The Early Farming Culture of the Middle Ganga Plain with Special Reference to the Excavations at Jhusi and Hetapatti

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ABSTRACT

The archaeological investigations in the middle Gangetic plain have revealed a long cultural sequence right from late Upper Palaeolithic to the historical period. The first colonizers of the Gangetic plain were the Epipalaeolithic and Mesolithic hunter-gatherers of the Vindhyas. The excavations conducted during last two to three decades have brought to light a distinct Neolithic culture in the region. The Mesolithic people had started exploiting the edible wild grains for their consumption is evident not only from a good number of grinding stones from the excavated Mesolithic sites of the Ganga plain and the Vindhyas but also from the evidence of wild rice from Chopani Mando in the Vindhyas. Recent discoveries of the early farming culture of the region have proved that it was one of the early centers of agriculture in the world.

The Indo-Gangetic plain has a significant position in the history and archaeology of India. Entire Ganga Plain, divisible into three main units: (i) Upper Ganga Plain, (ii) Middle Ganga Plain, and (iii) Lower Ganga Plain has been an important geographical feature in Indian sub-continent. It looks a flat alluvial land, marked by rivers originating from the Himalayas, horse-shoe-lakes and rivulets emerging from these lakes and has a slope from north-west to south-east. The middle Gangetic plain measuring about 144,409 sq. km, is bounded by the Himalayan tarai in the north, Vindhyan plateau in the south, Ganga-Yamuna confluence in the west and Bihar-Bengal border in the east. It includes modern eastern Uttar Pradesh and plain of Bihar. On the basis of the river system, the middle Ganga plain is sub-divided into the Ganga plain North and Ganga Plain South, the former further sub-divisible into (i) the Ganga-Ghaghara doab, (ii) the Ghaghara-Gandak interfluve, (iii) Gandak-Kosi interfluve and (iv) Kosi-Mahananda interfluve and the latter, i.e. the Ganga Plain South into (i) West of Karmanasa, (ii) Karmanasa east interfluve, (iii) Lower Son Valley, and finally (iv) the Magadha-Anga Plain.¹ Needless to say the Ganga constitutes the lifeline of the area under discussion. It has been the cradle of Indian civilization right from the terminal Pleistocene period. Geologists believe that the Ganga plain, a peripheral foreland basin came into existence in Early Miocene, expanded in the Middle Miocene and attained its present form in the Late Quaternary. It has a surface cover of Holocene sediments of variable thickness throughout.²
The Ganga plain was initially very rich in wild flora and fauna due to favourable climate, but has now to some extent been changed because of deforestation and excessive hunting and cutting of forest primarily due to pressure of human population.

The changing climatic conditions during early and middle phases of Holocene in the area played a significant role in the evolution of cultures. The excavations and explorations conducted during the last four decades by University of Allahabad, Banaras Hindu University, Deen Dayal Upadhyaya University Gorakhpur, University of Patna, U.P. State Archaeology Department, Bihar State Archaeology Department and Patna Circle of the Archaeological Survey of India, have furnished a complete cultural sequence of the region - Epipalaeolithic, Mesolithic, Neolithic, Chalcolithic, Early Iron Age and historical periods (Fig.1). The Gangetic plain was far the first time colonized by the Stone Age culture of the Vindhyas. Right from the earliest phase, i.e. Epipalaeolithic and Mesolithic, both the regions, Vindhyas and the Ganga plain, have been in close cultural contacts. Recent excavations have thrown new light on the early

Fig. 1. Archaeological sites in the Ganga plain.
farming culture of the area. Present paper proposes to reconstruct the life of the first farming culture (Neolithic) of the Gangetic plain in the light of recent excavations at Jhusi and Hetapatti (Fig. 2).

Excavations at Jhusi

Jhusi (Lat. 25° 26’ 10” N., Long. 81° 54’ 30” E.), the ancient Pratisthanpur, is located on the left bank of the Ganga within a marked meander very close to the Ganga-Yamuna confluence at a distance of about 7 km to the east of Allahabad city. The Department of Ancient History, Culture and Archaeology, University of Allahabad has conducted excavations at the site on Samudrakup mound (Fig. 3) for five seasons, 1995, 1996, 1997, 1998, 1999, 2002 and 2003 in four different areas. It is a multi-culture site having occupational deposit from the Neolithic to Early Medieval Period cultures.

Stratigraphy and the Cultural Sequence

The archaeological occupational deposits at Jhusi and Hetapatti are resting on the geological formations belonging to the terminal Pleistocene/early Holocene period. The section of old alluvium of the Ganga, Bhagar, pertaining to the terminal Pleistocene and early Holocene formations exposed at a number of places, has a thickness of more than 10 m. The habitational deposit at Jhusi is resting on a geological formation having thickness of more than 10 m. The formation is exposed also near Phaphamau to the left bank of the Ganga. This exposure is divisible into four units. At the bottom there is concretionary horizon, which is hard and full of calcium carbonates and may be equated with unit 7 (Gravel III) of the Belan section in the Vindhyas. The overlying deposit is blackish in colour and clayey in character having small shells and is coeval to palaeo-sol of the Belan. Plastic clay constitutes the third unit and the artifacts of the first settlers of the Gangetic plain (Epipalaeolithic) are found on the top of this formation, while the fourth and the last unit is characterized by fine sand and silt, which has yielded the Mesolithic microliths. The deposit is coeval to the topmost horizon of the Belan section.

The formations coeval to the upper formations of the early Holocene in the Vindhyas, as revealed from the Belan and Son sections, were formed under less humid condition (moisture condition) and were succeeded by a return to a more equable climate in the period of Mesolithic and Neolithic.
The total thickness of cultural deposit at Samudrakup mound of Jhusi is about 16.5 m. Though the earliest artifacts at the site belong to the Mesolithic period, the first habitation deposits at the site belong to the Neolithic culture. It has a thickness of 1.5 m at Jhusi and about 60 cm at Hetapatti. As revealed from the excavations at Jhusi following cultural sequence has been obtained:

1. Mesolithic
2. Neolithic
3. Chalcolithic
4. Early Iron Age (Pre-NBPW with Iron)
5. Northern Black Polished Ware culture
6. Sunga and Kushana Period
7. Gupta Period, and
8. Early Medieval Period

There is stratigraphic break after the Neolithic and Gupta period deposits.

During the end of the Pleistocene and beginning of Holocene period the Mesolithic man colonized the Ganga Plain. This evidence has been revealed from the Mesolithic sites of the Ganga Plain. Possibly the first settlers at Jhusi also were the Mesolithic people, whose evidence has been found in the form of microlithic tools like blades, points and triangles.

It may be mentioned that the lowest level at Jhusi has revealed geometric microliths. Such artifacts also have been found from the neighbouring sites of Nibi Kalan and Jamunipur Kotwa. It may be presumed that on the top of geological formation below the archaeological deposit the Mesolithic man was on the scene and that is why we are getting the microliths. Layer 57 of square SF-7 is yellow brown silt and belongs to the Mesolithic culture. The subsequent cultural deposits are resting on this formation.

**Neolithic at Jhusi**

The evidences of Neolithic culture were found in 2002 and 2003. The earlier excavations in northern, central and eastern areas of the site had revealed the evidence right from Chalcolithic period up to early medieval period. To confirm whether the Pre-NBPW Chalcolithic culture is extended to the southern part of Samudrakup mound, two trenches SF-8 and SG-8 in 2002 and two SF-7 and SG-7 in 2003 each measuring 5 X 5 m were laid out for the excavation. Square SF-7 has revealed interesting evidence of the Neolithic culture. Layers 45 to 56 measuring 1.50 m belong to this phase. The occupational layers of this phase yielded hand made pottery, consisting of cord impressed ware, rusticated ware, burnished red ware, burnished black ware and crude black-and-red ware; microliths; pieces of grinding stone and animal bones. There is evidence of rice husk in this pottery used as temper. It seems that the habitation during the Neolithic phase was in limited area, whose evidence is coming in the southern fringe of Samudrakup mound of Jhusi. The overlying layer 44, which is the sealing layer of the Neolithic deposit is marked by gritty and sandy material. Evidently it was the result of erosional activity yielding rolled pieces of potsherds and animal bones. Its bottom line is zigzag. It seems that there was a time gap between the end of the Neolithic and the beginning of the Chalcolithic and the area remained unoccupied for a considerable time after the Neolithic period.
The settlements of the Neolithic people have left behind the evidence of circular huts known through the patterns of post-holes that have come to light (Fig. 4). The walls of the huts appear to have been constituted by bamboo and reeds smeared with mud plaster, as is evident by the burnt clay lumps with wattle and daub impressions on them. The evidence of structures have been obtained in the form of hut floor, hearth and oven. On the top of layer 53 parts of three hut floors - A, B and C were located. Hand made potsherds, charred and semi charred animal bones and charred grains were found from these hut floors. A sand stone quern fragment and a potsherd having both the ends rubbed, a trapeze made on chalcedony and steatite beads were recorded from floor A. Three circular hut floors littered with potsherds were also found 13.80 m below datum associated with layer 55. Of the other structures mention may be made of a few pits containing animal bones. A noteworthy structure consists of a plastered burnt floor enclosed by two parallel burnt mud walls, which was possibly used as community hearth or kiln for baking the pottery (Fig. 5).

The ceramic industries characterizing this phase are thick to medium in fabric and ill fired. The core of the pots is blackish, greyish and occasionally reddish. Clay used for manufacturing the pots is not levigated. The surfaces of pots or uneven indicating thereby that these are hand made. Tempering material like rice husk, millet husk and chaffs have been found in the pottery. The pottery, on the basis of surface treatment, is divisible into four wares: (i) cord impressed ware, (ii) rusticated ware, (iii) burnished red ware, (iv) burnished black ware and (v) crude black-and-red ware. The first three wares may be considered as sub-groups of red ware. As sometimes the surface treatment of cording, rustication and burnishing was not provided to whole body of the pot, there are ample number of pots without such surface treatment, which may belong to any one of these wares. Some of the pots may be of ordinary red ware. There are also instances where the same pot has rustication on the corded or burnished red surface. Though the shapes available
are limited but mention may be made of jars (Fig. 6), basins (Fig. 7), spouted vessels (Fig. 8), bowls and platters (Fig. 9). Jars vary from big size to medium size with concave or carinated neck having featureless rim. On the outer surface on some of the jars there are impression of cording and rustication analogous to those of the Neolithic sites of the Vindhyas. The basins with applique decoration on the shoulder have red burnishing on inner surface and just above the appliqué on outer surface and also rustication below the appliqué, on outer surface some times with soot mark. Evidently these were the cooking vessels. The evidence of appliqué decoration on the base of the spout, where it is luted with the body of basins is noteworthy on one of the basins.

The excavation of the Neolithic level revealed a good number of beads, mostly micro beads made of paste material like steatite, which include disc shaped micro beads and grain shaped micro beads. Some cylindrical beads of paste material also have been found. Unperforated and unfinished specimens indicate that the beads were manufactured at the settlement itself. The segmented pieces indicate that after giving it a shape and perforation these were cut in small pieces to get the shape of micro beads.
Disc beads made of terracotta; small cylindrical bead of banded agate and flat truncated bead of banded chalcedony are also present. The stone beads have hourglass perforation.

The Neolithic layers have also revealed a good number of microlithic tools, which include retouched and/or utilized blades, backed blades, truncated and retouched blades, scrapers, triangle, trapeze, point, drill, lunate, etc. Among the waste material mention may be made of flakes, blades, chips, core rejuvenating flakes and exhausted core. The lithic artifacts are generally broken. The raw material of the lithic industry includes chert, chalcedony, carnelian and quartz, which are also found in the form of nodules.

Tanged and simple bone arrowheads made of shaft or antler portions of animal have also been obtained (Fig. 10). Side scrapers and end scrapers made of bone are also included in the bone tools.

Flat quern fragments with lustrous smooth or pitted surface, mullers with smooth or pitted surface and anvils made of sand stone and quartzite are the food processing equipments. Some basin shaped quern fragments also have been obtained. A stone ball possibly was used as hammer stone and/or sling ball (Fig. 11).

Potsherds and burnt clay lumps with seed, husk and chaff impressions including those of rice, sesame, etc. have been recovered from excavation. Dr. K.S. Saraswat
Fig. 8. Pottery Types, Spouted Basons and Spots

Fig. 9. Pottery Types, Bowls and Platters, Jhusi.
and Dr. A.K. Pokharia of the Birbal Sahni Institute of Palaeobotany, Lucknow are collaborating in the field of archaeo-botany. Some very significant archaeo-botanical discoveries have been brought to light by these diggings, which are listed in Table 1.

The Neolithic culture at Jhusi is characterized by hand-made pottery, which is commonly recognized as ill-fired cord impressed (Fig. 12), rusticated and burnished ware. Bone tools, bone arrowheads, fish and animals bones and stone tools including querns, mullers and sling balls. As an evidence of cooking vessel, mention may be made of a large sized spouted basin with soot marks at the bottom, which was found on one of the floors along with other artifacts (Fig. 13). This is further substantiated by the burnt plastered structure, enclosed by two parallel mud walls, as mentioned earlier, which might have been used as community hearth-cum-pottery kiln. The environment of Neolithic people at Jhusi appears to have been characterized by grassy land, frequented by occasional trees, which probably did not constitute a thick forest, though bamboo groves appear to have predominated. Marshy land and lakes also seem to have marked the landscape. The companions of the Neolithic man of Jhusi were cattle, sheep-goat, boar, *barasingha*, etc. Fish, turtle and birds

Fig. 10. Bone arrowhead, Jhusi.

Fig. 11. Food producing stone artefacts, Jhusi.

Fig. 12. Cord impressed potsherds, Jhusi.

Fig. 13. Spouted basin, in situ, Jhusi.
<table>
<thead>
<tr>
<th>Locus</th>
<th>Species</th>
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<tr>
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<tr>
<td>Stratum: 55</td>
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<td>Stratum: 53 (Floor B)</td>
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<tr>
<td>4. JHS</td>
<td><em>Hordeum vulgare</em> (Barley), <em>Triticum aestivum</em> (Bread wheat), <em>Oryza sativa</em> (Rice), <em>Lathyris sativus</em> (Grass pea), <em>Macrotyloma uniflorum</em> (Horse gram), <em>Vicia sativa</em> (Vetch), <em>Ziziphus nummularia</em> (Ber)</td>
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definitely constituted important item of their diet. The food grain produced by them comprised of rice, millet, barley, wheat, lentil, pea, grasspea, blackgram, horsegram, vetch, sesame, etc. Other botanical remains include *anwila*, coix, grape, *ber* and bamboo.

**Excavations at Hetapatti**

A new site of the Neolithic culture at Hetapatti (Lat. 25° 29' 0" N., Long. 81° 55' 31" E.) is located on the left bank of the Ganga. It is at a distance of about 20 km from Allahabad in north-east direction. The site is divided mainly in three mounds. The main mound named HPT-II is about 10 m high from the surrounding areas and it contains archaeological deposit upto early medieval period. The other two mounds, named HPT-I and HPT-III, are about 6 m high and contain archaeological deposit only upto NBPW and Kushana periods respectively. There is extensive exposure of geological formation measuring more than 7m in thickness on which the archaeological deposit is resting. In this way on the left bank of the Ganga a platform was already created on which the man subsequently started playing his role.

The site is being excavated by the Department of Ancient History, Culture and Archaeology, University of Allahabad.

**Neolithic at Hetapatti**

Trench I-1 located on highest point of the site HPT-I is the western most trench selected for excavation. The Neolithic horizon, which is disturbed by the later pits, is light yellowish in colour and compact in texture. The hand made Neolithic pottery, characterized by cord impressed ware, rusticated ware, ordinary red ware and occasionally burnished red ware, is found from this horizon. The functional pottery types include jars, shallow and deep bowls and basins some times luted with spouts, etc. Some of the spouted basins have applique decoration on the shoulder. Besides, the ceramic assemblage the Neolithic horizon has also yielded a good number of animal bones, flake and blade fragments of semiprecious stones and a few other stone objects. A good number of burnt clay lumps with bamboo and reed impression have been recovered suggesting thereby the hut structure. Some hut floors marked by Neolithic artifacts like handmade pottery including corded and rusticated wares, burnt clay lumps with reed marks, animal bones, quern and muller fragments, microliths, etc. (Figs. 14, 15) were also exposed. Soil samples from this trench particularly
from the Neolithic horizon have been collected for pollen analysis. It is hoped that when analysis is complete it may throw light not only on the range of crops but also the contemporary vegetational world. This could also help us in reconstructing environment during the Neolithic period. The Neolithic deposit in this trench is 60 cm, divisible into four layers.

Trench C-8, lying to the south east of the I series of the trenches also measuring 5 x 5 m was put to excavation. Being situated on the margin of the mound, part of the trench particularly on the north eastern side is sloping and therefore step digging was conducted in this trench. Excavation in this trench was conducted up to a depth of 80 cm divisible into seven layers. Of these, layers 2 to 6 with a thickness of 70 cm belong to Neolithic. These layers have yielded typical Neolithic pottery (Fig. 16), animal bones and burnt clay lumps. Some of these burnt clay lumps suggest wattle and daub structure. Two pits were also located in the trench but significantly enough these pits have also yielded Neolithic materials. Other significant feature is calcium carbonate in different layers, some times covering the Neolithic pottery and animal bones, suggesting thereby that the formation of calcium is post Neolithic.

The identification of Neolithic level at Jhusi and Hetapatti in Allahabad on the Ganga presents for the first time Neolithic culture on the western margin of the middle Ganga plain. There may be hidden Neolithic settlements in between the eastern and western margins of the area.

**Neolithic in the Middle Ganga Plain**

As mentioned earlier the archaeological investigations carried out in the middle Ganga plain have revealed evidence of the Stone Age relating to the Epipalaeolithic and Mesolithic cultures. In the western part of the middle Ganga valley, where a good number of preceding Mesolithic sites are located, the succeeding Neolithic culture was not present before the discovery of Neolithic settlement at Jhusi and Hetapatti in Allahabad district.

The explorations conducted in the eastern part of the mid Ganga valley during the last four decades have resulted in identification of several Neolithic settlements. The important excavated sites in Uttar Pradesh, other than Jhusi and Hetapatti of Allahabad, include Bhunadih and Waina in Ballia, Sohgaura and Imlidi Khurd in Gorakhpur and Lahuradewa in Sant Kabirnagar district, while Chirand in Saran, Chechar Kutubpur in Vaisali, Taradigh in Gaya and Senuwar in Rohtas district in Bihar. Most of these excavated sites are multi-culture sites having yielded archaeological relics ranging from Neolithic to early historical periods.

**Settlement Pattern:** All the excavated sites are located on the banks of rivers, generally on the confluence of two rivers, near meander above the flood plain or on horse-shoe lakes as in the case of Lahuradeva.

**Structures:** The excavations, though conducted on a limited scale, have brought to light evidence of
circular or oval huts known through the patterns of post-holes that have come to light from almost all excavated sites of the area. Wattle and daub structure is attested by good number of burnt clay lumps with bamboo and reed impression. At Chirand, the evidence of pit dwelling has also been reported. Of the other structural remains mention may be made of hearths, pits and silo probably for storing the grains.

**Subsistence:** The Neolithic people of the Ganga valley as those of the Vindhyaas were farming and pastoral communities is attested by the cultivated variety of rice, barley, wheat, field pea, lentil, green gram, etc. recovered from the excavated sites. However, the botanical evidence obtained from Senuwar and Jhusi in mid Ganga valley read with its counter part of Tokwa in the Vindhays suggests that in the early phase only rice and some primitive millets were being cultivated. With the passage of time other cereals were also added. The Neolithic deposit at Senuwar is divided into two subgroups 1A and 1B. From the lowest part of the middle of period IA only grains of cultivated rice, (*Oryza sativa*) were found along with wild plants like jobs tear, fox tail/bandra, wild rice, *jharberi*, *chaulai* and wild *palaka*. But in the later phase of IA new cereals like barley, wheat, *jowar* millet, lentil, field pea, finger millet (*ragi*) and *khesari* were introduced. The available evidence is demonstrative of the fact that by the late phase of Neolithic culture in the mid Ganga valley, double crop pattern had become an accomplished fact.

Domesticated animals include cattle, buffalo, sheep, goat and pigs. Besides these, the bones of elephants, rhinoceros, stag, deer, etc. have also been found from some of the sites. Of aquatic fauna whose bones have been found, mention may be made of fish and turtle. Bones of birds have also been found. The available evidence, thus, indicates that besides agriculture and domestication the Neolithic people of the mid Ganga plain also practiced hunting, catching and fishing.

**Material Culture:** The ceramic industry of the Neolithic Gangetic plain is rich and varied. The available evidence indicates that in the early stage of the culture, as indicated at Chirand, Lahuradeva, Jhusi and Hetapatti, people were using hand made pottery but subsequently the slow wheel appears to have been used for the purpose. The ceramic assemblage includes ordinary red ware, lustrous red ware, burnished ware (red, black and grey), rusticated ware, black-and-red ware and corded ware. The clay used for manufacturing the pots is not well levigated. It contains grits, husks and chaff as degraissant. Pots are generally ill-fired and have blackish grey core. Pottery types exhibit variety suggesting thereby that these were put to different uses. Pottery types include bowls with varying profile, vases, vessels, basins, miniature jars, *handis*, etc. Bowls, basins and vases also have some times spouts. The cording exhibits dozen of patterns. Some of the pots, generally vases, were made in two parts separately - the lower portion and the rim portion and subsequently these were luted together.

Occurrence of painted sherds has been reported from Imlidih Khurd, Lahuradeva, Chirand and Senuwar. The post firing paintings of Chirand and Senuwar are confined to the rim and have been executed in red ochre. At Chirand the painting motifs consist of linear designs of criss-cross lines and concentric circles. At Imlidih Khurd painting executed in white red pigment over a bright slip has been reported. Post firing scratching by sharp instrument is another
feature of decorating the pots. Often the scratching results in geometric patterns such as opposed triangles within concentric circles and floral motifs. Pots with appliqué bands have also been reported. On these appliqué are executed chain and rope patterns or incised decorations. In this connection it may be pointed out that appliqué patterns are confined to big pots like handis and basins. Wheel-thrown pots are reported from the late Neolithic phase of Senuwar.

As revealed from the excavated sites the culture is associated with microlithic industry. Bladelets, flakes, blades, scrapers, arrowheads, serrated points, lunates, borers, etc. fashioned on chert, chalcedony, agate, jasper, and quartz have been found from some of the sites. However, celts of basalt and granite have been obtained from Lahuradeva, Chirand and Senuwar. Heavy-duty stone objects include fragments of querns, mullers, balls, hammer stones, etc., fashioned on sandstone or quartzite. Beads, finished and unfinished and fashioned on chalcedony, agate, etc. have been found at Jhusi, Chirand and Senuwar. Chirand, Lahuradeva, Jhusi and Hetapatti have also yielded beads of steatite and/or faience.

Bone tools have been found at Jhusi, Senuwar and Chirand. The last site has yielded a corpus of bone tools and weapons including celts, scrapers, chisels, hammers, needles, points, borers, awls, arrowheads, etc. Other bone objects comprise ornaments like pendants, earrings, bangles, discs, combs, etc.

Terracotta objects including edge ground potsherds (triangular or rectangular in shape), spherical beads with central perforation were obtained from Senuwar. Chirand has yielded terracotta wheels, beads, bangles, cakes, birds, snakes, etc.

Origin

The first farming and pastoral culture of the Vindhyas is the Neolithic culture. As revealed from the Mesolithic culture of the area, food processing equipments, microliths, bone tools and wild animals and wild grains, which were domesticated/cultivated subsequently in the Neolithic period, it can be inferred that the base for the Neolithic culture was being prepared in the Mesolithic period.

Neolithic culture of the Vindhyas is also credited with developing the Neolithic culture in the Gangetic plain as indicated by comparative study of the culture of both the regions. The excavated sites of the Vindhyas and Ganga plain present ample evidence of cultural contact of both the regions. The preceding Mesolithic culture of the Ganga valley contains food-processing equipments made on sand stone/quartzite but no pottery, where as in the Vindhyas it is associated with hutments and hand made pottery also. Among the ceramic industries, the cord-impressed ware has much archaeological importance as it denotes the cultural contact of Vindhyas with that of the Ganga plain. The cord-impressed ware has been found in Neolithic context at Chirand, Chechar Kutubpur, Taradih, Sohagaura, Lahuradeva, Jhusi and Hetapatti in the middle Gangetic plain that has techno-typological similarity with that of the Vindhyas. The evidence suggests that the Neolithic pottery of the middle Gangetic plain has a considerable influence of the Vindhyan Neolithic pottery. It is suggested that the Neolithic culture of the Ganga plain owes to the Vindhyan Neolithic for its origin.

Chronology

The problem of the antiquity of the Neolithic culture of the region is still not finally settled but now we have some relevant C-14 dates from the excavated
Neolithic sites of the Vindhyas and Ganga plain. Considering three of C-14 dates reading 4530 ± 185 BC (PRL 101), 5440 ± 240 BC (PRL 100) and 6570 ± 210 BC (PRL 224) obtained from Koldihwa as dependable, the culture was dated to the 7th-6th millennium BC. But being the only site of such antiquity doubts were raised by several scholars. The C-14 date belonging to the transitional phase of the Neolithic to Chalcolithic at Koldihwa is 1440 ± 120 BC (PRL 223). The absolute dates obtained from Mahagara also indicated a late date to the culture, though these dates have the possibility of contamination of samples. Two TL dates reading 2265 BC and 1616 BC and four C-14 dates reading 1440 ± 150 BC (PRL 409), 1330 ± 120 BC (PRL 408), 1440 ± 100 BC (PRL 407) and 1480 ± 110 BC (BSI) have been obtained from the samples from Mahagara. These dates are not consistent with the stratigraphy possibly due to contamination of samples. In the light of calibrated C-14 date obtained from Kunjhun, reading 3530-3335, the beginning of the Vindhyan Neolithic culture was proposed to 4th millennium BC. Three C-14 dates have come to light from recent excavations at Lahuradewa in the middle Gangetic plain, which read as 5320 ± 90 BP (BS 1951) (cal BC 4220, 4196, 4161) and 6290 ± 160 BP (BS 1966) (cal BC 5298). Recently three relevant C-14 dates have been obtained from Tokwa. When calibrated these read 6591 BC (BS - 2417), 5976 BC (BS - 2369), 4797 BC (BS - 2464). An AMS C-14 date for a carbonized domesticated rice would push the antiquity of the Neolithic culture at Lahuradeva in 7th millennium BC. From the Neolithic horizon of Jhusi three C-14 dates have been obtained. These dates when calibrated, read 7477 BC (BS - 2526), 5837 BC (BS - 2524) and 6196 BC (BS - 2525). The earliest date obtained from the site would put the beginning of the Neolithic culture of the site in 8th millennium BC.

The combined testimony of the available C14 dates obtained from Koldihwa and Tokwa in the Vindhyas and Jhusi and Lahuradeva in the middle Ganga plain would push the antiquity of the Neolithic culture in the northern Vindhyas and the middle Ganga plain to a hoary past. The antiquity of the early farming culture of the Gangetic plain on the basis of these dates may be pushed back to the later half of 8th millennium B.C. and almost same or slightly earlier antiquity may be proposed for the Neolithic culture of the Vindhyas.

Conclusion

The discovery as a result of excavations at the Mesolithic sites of Sarai Nahar Rai, Mahadaha and Damdama in the Gangetic Plain by the Department of Ancient History, Culture and Archaeology, University of Allahabad in the sixth, seventh and eighth decade of the last century presented a surprise because Stone Age culture sites of the Mesolithic phase were located in an area totally free of hills - the source of stone supply. Indications of the Mesolithic culture were available from more than 200 sites in the mid-Ganga plain but Neolithic was conspicuous by its absence in this area. It was, therefore, surmised that there was a cultural break after the Mesolithic in this region and settlers of the Chalcolithic phase at Jhusi and other sites probably were not native to this region. But the current excavations at Jhusi have succeeded in discovering below the Chalcolithic phase nearly 1.5 meter thick Neolithic deposit. This excavation is significant because it presents the proof of cultural continuity in an unbroken sequence right from the Mesolithic through the Neolithic to the Chalcolithic which again continued in an unbroken
sequence into the historical period down to the time of the Buddha and, further on, up to the early medieval period. In this way, it is an epoch-making discovery, as it has taken the antiquity of the region in an unbroken manner to the Mesolithic times.

The archaeological evidence shows that the Gangetic Plain owed to the Vindhyas not only for its first colonization in the Mesolithic period but as evident by very close affinity in the ceramic industries, microlithic component, food processing equipments, bone tools, beads and settlement pattern revealed from the excavations at Tokwa and other sites in the Vindhyas and Jhusi and other sites in the middle Gangetic Plain it can be concluded that both the regions are intimately related to each other for the origin and development of Neolithic culture. The C-14 dates from recent excavations at Jhusi and Lahuradeva in the middle Ganga plain and Tokwa in the Vindhyas suggest that this region was one of the early centers of agriculture in the world. The evidence of barley (*Hardeum vulgare*), bread wheat (*Triticum aestivum*) and other winter crops along with summer crop like rice (*Oryza sativa*), etc. from early levels of Neolithic Jhusi indicates that the area was in cultural contact with the original home of winter crops right from the early phase of the Neolithic culture. It may be mentioned that in still nearer region the Himalayan *tarai* still has some wild barley species. The wild ancestor of the six rowed barley (*Hardeum hexastichum*) is found in eastern Tibet.37

The discovery also highlights the fact that Jhusi has been a cradle of human civilization right from the Mesolithic age down to the blossoming of urban phase of the culture of this region. The caravan of the human succession journeyed through the hunting-gathering, foraging, farming and village life before striking upon the legendry urban theme of being the capital city of the Pururava. It is born, bred and developed at its own epicenter, the mid-Ganga Valley as exemplified by the present excavations at Jhusi. Outside influences, if any, were of an interactive rather than originary character.

**References / Notes**


8. The site of Jhusi due to its strategic location on the confluence of the Ganga and Yamuna had attracted the attention of archaeologists and the antiquities found from the site are displayed in different important museums of the world. The site was excavated by the Department of Ancient History, Culture and Archaeology, University of Allahabad in five seasons. Prof. V.D. Misra, Dr. J.N. Pal and Dr. M.C. Gupta participated in all the seasons, while in 1995 and 1998 Sri B.B. Misra, Dr. J.N. Pandey and Dr. U.C. Chattopadhyaya also participated in the excavations.


15. The faunal remains from Jhusi and Hetapatti are very kindly being studied by Dr. P.P. Joglekar of Deccan College, Pune, we are thankful to him.


27. Singh, B.P. 1990 ‘Early Farming Communities of Kaimur Foot Hills’, Purāttatva 19: 6-18;


35. We are thankful to Dr. K.S. Saraswat and Dr. A.K. Pokharia of Birbal Sahni Institute of Palaeobotany, Lucknow for the C-14 dates and also for the study of botanical remains.


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