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FOOD-PRODUCING COMMUNITIES IN PAKISTAN AND NORTHERN INDIA[1]

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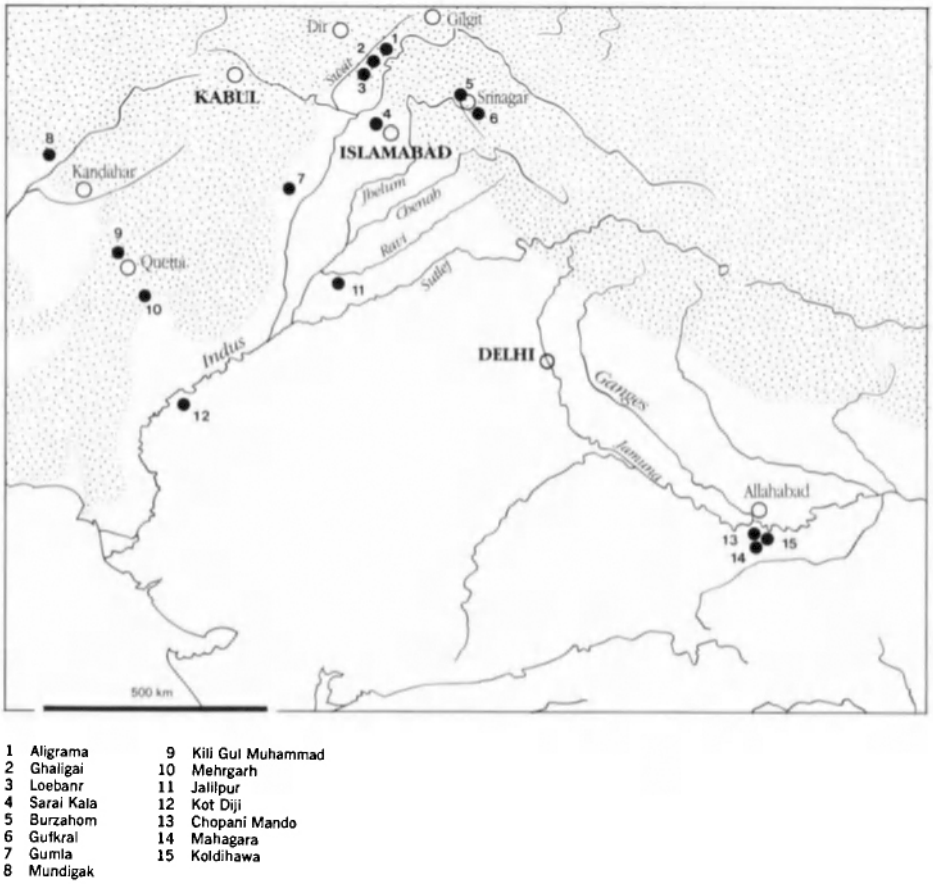
RECENT archaeological discoveries in this region have produced sufficient evidence to reconstruct the various stages in the evolution of the food-producing communities on the basis of local developments. The old model of diffusionism from west to east and its consequent effect on the regional developments in Baluchistan and the Indus valley needs to be modified in the light of the new cultural data that have provided very early dates comparable with those found in western Asia.[2]

The cultural material is not only varied in time but also extensive, covering the northern, central and southern parts of the Indus valley. From the north, the excavated material comes from Swat, Dir and Sarai Kala (Saraikhola) near Taxila; from the central area the excavations at Jalilpur and Gumla have supplied the data; from Baluchistan Kili Gul Muhammad provided the first reliable date; and more recently Mehrgarh, at the foot of the Bolan pass in the north of the Kachi plain, has proved to be a classic site showing a full sequence of the development of Neolithic and Chalcolithic cultures in this region.[3] Mehrgarh is situated on one of the main routes connecting the high inland plateau of Central Asia to the alluvial plains of the Indus system. The Kachi plain, where it is located, is a transitional area between two different worlds, the arid inland plateaux of Baluchistan, Afghanistan and Iran on one side and the Indo-Gangetic plains on the other.[4]

Mehrgarh has been in the course of excavation for the past decade by the French Archaeological Mission to Pakistan led by J. F. Jarrige. The Neolithic site, called MR3, covers an

[1] See Map 5.
[2] Jarrige, 1984, p. 21.
[3] The description of sites from Pakistan in this section mainly follows Allchin and Allchin, 1982, Chapter 5, q.v., and quotes extensively without further reference.
[4] Jarrige and Lechevallier, 1974, pp. 463–4.



MAP 5 Food-producing communities in Pakistan and northern India.

area of several hectares characterized by the presence of flint tools etc. on the surface. It has been cut to the east by the Bolan river and to the north by a wide and deep gully. At one point the Bolan river has carved a deep channel through the site, creating a straight cliff over 10 m high, showing a continuous series of archaeological layers from top to bottom.[5]

In different parts of the main Neolithic site at Mehrgarh eight periods have been defined. Period I (site MR3) covers the aceramic Neolithic phase; Period II covers the ceramic Neolithic and Chalcolithic phases represented at site MR4, which spreads around the nuclear site of MR3. Period III is found at the site of MR2, covering an area of about 900 m^2. Periods IV to VII are observed at the original site, MR1, and Period VIII is evidenced at the cemetery to the south of MR1 at Sibri, 8 km away.[6]

Period I, which is aceramic, the first phase of settlement, is marked by plant and animal domestication, craft activities and burial practices – features which fit into a western Asian context. In absolute chronology this period is dated to around 7000 B.C. It is followed by

[5] Lechevallier and Quivron, 1981, pp. 73–4.
[6] Lechevallier, 1984, p. 41.

a Neolithic phase whose deposits are associated with a few coarse chaff-tempered sherds. This is dated between 5500 and 6000 B.C. and is referred to as Period IIA. Its cultural assemblage is still very similar to that of the aceramic Neolithic Period I, but in addition to a few stone vessels and fragments of thick bowls in alabaster, there are a very restricted number of pot-sherds in a chaff-tempered ceramic, occasionally with a red slip. On the other hand Jarrige notes:

> There are so far no remains reported from this region which could be connected to a proto-Neolithic stage which, as in Palestine or the Zagros area, from 12,000 B.C. onward, corresponds to a phase of incipient cultivation... But one must not exclude the possibility of further discoveries.[7]

Period IIB, which is dated to 5000 B.C., includes the archaeological remains on the tops of the cliff that overlies two palaeosols and thick strata of alluvium. Evidence from Period II does not show any major innovation. The tool-kit in bone and stone derives from the earlier Period and metallurgy is limited to the 'discovery of a ring and a bead in copper, plus a small ingot also in copper from an early level of Period IIB'. Pottery, which is a new element, is found in very limited quantity.[8] Period III, which is dated around 4000 B.C., shows the mass-production of pottery, a high density of population, many industrial activities 'showing the skill of the artisans using fine micro-drills in phtanite, suggesting the use of bow-drills, working and engraving ornaments in shell. The discovery of a few crucibles containing traces of copper indicates some developments in metallurgy'.[9] Such an impressive complex of developments in all these fields bears witness to a process of evolution that ultimately culminated in the highly complex socio-political organization seen later in the Indus Civilization.

Right from the ceramic level of Period I architectural discoveries have been made: a rectangular room of a house has walls built of mud-bricks of regular size, the bricks showing finger impressions on their surfaces. On its floor of packed clay a small grindstone and reed impressions were found. On a higher level of Period I one complete structure, with its walls built with three rows of mud-bricks and making four small compartments, measured 1.5 × 1.0 m. In the upper level several complex buildings have been excavated. These buildings are divided into six or ten rectangular rooms. Such large rectangular buildings of various plans, proportions and types of construction were apparently designed for different purposes.[10] In Period II similar compartmented buildings are found which have been identified as granaries. In Period IIA alone three such buildings have produced coarse ware,

[7] Jarrige, 1984, pp. 22–3.
[8] Ibid., p. 24.
[9] Ibid., p. 27
[10] Lechevallier and Quivron, 1981, pp. 72–7.

a grooved elephant tusk and seeds of barley.[11] In Period III five further compartmented buildings representing three building phases have been exposed.

Side by side with architectural activity human burials have also been found. In the lower levels the burials are characterized by the lack of built structures: red ochre covers the skeletons and the ornaments placed among them. Only stone, shell and bone were used to make these ornaments. In the northern part of the site graves belonging to the upper level were found associated with structures. These burials attest to elaborate funeral rites. Numerous traces of red ochre have been observed with the bones stained red. The skeletons are all in a flexed position. No regular burial structure or pit has been observed. The deceased are buried with many ornaments and offerings such as hexagonal shell pendants, a stone pendant, stone and shell necklaces, bone rings, the bottom of an asphalt-coated basket, and, in addition, one skeleton showed traces of a textile. In the eastern burial ground, pit burials with remains of mud-brick structures have been found. The grave goods include a complete basket, a necklace of turquoise and steatite beads, a stone and shell bracelet, a stone chisel and a textile impression.[12]

The faunal remains from Mehrgarh are highly significant in that they demonstrate the progression from a hunting-and-collecting to a food-producing economy. In the aceramic Neolithic the predominant animal remains are those of wild species, particularly gazelle, while sheep or goat are markedly less numerous and cattle – whether wild or domesticated – are still less frequent. Thereafter, in successive stages, the position changes: gazelle becomes less and less common, while sheep and goat and later zebu cattle increase in frequency, until these three domesticated species assume proportions in the economy comparable to those which they hold to this day. From MR3 twelve species of big game have been identified. They include gazelle, swamp deer, nilgai, black buck, onager, spotted deer or chital, water buffalo, wild sheep, wild goat, wild pig and elephant. R. H. Meadow draws the following conclusion:

> First, a shift during the aceramic Neolithic from the hunting of wild animals to the keeping of domesticated sheep, goats and cattle; second, an increase in the importance of zebu cattle in relation to sheep and goats during the course of the aceramic and early ceramic periods; third, a revival of this trend during later occupations at the site; and, fourth, a decrease in the size of the individual domestic animals through time.[13]

Evidence of cultivated plants has been obtained from impressions of straw and grain in mud-bricks. These impressions show various kinds of barley and wheat. The barley shows characteristics of a local variety. Naked six-row barley seems to have been the principal

[11] Jarrige, 1984, pp. 24–5.
[12] Lechevallier and Quivron, 1981, pp. 79–85.
[13] Meadow, 1984, p. 34.

crop. Naked wheat is present in restricted quantities together with typical hulled varieties. Other floral remains from this period include *zizyphus* fruit, grape and date palm. Cotton seeds have also been found.[14]

As regards the flint industry, houses in general contain very few flint artefacts. But in tombs, particularly in the upper levels of MR3, some artefacts are recorded which are interesting for their quality and freshness. A total of 32,000 artefacts have been collected, of which over 20,000 belong to Period I, 4,000 to Period II and 4,000 to Period III. The remainder belong to later periods. Various types of flint arfetacts have been found from Periods I to III. They include cores, hammer-stones, blades, bladelets, flakes, geometric microliths, sickle blades, burins, borers and end-scrapers. Among the blades are truncated, notched, backed and retouched varieties. Axes/adzes have also been found but arrowheads are seen only in the later periods. M. Lechevallier concludes:

> Periods I and II form the first unit; there is a great homogeneity in the blade production. The assemblage is on the whole Neolithic, with certain Epipalaeolithic characteristics like the varied, unstandardized geometric microliths. Period III has its own characteristics: the disappearance of microliths and the exclusive use of new types (large triangles and obliquely truncated blades), and a large number of retouched flakes such as scrapers, notches and denticulates.[15]

Pottery, which is a new element in Period II, is found in very limited quantities. The number of sherds increases in Period IIB when pottery becomes much finer with vessels shaped on a turntable and rounded with a dabber. At the site of MR4 above the filling of rooms of the early phase and in the loose deposit above two burials an enormous amount of potsherds were recovered. Half of them, which show a mixture of straw and clay pressed by hand, are fragments of bowls and flat circular dishes with a grooved surface; it is a yellowish ware. A small number of vessels, which are also hand-made but of better quality, have their lower part moulded in a basket. The other half of the sherds belong to fine wheel-turned ware, consisting of open bowls and medium-sized globular vessels with a collared rim in buff, often decorated with simple geometric motifs, criss-cross and oblique lines, dots or hatched squares. Sometimes the decoration is bichrome. Many bangles, rectangular in section, made out of the same buff ware, have also been found.[16] Period III shows the mass-production of pottery with heaps of sherds, 40 per cent in a fine fabric with geometric or animal motifs. This is a great technical advance over the hand-made and basket-marked pottery of the earlier period. The pottery of this period evidences an intensive use of the wheel, improved quality of paintings, mostly geometric in the early phases and later consisting of rows of caprids and birds.

[14] Costantini, 1984.
[15] Lechevallier, 1984, p. 50.
[16] Jarrige and Lechevallier, 1979, pp. 477–8.

Among the exceptional finds of Period III are five figurines made from unfired clay. Three represent human beings and two animals. One human figure is conical in shape and has a necklace of appliqué clay lozenges. The second is in a seated position. They are similar to the early human figurines of western Iran.[17]

The evidence from the first two periods of Mehrgarh has opened a new chapter in the Neolithic of this region.

> The cultivation of cereal crops and the husbandry of animals were practised in addition to hunting and gathering in Period I, and to their exclusion in Period II. Specialized crafts existed, and a network of long-distance contacts brought to Mehrgarh turquoise from Iran or Soviet Central Asia, lapis lazuli from northern Afghanistan and shells from the coast of the Arabian Sea.[18]

In the light of the finds from Mehrgarh it becomes abundantly clear that we are dealing with a pattern common to the whole Central Asian area. The artefactual assemblage of Mehrgarh is of an archaic aspect; it is a Neolithic-type industry, similar in many respects to that of Jeitun in south Turkmenistan. We may distinguish there elongated blades, geometric microliths (trapezes and, more seldom, lunates). We may also note bone awls, axes and adzes made of polished stone. Particular attention was given to the trimming of implements, as in the case of a bone polisher, which is adorned with a carved ornament. Stone blades were used in most cases as inset blades in sickles, the principal implement of early farmers. The earliest complexes of Mehrgarh may perhaps be dated to the sixth millennium rather than to the seventh millennium B.C. as is often hypothesized. In the course of their existence, a gradual emergence of a new type of economy occurred. At Mehrgarh, along with flint implements, which soon achieved a high degree of perfection, pottery was being made on the potter's wheel and decorated with picturesque painted patterns. Hence a local artist school emerged, being part of the pattern of prehistoric Indus valley cultures in India and Pakistan.

Another settlement of considerable antiquity, though not as ancient as Mehrgarh, is Kili Gul Muhammad[19] located about 3 km north of the modern city of Quetta in the plains near the Zarghun mountains (Fig. 1). It is a small mound approximately 90 m long by 55 m wide. Here in 1950, W. Fairservis carried out a small exploratory excavation, only 3.5 m^2 reaching virgin soil at a depth of 11–14 m. Hence in the lower levels the area excavated was very small indeed. Period I, the lowest of the four cultural phases revealed at the site, produced C14 samples from a hearth in its uppermost levels. These have given dates of 4900 and 4300 B.C. (MASCA corrected). Below, there is a further deposit of nearly 4 m in

[17] Jarrige and Meadow, 1980, p. 108.
[18] Ibid., pp. 107–8.
[19] Fairservis, 1956.

thickness, doubtless representing a considerable time duration. These earliest date indicate that the inhabitants kept domestic sheep, goats and oxen, and were probably nomadic. However, by the end of the period they had houses of mud-brick or hard-packed clay. Their material equipment included blades of chert, jasper or chalcedony, and a fragment of rubbing or grinding stone, but no metal objects. Awls or points of bone were also found, but no pottery was discovered, and hence the excavator treats the period as pre-ceramic. There followed two further periods, II and III, the earlier yielding crude hand-made and basket-marked pottery. These levels contained further house walls of mud-brick, and a material culture otherwise little different from that of the preceding period. The predominant pottery had a red or yellow-red surface with a yellowish body, and a coarse ware with a sandy body was also found. In Period III the first copper was found along with distinctive pottery, both wheel-thrown and hand-made, decorated with black or painted designs including simple geometric motifs.

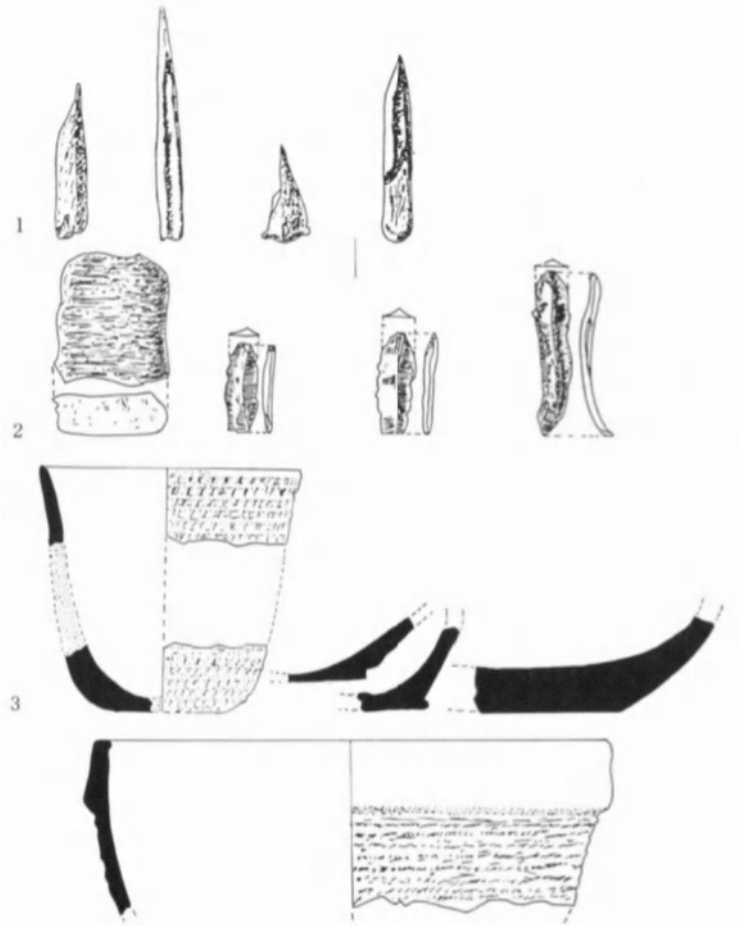


FIG. 1 Kili Gul Muhammad I (1: bone implements; 2: stone artefacts; 3: hand-made wares).

A third early settlement is at Sarai Kala[20] (Fig. 2). It stands in a prominent position on the southern bank of the Kala Jala (stream) near the Grand Trunk Road at a distance of about 3 km south-west of Taxila. The mound which rises in four successive terraces measures about 610 m north–south and 300 m east–west. The depth of the cultural deposits is more than 4 m. Of the four periods only the first relates to this chapter. This may be described as Neolithic on account of the material culture. Subsequent investigations have revealed the presence of several pit-dwellings in this period. Ground-stone axes, a stone-blade industry, bone points and burnished pottery formed the material culture. This period is now dated by C14 to 3000–3160 B.C. Only a very small part of the blade industry came from Period I, the majority of the finds arising from the second period. The same is true of the ground-stone axes, which are of simple kind, generally with median ground edges and rounded butts. The pottery is coarse red-brown and frequently burnished. There is a limited range of types, all hand-made or built on a simple turntable. Some of the pottery shows the addition of a coarse gritty sand to the outer surface while the clay was still soft. Painted pottery is notably absent. There is no evidence of any metal in this period, though later it becomes relatively common. This excavation provides evidence of a period which, though in many respects differentiated from its successor, none the less has many continuing traits, suggesting that there was no complete abandonment of the settlement or change in population.

Period I at Sarai Kala belongs to the Late Neolithic, assignable to the late fourth and early third millennia B.C. Outstanding features of the pottery of Period I are that it is all hand-made, slipped with dark-red colour, and the vessels are burnished on both sides or only externally. The fabric is generally fine but some examples are also present in which tempered clay has been used. The body is generally thick and the bases show basket or coiled-mat impressions. However, there is no evidence to show that the hand-made wares of Period I were moulded in baskets and then surface smoothed. It seems more likely that the vessels were made either resting on a mat or placed on a mat for drying after they had been made. As regards the burnishing technique, it seems that a red slip was applied and then the surface was rubbed with a dabber or stone so as to produce a glassy surface. In some examples a thick coat mixed with mud was applied on the exterior surface on which sand was dusted. These wares also occur at Gumla, Mehrgarh and in the fourth and early third millennia B.C. levels of Jalilpur.

At Sarai Kala, basket impressions occuring on the bases and the technique of scratching the external surface with a straw brush are reminiscent of the Neolithic pottery of the Yangshao horizon in northern China and the Neolithic pottery of Burzahom in Kashmir.

[20] Halim, 1972*a*, 1972*b*; Thomas and Allchin, 1986.

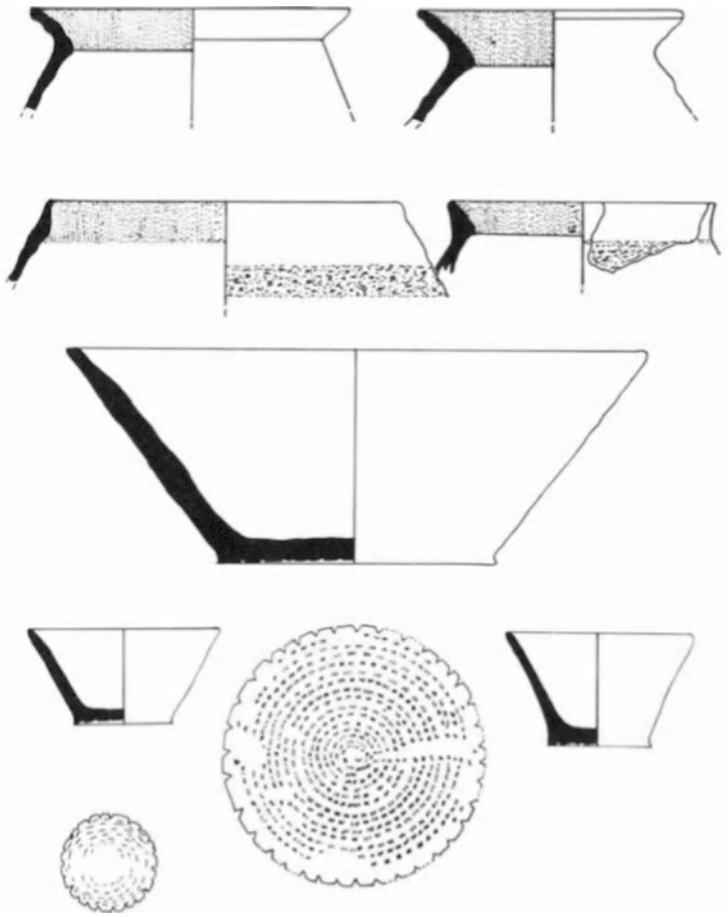


FIG. 2 Sarai Kala I: hand-made and burnished wares.

There are, however, local differences in the colour of the pottery. It is also significant to note that the earliest levels of Sarai Kala and Burzahom yielded bone tools and ground-stone celts which are also strikingly similar to those associated with the Yangshao horizon of the Neolithic period.

The prehistoric site of Jalilpur[21] is located about 5 km south of the left bank of the Ravi river and at a distance of 65 km south-west of Harappa in the central Indus valley. The mound covers an area of 360 × 400 m with a maximum height of 5 m above the surrounding cultivable fields. The excavations revealed an accumulation roughly 2 m thick which represented two culturally distinct but interrelated occupational periods. The earlier, which is labeled Jalilpur I, consists of three main occupational levels above the natural soil. Here too the early Period may be called Neolithic, in that no copper or bronze has been reported, and the stone-blade industry and the bone points recall Period I at Kili Gul Muhammad, Gumla and Sarai Kala.

[21] Mughal, 1972.

The occupational levels assigned to Period I did not reveal any substantial structural remains in the excavated area but mud-brick and mud-floors are attested. The pottery of the period is hand-made of bright red clay, with a soft crumbling surface. A most distinctive feature is the roughening of the surface by the application, before firing, of a thick coating or slurry made up of clay mixed with fragments of crushed pottery, providing an equivalent to the granular sand-roughening of pottery from the early level of Sarai Kala. From the mud floor laid on a layer of lime 'Kankar', one rectangular bead of sheet gold, with tabular perforation, and several barrel-shaped cylindrical beads were found. Other finds include terracotta net-sinkers, chert blades, numerous bone points and a large number of bones of cattle, sheep, goat and gazelle. The presence of terracotta net-sinkers indicates that fishing formed an element of the economy. However, many animal bones that were either burnt or cut suggest that the inhabitants of this period depended on slaughtered animals for a major part of their diet.

Another settlement of considerable antiquity, though not as ancient as Mehrgarh, is Gumla,[22] north-west of Dera Ismail Khan. The location of this site is in some ways similar to Mehrgarh. Gumla lies to the west of the Indus river, where the alluvial plain of the Indus meets that of the tributary Gomal river. It is a small mound, and was excavated by A. H. Dani. A sequence of six periods was discovered, of which only the first concerns us here. It is claimed in the report that the earliest stratum contained no structural remains and no pottery but only hearths, community ovens, animal bones and stone tools (microliths) and goes back to the Neolithic. It is stated that pottery of the subsequent Period falls into two classes, of which one, consisting of coarse hand-made sherds, was only found at the bottom of the deposit, while the other, of better made pottery, including painted wares, occured in pits dug during the second period. The coarse pottery can be fairly assigned to the first period. The relative lateness is almost confirmed when we compare the blade and microlith industry with that of Mehrgarh. None the less, as Gumla seems to be the first of the whole series of sites in the neighbourhood of Dera Ismail Khan its importance is obvious.

The Ghaligai[23] rock shelter is located at the foot of a limestone hill near the road from Mingora to Barikot in the former state of Swat. The excavation in the rock shelter has furnished important evidence about the prehistoric cultures of Swat and the north-west regions of the subcontinent. As many as seven major periods have been established of which the earliest, the pre-ceramic level, is considered to be of Neolithic Age.

[22] Dani, 1970/71.
[23] Stacul, 1967, 1969.

The cultural component from the lowest level comprises pebbles and flakes. This earliest phase is overlain by a level containing pottery. The pottery is all hand-made, tempered with coarse sand and with a surface colour varying usually from red-brown to grey-brown. Most of the vases show traces of slip and some even have their inner surface burnished. The partially reconstructed shapes include jars with everted rims, hemispherical bowls, and biconical vases, and certain shapes can be compared to common types in the Chalcolithic Period sites of Soviet Turkmenistan. Three C14 dates give 2970–2930 B.C. The stone artefacts are all made from pebbles, primarily with pyramidal points, half-moon flakes and flakes with wide flat bodies, some showing a shouldered hoe profile. There are also tools made from animal bones. Animal remains include antler and boar tusks, and lead us to think that in this period those who frequented the shelter practised hunting.

The coarse burnished grey and brown wares of the early level recall in general terms those of Burzahom in Kashmir and Sarai Kala, and lead us to believe that all belong to a single complex. Although not yet securely dated we may expect this interesting site to belong culturally if not chronologically to the broad Period of the early occupation at both the above-mentioned archaeological sites in Kashmir and near Taxila.

On the basis of the present evidence certain broad conclusions can be drawn. The earliest settlements not only in Pakistan but in the entire subcontinent have been found west of the Indus, on the borders of the Iranian plateau. At Mehrgarh there is a pre-ceramic Neolithic which may have lasted for a long period, perhaps for as long as two millennia (7000–5000 B.C.). At the close of this period there were already developed mud-brick structures; wheat and barley were cultivated; cattle and sheep were domesticated. This was followed by a period of ceramic Neolithic, when comparable settlements were found at Kili Gul Muhammad, Sarai Kala, Jalilpur, Ghaligai rock shelter and Gumla. One of the most striking things about this early Period is that trade links with the Arabian coast and with Soviet Central Asia seem already to have been established. The main similarities of Neolithic material cultures are bone points, stone tools commonly found on all the contemporary Period sites, and hand-made pottery with basket-like impressions on their bases. Such affinity in artefactual remains in three areas, mixed with other materials, has suggested to some an outward contact with northern China and Soviet Central Asia.

Evidence for food-producing communities in northern India has come from Kashmir and the Ganges valleys. Both areas have their own peculiarities. While the Kashmir Neolithic shows a development in the colder region, the material from the Ganges valley shows a pattern in the plains of north India. The period following the close of the Pleistocene in Kashmir still remains inadequately understood as the transition or transformation from the terminal hunter/forager stage to the farming economy and the adaptation to Post-Pleistocene

environmental changes has not so far been fully identified in these areas. Current investigations into this admittedly complex problem have, however, revealed at Sombur in the Kashmir valley, a lithic industry, based on jasper, siliceous limestone and trap, and represented in such tool types as burins, points and borers.[24] This industry, being the first find of its kind in the valley, may perhaps indicate a particular stage in this long-drawn process of the transformation from the exploitive to productive economies. It may be recalled that H. de Terra and Paterson also found some thin indeterminate flakes near Sombur in the lowest Jhelum terrace which they had postulated as representing a Late Palaeolithic or Proto-Palaeolithic culture.[25] Understanding of the origins and early spread of farming in the valley, therefore, is still very insecure and fragmentary.

The Neolithic culture in the Kashmir valley is represented by nearly three dozen sites, all located on the elevated flats of the Karewas, often overlooking streams and lakes. As regards depositional environment SEM (scanning electron microscopy), studies have shown that the deposit preceding the Neolithic occupation at different sites is a wind-borne silt called loess, the deposition of which ceased before the advent of Neolithic culture in the valley.[26] Pollen diagrams constructed from the Harwan deposits not very far from Srinagar have furnished evidence for a three-stage disturbance of natural vegetation as shown by the decline and appearance of pine-forests. The clearance of these at one stage is thought to be related to the farming experiments of the Neolithic settlers in the valley.

Of the explored Neolithic sites, only two, namely Burzahom and Gufkral, have been systematically excavated. The former, literally meaning the place of birch, and situated 16 km north-east of Srinagar, was initially excavated in 1935, albeit in a summary fashion, by H. de Terra and Paterson, who laid bare the potentialities of the site by recording a succession of three cultural strata.[27] It was not until 1960, however, that a large-scale excavation extending to 1971 was undertaken by T. N. Khazanchi of the Archaeological Survey of India.[28] Gufkral, literally meaning the cave of the pottery and situated 41 km south-west of Srinagar, was initially explored by Khazanchi in 1966 and is currently under excavation by A. K. Sharma of the Archaeological Survey of India.[29] The excavations at these sites have yielded a three-phase evolving sequence of the Neolithic culture followed by the Megalithic and historical cultures. The scope of the present study, however, concerns itself

[24] Pant et al., 1982.
[25] Paterson and Drummond, 1962; de Terra and Paterson, 1939, p. 233.
[26] Pant et al., 1978.
[27] De Terra and Paterson, 1939, p. 234.
[28] Khazanchi, 1976.
[29] Sharma, 1967.

only with the Neolithic culture and unless otherwise stated the data furnished below relate to the excavated remains at Burzahom.

Of the three phases of the Neolithic culture, the earliest, labelled as IA, is ceramic. During this period the subsistence economy of the people seems to have been both specialized in food-gathering and cereal-farming, including stock-raising, as evidenced by the finds at Gufkral of bones of both wild (ibex, bear, sheep, goat, cattle, wolf and Kashmir stag) and domesticated (sheep and goat) animals and grains of wheat, barley and lentils. So far as it goes confirmatory evidence in respect of domesticated animals is also available at Burzahom. As regards cereals no direct evidence of their discovery has so far come forth from that site, but palynological studies carried out near the site have revealed the existence of weeds, usually associated with the cultivation of wheat and barley.[30] The analysis of the bones of domesticated goats reveals the absence of very old animals and a predominance of immature ones, suggesting herd management.

The inhabitants lived in underground pits which on plan were mostly circular or rectangular and less frequently oval or squarish, the former variety being usually narrow at the top and wide at the base (Fig. 3). The pits were cut into the natural loess soil by means of long stone-celts, the tell-tale marks of which are still present on some of their sides. The floors were found to be painted in red ochre. The size of the pits, including the depth, varied according to the needs of the family. As protection against the weather, the pits had a birch-cover supported on wooden posts as indicated by the presence of post-holes along the periphery of the mouth. In close proximity to these pits were also found smaller-sized shallower pits which were used by the dwellers as storage-bins and hearths. The floors of the storage-pits at Gufkral were also treated with a red ochre paint. The floors of the storage-pits or chambers were likewise cut in the loess soil and had post-holes at the corners for supporting a roof. For their daily occupation, they used both bone and stone tools, the former consisting of points, needles and scrapers (Fig. 4a), and the latter of axes, drills, picks, pounders, querns and mace-heads (Fig. 4b). Besides, tools were also made of antler-horns. The stone tools were made of the Himalayan trap while the bone ones came from various animals including goat, sheep and stag when the bones were at the green stage.

In the succeeding phase, labelled as IB, pottery came to be used. Among animals, cattle and dogs, and among plants, common peas, also began to be domesticated in addition to those already known in the earlier phase. During this period, as also in the following, the percentage of domesticated animal bones shows a progressive increase and those of wild animals a corresponding decrease. It is interesting to note that with the exception of the wolf all the animals hunted during the various phases of the Neolithic Period belong to the

[30] Singh, 1964; Vishnu-Mittre, 1968.

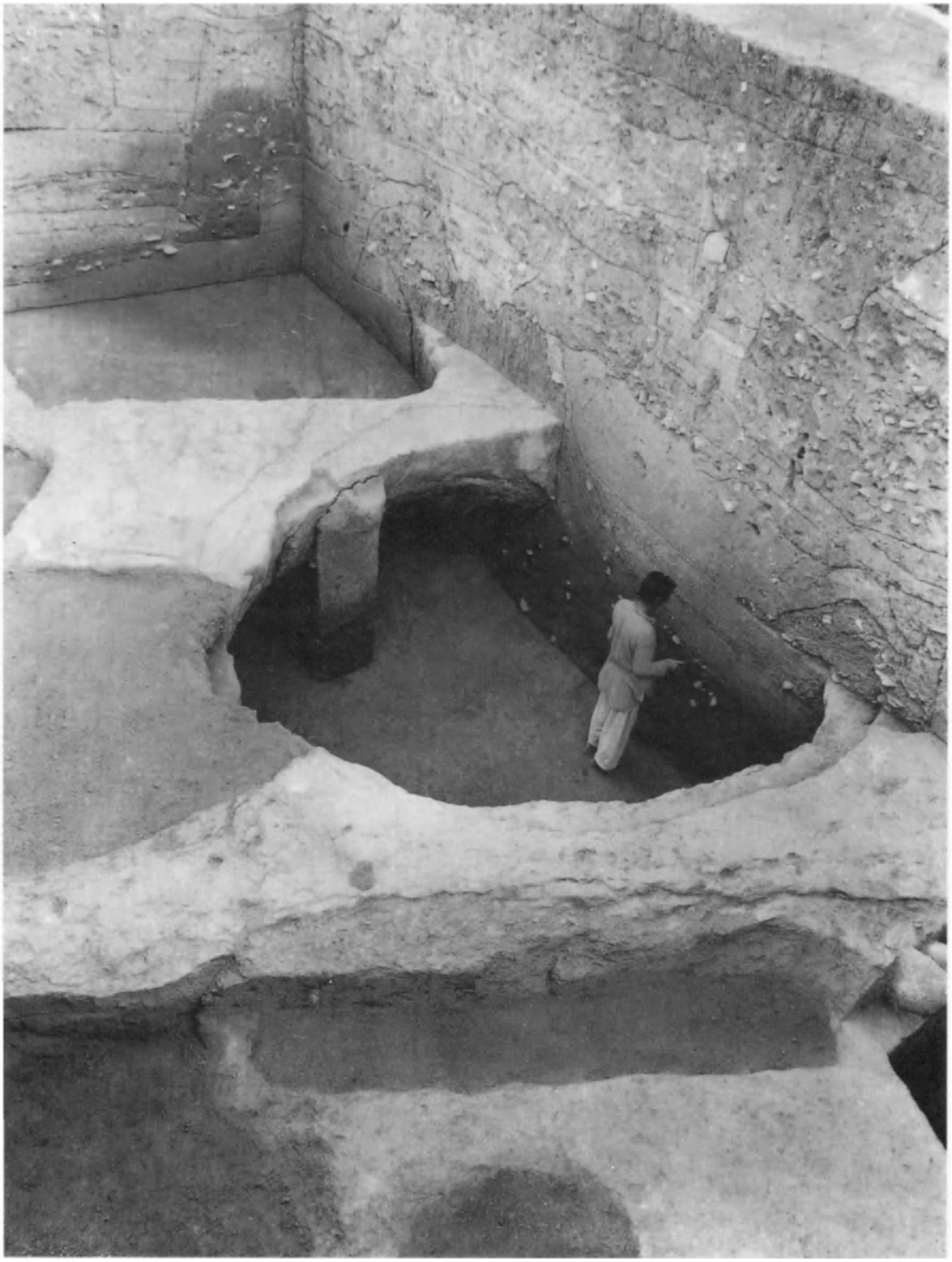


FIG. 3 Burzahom: pit-dwelling – Period IB.

herbivorous group. The other items of cultural equipment of the previous phase continued during this phase with an increasing variety in tool-kit – harpoons, needles with or without

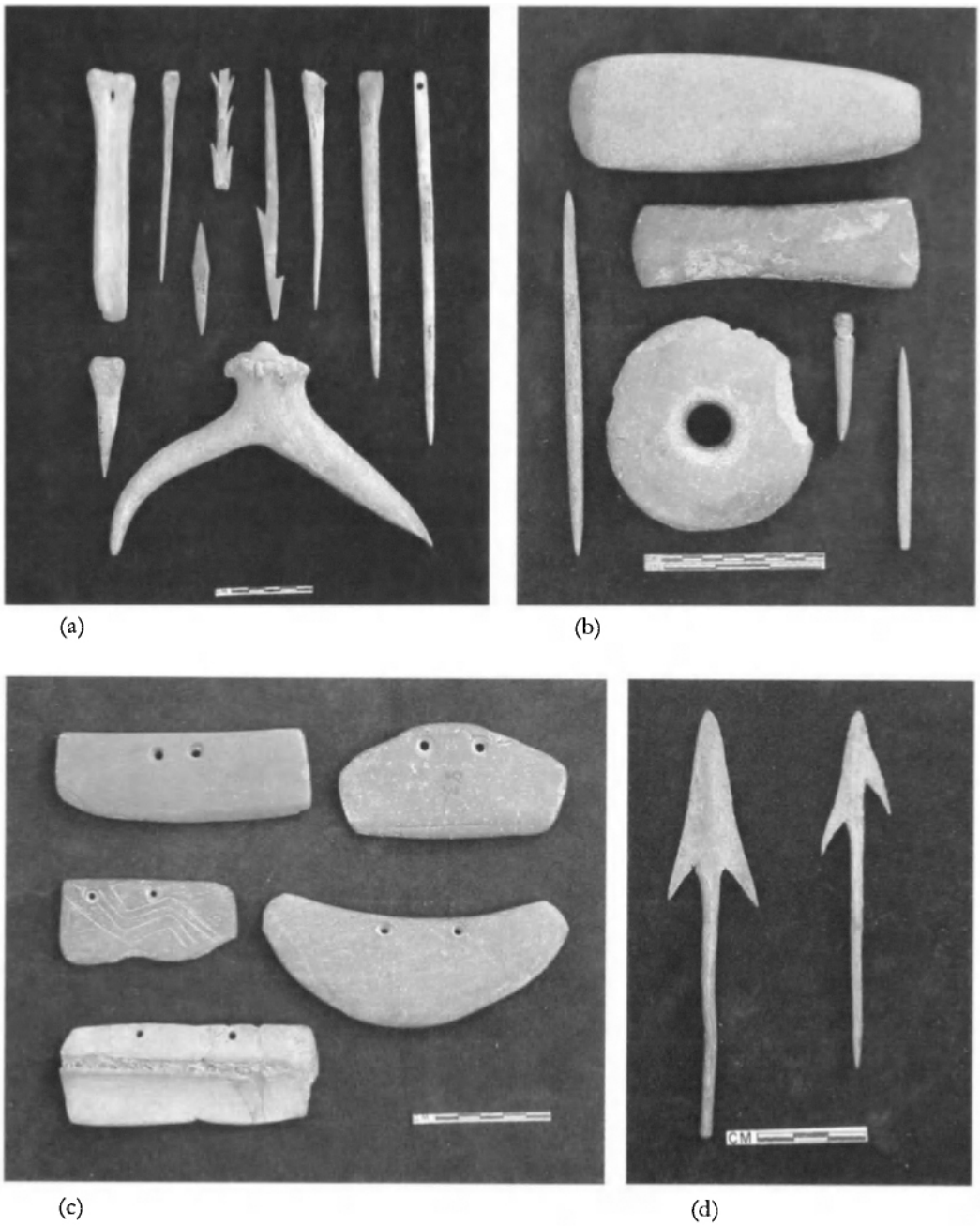


FIG. 4 Burzahom: (a) representative bone tools; (b) representative stone tools; (c) harvesters, stone and bone; (d) copper arrowheads.

eyes, awls, and arrowheads in bone, hoes, chisels, adzes, etc., in stone. In view of the restricted extent of the excavation in the aceramic levels (Period IA) no emphasis need be laid on the presence or absence of a particular bone or stone tool in the deposits of Periods IA and IB, the distinguishing trait between the two periods being only the use of pottery in the latter. The inhabitants continued living in subterranean pits and chambers. Examples

are not wanting where pits of the previous period have been reused by widening the sides, the pit-floors showing different levels of occupation. At Burzahom as many as thirty-seven circular pits and forty-five pit-chambers have been exposed. Of these, the latter were found mostly in the central part of the settlement and the former in the peripheral, suggesting perhaps a planned layout with clan type of kinship grouping. The largest of the circular pits measures 2.74 m at the top, 4.57 m at the base and 3.95 m in depth. Although steps were provided in the deeper pits, these do not reach the bottom, access to which would presumably be by direct descent beyond the step level. The excavated pit-chambers had depressions on all four sides and storage-pits and hearths in the centre, the hearths being either of stone or earth.

Coming to pottery, three principal fabrics, all hand-made, were in use during this phase (Fig. 5): thick coarse grey ware; fine grey ware; gritty dull red ware. Among these, the thick coarse grey ware predominated over the other two fabrics. Made by strip or coil technique, the ware shows irregular marks of brushing on the surface, resulting from the rubbing of twigs or grass bundled together. It is uniformly fired to a dull grey colour but shows an irregular fracture due to the presence of coarse grains of sand in the paste. The main shapes represented in this ware are the globular jars and basins, both of which show disc bases, often bearing mat-impressions, suggesting a high level of development of fabric and mat technology. It is certain that people wove mats and twined baskets for domestic use. The fine grey ware, potted with coil or strip technique, is comparatively thinner in section and has a finer matrix tempered with crushed rock. Fired to a uniformly ash grey colour, its surface shows marks of brushing and scraping. It is represented mainly in vase forms showing incised nail-tip decoration on the rim. The third fabric, namely the gritty dull red ware, is made of a coarse paste containing pieces of quartz, the technique of potting being the same as that of previous fabrics. Indifferently fired, showing unoxidized core-portions, it is represented in jars, deep bowls and basins.

The last phase of the Neolithic culture in the valley, Period IC, marks a distinct change from the preceding phases.[31] The underground dwelling pits and chambers of the earlier periods were no longer used. Most were filled up and covered with a mud-plastered floor having a thin coat of red ochre. The dwelling units now began to be built above ground either from mud or mud-bricks. At Burzahom, the presence of numerous post-holes, in one instance as many as forty-nine in an area of 3.96 $\times$ 1.31 m, indicates timber structures as well. A few mud-platforms with remains of walls were also exposed at Burzahom. Associated with these structures were various floors carefully made of rammed earth coated with red ochre, as well as hearths and storage-pits. The basis of subsistence seems to have

[31] Khazanchi, 1977.

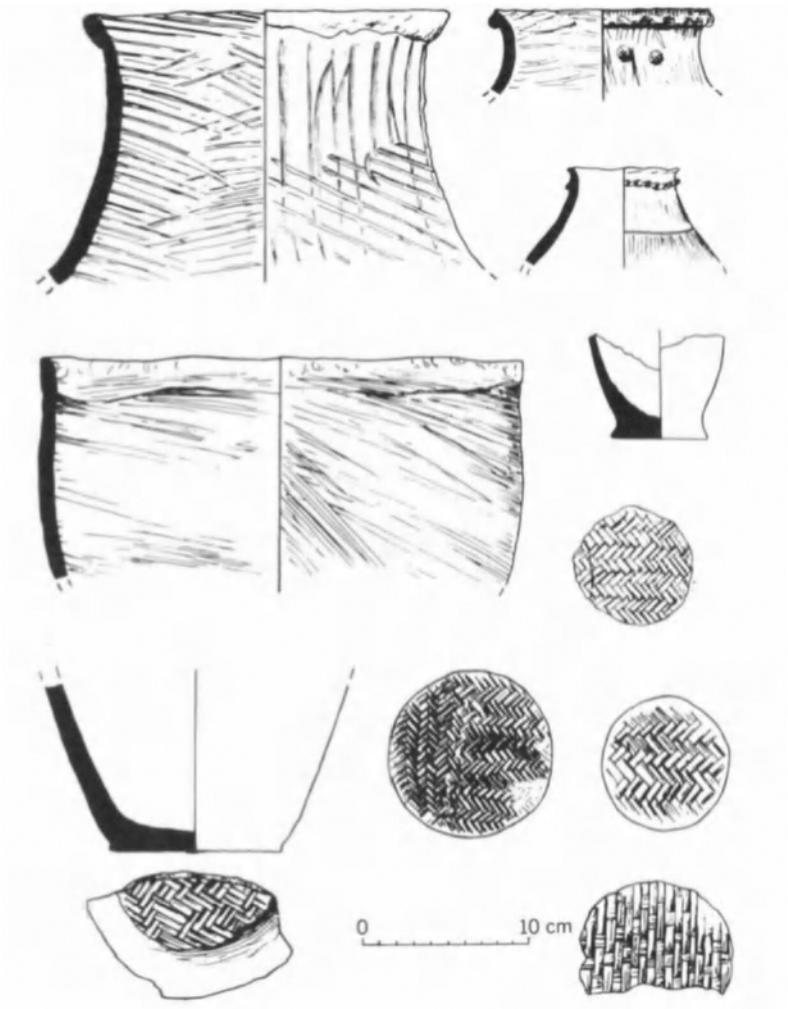


FIG. 5 Burzahom: representative pottery from Period IB.

undergone progressive changes. The period saw a further diversification in material equipment, perhaps through contacts with other regional and extra-regional cultures. Not only did the tools begin to be made to a better finish and in larger number indicating craft specialization, but some new types were also added to the kit, such as the large-sized bone needle with or without eye, the small-sized bone points, the double-edged pick, spindle whorl and harvester (rectangular or semi-lunar knife with holes) (Fig. 4c). The last was made both from stone and bone and was probably fastened to the hand with strings through the holes for cutting, scraping and harvesting.

In ceramics, another fabric termed burnished grey ware was added to the already existing range. Made by the coil-and-strip technique it was fired to variegated shades of grey and black and shows a burnished surface. The core-sections show a fine-to-medium paste with fillers. The principal shapes represented in this ware are high-necked globular jars, dishes

with hollowed stands and stems with triangular perforations, bowls and basins. Although the ceramic industries of the preceding Period continued in use, the fine grey ware and the burnished grey ware became the dominant industries of the period.

Noteworthy among the finds of pottery, however, is the occurrence, in the lower levels of the period, of a wheel-made vase of orange-slipped ware, painted in black with a horned figure (Fig. 6), in a panel between the neck and shoulder bands. The pot is further decorated with multiple incised wavy lines at the level of the painted figure and with close parallel corrugations on the lower part of the body. Both in shape and in painted design the pot resembles the pre-Harappan Kot Diji fabric[32] and obviously must have been imported from the nearest site of that genre, namely Sarai Kala.[33] In the upper levels of the period was also found a wheel-made red ware pot containing as many as 950 beads of agate and cornelian, which again seems to be out of context with the existing assemblage. Metallurgy as such does not seem to have been practised by these early farming communities of the Kashmir valley. But a few copper arrowheads (Fig. 4d), a ring, bangle fragments and a pin were found in the deposits of Period IC at Burzahom and a pin with flattened head in the corresponding levels at Gufkral. Their occurrence, however, seems to be as intrusive as that of wheel-made painted pottery and agate beads etc., and as such did not alter the basic Neolithic subsistence economy and technology of the period.

FIG. 6 Burzahom: painted pot of Kot Diji affiliation, Period IC.

[32] Dani, 1970/71; Khan, 1965.
[33] Halim, 1972*a*, 1972*b*.

Other finds which deserve special attention are the two engraved stone slabs found fixed in a rectangular structure, forming some sort of tank. Of these, one was upside down, while the other was in a damaged condition, indicating that both were out of their original context. The former slab is slightly broken towards the top but retains the original width of 70 cm, with the result that the upper part of the scene is partly lost. The engraving depicts a hunting scene showing a stag being pierced from behind with a long spear and struck from the front by an arrow by two hunters. The upper part of the scene shows two suns and a dog. The ritualistic value for a successful hunt notwithstanding, the two suns may perhaps signify that the hunting was done during the daytime.[34] The other stone slab, broken along the edges and originally perhaps rectangular in shape, depicts an incomplete pattern identified as a tectiform. The design on the slab seems to be a highly stylized and abstract representation of a hut with a domed roof, the body portion of the anilmal and its tail. These engraved stone slabs 'are the only indubitable examples of Neolithic art in India, found from a regular, stratified dig'.[35]

Evidence relating to the burial practices was provided by six human internments exposed at Burzahom,[36] which indicate that both primary and secondary interments were in vogue. Of the six burials excavated, four showed primary interments, two adult bodies were found, placed in a crouching position, oriented respectively north-east to south-west and south-east to north-west; one body of a child in foetal position, oriented west to east; and one other adult in an extended, articulated position, oriented south-west to north-east. The two secondary burials had no fixed orientation. In fact, one was partially articulated, and oriented south-east to north-west.

Three of these human interments (one secondary and two primary, including that of the child) had no grave-goods while the remaining three (one secondary and two primary) contained respectively such items as a small barrel-shaped paste bead, animal bones, a skull and fragments of antler, a soapstone circular disc and five cornelian barrel-beads. A distinctive feature of these burials was the application of red ochre on the interred human and animal bones (excepting the child). A special feature of one of the primary burials was the existence, on the left parietal bone of the skull, of eleven trephined areas – six complete circular holes, varying between 8 and 13 mm, and five shallow depressions, being unsuccessful attempts at treatment, none of them showing any signs of healing. Opinions, however, differ about the purpose of these trephinations. One view holds that they are *ante mortem*, made perhaps to treat apparent anomaly of the skull, while the other view asserts

[34] Pande, 1973.
[35] Pande, 1972.
[36] Sharma, 1967.

TABLE 1.

Laboratory No.	Period	C14 date half-life value 5730 years (B.C.)	MASCA calibrated dates (B.C.)
TF–123	IB	2225 ± 115	2650–2780
TF–127	IC	2100 ± 115	2550
TF–14	IC	2025 ± 350	2340–2460
TF–13	IC	1850 ± 125	2160
TF–129	IC	1825 ± 100	2120–2140
TF–15	IC	1535 ± 110	1720–1760
TF–128	IC	2375 ± 120	2920–2940

that the perforations are a clear case of *post mortem* operation, undertaken for ritual purpose rather than for medical treatment.[37] Dental wear patterns reveal that the Neolithic population of Burzahom had a very coarse and rough diet, which is consistent with their subsistence economy. On the ethnic side, an analysis of the values of the absolute measurements and indices shows that the Burzahom skulls are closer to mature Harappan skulls from Cemetery R-37 than to those of the Neolithic people of southern India.[38]

Examples of animal burials were also found in the deposits belonging to Period IC. In one such burial fragmentary bones of wild dogs along with two antlers of *barasingha* were found. The bones of wild dogs comprise five skulls with vertebral columns in articulated position. From the condition of the bones it may be inferred that the dogs were first sacrificed, then stripped of their flesh and finally buried ceremonially. There are seven C14 determinations from Burzahom as indicated in Table 1. There is only one sample from Period IB and none from Period IA. All the remaining samples belong to Period IC, and except for one aberration, namely. TF–128, these are found to be consistent, showing a time bracket of 2100–1500 B.C. ± 100 MASCA calibrated to 2250–1720 B.C. Using the MASCA calibration, it seems reasonable to assign the following dates to the respective three periods of the Neolithic culture in the Kashmir valley: Period IA, 3000–2850 B.C., Period IB 2850–2550 B.C. and Period IC 2550–1700 B.C.

Coming to inter- and extra- regional relationships, we find that the Kashmir Neolithic culture shares certain traits with the Neolithic cultures of Sarai Kala in the Potwar plateau,[39] Ghaligai and Loebanr Swat valley[40] all in Pakistan, and Yangshao far away in the Yellow River valley in China[41] which calls for an analytical study.

[37] Basu and Pal, 1980, pp. 15–19.
[38] Ibid., pp. 73–80.
[39] Halim, 1972*b*, pp. 3–32; Mughal and Halim, 1972.
[40] Stacul, 1967, 1969, 1976, 1977.
[41] Chang, 1977, pp. 91–142.

The similarity extends only to the technique of potting to produce mat-impressions on the bases and straw scratchings on the body, and to the use of celts and bone objects, irrespective of their small number. Admittedly, these are only rudimentary similarities. The distinctive elements of the Kashmir Neolithic culture remain unparalleled. This is not to deny the existence of contacts, however tenuous, with other regions. The occurrence, in the levels of Period IC at Burzahom, of a typically Kot Dijian globular vase,[42] which is one of the dominant types of the pottery of Period II at Sarai Kala dated to 2800–2400 B.C., is illustrative of such an inter-communication. The painted pots from Sarai Kala could have been brought to Burzahom at any time during Period II at the former site, possibly in the latter half when their frequency rises to 13 per cent,[43] but not later. At any rate the linkage invests the sequences at both sites with some measure of near contemporaneity.

As regards Ghaligai and Loebanr, the reported similarities with the Neolithic culture of Burzahom, in the case of the former, are principally the occurrence, in Strata 17, 16 and 15, of grey or grey-brown drab ware and burnished black ware, sometimes with mat impressions on the vases and bone implements; in the case of the latter, the presence at Loebanr III of underground dwelling pits and the use of black-grey burnished ware and gritty drab ware, with basket or mat-impressions and of stone (celts and mace-heads), and bone objects (points, awls, etc.). A closer analysis of the Neolithic assemblages from each site would show that the similarities are only generic. At Ghaligai, the Neolithic culture is associated with a flake-tool industry and at Loebanr with a wheel-made painted ware, terracotta human and animal figurines and objects of copper and iron.

It may be recalled that the above-mentioned traits, but for the intrusive copper objects, are conspicuously absent in the Neolithic culture of the Kashmir valley. Furthermore, the appearance in Swat of the black-grey burnished ware, with characteristic types like bowl-on-stand, is probably connected with the influences originating from northern Iran (Shah-tepe, Tepe Hissar, etc.). The dates in Table 2 indicate the chronological horizon of the Neolithic phase in the Swat region, which demonstrably is a later manifestation than that of Kashmir (Burzahom). The occupational phase of Loebanr III is related to Period IV in the sequence of proto-historic cultures in the Swat valley. The C14 date from Ali-grama (P–2152), ascribable to this period, confirms the range indicated by the Loebanr dates.

To recapitulate the contacts of the Neolithic cultures of these two regions with that of China, we find unmistakable examples of two items of material equipment of the Yang-shao culture of north China, namely the harvester (semi-lunar knife with holes) and jade beads which were included in the inventory of the Neolithic cultures, the Kashmir and

[42] Mughal and Halim, 1972, Fig. 12.
[43] Ibid., pp. 41–2, Tables 9 and 10.

TABLE 2

Laboratory No.	Period level	C14 date half-life value 5730 years (B.C.)	MASCA calibrated dates (B.C.)
R–377	Ghaligai III Stratum 17	1505 ± 50	1920–1950
P–2583	Leobanr III Pit 1, Layer 5	1430 ± 90	1650
P–2584	Leobanr III Pit 1, Layer 6	1280 ± 60	1500
P–2585	Leobanr III Pit 1, Layer 7	1400 ± 60	1600–1640
P–2856	Leobanr III Pit 1, Layer 5	1510 ± 60	1690–1730
P–2152	Aligrama Layer 13	1400 ± 60	1690–1710

Swat valleys respectively. Besides, the occurrence of semi-subterranean dwellings and of mat, or basket, impressions on the bases of some of the pots is common in all the three regions. For a proper appraisal of this inter-relationship or nexus we may take into consideration both the temporal horizon and the form or identity of the Yangshao culture. The spread of the Yangshao culture in Chung Yuan region is ascribed to 6000–3000 B.C. and in Gansu to 3000–1800 B.C.[44] In respect of material equipment, the Yangshao culture in both regions presents a different cultural style to that of the Kashmir (Burzahom) or Swat Neolithic cultures, as revealed by the range and forms of ceramics, including especially tripods with solid legs, the painted ware, terracotta human figurines, horse models and separately located cemeteries *vis-à-vis* the habitation area.[45] The mechanism of diffusion or borrowing of only two characteristic items of equipment of this culture by the Neolithic cultures of the Kashmir and Swat valleys still remains inadequately understood. Meanwhile, a significant addition to our knowledge on the subject has been made by the recent explorations undertaken in northern Sikkim where typical harvesters have been found with other Neolithic tools like celts (some with single and double perforations), adzes, etc., from a number of locations in the Djangu area. Single perforated celts have also been reported from the Neolithic assemblages of Hunan province in northern China. Such close affinity in artefactual remains in these areas would suggest a southward penetration of the cultural influences from China some time in the early part of the third millennium B.C. or a little later, perhaps through Lungshenoid cultures,[46] some of which were characterized by the

[44] Chang, 1977, p. 119.
[45] Ibid, p. 105.
[46] Dikshit, 1982.

use of burnished grey-black pottery. The possible route of this penetration into Kashmir and the Indus valley was through a series of passes which link the Gilgit valley with Xinjiang (Sinkiang). In the absence of identifiable sites located between northern China and the Kashmir, Potwar and Swat regions, it would be premature to consider the manifestations of the Neolithic cultures in these regions 'as separate extensions from one long cultural tradition of Yangshao Neolithic cultures'.[47] The antecedent stages of these cultures still remain to be fully ascertained.

In the Belan valley and the Vindhyan plateau the findings at Chopani Mando, Koldihawa and Mahagara indicate a continuous sequence of transition from the stage of intensified food-gathering and selective hunting (Epi-Palaeo-lithic) through incipient food-producing (Advanced Mesolithic or proto-Neo-lithic) to settled village farming (Neolithic). This admittedly is the first evidence of its kind in India which seeks to dispel notions of diffusion of the Neolithic way of life either from western or south-eastern Asia, and to establish the primacy of the proposed chronology (seventh–fifth millennia B.C.) for the latter and the existence of antecedent stages thereof.

Chopani Mando is located within a former meander on the left bank of the Belan, 77 km east-south-east of Allahabad. The excavation revealed a threefold sequence of cultures, extending from the Epi-Palaeolithic, through Early Mesolithic to advanced Mesolithic or proto-Neolithic. The first two cultural periods are distinguished largely by the occurrence of particular tool types such as blades, non-geometric and geometric microliths, their gradual reduction in size and the change in raw material. In the proto-Neolithic period, significant additions to the repertory of tools and other cultural equipment were: (a) tranchets; (b) groundstone tools like hammer-stones, anvils, querns, mullers and ring-stones; and (c) use of hand-made pottery (red ware and khaki or brownish-grey ware), sometimes decorated with impressed designs. Of special importance at this site was the discovery of a number of hut foundations and hearths, which began to appear from the Early Mesolithic period onwards. Thirteen such huts belonging to the proto-Neolithic were exposed. These were either round or oval in plan with an average diameter ranging between 5.7 and 3.5 m. The floors were littered with a large number of microliths, anvils, hammer-stones, sling balls, mullers, querns, fragments of burnt clay, animal bones, potsherds, etc. These huts were close together in a beehive fashion. The economy of the settlement was that of gathering and hunting. There is no evidence for the domestication of animals or plants. From the presence of querns and mullers, however, we may infer some sort of incipient cultivation; perhaps the people were on the very threshold of effective food-production. The excavation yielded remains of wild rice (carbonized, embedded in lumps of burnt clay) and bones of

[47] Mughal and Halim, 1972, p. 37, n. 7.

wild cattle and goat/sheep. The Mesolithic period at Chopani Mando is ascribed to around the ninth to eighth millennia B.C.

The other notable sites in the region which deserve our attention are Kol-dihawa and Mahagara, situated on the opposite banks of the Belan river, the former on the left bank and the latter on the right, only 3 km from Chopani Mando, and about 85 km south-east of Allahabad. The excavation at Koldihawa revealed a threefold sequence of cultures covering the Neolithic, Chalcolithic and Iron Age. The Neolithic culture was distinguished by the occurrence of ground stone tools, including celts, microliths and hand-made pottery represented by cord-impressed, rusticated and burnished wares. Palaeobotanical analysis of the rice-husks used in the paste of the pottery showed that the rice belongs to the domesticated variety, which on the basis of C14 dates obtained for the Neolithic deposit (seventh–fifth millennia B.C.) provides the earliest known evidence so far for rice cultivation in the subcontinent.[48]

Mahagara is a single culture (Neolithic) site with a 2.6 m thick occupation-deposit, indicating six structural phases. As many as twenty huts, represented by floors and post-holes were exposed in the excavated area. Of these, eighteen belonged to the last structural phase (VI). The sides of these huts were perhaps retained by wattle-and-daub screens as evidenced by the presence of burnt fragments of daub-bearing impressions of reed or bamboo. These eighteen hut-floors are reported to constitute the remains of houses situated in a nucleated ring-like fashion. On these hut-floors lay scattered Neolithic blades and microliths, pottery, querns, mullers, sling balls, celts, bone arrowheads, terracotta beads and bones of animals. An interesting feature of the excavation was the discovery of a cattle pen, irregularly rectangular in plan, measuring 12.5 $\times$ 7.5 m, with the longer axis oriented north–south. The cattle pen seems to have been fenced by twenty post-holes with wider spaces left for the openings, of which three can be surmised, two on the eastern and one on the western side. Within the fenced area no pottery or other finds were found, instead a large number of hoof-impressions of cattle, belonging to different age-groups and occurring in clusters, were recorded. From the number of hoof-marks, it is estimated that the cattle pen would accommodate about forty to sixty animals. Outside the pen, near the hut clusters, hoof-marks of sheep or goats were found situated almost in a straight line, suggesting the movement of the animals. The Neolithic pottery is represented by four wares, called cord-impressed, rusticated, burnished-red and burnished-black, all hand-made and ill-fired. Among these, the cord-impressed ware is the most distinctive. The subsistence economy of the people was based upon both hunting and farming, as attested by the occurrence of both wild and domesticated cattle, sheep, goat and horse, and rice. The simultaneous existence

[48] Sharma, 1980.

of skeletal remains of wild and domesticated cattle is indicative of the process of transition from a hunting to a food-producing economy.[49]

Hence, important changes both in culture and in subsistence activities occurred in the north Indian subcontinent in the course of the Neolithic period. The long epoch related to hunting and food-collecting came to an end, and a new epoch based on food-production started. The great number of new sites discovered by archaeologists from India and Pakistan make it possible to study this process as a complicated and concrete phenomenon, as separate tribal groups were developing following their own courses and at different rates. Hence, a characteristic feature of the Central Asian region gradually emerged, that of inequality in historical development. The Mehrgarh settlement in southern Pakistan features an early stage in the transition to an agricultural-pastoral economy with a mode of life of its own, and particularly with a well-established everyday life pattern. Neolithic culture developed in the mountainous regions particularly in Kashmir. A lengthy survival of pit dwelling and retardation in a transition to food-production were typical of that area. The archaic traditions in some cases survived up to the time when the process of emergence of the urban type civilization was well under way in the Indus valley. Broad cultural links, particularly within Central Asia persisted and developed in the course of the Neolithic period. Thus, the Mehrgarh materials find close analogies in the Jeitunian of southern Turkmenistan, as well as in several sites of northern Iran (Tepe Sang-i Chakmak). Several features of the Neolithic cultures in the mountainous regions (e.g. semi-lunar knives) may be placed within the area of eastern Asian traditions. These may be seen as a reflection of cultural links, as well as common cultural traditions with the Xinjiang Neolithic cultures (see Chapter 13). However, the discovery in the Gangetic valley has produced sufficient evidence for accepting the primacy of food-production in this region.

[49] Thapar, 1984, pp. 195–7.