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## THE INDUS VALLEY (3000–1500 BC)

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## GENERAL BACKGROUND

The Indus civilization,<sup>1</sup> which ranks geographically as the largest among the four widely known civilizations of the Old World, is known to represent the earliest manifestation of urbanization in South Asia. For a proper understanding of the process of urbanism in this region, however, it would perhaps be relevant to study contemporary development in the neighbouring areas, which seem to constitute a very large sphere of cultural interaction.

The ecological and environmental aspects leading to urbanization have often been emphasized in the development process in southern Mesopotamia and the Iranian plateau. Between the two areas, highland and lowland, a dichotomy seems to have developed that influenced the historical and social organization of both societies. The lowland communities situated on the alluvial plains of Mesopotamia depended upon agriculture to produce surplus foodstuffs, and as such established settlements with nucleated centres along major areas of dry-farming with nucleated centres along major waterways. In contrast, the highland communities existed in areas of dry-farming with a lower agricultural productivity, a lower population density and a comparative autonomy and isolation. But the needs of one area complemented those of the other. In fact, the interrelationship between the two was forged by their complementarity: the highland communities were rich in resources like copper, turquoise, chlorite, wood and so on, while the lowland centres had a surplus of foodstuffs and manufactured goods, including textiles, for export. The geographical factors governing settlements in the Indus Valley are somewhat similar to those obtaining in the Mesopotamian lowlands and the Iranian highlands. In the Indus Valley, the whole area can be divided into two principal divisions: the western highlands represented by the Sind Kohistan, Kirthar and Sulaiman ranges; and the lower Indus Valley, divided into western and eastern sectors and the deltaic area. The rugged and desolate character of these mountain ranges is accentuated by the extreme sparseness of their vegetation. Nevertheless, they afforded excellent grazing for sheep and goats and for wild ibex and urial. There are several transverse lines of drainage in these mountain ranges which also serve the purpose of communication from the valley to the Iranian plateau, Seistan, Afghanistan and Turkmenia. A noteworthy feature of the western highlands was the development of steep slopes at the base of the hills, forming a piedmont zone between the western highlands and the alluvium in the east. The ancient settlements were clustered in the valleys of the Zhob, Loralai, Queta, Pishin and Kej, and in the alluvium plains of Las Bela and SibiKachi and,

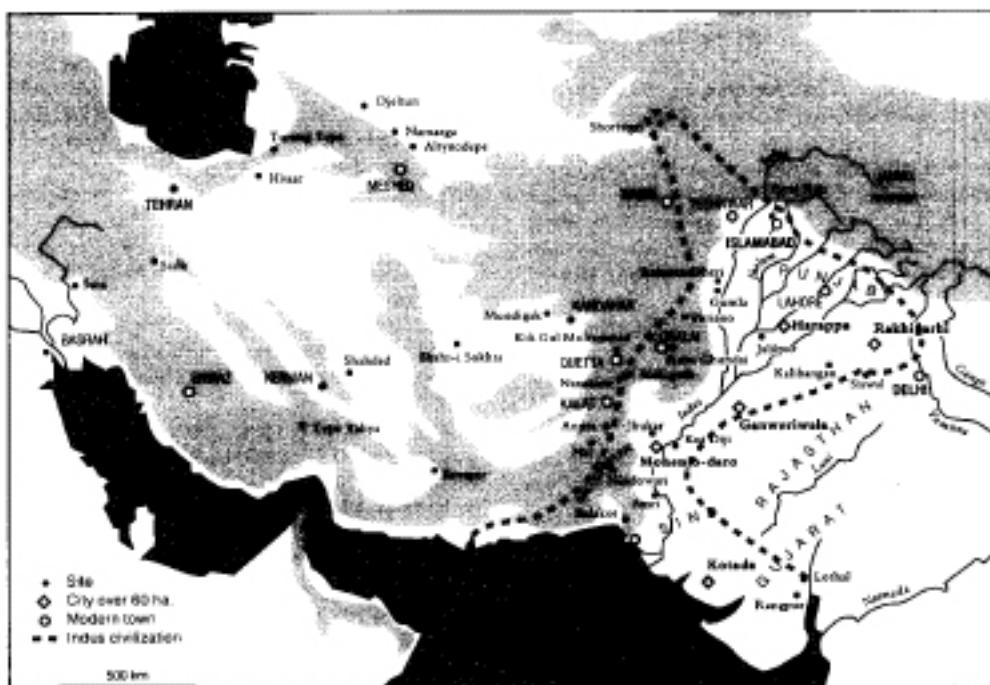
<sup>1</sup> Normally cultures are named after the site of their first discovery. This culture therefore should more approximately be named the Harappan culture. But since it is an expression of a highly evolved civilization and since its distribution was initially found to be in the Indus Valley, it is here also called the Indus civilization. The terms Harappan culture and Indus civilization are interchangeable.

in their level of cultural manifestation, created the potential for the evolution of cities along the Indus. The scantily habitable dry plateau of Iran and Baluchistan drove the highlanders into the fertile Indus Valley. This movement was possible because the lower slopes of the Kirthar and Sulaiman ranges fall gently into the plains below.

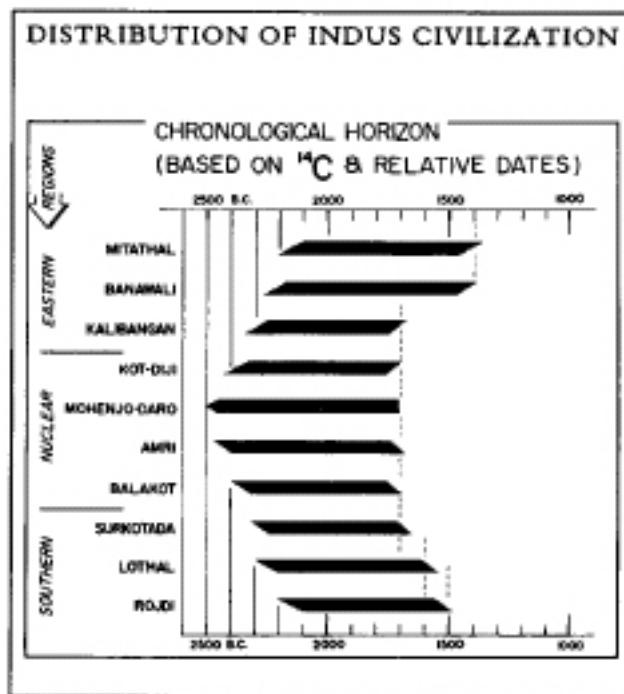
Baluchistan thus was neither a backwater nor a borderland but an area of distinctive physical environment connected with surrounding regions and nearby centres of civilization through easily accessible routes. It was also the most important cultural region, where shifts from hunting and gathering to sedentarism led to primary urbanism. Recent discoveries at Mehrgarh give substance to the hypothesis that Baluchistan played a dominant role in the shaping of urban civilization in South Asia. The Mehrgarh area is the proluvial-alluvial basin of the Nari and Bolan rivers, extending into the plains of Kachi. It is a natural area of transition from true plateau to alluvial plain of the Indus and as such most favourable to the development of the transitional Neolithic and primary urban economies. Excavations at Mehrgarh (Jarrige, 1982; Jarrige and Lechevallier, 1979; Jarrige and Meadow, 1980) have revealed a continuing sequence of cultures from the aceramic Neolithic (eighth millennium BC) through ceramic Neolithic (sixth-fifth millennium BC) to the Bronze Age (fifth-third millennium BC), contemporaneous with Kili Gul Muhammad, Rana Ghundai, Damb Sadaat, Shahr-i Sokhta, Mundigak and Kot Diji. Eight kilometres to the south at Nausharo lies a mature Harappan site, indicating that the Kachi plain was definitely a part of Harappan territory. The last phase of occupation at Mehrgarh, labelled the South Cemetery or Sibi phase, yielded some stone and bronze objects including pottery forms showing analogies with Central Asian sites (Bactria, Margiana, southern Turkmania, and so on), belonging to the close of the third millennium BC, as also with Harappan elements, signifying that the cemetery is contemporary, at least in part, with the Indus civilization. Excavation at Pirak in the same area links the sequence to the Iron Age, ascribable to the close of the second millennium BC. Baluchistan should, therefore, be considered an area which functioned not only as a cultural conduit linking Iranian plateau developments with those in the Indus Valley, but also as an area which itself had significant cultural development.

## DISTRIBUTION (Map 14)

The discovery of the Indus civilization in 1921–2 had, according to Marshall (1931), at a single bound taken our knowledge of India back some 3,000 years. Explorations and excavations, conducted during the twenty-five years following its discovery, indicate that its area of spread lay principally in the Sind plains, with significant cultural contacts to sites in the secluded valleys of Baluchistan, such as Dabar-kot, Sutkagen-dor, Dasht Kaur on the Makran coast close to the Iranian border. Harappa and Chak Purhane Syal on the Ravi, Kotla Nihang Khan near Rupar, on the left bank of the Sutlej in the foothills of the Himalayas, a few sites along the Hakra in the erstwhile Bahawalpur state and Rangpur on the Sukha Bhadar in Kathiawad, Gujarat, were the only recorded sites of this civilization lying outside the Sind region. In 1947, therefore, after the creation of the two independent republics of India and Pakistan, most of the known area of spread of this civilization fell within the borders of Pakistan, leaving only Koda Nihang Khan and Rangpur, the two seeming outposts, within the territory of India. Sustained fieldwork during the last four decades or so in regions contiguous to the Pakistan frontier, particularly along the ancient beds of Sarasvati-Ghaggar and the palaeochannels of the Sutlej and the Yamuna in Rajasthan, Haryana and Punjab, and the flat alluvial plains and coastal lowlands of Gujarat, has extended the limits of the civilization well within the present-day frontiers of India: in



MAP 14 Distribution of Indus civilization during the mature and later periods, c. 2500–1500 BC.

Map 14 (*Continued*)

the east, up to Alamgirpur on the Hindou, a tributary of the Yamuna, across the Indo-Gangetic divide, some 45 km north of Delhi; in the north, up to Manda, on the right bank of the Chenab, some 28 km north-west of Jammu, in the foothills of the Pir Panjal range; and in the south up to Daimabad on the left bank of the Pravara, a tributary of the Godavari, some 230 km east-north-east of Bombay. Likewise, during the same period, within Pakistan itself, explorations, particularly in the regions of Gomal, Bannu, Cholistan, Bolan and along the Makran coast extended the distribution both within and outside the Indus Valley. Thus amplified, its total area of spread, falling within both India and Pakistan, covers over 1.2 million km<sup>2</sup> with about a 1,900-km-long seaboard, much larger than that of the widely known contemporary Bronze Age civilization of either Egypt or Sumer.

## SETTLEMENT PATTERN

The core or nuclear area lies in Pakistan, principally within the valley of the Indus and its tributaries, and that of the parallel river system of the ancient Sarasvati (the present-day dry beds of Hakra and Nara). Only one site in interior Baluchistan, Dabar-kot, has evidence of a major Harappan phase occupation, and even there it is limited to a particular area of the site. All the other known Harappan sites, Nausharo, Pathani Damb and Balakot, Sontakakoh and Sutkagen-dor along the coast, are located along Baluchistan's eastern and southern fringes.

The Indus does not flow north-south directly but takes a deep S-shaped curve, thus adding more to the cultivable land. Being fed by both snow and monsoon and having a gradient of 4.8 cm per km in the Sind region, periodic flooding has been an important phenomenon of its regimen. The distribution of Harappan sites in the Sind corridor follows the active floodplain of the river or the *dhands* which depend on the summer floods. On the west of the Indus flows a stream known as the Western Nara, whose water sources are the streams of the Kirthar range and the floods of the Indus. Eventually these waters empty into Lake Manchar which, with its periodically changing level of filling and emptying, provided excellent arable land for cultivation and as such witnessed the rise of some early Harappan settlements such as Pandiwhali, Damb Buthi and Ali Murad. Another distinct ecological region from which Harappan sites have been reported is the Kachi plain, a flat expanse of alluvial outwash, located at the foot of the Bolan Pass. On the eastern flank of the Indus is the Eastern Nara of the Ghaggar Hakra-Sarasvati system, which showed a concentration of sites in Cholistan. Along the Kirthar and Sulaiman ranges and in the Indus Kohistan area in the south-west, the settlements were near spring water. Sutkagen-dor, Sotka-koh, Balakot were essentially sea-ports, controlling coastal traffic and trade. Each of these sites is located at the outlet of an important valley through which the Makran coast is approached from the Baluchi hinterland. Closer to Punjab the tributaries of the Indus have broad alluvial plains largely unaffected by the flood. The reported Indus sites are Harappa, Chak Purhane Syal and Jalilpur on the Ravi.

The classification of Harappan sites into cities, towns and villages is imprecise. The cities, such as Mohenjo-daro, Harappa and Lothal, are generally distinguished by their size and the presence of monumental architecture, including a citadel. Nevertheless one can distinguish industrial centres, such as those in Cholistan which were production centres of specific crafts; camp sites of pastoralists who utilized desert or marginal areas of the valley; port towns like Sutkagen-dor and Sotka-koh, which carried on maritime trade and were at the same time connected with the resource regions of the hinterland; and

multipurpose sites. Coastal sites like Allardino and Balakot exploited the marine resources. In the western fringes of the Thar desert, where between 1974 and 1977 extensive explorations were carried out, the location of sites shows a different distribution. Among high-density sites is the metropolitan city site of Ganweriwala, covering 81.5 hectares in area, and equidistant from both Mohenjo-daro and Harappa. It is reasonable to assume that originally Harappa and Mohenjo-daro were also located in high-density areas, which at present it is not possible to reconstruct due to intensive cultivation and other landform changes resulting from human intervention. The area enclosed by these three cities (Mohenjo-daro, Harappa and Ganweriwala) seems to mark the core or nuclear area of the Indus civilization. It was almost the same area which was under occupation during the Early Harappan period, prior to the maturity of the Indus civilization.

Access to raw material was secured by a chain of sites along the lines of communication. Settlements were established at resource points, such as at Shortugai on the Oxus, for obtaining lapis lazuli from the Badakhshan region. The sites in the hills were intended to guard the passes and to keep the lines of communication open between the Indus Valley and Baluchistan for internal trade and accessibility to sources of raw materials. The sites located in the desert on the eastern fringes of the valley are marked by limited cultural materials, indicating temporary occupation.

As far as India is concerned, the area of spread of this civilization falls broadly into two separate geographical regions, forked essentially by the Thar desert: (1) the eastern region, covering Rajasthan, Haryana, Punjab, some parts of Jammu and Kashmir and Uttar Pradesh, the river systems being the Ghaggar-Sarasvati, Chautang, Sutlej, Beas, Ravi, Chenab and Yamuna; (2) the southern region, covering Kutch, Kathiawad, the coastal flats of Gujarat and some areas of the hinterland of Maharashtra, the river systems being the Luni, Banas, Sabarmati, Narmada, Mahi, Kim, Tapti and Godavari.

The eastern region, which was a multi-river system, in sharp contrast to the one-river system of Sind, was marked by wide foodplains with a vast surface for the annual flood-silt. Landform studies have shown that Sutlej was at one time the main tributary of the Ghaggar-Sarasvati and so was the Yamuna, making Ghaggar-Sarasvati a mighty river which probably debouched into the Rann of Kutch through Hakra and Nara. The Ghaggar-Hakra had a well-cut bed in the alluvium but no large delta, which a river of this size is expected to form. Some time towards the first quarter of the second millennium BC, tectonic movements had forced both the Sutlej and Yamuna to take up their present courses, as demonstrated by a multitude of small channels into which they coursed, leaving the non-perennial Ghaggar-Sarasvati dry, with the result that its diminished water supply failed to sustain the settlements downstream. This phenomenon is reflected in the distribution

pattern of the sites. A large number of the pre-Harappan<sup>2</sup> and Harappan sites are found principally along the now dry bed of the Ghaggar-Saraswati, and along the braided channels of the Sutlej, such as the Naiwals and the Wah, but there are none on the present channels except Rupar. The drying of the river systems resulted in pre-Harappan sites in the Chautang Valley becoming isolated, and developing along their own lines. On present showing, the densest distribution of sites, both pre-Harappan and Harappan, is noticed paradoxically not on the Indus river and its tributaries with which the name of the civilization is associated, but on the now dry Hakra-Ghaggar-Saraswati and its equally extinct tributaries.

In the southern region, the spread was not uniform in scale as in Sind, Punjab and Rajasthan. The drainage networks of Kutch, Kathiawad and the rest of Gujarat are unrelated to each other. This explains the diverse ramifications of the Indus civilization in this region. Surkotada, Dholavira (Kotadi) and Bhatastrav show divergent traits. Significantly, no pre-Harappan sites have so far been located in this region.

As far as the coastal areas are concerned, the indented coastline from the Gulf of Cambay southwards affords suitable sites for ports, as evidenced by the location of Prabhas Patan on the banks of the Hiranya, Lothal on the Bhogavo, Mehgam on the estuary of the Narmada and Bhagatrav on the estuary of the Kim. In the north-eastern coastal zone of the Little Rann, the rivers Banas, Saraswati and Rupen have, by their coalescing silt, formed an estuarine plain which provided a favourable ecological zone for the Harappan communities to settle and there are many sites in that area. The Gujarat plains, located between the marshy coastal zone and the plateau and mountains in the interior, are remarkably flat, with sluggish meandering streams, and as such afforded suitable settlement sites.

The plateau of Kathiawad is marked by a radial drainage pattern. Among the notable sites located in the valleys of these rivers are Rojdi on the Bhadar and Rangpur on the Sukha Bhadar. An interesting feature of the plateau of Kathiawad, however, is the occurrence of numerous dikes, sometimes as wide as 60 m, which provided raw material for many objects, including beads.

The Kutch plateau is drained by rivers flowing into the Gulf of Kutch in the south and Rann of Kutch in the north. None of these rivers has a course longer than 60 km. Notable Harappan sites include Surkotada, Desalpur, Dholavira and Pabumath. Being located on the margin of the Rann, Dholavira could possibly have functioned as a port station.

The settlement pattern is conditioned by ecological factors; subsistence and technoeconomies; perhaps a sloping horizon, indicated by a directional movement from the

<sup>2</sup> The term pre-Harappan is interchangeable with Early Harappan or proto-urban.

nuclear area to both the eastern and southern regions; and climate. The ecological factors have already been described, and climate is dealt with in a section of its own below.

Alamgirpur and Hulor, located across the divide of the Indus and Yamuna systems, mark the eastern limit of the ecological zone, beyond which lay the real Indian monsoon-fed jungle which the Indus people found it difficult to bring under cultivation with the tools at their disposal. The upper Ganga-Yamuna, being transitional between the arid Indus and the monsoon Ganga plains, forms the eastern limit of winter farming, which was the basis of the subsistence economy of the Harappans. They depended largely on perennial rivers, which afforded extensive floodplains annually inundated by monsoon floods, depositing fresh silt for cereal cultivation. The other consideration was the navigability of the river, permitting transport for internal trade, and accessibility to natural resources. The densest distribution of sites is in close proximity to the source of copper, represented by the Khetri belt in Rajasthan and Amba Mata in Kutch. Tin ore deposits are also known to occur in the Aravalli hills, in Bhilwara and Udaipur in Rajasthan and Banas Kantha in Gujarat. This is particularly significant because of the occurrences of chalcopyrite deposits in the Aravallis. Steatite, yellow fine-grained stone and dark grey slate were readily available in Rajasthan, while camelian, a gate and other chalcedonic semi-precious stones could be obtained from Gujarat near Rajpipla. The latter region also offered red ochre, shell and ivory, which were items of long-distance trade. The sources of construction timber, such as pine, deodar and elm, were the lower Himalayan Panchmahals and western ghats. Harappan expansion into the Gujarat seems to have been largely in quest of ports and raw materials. Chert, flint, jade, lapis lazuli, silver, gold and so on, which were not available in these regions, involved long-distance trade through either simple or complex exchange systems, which in turn led to interregional interaction.

## CLIMATE

The ancient climate of South Asia has been a subject of considerable debate and the available evidence has been interpreted variously. Both Stein (1931) and Marshall (1931) postulated appreciably wetter conditions during pre-Harappan and Harappan times (third millennium BC). Their inference was largely based on five factors: (1) the presence of *gabarbands* for the control of water; (2) a larger number of ancient mounds in contrast to the present-day settlements, along with their respective depth of occupation; (3) the use of baked brick at Mohenjo-daro, Chanhudaro and Harappa, requiring a plentiful supply of fuel; (4) the presence at both Mohenjo-daro and Harappa of an elaborate drainage system to dispose of storm waters; and (5) the occurrence of marsh or jungle animals (tiger, rhinoceros, buffalo, elephant) on seals and the absence or extreme scarcity of camels. The environs of Mohenjo-daro were thought to be covered with dense jungle, being a natural habitat for such animals. At the same time, Marshall was also aware of the weakness of the argument, especially when applied to the contemporary civilizations of Egypt and Mesopotamia and had, therefore, reservations about this pluvial theory. Wheeler (1968), too, felt that the argument of the wet climate would not stand up.

In 1971, Gurdip Singh (1971, 1974) carried out pollen analytical studies of salt-lake deposits (at Sambhar, Didwana and Lunkaransar) and fresh-water lake deposits (Pushkar) in the area centering on the Rajasthan desert. The environmental sequence built up from pollen analysis has been grouped into six phases, of which phase IV, ascribable to c. 3000–1000 BC, covers the period of the Indus civilization, including its antecedent and subsequent phases. This phase IV is subdivided into IVA (3000–1800), IVB (1800–1500) and IVC (1500–1000 BC). Of these, IVA shows wet conditions, IVB drier conditions and IVC a reversal to relatively weak wet conditions. The palaeoecological picture of sub-phase IVA suggests an annual rainfall of at least 50 cm in excess of the present-day average in the arid belt of Rajasthan. The hypothesis of a wetter climate during Harappan times is supported by meteorological studies (Ramaswamy, 1968), oxygen isotope ratios from the Arabian Sea cores, climatic modelling of monsoon intensities (Meadow, 1989) and ecological factors (Agrawal and Sood, 1982).

The wetter-climate theory has, however, been questioned by various scholars (Raikes and Dyson, 1961; Raikes, 1967; Chowdhury; Ghosh, 1951; Thapar, 1977, 1984; Vishnu Mittre, 1978, 1982; and Mishra, 1984), who feel that there has been no appreciable change in the climate during the past 9,000 years or so and that the arguments for a wetter climate lack conviction. Vishnu Mittre, in his analysis of the Rajasthan pollen diagram, postulated an arid climate during the period 3000–2000 BC. As for the growth of cities, it

was averred that most of the sites were in a floodplain environment where rainfall was of minimal importance, and as such could have prospered on zero rainfall with or even without artificial irrigation, and that the floodplains of the Indus still support gallery forests which provide a habitat for wild animals. Furthermore, it is pointed out that the carrying capacity of the drains found at Mohenjo-daro does not equate with a greater rainfall. Their homely function clearly was that of disposal of domestic waste. The *gabarbands* again were a device for conserving the silt content of short-lived seasonal floods beside torrent beds that are normally dry. Furthermore, the evidence obtained from pollen studies in Rajasthan cannot justifiably be extrapolated for the entire area of the civilization without circumspection, especially as the palynological evidence obtained from Balakot in Sind does not seem to suggest a decidedly wetter climate during the fourth-third millennium BC (Dales, 1986). At the same time one need not deny varying environmental contexts, both biotic and abiotic, having short-term fluctuations in different parts of the area.

## ORIGIN AND GROWTH

Ever since the discovery of the Indus civilization, various views have been expressed about its origin and subsequent growth into full maturity. Based largely on the occurrence of certain Indus-related material on Mesopotamian sites it was initially suggested that it was an offshoot of the Sumerian civilization which had preceded it and was likewise a riverine one. A closer analysis of the Indus and Mesopotamian cultures would indicate that the basic differences (town planning, scripts, weights and measures) bar the possibility of any direct ‘colonization’ of the former by the latter. At the same time it must be admitted that the dissimilarities are in the detailed performance of basic concurrences, such as the attributes of the city itself, widespread trade, well-organized agriculture, fertile river valleys, specialist craft and ceremonial centres. Considering the nature of the lands in between the two regions – barren mountains with scattered settlements – it is reasonable to argue that any Mesopotamian-generated influence is unlikely – or to have become radically altered – before it could reach the Indus plain. Whatever influences moved from west to east, and some certainly did, they enhanced an already existing situation.

Another view is that the civilization arose independently in north-western India out of the mosaic of Indo-Iranian borderland and Baluchi village-farming cultures, mostly antedating the Harappan culture and some even contemporary with it (Fairservis, 1971). The plethora of cultures covering the entire food-producing cultural succession has been classified into six phases or five stages, each culturally and technologically more advanced than the preceding one, with the last phase representing the civilization itself. This view would postulate prosperous peasant village economies in the highlands leading to rich urban ones after their inhabitants became sufficiently skilled to exploit the potentials of the floodplains, with the whole empirical tradition of food production, derived from an Iranian ancestry, for a successful adaptation to the new environment. By implication this means that the Indus civilization was the natural culmination of a long process. The genesis of the civilization and its ethos remains, however, unexplained. A close study of the Baluchi hill cultures would no doubt reveal a pattern of a somewhat uniform development level of material culture, but we still lack knowledge of the catalytic agent or motivating factor necessary for the next vital step.

It is well known that on each of the excavated sites where Harappan occupation has been found to be overlying that of the pre-Harappan (Kalibangan, Harappa, Kot Diji, Gumla, Balakot), the Harappan settlement seems to have started suddenly in all its maturity. Amri, however, provides a continuous occupation with a transition from the pre-Harappan to the Harappan phase.

Field research oriented towards early cultural development in the greater Indus Valley (Mughal, 1970) has provided evidence which indicates that cultural processes leading to full urbanization were already under way in this region from the middle of the fourth millennium BC. Detailed analysis of the material excavated from the sites of the antecedent cultures in the greater Indus Valley, including those from Kot Diji, Rahman Dheri, Jalilpur, Amri, Balakot, Kalibangan and so on, have shown the presence of many elements, namely fortifications, ceramic forms (including terracotta cakes, bangles, toy-cart wheels, bulls) and metal technology, which later characterize the Indus civilization. This phenomenon lends some sense of unity in certain cultural traits, styles and techniques antecedent to the emergence of cities. But the idea of the grid-patterned city with the centralization of a variety of interdependent activities, monumental architecture, an elaborate system of weights and measures, extensive copper-bronze metallurgy and the art of writing, the hallmark of the civilization, was conspicuously absent in these cultural manifestations although it has been argued that the beginnings of writing can be seen in the graffiti and potters' marks occurring on the pottery of cultures which are designated as Early Harappan or formative stages of the Indus civilization. For the origin of the Harappan city, it has been speculated that the increase of agricultural produce in the villages forced the need for markets and hence a merchant class (Agrawal, 1972–3). The merchants not only planned Harappan cities, but also deliberately standardized their cultural traits. The Harappan abruptness was thus argued as deliberate and not a process of natural growth.

There is yet another view which, based on recent archaeological evidence (obtained from excavations at Tepe Yahya and Shahr-i Sokhta), demonstrating the full-scale development of partly literate and economically demanding complex societies on the Indo-Iranian borderlands at the end of the fourth millennium BC, points towards eastern Iran as the homeland of the formative influence on the Indus civilization. It is reasonable to argue that the fairly advanced village communities of Baluchistan, such as Kulli, with possibilities of synoecism, were in contact with the Iranian highlands and southern Mesopotamia, Khuzistan, Turkmenia, Seistan and southern Afghanistan and the native development of village-town complexes, as represented by these cultures, seems to have been spurred on by the diffusion of the idea of civilization from this early urban interaction sphere. The possibilities seem to have been exploited at many sites with varying measures of success. Recent excavations at Tepe Yahya and Shahr-i Sokhta have provided a synchronism between such features as proto-Elamite tablets, Nal ware, or terracotta bulls, the former site also yielding a Persian Gulf seal, a seal-impression with unmistakable Indus script on a potsherd, and Mesopotamian ceramics. The presence of a late fourth- and early third-millennium proto-literate community in the area may in turn have provided the stimulus for

the system of writing in the Indus civilization. Furthermore, findings at Bahrain, Failaka, Bampur, Altyn-depe, Shortugai, Sarai Kala and Gumla indicate a pattern of communication between Mesopotamia, Seistan, Turkmenia, Afghanistan, Baluchistan and Sind which would support the movement of ideas.

The role of the idea and stimulus diffusion from Mesopotamia, Iran and Seistan, combined with the genius loci, has to be duly recognized. Wheeler long ago stated that ideas have wings and in the third millennium BC the idea of urbanism was in the air in western Asia. A model of civilization, however abstract, was present in the minds of the Indus founders and the setting was socio-culturally mature enough to assimilate it. One could argue for a catalytic influence of a selective, qualified and transient character which spurred on the synoecism that was to happen. The role of the genius loci was emphasized by Ghosh (1965), who felt that the origin of the civilization should be looked for within the earlier pre-Harappan culture itself and not from outside. He visualized that the local people, without any outside colonizers or conquerors, woke up to new ideas and reacted accordingly, perhaps led by a few genius dictators, trade with west Asia making them realize the need for standardization. But where this explosive phenomenon took place still remains to be established. Do the unfathomed levels of Mohenjo-daro or the unexcavated site of Judeirjo-daro hold the key?

## THE PROTO-URBAN AND PRE-LITERATE CULTURES

### Baluchistan

By about 5000 BC permanent settlements had come into existence in the Greater Indus Valley and Baluchistan near the sources of water or the moisture-retentive soil of the mountain valleys, where cereal crops were cultivated and goat, sheep and cattle were already fully domesticated. A degree of craft specialization, long-distance trade, complexity in dwelling houses and public buildings that had appeared during the Neolithic period at Mehrgarh and Kili Gul Muhammad were further developed into more complex socio-economic religious and political institutions, which formed the basis of urbanism in the Indus Valley.

The early cultural manifestations, both in Baluchistan and the Indus Valley, are distinguished by the material assemblages of common cultural traits and are usually known after their area of concentration or the principal site names. These cultures present a continuous development from c. 5000 to 2500 BC.

The middle of the fifth millennium BC marks the beginning of the Chalcolithic period in Baluchistan and is represented in the Quetta Valley at Kili Gul Muhammad levels II-III and at Mehrgarh period III. Comparable materials are found in the Kalat plateau designated there as Surab I-II and at Sur Jangal I-II in the Loralai Valley of northern Baluchistan (Fairservis, 1959). Fast wheels for making pottery were introduced and new pottery vessels and decorative designs emerged. An intensification of other crafts is noticeable by the discovery at Mehrgarh of crucibles with copper pieces and of lapidary and shell-working areas. Buildings included compartmented granaries, implying the availability of a surplus and the intensive cultivation of cereals, mostly barley. The evidence ties in well with Mundigak I and II and Namazga period III.

During the second half of the fourth millennium BC further changes and elaborations took place, though there was no cultural discontinuity at Kili Gul Muhammad, Surab or Mehrgarh. New ceramic styles consisted of bichrome and polychrome painted motifs, the ‘wet’ and grey wares, along with those of earlier traditions. Female figurines as cult objects became more stylized in representation, indicating an increased importance of religion. The houses continued to be built with mud or mudbrick on stone foundations.

The beginning of the third millennium BC in Baluchistan demonstrates increasing complexity in architecture and a profusion of pottery for which the Kachi plain and the Quetta Valley provide the best information. Public or monumental architecture in the form of platforms appeared at Damb Sadaat and Mehrgarh. The form of the ‘Mother Goddess’ with

bejewelled breasts became standardized. Special areas for craft activities were demarcated. The presence of marine shells, lapis lazuli and turquoise suggest that Baluchistan had already established wide-ranging contacts. The distribution of ceramic forms and painted motifs over a wide area shows an extensive communication network both within the Indus Valley and with other regions. The Quetta painted style occurs on the pottery of Mundigak III in Afghanistan, Shahr-i Sokhta in Seistan and even beyond the Early Bronze Age sites in Turkmenistan or Namazga IV. This type of associated ware also extended southward to Nal in southern Kalat and on the piedmont plain of the western part of the Indus Valley.

One of the significant culture areas in southern Kalat is represented by the site of Sohr Damb, which produced a very distinctive wheel-made pottery both in form and decoration and a variety of bronze tools in the burials (Hargreaves, 1929). Canisters with ring bases and other vessels, including cups and bowls, depict a great variety of geometric and floral motifs, including zoomorphic ones. The Nal pottery is also widely distributed and thus provides a good chronological horizon around 3300–2500 BC.

The Loralai-Zhob archaeological sequence is known from Rana Ghandai (Ross, 1946), Sur Jangal and Periano Ghondai. Structures of mudbrick and mud on stone foundations, flint tools, leaf-shaped arrowheads, copper objects, alabaster vessels and terracotta female figurines occur with red wares painted in black in a variety of designs. Contacts with the Bannu basin and Gomal Valley are indicated, especially during the early third millennium BC. At the same time, the lower Indus Valley demonstrates interaction with central and southern Baluchistan.

## Sind

In contrast to the regional cultural pattern of Baluchistan, the vast plains of the Greater Indus Valley show great uniformity in materials approaching cultural integration, with the exception of peripheral areas such as south-western Sind and north-east Rajasthan. The Early Bronze Age cultures in the Greater Indus Valley with fortifications, long-distance trade or exchange, craft specialization and the local production of standardized tools, ceramics and other items, an agriculture-based economy, a formalized religion, the beginnings of writing in the form of graffiti and potters' marks, and a large settlement size with complexity of architecture, represent the Early Harappan stage. The appearance of large sites such as Mohenjo-daro and Harappa during the middle of the third millennium BC, in fact, marks the climax of cultural processes which were already under way at least from the middle of the fourth millennium BC (Mughal, 1970, 1988).

Before the appearance of urban centres in about 2500 BC, the lower Indus region was dotted with permanent settlements having varying degrees of complexity in their social organization, architecture, tools technology, and exchange systems, with an economy based on agriculture and animal husbandry. These early settlements, numbering over thirty, were contemporary in date with the Bronze Age cultures of Baluchistan, roughly belonging to the middle of the fourth and early third millennium BC. The most significant sites are Kot Diji and Amri, which in turn form the basic frame of reference for the Early Bronze Age of the lower Indus Valley.

Kot Diji, covering an area of at least 2.6, hectares is located on the east bank of the Indus, opposite Mohenjo-daro (F. A. Khan, 1965). The earliest occupation at the site, termed 'Kot Dijian', was enclosed by a fortification of mudbricks and was represented by levels 4 to 16, which are dated by radiocarbon (calibrated) between 3300 and 2500/2200 BC. The use of bronze, though restricted to household and personal ornaments, is attested. Other objects include chert blades, leaf-shaped arrowheads, stone pestles, grinding stones, beads of carnelian and lapis lazuli, and a variety of terracotta objects, such as cones, toy-cart frames and wheels. The most distinctive element of this culture is the wheel-made pottery, often painted on the neck with a simple black or brown band, and represented in globular vessels on stands, flanged vessels with lids, pans and bowls. The ceramic types in particular are related to those found in early third-millennium contexts at sites of the central and northern Indus Valley. The Kot Dijian levels yielded materials which anticipated some elements of the mature Harappan culture. Kot Dijian materials, therefore, are now considered to represent the early formative or proto-urban stage of the Indus civilization

The other site meriting attention is Amri, located in the south-western part of the lower Indus Valley, on the right bank of the river. The earliest occupation of the site, termed 'Amrian', goes back to the middle of the fourth millennium BC. Because of its proximity to the river, subsistence at this settlement included fishing in addition to agriculture and pastoralism. A degree of complexity in domestic and other architecture is noticeable in the presence of compartmented structures. Finds of semi-precious stones, alabaster and certain ceramic types, originating from Baluchistan and east of the Indus, shows that Amri and related sites in the Indus Kohistan and Kirthar regions were involved in a large interaction system. Amrian ceramics are distinguished by their vessel shapes and richly painted designs in black or brown and bichrome. Over 80 per cent of the pottery in the early levels was hand-made, but decreased progressively till replaced by the wheel-made pottery in later periods. Amrian painted pottery displays a wide range of geometric animal and plant designs. The polychrome pottery in particular has links with the Kechi Beg painted pottery of the Quetta Valley. There is a great concentration of Amrian sites in the Sind Kohistan

area and on the piedmont plain of the Kirthar mountains, where twenty-seven sites have so far been discovered. Another site in the lower Indus Valley showing an antecedent culture below the Harappan occupation is Balakot.

The contiguous region of the upper Indus Valley was densely populated during this period, as indicated by nearly one hundred sites, with as many as forty occurring in the Cholistan area. Their heavy concentration in the upper and central Indus Valley seems to point to this being the core area, which later led to full urbanization. The sites most pertinent to the early development are Sarai Kala in the Taxila Valley, Harappa and Jalilpur in the central Indus Valley.

### Frontier regions of Pakistan and the Punjab

Sarai Kala represents two major cultural periods (Halim, 1970–1, 1972). Beginning with the late Neolithic horizon in period I, the occupation was followed by people who used wheel-made pottery and made extensive use of stone and bone tools, bronze and copper and a variety of terracotta objects. No permanent structures were found but the presence of post-holes suggests the use of perishable materials in the construction of dwelling houses in addition to mud walls on stone foundations. The settlement was a permanent one, indicating that sufficient economic resources were available to support growing populations. The pottery is comparable with the known Kot Dijian ceramics of the early third millennium BC. Two other sites in the same valley, at Jhang (Mughal, 1989) and Hathial (G. M. Khan, 1983) repeated the cultural pattern of Sarai Kala II in terms of material equipment.

Jalilpur, near the banks of the Ravi, represents another settlement of the early third millennium BC preceded by an occupation which is related to an earlier ‘Hakra’ phase known extensively from Cholistan (Mughal, 1972, 1974). Much lapis lazuli and some buff wares from contemporary sites indicate a large interaction involving inter-settlement and interregional trade or exchange. The pottery from Jalilpur is Kot Dijian but also contains bichrome ware, which is otherwise absent from the type-site of Kot Diji but occurs frequently at the upper Indus Valley sites. Harappa, located 70 km north of Jalilpur, was the first site to produce ceramics which are now characteristically Kot Dijian. Recent excavations have uncovered a large area of the Early Harappan occupation.

In the core area of the Early Harappan culture, where at least forty settlements have been discovered in Cholistan and many more on the Indian side, there appears to be maximum concentration of populations. It is possible that they practised agriculture on the floodplain of the Hakra River and its tributaries and also raised cattle, sheep and goat utilizing the desert environment, because camp sites indicating temporary occupation have also been found containing characteristic Early Harappan pottery and other materials. The presence

of kilns at some of these sites is suggestive of specialized craft activities in addition to the production of wheel-made pottery (Mughal, 1982, 1989).

The north-western part of the Greater Indus Valley, from the Sulaiman piedmont to the Indus river, including the Gomal plain and the Bannu basin, was also a flourishing centre of early cultures from the middle of the fifth to the third millennium BC. In the Gomal plain two sites have been excavated, Gumla and Rahman Dheri. Of these, Gumla (Dani, 1970–1) showed a twofold sequence of cultures with the earlier occupation showing a Neolithic subsistence economy and the latter a Bronze Age Early Harappan assemblage dated to the second-third millennium BC. During that period, bronze tools were used in addition to microliths and parallel-sided chert blades. Pottery was made on the fast wheel, fired to a red colour and generally painted with either black or brown or in two colours, producing a number of linear and geometric designs. Significantly, the assemblage contained six mature Harappan ceramic types, indicating contacts with the urban centres of the Harappan civilization.

Rahman Dheri, covering an area of 22 hectares, is the largest known site in the Gomal Valley (Durrani, 1988). Excavations revealed three periods of occupation. The site seems to have been fortified from the very beginning. The occupation of period IA showed mud structures, some with circular grain silos, one of which also contained charred wheat grains. The subsistence economy of the people depended on agriculture, with cattle, goat and sheep. In the following period, II, the grain silos were replaced by large pottery storage vessels fixed in the ground. Otherwise, the earlier traits, including the use of packed mud structures, continued through this occupation. In the last period, III, the city wall fell into disuse but the mud platform, after being repaved, continued to be used. Specialized crafts such as lapidary are attested by the occurrence of beads in all stages of manufacture and numerous stone drills. Bronze tools, chert blades and micro-blades, terracotta figurines of animals and females, a large number of household and ornamental objects speak of a flourishing community. The pottery contains all the principal Early Harappan wares, some comparing with those of north Baluchistan ceramics of contemporary date, especially of the Zhob and Loralai valleys. One of two other sites in the region, Hathala, was excavated to a limited extent, the evidence of which repeated that of the Gumla sequence.

The Bannu basin in the north-western frontier province of Pakistan has recently emerged as an archaeologically important region with early cultural developments. It is watered by three rivers, the Kurram, the Tochi and the Gambila. Intensive exploration has revealed settlement sites of various periods. Of the Early Harappan or Early Bronze Age period, nine sites have so far been discovered, including Tarakai Qila, Islam Chowki, Mirzali Khan Dheri or Seer Dheri, Lak Largai, Takhit Khel, Zabta Khan Dheri and Barrai

Khurarra; the first three sites have been excavated to varying extents. The earliest known radiocarbon date, of the mid-fifth millennium BC, comes from the first occupation at Sheri Khan Tarakai, an extensive site about 0.2 km<sup>2</sup> in area (F. Khan et al., 1986), showing a 2 m thick occupation. Implements of stone such as flakes, cores, polished axes, ring stones, querns and large milling vessels dominate the artefact assemblage. Of considerable interest is the discovery of coarse red ware, occurring at the earliest levels. The painted designs include representations of caprids, usually in pairs, a Maltese cross and geometric designs. Vessels treated on the external surface with mud appliqué resemble those from Hakra and Amri. The characteristic Early Harappan wares of the Greater Indus Valley occur together with those of northern Baluchistan.

The two other sites in the Bannu basin, Lewan or Dar Dariz and Tarakai Qila, represent a single cultural group of early third-millennium settlements which in content and date compare with the Early Harappan Kot Dijian ceramics and other related materials. The structures at Tarakai Qila were made of mudbrick or mud over stone foundations. There is an indication of a fortification wall on the eastern side of the site. Lewan, on the other hand, had no regular structures but showed occupational debris in pits of varying depths. The site produced a large number of special tools, such as ground stone axes, ring stones, querns and hammers, including burins, points, scrapers, blades of different shapes and leaf-shaped arrowheads; and micro-drills for making beads locally of turquoise and lapis lazuli.

#### India, Punjab, Haryana and Rajasthan

In the contiguous Indian territory, pre-Harappan settlements have been located on the Ghaggar (ancient Saraswati) and Chautang (ancient Drishadvati), being an extension of the pattern obtaining in Cholistan across the border in Pakistan (Mughal, 1981). Noteworthy sites on this river system are Kalibangan, Banawali, Siswal, Sothi, Rakhigarhi, Balu and Rohira. Besides these, another site, Mitathal, was located on the dried-up old course of the river Yamuna, which at one time is reported to have contributed to the Ghaggar system. Except for Sothi, at each site a stratified or cultural relationship between the pre-Harappan and Harappan cultures has been revealed. Among these, Kalibangan, Banawali, Siswal and Mitathal provide the main evidence.

Kalibangan (B. K. Thapar, 1975) is situated 310 km northwest of Delhi, along the left bank of the now dry river Ghaggar in the northern part of Rajasthan. The excavation revealed two periods of occupation, of which the upper belonged to the Indus civilization or the Harappan period and the lower to the previous phase termed, albeit loosely, pre-Harappan.

The settlement was found to have been fortified from the very beginning of the occupation. The fortification wall was made of mudbricks (in size  $30 \times 20 \times 10$  cm, ratio 3:2:1), plastered both externally and internally with mud. Within the walled area houses were built of mudbricks of the same size as those used in the fortification wall, the masonry being in ‘English’ bonding. The use of the baked brick was attested by a drain, the size of the bricks being the same as that of the mudbricks. Interesting evidence of cooking practices was revealed by the presence within the houses of ovens, both of the underground and over-ground variety, closely resembling the present-day tandoors used in the region.

The distinctive trait of the period, however, was the pottery, which was characterized by six fabrics, labelled for convenience fabric A to F. One of these was marked by a finer textured paste and all-over smooth-slipped surface in shades of red or purple-red and painted in black, and was found to be closely related to Kot Dijian. Similarities in other fabrics with Amri and Baluchistan sites were also noticed. Among other finds of this period, the more noteworthy were small-sized blades of chalcedony and agate, sometimes serrated or backed; beads, variously of steatite (disc), shell, carnelian, terracotta and copper; shell bangles; terracotta objects, comprising a fragmentary bull, toy-cart wheel, bangles; quern stones with mullers; a bone point; and copper objects, comprising a celt, a bangle and a nondescript cutting tool.

Belonging to the same period was also found a ploughed field, showing a grid of furrows, permitting the cultivation of two cereals at a time. This is possibly the earliest ploughed field excavated so far (Lal, 1970–1).

Banawali (Bisht, 1984) lies on the right bank of the now dry Saraswati, some 220 km north-west of Delhi in District Hissar, Haryana. The excavation revealed a threefold sequence of cultures, of which the earliest belongs to the pre-Harappan, followed by the Harappan and Late Harappan.

The 3 m deposit of the pre-Harappan occupation revealed an assemblage strikingly similar to that of Kalibangan, being characterized by the occurrence of all six pottery fabrics and other finds recorded at the latter site. The settlement seems to have been fortified, though not from the earliest occupation. The structures were built of mudbricks (of sizes  $30 \times 20 \times 10$  or  $36 \times 26 \times 13$  cm, all in the ratio 3:2:1). In addition square  $30 \times 30 \times 10$  or  $27 \times 27 \times 9$  or  $24 \times 24 \times 12$  cm bricks were also used. The use of kilnburnt bricks was also recorded. Noteworthy structures exposed by the excavation include a 2 m wide brick-on-edge pavement, a partially excavated house showing several hearths and fire-pits, with the floor area turned red, pointing perhaps to its use as a metal-smith’s workshop. Another interesting find was the existence of circular pits, neatly dug into house floors and containing a fine bluish ash mixed with charred grains, perhaps used as silos

or bins. Among other finds obtained from the deposits of this occupation are points and awls of bone; chalcedony micro-blades; shell bangles; faience, copper and terracotta; beads of gold, semi-precious stone, steatite (disc), faience, bone and clay; a stone weight (not conforming to the binary system of Indus weights); and a terracotta animal figurine. A noteworthy find is a sherd depicting a canopied cart having spoked wheels. The upper levels of this occupation showed evidence of the presence of Harappan ware, though without its classical forms, as also of terracotta cakes, and the use of bricks of both pre-Harappan and Harappan size in the same house. The full nature and import of this seemingly transitional phase still remains to be ascertained. Suffice it to mention that such a phase, though absent at Kalibangan despite the continuance of pre-Harappan pottery up to the middle levels of the succeeding Harappan occupation in the lower city, has already been identified at Amri (Casal, 1964), Siswal and Mitathal (Suraj Bhan, 1975).

The other two sites where comparable material has been found are Siswal, situated 26 km west of Hissar on the left bank of the now dry Chautang, and Mitathal, 118 km northwest of Delhi along the dried-up course of the Yamuna (Suraj Bhan, 1975).

In Pakistan many sites besides those in Irani Seistan (Amri, Balakot, Gumla, Hathial, Harappa, Jalilpur, Kot Diji, Lewan Dhari, Mehrgarh, Rahman Dheri, Sarai Kala and Tarakai Qila) have yielded comparable pre-Harappan or Early Harappan assemblages, falling within a time-range of 3400–2200 BC. On the basis of radiocarbon dating the pre-Harappan period at Kalibangan is ascribed to c. 2500–2300 BC (uncalibrated). On the other Indian sites it seems to have continued still later, developing on its own lines within the lifetime of the mature Harappan period itself. The pre-Harappan communities appear to have arrived in Rajasthan somewhat later than in Sind.

## THE MATURE HARAPPAN CULTURE: FORM AND CONTENT

The mature phase's uniqueness in both form and content stands out conspicuously among contemporary civilizations. A remarkable feature is the general uniformity of city planning throughout its area of spread. The same uniformity is also reflected in the standardized materials of diverse kinds and the representational art. No formal temple buildings comparable to those of Egypt and Mesopotamia have been found at the major urban centres, except for platforms for the fire altars at Kalibangan. Again, no tombs of an upper or rich class have so far been encountered to signify hierarchic burial customs.

The layout of the major cities and towns was rigidly followed with the concept of an acropolis (citadel) raised artificially with mudbrick and mud within a defensive wall and the lower city sprawling at its side. At Mohenjo-daro, Harappa and Kalibangan, the citadels were located to the west of the lower city while at Lothal, Banawali and Surkotada these were parts of the city complex itself, though separately demarcated. The high citadel appears to have been an administrative centre of the city, and perhaps of the area around which the major public buildings were located.

In city planning, the Indus civilization surpassed many of the known Oriental civilizations. Its gridiron pattern, with streets running north-south and east-west, divided the city into roughly rectangular blocks. The social and economic status of the residents was quite pronounced judging by the size of houses and also by their location. The largest houses, which measured up to  $26 \times 18$  m, were enclosed by a thick high wall, having a large courtyard, a series of rooms including a bathroom, a well and a staircase leading up to the second storey. The smaller units had two to four rooms and a courtyard. Within the city, areas were demarcated for specialized craft or labour activities such as pottery (evidenced by kilns), shell and lapidary working and grain husking. An elaborate brick-lined drainage system that still works efficiently after the rains is an unparalleled feat of engineering skill.

A high degree of standardization is seen in brick size, weights and measures, pottery forms and painted designs, chert blades, metal objects and seals. Such evidence leads us to infer that the Harappan administrative system was highly efficient in enforcing standards. The system of government or administration is not yet known, although a hierarchy is implied with provincial or regional branches. Whatever the definition of central authority may be, the maintenance of an efficient network of communication within the entire area, and the standardization of material remains, indicating a thorough cultural integration, is unparalleled in the history of Oriental civilization.



Figure 38 Principal buildings at the citadel mound of Mohenjo-daro (after Wheeler, 1968).

Although many sites of the Indus civilization have been excavated both in Pakistan and in India, in the present context it suffices to talk about Mohenjo-daro, Harappa, Kalibangan, Lothal and Surkotada which, being horizontally excavated on an appreciable scale, have provided the bulk of the evidence for the form and content of the civilization.

*Mohenjo-daro* is situated on the right bank of the Indus in District Larkana of Sind. Excavations, though carried out on an extensive scale, have not so far reached the bottom of the occupation owing to a nearly 10 m rise in the level of the plain as a result of the alluvial deposition of centuries, and correspondingly also of the water table. The settlement consisted of two ports with a citadel and a sprawling lower city (Fig. 38).

The citadel, located to the west of the lower city, is built on an artificial platform of mud and mudbricks, atop which were the main buildings. Except for the occurrence of rectangular bastions at the south-eastern corner, two of them flanking a postern gate, no

definitive defensive wall has been revealed. Of the excavated buildings within the citadel, the most famous is the Great Bath, measuring 12 m from north to south, 7 m broad and 2.5 m deep. The floor of the bath is approached from north and south by flights of steps. The bath was adequately made watertight by the use of gypsum and bitumen. This bath had probably a ritualistic use. Immediately to the west of the Great Bath was a granary consisting of twenty-seven blocks of bricks of varying but regulated size. Other noteworthy structures within the citadel were an unusually long building identified by the excavator as the residence of a high official (or perhaps a college of priests), and an assembly hall.

To the east of the citadel lay the lower city. The basic layout was that of a gridiron of main streets running north-south and east-west, dividing the area into blocks. Six and probably seven such blocks have been identified during excavations. The houses, built exclusively of baked bricks, opened not onto the main streets but onto the lanes. The focus of activity was the courtyard. The streets were unpaved but were provided with brick drains with manholes at intervals.

*Harappa*, the type-site, lies along the left bank of the Ravi. Nowadays the river flows about 9 km further north. The general layout consisted of a citadel towards the west and a more extensive lower city to the east. The site was very badly wrecked in the middle of the nineteenth century by the extraction of bricks as ballast for the Lahore-Multan railway. Owing to the degradations by brick robbers, very few remains of monumental architecture or signs of a street plan are visible.

The citadel was a rough parallelogram on plan with the longer axis on the north-south. The buildings in the interior stood on an artificial platform of mud and mudbricks which was contained on all sides by a defensive system, showing at regular intervals rectangular bastions. The main entrance seems to have been on the north. On the western side, however, was a curved re-entrant controlled by bastions and supervised from guardrooms. At the southern end of this system, a series of steps or a ramp led up to the citadel.

Overlooked by the citadel towards the north, barrack-like dwellings and circular working platforms were found. Beyond that lay a double range of granaries on a revetted platform. The approach to the granaries was on the north, from the river bank, suggesting the use of water transport for incoming and outgoing supplies of grain. The cemeteries R-37 and H are discussed below (Burials).

The Harappan metropolis at *Kalibangan* consisted of two principal parts, the citadel on the west, represented by a smaller mound (KLB-1) and the lower city on the east, represented by a bigger mound (KLB-2), recalling the identical disposition of the mounds at Mohenjo-daro and Harappa. The citadel was located on top of the remains of the preceding occupation, thus gaining an eminence over the lower city, which was laid out towards the

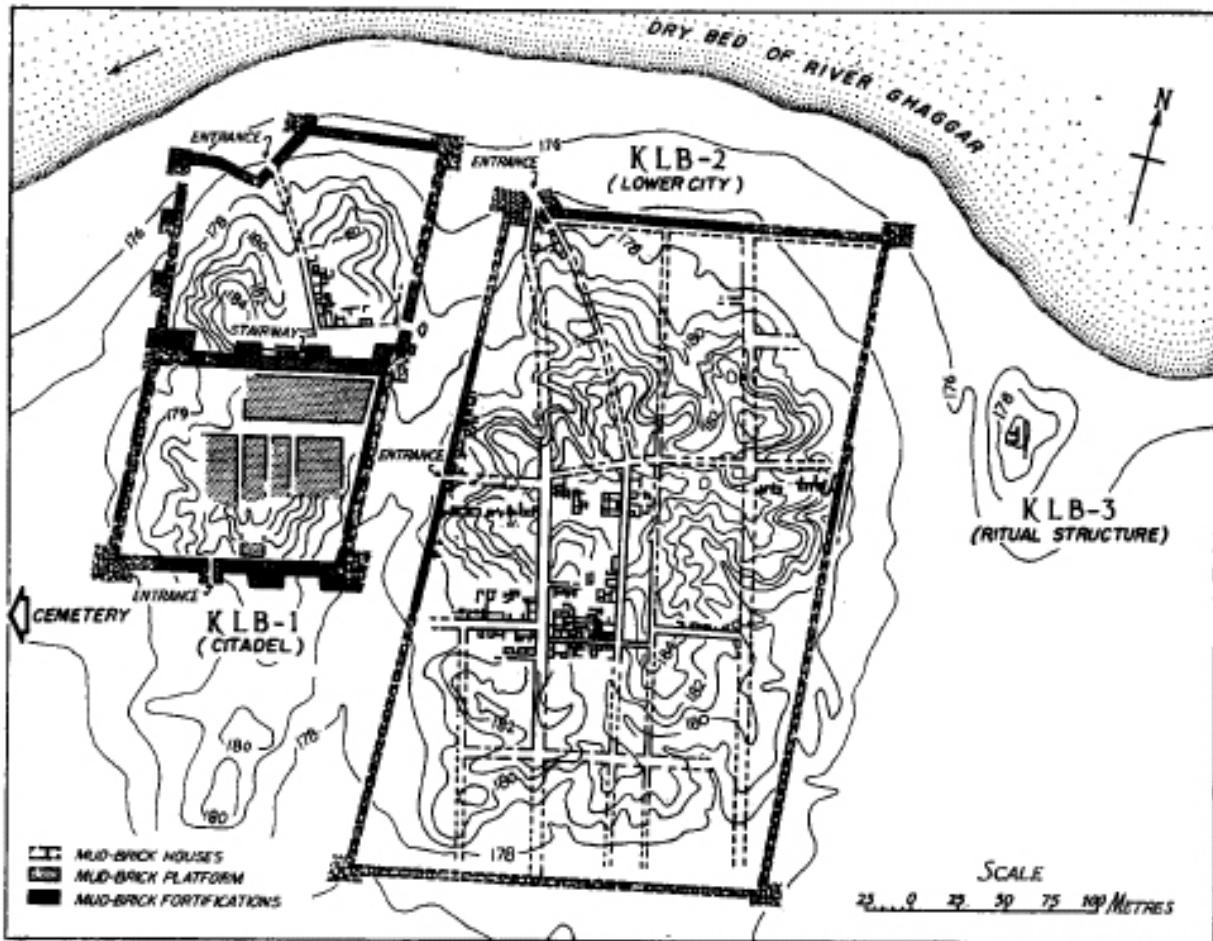


Figure 39 Harappan metropolis kalibangan; period II.

east on the natural plain, leaving a gap of over 40 m between the two parts of the settlement (Fig. 39).

The citadel complex is roughly a parallelogram some 240 m from east to west and consists of two almost equal but separately patterned parts with a bipartite wall in between. Both these parts were contained by a fortification wall, built throughout of mudbricks (size  $40 \times 20 \times 10$  cm and  $30 \times 15 \times 7.5$  cm; ratio 4:2:1). The southern half of the citadel, which was more heavily fortified, contained some five to six massive platforms some of which may have been used for religious or ritual purposes as attested by the occurrence of 'fire altars', a brick-lined pit containing bovine bone and antlers, beside wells and elaborate drainage running through the passages. The northern half of the citadel contained residential buildings, perhaps of the elite or the ruling minority. Both these parts had separate entrances besides an intercommunicating one. The lower city was also fortified, being a parallelogram measuring some 360 m from north to south and 240 m from east to

west, showing a gridiron or irregular net plan of streets running north-south and east-west, dividing the area into blocks. In the excavated area, the streets do not seem to lead into any important building nor open out into well-defined public squares (Plate 106). The houses were made of mudbricks of the size  $30 \times 15 \times 7.5$  cm. No street drains were encountered in the city. House drains were found to discharge themselves into soakage jars buried under the street floors. Two entrances, one on the west and the other on the north, were exposed. Besides the two principal parts of the metropolis, there was also a third one situated about 80 m further east of the lower city, which perhaps was used for ritual purposes.

The finds obtained from the occupation strata are all characteristic of the Indus civilization, for example chert blades, chert weights, terracotta animal figurines, seals, copper objects, and pottery both plain and painted (Plate 107). The following deserve special mention: a cylinder-seal; a terracotta cake incised on the obverse with a horned human figure and on the reverse with a human figure pulling an obscure animal (perhaps a sacrificial animal); a copper bull; a terracotta graduated scale; and an ivory comb.

*Lothal* is situated on the coastal flats at the head of the Gulf of Cambay, 80 km south-west of Ahmedabad (Rao, 1973, 1979–85). The excavation revealed five phases of continuous occupation, of which the first four labelled Lothal A are Harappan and the fifth, labelled Lothal B, is a variant or sub-Indus representing a later degenerate phase. While the ceramics belonging to Lothal A show all the essential elements of the Indus civilization in the substantive sense, there are two which are not met with in the nuclear region of Sind or in the eastern region: the micaceous red ware and the black-and-red ware both showing painted decoration. Among other noteworthy ceramics of Lothal A is the ‘reversed slip’ ware which indicates a connection with sites in Sind and Baluchistan. Apart from these specialities, both the pottery and other finds obtained from the excavation are typically Indus. Some of the painted designs, however, do signify a provincial style.

The settlement was found to be fortified with a mud and mudbrick wall measuring some 300 m from north to south and 225 m from east to west, a trapezoidal south-eastern part of which was intended to serve as a citadel or acropolis, being separated from the remaining part of the city by a 7 m high podium made of mud and mudbrick. The prominent structures located on the citadel included what the excavator calls the ruler’s residence, a regimented series of rooms each with a brick-paved bath and a warehouse or granary, built of twelve cubicle blocks with air ducts or passages running in between. On the eastern flank of the city was an oblong basin, measuring on an average 214 m in length (north-south) and some 37 m in width (east-west) and perhaps 4.5 m in depth (the extant height of the embankment in the north-west corner being 3.2m). Adjoining the western embankment was a mudbrick platform, intended perhaps for handling cargo. The basin is claimed to

have been a dockyard for shipping, an interpretation which some scholars dispute (Shah, 1960; Leshnik, 1968; Pandya, 1977; Ratnagar, 1981). Notwithstanding these differing views, both the dock and the warehouse, coupled with the discovery at this site of a Persian Gulf-style seal are indicative of the maritime trade of this coastal site.

Lothal B phase was marked by certain changes in ceramics: the perforated jars and beakers became scarce; the dishon-stand became squatter; the complicated geometrical designs were replaced by free-style linear patterns, including stylized peacocks and birds drawn on a limited surface of the pot; and terracotta bangles were completely replaced by those of conch shell, cubic chert weights by spherical shaped ones of schist and long ribbon flakes by short blades. A significant change in the seals was the absence of the animal motif and other pictographic elements. The dockyard too became unserviceable. An inclusive time-bracket of c. 2300–1600 BC is indicated for the occupation of both periods A and B at Lothal.

*Surkotada*, situated some 160 km north-east of Bhuj, provides tangible evidence of the diffusion of the Indus civilization from the lower Indus Valley to Gujarat by the land route (Joshi, 1979). The excavation brought to light a sequence of three cultural phases of the Harappan culture, labelled sub-periods IA, IB and IC. From the very beginning of the occupation (sub-period IA) the settlement was fortified on a rectangular plan (approximately 120 × 60 m with east-west as the longer axis) and was divided into two parts of which the western half was used as a citadel and the eastern half as a residential annexe. The citadel part, built on an artificial podium, was higher than the residential annexe. The fortification wall was built of mud with a veneer of rubble masonry at the base. While the main entrance to the citadel seems to have been on the south, an intercommunicating passage between the two parts of the settlement was provided on the east by a ramp. The objects obtained from the deposits of this sub-period were largely Harappan, and included a typical steatite seal, sherds bearing painted Indus characters, and long chert blades. Besides the characteristic Harappan pottery, a cream-slipped bichrome ware, showing painted designs in brown and purplish-red or black, and the ‘reserved slip’ ware were also found. The inhabitants practised pot-burial as one of the methods of disposal of the dead. In sub-period IB, Indus elements became less pronounced with the appearance of the new ceramic tradition of coarse red ware. The upper levels yielded sherds of the white-painted black-and-red ware. In sub-period IC, the Indus pottery tradition had further waned, the dominant ceramic being the white-painted black-and-red ware. The fortifications were reconstructed in rubble and partly dressed stone masonry with revetments and corner bastions. An elaborate gateway complex was provided on the southern side of the citadel. Noteworthy finds from this sub-period include a terracotta seal bearing Indus script and chert weights. The existence

of a horse is indicated by the discovery of bones of this animal in the deposits of this sub-period, thus supporting the artefactual evidence obtained at Rangpur. An inclusive time-bracket of 2300–1700 BC is proposed for the three sub-periods of occupation at Surkotada.

## THE ECONOMY

The economy was largely based on agriculture and animal husbandry, with trade or exchange networks for the procurement and distribution of raw materials and manufactured items within and outside the Indus Valley. The recent recovery and analysis of faunal remains from the Early Harappan (Jalilpur, Mehrgarh IV-VII and Balakot) and mature Harappan sites (Allahdino and Harappa) demonstrate the dominant use of cattle. By the beginning of the second millennium BC, however, the domestic camel, horse and donkey were also present, while the onager, wild boar, gazelle and rhinoceros were hunted. Other animals known to the Harappan people include the dog, water buffalo and the cat besides fish, river turtle and birds.

The subsistence was based on winter-sown and spring/ summer harvested (rabi) crops. Long before the beginning of the Indus civilization, people were already growing winter-sown (rabi) crops once a year. These consisted of five kinds of wheat (einkorn, emmer, hard wheat, bread/dub wheat and short wheat), three kinds of six-row barley and also field peas, chickpeas, lentils, flax/linseed, jujube and mustard. Dates and cotton were harvested in summer/autumn from at least the sixth millennium and grapes by the beginning of the fourth millennium BC. In addition, melon seeds and sesame were consumed. Towards the end of the Indus civilization, in the second millennium BC, the Harappans diversified their agriculture by growing autumn harvest (kharif) crops in marginal areas to the east and south of the Indus Valley, especially in Gujarat and even in the Kachi plain in the west-central Indus Valley. Evidence of rice cultivation was found at Lothal and Rangpur in Gujarat and at Pirak (Constantini, 1979; Vishnu Mittre and Savithri, 1982). Sorghum (jowar), finger millet (ragi), bulrush millet (bajra) of African origin and two Asian millets, proso and foxtail, were cultivated. Terracotta models of ploughs closely resembling those used today are reported from Cholistan and Banawali.

## trade

It is widely known that Sind and the alluvial plains of Punjab are devoid of useful minerals with the result that subsistence related materials had to be imported. These substances include copper, tin, gold, silver, limestone, alabaster, basalt, granite, marble, slate, steatite, gypsum, bitumen, lapis lazuli, carnelian and other semi-precious stones such as jade, turquoise and amazonite (Marshall, 1931; Wheeler, 1968). The sources of some of these materials were far distant. Trade links have been indicated with Afghanistan, Baluchistan, central Asia, north-eastern Iran, Rajasthan, Gujarat, Punjab and south India. The invention of writing, the use of seals and sealings and standardized weights and measures all point to a flourishing trade and commerce. The discovery at Altyndepe of three seals, one with two Indus characters, the other with a swastika, and the third portraying a three-headed griffin along with various items of ivory such as sticks and gaming pieces, decidedly of Indian origin, and of the ithyphallic terracotta type from Namazga, paralleled at Mohenjo-daro, indicate a northern overland route passing through Mundigak to southern Turkanistan (Masson, 1981).

Recent excavation at Shortugai in the Oxus basin has revealed the existence of an Harappan colony that was carrying on trade in lapis lazuli. Apart from typical Harappan painted pottery, a square seal, bearing the Indus script with the figure of a rhinoceros, and the occurrence of graffiti on the rims of jars and on beakers, barrel-shaped agate beads, long tubular and etched carnelian beads, shell bangles, toy cart-frames, terracotta cakes, zebu figurines, and the use of mudbricks of Harappan size (32 × 16 × 8 cm) also confirm the trading character of the colony (Francfort, 1984).

Artefactual evidence of trade contacts with contemporary Mesopotamia and Elam has been adduced by the occurrence of many and varied finds. These include: seals of Indus style; etched carnelian beads; kidney-shaped pieces of inlay made of bone; various objects of ivory; cubed dice; gold discs; beads with tubular perforation, depictions of the Indus trefoil pattern; the Indus bull with manger at various sites in Mesopotamia and Elam, and of pottery bearing knobs on barbotine, pyxis of greenish-grey stone (chlorite); metal pins with spiral or animal heads; leaf-shaped knives and bun-shaped copper ingots; shaft-hole axes, ring kernoi, theriomorphic vases, and barrel-shaped weights. The discovery at Mehrgarh's south cemetery and at Sibri of some objects showing Murgabo Bactrian parallels and of etched carnelian beads on the Iranian sites of Hissar, Marlik, Shahdad and Bakum and at Mundigak in south Afghanistan further reinforces the evidence of contacts between the Indus civilization and neighbouring regions. It is evident that the region was an integral

part of the interregional network of exchange or trade of specific items emanating from their respective production centres.

The number of objects of Indus style found in West Asia admittedly does not imply a sizeable scale of trade. Of the Mesopotamian or Mesopotamian-inspired objects found on the Indus sites, the examples are still fewer. Lamberg-Karlovsky (1972), however, argues that such material may have resulted from indirect contact-trade and as such emphasizes the role of sites such as Tepe Yahya in Iran in the Indus-Mesopotamian land-route trade.

In 1954, the decipherment of certain Sumerian and Akkadian documents which refer to lands called Dilmun, Magan and Meluhha added further dimensions to the trade between Mesopotamia and the Indus Valley (Oppenheim, 1954). Sargon of Akkad (*c.* 2370–2280 BC) mentions that ships from Dilmun, Magan and Meluhha were docked at his capital. Textual evidence shows that the Indus-Mesopotamian contact started with the Early Dynastic III period and continued through the Larsa period, thus covering both the pre-Harappan and Harappan periods. The Mesopotamia texts show a trade contact through both Dilmun and Magan. Among these Dilmun was more a trade entrepôt than a producer of items of trade mentioned in the texts. During the period when the trade via Dilmun was at its peak, another series of seals called the Persian Gulf seals was used. They depict themes mostly influenced from Mesopotamia, though a few still show the Indus script with the bull. These seals are button-shaped and circular in plan; a seal of this distinctive type has been obtained from Lothal.

The land of Dilmun has been identified with the Bahrain archipelago, Failaka and Tarul islands and a part of the adjacent Arabian mainland, and has a unique position in Sumerian mythology (Cornwall, 1946; Bibby, 1969; Ratnagar, 1981). Cuneiform inscriptions from both Failaka and Bahrain support this identification. It is favourably positioned, both geographically and strategically, on the well-frequented maritime trade route, connecting Mesopotamia with the Indus Valley. It was important as a watering station, being blessed with sweet water. The occurrence in Bahrain (Ras al-Qala) and Failaka of gaming pieces of lapis lazuli together with lapis pendants, worked ivory pieces, polished stone weights and Persian Gulf seals, including a few bearing Indus pictographs closely resembling those found at Lothal and Mohenjo-daro, amply demonstrates the role of Dilmun as an entrepôt in this trade. On the Bahrain islands the type-site Barbar provides a chronological sequence from 2900 to 1800 BC.

Magan or Makan has been identified with Oman and Umm an-Nar near Abu Dhabi (Weisgerber, 1984). It is called a land of mines. Texts mention the following materials coming from Magan: timber, reeds, wood, diorite, onions, stone vases, carnelians, red ochre, copper, ivory, gold dust and goats. Of these, at least two, ivory and carnelian, could have

originated from the Indus: Magan only transshipped them. Recent archaeological findings in Oman, particularly at Mayasar I, Ras al Junayez and Hili, have furnished supportive evidence (triangular prismatic and pear-shaped seals, Indus-type decorative patterns on pottery, ivory combs, and sources of copper and chlorite) of a link between the Indus Valley and Oman (Magan) in the chain of maritime trade through the Persian Gulf.

Meluhha is identified with regions in the east of Mesopotamia, including the northern shore of the Persian Gulf and the Arabian Sea and the Indus Valley. Meluhha is reported to have supplied to Mesopotamia timber, a variety of woods, copper, gold dust, lapis lazuli, carnelian, wooden furniture, ivory figurines of birds, peacocks and red dogs, all of which, except lapis lazuli, must have originated in India. In the latter part of the second millennium BC, however, both Magan and Meluhha were thought to be Egypt and Nubia or Ethiopia.

The items of trade reportedly travelling from Mesopotamia eastwards were principally foodgrains, oils, wools and textiles. How much of it reached India is a matter of conjecture, as most of these goods are perishable.

The archaeological evidence of trade with the Elamites, who were political rivals of Sumer and Akkad, is patchy. Alleged connections are indicated by a fragmentary sealing on a potsherd recalling the Harappan seal and two etched carnelian beads (Lamberg-Karlovsky and Tosi, 1973; Lamberg-Karlovsky, 1976) found at Tepe Yahya in stratum IVA. The presence of Harappan sites such as Balakot, Sotka-koh and Sutkagen-dor on the Makran coast indicates the likelihood of an ocean trade route.

## WEIGHTS AND MEASURES

The level of standardization and uniformity in weights and measures achieved and maintained during Harappan times was remarkable. The system was so efficient for the economy and for trade that it was also adopted in ancient Dilmun (Bahrain), where a number of weights were found along with Indus seals bearing the script.

The weights were made of chert, limestone, steatite, chalcedony and other stones in different sizes. The most common shape was cubical but some spherical, cylindrical and barrel-shaped weights were also used. Some pottery scale-pans also indicate the use of weighing scales; singularly interesting was one bronze or copper bar with a pair of pans confirming their use.

The Harappan weights are unmatched in the contemporary ancient world because they fall strictly within a system which is binary as well as decimal. The lower denominations are binary: 1, 2,  $\frac{1}{3} \times 8$ , 4, 16... to 12,800 with a unit ratio of 16 equal to 13.625 g. The higher denominations are in the decimal system with fractions in thirds.

The system of measures is revealed by a graduated piece of shell from Mohenjo-daro, a fragmentary bronze rod from Harappa and a terracotta rod from Kalibangan. The shell scale has nine subdivisions of 0.670 cm units. Five of these sub-divisions make the Harappan ‘inch’ equal to 3.352 cm, thus making a Harappan foot equal to 33.52 cm. In addition to linear measurements there was the cubic system. The bronze rod is marked with lengths of 6.012 cm. It is clear that both the linear and cubic systems were used. The measurements of the buildings at Harappa and Mohenjo-daro conform to both these systems of measurement. The Harappan foot varied between 33.02 and 33.52 cm.

## ARTS AND CRAFTS

The arts and crafts of the Harappans are demonstrated by a great variety of material objects. Certain categories of objects, however, stand out to illustrate technological and artistic skills and a high level of craft specialization.

Ceramics are among the most abundant finds at Harappan sites and include a wide range of pottery vessels, human and animal figurines, bangles and other objects of daily use. The pottery was manufactured on a fast wheel and was made of finely levigated clay which was well and evenly fired to different shades of red. The vessels range from large storage jars to bowls, dishes, offering stands, cylindrical and perforated jars. Not only the forms but also the painted designs in black over bright red slip were standardized, reflecting craft specialization. The painted designs are both geometric and floral, the recurrent ones being 'pipal' leaf, fish-scale and intersecting circles (fig. 40).



Figure 40 Typical mature Harappan pottery (after Wheeler, 1968).

The human figurines, both male and female, and mostly hand-modelled in terracotta, are quite expressive, some appearing to be of a cultic nature. The male figurines are depicted with a long or pinched nose, a slit mouth, oblique eyes and a largely flat body. Most of the female figurines are shown in a standing position; each half was vertically moulded, and the two halves were then joined together. In finished form, the terracotta female figurines are depicted wearing a short loin cloth and wide girdle, necklaces and an elaborate fan-shaped head-dress and a cup-shaped pannier on each side, perhaps for an oil lamp or incense.

Among the animal figurines, which again were hand-modelled, the humped bull dominates, other animals represented being the buffalo, elephant, dog, sheep, rhinoceros, pig, monkey, turtle and horse. In addition, terracotta models of carts with solid wheels and toys such as whistles, rattles and cones, thought to be used as styli for inscribing on clay, and cubical dice are also found.

Metallurgy is represented by household vessels, weapons, implements and small objects of gold, silver and lead. Copper was obtained from various sources, including the Chagai hills in Baluchistan, the Kreti-Ganeshwar area of Rajasthan and perhaps Oman and southern Iran (the legendary Magan). The Harappans were familiar with various manufacturing techniques of hammering and the use of simple and complex moulds. Among sculptures, the bronze statuette of a dancing girl, 11.2 cm in height, is a remarkable piece of casting and skilful execution. It depicts an easy standing posture, the right hand on the hip and the left arm adorned with bangles. The animals such as a buffalo with long swept-back horns, a charging bull and ram or goat are rendered in a naturalistic and expressive manner. Apart from this a variety of vessels such as bowls, dishes, cups and weapons, and implements such as spears, arrowheads, knives, axes and pins were also made (Figs. 41, 42).

Of the stone objects, the best specimens of representational art are sculptures of limestone and alabaster from Mohenjo-daro and Harappa, and hundreds of steatite seals. The sculptures portray human heads and seated figures with expressive details of hairstyle. One bust of a male found at Mohenjo-daro is an outstanding example of the sculptural art of the civilization, and is thought to represent the ‘king-priest’. The rendering of the beard and shaven upper lip, a fillet on the forehead and ear like a cross-section of a shell resemble the other human sculptures. A cloak across the left shoulder has distinctive trefoil motifs which were originally filled in with red paste. Two small statuettes from Harappa are remarkable examples of realistic modelling in exhibiting naturalistic poses and movement of limbs. In addition to these works of art, large quantities of lithic materials, including chert flakes and blades, were used as tools for a variety of activities.

The steatite seals bear eloquent testimony to the superior craftsmanship and technical achievements of the Indus artisans. Measuring usually 1.8–3 m long and having a perfo-



Figure 41 The Indus bronze and copper vessels (after Wheeler, 1968)

rated boss at the back, the intaglio designs show a great number of animals and other figures with pictographic script or linear designs. The frequently represented animal, the unicorn, or the ox-like animal with a single horn, is invariably shown with the sacred manger or incense-holder, consisting of a bowl-shaped cage on the top of a post. Short-homed bulls are most naturalistically represented, suggesting religious veneration, especially seen in the terracotta bull figurines. In addition, rhinoceros, elephant and tiger are shown with a manger in front. Despite the small size of the finished article, the engravers managed to carve tiny details with great skill including, for example, composite figurines showing three to six heads of different animals radiating from one ring. One such elaborate representation has the face of a human being, crowned with the horns of a bull, the forepart of a ram, the hindpart of a tiger and a tusk of an elephant. The depiction of human figures and those combined with tree and animal motifs were perhaps intended to portray divine figures.

The carnelian beads with etched designs were produced at the lapidary workshops of Chanhudaro, Lothal and elsewhere. They were in great demand even outside the core area of the Indus civilization. Their occurrence in other regions not only provides relative dating but also demonstrates the degree of interaction. The common shape was a long barrel. Beads were also made of other semi-precious stones, as also of steatite, faience, shell and even terracotta.

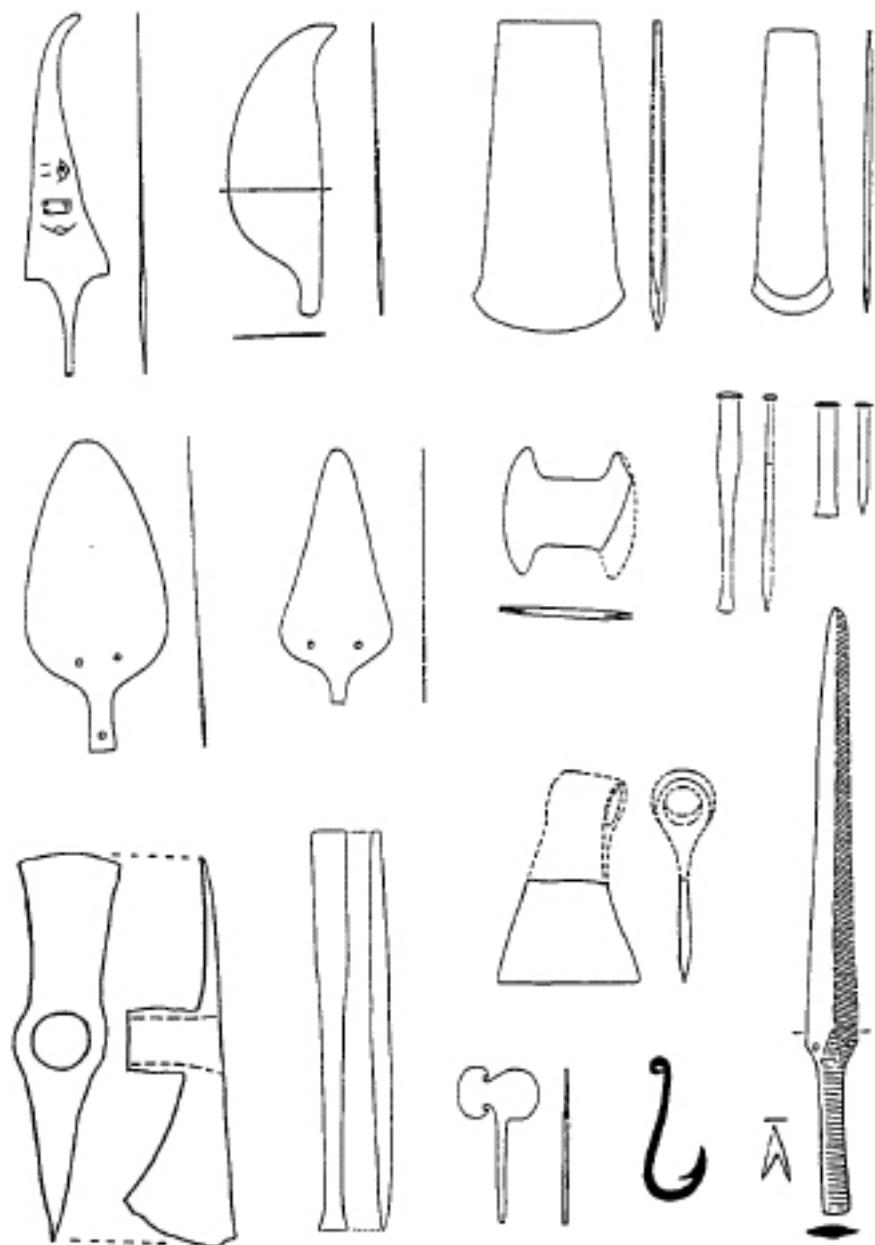


Figure 42 The bronze and copper tools from Harappa and Mohenjo-daro (after Mackay, 1938 and Vats, 1940).

## THE INDUS SCRIPT

The Indus script, which is essentially pictographic, is found to be unrelated to any contemporary script. It contains over 400 distinctive symbols or characters, and is found chiefly on seals but also on pottery, ivory sticks, copper objects and tablets. The number of characters represented in an inscription may vary from, one to twenty-six, the average length of a text being five characters. No long inscriptions with significant recurrent features have so far been reported. Continuing research on the decipherment of this script has so far shown no difference in the script from one site to another nor any definitive evidence of its evolution, notwithstanding certain professed claims of development from syllabic to phonetic with signs reduced to a bare 20 odd (Rao, 1982). Distribution analysis of these seals has failed to yield any coherent pattern. The only aspect on which there seems to be a consensus is the direction of writing, namely from right to left, which is supported principally by four instances of evidence: (a) a seal from Harappa with writing in three planes along three of its sides – top, left side and bottom; (b) a potsherd from Kalibangan with sharply scratched superimposed strokes with a flourish on die left end; (c) a tendency towards slight compression of the signs on the right side – that is on the left side of the impression; and (d) signs carried over to a second line, or overruns. Instances of a boustrophedon sequence of signs is also recorded where there is a second line.

Many claims have been made for the decipherment of the script, but none of them has received universal acceptance. As far as language is concerned, there are two main approaches to the problem, one advocating the proto-Dravidian affinity, and emphasizing the agglutinative aspect of the language (Asko Parpola, 1984), and the other the Indo-Aryan related to Vedic Sanskrit, focusing on the language's inflectional nature and compound signs (Rao, 1982). These lines of argument clash with one another. However, as a useful tool for further investigation a concordance of the texts has been published (Mahadevan, 1977; Koskenniemi et al., 1973; Koskenniemi and Parpola, 1979, 1980). Meanwhile, it could be reasonably argued that writing had a limited use, perhaps by a privileged literati. Whether the seals indicate proper names relevant to trade we do not know but one could conjecture, with due reservations, that unlike the cuneiform texts the Indus seals were not used as a means of more complex communication.

## RELIGION

Evidence of this complex aspect of the civilization is inconsistent and, in the absence of any textual records, has to be reconstructed from the surviving material artefacts, noteworthy amongst which are: (a) the seals, the scenes on some of which may be interpreted as religious (including the well-known Pasupati seal from Mohenjo-daro); (b) aniconic and polished phallic objects and ring-stones; (c) a few stone images, particularly the nude ithyphallic torso from Harappa; (d) semi-nude female terracotta figurines with elaborate head-dresses, and associated with the mother-goddess cult from Mohenjo-daro and Harappa; (e) a terracotta cake from Kalibangan (citadel part), showing a horned deity on one side and a man pulling an animal (goat or ox, perhaps sacrificial) on the other. The occurrence of a brick-lined pit atop one of the platforms in the citadel area at Kalibangan, containing bovine and antler bones, does point to animal sacrifice.

It is surprising that no female terracotta figurines of mother-goddesses have so far been recorded at any of the excavated sites located within the present-day borders of India (Kalibangan, Lothal, Surkotada), except for a few examples from Banawali that are not in the style of the characteristic pannier-shaped head-dress. Even among the seals found at Kalibangan none depicts a deity except perhaps the composite man-faced animal figure on a cylinder-seal. On the other hand, a row of ‘fire altars’ has been found on top of one platform in the citadel area. Similar ‘fire altars’ or ritual pits have also been attested individually in many houses in the lower city. Apart from these, an exclusive structure containing a group of two such ‘fire altars’ was found to the east of the lower city outside the fortification wall. The absence of normal occupation debris on this site suggests that the structure was intended for some religious or ritualistic purpose. It would appear, therefore, that the ritual connected with these ‘fire altars’ played a dominant role in the religious life of the Harappans at Kalibangan. The recurrent features of the altars show that a shallow pit, oval or rectangular on plan, was dug out; a fire was lit and put out on site, as shown by the fragments of charcoal in the basal part of the pit; a cylindrical, occasionally faceted or rectangular block of clay, sun-dried or sometimes pre-fired was fixed in the centre, and flat triangular or circular terracotta cakes were placed around the block, perhaps as symbolic offerings. The importance of water in connection with these rituals, though not necessarily with deification, is indicated by the almost extravagant provision of wells and drainage in the citadel area. At Lothal, too, several fire altars are reported, though with different features (Rao, 1979–85). No such altars have so far been reported from Mohenjo-daro and Harappa, though the Great Bath at Mohenjo-daro does point to the association of water with ritualistic and religious purposes. The observance of whatever ritual is associated

with the fire altars, therefore, seems to be peculiar to the region of Kalibangan and perhaps Lothal.

Concrete evidence about the religion of the Indus civilization continues to elude us, although from the available evidence it would appear that religious beliefs and practices varied from region to region. It seems to have been a mélange of many contemporary religions or ritualistic observances.

## BURIALS

Among the excavated sites, cemeteries have been located at Harappa, Rupar, Chandigarh, Kalibangan, Lothal and Surkotada, but no royal grave or burial of any other special category has so far been encountered. At Mohenjo-daro, no orderly burials of the Harappan period have as yet been found. At Harappa, the cemetery (labelled R-37) was located to the south-south-west of the citadel and contained extended articulated inhumations (with the head towards the north) with pottery and other grave goods, including items of personal jewellery, placed in a rectangular or oval grave-pit, which in one singular case contained a coffin of rosewood covered with a lid of deodar, and in another case was lined internally with mudbricks. "Within die citadel area were also found some post-cremation burials, containing a melange of odds and ends, the exact significance of which cannot be assessed (Wheeler, 1968). At Rupar the cemetery was located to the west of the habitation area and contained extended articulated inhumations (generally with the head towards the north-west) in rectangular grave-pits, containing pottery and grave goods as at Harappa. At Chandigarh, the remains of the cemetery, exposed as a part of the rescue operations conducted in one of the shopping areas (sector 17C), shows similar features of extended articulated inhumations with north-south axis.

At Kalibangan, the cemetery of the Harappan period was located to the west-south-west of the citadel on the present active floodplain of the river; formerly it must have been beyond the reach of the annual floods. Excavation revealed three types of burial: (I) extended articulated inhumations in rectangular or oval graves (with the head towards the north, except for one aberrant example) containing, besides the skeleton, pottery and personal ornaments and toilet objects (Plate 108); one of the graves was found to be internally lined with mudbricks; (2) a pot or urn burial in a circular pit, containing, besides the main urn, other pots along with such grave goods as beads, shell bangles and steatite objects; and (3) pottery deposits and personal ornaments such as shell bangles and beads in a rectangular or oval grave with the longer axis running north-south. The last two modes of burial were not associated with any skeletal remains. In the case of the third category, the striking feature was the filling, which showed two stages. The occurrence of three varieties of burial practice has posed sociological problems. Meanwhile, it may be affirmed that the grave goods obtained from each of these sites are characteristically Indus.

At Surkotada, the cemetery was located to the north-west of the settlement. The burial practice so far encountered consists of a pot burial in a circular pit, covered by a capstone and low cairn.

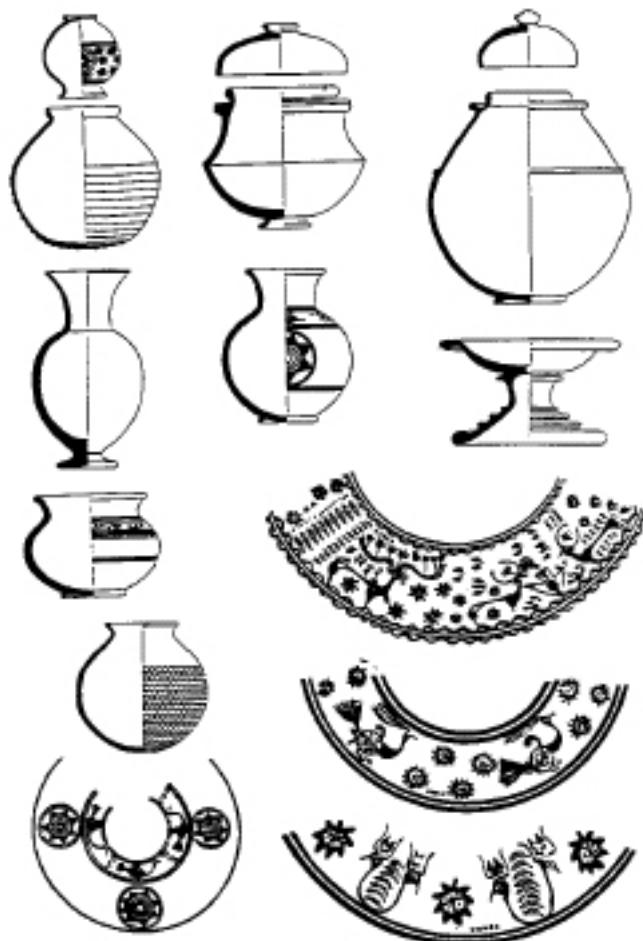


Figure 43 The cemetery H pottery and painted designs from Harappa (after Vats, 1940)

At Lothal, on the other hand, the cemetery was located to the west of the settlement and showed two types of burial practice, both being extended articulated inhumations in rectangular graves with pottery and other grave goods; but while one type of grave contained one skeleton, the other contained two. In two of the three joint burials, skeletons of two individuals of the same sex (male) were found buried together (Rao, 1985).

At Harappa, ‘Cemetery H’ was found stratigraphically overlying Cemetery R-37. This cemetery, which belongs to a later cultural complex, contains two strata, each representing different modes of burial. Of these, the lower stratum (II) contained extended articulated inhumations, with accompanying pottery and grave goods in rectangular graves with the head towards the east of north-east, as distinct from the usual Harappan practice of placing the head towards the north. The upper stratum (I) consisted of fragmentary burials in large urns covered with lids. Babies were buried in an embryonic position in these urns (Fig. 43).

While extended inhumation with the necessary grave goods seems to have been the normal burial practice during the Harappan period, simultaneous inhumation of two bodies has not been discovered at any other Harappan site except Damb Buthi. Equally divergent is the evidence from Kalibangan in respect of pot burials and graves without skeletal remains. Furthermore, there does not seem to be any uniformity in the location of the cemetery *vis-à-vis* the city or the citadel. The size of the cemeteries encountered appears to be relatively small in comparison with the corresponding settlements, which would suggest other modes of disposal of the dead.

Studies of the skeletal remains from Harappa indicate two broad categories of ethnic types, proto-Australoid, Caucasian or Eurafrican and Mediterranean Indo-European or Caspian. Similar studies of the Lothal burials show two categories, one having a dolicho-cranial head while the other a brachy-cranial, which in turn reveal a close relationship with those at Sialk. It is evident that the population of the Indus civilization was a mixed one. The study of thirteen skulls from stratum II and eighteen from stratum I of Cemetery H at Harappa indicated a new group of the round-headed type which was completely absent from the mature Harappan cemetery R-37.

## DATING

The problem of chronology is an involved one, especially since there is a time-lag between the origin and growth of this civilization in the nuclear area and the areas to the east, and the possibility of error or disparity in radiocarbon dating.

The lowest levels of Mohenjo-daro have not so far been reached because of the high level of the water table. Marshall, whose excavations at Mohenjo-daro (1921–7) constitute the substantive work, suggested that the occupation of Mohenjo-daro fell approximately between 3250 and 2750 BC. He acknowledged that the short period of 500 years must not of course be taken to cover the whole rise and fall of the Indus civilization, and postulated a thousand years for a period of antecedent growth.

Mackay (1938), who undertook further excavations at Mohenjo-daro from 1927 to 1931, assigned the lowest attainable levels to about 2800 BC and the uppermost to 2500, allowing some three hundred years. Vats (1940), who excavated Harappa from 1921 to 1931, felt that the lowest levels were earlier than those attainable at Mohenjo-daro and suggested a time-bracket of c. 3500–2500 BC, basing his argument primarily on the occurrence of tiny seals and sealings of an archaic type below stratum IV in mounds F and AB. The inclusive time-bracket for the Indus civilization was thus fixed at 3 500–2500 BC. This dating was based on a comparative study of objects of Indian origin and type found in the then datable contexts in Iraq and Iran.

This position continued till 1946 when Wheeler undertook further excavations at Harappa and critically examined the chronological evidence. His careful analysis revealed that the fixed point in the estimation of the time-spread of this civilization was its contact with Sumer in and about the time of Sargon of Akkad, whose date is now placed around 2370–2344 BC. Documentary evidence vouches for vigorous commercial activity in the Sargonid and Larsa periods. For the collapse of the Indus civilization, Wheeler held Aryan invaders responsible. Suggesting a plausible explanation for the massacre of men, women and children in a late period strata at Mohenjo-daro, he stated, albeit dramatically, that Indra stands accused. In this computation, the terminal date was conditioned largely subjectively, for 1500 BC is the conventional date for the Aryan incursions into India. Wheeler thus postulated that the millennium, 2500–1500 BC, was a possible inclusive date for the civilization, without prejudice to the unplumbed depths of Mohenjo-daro. He supported his argument by the occurrence of a seal in the Kassite levels at Ur, without discounting the possibility of its later survival, especially when the bulk of the evidence relating to the seals ascribed to a dated context pointed to the Sargonid and Larsa periods. He corrected himself later and proposed 1700 BC as the terminal date of the civilization.

Subsequent to the development of radiocarbon dating, excavations at Rangpur, Lothal, Kalibangan, Surkotada, Gumla, Amri, Balakot and Kot Diji, and renewed investigations at Mohenjo-daro and Harappa have provided fresh evidence for cross-checking or modifying the traditional chronology. A sufficient number of samples obtained from the various levels of these sites has now been radiocarbon dated.

By an objective analysis of the large number of  $^{14}\text{C}$  determinations from these sites and two other allied sites, Damb Sadaat and Niai Buthi, Agrawal (1974) proposed a maximum date-bracket of 2300–1750 BC for the total time-spread of the mature Harappan culture (Agrawal and Kusumgar, 1974). We may agree with the upper end of the bracket, but must reconsider the soundness of 2300 BC for the lower end. In view of the unexcavated lower strata of Mohenjo-daro, coupled with seven  $^{14}\text{C}$  dates from the upper levels of that site with a mean date of about 1970 BC, there is a good case for ascribing the lower end of the time-spread to 2500, if not earlier. Conversely, at Mohenjo-daro, in the lower attainable levels, we have almost securely dated evidence in the occurrence of a carved steatite vessel which is assigned to the Mesopotamian Early Dynastic period or even earlier, and as such should provide a rough chronological horizon to these levels of Mohenjo-daro.

The ‘sloping horizon’ depends on the amount of time required for the spread of the elements used as horizon-markers. The Indus civilization has an overall duration of about 800 years and covers an area of not less than one million km<sup>2</sup>. Within such a vast area, environmental differences must have played a significant role in its diffusion, as also in moulding cultural adaptations: manifestations in Gujarat, Haryana, Punjab, Jammu and Kashmir bear ample testimony to this. In Haryana, many sites of the pre-Harappan complex, which were not affected by the initial spread of the Indus civilization, are found to have continued almost up to the collapse of the latter. Similarly, both the beginning and the end of the civilization in Rajasthan, Haryana, Punjab, Jammu and Kashmir are obviously later than those in the central zone or core area, as is amply demonstrated in the cultural remains.

Coming to the applicability of the radiocarbon dates, it has been found that the method is not without disparities, which become serious in the earlier part of the second millennium BC and increase steadily backwards to the fourth millennium. To overcome these disparities, a calibration curve was decided upon at a conference in New Zealand in October 1972. Since the period during which these disparities are more pronounced corresponds to the time-spread of the civilization and its antecedent phases, it is necessary for us to consider the applicability of the calibration curve *vis-à-vis* historical dates and archaeological material. Although it is admitted that the correction graph is not yet fully adequate, it cannot at the same time be denied that the present time-spread based on  $^{14}\text{C}$  dates without

calibration is late. With the suggested MASCA calibration, the bracket would be around 2700–1900 BC; this would justifiably explain the pre-Sargonid contacts.

## DECLINE AND AFTERMATH

Environmental factors, including the behaviour of the river, climate and accessibility of natural resources, were largely responsible for the growth into maturity and the expansion of the Indus civilization. Paradoxically, it is these very factors, in a multi-causal framework, which became responsible for its weakening. The occurrence of skeletons lying scattered in the upper levels of houses and lanes at Mohenjo-daro was cited as evidence of attack by the Aryans. The evidence of the late Cemetery H at Harappa was considered to represent the invading group of Aryan-speaking people (Wheeler, 1968). But the postulation of an Aryan invasion as a determining factor for the end of the civilization does not seem to be tenable if 1750 BC is its terminal date.

Long-distance and internal trade in resource materials was badly disturbed towards the first quarter of the second millennium BC affecting the distribution of raw materials and luxury goods, with the result that remote settlements became impoverished. As trade seems to have been a *leitmotiv* of the civilization, its cessation would have adversely affected the prosperity of the cities, leading to de-urbanization and the dispersal of population (Ghosh, 1982). During the same period, shifts in the drainage pattern seem to have occurred; the Ghaggar-Hakra-Wahinda system disappeared, due largely to the capture of the Yamuna by the Gangetic system and the Sut-lej by the Indus. It has also been argued that the Harappan cities, under growing population pressure, were destroying their environment by overgrazing, overcultivation and overconsumption of vegetation and thus were wearing out their landscape. Continuing demand for wood during the mature phase resulted in deforestation in the Himalayas, which in turn led to erosion and the displacement of channels due to the raising of their beds through the deposition of detritus.

The Greater Indus Valley falls within an active seismic zone. Tectonic disturbances, of which there is tangible evidence, had made the Indus prone to flooding, resulting in ponding and the consequent rise of the water table in the area; and the disruption of the Ghaggar-Nara flow channel, as evidenced by the reverse gradient of the river near Manot, which resulted in a reduction in the supply of water further downstream. The reduction and ultimate complete termination of this water supply must have adversely affected vital agriculture and forced the population to relocate their settlements, as is abundantly evident by the settlement pattern in Cholistan and further east in Rajasthan. There is evidence to indicate a dam-like extrusion across the Indus as a result of tectonic movements some 120 km downstream of Mohenjo-daro which ponded back the river, making Mohenjo-daro an island. The results of such a phenomenon, which was repeated, must have been disastrous to the morale and organization of the city. Coupled with these factors, towards the

close of the second millennium BC eustatic phenomena (tectonic coastal uplifts or marine regressions) took place along the northern margin of the Arabian Sea with consequent rapid morphological changes. As a result some of the old ports, both on the Makran and Kutch-Kathiawad coasts, were left several kilometres inland and lost their trading role; and as the water table receded on inland sites, civic standards declined. Above all one must not underrate the factor of the natural fatigue of an overgrown civilization.

Eustasy, pluvials and aridity produced different reactions in different physiographic regions, which would perhaps explain the survival and variability of the Indus civilization in regions like Gujarat, Haryana and Punjab and the contiguous area of Uttar Pradesh during the first half of the second millennium BC. In both the southern and eastern regions many new small-sized settlements were established in new locations. The Late Harappan settlements in the eastern regions were shifted to those tributaries and braided river courses which had an assured water supply and a higher water table for sustaining their economy, or to peripheral, less arid areas within the monsoon zone of the Ganga-Yamuna doab, thus avoiding the desiccated lower valleys. Similarly (Possehl, 1980), one notices a spread of sites into the interior of Kathiawad, where the number of settlements of smaller size increases appreciably.

In Kathiawad, Prabhas and lustrous red wares are the two distinct ceramic industries which outlived the mature period of the Indus civilization. In Kutch, it is the white-painted black-and-red ware of the Banas Valley, and at other sites in Gujarat it is the sturdy red ware, painted with elementary designs. As compared to this, the Late Harappan phase in the eastern region is represented by an amalgam of an effete culture, consisting of remnant traditions of pre-Harappan, Harappan, Bara and even to a limited extent Cemetery H cultures. The pottery shows a general decadence in fabric, potting and surface treatment, with monotonous geometric designs. The long ribbon-flakes of chert were replaced by small-sized blades of locally available material. Standard weights were no longer in use. As a general rule, the Late Harappan occupations show decadence or loss of civic standards and absence of urban discipline. While typical Harappan seals or characters incised on pottery do occur at some sites (Bhagwanpura, Lothal, Rangpur, Daimabad) they seem to be more a survival of the past than objects of effective use. In the southern region it was a case of transmutation while in the eastern it was of cultural fragmentation.

## 12.8

### THE POST-INDUS CULTURES (1500–700 BC)

(*B. K. Thapar and Abdul Rahman*)

The eventual collapse of the Harappan civilization in the middle of the eighteenth century BC marked the end of centuries-old human experience of urban life. With it disappeared the idea of town planning and municipal organization, the use of uniform weights and measures, the construction of monumental buildings and writing. Although the dissolution of a civilization does not necessarily presuppose the total extinction of its bearers, yet a considerable proportion of the population in this case also seems to have changed, giving place to newcomers who had their own distinctive pattern of life in which urbanism had no place. The newcomers settled in the conquered territories in the form of scattered peasant communities, fighting among themselves and also against the local population until they had a complete upper hand. These farming communities gradually established nuclei here and there which, with the lapse of time, grew into villages and towns. But these towns were very different from those of the Indus civilization in that there was no rigid planning behind them. In fact the idea of town planning died in the place where it had originated and had to be re-introduced after about two thousand years. Who were these newcomers? At what period did they enter the basin of the River Indus and in what form? What material culture did they themselves possess? These are the kinds of questions which exercise the minds of those who focus attention on the aftermath of the Indus civilization. Two kinds of evidence, each having its own limitations, are available: archaeological and literary.

## ARCHAEOLOGICAL EVIDENCE

Noteworthy sites where the stage of decline or change has been identified through excavation are Jhukar (Majumdar, 1934), Chanhudaro (Mackay, 1943) and Amri (Casal, 1964) in Sind, the South Cemetery at Mehrgarh and Sibri in the Kachi plain (Santoni, 1984), the Kulli complex sites in southern Baluchistan, and the type-site Harappa (Vats, 1940), all in Pakistan, and Rangpur, Lothal, Surkotada in Gujarat, Banawali and Bhagwanpura in Haryana and Bara in Punjab, all in India. At Jhukar, Chanhudaro and Amri it has been labelled the Jhukar culture, distinguished essentially by a ceramic style – a buff ware, painted in black showing certain designs and shapes which are different from those of the characteristic mature Harappan culture. The commonest designs are groups of connected semicircular lines or loops, rows of elongated lozenges, circles with red dots, squares, and so on (Mughal, 1992). At Amri, a progressive transformation of the classic Harappan pottery is seen in period III which becomes a forerunner of the Jhukar ware in period IID. Recent researches have clearly demonstrated that this pottery style existed in association with the continuing but diminishing Harappan ceramic tradition without any break. Notable changes in the cultural equipment were, however: the virtual disuse of the squarish stamp seal and the appearance of the circular ones (button seals with different designs); the restricted use of cubical weights and the stylized female figurines, the occurrence of the Indus script only on pottery; and the increase in the production of beads and of faience objects. Likewise Kulli-complex sites with some distinctive pottery forms appear to have lasted longer to become contemporaneous with Jhukar and Mehrgarh VIII.

At Harappa, the stage of decline is recognized as the Cemetery ‘H’ culture, marked by two modes of burials in separate strata. The associated pottery handsomely painted with motifs that include human beings, stylized plants, frequent representations of cattle, goat, peacocks and fish, stars, and so on was quite unlike either the Harappan or the Jhukar or the Kulli pottery. Most abundant, however, are the continuous scenes in panels or in roundels and so on. These scenes are a subject of unusual interest, having been attributed by the excavator to the Aryans. The corresponding habitation stratum was marked by shoddy jerry-built structures. However, this type of pottery has been reported from several sites in Cholistan which have both regular settlements and industrial features such as kilns. It is thus no longer an isolated phenomenon. In these sites Cemetery H-related ceramics existed in association with a waning Harappan cultural tradition until the latter retained only a few forms which were ultimately lost.

On the Indian sites, a significant feature of the decline is the increase in the number of settlements in the eastern region, including Cholistan, and the southern region, oriented to

different de-urbanized subsistence patterns, including pastoralism. The settlements were essentially smaller in size and located away from the floodplain. These cultures subsequently give way to the various Chalcolithic cultures of central India and Deccan.

During the second millennium BC within the area of the Indus civilization, and also in the adjoining areas, many Chalcolithic settlements sprang up. These settlements represent different regional culture groups and are remarkable in their demonstration of hybrid backgrounds and enduring traditions. In time range they were either contemporary with or later than the Indus civilization.

In Pakistan, clear evidence of post-Harappan occupation is reported from Pirak near Sibi on the fringes of the Indus plains, Jhangar in Sind and the Gomal and Swat valleys, including the Gandhāra plain.

#### Baluchistan-Sibi

More clear evidence of a post-Harappan occupation on the fringes of the Indus plains comes from Pirak, near Sibi. Archaeological excavations at this site have clearly shown that, after an initial Harappan occupation which was followed by a break of unknown duration, the site was re-occupied in the beginning of the second quarter of the second millennium BC. Three successive phases of this unbroken occupation have been recorded. In the first phase structures of unburnt brick were found in association with pottery which combined its coarse clay and hand manufacture with a painting tradition clearly related to that of earlier periods in this area. A major proportion of the pottery, however, was a coarse ware decorated with appliqué bands and fingertip impressions. Of the animal remains both the horse and the camel were not only represented by their bones but also by terracotta and unburnt clay figurines. Common among the terracotta objects were button seals of circular, square or curved forms. Bronze or copper objects have also been found along with a stone-blade industry which included many serrated edges meant perhaps for working on bone or ivory. A more or less similar assemblage with numerous terracotta and clay figurines of Bactrian camels, horses and human beings including riders was found in the second phase. Along with a large number of copper and bronze tools at this level came to light the first piece of iron. The third phase also shows a continuation of all the elements of the earlier phase, except that iron is now represented by a larger number of examples. Radiocarbon dates indicate for phase III a span of c. 1000 to 800 BC, and an earlier date c. 1370 to 1340 BC perhaps represents the second phase.

The cereal remains at Pirak during period I are wheat, barley, rice, millet and oats. These are fairly well documented in the two sectors where soil samples were taken. Sorghum on

the other hand is very scarce and its identification remains dubious on account of the small number of finds and their poor state of preservation (Jarrige, 1979, p. 331).

The material culture of Pirak does not seem to be a purely local phenomenon: it is reasonable to assume that it extended all over the northern part of the Kachi plain. Alongside marked differences, some features of the Pirak culture relate it to a local tradition brought to light at Mehrgarh. At the same time it shows evidence of contact with Central Asia. The Pirak culture, in the words of the excavator, is ‘an original synthesis of regional elements and outside contributions from various sources’.

### Sind

The assemblages that follow the Late Harappan Jhukar horizon in Sind are known as Jhangar. Stratigraphically it occurs after the Jhukar-period occupation at Chanhudaro and Amri and is distinguished by a distinctive black and grey burnished pottery, either plain or decorated with incised geometric and linear designs. This ceramic is a complete departure from the Jhukar pottery tradition. A kind of grey incised ware apparently different in fabric from that of Jhangar also occurs at Pirak IIIB in association with iron and is dated to 915–790 and 890–770 BC (calibrated). The occupation of Jhangar may thus reasonably be placed in the beginning of the first millennium BC (Mughal, 1992).

### Gomal Valley

In the Gomal Valley, particularly at Hathala, Gumla and Marha Sharif, different types of graves have been termed the Gomas Grave culture. Across the Indus, graves of Sarai Kala period III show a close resemblance to these graves. Stratigraphically, they fall into two periods. The earlier of these was a burial-cum-funeral type wherein besides the human body and a few objects, a sacrificed animal was also interred, which in addition shows evidence of fire. The upper and later burials contain human skeletons generally without any funerary objects. The Sarai Kala graves across the Indus also fall into two types distinguished largely by the method of construction, both of which contain no funerary accompaniments to the skeleton, except for two iron finger-rings and fragments of paste bracelets. The mode of burial, however, resembles the later period graves of the Gumla region which may also be ascribed to the Iron Age. The recognition of the Goma Grave culture thus presents a new cultural complex in the post-Indus civilization period.

## Swat Valley

The cultural sequence of the Swat Valley (Stacul, 1984) is based on that of the Ghaligai site where seven periods (I-VII), extending from the third millennium BC into historical times, have been identified. We are concerned with periods IV and V of this sequence.

Period IV of the Ghaligai sequence, belonging to around the seventeenth century BC, is recorded at several sites and seems to be connected with population growth and new forms of stable agricultural settlements. It is marked by a new tradition in pottery, stone and bone tools, and a settlement pattern with evidence of long-distance trade. The sites are situated near rivers on top of or on the slopes of hills not far from valley floors. During this period, around the middle of the second millennium BC, pit-dwellings were replaced by stone-walled houses, built of irregular stones and pebbles. Another technological feature was the introduction of copper. A graveyard belonging to this period was also located at Kherai on the mountain slopes of the Gorband Valley. The graves are rectangular in plan and are covered over by stone slabs. While some of the graves contained inhumations others were without any skeletal material. The grave furnishings, apart from pottery, include in some cases gold ear-rings.

The pottery is represented by a black-grey and buff ware, generally burnished, showing a mottled surface and turned on a slow wheel with frequent basket impressions on its base. Alongside this was a red ware of medium to fine texture, turned on a fast wheel, having painted designs in black, including vegetal representations. While the former recalls the widespread stylistic horizon of the northern Iranian region, the latter seems to have developed from Harappan urban and post-urban cultures. Jade and shell objects testify wide interregional trade. Terracotta figurines, both human and animal, were found mostly around the fireplaces, indicating probably their cultic context. The animal figurines always represent the humped bull. Copper objects included a leaf-shaped spearhead. The faunal remains, with a high frequency of zebu, clearly suggest husbandry rather than hunting as the main activity. The horse is also known. The vegetal remains indicate the existence of wheat, barley and rice and suggest specialized farming in the large areas of fertile and well-watered land.

Between periods IV and V, a transitional phase has been noticed in the occupational layers at Aligrama, marked essentially by a change in pottery and some other associated objects, period IV can be considered the formative phase of the so-called Gandhāra Grave culture, represented by period V. A new stylistic horizon in ceramics, showing close connections with northern Iranian cultures, marks the beginning of period V. The period also witnessed an increase in settlement life. The pottery is characterized by the presence of three classes, grey-black, fine red and coarse red, which remain constant throughout the

occupation period of the Grave culture. There is, however, a gradual refinement of the paste and the use of the fast wheel, facilitating the production of vases with thinner sides that take on a distinctly grey colour. The period also witnessed a shrinking of contacts with areas outside the valley. As well as direct relations with the adjoining Dir Valley, remains of the Gandhāra Grave culture have been identified at Zarif Karuna near Michni in the Peshawar Valley and at Hathial near Taxila. It would seem, therefore, that this proto-historic culture does not represent an isolated episode but is part of a much wider culture, spreading into two different regions, the sub-Himalayan zone of the Pakistan-Afghan border in the west and the alluvial plains of Peshawar.

### Gandhāra Grave culture

The Gandhāra Grave culture, corresponding to period V of the Swat-Ghaligai sequence, represents the material remains of the cemeteries excavated at Butkara II, Katelai I and Loobar I, all of which share the same characteristics.

Recent excavations carried out by the Italians in Swat have produced remains which suggest to the excavators that the material of Swat has points of contact with Iranian production, and especially with that of north-eastern Iran; it seems particularly close to the ceramic production of the locality of Tepe Hissar IIB. Since Hissar IIB can be dated at least as early as the first quarter of the second millennium BC, it is obvious that some of the Swat sites have great importance in a discussion of the problem of the post-Harappan occupation of the Gandhāra plain.

The burial tombs consist of two small chambers one above the other. The upper chamber (about 2 to 2.5 m<sup>2</sup> by 2 m deep) was filled with soil and charcoal after the burial and surrounded generally by a rough stone circle. The lower chamber, separated from the upper by stone slabs, was smaller and contained the human remains with accompanying funerary furniture. The great majority of the burials contained either inhumations, in which case the corpse was placed on its side (N.-S.) in a flexed position, or cremation, probably after fractionalizing. At Katelai, not only was a portion of the cemetery devoted to child burials but in the midst of the necropolis two complete skeletons of horses were recovered. A smaller number of the graves contained cremated ashes, sometimes gathered in a pottery cist or 'box-urn' with flat lid, a large urn with a face decoration consisting of appliqué and cut-out features.

The grave goods included large quantities of a distinctive plain pottery, either buff red or grey, and of a distinctive range of forms. These comprised tall 'champagne goblets', pedestal cups, beakers with large flared mouths, bottles with tall narrow necks, an occasional jug with a raised lip, spouted pots –some with small handles and one curious triple

pot on three stems rising from a base. There are also sometimes terracotta figurines of a distinctive type – generally flat tablets with rough human forms, appliquéd breasts and highly stylized heads, some with incised necklaces and eyes. Metal objects include those of copper or bronze, most commonly pins with decorated tops and, much more rarely, objects of iron.

A. H. Dani's (1967) excavations at Timargarha and Thana have further extended the range of these grave people first identified in Swat. He has found evidence of them in Thana, Dir, Bajaur (Inayat Qila) and Mardan (Panjpir). He has termed this complex the 'Gandhara Grave culture'.

'As the culture belongs to a people or peoples whose names have not been revealed to us in our excavations', Dani explains, 'we have preferred to derive the archaeological terminology for two main factors; first, the culture is known to us mainly from the grave goods and, secondly, it was first discovered in this region, Gandhāra,.' (Dani, 1967, p. 25). Similar graves have more recently been exposed in Zarif Kuruna in the Peshawar Valley.

Based on both typology and a limited stratigraphy, Dani has divided his material into three periods:

Period I – Complete burial with copper

Period II – Cremation and burial with copper

Period III – Fractional and multiple burial with copper and iron

The people of these periods apparently placed their settlements on the alluvium and near to the foothills of the river valleys. They also had the horse and practised some agriculture, circular and rectangular storage rooms having been found. In general, the grave furniture is similar to that found in Swat though there are distinct period differences, especially in ceramics. The whole is dominated by grey and red wares. According to Stacul's classification, the graves may be divided into four groups of which only the last, associated with the thin-sided grey and red ware, produced iron tools. Thus there seems good reason to think that a fair proportion of the graves predate the arrival of iron in this area.

The broad chronology of the graves, derived both from cross-dating parallels with sites outside India and Pakistan, and from the dozen or more radiocarbon dates so far published, appears to cover a wide range. Katelai I produced five samples dated between 1500 and 200 BC, from Timargarha two samples give dates of 1710 and 1020 BC while from Barama two samples were dated between 800 and 430 BC. K. Jettmar (1967, pp. 203–9) has produced evidence that Dani's period III may well be of the seventh to sixth century BC. This is based on a comparison of a three-holed cheek piece of iron found in Timargarha with a similar one found in central Asia. Another synchronism of late occurrence may be found in the grey-ware sherds from Hathial (near Taxila Museum) with Kharoshti letters scratched on

them. Thus continuity of occupation is attested for agricultural people who had horses and cattle and who lived in and about the Gandhara plain for almost a thousand years. Their connections to central Asia and Iran are definite, though of what character is still not known.

### Cairn burials and Londo ware

Towards the beginning of the first millennium BC iron seems to have been brought to the borders of Baluchistan by a people who buried their dead in cairns, were horse riders and used pottery with a characteristic decoration and a distinctive pot form. Several such cairn burial sites were located by Stein (1937) in Baluchi Makran as far as Kulli and hence north up the Mashkai Valley into central Jhalawan, notable among these being Gatti, Jiwanri and Zangian. The cairn burial pottery is a coarse red ware, painted with continuous bands of large volutes or pot-hook spirals. The typical pot form was a spouted flask with lugs pierced for a carrying cord. Almost contemporary with these burials was another class of pottery designated Londo ware by De Cardi (1951), which occurs at several sites extending from Shami Damb to Kullu Kalat. It is a grog-tempered red ware, probably handmade and painted in black with pot-hook spirals. These Londo ware spirals seem to be copies of the bolder volutes of the cairn burial pottery. That users of Londo ware were also horse riders is attested by horse motifs on their pottery.

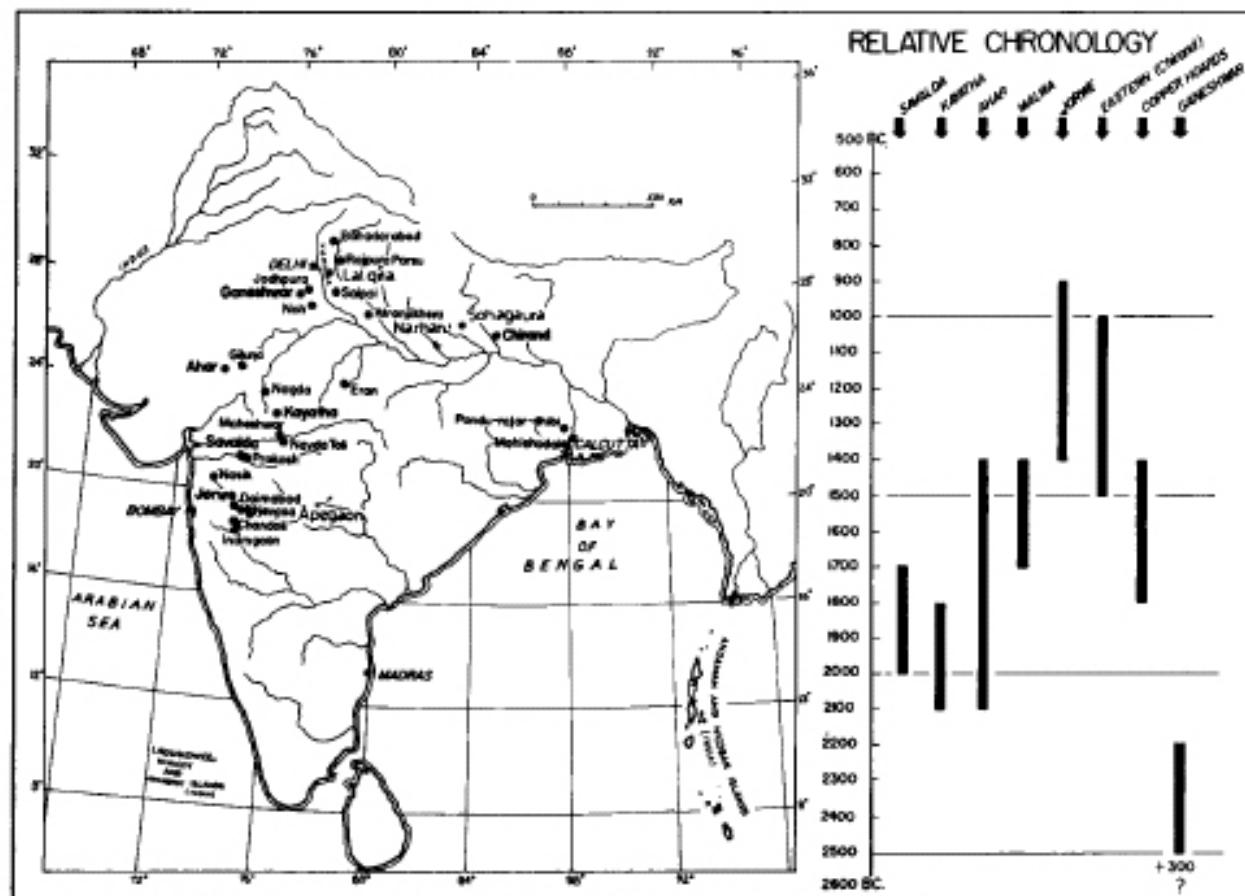
### Central, western and eastern India (Map. 15)

Within India, during the second millennium BC the following Chalcolithic cultures flourished, some of which were part contemporary with the closing phase of the Indus civilization.

1. The Sawalda culture in the Tapti, Pravara and Godavari (*c. 2000–1700 BC*)
2. The Kayatha culture in the central Malwa region of the Chambal Valley (*c. 2100–1800 BC*)
3. The Ahar culture, sometimes also referred to as the Banas culture from its distribution in the Banas Valley in southeastern Raj as than (*c. 2100–1400 BC*)
4. The Malwa culture in central and western India (*c. 1700–1400 BC*)
5. The Jorwe culture in northern Deccan (*c. 1400–900 BC*)
6. The Eastern Chalcolithic culture in the middle and lower Ganga basin, including the Vindhyan region and West Bengal (*c. 1300–1000 BC*)

Excepting the last one, the main focus of these cultures was the great central Indian plateau which is characterized by black cotton soil and scanty rainfall (500 to 1000 mm). In the second half of the second millennium BC, the Chalcolithic elements of the northern Deccan also intruded into the Neolithic phase of the Krishna, Godavari and Tungabhadra valleys, by moving down the Bhima River. All these cultures shared a common level of subsistence economy and technology but were distinguished from each other by a distinctive painted ceramic industry. The mixed economy of these Chalcolithic communities was based on agriculture, stock-raising and hunting-fishing. Their equipment included blades and microliths of siliceous material such as chalcedony. They used copper, albeit on a restricted scale, except at Ahar. These cultures were represented by essentially peasant, agricultural settlements, which did not develop into an urban status because of inadequate technology for exploiting the environment.

The salient features of each of these cultures, based on the excavation conducted at some principal sites, are as follows:



## MAP 15 Post-Indus civilization: Chalcolithic cultures and copper hoards.

### The Sawalda culture

The type-site lies on the southern bank of the Tapti River in District West Khandesh, Dhule, Maharashtra (IAR, 1960). The culture is known to occur principally in the Tapti and Godavari valleys (Deo et al., 1979) but has also been reported from some sites in the Krishna and Kaveri valleys (Sali, 1986). The culture's distinctive trait, however, is pottery, characterized by a medium to coarse fabric, with a thick slip as a surface treatment, in varying shades of brown, chocolate, pink, orange and red which during firing developed crackles. It is painted over in black or purplish red or in both and sometimes also in ochre-red, with geometrical and other designs, depicting plants, animals, stylized human figures, and antennae-ended arrows, double-barbed fishhooks, harpoons, and so on. The types represented comprise high-necked jars, basins, platters, dishes-on-stands and knobbed lids. Associated with this characteristic ware were also found burnished grey and thick coarse red wares (Sali, 1986). The associated finds consist of microliths, beads of semi-precious stone, stone objects such as saddle querns and mullers, and bone arrowheads, harpoons and a few objects of copper. The people lived in mud houses and cultivated wheat, barley, lentil, common pea, green-gram, black-gram, hyacinth bean and *ber* (Indian jujube).

### The Kayatha culture

The type-site is situated 25 km east of Ujjain in Madhya Pradesh on the right bank of the Choti Kali Sind, one of the feeder tributaries of the Chambal (Ansari and Dhavalikar, 1975). The culture is known to occur in the Chambal Valley and is characterized by three principal ceramic industries: (1) sturdy violet-painted pinkish-red ware used for big jars and decorated with bold strokes; (2) red-painted buff ware represented by spheroid vases and dishes with linear designs. This ware seems to have been a de luxe ware as attested by the deposit of two necklaces of 175 and 160 beads of semi-precious stones and 27 copper bangles in the pots of the ware; and (3) combed ware used for bowls and dishes occasionally decorated with multiple zigzag or wavy horizontal lines executed by a comb-like instrument.

Other associated finds of the Kayatha culture include: copper objects such as axes, bangles, chisels; blades of chalcedony and agate; a stone mace head; beads of semi-precious stone including micro-beads of steatite. The people lived in houses of mud or wattle and daub with floors made of hard compact silt.

### The Ahar culture

The type-site which gives the culture its name lies on the left bank of the river of the same name, about 3 km east of Udaipur in Rajasthan (Sankalia et al., 1969). The principal sites where remains of this culture have been exposed are Kayatha, Ahar and Gilund (IAR, 1960b). The Ahar culture is distinguished principally by a plain ceramic as well as white-painted black-and-red ware, available unburnished, burnished, brown-slipped and coarse, and has a limited range of shapes such as bowls, bowls-on-stands, elongated vases and globular vases. The bowl, however, is the recurrent type.

Among the other cultural remains of the Ahar culture, particularly noteworthy is the occurrence of the short bicone terracotta beads bearing punctured designs, and the terracotta bull figurines. While the bulls show a striking resemblance to west Asian specimens from Troy and other sites in Anatolia, including Anau in Turkmenia, the stylized form of the bulls is unique. Their occurrence in large numbers would perhaps indicate their use for votive purposes. Depending upon the availability of resource material, the houses were built of mudbricks or kiln-burnt bricks or wattle and daub, sometimes reinforced with quartz nodules.

### The Malwa culture

The culture takes its name from the nuclear area of its distribution, namely Malwa, a geographically-cultural unit denoting the region lying between the Chambal in the north and the Narmada in the south. Its eastern boundary may extend to the Betwa River while the western is delimited by the Aravallis. The principal sites where remains of this culture have been exposed are: Maheshwar and Navda Toli on the Narmada (Sankalia et al., 1958); Nagda on the Chambal (Banerjee, 1986); Prakash on the Tapti (Thapar, 1967); Daimabad on the Pravara (Sali, 1986); Kayatha on the Choti Kali Sind (Ansari and Dhavalikar, 1975); Earn on the Betwa (U. V. Singh, 1976) and Inamgaon on the Ghod (Sankalia et al., 1971).

The Malwa culture is distinguished essentially by a ceramic: the Malwa ware. The ware was made on a wheel and was invariably dressed with an orange slip mostly on the outside or, in the case of the dishes, both on the outside and the inside. On the slipped surface were painted linear designs in a thin purplish to brown-black pigment, though the red background predominates. In addition to the geometric, representational motifs, displaying animals such as the stylized peacock, spotted deer and crane, used as fillers, are also employed. The commonest shapes represented in this ware comprise vases, bowls (including spouted), chalices, dishes and dishes-on-stands, saucers, lids and so on.

Associated with this principal ware was another distinctive cream or buff-slipped ware. The ware is made on a wheel and is dressed with a slip ranging from yellowish through reddish to buff cream in colour. On the slipped surface are painted linear designs in black or purple, the designs being largely geometric. Representations of human figurines and antelopes also occur in this ware. The shapes met with include goblets, bowls, including the stemmed variety, dishes-on-stands and globular vases. As evidence of the interrelationship with contemporary cultures, the white-painted black-and-red ware of the Ahar culture and its variant, the white-painted pale grey and black-and-grey ware of Prakash, also occurred at some sites.

The subsistence economy of the Malwa culture was based on farming, hunting and fishing. The people grew wheat, barley, rice, lentil and green-gram. They lived in houses made of mud and occasionally also of mudbrick.

### The Jorwe culture

The distribution of this culture extends principally to the semi-arid zones of the northern Deccan plateau with Pravara, in the Godavari basin, as the nuclear area. Noteworthy sites where deposits of this culture have been exposed are Nasik (Sankalia and Deo, 1955), Navase (Sankalia et al., 1960), Chandoli (Deo and Ansari, 1965), Prakash (Thapar, 1967), Navdatoli (Sankalia et al., 1958), Daimabad (Sali, 1986) and Inamgaon (Shankalia et al., 1971; Dhavalikar, Sankalia and Ansari, 1988).

The culture is distinguished by Jorwe ware, which is made on a fast wheel with uniformly built thin walls. The surface colour ranges from drab through light orange to shades of red. It is comparatively more hard-fired than the Malwa ware. On the slipped surface are painted linear designs, singularly monotonous. The decoration is confined to the portion above the girth and in some cases to the inner bases as well. The characteristic shapes in this ware are very few indeed, consisting of a concave-sided bowl, a tubular-spouted vase and a plain high-necked jar. Besides this ware, a burnished grey ware (occasionally red-ochre painted on rim portions) and a coarse red ware were also current during this period.

A distinctive feature of the Jorwe culture was its mode of disposal of the dead. Usually, adults were buried in an extended position, while children were put in two coarse red-grey ware urns, placed horizontally mouth-to-mouth in a grave-pit. In both cases the grave-pits were dug within the houses. At Inamgaon, a departure from the usual practice was shown by a four-legged burial urn of unbaked clay, modelled to resemble the abdomen of a female, which contained the skeleton of a male in a sitting posture.

The Jorwe people subsisted on farming, hunting and fishing. They cultivated a number of crops such as barley, wheat, lentil, kulith, pea and very rarely rice. They also collected fruits such as *ber* (Indian jujube). Barley seems to have been the principal cereal, for it could be cultivated without difficulty in a semi-arid environment.

The houses of the Jorwe people were built of wattle and daub with perhaps conical roofs. The settlements at Inamgaon and Daimabad were found to have embankments against floods.

Two phases of the Jorwe culture have been identified, the earlier of which came to an end around 1000 BC as a result of increasing aridity in the area, which perhaps led to a large-scale migration southwards to the Krishna Valley, while the late phase lingered on till 700 BC, reflected by impoverished equipment. The migration of the Jorwe culture people towards the south led to the introduction of Chalcolithic elements in the late phases of the Neolithic cultures of Krishna, Godavari region. There is reason to believe that as a result of this migration in the southern Deccan, the population and the economy therein underwent a concomitant expansion during the period 1500–1000 BC. Some degree of sedentarization seems to have been introduced.

### The Eastern Chalcolithic culture

The manifestations of this culture are to be seen in eastern parts of Uttar Pradesh, Bihar and West Bengal including the Vindhyan regions, the principal excavated sites being Koldihawa, Narhan (P. Singh and M. Lal, 1985) and Sohagaura (Chaturvedi, 1985), both in District Gorakhpur and Kheradih (IAR, 1985) in District Ballia, Uttar Pradesh; Chirand in District Saran, Bihar (IAR, 1967–78); and Pandura-jardhibi (Dasgupta, 1964) and Mahisdal (IAR, 1967b) respectively in districts Burdwan and Birbhum, West Bengal.

The distinctive ceramics of this culture are: plain and white-painted black-and-red ware; black-slipped ware with occasional paintings in white; grey ware with impressions of paddy husk; red ware painted in black; and a chocolate or buffish ware painted with cream-coloured designs. Amongst these, the grey ware alone is hand-made, the rest being wheel-made. The noteworthy shapes represented were bowls, including channel-spouted basins, tulip-shaped vases, bowls-on-stands, lids and so on.

The subsistence economy of the people continued to be based on farming, hunting and fishing. Among cultivated cereals, wheat, barley and rice were known.

### The copper hoards and related cultures

In the mid-Ganga Valley and the *doab* an enigmatic culture, represented by copper hoards, flourished during the post-Indus period. In time range it was largely contemporary with the Chalcolithic cultures of central India, Deccan and the lower Ganga regions.

Since the early part of the nineteenth century copper hoards (consisting of harpoons, anthropomorphic figures, antennae-hilted swords, flat and shouldered axes, bar celts, trunion axes, socketed axes, bangles and rings) have been reported, mostly as caches, from various parts of south Asia (B. B. Lal, 1951). The hard core of the hoards was found in the mid-Ganga *doab*. Their authorship has been variously ascribed to the refugee Harappans, Vedic Aryans, Mundas or the original Mundari-speaking people, and eastern Austronesian tribes, but the other component of their culture has not been clearly defined (M. Lal 1983).

On the basis of circumstantial evidence, notably at Bahadarabad and Rajpur Parsu where copper hoards had been reported earlier, a ceramic labelled ochre-coloured pottery (OCP), first identified at Hastinapura in Uttar Pradesh (B. B. Lal, 1955), was claimed to be associated with the hoards although they had till then not been found in stratigraphical association with each other. This hypothesis was confirmed in 1970 when excavation at Saipai in District Etawah, Uttar Pradesh, for the first time established the association of OCP with copper hoard objects, notably a hooked spearhead and a harpoon. The epithet ochre-coloured pottery, however, is a misnomer, for the pottery appears to have been a normal red ware, some of which seems to have been also painted in black designs. The ochreous colour of the pottery, which rubs off easily, may have resulted from the humid conditions of the deposit in which the pottery lay buried. Corroborative evidence has also been obtained from the excavation at Lal Qila in District Bulandshahr, Uttar Pradesh (Gaur, 1973). Here, for the first time, copper objects, particularly a fragmentary celt and arrowheads not covered by the hard core of copper hoards were found along with the OCP. The significance of these finds is further underlined by the discovery at Kiratpur (3 km from Lal Qila) of Copper Hoards containing an anthropomorphic figure, two celts and a few bangles.

The culture represented by the copper hoards had earlier been dated to the second half of the second millennium BC (B. B. Lal, 1951). Thereafter, on the basis of the thermoluminescence method (Huxtable et al., 1972) a time-range extending from 2650 to 1180 BC was obtained through potsherds from four sites. Keeping in view the margin of error in these determinations, a central date of 2000–1500 BC seems to provide the workable time bracket. This brings us to another assemblage with which OCP has been reported to be associated.

In Rajasthan, OCP was found at Noh in District Bharat-pur (IAR, 1967a; Kumar, 1971–2) and at Jodhpura in District Jaipur, from deposits underlying those yielding the plain black-and-red ware. Recent fieldwork in District Sikar (Agrawal and Kumar, 1982) has revealed another site where OCP has been found in association with a large number of copper objects and microliths. This site, known as Ganeshwar, is located close to the rich copper mines of the Sikar-Jhunjhunu area of the Khetri copper belt, which in addition contains quite a number of hot and cold water springs favouring the manufacture of tools. The copper objects recovered from the excavation in the Ganeshwar region include arrowheads, spearheads, fishhooks, spiral-headed pins, celts, bangles, chisels, and so on. Some of these shapes closely resemble those discovered at Indus sites. A noteworthy find is a terracotta cake simulating the Indus type. Meanwhile, it must be stressed that the use of the appellation ochre-coloured pottery in the context of Ganeshwar is both misleading and inappropriate. Here OCP is a red-slipped ware often painted in black and decorated with incised designs, and seems to belong to an indigenous regional ceramic industry. Its relation or similarity with OCP associated with copper hoards of the mid-Ganga region remains as yet undefined. According to radiocarbon determinations the deposits at Ganeshwar are ascribed to 2800–2200 BC (Agrawal and Kumar, 1982). This evidence leads us to surmise that this region supplied the copper objects found at the Harappan sites located in Punjab, Haryana and Rajasthan, if not further west.

Notwithstanding these observations, some scholars postulate two categories of OCP, the one associated with the Late Harappan phase in Punjab, Haryana and the Upper Ganga-Yamuna *doab* and the other with the copper hoards of the mid-Ganga *doab* (Suraj Bhan, 1971–2). The Ganeshwar assemblage in time range falls outside these categories.

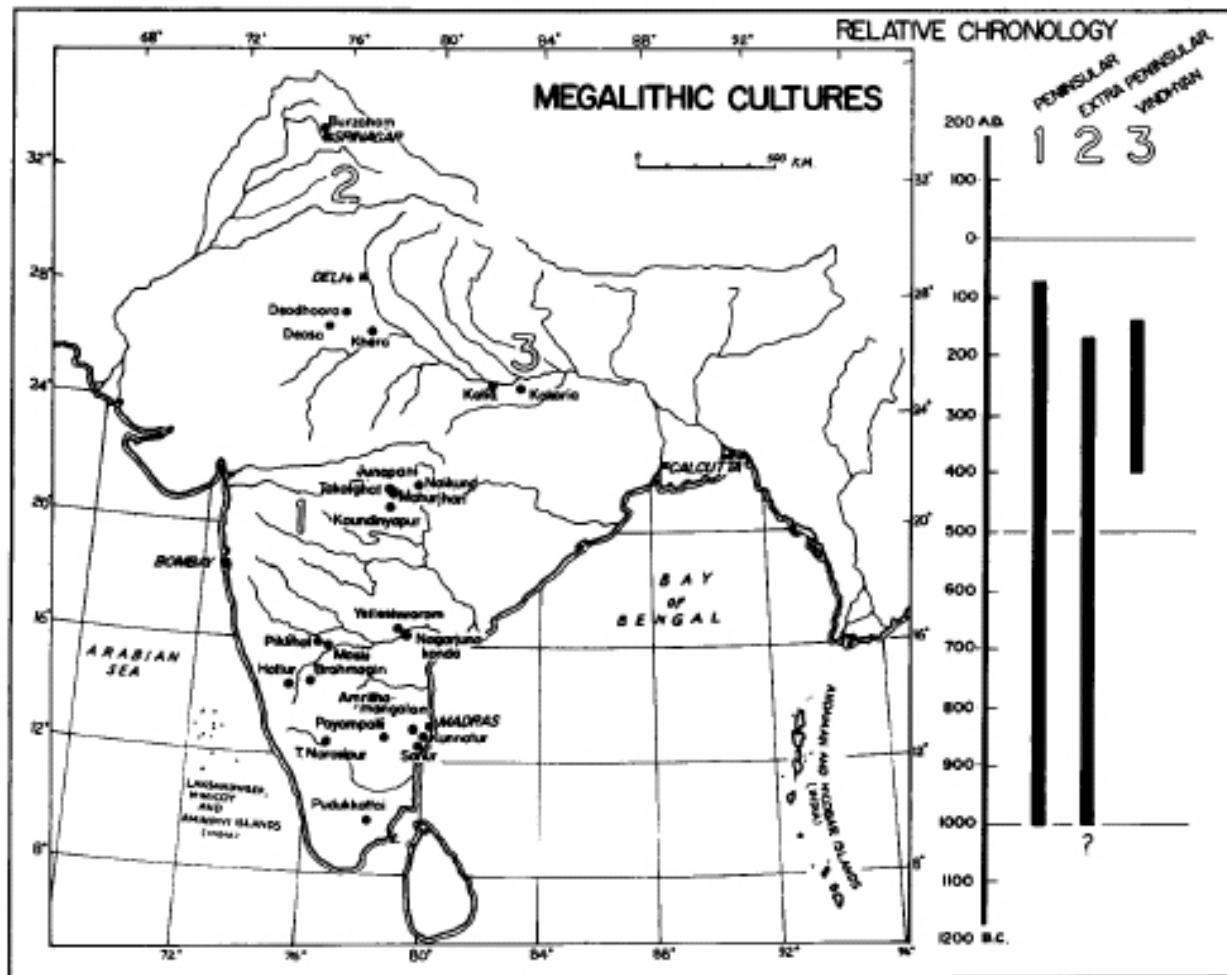
## Peninsular India

### The Iron Age

An event of greatest economic consequence was the arrival of iron in South Asia. Among the Iron Age cultures which fall within the first half of the first millennium BC, mention has already been made of those flourishing in Pakistan. From India, the Megalithic cultures and the Painted Grey Ware culture deserve our attention.

### Megalithic cultures (Map 16)

Peninsular India has long been known to contain a large number of megalithic structures (burials) of various types belonging to the early Iron Age. Often such burials are grouped in small clusters but occasionally they extend over quite large areas. They also include plain



MAP 16 Post-Indus civilization: Megalithic cultures.

burials such as urns deposited in pits without any significant lithic appendage. Despite structural or regional disparities, they share a common cultural equipment, indicating the widespread influence of a single technological tradition. Outside the peninsula, they have been reported from Baluchistan and Baluchi and Persian Makran Waghdor, Shah Billawal and Murud Memom, the last three within a radius of 32 km of Karachi and Asota, 27 km north-east of Mardan, all in Pakistan; and the Leh Valley of Ladakh, Burzahom and Gufkral, within a radius of 40 km of Srinagar; Deosa, 52 km from Jaipur; Khera, 6 km from Fatehpur Sikri; Deodhoora and Ladyuna in Almora; and the outcrops of the Vindhyas in Districts Allahabad, Banda, Mirzapur, Varanasi and Singhbhum. An interrelationship of the megalithic practices of these diverse regions has not so far been established, but speculative as it may be, it does stir the imagination (Lesknik, 1974). To this formidable list may be added the megalithic structures of north-east India, introduced by the Austroasiatic immigrants into this region, where they are known to be more or less a living tradition of

the aborigines and are mostly commemorative rather than sepulchral. A noteworthy feature of these megaliths is the paucity of habitation sites of a related culture.

As already stated above, the megalithic burials are densely concentrated in peninsular India, falling roughly between  $8^{\circ}$  and  $21^{\circ}$  N. While in some regions they are found near large tanks, in others they are located in dry areas where the rock bench is high and in yet others they were erected in the monsoon-fed laterite area. Apart from these topographical considerations, their distribution seems to have also been conditioned by the availability or access to resource material such as iron, gold and so on. For example, the concentration in Vidarbha and Hospet can be easily explained by the availability of iron ore. Similarly, the megaliths of Maski are close to the gold mines.

The subsistence economy which characterizes the megalithic culture of peninsular India is indicated by cereal grains and artefacts found at the excavated burials and habitation sites. The available evidence is admittedly slender but shows a pattern whereby rice seems to be the principal cereal crop of the southern region as against wheat and barley of the Vidarbha and northern Decca. Among the iron objects obtained from the various megalithic burials and related habitation sites, the number of agricultural tools such as sickles and hoes was rather small. Weapons such as daggers and swords far out number the agricultural equipment in the burials, but this may be due to their ritualistic significance. The presence of a horse skull with skeletal remains, horse-bits and stirrups among the miscellany of metal objects deposited in some of the megalithic burials, particularly of the Vidarbha region, would suggest that some of the megalithic people were horse nomads. At the same time the evidence of cultivated species (wheat, barley, lentil, common pea, rice, common bean, horse gram) obtained from excavated megalithic sites all over India suggests that the Megalithic people, at least some of them, were regular agriculturists and probably farmed in both summer and winter seasons, producing enough food for the rest of the community (Kajale, 1989).

As regards typology, it is proposed to exclude from discussion the living traditions among the aborigines of northeastern India, who erect menhirs or build dolmens or flat stone seats essentially as memorials. Ever since the first reported find of the megalithic burials in India, different names, derived from European analogues, have been given to these burials. It was only in 1949 that a scientific attempt was made by Krishnaswami to classify them, largely on surface indications. But this classification is again fraught with difficulties because of the variation between the surface indication and the plan actually revealed by the excavations. Thus what appears as a stone circle or a cairn circle on the surface may, on excavation, reveal a pit, a sarcophagus, or an urn. Again, a cist circle may have a cist with or without a porthole, contain a transept or a passage chamber. Broadly

speaking cairn circles are found in Vidarbha, while in lower Deccan and the rest of peninsular India there is a bewildering variety of such tombs: cairn circles, cist circles including the transepted variety and the passage chambers, pit circles, menhirs and alignments, urn burials, dolmenoid cists, hat stones or mushroom-shaped umbrella stones, hood stones and rock-cut underground caves with single or multiple chambers (catacomb tombs). Of these, the last three types were peculiar to Kerala, the passage-chamber tombs are mostly confined to northern Karnataka (Sundara, 1975) and the cists of the transepted variety to the Pudukkottai region in Tamil Nadu. In the extra-peninsular region are found cists, stone circles, cairns and menhirs.

Megaliths have a widespread distribution both in Europe and in Asia. The striking similarities in structural form, and the use of large stones, particularly for tombs, in disparate regions, may possibly argue for a common source at least of the concept. However, the associated cultural remains, including the age of the megalithic burials in Europe, India and East and South-East Asia, are different. The European megaliths belong to the Neolithic and Chalcolithic assemblages, falling between *c.* 5000 and 2000 BC, while those of India belong to the Iron Age, within the first millennium BC, and those of east and south Asia began essentially with the Bronze Age and continued till the beginning of the Iron Age, covering a period of *c.* eighth to third century BC.

The first diagnostic trait of the Megalithic culture of South India is a widely familiar dual-tone ceramic, known as the black-and-red ware, and plentiful use of iron. There are in addition four other associated ceramics, all-black ware, red ware, micaceous red ware, and the russet-coated white-painted ware. Among these, the micaceous ware, occasionally painted in black with linear designs, is mostly found in the megalithic burials of the Vidarbha region, while the russet-coated ware decorated with rectilinear or slightly curvilinear patterns in kaoline is known principally in the Coimbatore region with limited occurrence in other areas as well. The remaining two, the black-and-red ware and the all-black ware, are found throughout the peninsula. A related ceramic, however, is the black-and-red ware with white paintings associated with megalithic monuments in the southern parts of the peninsula in the Madurai and Tirunelveli Districts. On some pots graffiti, including potter's marks, occur. Various theories have been propounded about their meaning but their real purpose still eludes us. At the same time studies have shown that a large number of such symbols are common on the pottery of the Harappan, Chalcolithic and Megalithic cultures (B. B. Lal, 1962).

The other distinctive trait of this culture is the use of iron. The range of objects included swords, daggers, barbed and tanged arrowheads, lances, flanged spears, axes with cross bands, chisels, saucers, frying pans, lamps, nails, sickles, hoes and so on. One of the exca-

vated burials in Vidarbha (Mahurjhari) yielded a complete horse head made of copper sheet with iron-riveted knobs stitched over leather. Copper, bronze, gold and silver were also used for ornaments and other less essential objects. Among personal ornaments are beads of semi-precious stones, including the etched variety in carnelian.

It is a curious paradox that a people with such an advanced knowledge of sepulchral architecture should have left very little trace of their domestic architecture, which is reflected only by floors occasionally with postholes, which suggest modest timber constructions.

Of the extra-peninsular megaliths and those of the Vindhyan region, excavations at Burzahom and Gufkral have indicated the association of iron (without the distinctive black-and-red ware) with the menhirs, which were found to be non-sepulchral. Similarly, excavations of some of the megalithic tombs in District Allahabad have established the presence of iron. In the same Vindhyan region (Districts Mirzapur and Varanasi), however, iron was not recorded in the megalithic burials, which nevertheless show a typological likeness to those of District Allahabad and of the peninsula, being cists and cairns. On the other hand microliths and pottery, comparable with the Chalcolithic culture of central India (Mandal, 1972) have been obtained from this group. The excavated cist burials in District Almora have also established the presence of iron.

The megalithic builders have often been recognized as the primary speakers of the Dravidian language, based largely upon the concentration of their occurrence in the peninsula (Heimendorf, 1945), though some scholars postulate an Aryan origin for the south Indian megalithic (Parpola, 1973), basing their arguments on the horse-centred Early Iron Age graves of Caucasus and Luristan, including Necropolis B (*c.* 1000–800 BC) and those of south India, particularly the port-holed tombs (Leshnik, 1974). The cairn burials of Baluchistan seem to provide a link in this chain, thus suggesting an overland diffusion. At the same time other scholars hold, with Sundara, that ‘Indian megalithism was derived from the Mediterranean region via the coastal route’ (Sundara, 1975), or agree with Leshnik (1974) that the ancestry of Indian megaliths seems to lie in Persia, linked to Caucasian influence.

Studies of the human remains obtained from some of the excavated burials (Zuckerman, 1930; Sarkar, 1960, 1972; Gupta and Dutta, 1962), indicate besides an autochthonous Australoid type, a brachy-mesocephalic people, similar to the Scythio-Iranian stock as encountered in Necropolis B and in the deposits of period III of Tepe Hissar. It is postulated that the great migration of these Scythio-Iranians took place between 2000 and 1000 BC from the Ukraine region. Studies of the head forms from the different types of megaliths have shown on the other hand that the jar burial people, like the one at Adichanallur in the

extreme south, appear to possess head forms falling within the dolichocranial range verging towards the hyperdolichocephalic. The megalithic builders seem to be a hybrid population.

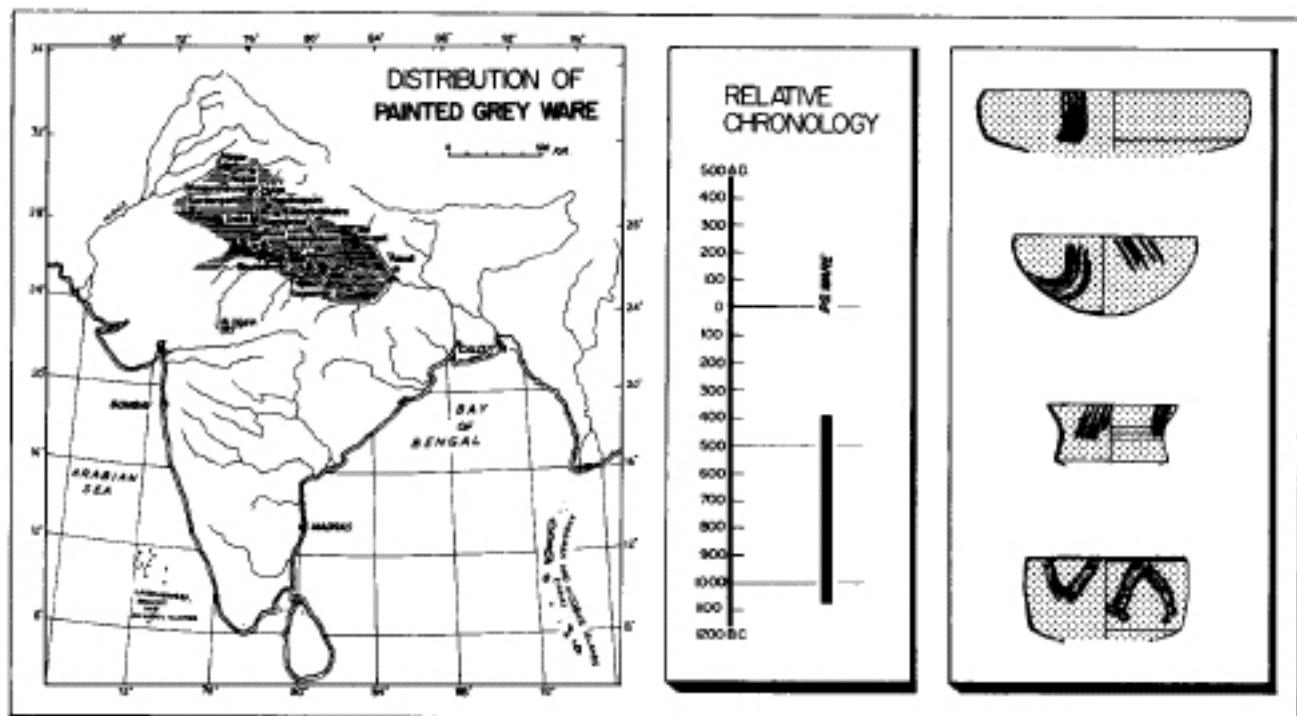
As regards chronology, the Megalithic culture of peninsular India overlaps in the initial stage with the Chalcolithic-Neolithic and in the terminal stage with the deposits ascribable to the beginning of the Christian era, yielding *inter alia* securely dated Roman denarii and rouletted ware. The overlap phase of the Neolithic-Megalithic culture has, at one of the excavated sites in Karnataka (Hallur), been dated, on the basis of  $^{14}\text{C}$  determinations, to c. 1000 BC, which is also supported by six thermoluminescence dates from another site in the same region (Komaranhalli) with a time-range of 1400–900 BC. The Megalithic culture in south India, therefore, endured for nearly a thousand years – the first millennium BC. Within this time-span, two main phases (1100–500 and 500–100 BC) have been postulated (McIntosh, 1985). For the Vindhyan megaliths,  $^{14}\text{C}$  determinations indicate a range 270 ± 150 BC. The menhirs of the Kashmir Valley (both at Burzahom and Gufkral) are also assignable to the first millennium BC, as they succeed the Neolithic occupation of the site.

During the last four decades or so, megalithic burials have been excavated in all parts of India, particularly in the south. Typologically, they consisted of cairn circles (some containing terracotta sarcophagi), burial urns, stone circles, kodaikal, pit circles and cist circles with portholes, passage-chamber tombs and menhirs (Thapar, 1985). Among these, the burials of south India invariably indicated the use of black-and-red ware besides other wares and iron. The associated human skeletal material in a few cases showed extended articulated skeletons, but generally consisted of secondary burials of more than one individual, bundled together in the same grave representing something like a family ossuary or vault. The presence of iron is attested in the stone circles excavated in the Allahabad District of the Vindhyan region, but not in the graves in the same region. In the extra-peninsular region iron was found in the associated deposits of the menhirs of Burzahom and Gufkral, which incidentally did not contain any sepulchral remains.

### The painted Grey Ware Culture (Map 17)

In north India, particularly in the Indo-Gangetic divide and the upper Gangetic basin, painted grey ware appears in the first half of the first millennium BC, when the use of iron was introduced. The present-day distribution of this ware covers the dried-up valley of Sarasvati, including the Bahawalpur area in Pakistan, Punjab, Haryana, western Uttar Pradesh and the adjoining areas of Rajasthan, corresponding to the areas occupied by the Kuru-Pancalas, Surasenas and Matsyas, mentioned in the later Vedic texts and the *Mahabharata* (Sharma, 1985) and as far south as Ujjain in Madhya Pradesh. The occurrence of some sites has also been reported from as far west as Lakhio Pir in Sind and Harappa in

southern Punjab, both in Pakistan (B. B. Lal, 1992). However, most interesting is the discovery of this ware at Thapli on the bank of Alaknanda in District Tehri, Uttar Pradesh, which takes the Painted Grey Ware culture right into the Himalayas. The sites of this culture are located along river banks. The distinctive features of the ware are the superior quality of the paste formed of well-levigated clay and the fine thin well-burnt fabric. On the grey surface of the body are painted linear and dotted patterns in black. Instances of red-on-grey and black-on-black and bichrome painted designs are also attested. The types represented are straight-sided bowls, cups and dishes with incurved sides and saggars bases and occasionally smaller vases. Amongst unusual shapes, special mention may be made of corrugated stems from Hastinapura and Atranjikheda which may have formed part of a dish-on-stand, and a strap handle from Sardargarh. The distribution of the painted grey ware as well as its stratigraphical position in the cultural history of India has given it considerable significance, being one of the dominant ceramic industries of the interregnum following the end of the Indus civilization. Notwithstanding its standardized table-ware character, no urban connotation is discernible in the material culture associated with it. In this context it is important to note that the ware formed 10 to 15 per cent of the ceramic assemblage of any excavated site. The majority of the associated ceramic was of red ware. The material equipment of the people using this ware was none too rich. The houses were



MAP 17 Post-Indus civilization: distribution of Painted Grey Ware.

generally made of adobe in the wattle-and-daub technique. But sometimes mudbricks have also been reported, but not their size. At Bhagwanpura a house plan has been identified with as many as thirteen rooms. The use of kiln-burnt bricks is also attested at a few sites, the recovered pieces being too fragmentary to indicate the complete size. The impact of iron does not appear to have brought any catalytic change in the economy of the people nor contributed substantially to the specialization of handicrafts. Most of the iron artefacts found from the Painted Grey Ware levels comprise arrowheads, spearheads, sickles, supplemented by nails, pins, hooks, knives, chisels and so on. The social and economic pattern remained rural. It is reasonable to argue, therefore, that though the use of iron may have started around 1000 BC, its industrial use came only around the seventh-sixth century BC leading to urbanization in northern India. Although iron had come into use during the Painted Grey Ware period, copper was still an indispensable material.

The credit for bringing the upper Ganga-Jamuna Valley under large-scale cultivation goes to the Painted Grey Ware people. The subsistence economy was based on agriculture and cattle breeding. Rice seems to have been one of the staple cereals, although evidence of wheat and barley has also been attested, which would indicate that people had begun to grow two crops a year. The horse was known to them, from which one might infer the use of chariots. For their subsistence they depended on domesticated animals such as cattle, buffalo, pig, goat and dog. Besides the introduction of iron, the Painted Grey Ware people were also responsible for bringing in glass technology, as attested by the occurrence of glass bangles and beads. Other associated finds of this period consisted of bone objects, terracotta human and animal figurines and dice and gamesmen.

As to the date of this ware, <sup>14</sup>C determinations from different levels of occupation are available from eleven sites, and range between 1025 and 350 BC. On a closer analysis of these determinations, discounting the untenable ones, it is observed that most of them are concentrated between 900 and 400 BC. Notwithstanding this, the excavator of Hastinapura has assigned the beginning of this ware to c. 1100 BC (B. B. Lal, 1955) and that of Atranjikhera (Gaur, 1983b) to c. 1200 BC. Accordingly the Painted Grey Ware levels in the iron-using sites of the upper Ganga-Jamuna basin may broadly be dated between 1100 and 700 BC. The ware has recently been found to overlap with an amalgam of the late Harappan phase on some sites in Haryana and Punjab (such as Bhagwanpura, Dadheri and Sanghol) in non-iron contexts, which may perhaps support the early dates proposed above whereby the pre-iron phase, which has yet to be firmly established, may well antedate 1100 BC (B. B. Lal, 1992).

Primarily on the basis of its distribution in the area coterminous with the land of Brahmapurta or Brahmarshi-desa, held holy in Aryan literature, postulations have been made

linking the ware with the coming of the Aryans (B. B. Lal, 1955) into India. To which wave of the movement of the Indo-Aryans the painted grey ware belongs still requires to be established. In this context the date of the pottery is important. The material equipment which included the painted grey ware, particularly the iron phase, is comparable on many counts to the material culture of the later Vedic texts (Brahmanic-cum-Upanishadic period), which included the beginnings of territorial state formation, the advent of social stratification, the emergence of administrative machinery and so on. There seems to be an overall concordance between the later Vedic-cum-early Brahmanic period on the one hand and the upper Ganga-Jamuna Valley stage of the Painted Grey Ware culture on the other (B. B. Lal, 1992). The Rigvedic people were mostly pastoral and did not know the use of either iron or glass as opposed to the Painted Grey Ware people who used both and were a fully-fledged agrarian society. Furthermore, the painted grey ware had a distinct influence on the later ceramic industries of northern India, such as the northern black polished ware, and more importantly perhaps brought northern India to the threshold of what is known as the second urbanization.

Seen in the present context painted grey ware seems to be unconnected with the relics of any previous culture known in India. It is reasonable to argue that its authors did not spring out of Indian soil. As regards its links further west, the painted grey ware can be compared with the assemblage of the Gandhāra Grave culture of the Swat Valley in Pakistan, which indicated two waves of movement of the people using the grey ware, the first being associated with copper and bronze, and the second with iron. No specific resemblances have, however, been noticed in the shapes represented in the two respective wares: the distinctive type of the Gandhāran Grave culture is the tall pedestalled vase while that of the painted grey ware is the dish or thali, although flat-bottomed vases occurred during the period of the second wave of people, who used fractional burials.

Comparing the two assemblages, that is the painted grey ware of the Ganga-Yamuna *doab* and that of the Gandhāra Grave culture of the Swat Valley, Dani (1967) postulated that it might not be improper to seek the origin of the former in the development of the grey ware of the Gandhāra Grave culture in the as yet unexplored intervening plains between the Indus and the Beas. According to him, ‘a definite answer to this question will be provided only when our investigations are extended into Punjab, east of the River Indus’ (Dani, 1967, p. 55).

In this context it is worthwhile to record the up-to-date evidence. On the Indian side, the occurrence of this ware has been traced up to Gharinda in Punjab near the Indo-Pakistan border. Persistent explorations in the Pakistani part of Punjab, east of the River Indus, have now resulted in the discovery of sites at Dhok Gangal and Dheri Qila near Chaklala

airport, adjacent to the Islamabad highway, ‘yielding grey ware associated with red ware with impressed designs which can be related with the Painted Grey Ware of the Hakra River in Punjab’ (Salim, 1992, pp. 37, 4.8). At the present stage the evidence seems to be indicative rather than proven since the classical painted grey ware with characteristic paintings has still not been found. Since, however, the above-mentioned sites lie in the area of spread of the Gandhara Grave culture, what is needed is a more intensive survey followed by excavation to establish the correlation between the two cultures.

## LITERARY EVIDENCE

Another valuable source which can be profitably tapped for information regarding the post-Harappan period is ancient Indian literature. This literature was composed by a people who called themselves ‘Arya’ (noble) as opposed to the local *dasa* or *dasyu* (slave) and passed it on for many centuries in an oral form. It goes back to the oldest surviving text, the *samhita* or compilation of the hymns of the *Rigveda*. A reasonable estimate of the antiquity of many of the individual hymns is that they extended over several previous centuries. The *samhitas* of the other Vedas, the *Yajur*, *Soma* and *Atharva*, and the subsequent literature generally classified as late Vedic may be taken to belong to the subsequent seven centuries or so. Thus there are well over a thousand years for which there is textual evidence, though of a limited sort.

The *Rigveda* is a curious document. In length it is approximately equal to the *Iliad* and *Odyssey* together, and consists of over a thousand poems or ‘hymns’. These vary from more or less epic chants, hymns of praise and prayers to the gods, to magic spells and fragments of popular songs, all of varying standards – ‘sometimes true, genuine and even sublime, but frequently childish, vulgar and obscure’, as Max Müller remarks (quoted: Piggott, 1950, pp. 256–7; cf. Müller, 1956, p. 26). The language is elaborate and self-consciously literary and the metrical composition, based on syllabic verse forms, is often extremely complicated. By far the greater part of the *Rigveda* consists of invocations of the many gods of the Vedic pantheon and scarcely more than forty hymns are found which are not directly addressed to these deities. From these materials, it is obvious that conclusions can be drawn only with much caution.

Although it is difficult to arrive at any definite conclusion regarding the original home of these ‘Aryas’, generally referred to as Indo- Aryans, we are in a somewhat better position in respect of their early settlements in northern India and Pakistan and their gradual expansion over the whole of this area. For this the evidence of the Vedic literature comes to our aid. Fortunately, the *Rigveda* contains abundant geographical data which can be tied up here and there with current geographical names. Rivers, for instance, have all along played an important part in the lives of the Hindus, and even in the *Rigvedic* age they were esteemed as deities, presumably on account of the immense benefits they conferred on humanity. Out of the thirty-one rivers mentioned in the Vedic texts, about twenty-five names occur in the hymns of the *Rigveda* alone. In the celebrated *Nadistuti* the *Rigveda* enumerates several streams most of which belong to the Indus system.

Of the five streams, that is the Sutudri, Vipas, Parushni, Asikni and Vitasta, which gave Punjab its name and united together flowed into the Indus, the *Nadistuti* omits the Vipas

and inserts the Marudvridha. The Sutudri is the most easterly river of the Punjab, identified with the modern Sutlej. Parushni, the modern Ravi, was an important stream which played a decisive part in the *Dasarajña* (battle of ten kings), by rising and drowning the enemies of Sudas. Asikni, known later as the Chandrabhaga, is the modern Chenab in the Punjab. Finally comes Vitasta, the most westerly of these rivers, known today as the Jhelum. Of the western tributaries of the Indus, the *Rigveda* mentions the Kubha (Kabul), Krumu (Kurrum), Gomati (Gomal), Suvastu (Swat) and Gauri (Panjkhora). The word *suvastu* signifying ‘fair dwellings’ seems to indicate that there were Aryan settlements along its banks. The River Rasa has been identified with the Jaxartes, a stream in the extreme north-west of the Vedic territory. Outside the Indus basin are mentioned the Rivers Ganga, Yamuna and Sarasvati. The Ganga does not appear to be a well-known or even important stream in the period of the *Rigveda*. The Yamuna was mentioned only thrice but the Sarasvati is the river *par excellence*, frequently mentioned in the Vedic texts. As the names of the rivers in the *Rigveda* show, the Vedic people knew the whole of the Punjab and occupied the best part of it. It was probably there that most of the Vedic hymns were composed.

The whole territory known to Vedic settlers was divided into a number of tribal principalities ruled by kings. The one great historical event which reveals itself in the fragmentary allusions of the *Samhitas* is the contest known as ‘the battle of the ten kings’, referred to above. The most probable version of that conflict is that it was a contest between the Bharatas, settled in the country later known as Brahmavarta, and the tribes of the north-west. The Bharata king was Sudas, of the Tritsu family, and his domestic priest, who celebrates according to tradition the victory in three hymns, was Vasishtha. The sage had superseded in that high office his predecessor Visvamitra under whose guidance the Bharatas had earlier fought successfully against their enemies on the Vipas and Sutudri – whereupon a long and bitter rivalry ensued between the two priests, and in revenge Visvamitra led a tribal confederacy of ten kings against the Bharatas, only to meet with utter disaster in the waters of the Parushni.

Of the ten tribes five are of little note. These were the Alinas, perhaps from the north-east of Kafiristan, the Pakthas, whose name recalls the modern Pakhtun, the Bhalanas, possibly connected with Bolan Pass, the Sivas from near the Indus and the Vishanins. Better known in the *Rigveda* are the other five, the Anus who dwelt on the Parushni, the Druhyas who were closely associated with them, the Turvasa and Yadus, two allied tribes, and the Purus, dwellers on either side of the Sarasvati, and therefore probably close neighbours of the Bharatas. As a result of the battle the Anu and Druhya kings were drowned and Purukutsa of the Purus met his death. There was another war that Sudas had to fight in

which three non-Aryan tribes, the Ajas, Sigrus and Yakshus, united under King Bheda but suffered defeat with great slaughter on the Yamuna.

The king was pre-eminently the war lord and the *Rigveda* gives some idea of the mode of warfare. The king and his nobles fought from chariots, and the common people on foot. As in later days, we hear of martial music and banners in connection with battle. The principal weapon was the bow and arrow. The arrows were tipped with points of metal or poisoned horn. Other weapons were lances, spears, axes, swords and sling stones. The king was assisted by two assemblies called *sabha* and *samita*. Great importance was attached not only to concord between the king and the Assembly but also to a spirit of harmony among the members of the Assembly. A hymn of the *Rigveda* invokes such a unity: ‘Assemble, speak together, let your minds, be all of one Accord.’

The royal authority was to some extent curbed by the power and prestige of the priest (*Purohita*) who accompanied the king to battle and helped him with prayers and spells. The Aryans did not have an advanced economic system and relied for their unit of value and means of barter on the unwieldy cow. The *nishka*, a term later used for a gold coin, is also mentioned as a sort of currency, but at that time it was probably a gold ornament of some kind. There is no evidence of a regular class of merchants or money-lenders, though indebtedness is sometimes referred to.

The immigrant Aryans had to wage bitter and prolonged fights with the indigenous people. But there was no attempt at the extermination of the conquered foes. Theft, burglary, highway robbery and cheating (chiefly at gambling) are among the crimes recorded, cattle lifting at night being a frequent one. Marriage of brother and sister was looked upon as incest. Tying the criminal to a stake was a common form of punishment. The Aryans were in fact a wild, turbulent people and had few of the taboos of later India. They were much addicted to inebriating drinks of which they had at least two, *soma* and *sura*. *Soma* was drunk at sacrifices and its use was sanctioned by religion. *Sura* was purely secular, and was evidently very potent: in some passages it is mentioned with disapproval by the priestly poets.

Among their chief gods was Dyaus, a personification of the sky and identical with the Greek Zeus. Varuna is the upholder of the physical and moral order symbolized in nature (*rita*). He is also called the *Asura*. This aspect of Varuna goes back at least to the Indo-Iranian period since Ahura Mazdah (the wise spirit of the *Avesta*) agrees with Asura-Varuna in character. Surya is the most concrete of the solar deities. As the all-seeing god, he is often called the eyes of Mitra, Varuna, Agni and other gods. The dawn produces Surya and he is said to be the son of the goddess Aditi and Dyaus. Savitra is pre-eminently a golden deity. His eyes, arms, hands and tongue are golden. Pushan is a god with a very vague personality.

The greatest god of the *Rigveda* is Indra to whom about one quarter of the hymns are addressed. He is the apotheosis of the Aryan battle leader, strong-armed, colossal, tawny-bearded and pot-bellied from drinking. He wields the thunderbolt and fights like a hero with bow and arrows from his chariot. He is a cattle raider, a destroyer of enemy strongholds and a victorious leader of the Aryans in their conquest of the hated aboriginal population of the Punjab. With him fight the young warrior bands, the Maruts, who seem to be commanded by Rudra, rival to India and yet in some ways his counterpart.

The despicable enemies who dare deny Indra's supremacy are referred to as *dasa* or *dasyu*. They have a black complexion, flat noses and they are indifferent to the gods. They do not perform the Aryan sacrifices and probably worship the phallus. But they are wealthy with great stores of gold and live in fortified strongholds. One such stronghold is Hariyupiya, identified with modern Harappa.

As in all simple pastoral societies, the Aryan vocabulary is rich in names for every aspect of the herds of cattle. Milk evidently formed an important item of diet. The cows were milked three times a day and castration was practised. Beef was freely eaten as the main meal dish; slaying cows for guests was an attribute of highest praise and Indra was champion beef eater. Mutton and goat flesh were also eaten. Leather was used for many purposes such as strings, bow-strings, chariot traces, reins and whips. The grain grown seems likely to have been barley. The ripe ears of barley were cut with a knife or sickle, bound into sheaves, strewn on a threshing floor, and eventually winnowed or sifted to separate the grain from the chaff.

Some form of container or measure was used for which the word *urdara* is used. Fields were tilled by an ox-drawn plough, though the yoke is nowhere mentioned in the *Rigveda* in this connection. Dogs were used for guarding houses and for boar hunting. The horse was the characteristic domesticated animal of the Aryans. The Aryan horses seem to have been used essentially as chariot animals, whether in warfare or for chariot racing, which was a favourite sport.

Practically nothing can be gleaned from the *Rigveda* about the appearance or layout of an Aryan settlement or of the houses, mainly because such mundane affairs did not lend themselves to metaphors in hymns to the war-gods. All the Aryan buildings, however, appear to have been of wood, and the house seems to have been rectangular, with a thatched roof, divided into more than one room or compartment. The central hearth in an Aryan house had a position of special importance, and was the focus of the household religious rite. Little again can be gathered of clothing, except that it was mainly of woollen cloth. Clothes that were either embroidered or woven in ornamental patterns were worn by women, and a cloak or mantle was worn probably by both sexes. Specialized crafts within

the community include that of the metalsmith and the carpenter working with an axe or adze and making fine carved woodwork for chariots. No direct mention of a potter occurs. Bronze seems to have been the only metal worked; it follows that copper must also have been used. Household utensils such as kettles were made of metal (*ayas*). What metal the *ayas* was is uncertain, though the word is cognate with the German *eisen* and the English *iron* and is also akin to the Latin *aes* meaning bronze. Its colour is to be inferred from the epithets used, such as reddish, which seems to be a reference to bronze.

It is unfortunate that no written records have come to light from excavations to supply names for different cultural materials. Nor is there anything in the Vedic literature to show that the Indo-Aryan peoples possessed a specific material culture, special pottery, or particular figurines or objects, which being discovered in the field would enable us to establish some kind of identification marks for their migration. As for the sacrificial rites that are the very subject of these ancient texts, they do not imply the building of special monuments, which would be useful as a landmark for archaeologists. And yet there is enough in the *Rigveda* to show that no relationship existed between the mature Harappan cultural milieu and the habitation pattern of the Aryans as described in it. The *Rigveda*, for instance, attests that the horse was a favourite animal of the Aryans, but this is precisely the animal which has not been reported from the mature Harappan levels. In the Late or post-Harappan contexts, however, the horse is abundantly evidenced and this seems to be the period which roughly marks the advent of the Aryans in the Indus basin. It follows therefore that many of the mature Harappan cultural traits, such as town planning and writing, had already been forgotten before the Aryans made the Indus basin their permanent home. Being a pastoral people they were not in need of them, hence they never tried to revive them.