

Understanding the Neolithic in Northern India

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In January 2006, I was invited by Dr Rakesh Tewari of the Directorate of Uttar Pradesh State Archaeology to attend a conference in Lucknow, one purpose of which was to discuss the possibility that the basal layer of the site of Lahuradewa, a site located in the basin of the Ghaghara River, a tributary of the Ganga, might contain evidence for an independent mid-Holocene domestication of rice on the middle Ganga Plain. Together with the other delegates I visited the site, and spent several days in Lucknow discussing the possibilities with archaeologists and palaeobotanists, both Indian and foreign. I base the opinion presented below on the research done for my recent book *First Farmers*,¹ plus my reading of the many offprints and journals given to me during the Lucknow meeting. I would like to thank Rakesh Tewari for his invitation, and acknowledge that he and his many colleagues have put this aspect of Indian archaeology very solidly on the international archaeological stage. The quality of archaeological reporting in *Prāgdhārā*, especially for Lahuradewa, is of a very high standard. Many of the problems I have faced in identifying precise information on the contents of Gangetic archaeological sites would dissolve if all reports were so carefully presented!

The origins and spreads of agriculture - some background considerations

It is necessary first to consider some comparative observations concerning the origins and spreads of agriculture and agricultural populations - essential background if we are to give serious consideration to any possibility of independent agricultural origins in northern India.

Agriculture has been primarily a Holocene phenomenon, a result of ameliorating climatic conditions and increasing human population densities after 15,000 years ago. Precise reasons for shifting to farming are multiple, and relevant variables will include responses to the need for risk management, an availability of high-yielding and domesticatable species, a desire for a group-size advantage (strength in numbers), and perhaps a wish to promote status rivalry. Seven regions of the world have archaeological records sufficiently robust to suggest that they witnessed independent developments of agriculture out of foraging backgrounds, these being the Levant, central China, western and central Africa, the New Guinea Highlands, Mesoamerica, the northern Andes, and the Eastern Woodlands of the USA. For some of these regions there are possibilities of secondary

stimulation behind the farming origins, but I will avoid discussion of these issues here. Each of these regions, very significantly in my view, would appear to have been an origin zone for outwards dispersals of human populations, material culture, subsistence complexes and language families. In my recent book² I give the rationale behind these statements.

The Indian subcontinent has not been widely regarded as an independent locus of early agriculture, but I return to this issue below. It can hardly be forgotten that India contains a number of major native plants that were brought into cultivation, especially legumes and millets, and, perhaps most importantly, rice of the *indica* sub-species of *Oryza sativa*. Dorian Fuller,³ for instance, has recently suggested that South Asia might have witnessed several independent transitions from hunting and gathering into agriculture, but notes that the archaeological record to render any of them secure is currently lacking.

As I explain in my 2005 book, if we examine regions of agricultural origin, we also find evidence for a related origin of many of the major language families. The Indo-European and Afroasiatic language families spread from Anatolia and the Levant respectively; the vast Bantu subgroup of the Niger-Congo family from western Africa; the Sino-Tibetan, Austroasiatic, Tai and Austronesian families from eastern Asia. The Dravidian language family is undoubtedly native to some region of South Asia, and probably also spread with some form of food production,⁴ although not necessarily one of completely independent origin. Regions that gave rise to mixed farming with cereals produced more widespread outflows of culture and language than regions based purely on fruit and tuber horticulture. To illustrate this, compare the New Guinea Highlands (with fruit and tuber horticulture) with East Asia.

Papuan language speaking New Guinea populations, with economies that lacked cereals and domesticated animals, did not spread far beyond New Guinea. But *japonica* rice, millets, domesticated animals, and a large complex of Neolithic material culture with its ultimate origins in central China certainly spread throughout Southeast Asia. The West Asian complex of Neolithic agro-pastoralism likewise spread remarkably widely, from North Africa and Europe to northern India.

Furthermore, regions of agricultural origin reveal a number of characteristic features. First of all, there is continuity from the preceding hunter-gatherer phase into the early phases of farming. This is quite different from the replacement or assimilation situation that we see in regions where farming has been introduced, as for instance across most of Southeast Asia. In the regions of primary origin that we understand fairly well, currently headed by the Middle East and China, the continuous trajectory from forager to mixed farmer took at least two millennia to occur, and was associated with very considerable demographic growth.

A very clear example of the latter can be illustrated from Neolithic central China, which witnessed some very considerable overall population growth, despite local variation caused by regional fluctuations. For instance, Liu⁵ records for Shandong an increase in site numbers from 16 in the Beixin early Neolithic (6000 BC) to 893 in the Longshan late Neolithic (2500 BC). And site numbers are not all, since Longshan sites are up to 246 ha in size, but early Neolithic sites much smaller. What rate of population growth we are witnessing is uncertain, but over the 3500 year period involved we could have a 100-times (or more) multiplication of population in the survey regions concerned. In other words, 1000

people would have become 100,000, over a span of 3500 years. Similarly, for the Dongtian Lake region of Hunan Province, Zhang and Hung⁶ record an increase in site numbers from 22 in the Pengtoushan Phase (c. 6000 BC) to 200 in the Qujialing-Shijiahe Phase (c. 3000 BC).

Population calculations of this kind are not available for most of Neolithic Southeast Asia, but Hung Hsiao-chun⁷ calculates a similar one for eastern Taiwan during the Neolithic. Here, there are five recorded Dabekeng sites dating to c. 3000 BC, but 43 “fine corded ware” sites dating between 2500 and 1500 BC. Even allowing for the obvious fact that older sites are more difficult to find, there is clearly a situation of considerable population growth recorded here.

Another factor that arises eventually in most regions of early agriculture, especially cereal agriculture with domestic animals, is the phenomenon of population expansion and migration. It required about 3000 years for Neolithic lifestyles to spread from central China to Mainland Southeast Asia, and 4000-5000 years to spread from central China throughout Oceania. The 3000-year time lag is similar to that required for the Neolithic spread through Europe from Anatolia, and into the Ganga Basin with western Asian crops via the Indus region. From my perspective, this suggests gradual expansion of agriculturalist populations as a result of a fairly gentle but inexorable pressure from increasing population densities and a relatively uncoordinated but also inexorable requirement for new land. This is not the same as suggesting that Neolithic migrations were caused *purely* by population pressure, and it is not suggested that agriculture was in itself a simple “cause” for anything. Better to refer to it as a necessary pre-condition, upon which many more

proximate causes for individual movements into new territories were layered.

As far as the eastern Asian region is concerned, the chronology of outflow of Neolithic lifestyles can be summarised as follows:

- 8000-6000 BC: development of cereal agriculture with domesticated pigs and chickens in central China, with *japonica* rice in the south, millets in the north.⁸
- 6000-3500 BC: gradual spread of Neolithic lifestyles through southern China.
- 3500 BC: Neolithic settlement of Taiwan (Dabekeng culture).
- 3000-2000 BC: Neolithic settlement of Mainland Southeast Asia.
- 2500-1500 BC: Neolithic settlement of Philippines and Indonesia.
- 1400-800 BC: Lapita spread through Island Melanesia and western Polynesia.
- AD 500-1200: final long-distance Austronesian settlements of Madagascar and eastern Polynesia.

In my *First Farmers* I relate these Neolithic spreads to the establishments of the Sino-Tibetan, Austronesian and Austroasiatic language families. Higham⁹ also relates the spread of Austroasiatic languages in Mainland Southeast Asia to the spread of rice cultivation and pottery after 2500 BC from southern China (including Yunnan), through Thailand and Indochina, into Peninsular Malaysia. Offshore, the spread of Austronesian languages with Neolithic movements from Taiwan to Batanes and Luzon on the one hand, and Borneo on the other, is also now well documented archaeologically for the period

between 2500 and 2000 BC.¹⁰ For Sino-Tibetan we have more difficulty since so little is known about the Neolithic in southwest China and Burma, but for the Chinese Neolithic heartland itself, especially along the Yellow River, we can read continuity of cultural development from Neolithic times into the fully Sinitic Bronze Age. It is the Tibeto-Burman rather than the Sinitic portion of Sino-Tibetan that offers the most problems at present, and it is not clear when Tibeto-Burman languages might first have reached the northern fringes of South Asia.

One other point must be made about the tropical and equatorial Southeast Asian Neolithic. For taphonomic reasons most sites contain very feeble records of agriculture, such that some archaeologists simply regard large blocks of it as hunter-gatherer in economy. In my view this is a mistake. Lack of obvious dependance on farming can simply mean non-survival of evidence in hot wet monsoonal climates. This has been made very clear by the earliest Taiwan Neolithic, where evidence of agriculture was completely lacking, following the first detailed presentation of this material by K.C. Chang,¹¹ until the recent discoveries from deep waterlogged sites in the Tainan Science-based Industrial Park.¹² The Dabenkeng people at Nanguanli cultivated rice and foxtail millet, yet all other dry land TPK sites, mostly highly weathered and eroded, reveal absolutely no evidence for such activities. Deeply stratified waterlogged sites can be absolute treasure houses, and location of wet sites in the Ganga delta and other deltaic regions of the Indian subcontinent is a definite priority, particularly for dating the beginnings of rice cultivation.

If a case is to be made that South Asia witnessed an independent transition into agriculture, separate from those in West and East Asia, then we must

keep the above comments in mind. Independent transitions to agriculture carry implications for their associated archaeological records. I have an open mind on the South Asian situation, and we currently have two proposals for independent agriculture within the subcontinent; one by Fuller¹³ for independent domestications of native millets, legumes and rice in various regions, and another for the middle Ganga Basin, for which the site of Lahuradewa is a prime candidate.

Definable and historically-relevant populations in the South Asian past

In *First Farmers*, and subsequently in a paper given at a meeting in Kyoto in June 2005,¹⁴ I have defined and refined my views on South Asian agricultural prehistory from the archaeological, linguistic and biological perspectives. My overall conclusions, as stated in the abstract for my Kyoto paper, are as follows:

This paper presents a hypothesis derived from consideration of the archaeological record for South Asia, and the comparative linguistic records for the Indo-Aryan and Dravidian languages. The South Asian archaeological record witnessed a major change from Mesolithic into Neolithic/ Chalcolithic cultures across much of the Subcontinent between 3500 and 2000 BC, and such a change can be argued strongly to have been associated with population movement. I suggest that both the Indo-Aryan subgroup of languages and the Dravidian language family spread into and through South Asia from about 3500 BC onwards, the former with Chalcolithic cultures of pre-Harappan descent that spread into northwestern India and the Ganges Basin, the latter spreading at the same time from the southern Indus region through western into

southern India. The Dravidian speakers were the founders of the southern Indian Neolithic. Munda speakers with rice cultivation spread into eastern India from Southeast Asia around, or perhaps before, 3000 BC, meeting Indo-Aryan speakers in the Ganges Basin. The initial arrival of Indo-Aryan languages at a time as late as the events recorded in the Rigveda (mid second millennium BC) is not, in my view, supported either by linguistics or archaeology.

I know that many archaeologists will reject this outline. Some might claim that no migrations have entered the Indian subcontinent since the Palaeolithic, that the Indo-Aryan languages spread into the subcontinent like a virus or just developed there by themselves, and that ancient Indo-Aryans never existed as a definable and historically-relevant population anywhere outside the Indian subcontinent. Some might claim that linguistic prehistory is not a proper topic for an archaeologist to consider. From my above statements, I hope that my views on these matters are clear. If archaeology cannot throw light on the genesis of the modern-day human pattern in India, or anywhere else in the world, then it is nothing more than an antiquarian discipline, with no explanatory value for humanity at large, beyond its own practitioners. The historical record of language movement, replacement, borrowing and shift makes it quite obvious to me that early Indo-Aryan and Munda languages can only have entered the subcontinent from outside, with ancestral communities of speakers. Homeland and migration issues also apply to the early Dravidian languages, although in this case it is likely that the early Dravidian speakers were native to somewhere within the Indian subcontinent (the northwest in my view, but in this paper I do not discuss Dravidian further).

The questions, of course, for Lahuradewa and the Ganga Basin, will relate to the prehistory of the Indo-Aryan and Munda speakers who still inhabit the region today. Dravidian languages have apparently never been spoken in this area, at least not according to any surviving substrates, placenames or oral traditions.¹⁵ The linguistic and archaeological evidence suggests very strongly that the initial migration of Indo-Aryan speakers into South Asia occurred at about 3500-3000 BC, coming from the northwest in the form of the Pre-Harappan and Early Harappan cultures of Pakistan, Haryana, Punjab, Rajasthan and Gujarat, and entering the Ganga plains as the so-called OCP (Ochre-Coloured Pottery) culture. Earlier dates for this movement are certainly not warranted by the archaeology or the linguistics of northern India.

But what about the Mundas? Their distribution is much smaller now than that of the Indo-Aryans, and the Munda languages are spoken in relatively small pockets of territory in northeastern Peninsular India (mainly the Chota Nagpur Plateau of Jharkhand, Orissa and Bengal), with Korku located quite far west near the Narmada River in Madhya Pradesh (see Fig. 1). Together with the Mon-Khmer subgroup, the Munda subgroup forms a basal branch in a much more extensive language family called Austroasiatic.¹⁶ This is spread across Mainland Southeast Asia and contains major languages such as Khmer and Vietnamese, as well as many fairly isolated tribal languages. The Mon-Khmer languages also reached India, being represented by Khasi of the Meghalaya, the most westerly language of the subgroup (Fig. 1). The Austroasiatic homeland is not known with certainty, but majority opinion points rather vaguely to southern China, somewhere between the Yangzi river in the north and the northern

fringes of Mainland Southeast Asia in the south. Diffloth has recently suggested, without presenting a detailed argument, that Proto-Austroasiatic might have

been located somewhere in the vicinity of Assam, Bangladesh and Burma, but perhaps in an upland rather than a lowland area.¹⁷ Proto-Munda

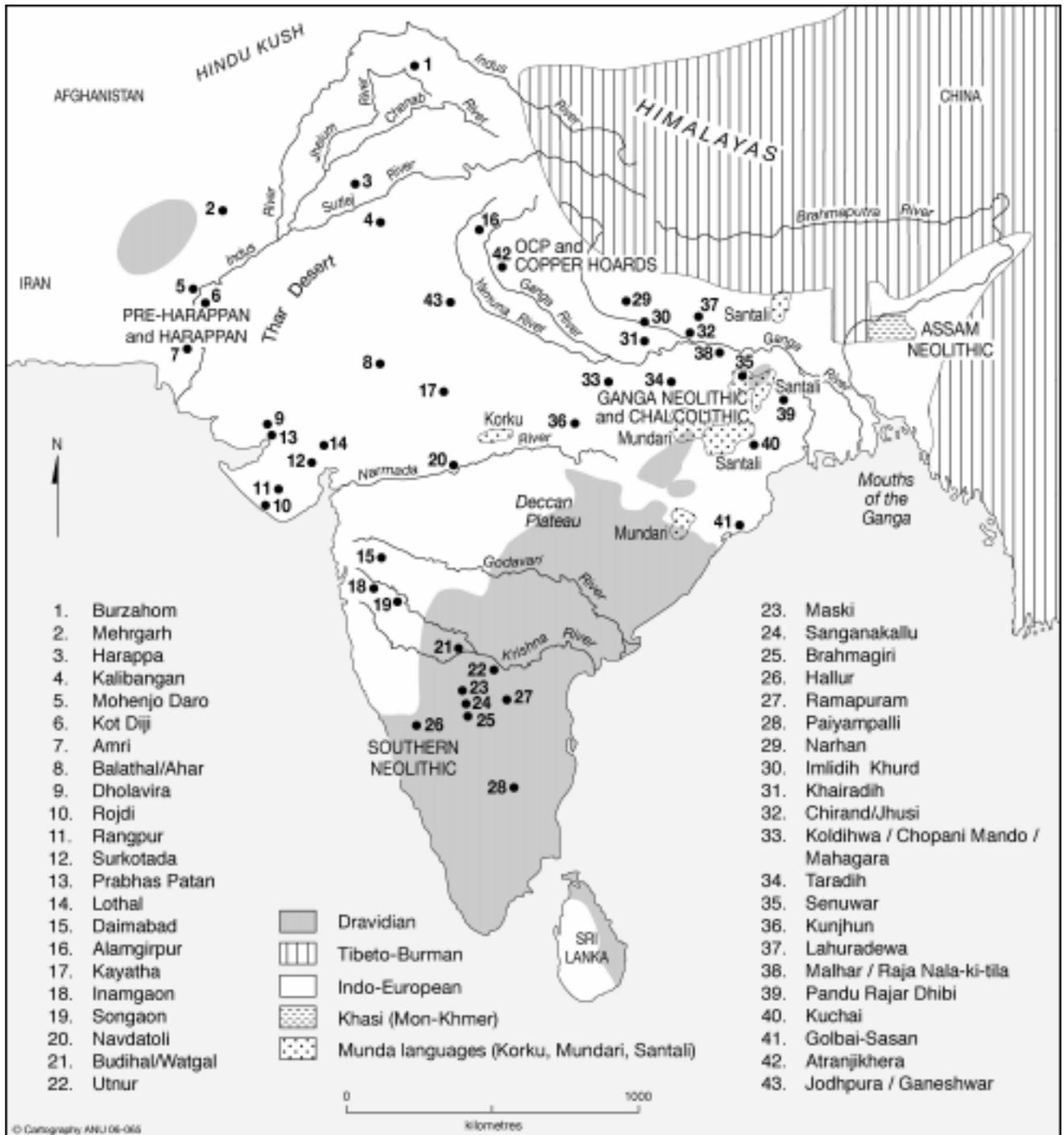


Fig. 1. Major language families and the distributions of Neolithic/Chalcolithic archaeological sites in South Asia.

reconstructions have long been known to indicate a foundation agricultural economy with both rice and millets.¹⁸

The Austroasiatic distribution in many areas, including northern India, is almost certainly a remnant overlain by the more recent expansions of the Indo-Aryan, Tibeto-Burman and Tai languages. To argue otherwise would mean postulating a large series of rather unlikely independent moves. In the case of India, we can only assume on distributional grounds that the Munda languages have been swamped by Indo-Aryan languages during the past 2500 years of intensive Hindu-Buddhist (and Moghul) empire building in northern India. This means that the viewpoint of Witzel¹⁹ and Southworth,²⁰ that Munda languages once covered most of the Ganga Basin, even serving in the form of Witzel's "Para-Munda" as a good candidate for a northern Harappan language, could be worthy of very careful consideration. Kuiper²¹ and Witzel²² discuss Munda borrowings into Rigvedic Aryan, apparently on a time level preceding that of the Dravidian loans, although Osada questions the reliability of reconstruction of some of the loans concerned.²³

Other early linguistic players in the Ganga Basin would have included Tibeto-Burman languages, of which some Gangetic riverine placenames survive according to Witzel,²⁴ and one or more enigmatic unknown languages that provided a number of agricultural loans into the Indo-Aryan languages.²⁵ Southworth²⁶ locates these unknown languages further west in the Indus region, but not all linguists agree on their significance, or that of Munda, preferring to see many of the loans into Indo-Aryan as being simply of earlier Indo-Aryan origin.²⁷ Nevertheless, no matter which linguist one believes, there is an undeniable likelihood based on modern

distribution that Munda languages were once spoken at least as far west as the Middle Ganga Basin. Furthermore, if the ancestral Mundas did enter northeast India with rice and millet agriculture from Southeast Asia, it is most *unlikely* that the date of entry was before 3000 BC, given current agricultural chronologies for the latter region.

There must always be a small possibility, admittedly remote according to current linguistic opinion, that the Austroasiatic family as a whole arose in the Ganga Basin, such that the Mundas are stay-at-homes and the Mon-Khmers are travellers. Munda and Mon-Khmer are coordinate first order subgroups, so the family tree does not in itself specify a precise homeland. As noted above, Diffloth has suggested (albeit without strong conviction) that Assam, Bangladesh and Burma could have been within range of the Austroasiatic homeland. This issue can only be arbitrated by future linguistic research, and archaeologists would be well advised to bear the possibility in mind. Currently, however, the idea of an Austroasiatic homeland in the Ganga Basin has no definite linguistic status and I do not intend to promote this idea further at this point.

The Archaeology of the Middle Ganga Plain

Firstly, I review what we know about middle Ganga Plain archaeology, at least with reasonable certainty.

The Mesolithic

Mesolithic populations were established on the plain and in the foothills of the Deccan Plateau to the south during the early Holocene. Sites such as Sarai Nahar Rai, Mahadaha and Chopani Mando²⁸ have yielded a lithic industry with small prismatic blades and microlithic backed forms, including triangles and trapezes. There appear to be no polished adzes or

axes in the pre-pottery layers of any of these sites, and no pottery that can be regarded as indigenously Mesolithic. However, the lithic industries would appear to be indigenous to this region and to descend from Epi-Palaeolithic forebears.²⁹

These Mesolithic populations constructed circular wattle and daub huts with bamboo frames, buried their dead in extended fashion (Sarai Nahar Rai and Mahadaha), and enjoyed a sufficient population density, at least at Sarai Nahar Rai, for interpersonal violence to be a significant problem (stone points impacted into skeletons). Sarai Nahar Rai³⁰ has an early Holocene bone date of 8100 ± 100 uncal BC (TF 1104), and Sharma *et al.*³¹ quote four further Mesolithic dates between 12,000 and 8000 uncal BC, of which two at least appear to come from the cemented gravels beneath the Neolithic deposit at Mahagara. Significantly, rice remains usually glossed as wild occur in several of these sites.

Neolithic and Chalcolithic

Cultures of pre-Harappan origin entered the upper part of the Ganga Basin from the west and northwest, spreading initially around 3000 BC with copper working in the form of the Ochre Coloured Pottery and Copper Hoard complex.³² These populations brought in the west Asian assemblage of crops and domesticated animals, to which were added native species such as *Bos indicus*. Continuing movements from the Late Harappan sphere doubtless strengthened this population,³³ and beyond the OCP distribution it continued to spread eastwards with copper working and a refined and wheel made variety of Chalcolithic black-and-red ware, originating from the Harappan of Saurashtra according to H. N. Singh.³⁴ This black-and-red ware, usually reduced to black in the interior and slipped a bright red on

the exterior, appears as an addition to the older Neolithic assemblages that were present in the middle and lower Ganga Basin. It reached Bengal by about 1500 BC, where it appears in the site of Pandu Rajar Dhibi,³⁵ apparently succeeding a basal layer with hand-made and rice impressed pottery (the original report on Pandu Rajar Dhibi is rather ambiguous on this point).³⁶ In my view, the OCP and BRW episode represents the only cultural spread in north Indian prehistory that can convincingly be equated with the movement of Indo-Aryan speaking populations.

To the east of the OCP sphere, the Chalcolithic black-and-red ware was preceded by a series of Neolithic assemblages, with no copper artifacts, and with hand made and undecorated, or sometimes red-slipped, incised or cord-marked pottery, the latter being possible markers of cultural sharing with China or Southeast Asia. Relevant sites include Lahuradewa, Koldihwa, Chopani Mando, Mahagara, Kunjhun, Raja Nala-ka-tila, Jhusi, Malhar, Tokwa, Chirand, Imlidih Khurd, Senuwar, Taradih and Pandu Rajar Dhipi (Fig. 1).³⁷ Senuwar³⁸ and Lahuradewa both have a lower layer (the basal 50 cm) with rice alone, without western Asian crops, and this could, of course, be very significant.³⁹ A similar situation might apply at Pandu Rajar Dhibi. Otherwise, most sites postdate 2000 BC and contain in their basal layers both rice remains and the remains of various west Asian crops such as wheat, barley, peas and lentils, and bones of evidently domesticated cattle, sheep and goats. Mahagara, indeed, has a post hole enclosure identified as a cattle pen, with both cattle and goat hoof prints in association.

In my *First Farmers* I drew the obvious conclusion, that all of this represented a meeting of westerly and easterly originating population flows, Indo-Aryan

and Munda speakers respectively, encompassing the Ganga Basin during the third and second millennia BC. The Munda populations had settled (by 3000 BC?) in the middle and lower Ganga Basin prior to the Indo-Aryan arrival there, but rice travelled quite far west into different cultural spheres, to sites such as Gufkral, Balathal, and Early Harappan Kunal and Balu.⁴⁰ Indo-Aryan populations were already in northwestern India by 3500-3000 BC, and some of their crops and domestic caprines might have been adopted by non-Indo-Aryan communities lying to the east. It is quite possible that speakers of Masica's unknown languages⁴¹ were also in the Ganga Basin at this time, but since these have no surviving descendants we cannot easily take this possibility into account. Over the long term, the OCP/black-and-red ware cultural lineage, derived essentially from the Pre-Harappan and Harappan cultural spheres, with the use of copper tools, became dominant in most regions downstream to Bengal by 1500 BC.

Did the arrival of farming populations from west and east cause any major changes to the Ganga Basin environment, deforestation for instance? Interestingly, I.B. Singh⁴² has published a chart of monsoon rainfall variation based on palynological records from the Ganga Plain, showing a marked and rapid retraction of humidity after about 5000 years ago. Was this shift due to independent climate change as Singh suggests, or could it also reflect human deforestation and environmental impact with increasing agriculture after 3000 BC?

Remaining Questions, and a Role for East Asia?

The above sequence, with a Neolithic presence in the middle and lower Ganga Basin overlain in part,

between 3000 and 1500 BC, by a spread of Chalcolithic cultures from the west, raises some major issues of cultural continuity in the sites listed above. Does the pottery in the Neolithic assemblages grade seamlessly into the black-and-red ware of Chalcolithic type? Or was there something of a marked change, as the cultural scenario presented here would imply? Because Indian archaeologists use the term "black and red" ware in so many ways, as detailed at great length by H.N. Singh,⁴³ it is extremely hard for me to judge this question without examining all the assemblages at first hand. Many Indian archaeologists accept a total continuity on the Ganga Plains from Neolithic to NBPW,⁴⁴ but Misra *et al.*⁴⁵ note the existence of a cultural break between Neolithic and Chalcolithic at the sites of Tokwa and Jhusi, and this might also be the case for Pandu Rajar Dhibi. I suspect that more research needs to be done on this topic.

Similar questions apply to house floor shapes, lithic tool types and copper artifacts. When house remains are preserved in these Neolithic sites they are always circular or oval, with post frames, often of bamboo, and wattle and daub walls (for instance, Chirand, Tokwa, Mahagara and Chopani Mando). Most of these contexts are Neolithic, but what happens to house floor shapes in the Chalcolithic? Do they become rectangular, as we would expect if there is an inflow of cultural influence from the solidly rectangular Pre-Harappan and Harappan traditions of the Indus Valley region in Pakistan?

Most sites have continuing blade industries, now with the addition of polished adzes and axes (mainly axes, it would appear from illustrations, but few authors discuss this important distinction), and microliths appear to have faded in significance, except perhaps at Tokwa.⁴⁶ In this case, the blades are

surely of either Harappan or local Mesolithic derivation; blade production never occurs in Mainland Southeast Asia.

The Gangetic copper hoards reflect Harappan ancestry and have no connection with the socketed copper/bronze technologies of Southeast Asia. To my knowledge, there are no detectable relationships between northern Indian and Southeast Asian copper/bronze artifacts (although I am not certain about this for Assam). The Gangetic Neolithic assemblages of the third millennium BC have no copper or other metal, and this is exactly what we would expect if these are to be associated with Munda speakers of easterly pre-metal derivation. Copper/bronze working in South China and Southeast Asia postdates 2000 BC, and the Munda movements were surely earlier than this.

As for the pottery, the Neolithic sites have a mixture of cord-marked, red-slipped and unslipped wares, usually red or black in surface colour and often with rice husk tempers. Highly polished black pottery, painted wares, and the black-and-red ware in which the exterior is red-slipped and the interior reduced to black, appear to be Chalcolithic (second millennium BC). Cord-marking continues into the Chalcolithic and later in many sites, well into the late second millennium BC in the case of Narhan,⁴⁷ and it has to be stressed that nowhere in the Ganga Basin is there a layer of purely cord-marked pottery that is replaced decisively by a layer with Chalcolithic red and black polished wares. The situation appears more to be one of gradual fusion.

The archaeological origin of the oldest recorded Neolithic cultures of the middle and lower Ganga Basin, even more so of Assam, can with some degree of optimism be related to contemporaries in southern China and Southeast Asia. The Munda

linguistic evidence of course suggests an east to west movement, out of Southeast Asia, as does that for the Austroasiatic Khasi of Meghalaya, but we do not yet have enough archaeological evidence to pinpoint source regions. Indeed, connections with several areas are likely.

Without specifying directions of movement, I will here list some possible similarities that especially involve Assam and Mainland Southeast Asia.

1. Assam lacks true blade and microlithic industries, having instead a range of small flakes and Hoabinhian-like pebble industries,⁴⁸ exactly like southern China and Mainland Southeast Asia.
2. A number of artifact classes widespread in the Assam Neolithic also have some very obvious generic relationships with Southeast Asia, including cord-marked pottery and shouldered adzes.⁴⁹
3. The undated site of Napachik in Manipur⁵⁰ has pottery tripods similar to those found in Neolithic sites (*c.* 2000-1500 BC) down the Thai-Malay Peninsula,⁵¹ but distances here are perhaps too great to enforce any direct connection.
4. Red-slipping is also very common in southern Chinese and Southeast Asian archaeological assemblages, but so it is also in western India and western Asia, so this is not necessarily significant.
5. In terms of polished stone, many authors have commented on similarities in stone adzes between Assam and Southeast Asia, and northern Assam has examples of jadeite tools cut rather than flaked into shape, using East Asian technology, that might be of Yunnan or Burma origin.⁵² Given recent breakthroughs in the sourcing of

Taiwan jade,⁵³ this is clearly an most interesting area for future research. Sankalia⁵⁴ was probably correct when he stated “The major role was played by the Upper Yangtze Valley of Szechwan and Yunnan in developing the Neolithic cultures of Assam.”

6. The Gangetic region is further removed from Southeast Asia than is Assam, and the linkages here with Southeast Asia are less clear. The Ganga Basin witnessed a carry-over of microlithic industries into Neolithic contexts, these clearly having nothing to do with Southeast Asia at all and being mainly derived from indigenous Mesolithic populations. But during the Neolithic we have some interesting Southeast Asian parallels for pottery bowls on pedestals (Bisht, this conference), mushroom-shaped pottery anvils of baked clay (Tokwa - J.N. Pal, this conference), and bowls with channel spouts.⁵⁵ Chopani Mando has an unusual incised and stamped ware with curvilinear patterns (Fig. 2), that to my knowledge has not been found elsewhere in India.⁵⁶ This occurs in the undated upper layer of the site,

continuing directly on from a Mesolithic occupation, and is associated with circular house floors. It is not clear from the report by Sharma and colleagues if this impression and incision was the only kind of decoration at Chopani Mando, but there is no reference to a presence of corded ware or any use of red slip. However, the curvilinear motifs and the zones of stamped decoration that enclose the designs are paralleled very closely in pottery dated to the third millennium BC from the site of Xinguang, west of Lake Erh in western Yunnan,⁵⁷ lying within 500 km of the Brahmaputra Valley across the uplands of northern Burma.

Allowing for the continuing existence of Mesolithic lithic technologies into the Neolithic, we can see in the middle and lower Ganga Basin a presence of Neolithic cultural elements that appear to have more in common with contemporaries in Yunnan and Southeast Asia than they do with the Pre-Harappan/OCP/BRW cultural lineage that entered the region from the west. Can we see, in these admittedly hazy discoveries, a Neolithic lifestyle



Fig. 2. Unslipped incised and stamped pottery from Chopani-Mando. Photographed by the author in the office of Professor G.R. Sharma, University of Allahabad, 1983.



Fig. 3. Cord-marked pottery from Koldihwa. Photographed by the author in the office of Professor G.R. Sharma, University of Allahabad, 1983.

that we can associate with early Munda speakers, or with speakers of Masica's unknown group of languages, between 3000 and 2000/1500 BC, prior to the arrival of the Indo-Aryan populations? I believe that we can.

Lahuradewa IA

Lahuradewa level IA, the 45 cm thick basal layer of the site, has remains of rice, with evidently a domesticated form as well as the wild *Oryza rufipogon* that still grows in the lake near the site today. West Asian winter crops are absent. The site has no lithic industry, perhaps because it lies within the alluvial plain too far from lithic resources. The handmade, cord-marked, and occasionally red-slipped pottery from Lahuradewa IA, sometimes with rice husk temper and with a few bowls on pedestals, is currently associated with C14 dates that extend back as far as 6400 BC. The following Lahuradewa level IB dates from the third millennium BC and witnessed a continuation of the same material culture, including the cord-marked pottery, now with the addition of a number of "Harappan" markers such as barley,

wheat, lentil, pea, bones of cattle and buffalo, and steatite beads. Copper and painted pottery appeared in Lahuradewa level II, c. 2000 BC, with polished black slip ware and perforated sherds with affinities in Ahar and the Harappan.⁵⁸

My reading of this situation is that Lahuradewa IA and IB genuinely represent a Neolithic horizon beneath the Chalcolithic layer of Lahuradewa II. In them we witness a Gangetic society gradually coming under the influence of a cultural flow from the west. This Neolithic horizon almost certainly represents a non-Indo-Aryan, perhaps Munda, former presence.

However, the claims for rice domestication at Lahuradewa at 6400 BC are unprecedented, and no other Gangetic sites of this type can convincingly be dated earlier than 3000 BC (including Koldihwa, according to recent AMS dates: Dorian Fuller, pers. comm. at this conference). I am not able to state if the early Lahuradewa dates are 'correct' or not (that is, dating the context that they are believed to date), or if the domesticated rice is correctly identified, or if it is morphologically wild. These are questions that only the excavators and palaeobotanists can answer. However, for me, there are questions raised by this site:

1. If there was an independent development of rice cultivation in the middle Ganga Basin by 6500 BC, why are there so few other Neolithic sites in India older than 3000 BC? Could the early AMS dates on rice result from Mesolithic activity involving exploitation of wild rice, incorporated with disturbance of the original topsoil into the lower layers of the Lahuradewa Neolithic deposit?
2. Is the pottery sequence from Lahuradewa IA into the Iron Age layers of the site absolutely

continuous, with no evidence at all for any external impact, or does it, as I am suggesting here, reveal the appearance of new stylistic elements just prior to the Chalcolithic of Lahuradewa II? This is essentially a question of the identity/identities of that vast complex of Indian prehistory pottery known as “black and red ware”. Is all BRW “the same” in its cultural implication, or, as H.N. Singh⁵⁹ suggested, does it hide a multitude of identities?

Conclusion

After all this hunting for clues, I suggest the following skeletal framework for Ganga Basin archaeology. Mesolithic hunter-gatherers and exploiters of stands of wild rice, users of a blade and microlithic stone technology, occupied the plains during the early Holocene. Around 3000 BC, small groups of pottery-using and Munda-speaking rice cultivators entered the valley from the east, probably from Yunnan and Burma, via Assam. They appear to have adopted the Mesolithic stone working technology, and perhaps extended their area of settlement into the upper part of the Ganga Basin. Also around 3000 BC, Chalcolithic populations speaking Indo-Aryan languages began to move into the Basin from the west, bring Early Harappan cultural traditions and the “classic” forms of OCP and BRW pottery, in many sites with evidence for use of the wheel during manufacture (the older Neolithic pottery being hand formed). Over the next millennium, these two

agriculturalist populations influenced each other throughout the Basin (for instance, OCP and corded pottery occur together in the site of Madarpur, in District Moradabad, a little east of Delhi),⁶⁰ a process that might have been fairly balanced until the development of cities and ultimately empire in the first millennium BC, when the Mundas were only left with peripheral regions to support a continuing separate ethnolinguistic identity. Masica’s unknown language speakers, if they really existed, would appear to have vanished completely, leaving only loan words to record their former presence.

Thus, I suggest that Lahuradewa IA provides us with a window into the Munda past in the Ganga Basin, prior to the arrival of Indo-Aryan speaking peoples in this region. It is difficult to argue seriously for a Munda arrival in this region much before 3000 BC, so the identity of the rice dated to 6400 BC in Lahuradewa IA remains a little uncertain. Does it represent Mesolithic rice exploitation that left traces in the topsoil prior to the foundation of Lahuradewa IA? This is quite likely in my view. While I would happily accept a presence of incipient rice cultivators on the Ganga Plains at 6400 BC, were archaeology to demonstrate their existence convincingly, I would doubt they were Munda or Indo-Aryan speakers. They also, seemingly, did not found a sedentary village settlement pattern. This situation must make a Mesolithic rice-collecting economy the most likely explanation (for the moment, at least) for the pre-3000 BC radiocarbon dates from Lahuradewa IA.

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