Chopping-Tools made on pebbles. This site was named Rampura after the nearest village to the find spot.

T 3, between the Surajpur Choa and the Kurpuli Nullah, appears to be non-implimentiferous. The Kurpuli Nullah forms the boundary of the Rampura site to the northeast, but of course, on the higher T2 level.

The road level across the Kurpuli Nullah seems to be T3. T2 continues on this side of the above Nullah. Here, on top of T2, immediately above the road, a completely silicified, small fossil bone was found. This find may be significant; on the other hand, it may merely be an outwash of the highly fossiliferous Pinjor Silts

across the Sirsa, though it is difficult to visualize how the bone could have travelled in an upward direction towards a basically higher level. Unfortunately the bone is too small to allow exact identification; it appears to be a long bone fragment of a small mammal.

#### Manakpura

On the same terrace, between the villages of Manakpura and Ramnagar, another fairly rich site was discovered. Here again the gravels are covered with a topsoil deposit at present under cultivation. Nevertheless, a fair number of Choppers and Chopping-Tools made on pebbles as well as some discoidal cores were recovered from the site. In addition to the large pebble tools, some smaller types with steep peripheral flaking from a split pebble base upwards also occur. Again hardly any flakes were found.

The Manakpura site is bound to the southeast by the Chandi Naddi and its various branches beyond which the terraces are taken up again near the village of Chohlowal. In between, rather off the road, a small area near the village of Karanpur seems to be located on a patch of T2. However, this spot was not examined because time was running short on the day of inspection.

#### Chohlowal

Just across the nameless rivulet to the northeast of Chohlowal village the road steeply climbs up to T3. Here, immediately near the roadside, a few crude pebble Choppers were found. T2, on which Chohlowal is located, also yielded some artifacts. Apart from a few Choppers and Chopping-Tools made on pebbles, a number of flakes with plain striking-platforms were found here as well.

#### Kiratpur

About one mile from this site the road crosses the last Nullah, locally known as the Chhota Sirsa, i. e. the Little Sirsa, before the turn towards the mountains of the Sirsa River. What appears to be T2, a high terrace to the northeast, immediately beside the road, seemed to be a likely spot for artifacts. None, however, were found. Just beyond the village of Kiratpur, which is located on this terrace, the general geological picture changes.

Whilst the general level still appears to be T2, this terrace is very badly eroded, and seems to have been partly washed away by a recent shift of one of the Sirsa beds. There also appears to be some evidence of comparatively recent, large scale erosion of the Pinjor Silts from the nearby cliffs just across the Sirsa River: very large heaps of loosely consolidated silts lying around seem to indicate this possibility. It should be noted here, that the further upriver we move, the narrower the channel of the river becomes. At the point at which the Sirsa bends towards its headwaters, near the village of Basawal, the Upper Pleistocene cliff formations follow



along the bend of the river, thus being placed at a right angle to the terraces on the opposite bank of the river, subjecting these terraces to periodic deposition of erosional materials derived largely from the Pinjor Silts. These materials, in their turn, are rarely allowed time to consolidate, since the annual flooding of the Sirsa as well as the Monsoon precipitations remove most of them. This forms a bottle neck between the cliffs to the south and the terraces to the north. Beyond this, to the southeast, lies the contagious watershed of the Jhajra.

In this area a few large and rolled flakes with plain striking platforms, as well as a few Chopping-Tools made on pebbles were found. These were evidently not in situ.

#### Sirsa Bridge

We shall now turn towards the other end of the Sirsa Valley. The fossiliferous Sirsa cliffs, forming the Upper Pleistocene deposits of the region, from the Sirsa bridge near Nalagarh up to Pinjor have been examined at two points within Nalagarh State. At the great Sirsa bridge, just near the fourth milestone on the Nalagarh-Rupar road, the following evidence was recorded.

The bottom of the deposits consists of an extremely loose grey sand covering about fifty feet, as measured from the river bed. Above this, some seventy feet of banded Pinjor Silts (fossiliferous) are covered by fifteen feet of a well cemented boulder conglomerate which appears to represent the Boulder Conglomerate of the West-Punjab. If this is correct, the silts and gravels above, measuring approximately eight and six feet respectively, may represent T 1. However, one thing should be mentioned: whilst in the West-Punjab the Boulder Conglomerate consists largely of quartzite pebbles, the deposit here is mainly made up of sandstone boulders and pebbles similar to those abundantly found on and in the terraces within the Sirsa Valley.

It has been suggested that this conglomerate represents the overlap of the Una Beds onto the Pinjor Silts, in which case it would be a little earlier than the Boulder Conglomerate in the West-Punjab. At any rate, on top of the overlying gravels a very few, very crude, large quartzite flakes with plain striking-platforms were found.

The deposits near the Sirsa bridge are tilted. This results in the boulder conglomerate touching the surface about one mile up river. However, near the village of Mundiarpur, some two miles up river from the bridge, this deposit reappears about twice as thick as it is near the bridge.

#### Mundiarpur

Some burials that appear to be late prehistoric, were discovered in the silts of the top deposits of the cliffs near the village of Mundiarpur at a point locally known as Haddiwala Tibba. Human bones here stick out about four feet below surface in the section of the main cliff break-down towards the Sirsa River. This point is about 200 feet above the level of the river on an abrupt and extremely steep edge, magnificently overlooking the valley. Since the burials took place, erosion has progressed very sub-

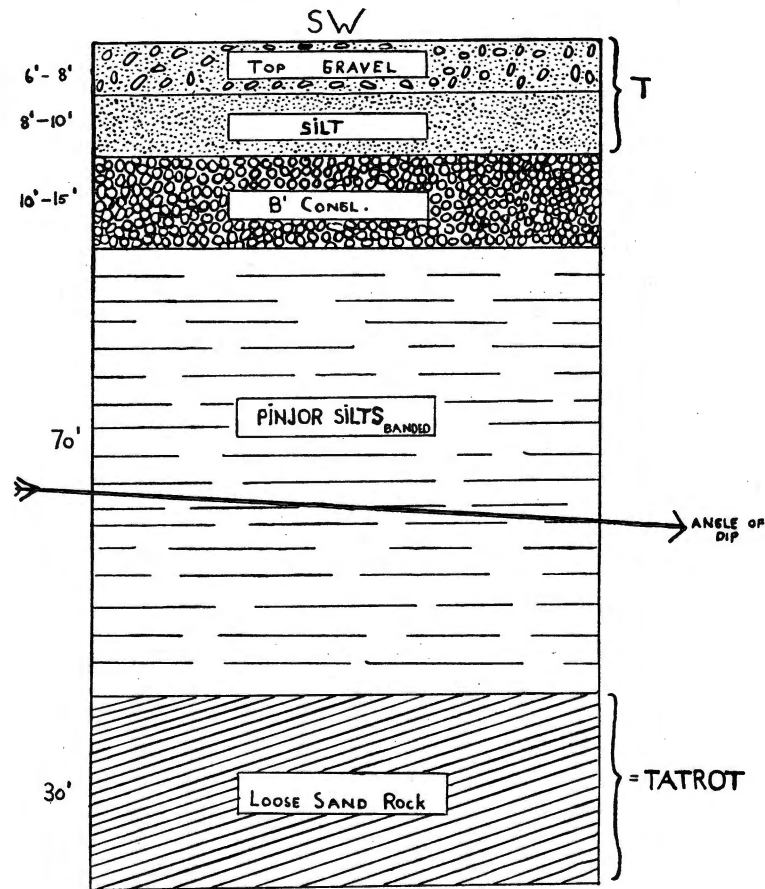


Fig. 5. Section near the Sirsa Cliffs.

stantially. The entire surrounding area, in particular the immediate neighbourhood of the burials, consists of nothing but steep gullies and slopes, loosely strewn with indefinable, much weathered potsherds.

Regarding these burials, which should be excavated at an early date, the following observations can very tentatively be made. It has been reasoned, that whenever man had settled up here, the area could not possibly have been as eroded as it is now, but must have been somewhat flat and, incidentally, much further removed from the present edge of the cliffs. Judging by the recent and sub-recent progress of erosion, which is well documented locally, at least 3 000 years seem to have elapsed since this spot could have been profitably settled. The bones exposed are very brittle and in a state of partial fossilization.

The pottery remains consist of quantities of tiny sherds made of red, poorly fired clay, rarely bearing any decorations. Occasionally painted sherds occur, but the

designs seem to consist of black bands only. These remains can be found over a wide area all along the edge of the cliff but rarely extending more than a few yards into the inside region, i. e. away from the very edge of the cliffs.

#### Dhang

As the main road between Nalagarh and Rugar leaves Nalagarh, it is flanked on the right side, between the third and fifth milestones, at first by the Chikni Naddi and, after the same has joined the Sirsa near Zakāt Khana, by the latter river. The right banks of these two watercourses are formed first, by the recent alluvium which we have named within the Sirsa Valley T4. Next to this, a very high terrace, about eighty feet high, near Zakāt Khana, but somewhat dropping in height towards the Sutlej River to the west, rises out of T4. This indicates that T3 is missing here. Consequently, providing these calculations are correct, this terrace represents T2. The stratigraphical composition of this terrace, however, is different from the usual T2 formations encountered within the Sirsa Valley. Instead of the medium-to ill-defined poorly or non-stratified gravels of varied thickness overlying a silt deposit, the terrace near Zakāt Khana consists of three well - defined stages, which from bottom to top read as follows:

- a) 40'—50' Silts.
- b) 8'—10' Well cemented gravel conglomerate.
- c) 15'—20' Loose, unstratified top gravels.

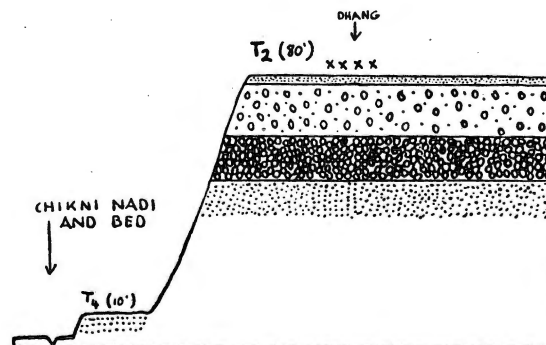


Fig. 6. Section through the Terraces at Dhang.

This terrace is very extensive. It was examined near the village of Dhang, opposite Zakāt Khana (not to be mistaken with Dhang opposite Rajpura), and near the fortress Palasi, the former State Capital of Nalagarh. Behind Dhang, at a distance of about a mile, there is an abrupt higher elevation which would appear to represent T1 (see map). About a furlong southwest of this village, on the edge of the terrace around the Harappa graveyard, discovered incidentally during the examination of

the area, large quantities of Choppers and Chopping-Tools made on pebbles, flakes with plain and prepared striking-platforms, points and a variety of other implements and waste flakes indicating a workshop, were found. The site is very rich and quite extensive, and numerous stray implements were recovered over an area of very considerable size.

Though this terrace was not explored very extensively, it is more than likely that a number of other Palaeolithic sites exist along its edge.

#### D h e r M a j r a

Following the Nalagarh—Rupar road further down towards Rupar, after crossing the Sirsa River and the Kānāhan Naddi, the Harappa site of Dher Majra (Bikkun) is reached. This site is located on T 3. A number of pebble Choppers and Chopping-Tools as well as numerous flakes with plain striking platforms were picked up from here. The site stretches up to the village Bikkun, though due to a thick cultivated topsoil, implements here are not very common. The artifacts lying on top of the twelve feet of Harappa deposits obviously have been washed down from a higher level. The general habitus of the Dher Majra artifacts is that of typical T 2 assemblage. It therefore seems justified to assume that the original site is located somewhere on T 2, which would appear to be present near the village of Sahu Mazra and Ghanaula Fort. At the time of the present exploration crops were standing on this terrace; hence it could not be examined in detail.

#### F o s s i l S i t e s

Mention may be made here of the fossil sites in the Pleistocene cliffs which were examined in the course of the Stone Age research. The largest fossil area investigated is that behind the village of Basawal, three miles from Pinjor, near the Sirsa/Jhajra watershed. Here, imbedded in the huge Pinjor Silt deposits, a large variety of completely silicified bones of a typical Lower Pleistocene fauna was discovered. Various types of *Elephas*, notably *Elephas planifrons* and *Elephas meridionalis*, as well as bones of *Bos acutifrons*, *Equus* and *Sus* are very common. Also antler occurs in considerable quantities.

Other sites nearer Nalagarh are Kursiwala Tibba and Tib Tibba, both near Mundiarpur village. Here the Pinjor Silts are considerably thinner than further up the valley. This may be the reason why fossils are not so abundant at these sites.

The fossil materials are being studied and it is intended to publish them separately in the near future.

#### F o s s i l W o o d

Fossil wood occurs imbedded in the Nalagarh Sandstones, which are a subdivision of the Nahan formation, of probably Miocene age. The Nalagarh Sandstones form the first mountain ridge on the spurs of which Nalagarh town is located. The wood is Dicotyledonous wood, and it occurs in great abundance wherever the Nalagarh

Sandstones are slightly eroded. A very large chunk was found in situ just behind the present State Guest House at Nalagarh. All along the spurs towards the Khokra-ka-Choa sites, fragments, some of very considerable size, were picked up.

A fragment of fossil wood found in the Sirsa cliffs behind the great bridge undoubtedly represents an outwash from the period before the formation of the Sirsa Valley. The distance from this point to the Nalagarh Sandstones is a little over four miles. The same applies to a fragment found at Dhang and a large piece recovered at Malpur-da-Choa.

### Conclusions

The following facts may be deduced from the above pages; Implements were recovered from two terraces styled T2 and T3, in the descending order. T4, forming the recent alluvium, is non-implementiferous, whilst T1 appears to occur on top of the Sirsa cliffs near the great bridge and behind Dhang. A few doubtful, crude flakes were recovered from this deposit, but they are not very convincing as artifacts. The implements found are generally unpatinated and unrolled. There are only a few such specimens from Kiratpur and some stray specimens from other sites. It should be pointed out here, that patination on quartzite is not readily detectable. The main types of implements recovered from T2 and T3 are Choppers and Chopping-Tools made on pebbles, the Choppers occurring not as commonly as the Chopping-Tools. On T2 the proportion of flake implements and, in the case of factory sites, waste flakes, is considerably greater than that of Choppers and Chopping-Tools. The ratio is 5 to 1. On T3, however, Chopper and Chopping-Tools dominate, though artifacts are very much more thinly strewn on this terrace than on T2. It would appear, though, that Choppers and Chopping-Tools exist in roughly equal distribution on both terraces.

In addition to Choppers and Chopping-Tools of the general crude type occurring on T3, on T2 there also exist more delicately and symmetrically flaked types. The former variety (Fig. 4) strongly resembles such late Sohan artifacts as those illustrated by De Terra on Pl. XLI, 4, 5. This, however, does not mean that the assemblage is a late Sohan assemblage: On the contrary, the general appearance of the materials as well as the geological context distinctly point towards an early Sohan industry. The symmetrical types (Fig. 7) do not seem to have any parallels in the West-Punjab. All Choppers and Chopping-Tools are invariably made on pebbles.

Among the flake tools from T2, the comparatively large proportion of triangular points (Fig. 7 ; 12, 13; 8 ; 1, 2, 3, 4, 5, 7) should be noted. This again would appear to be a feature not present in the West-Punjab. Again, flakes with prepared striking-platforms do occur, but they are very rare indeed if viewed in terms of the overall assemblage. The proportion to flakes with plain striking-platforms is about 30 to 1.

T2 has yielded quantities of discoidal cores (Fig. 4 ; 2, 3, 4, 5). These, however, are quite different in type from those in the West-Punjab. They exhibit an unique feature, namely convergent flaking on the dorsal side only. The ventral side is invariably formed by the untouched pebble cortex. Handaxes have not been found at all.

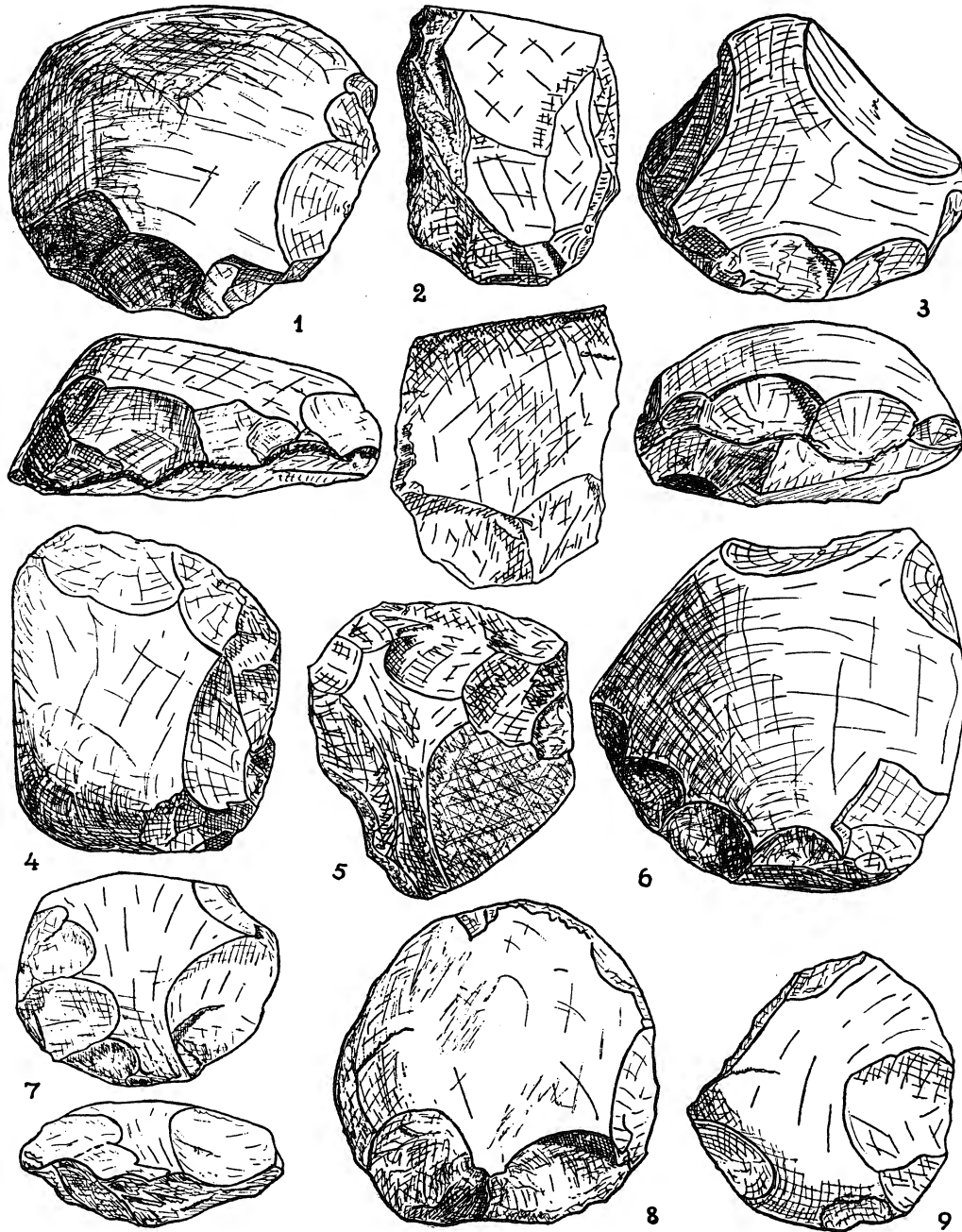


Fig. 3. Artefacts. 1/2 size.

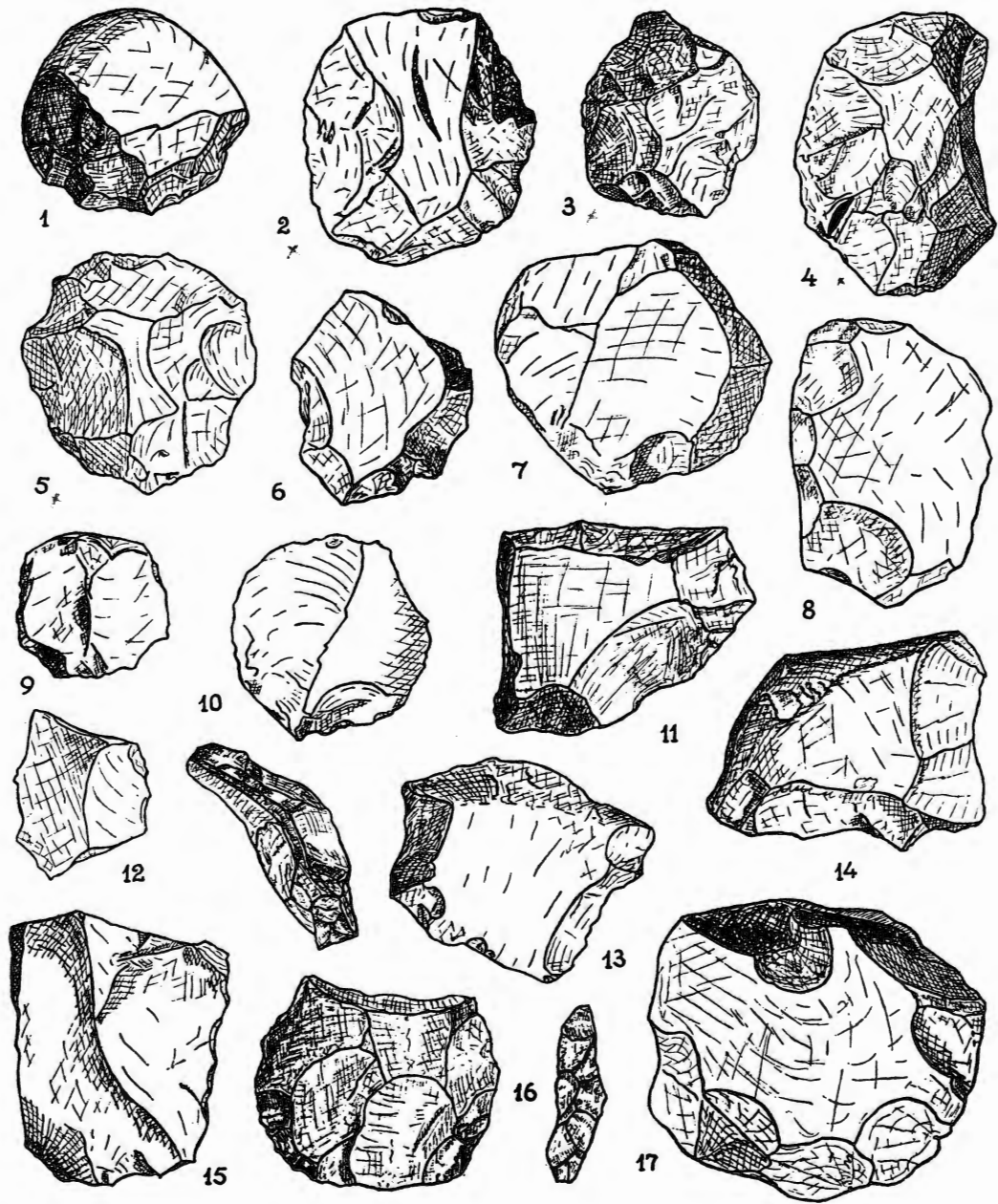


Fig. 4. Artefacts.  $\frac{1}{2}$  size.

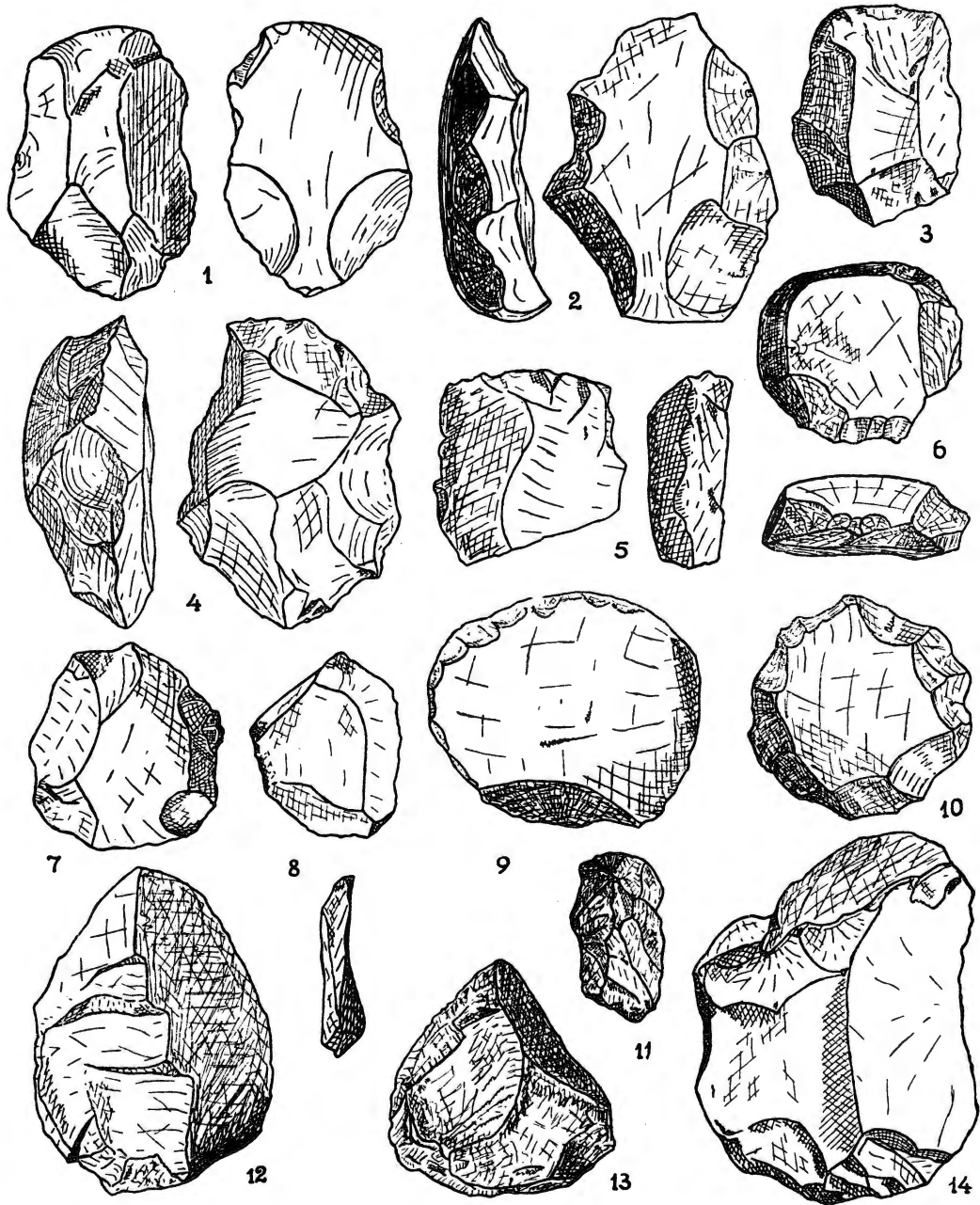


Fig. 7. Artefacts.  $\frac{1}{2}$  size.



There is one single specimen which may or may not be a very crude biface. Retouched flakes are rare, a fact also noted by De Terra in the West-Punjab. Frequently the bulbs of percussion on the flake implements have been removed, by secondary working, a feature which does not seem to occur in the West-Punjab to any great extent.

Among the Choppers, De Terra's Early Sohan types with split or cleaved bases such as those, illustrated on Pl. XXXIV, 1, 2, 4, have their parallels in the Sirsa Valley (Fig. 4; 14). Also types vaguely resembling cleavers occur in small quantities (Fig. 3; 2). The anvil stones found in the Sirsa Valley are unparalleled anywhere in India.

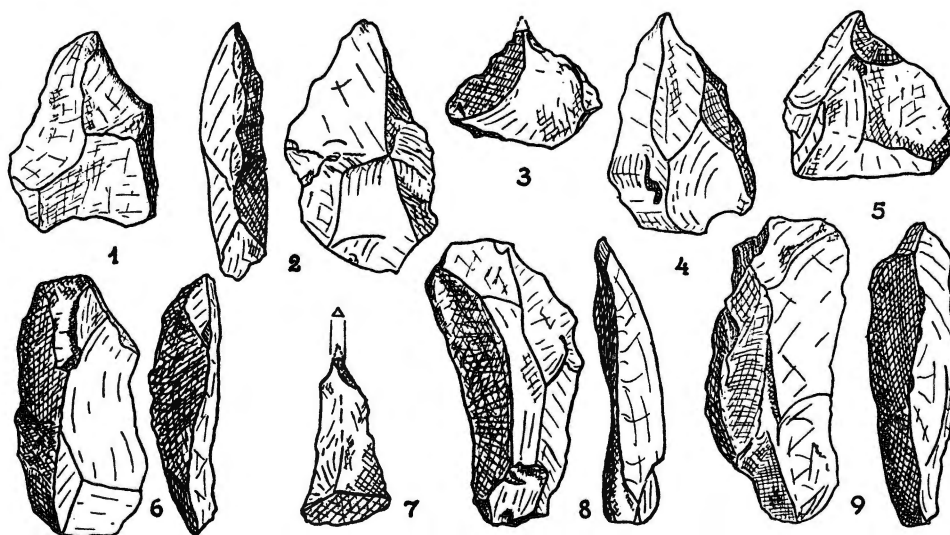


Fig. 8. Artefacts.  $\frac{1}{2}$  size.

A few words may be said here regarding some Palaeolithic implements allegedly found in the 1920's in the Siwaliks near Simla, and subsequently published, but not illustrated by Mr. Dharani Sen (1938). Mr. Sen states that the location of the site or sites was unknown to him, since the implements were collected but never marked or labelled by an officer of the Geological Department, now dead. Nevertheless, Mr. V. D. Krishnaswamy, on the strength of this evidence states in *Ancient India* No. 3, (p. 26) that Sohan artifacts were found as far away from the type sites as Simla. Moreover, Mr. Sen states that the assemblage shows typical Mousterian characteristics, which can hardly be said about the Sohan complex of artifacts.

After a careful study of Mr. Sen's article, the writer considers it very unlikely that the artifacts described have come from the Siwaliks near Simla. Apart from purely typological reasons, the fact that a fair number of these specimens are made of flint seems to indicate this. Flint is the one material Lower Paleolithic

artifacts in this region are never made of, presumably because it does not occur anywhere in the Siwaliks around Simla. A glance at a geological map of the region will show this clearly. Also, judging by the geography and geology of the region around Simla it is hard to visualize where Lower Palaeolithic sites could be located.

The present writer takes this opportunity to indicate here possibilities for further research in Stone Age history in the Siwalik region. In the first place, of course, some more work should be carried out in the Sirsa Valley. Apart from that, the Jhajra/Kaushalia River complex near Kalka requires extensive exploration, since here again fine sets of terraces are flanking the river banks. The Sutlej Valley above Rupar and the Sohan Valley near Hoshiarpur (Una Tahsil, Hoshiarpur District, Punjab (I); not to be mistaken with the Sohan Valley in the West-Punjab), which joins the Sutlej opposite Anandpur, are also of great interest. Here again, fans and terraces along the banks of the river are very likely to yield Palaeolithic remains.

Finally, I wish to thank the following for their collaboration: His Highness the Maharajadhiraj Sir Yadavendra Singh of Patiala; Colonel Surinder Singh, Raja of Nalagarh; Mr. Hilary Waddington, M. B. E., of the Department of Archaeology, Government of India; Drs. V. H. Boileau and K. Jacob, as well as Mr. B. N. Raina of the Geological Survey of India; Mr. Dharani Sen of the Anthropological Department of Calcutta University, who inspected some of the sites with me and tendered most valuable advice; Dr. H. L. Movius of Harvard University; and above all to Mr. K. A. D. Naoroji of Tata Industries and the Sir Ratan Tata Trust, who made this work possible.

#### Glossary

A few terms of Indian origin demanding explanation have been used in this report, because they occur on the official maps of the Survey of India. They are:

- Choa : A seasonal brook or stream.
- Khad : A valley basin.
- Naddi : A perennial stream or river.
- Nullah : A natural drainage channel subject to rapid erosion.
- Tibba : A dune or cliff.

The maps used here are based on the Survey of India one inch to a mile sheets

53  $\frac{A}{12}$ ; 53  $\frac{B}{9}$ ; 53  $\frac{B}{13}$ .

Analysis of Artifacts

- No. : Fig. 3 ; 1.  
Site : Dhang.  
Level : T2.  
Material : Ochre/brown quartzite.  
Type : Chopper made on a split pebble.  
Dorsal : The pebble cortex covers the entire surface except for the steeply flaked, lower and right functional peripheries.  
Ventral : Split base produced by artificial cleavage.  
Condition : Unworn and unpatinated.
- No. : Fig. 3 ; 2.  
Site : Khokra-ka-Choa II.  
Level : T3.  
Material : Ochre/brown quartzite.  
Type : Cleaver.  
Dorsal : The upper part of the surface consists of pebble cortex. Two roughly parallel flakes have been struck off the lower functional edge.  
Ventral : Three large, shallow flake scars cover the upper and central parts of the surface. On the right and left peripheries steep, resolved flaking. Flake scars at the functional edge correspond to dorsal flaking.  
Condition : Unworn and unpatinated.
- No. : Fig. 3 ; 3.  
Site : Rampur.  
Level : T2.  
Material : Wine-red quartzite.  
Type : Chopping-Tool made on a pebble.  
Dorsal : The butt is broken. The central and upper surfaces are covered by pebble cortex. Steep flaking on the lower and left functional peripheries.  
Ventral : One large primary flake scar due to attempted cleavage. Flaking along the functional peripheries corresponds to dorsal flaking.  
Condition : Unworn and unpatinated.
- No. : Fig. 3 ; 4.  
Site : Dhang.  
Level : T2.  
Material : Wine-red quartzite.  
Type : Chopping-Tool made on a pebble.  
Dorsal : The entire surface, except for the lower and right functional peripheries which are characterised by steep flaking, is covered by pebble cortex. Very massive and broad pebble butt.  
Ventral : Similar to dorsal side.  
Condition : Unworn and unpatinated.
- No. : Fig. 3 ; 5.  
Site : Khokra-ka-Choa II.  
Level : T3.

Material : Ochre quartzite.  
 Type : Massive Chopper made on a split pebble.  
 Dorsal : A patch of pebble cortex covers the upper part of the surface. The butt on top is worked into a flat surface. The entire lower functional half of the artifact is covered with steep flaking.  
 Ventral : Split base produced by artificial cleavage.  
 Condition : Unworn and unpatinated.

No. : Fig. 3 ; 6.  
 Site : Dhang.  
 Level : T2.  
 Material : Mauve/light mauve quartzite.  
 Type : Massive Chopping-Tool made on a split pebble.  
 Dorsal : The pebble cortex covers the entire dorsal surface except for the lower and left functional peripheries which are characterised by steep flaking. The two scars on the butt seem to be the result of an attempt to give some shape to the latter.  
 Ventral : The pebble cortex covers the upper part of the surface. Large negative flake-scars in the centre at an obtuse angle to the upper pebble cortex which served as striking-platform when the pebble was originally split. Resolved flaking on the left (dorsal right) periphery. Smaller secondary scars correspond to dorsal flaking.  
 Condition : Slightly worn but not patinated.

No. : Fig. 3 ; 7.  
 Site : Mehranwala I.  
 Level : T2.  
 Material : Wine-red/olive quartzite.  
 Type : Chopping-Tool made on a split pebble.  
 Dorsal : The entire surface, except for three flake scars on the lower functional edge, is covered by pebble cortex. Prepared butt on top.  
 Ventral : Split base with deep fissures.  
 Condition : Unworn and unpatinated.

No. : Fig. 3 ; 8.  
 Site : Manakpura.  
 Level : T2.  
 Material : Light ochre quartzite.  
 Type : Chopping-Tool made on a pebble.  
 Dorsal : The pebble cortex covers the entire surface, except for the lower, right and left functional peripheries which are characterised by steep flaking.  
 Ventral : Elaborate flaking all over the surface. Peripheral flaking on the edges corresponds to dorsal scars.  
 Condition : Slightly worn but not patinated.

No. : Fig. 3 ; 9.  
 Site : Khokra-ka-Choa II.  
 Level : T3.  
 Material : Brown/gray quartzite.  
 Type : Chopping-Tool made on a pebble.

Dorsal : Flaking around three quarters of the periphery with a patch of pebble cortex stretching from the upper part of the surface downwards.  
Ventral : Same as dorsal side but little pebble cortex left.  
Condition : Unworn and unpatinated.

No. : Fig. 4 ; 1.  
Site : Dhang.  
Level : T2.  
Material : Deep mauve quartzite.  
Type : Small Chopper made on a pebble.  
Dorsal : The upper surface is covered by pebble cortex. The lower functional surface is characterised by elaborate, steep flaking.  
Ventral : Pebble cortex; no flaking.  
Condition : Slightly patinated but unworn.

No. : Fig. 4 ; 2.  
Site : Mehranwala I.  
Level : T2.  
Material : Mauve quartzite.  
Type : Discoidal core.  
Dorsal : Delicate flaking all over the surface.  
Ventral : The entire surface is covered by pebble cortex.  
Condition : Unworn and unpatinated.

No. : Fig. 4 ; 3.  
Site : Mehranwala I.  
Level : T2.  
Material : Slate-gray quartzite.  
Type : Small discoidal core.  
Dorsal : Delicate flaking all over the surface.  
Ventral : The entire surface is covered by pebble cortex.  
Condition : Unworn and unpatinated.

No. : Fig. 4 ; 4.  
Site : Malpur-da-Choa.  
Level : T2.  
Material : Olive-brown/slate-gray quartzite.  
Type : Discoidal core.  
Dorsal : Delicate flaking all over the surface.  
Ventral : The entire surface is covered by pebble cortex. Partly broken.  
Condition : Slightly patinated but unworn.

No. : Fig. 4 ; 5.  
Site : Khokra-ka-Choa I.  
Level : T2.  
Material : Mauve quartzite.  
Type : Discoidal core.  
Dorsal : Delicate flaking all over the surface.  
Ventral : The entire surface is covered by pebble cortex.  
Condition : Unworn and unpatinated.

No. : Fig. 4 ; 6.  
 Site : Manakpura.  
 Level : T2.  
 Material : Brown quartzite.  
 Type : Small flake tool.  
 Dorsal : Pebble cortex forms the upper left and central surfaces of the artifact. Steep flaking along the lower left and right peripheries indicates the functional edge.  
 Ventral : The striking-platform on top has been removed by deliberate flaking. Several longitudinal flake-scars cover the ventral surface.  
 Condition : Unworn and unpatinated.

No. : Fig. 4 ; 7.  
 Site : Mehranwala I.  
 Level : T2.  
 Material : Brown Quartzite.  
 Type : Discoidal flake tool with plain striking-platform.  
 Dorsal : One large flake scar in the centre. Pebble cortex forms striking-platform on top. Peripheral flaking all around the implement. The fine point at the lower edge seems deliberate.  
 Ventral : Two large primary scars. Marked bulbs of percussion. Obtuse striking-angles.  
 Condition : Unworn and unpatinated.

No. : Fig. 4 ; 8.  
 Site : Khokra-ka-Choa I.  
 Level : T2.  
 Material : Brown quartzite.  
 Type : Chopping-Tool made on a poorly split pebble.  
 Dorsal : The central and right parts of the surface are covered by pebble cortex. The lower and left functional peripheries are characterised by several deep, but rather shallow flake scars.  
 Ventral : This artifact has a poorly split or cleaved base resulting in a thick functional end and a rather thin butt. There are some flaking attempts on the functional edge to correct this defect.  
 Condition : Unworn and unpatinated.

No. : Fig. 4 ; 9.  
 Site : Mehranwala I.  
 Level : T2.  
 Material : Red-brown quartzite.  
 Type : Small flake tool with plain striking-platform.  
 Dorsal : Two large flakes struck off from the right and left sides respectively thus forming a central ridge. No pebble cortex. Lower end retouched.  
 Ventral : One large primary flake scar. Pebble cortex forms striking-platform on top. Marked bulb of percussion. Obtuse striking-angle.  
 Condition : Unworn and unpatinated.

No. : Fig. 4 ; 10.  
 Site : Khokra-ka-Choa I.  
 Level : T2.

Material : Ochre quartzite.  
Type : Discoidal flake tool with plain striking-platform.  
Dorsal : Pebble cortex covers the upper right surface of the implement. One large flake scar on the left side. A small flake has been struck off the lower right edge in such a manner as to produce a small point at the bottom of the artifact.  
Ventral : One large primary scar. Pebble cortex forms striking-platform on top. Marked bulb of percussion. Obtuse striking-angle.  
Condition : Unworn and unpatinated.

No. : Fig. 4 ; 11.  
Site : Manakpura.  
Level : T2.  
Material : Light ochre quartzite.  
Type : Flat-based Chopper made on a split pebble.  
Dorsal : The central surface is formed by pebble cortex. Very steep, almost vertical flaking along the upper edges. Medium steep flaking along lower functional edge.  
Ventral : Flat base produced by splitting the pebble.  
Condition : Unworn and unpatinated.

No. : Fig. 4 ; 12.  
Site : Khokra-ka-Choa I.  
Level : T2.  
Material : Freckled wine-red quartzite.  
Type : Small, broken flake tool with plain striking-platform.  
Dorsal : No pebble cortex. Two large flakes struck off from the right and left sides respectively thus forming a central ridge. Lower end broken.  
Ventral : One large primary flake scar. The striking-platform on top is formed by pebble cortex. Well defined bulb of percussion. Obtuse striking-angle.  
Condition : Unworn and unpatinated.

No. : Fig. 4 ; 13.  
Site : Malpur-da-Choa.  
Level : T2.  
Material : Brown quartzite.  
Type : Flat. Chopper-like implement made on a split pebble.  
Dorsal : The entire surface, with the exception of the right and left peripheries which appear to be functional, are covered by pebble cortex. The functional edges are steeply flaked.  
Ventral : Split base with deep fissures.  
Condition : Unworn and unpatinated.

No. : Fig. 4 ; 14.  
Site : Malpur-da-Choa.  
Level : T2.  
Material : Wine-red/gray quartzite.  
Type : Flat-based Chopper made on a split pebble.  
Dorsal : The upper and left parts of the surface are formed by pebble cortex. Steep flaking on lower and right functional peripheries.  
Ventral : Flat base produced by splitting the pebble.  
Condition : Unworn and unpatinated.

No. : Fig. 4 ; 15.  
 Site : Mehranwala I.  
 Level : T2.  
 Material : Gray quartzite.  
 Type : Heavy-butted flake tool with plain striking-platform.  
 Dorsal : Two large scars cover the entire surface of the implement. The lower and right peripheries appear to be functional. This seems to be indicated by some vague retouch flaking on these edges.  
 Ventral : Pebble cortex forms striking-platform on top. Well developed bulb of percussion.  
 Condition : Unworn and unpatinated, but somewhat rolled.

No. : Fig. 4 ; 16.  
 Site : Mehranwala I.  
 Level : T2.  
 Material : Deep mauve quartzite.  
 Type : Discoidal core tool with facetting on the right side.  
 Dorsal : Accidentally broken top. Delicate flaking all over the surface. Retouched at the lower left. The entire lower periphery is functional.  
 Ventral : Two large flake scars with positive bulbs on opposing right and left sides form a depression in the center.  
 Condition : Worn but not patinated.

No. : Fig. 4 ; 17.  
 Site : Dhang.  
 Level : T2.  
 Material : Ochre quartzite.  
 Type : Massive Chopping-Tool made on a pebble.  
 Dorsal : The central and left parts of the surface are covered by pebble cortex. The butt on top has been artificially flattened by flaking. The lower functional periphery is characterized by steep flaking.  
 Ventral : Same as dorsal side. The flaking on the functional edge corresponds exactly to the dorsal flaking thus creating a fine chopping edge.  
 Condition : Somewhat worn but not patinated.

No. : Fig. 7 ; 1.  
 Site : Khokra-ka-Choa I.  
 Level : T2.  
 Material : Wine-red quartzite.  
 Type : Evolved, symmetrically worked Chopping-Tool made on a pebble.  
 Dorsal : Pebble cortex covers the entire surface of the artifact with the exception of two symmetrically corresponding flakes struck off the lower right and left edges respectively. Delicate trimming at the lower edge.  
 Ventral : No pebble cortex. Three parallel flake scars, one in the center, the others on the right and left sides respectively. Some flaking at the lower functional end, which was intended to thin out the working edge.  
 Condition : Unworn and unpatinated.

No. : Fig. 7 ; 2.  
 Site : Mehranwala I.  
 Level : T2.



Material : Mauve quartzite.  
Type : Elongated core tool made on a rather flat, split pebble.  
Dorsal : Pebble cortex stretches vertically down the entire centre of the surface. Steep flake scars on the right and left functional peripheries.  
Ventral : Cleavage of the pebble has produced one large negative scar in the centre. Rather indistinct flaking, apparently intended to thin out the functional edges, covers the entire periphery with the exception of the butt.  
Condition : Unworn and unpatinated.

No. : Fig. 7 ; s.  
Site : Khokra-ka-Choa I.  
Level : T2.  
Material : Mauve quartzite.  
Type : Chopper made on a split pebble.  
Dorsal : No pebble cortex. One large flake scar in the centre. Flaking on right, left and lower functional peripheries.  
Ventral : Split base produced by artificial cleavage.  
Condition : Unworn and unpatinated.

No. : Fig. 7 ; 4.  
Site : Khokra-ka-Choa II.  
Level : T3.  
Material : Yellow quartzite.  
Type : Chopping-Tool made on a split pebble.  
Dorsal : A patch of pebble cortex covers the centre of the surface. The upper left part of the artifact is broken. The entire lower part is functional and characterized by numerous long and deep, parallel flake scars.  
Ventral : Split base. Indistinct peripheral flaking corresponds to dorsal flaking on the functional end.  
Condition : Unworn and unpatinated.

No. : Fig. 7 ; 5.  
Site : Khokra-ka-Choa I.  
Level : T2.  
Material : Dull mauve quartzite.  
Type : Broad blade-like artifact made on a flake.  
Dorsal : Two large flake scars on each side of the surface determine the central ridge. Slight retouches on the left periphery. No pebble cortex.  
Ventral : On large primary scar. Pebble cortex forms striking-platform on top. Marked bulb of percussion. Obtuse striking-angle.  
Condition : Unworn and unpatinated.

No. : Fig. 7 ; e.  
Site : Rajpura.  
Level : T3.  
Material : Mauve quartzite.  
Type : Small, tabular Chopping-Tool made on a split pebble.  
Dorsal : Pebble cortex covers the upper and left edges. One large shallow flake scar in the centre of the surface. Small scars along the lower functional periphery.

- Ventral** : Split base. Flaking along the functional periphery corresponding to dorsal flaking.  
**Condition** : Unworn and unpatinated.  
**No.** : Fig. 7 ; 7.  
**Site** : Khokra-ka-Choa I.  
**Level** : T2.  
**Material** : Ochre quartzite.  
**Type** : Disc-shaped artifact made on a split pebble.  
**Dorsal** : Pebble cortex covers the centre of the surface. Fairly steep flaking around almost the entire periphery.  
**Ventral** : Split base produced by artificial cleavage.  
**Condition** : Unworn and unpatinated.  
**No.** : Fig. 7 ; 8.  
**Site** : Khokra-ka-Choa I.  
**Level** : T2.  
**Material** : Gray quartzite.  
**Type** : Small point made on a flake.  
**Dorsal** : Originally two large flakes were struck off, one from each side thus determining central ridge. Subsequently the removal of a large central flake, intended to flatten the artifact, removed the central ridge. The tip of the point is broken. No pebble cortex.  
**Ventral** : One large primary scar. Pebble cortex on top forms striking-platform. Marked bulb of percussion with a deep bulbar scar. Obtuse striking-angle.  
**Condition** : Unworn and unpatinated.  
**No.** : Fig. 7 ; 9.  
**Site** : Khokra-ka-Choa I.  
**Level** : T2.  
**Material** : Wine-red quartzite.  
**Type** : Discoidal core tool made on a flat pebble.  
**Dorsal** : Pebble cortex covers the entire surface with the exception of the lower and lower left functional edges which are characterised by delicate small and shallow flake scars. The right side of the artifact is broken.  
**Ventral** : One large primary scar. The pebble cortex carried over from the dorsal side on top forms the striking-platform. Marked bulb of percussion. Obtuse striking-angle.  
**Condition** : Somewhat worn but unpatinated.  
**No.** : Fig. 7 ; 10.  
**Site** : Malpur-da-Choa.  
**Level** : T2.  
**Material** : Brown quartzite.  
**Type** : Disc made on a flat split pebble.  
**Dorsal** : A large circular patch of pebble cortex covers the centre of the surface. Very steep flaking around the entire artifact.  
**Ventral** : Split base produced by artificial cleavage.  
**Condition** : Unworn and unpatinated.  
**No.** : Fig. 7 ; 11.  
**Site** : Malpur-da-Choa.

- Level : T2.  
Material : Mauve/brown quartzite.  
Type : Small end scraper-like implement made on a flake.  
Dorsal : Small delicate flaking all over the surface. Steep flaking on the upper periphery. No pebble cortex.  
Ventral : Two irregular primary scars seem to be conditioned by a flaw in the stone. The striking-platform and bulb of percussion at the lower end have been deliberately removed. Bulbar fissures are traceable.  
Condition : Unworn and unpatinated.
- No. : Fig. 7 ; 12.  
Site : Malpur-da-Choa.  
Level : T2.  
Material : Wine-red quartzite.  
Type : Large point made on a flake.  
Dorsal : Pebble cortex covers the entire left surface. Several flake scars on the right side determine the central ridge.  
Ventral : One large primary scar. Pebble cortex carried over from dorsal side forms the striking-platform on top of the implement. Marked bulb of percussion. Obtuse striking angle.  
Condition : Unworn and unpatinated.
- No. : Fig. 7 ; 13.  
Site : Malpur-da-Choa.  
Level : T2.  
Material : Ochre quartzite.  
Type : Very thin point made on a flake.  
Dorsal : The lower left surface near the periphery is formed by a patch of pebble cortex. Several shallow flake scars cover the remainder of the surface, Indistinct flaking on top.  
Ventral : One large primary scar. The striking-platform and bulb of percussion have been deliberately removed.  
Condition : Slightly worn but unpatinated.
- No. : Fig. 7 ; 14.  
Site : Mehranwala I.  
Level : T2.  
Material : Gray/green quartzite.  
Type : Massive end scraper made on a flake.  
Dorsal : Pebble cortex covers the top, being the striking-platform if viewed from the ventral side. One large flake scar on the right side determines the central ridge. Several scars on the left side. The lower functional end is marked by steep, partly resolved flaking.  
Ventral : This side is formed by a flat base produced by cleavage. The bulb of percussion is flat, but there are deep bulbar fissures. The striking-angle is acute.  
Condition : Unworn and unpatinated.
- No. : Fig. 8 ; 1.  
Site : Malpur-da-Choa.  
Level : T2.  
Material : Yellow quartzite.

- Type : Small point made on a flake.  
 Dorsal : The left side of the implement is broken. No pebble cortex. Three flake scars cover the entire surface. Of these the lower right and left ones determine the shape of the point.  
 Condition : One large primary scar. The striking-platform and bulb of percussion have been deliberately removed.  
 Ventral : Unworn and unpatinated.
- No. : Fig. 8 ; 2.  
 Site : Khokra-ka-Choa I.  
 Level : T2.  
 Material : Light brown quartzite.  
 Type : Small point made on a flake.  
 Dorsal : Two large flake scars cover most of the surface. Steep flaking on the left edge, Retouched lower right periphery.  
 Ventral : One large primary scar. Pebble cortex on top forms striking-platform. Marked bulb of percussion. Obtuse striking-angle.  
 Condition : Unworn and unpatinated.
- No. : Fig. 8 ; 3.  
 Site : Khokra-ka-Choa I.  
 Level : T2.  
 Material : Mauve quartzite.  
 Type : Small point or borer made on a flake.  
 Dorsal : One large flake scar on the left side determines the excentric ridge on the right side which runs right down to the broken tip of the artifact thus giving it a triangular cross-section. One small retouch scar on the lower left edge of the tip.  
 Ventral : Facetted striking-platform on top. One large primary scar. Poor bulb of percussion. Obtuse striking-angle.  
 Condition : Unworn and unpatinated.
- No. : Fig. 8 ; 4.  
 Site : Khokra-ka-Choa I.  
 Level : T2.  
 Material : Pink quartzite.  
 Type : Small point made on a flake.  
 Dorsal : Pebble cortex covers the entire right surface. Several shallow flake scars on the left side determine the central ridge.  
 Ventral : One large primary scar. The striking-platform and bulb of percussion on top have been deliberately removed.  
 Condition : Unworn and unpatinated.
- No. : Fig. 8 ; 5.  
 Site : Mehranwala I.  
 Level : T2.  
 Material : Ochre quartzite.  
 Type : Small point made on a flake.  
 Dorsal : A tiny patch of pebble cortex on the upper left edge represents the (ventral) striking-platform. The remainder of the surface is covered with indistinct flaking, with the exception of one well defined flake on the lower left which has evidently been removed to accentuate the shape of the point's tip. This is a typical feature of this variety of points.

- Ventral : One indistinct primary scar. Poor bulb of percussion. Obtuse striking-angle.  
Condition : Somewhat rolled but unpatinated.
- No. : Fig. 8 ; 6.  
Site : Khokra-ka-Choa I.  
Level : T2.  
Material : Ochre quartzite.  
Type : Blade-like knife made on a flake.  
Dorsal : A patch of pebble cortex forms the lower right surface. One large flake-scar just above the cortex on the right periphery seems to indicate the functional knife-edge. Steep ridge in the centre. Steep flaking on the left side.  
Ventral : Ill-defined primary scars. Remnants of bulbs of percussion on both ends. Both striking-platforms have been removed by dorsal flaking.  
Condition : Slightly worn but unpatinated.
- No. : Fig. 8 ; 7.  
Site : Khokra-ka-Choa I.  
Level : T2.  
Material : Wine-red quartzite.  
Type : Borer made on a small flake.  
Dorsal : Pebble cortex on top forms the (ventral) striking-platform. Two indistinct flakes, one removed from each side, determine the central ridge. One small retouch scar near the tip of the implement which is broken.  
Ventral : One large primary scar. Retouch flaking near the tip. Poor bulb of percussion. Acute striking-angle.  
Condition : Unworn and unpatinated.
- No. : Fig. 8 ; 8.  
Site : Mehranwala I.  
Level : T2.  
Material : Brown quartzite.  
Type : Blade-like knife made on a flake.  
Dorsal : A patch of pebble cortex in the centre of the surface. One large flake scar on the left functional periphery. Steep ridge in the centre. Steep flaking on the right periphery.  
Ventral : One large primary scar. Striking-platform and bulb of percussion have been removed by dorsal flaking. Rather thick lower end.  
Condition : Slightly worn but unpatinated.
- No. : Fig. 8 ; 9.  
Site : Mehranwala I.  
Level : T2.  
Material : Brown quartzite.  
Type : Blade-like knife made on a flake.  
Dorsal : One large flake scar on the right functional periphery. Steep ridge in the centre. Steep flaking on the left edge.  
Ventral : One large primary scar. Striking-platform and bulb of percussion on top are broken.  
Condition : Unworn and unpatinated.

## Z u s a m m e n f a s s u n g

Das Sirsatal und der gleichnamige Fluß sind im Nordwesten der Republik Indien, in den Territorien der ehemaligen Fürstenstaaten Patiala und Nalagarh gelegen. Hier gelang es dem Verfasser im Jahre 1951, eine Anzahl überaus ergiebiger Freilandstationen des Altpaläolithikums zu entdecken. Diese Stationen sind sämtlich auf den Pleistozänterrassen des Sirsatales gelegen. Es handelt sich hierbei um die ersten paläolithischen Funde Nordindiens diesseits der pakistanischen Grenze. Die nächsten Stationen sind über 500 Kilometer westlich, im West-Punjab (Pakistan) gelegen. Es ist dies das in den dreißiger Jahren von Dr. H. De Terra erforschte Gebiet (De Terra and Paterson, 1939). Nach Norden, Süden und Osten sind bisher auf weiteste Distanzen hin keine paläolithischen Stationen bekannt.

Der Sirsa ist ein, durch die jüngeren Siwalikberge fließender, Nebenfluß des Sutlej, der sich bei Rupar in den Sutlej ergießt. Die jüngeren Siwalikberge gehören geologisch in das Pliozän und Pleistozän. Sie bestehen aus klippenartigen, pittoresken Sandsteinbergen der Tatrot- und Pinjor-Formationen, die überaus reich an Fossilien sind. Der Sirsa fließt zumeist direkt unterhalb dieser steilen Sandklippen, die sein linkes Ufer bilden. Das rechte Ufer besteht aus einer Serie von Terrassen, die von oben nach unten gemessen T 2, T 3 und T 4 benannt wurden. Dieser Terrassenkomplex lehnt sich gegen die steilen Berge der mittleren und älteren Siwaliks. T 1 scheint nur im Mündungsgebiet des Sirsa an zwei Stellen vorhanden zu sein, wo sie in einem Falle (Fig. 5) eine Geröllschicht überlagert, die mit einiger Wahrscheinlichkeit dem Boulder Conglomerate im West-Punjab gleichzustellen ist. Trotzdem einige wenige atypische Abschlüge in den Schichten von T 1 gefunden wurden, befinden sich jedoch die eigentlichen Stationen auf T 2 und T 3. T 4 ist postglazial. T 2, die mächtigste der drei Terrassen innerhalb des Sirsatales, hat die reichsten und wichtigsten Stationen geliefert. Die Oberflächen beider Terrassen (T 2, T 3), deren Kern aus mittelgroben Sandsteingeröllen besteht, waren ursprünglich mit einem aeolischen Sand bedeckt, der heute, besonders auf T 2, beinahe gänzlich abgetragen ist, und die paläolithischen Stationen daher freigelegt hat. Durchweg konnte eine bei weitem größere Fundkonzentration auf T 2 beobachtet werden. Die vier bis heute gefundenen Ateliers stärkster Fundkonzentration sind alle auf T 2 gelegen. Mit Ausnahme der weiter unten erwähnten Artefakte aus fossilem Holz sind sämtliche Geräte aus Quarzitzeröllen, die im Sirsatale nicht vorkommen, hergestellt.

Typologisch handelt es sich bei den im Sirsatal gefundenen Artefakten um eine Fazies der frühen Sohankultur, die allerdings in mehreren Punkten von der frühen Sohankultur im West-Punjab zu unterscheiden ist. Die charakteristischen Artefakte dieser Stufe sind grobe „Choppers“ und „Chopping-Tools“ (da bisher noch keine zufriedenstellenden Ausdrücke für diese Hauwerkzeuge auf deutsch geprägt worden sind, behalte ich hier die von M o v i u s , 1949, pp. 377—379, aufgestellten englischen Begriffe bei). Es ist bemerkenswert, daß auf T 3 lediglich „Choppers“ und „Chopping-Tools“ vorkommen. Auf T 2 liegt außer diesen Typen ein Reichtum an Ab-

schlagen vor. Es handelt sich hierbei vornehmlich um solche mit nicht facettierten Schlagflächen. Jedoch wurden durchwegs auch Typen mit facettierten Schlagflächen festgestellt. Typologisch sind neben clactonien-artigen, unretuschierten Artefakten besonders eine Serie handspitzenartiger Geräte, mit absichtlich entfernten Schlagbuckeln zu erwähnen (Fig. 7 ; 13; 8 ; 1, 4). Dieser Gerätetyp ist im West-Punjab sehr selten. Ebenfalls fallen die runden Kerngeräte, deren Oberseiten gut bearbeitet, deren Unterseiten jedoch völlig unbearbeitet sind, ins Auge. Dieser Typ ist ebenfalls in der Sohanregion sehr selten (Fig. 4 ; 2, 3, 4, 5). Während im West-Punjab die „Choppers“ häufiger vorkommen als die „Chopping-Tools“, ist im Sirsatal das Gegenteil der Fall. Faustkeile, die im Sohangebiet vorhanden sind, sind im Sirsatal trotz genauer Suche nicht festgestellt worden.

Von besonderem Interesse sind die Artefakte aus fossilem Miozänholz, die auf der Khokra-ka-Choa II Station gefunden wurden. Das fossile Holz, das sich infolge seiner Brüchigkeit schlecht bearbeiten läßt, ist vermutlich zur Herstellung von Geräten herangezogen worden, weil die ortsfremden Quarzitgerölle nur mit Schwierigkeiten aus dem Sulejtale zu beschaffen waren. Fossiles Holz kommt jedoch in großen Mengen in den Miozänschichten der mittleren Siwaliks, wenige hundert Meter von der paläolithischen Station Khokra-ka-Choa I entfernt, vor. Der hier abgebildete Gerätetyp (Pl. VII) kommt häufig vor. Spitzenartige Artefakte sind ebenfalls nicht selten. Es ist unwahrscheinlich, daß diese fossilen Holzgeräte mit M o v i u s' (1943) burmesischen Artefakten aus fossilem Holz in Zusammenhang stehen. Typologisch jedenfalls sind keinerlei Anhaltspunkte dafür vorhanden.

Die Ateliers sind von Interesse, da hier eine Serie von klobigen Sandsteinen festgestellt wurde, deren Oberflächen mehr oder weniger tiefe Ritzungen aufweisen. Zuerst wurde angenommen, daß es sich hier um Gletscherschliffe handle. Dies ist jedoch ausgeschlossen, da das Sirsatal in der äußersten periglazialen Zone gelegen ist, in die Moränen niemals auch nur annähernd vorgedrungen sind. Da sich diese, teilweise recht großen Steine nur im Zusammenhang mit den Ateliers vorfanden, scheint es nicht ausgeschlossen zu sein, daß es sich hier um Ambosse, auf denen der Mensch seine Geräte herstellte, handelt (Pl. V). Da mehrere dieser Steine tief in der Geröllschicht der Terrasse festgestellt wurden, steht es außer Zweifel, daß sie in situ gelagert sind.

Zusammenfassend kann festgestellt werden, daß die Stationen des Sirsatales in den Rahmen der Sohankultur gehören, deren östliche Grenze sie nach dem Stande der heutigen Forschung darstellen. Chronologisch fallen sie in die frühe Sohangruppe, die nach M o v i u s (1949) in das Mittelpleistozän zu setzen ist. Im West-Punjab wie auch im Sirsatal befinden sich die wichtigsten Stationen dieser Periode auf T 2. Typologisch sowohl als auch quantitativ lassen sich Unterschiede zwischen den Typen des West-Punjab und des Sirsatales feststellen. Völlig neu sind die Geräte aus fossilem Holz und die Ambosse auf den Ateliers.

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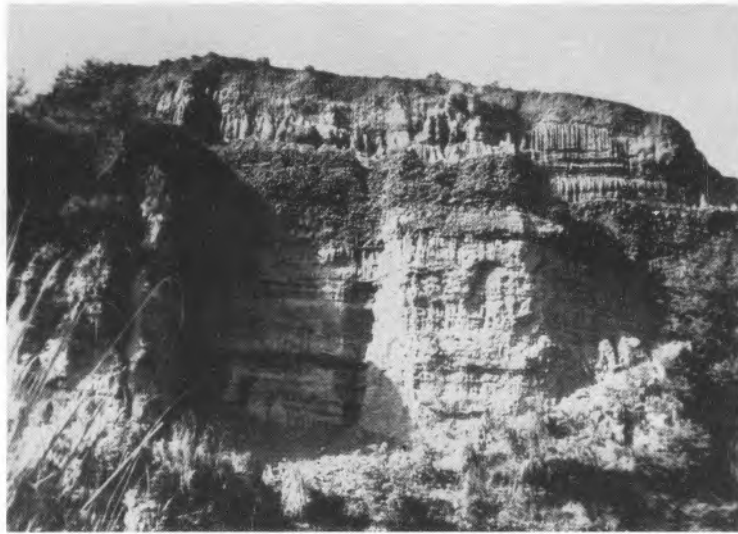
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The Boulder Conglomerate and Ti near Mundiarpur.



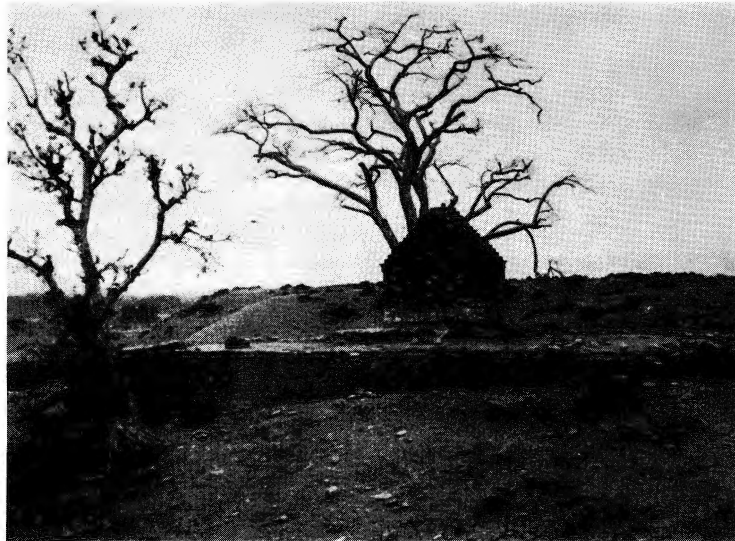
Anvil stone at Khokra-ka-Choa.



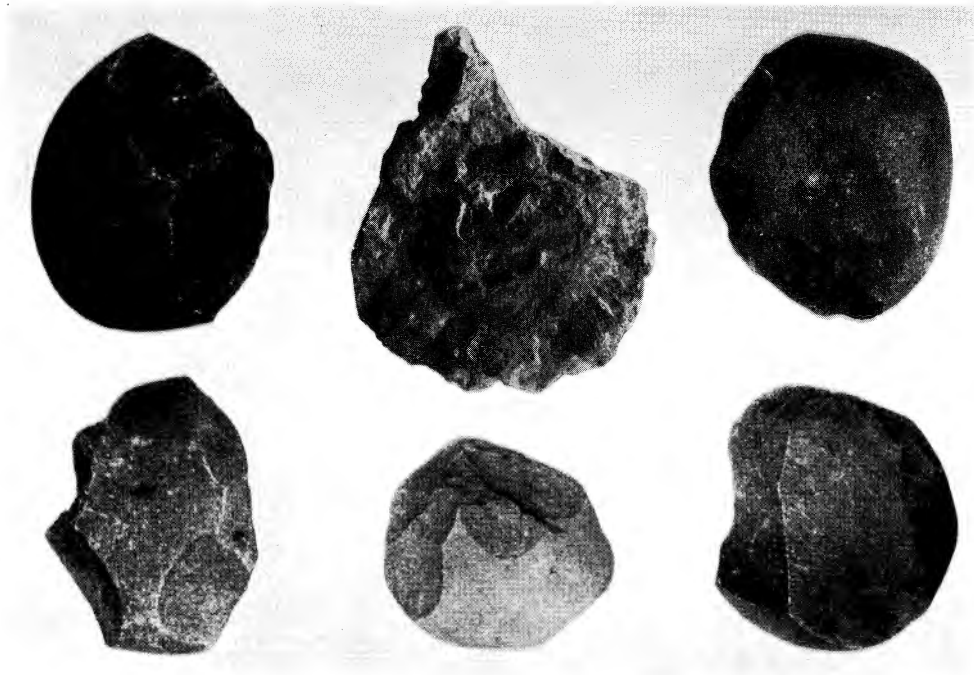
The Sirsa Cliffs near Mundiarpur.



The Sirsa Cliffs near the Sirsa bridge.



T 2 near Malpur-da-Choa. In the foreground a medieval shrine.



Artefacts from various sites. The second specimen in the top row is made of fossil wood.