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### Chapter

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# 1.25 THE INDUS CIVILISATION

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## Introduction

The study of the Indus civilisation – or more broadly defined, the Indus Tradition – has seen major advances in the past decade that challenge many earlier interpretations and provide new insight into the organisation and character of this urban culture (Map 1.25.1). New surveys in areas that were once poorly studied have revealed the presence of numerous settlements prior to the rise of cities, as well as new towns and villages that supported the major cities themselves. Excavations at the major cities, as well as at smaller settlements, have revealed new aspects of settlement and subsistence patterns; technological development; and aspects of socioeconomic, political and ideological organisation. The most frustrating challenge is the continued lack of bilingual texts that would help in deciphering the Indus script. However, some new discoveries in the study of the Indus writing system provide clues about its development over time and the patterns of sign use on specific types of objects. The decline, transformation and legacy of this urban civilisation are also aspects that have received considerable attention, with hotly debated topics that link it to later cultures in historical South Asia. The following chapter presents a general overview of the current state of research on the Indus Tradition along with some of the most significant new discoveries and questions that still need to be answered.

## History of Research and Current Challenges

The Indus civilisation was first discovered in the 1920s as regional surveys and excavations were being carried out by the Archaeological Survey of India (Lahiri 2005). Sites such as Harappa had been reported by earlier Western travellers, but it was not until preliminary excavations had been undertaken at both Harappa and Mohenjo-daro that the importance of the unique inscribed seals, painted pottery and figurines could be attributed to a newly discovered civilisation (Marshall 1924, 1931). Because of the fact that the first excavations took place

at Harappa, it was considered the type-site for this culture and led to the commonly used terms “Harappa Culture” and “Harappan Civilisation”. The label “Mature Harappan” is generally used for the main period of urban expansion, but most of the diagnostic features associated with this term are only found at the end of the Harappan Phase, which is dated to around 2200 to 1900 BCE at Harappa (Period 3C; see Table 1.25.1) (Meadow & Kenoyer 2005). Sir John Marshall was the first to use the term “Indus Culture” and “Indus Civilisation”, and repeatedly emphasised that the religion and culture were uniquely Indian, while the population itself was probably heterogeneous (Marshall 1931: 102ff). More recently, some scholars have come to use the term “Indus-Saraswati Civilisation” (also Sindh-Saraswati), or simply “Saraswati Civilisation”, because of the large numbers of sites that are located along the now-dry bed of this river system (Gupta 1996).

Prior to 1947 all of the discoveries of Indus sites were found in the regions controlled by the British India government, but most were located in what was to become Pakistan. After the independence of India and Pakistan, intensive surveys led to the discovery and excavation of many new sites in the northern and western territories of India, and surveys on the Pakistan side of the border revealed a large number of sites in western Punjab, Sindh and Balochistan. Each year, new sites are being discovered along the tributaries of the Indus, and many more sites are probably buried beneath the massive floodplains and later towns.

Surveys both before and after 1947 identified hundreds of settlements along the now-dry banks of an ancient river referred to with various names, such as the Saraswati-Ghaggar-Hakra-Nara (Stein 1942; Bhan 1973; Mughal 1997; Chakrabarti & Saini 2009; Kumar 2009). The reason for this high concentration of sites is primarily due to the fact that this area was gradually depopulated between 1900 and 1300 BCE as the river dried up and the abandoned sites were not covered by later silting or extensive urban development. This dried river system runs between India and Pakistan and, due to the sensitivity of the border area, many sites remain to be discovered and excavated. Another region that could potentially reveal additional Indus sites is along the borders of Afghanistan and Pakistan. At present, only one Indus site has been reported in Afghanistan, but there may be others in the border regions, since many minerals and other resources were coming to the Indus from the



MAP 1.25.1. Major cultural traditions of South Asia.

northwest (Law 2008). Indus-related materials, probably carried by traders, have also been found at several settlements in Oman, the United Arab Emirates, Iran and Iraq (Potts 1990; Tosi 2001).

There are now as many as twenty-six hundred sites that span the pre-urban, urban and late-urban phases of the Indus civilisation, with many more being discovered each year (Possehl 2002a). Unfortunately, it is not possible to estimate the total number of sites for different chronological phases since many of the earlier phases are deeply buried beneath later occupations, and many regions remain to be explored. Various attempts to model the available settlement distribution data (Gangal, Vahia & Adhikari 2010) need to be critically evaluated with this point in mind, since many regions are inadequately

surveyed, and the available data represent only a small percentage of potential sites.

One of the major challenges to the study of the Indus Tradition is the rapid destruction of sites by agricultural, industrial and urban development projects. Most sites have simply been removed to make way for fields or building projects, and although proposals for regional salvage archaeological projects have been made (Garge 2005), the increasingly rapid loss of sites is very disheartening.

Another challenge that is being mitigated through the Internet and international conferences is the opportunity for Indian, Pakistani and foreign scholars to share new information and data on recent excavations and surveys. The archaeology of South Asia continues to contribute to the global

TABLE 1.25.1. Chronology of the Indus Tradition.

<b>Foraging Era</b> Mesolithic and Microlithic	10,000 to 2000 BCE
<b>Early Food Producing Era</b> Mehrgarh Phase	7000 to 5500 BCE
<b>Regionalisation Era</b> Early Harappan Phases Ravi, Hakra, Sheri Khan Tarakai, Balakot, Amri, Kot Diji, Sothi, etc.	5500 to 2600 BCE
<b>Integration Era</b> Harappan Phase – general dates Harappa – Period 3A – 2600–2450 BCE Harappa – Period 3B – 2450–2200 BCE Harappa – Period 3C – 2200–1900 BCE	2600 to 1900 BCE
<b>Localisation Era</b> Late Harappan Phases Punjab, Jhukar, Rangpur, Bara, etc.	1900 to 1300 BCE

knowledge of human origins and cultural diversity as well as to archaeological methodology and theory through a wide variety of research projects, some of which are presented in this chapter.

## Chronology and Interpretative Models

When this civilisation was first announced by Sir John Marshall (1924), he compared it to the early civilisations of Egypt and Mesopotamia, and some scholars continue to evaluate the Indus in the light of these contemporaneous cultures. However, Marshall and many Indian scholars were convinced that the Indus civilisation was the result of autochthonous processes, with relatively little influence from the West (Marshall 1931; Vats 1940). During the later colonial and postcolonial period, Sir Mortimer Wheeler and several other scholars suggested that the origin of the Indus civilisation was the result of influence, direct or indirect, from urban societies in Mesopotamia or Iran to the west (Wheeler 1968; Fairervis 1975). Now, after considerable investigation, most scholars view each of the major civilisations as the result of indigenous processes, but it is also clear that they did not emerge in isolation, and that people, ideas and technologies were moving back and forth between them. More complex models for interpreting the origins and transformations of these early urban societies incorporate various theoretical approaches that include human ecology, systems theory, practice theory and various other perspectives (Boivin & Fuller 2002; Fuller & Boivin 2002; Paddayya 2002; Kenoyer & Meadow 2004).

The overall chronology of the Indus civilisation is based on a combination of both radiometric and relative dating using pottery and other diagnostic artifacts (Table 1.25.1). The framework for this chronology is determined to a great extent by the

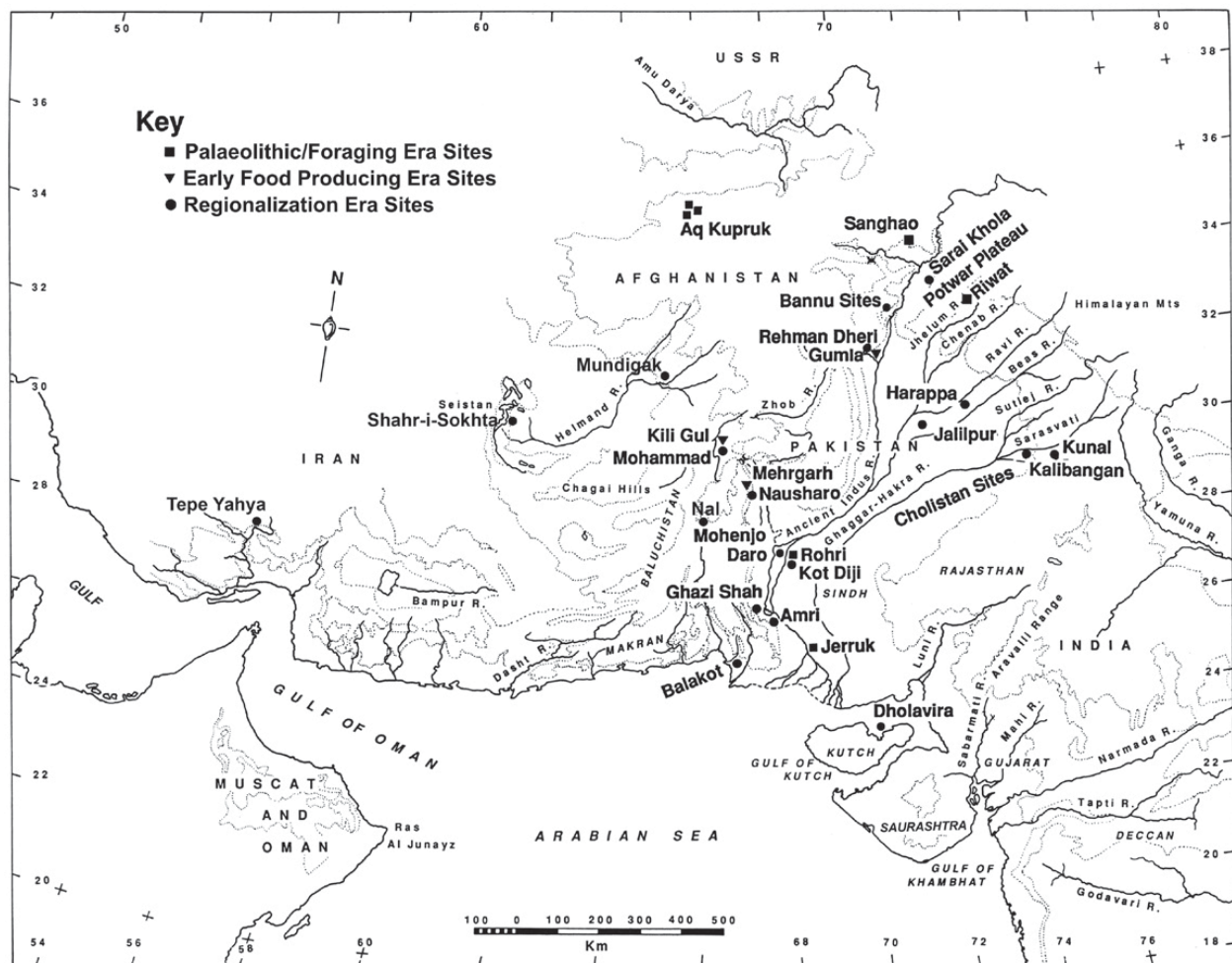
interpretative models used to organise the different types of data recovered from archaeological sites and the ethnohistorical or historical record. Various chronological frameworks for the Indus civilisation have been proposed since its discovery (Sankalia 1974; Fairervis 1975; Allchin & Allchin 1982; Mughal 1989; Shaffer 1992; Possehl 1999, 2002b), but for the purposes of this chapter I use a framework informed by the concept of “Cultural Tradition” to encompass the long-term cultural and technological developments in the vast area of the greater Indus Valley region (Shaffer 1992: 442). In the Indus Tradition (sometimes referred to as the Indus Valley Tradition), we see the emergence of distinctive features of site organisation, subsistence strategies, essential technologies and ideological expressions that are linked chronologically and geographically (Kenoyer 1991, 2006). Several major traditions can be identified for the northwestern subcontinent, including the Indus, Balochistan, Helmand and Bactro-Margiana. Additional Traditions in peninsular India include the Malwa, Ganga-Vindhya and Deccan (Kenoyer 2006; Map 1.25.1).

Each Tradition can be subdivided into Eras that are associated with larger structural patterns relating to subsistence, technology and socioeconomic organisation. The Era is not an evolutionary stage, and more than one Era can coexist within a tradition (*e.g.*, Foraging and Integration at the same time) or never appear at all. For example, there is no Integration Era in the Balochistan Tradition (Shaffer 1992). Each Era can be subdivided into Phases that are defined by patterns of materials such as ceramics, architecture and various other types of artifacts that are limited to a region and to a specific time period. Most important are the networks of exchange that link communities in different regions and provide avenues of communication and dispersal of knowledge, as well as genes.

While the main focus of this chapter is on the phases directly linked to urbanism, it is important to acknowledge the long-term cultural and genetic roots that derive from much earlier periods dating back to the Palaeolithic (> 10,000 BCE) (Dennell 2009). Hunting-foraging communities continued to coexist alongside later settled communities and probably contributed a wide range of technologies, forest products and labor to urban economies (Possehl 2002c). Trading networks that arose during the Early Food Producing and Regionalisation Eras may have developed along earlier seasonal migration routes. The Early Food Producing Era (c. 7000–5500 BCE) also set the foundation for settled agro-pastoral communities to spread throughout the piedmont and alluvial plains (see Chapter 1.24).

## Geographical and Environmental Setting

The greater Indus Valley (Mughal 1989) refers to a vast area drained by the various tributaries of the Indus River and the Saraswati-Ghaggar-Hakra-Nara River (Map 1.25.2). This rich alluvial plain is bordered by the Kirthar and Suleiman



MAP 1.25.2. Indus Tradition: Regionalisation Era sites.

mountains of Balochistan on the west, the Hindu-Kush and Karakorum to the northwest, the Pamir and the Himalaya to the north and east, and the Thar Desert and the Aravalli Mountains to the east. Farther to the south and east lie the island of Kutch, the peninsula of Saurashtra and the mainland of Gujarat. All of these adjacent regions had an important role in providing minerals, timber, agro-pastoral areas and other resources to the Indus cities. The deltas of the two major rivers allowed marine and riverine trade networks to connect the inland settlements to coastal towns and villages that were spread along the Makran, Kutch and Saurashtra coasts. Marine trade across the Arabian Sea linked the Indus settlements to communities farther to the west, along the coasts of modern Oman and the Persian Gulf.

Two major weather systems had an impact on the environment in this large area, providing precipitation and seasonal flooding to support at least two major crop cycles in the winter and summer months (Kenoyer 1998). The winter cyclonic system produces snowfall in Balochistan and rainfall in the northern and western parts of the Indus Valley. The summer monsoon brings heavy rainfall to the northern Indus Plain, with rain and snow in the high mountains in the north. The summer monsoon and sometimes even the winter

rains provide scattered and irregular rainfall in both Gujarat and Sindh. The most important aspect of these two systems is that they overlap and provide supplementary rainfall that is usually sufficient to sustain widespread agro-pastoral subsistence systems.

Although there is evidence for global fluctuation in climate and specifically the monsoon winds that may have impacted the northwestern subcontinent during the Holocene (Bryson & Bryson 2000), it is not clear whether these climatic fluctuations can be causally linked to the rise or decline of urbanism in the greater Indus region (Kenoyer 1998; Possehl 2002b). However, research on archaeobotany, palaeoecology and palaeogeography in various parts of the region does indicate that local patterns of change may have been the result of localised climate fluctuations and/or changing riverflow patterns, in combination with humanly induced landscape modification, erosion or soil degradation (Madella & Fuller 2006). Recent studies along the Beas and Ravi rivers near Harappa suggest that "... during the Middle Holocene – or Mature/Urban Harappan – there was a transition from strong seasonal rainfall to a more uniform moisture distribution" (Wright, Bryson & Schuldenrein 2008: 45) that would have contributed to a more stable agro-pastoral system during the



urban phase in the Punjab. These types of studies suggest that "... shifting agricultural strategies at a local level, which may have been encouraged by climatic change or instability, probably contributed to the emergence of Harappan urbanism at ca 2600 BC, and again to de-urbanisation starting in the period 2200–2000 ca. BC" (Madella & Fuller 2006: 1298). Additional studies are needed in surrounding regions to determine the extent of this stable weather system, and also to better document the possible decline in monsoon rainfall and annual flooding that has been proposed for around 2100 to 1500 BCE towards the end of the Harappan and Late Harappan phases (Wright, Bryson & Schuldenrein 2008: 42). Due to the vast geographic distribution of Indus settlements, it is unlikely that short-term climate change in one region would have had an impact on the entire Indus region. Settlements in varied ecosystems would have survived by developing very different adaptive strategies during the initial phases, leading up to urbanism and the final transformations at the end of the urban phase.

## Regionalisation Era: Origins of Indus Urbanism

The establishment of settled agricultural and pastoral communities in the greater Indus region, including the Saraswati-Ghaggar-Hakra region, Kutch and Gujarat, appears to have been a regionally varied process beginning around 5500 BCE, if not earlier. The most commonly accepted term for this period is Early Harappan (Mughal 1989), though some scholars continue to use Pre-Harappan or other site-specific names. Evidence for settled agro-pastoral communities has been found throughout Balochistan, the broad alluvial plains (Punjab, Haryana and Sindh), along the desert margins of the Thar, in Kutch, northern Gujarat and parts of Rajasthan (Map 1.25.2). Most of these communities developed a subsistence base consisting of winter-spring crops, such as wheat, barley, peas, lentils, grass pea and linseed (Madella & Fuller 2006), though some summer-autumn crops, such as beans (*Vigna* spp.) and various millets (possibly *Panicum* and *Setaria*), were also present (Kajale 1996; Fuller 2003; Weber 2003). The major domesticated animals were sheep, goat and cattle (both humped *Bos indicus* and nonhumped *Bos taurus*), but a wide range of wild animals were also being hunted, including the wild water buffalo that eventually may have been domesticated during this phase or in the subsequent Harappan Phase (Patel & Meadow 1998; Meadow & Patel 2003). Riverine, lacustrine and marine resources were also an important part of some Early Harappan subsistence systems, and seashells and other marine products were traded far inland (Kenoyer 1995; Belcher 1998).

Various names have been given to regional pottery traditions and other associated material culture from the Early Harappan Phase, such as Hakra, Ravi, Sothi, Kot Diji, Amri, Anarta, Padri

and so on (Shaffer 1992; Possehl 1999; Ajithprasad 2002). These regionally distinct ceramics include hand-formed and eventually wheel-made pottery with plain slips, black or brown painted bands and some polychrome decorations using white, red and black/brown pigments. Some of the regional forms and decorated motifs used during the Early Harappan continued on into the Harappan Phase in their respective regions. In contrast, specific types of cooking pots, bowls and globular jars, as well as black-on-red-slip painted motifs, such as intersecting circles, buffalo horned figures and fish-scale motifs, etc., became more widespread throughout the greater Indus region. By the end of the Early Harappan, shared pottery styles and motifs became the dominant forms throughout the greater Indus region and have been used as one of the key diagnostic features of the Harappan Period.

Similar patterns of regional and eventually panregional use can be tracked in most aspects of technology, architecture and settlement organisation. At most sites, chipped stone tools were initially made from the nearest locally available microcrystalline rocks, but by the end of the Early Harappan, high-quality tan-brown chert from the Rohri Hills in Sindh was being traded throughout the Indus region (Law 2005). Exotic stones, including lapis lazuli, carnelian, amazonite and variegated jaspers, were traded from distant resource areas, and many sites have evidence for local production of stone beads using stone drills or pecking techniques (Deo 2000; Kenoyer 2005a). Sites such as Mehrgarh and Harappa also have evidence for high-temperature pyrotechnologies, where beads made from soft steatite were fired at high temperatures to harden them, and glazed faience beads were also produced (Barthélemy de Saizieu & Bouquillon 1997; Kenoyer 2005a). The discovery of copper-melting crucibles indicates the processing of copper/copper alloy metals at many sites, though there is no evidence for smelting (Kenoyer & Miller 1999). Grey-fired and red-fired terracotta bangles, as well as some marine shell bangles, are also found at most Early Harappan sites, indicating shared ornament and symbolic traditions. The use of spindle whorls and polished bone spatulas suggests the development of textile production. Wool from sheep and goats would have been available, and there is botanical (Costantini 1984) and fibre evidence for the presence of cotton in this region beginning as early as the Neolithic (Moulherat *et al.* 2002). These communities had trade networks that crossed the plains to the western and northern highlands to acquire lithic and mineral raw materials.

The mode of transport for small quantities of goods could have been on pack animals, such as cattle, or even some of the larger sheep and goats. On the basis of toy terracotta cart wheels and possible toy cart fragments at Harappa (Kenoyer 2009) and Girawad (Shinde *et al.* 2008), it is possible that two-wheeled carts pulled by oxen were developed as early as 3700 to 3300 BCE in the Indus region. By the Kot Diji Phase, there are various types of toy carts and wheeled animal toys, which indicate the widespread use of wheeled vehicles for transport of goods as well as people. Another method of transport would have been along the rivers and coasts, but no models of boats have been recovered to date.

The organisation of settlements and the architectural features of the Early Harappan Period also show an initial period of regional diversity followed by the gradual adoption of similar forms of mud-brick architecture. At the sites of Kunal and Girawad in the Upper Ghaggar-Hakra Valley, circular and irregular-shaped pit dwellings with post-holes have been identified. The site of Kalibangan has mud-brick structures oriented north-south and east-west, and the site itself is surrounded by a massive mud-brick wall (Lal *et al.* 2003). The Ravi Phase occupation at Harappa extended over approximately 10 hectares and was divided into two adjacent settlements. Habitation areas included mud-brick structures and houses made from posts and reeds with mud plaster, with circular and irregular hearths, clay-lined storage pits and evidence of craft activity areas (Kenoyer & Meadow 2000). Both types of structures were oriented in the cardinal directions, a pattern that continued into the later Kot Diji and Harappan Phases. The mud bricks from Kalibangan have a thickness:width:length ratio of 1:2:3, while at Harappa they are 1:2:4, and at some sites they are not standardised at all. By around 2800 BCE, the Kot Diji settlement at Harappa had continued to build up on top of the two separate Ravi occupation areas, but each settlement was now surrounded by massive mud-brick walls, and the total area of the site was more than 25 hectares (Kenoyer 2008a). Although most sites were laid out in the cardinal directions, the site of Banawali (Bisht 1984) had a large, curved city wall encircling the northern part of the settlement during the Early Harappan occupation. Eventually, however, most sites throughout the Indus region adopted a standard mud-brick and fired-brick size (usually  $6 \times 12 \times 24$  cm) with a ratio of 1:2:4, and the cardinal directions were used to lay out the perimeter walls, interior streets and the major house walls.

During the Kot Diji Phase, large sites such as Harappa were supported by a hinterland of smaller towns and villages that have been identified through regional surveys (Mughal *et al.* 1996; Wright *et al.* 2005). Surveys along the Ghaggar-Hakra River to the east revealed a three- to four-tier settlement pattern during this same period, with sites as large as 27 hectares (Mughal 1997). Similar patterns can be seen around Rakhigarhi and Mohenjo-daro, but the total area of these sites during the Kot Diji Period has not been determined. Three- to four-tiered settlement systems are generally characteristic of urbanism and, when combined with the other features presented later in this chapter, it appears that this process was happening at multiple locations along both major river systems between 2800 and 2600 BCE.

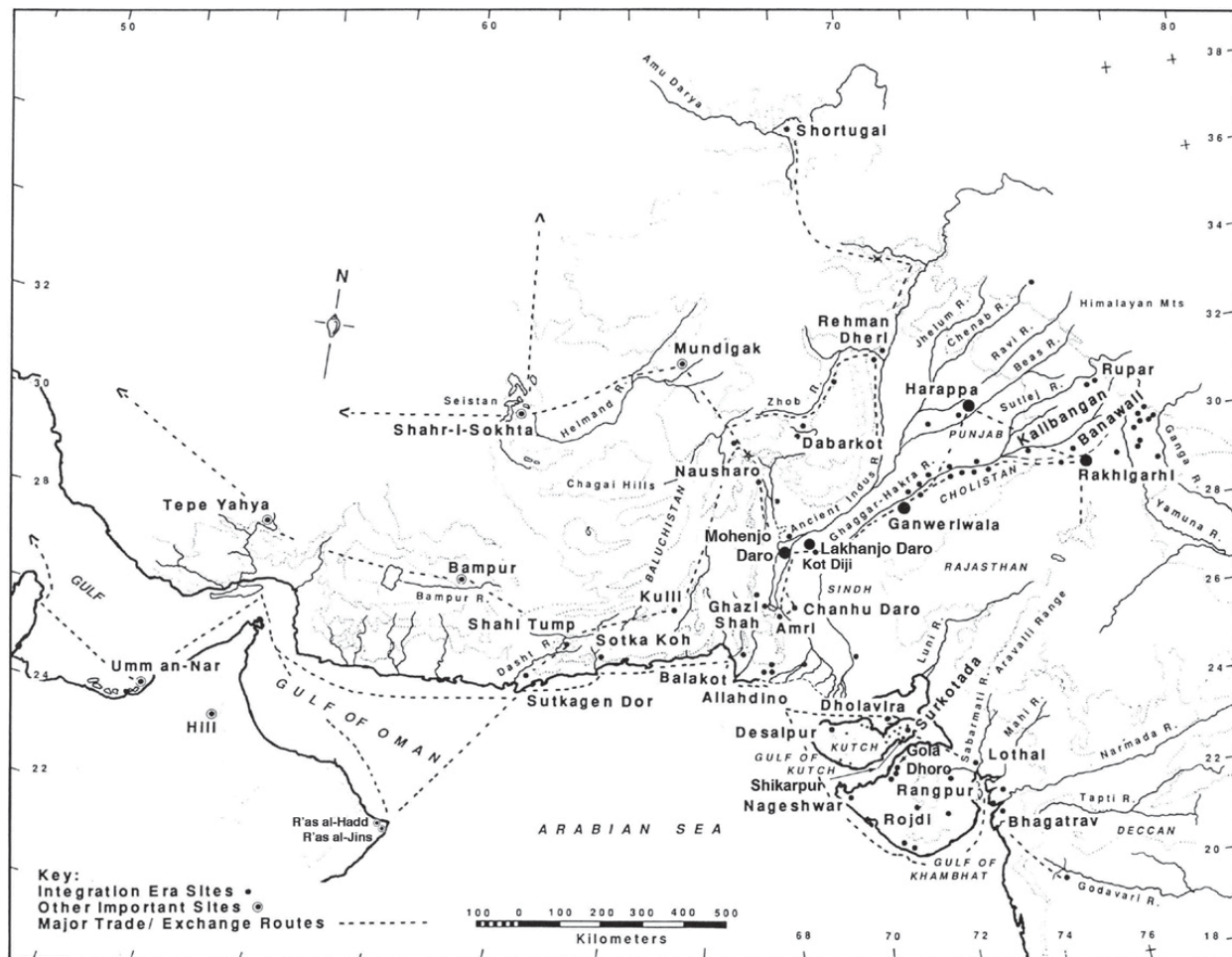
The construction of massive mud-brick walls with narrow gateways around settlements would have required the mobilisation of labour and transport of mud bricks and timbers on a relatively large scale. Following initial construction, long-term maintenance of the walls and gateways would have required additional civic coordination (Kenoyer 2008a). These perimeter walls probably had multiple functions, including the protection of inhabitants and their livestock from flooding, wild animals or raiders and the control of access into and out of the settlement for trade or other activities. Walled settlements appeared for the first time during the Kot Diji Phase, around

2800 BCE, and are distributed in all regions of the Indus Valley. At this same time, there is increasing evidence for the use of button seals made of bone, fired steatite or terracotta, as well as both pre-firing and post-firing graffiti. Seals and graffiti may have been used to indicate ownership, and at the site of Harappa there is evidence for a clay sealing and two standardised cubic stone weights that are clear evidence of some form of elite control (Kenoyer 2008a). At Harappa, the Kot Diji Phase graffiti and symbols found on a clay sealing impressed with a square inscribed seal indicate that a form of Early Indus script had come into existence between 2800 and 2600 BCE (Kenoyer & Meadow 2008). Additional research will probably turn up more sealings and weights from other regions of the Indus Valley, but so far this evidence has been reported only from Harappa.

Based on the excavation reports at sites such as Harappa, Kot Diji, Banawali, Bhirrana, Baror and Dholavira, there is clear evidence for cultural continuity between the Early Harappan and later Harappan occupations. In contrast, other sites such as Balakot, Nausharo, Gumla and Sarai Khola show discontinuities or abandonment at the end of the Early Harappan Period. These contrasting patterns suggest that while some settlements evolved smoothly from the Early Harappan to the Harappan socioeconomic and political system, other sites were totally reorganised or abandoned. Sites such as Gumla and Kot Diji had evidence of substantial ash layers that were initially interpreted as evidence of conflict, and the site of Nausharo has an extensive ash layer that is clearly evidence for some form of conflagration (Jarriige 2000). However, at all of these sites there are strong cultural and technological continuities between the Kot Diji and subsequent Harappa layers that do not reflect a major change in populations. Furthermore, the absence of any form of evidence for conflict at the larger sites suggests that, for the most part, the transition from the Early Harappan to the Harappan Period did not involve warfare or military conquest (Kenoyer 1998).

## Integration Era: Harappan Phase Sociopolitical Organisation

By around 2600 BCE, larger cities with diverse populations were established along the major river systems and on an island in Kutch that dominated the coastal trade networks from Gujarat to the Indus Valley (Map 1.25.3, Fig. 1.25.1). Regional patterns of interaction between the larger towns and their hinterlands led to more stable trade and interaction networks throughout the greater Indus Valley. These settlements were integrated through various socioeconomic, political and ideological mechanisms that remained relatively stable for more than seven hundred years. Without the aid of written records, we cannot know the names of specific leaders or the ideological



MAP 1.25.3. Indus Tradition: Integration Era sites.

changes that led to the rise of these cities, but individual decisions and community support would have been key to their success. So far, there is no evidence of the emergence of hereditary monarchies or centralised territorial states. In contrast to other early states, the Indus is relatively dispersed and decentralised. Some scholars have suggested that the political system of the Harappan Phase should not be considered a state-level society because it lacks evidence for centralised temples and administrative buildings, palaces and royal burials, and so on (Possehl 1998). This argument against the state is based to some extent on models derived from comparisons with Egypt and Mesopotamia, civilisations that were integrated through warfare and overt coercion. The evidence from the Indus suggests that warfare did not play a significant role in the rise of cities, and that economics and ideology may have been the key mechanisms for integration.

The cities reveal the presence of hierarchical social order, with some people living in larger houses, made of fired brick, while others lived in mud-brick structures inside or outside the walled areas of the settlement. Ornament styles using similar shapes and forms but different qualities of raw material indicate that symbols were shared by people of many different social and economic classes. For example, identical shapes

of bangles and beads were made from gold, bronze, copper, shell, faience and terracotta. The use of bangles as a social and ideological symbol can be seen to unite people living in a settlement, but the different raw materials and their relative value would have served to maintain a degree of hierarchy. Natural stone beads were copied in faience and terracotta, and similar ranking of ornaments is found at all sites throughout the Indus region (Kenoyer 2000).

As will be demonstrated in the following sections, the Indus cities and their hinterlands reveal a highly organised, hierarchical society, with multiple diverse communities integrated under a state-level system of political, economic and social order. A flexible model of relatively independent and self-sufficient city-states may be the best way to characterise the Indus political system (Kenoyer 1997). Over the course of seven hundred years, there were undoubtedly many fluctuations in political organisation within a single settlement, as well as regional patterns of governance. Small sites and towns such as Dholavira were possibly ruled by individual rulers or clans for part of their history. In contrast, most of the largest settlements may have been ruled by corporate bodies led by powerful landowners, merchants and religious leaders (Kenoyer 1998, 2008a). The well-planned layout of the settlements and the long-term



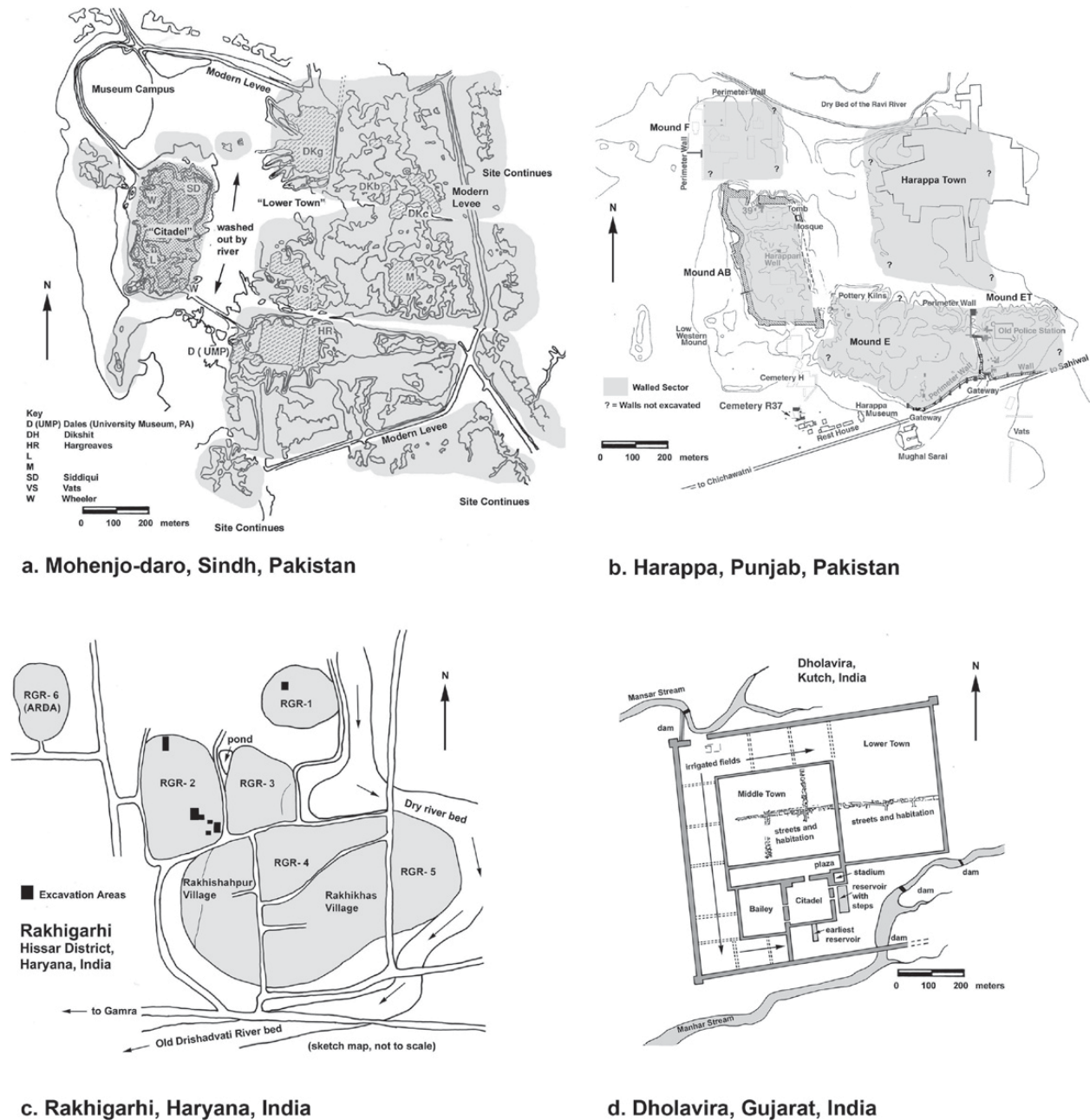


FIGURE 1.25.1. Major Indus cities.

maintenance of their city walls and internal organisation suggest that the Harappan Phase political system was quite stable and functioned efficiently.

## Harappan Phase Settlement Patterns

There is no precise event that can be associated with the beginning of the Integration Era, but this period saw the establishment of urban centres that were many times larger than the largest Kot Diji Phase towns. These cities of 150 to

250 hectares in area (Mohenjo-daro, Harappa, Rakhigarhi) (Fig. 1.25.1) dominated their landscape with towering walls and impressive gateways. They were made up of multiple walled mounds that included diverse populations of administrators, ritual specialists, service communities, craftsmen and traders (Fig. 1.25.2). The cities were supported by farmers and herders living in and around the city, as well as a vast hinterland of smaller towns, villages and resource areas (Kenoyer 1998).

The Harappan Phase at Harappa can be divided into three subphases (3A, 3B and 3C) based on architectural developments and changes in artifact styles and pottery. Around 2600 BCE, the original perimeter walls of the twin Kot Diji Phase



FIGURE 1.25.2. Harappan Phase terracotta figurines, Harappa, Pakistan. (Courtesy the Harappa Archaeological Research Project.)

settlements were rebuilt, expanded and eventually faced on the outside with fired brick. Although some fired brick may have been used during the earlier Kot Diji Phase at sites such as Kalibangan, this building material was not used at Harappa until the beginning of the Harappan Period (3A). By around 2450 BCE, new suburbs were added to the original walled sectors and eventually surrounded by massive city walls. The rapid population growth during this period can be explained only through the migration of new communities to the cities. Since many of the rural settlements around Harappa continued to be occupied throughout the Kot Diji and Harappan phases, some of these communities may have come to the city from more distant regions or resource areas.

During the height of urban expansion, from 2000 to 1900 BCE, additional suburbs were built and the old city walls were repaired. During this period, there is also evidence for

new styles of seals, ornaments and pottery forms, as well as expanded internal and external trade networks (Meadow & Kenoyer 2005; Kenoyer 2008a). The total area for Harappa, including the major walled sectors and settlements and cemeteries outside the walls, comes to around 150 hectares. Many attempts have been made to estimate the populations living in these large urban centres and, based on comparisons with modern Harappa, it is possible that the ancient city could have accommodated forty thousand to sixty thousand people, but the average population density was probably quite a bit less during most of the year.

Mohenjo-daro also had multiple mounded areas, some of which were walled. Due to waterlogging of the lowest levels of the site, a full chronology has not been established, but the site was founded during the Kot Diji Phase and expanded to over 250 hectares during the Harappan Phase. So far, no cemetery has been located at this site, though some scattered burials have been recovered in the course of salvage operations. The site of Rakhigarhi is made up of seven discrete mounded areas, including the Early Harappan mounds and cemetery that cover around 240 hectares.

The excavator of Dholavira has identified seven stages of development spanning the Early Harappan to Late Harappan Period, with the Harappan pottery, seals and some writing appearing in stages IIIA and B, followed by fully fledged Harappan in Stage IV and a declining Harappan occupation in Stage V (Bisht 2000). The site started out as a small walled settlement in the Kot Diji Phase (Stage I), but then grew to a large stone-walled town by the initial Harappan Phase (Phase III). During the Harappan occupation, the city consisted of three nested walled sectors with a total enclosed area of around 48 hectares. Additional settlement areas and a cemetery were distributed outside the walls, and altogether the site covered an area of around 100 hectares. The main function of the walls and gateways was probably to protect the city markets and workshops from raiders and to control the access of traders coming into and leaving the city. As discussed earlier however, there is no evidence that these walled cities were ever attacked or destroyed through warfare.

Regional towns, ranging in size from 10 to 50 hectares, were also located along the major rivers and trade networks that linked the major cities. The unexcavated site of Ganweriwala, located along the now-dry Hakra River in Cholistan, is c. 36 hectares with two mounded areas that cover around 10 and 14 hectares, surrounded by low-lying settlement and craft areas. Kalibangan is located farther north along the Ghaggar section of this same river. It consists of three mounds that total around 12 hectares, with a cemetery located to the west of the main citadel mound. The site of Junj Kuran is a walled settlement on the main island of Kutch and located to the west of Dholavira. It is around 14.35 hectares in area and was built with massive stone walls and internal subdivisions. One of the most important recently excavated sites is Farmana, in Haryana State just west of Delhi. Salvage excavations of the habitation area that covers around 18.5 hectares have turned up extensive mud-brick house foundations and well-planned streets. Around 900 m to the northwest of the settlement is a large cemetery with

well-preserved skeletons and burial offerings. Other large sites of the Indus include Judeirjo-daro and Lakhanjo-daro, but most of the former site is now destroyed and the latter is partly covered by the modern city of Sukkur, Pakistan.

Small towns such as Lothal, Kot Diji, Chanhudaro and Banawali range from 5 to 10 hectares. Walled villages between 1 to 5 hectares may have served as trade and craft centres along key trade networks. Although many writers focus on the larger cities, numerous excavations have been conducted at these smaller sites, such as Nausharo, Balakot, Kanmer, Shikarpur, Surkotada, Sutkagen Dor, Bhirrana, Baror, Nageshwar and Gola Dhoro (Bagasara). The smallest settlements are hamlets or trading posts that are less than one hectare in area. Allahdino is a farming estate just east of Karachi, and Shortughai is a small trading outpost near the lapis lazuli mines of northern Afghanistan.

## Indus Architecture and Settlement Planning

Although the earlier excavators and many current scholars have tried to define standardised units of measure for the Indus architecture and settlement planning, there is no concrete evidence for such a system. A single archaeological example of a “scale” has been reported from four of the major sites. The Mohenjo-daro scale is made of shell (Mackay 1938); the Harappa scale is made of copper/bronze (Vats 1940: 365–6); the Lothal scale is reported as ivory (Rao 1979), but appears to be a rib bone; and the Kalibangan scale is terracotta (Balasubramaniam & Joshi 2008). Although numerous attempts have been made to reconcile the irregular markings on these objects, no two rulers provide the same measurement. Even if they were scales, having only one example for each settlement does not make a convincing argument for their widespread use, and they are too small to have been used for any larger measurement. It is much more likely that measurements were made using standard body parts such as the fingers, span and stride that are used even today in many parts of the Subcontinent. The thickness of a Harappan brick is approximately equal to four fingers, the width to eight fingers, and the length to sixteen fingers. There is no absolute standardisation of Indus bricks, but the basic ratio of 1:2:4 is used for bricks at all Harappan sites and indirectly has an impact on the structure of all Indus architecture.

Excavations at both the larger and smaller settlements during the past two decades have begun to reveal the regional variation in urban and rural settlements. The major cities in the alluvial plain were built with a combination of mud brick and fired brick, along with some wooden components such as support pillars, roof beams and door and window frames. Two major brick sizes with a 1:2:4 ratio were used during the Harappan Phase. Small mud bricks and fired bricks measuring  $6 \times 12 \times 24$  or  $7 \times 14 \times 28$  were used for most house walls, drains, stairs and kilns. Larger unfired mud bricks,

measuring  $10 \times 20 \times 40$  cm, were used for constructing massive foundation platforms and city walls (Kenoyer 2008a). The fired-brick facing of the city walls used the smaller-sized bricks. Fired brick was also used for drains, sump pits, bathing platforms and wells. Smaller settlements in the alluvial plain were constructed primarily of mud brick, with some houses made with wooden posts and reed matting with mud plaster. Sometimes, fired brick or discarded pottery and stone was used for drains and bathing platforms. Settlements in the stone-rich regions of Kutch and Balochistan used dressed and undressed stone for foundations and city walls, with mud brick for superstructures. The massive citadel wall at Dholavira had a core of mud brick and a facing of dressed stone. At these sites, stone was also used for drains, bathing platforms and wells.

No standard house form characterises the Harappan Period, though the general pattern for private houses is a multiroom structure with a central open space or courtyard (Jansen 1993). Access to the house was generally from a side street, with a curtain wall to maintain privacy from people walking by outside. Larger building complexes had one or more open spaces and groups of rooms that may have been used by extended families or service communities. One building in the HR area of Mohenjo-daro had 156 rooms and covered an area of  $80 \times 40$  m. Although the earlier excavators did not identify any centralised palaces or temples, the reanalysis of the site plans at Mohenjo-daro suggests that some buildings were clearly elite residences and could be called “palaces” (Vidale 2010). Some domestic structures were associated with craft areas, such as pottery kilns, shell or lithic workshops or copper working, and many rooms were used for craft production as well as habitation. Open courtyards and streets were also used for craft activities.

Public buildings can be defined on the basis of open access from multiple directions and overall monumentality. Most of these structures were excavated before careful stratigraphic recording was developed, and we may never really know what the buildings were used for. At Mohenjo-daro, the so-called Great Bath is a large water tank with a surrounding colonnade, side rooms, an oval well and a series of bathing rooms. This tank was probably used for special public or elite rituals associated with water purification, but it is not possible to be more specific (Fig. 1.25.3). A smaller version of this type of tank may have been constructed in the HR area of Mohenjo-daro (*ibid.*), but no other sites have this type of water tank. Earlier excavators identified “granaries” at Mohenjo-daro, Harappa (Fig. 1.25.4) and also the smaller site of Lothal. There is no conclusive evidence that any of these buildings was used to store grain or any other major commodity. They were definitely large buildings, with brick or wooden superstructures, but all traces of their function have been lost.

No complete houses of the Harappan Period have been excavated, but carved terracotta model houses show flat-roofed structures with one or two storeys (Kenoyer 1998). These models also show that protective ledges were built over doors and windows to keep rainwater from flowing into the house.





FIGURE 1.25.3. Great Bath at Mohenjo-daro, Pakistan. (Photo by J. Mark Kenoyer, courtesy the Department of Archaeology, Government of Pakistan.)



FIGURE 1.25.4. "Great Hall" at Harappa. (Courtesy the Harappa Archaeological Research Project.)





FIGURE 1.25.5. Reconstruction of Harappa Mound E/ET gateway and drain. (Drawing by Chris Sloan, courtesy the Harappa Archaeological Research Project.)

Some windows had lattice shutters that would allow airflow and light, but at the same time maintain privacy. Two holes at the top of the doors suggest that some doors would have been covered with hangings, and a hole at the bottom of the door may represent the use of locking devices to seal wooden doors. Many houses at Mohenjo-daro had brick stairs leading to a second storey, and some houses were built with rooms at different levels due to various phases of reconstruction and renovation. Cooking areas have been identified in open courtyards as well as in what may have been closed rooms. A single house often had multiple cooking areas that may have been used for different types of foods or for use by different members of an extended family (Kenoyer 1998). Circular, square and oval hearths are quite common, and some had a central upright brick that may have been used to help support cooking pots. Larger keyhole-shaped ovens with a central column may have been used for preparing roasted meats and breads. Kilns with this same shape were also used to fire pottery.

Latrines and bathing platforms were located in small rooms next to an outer wall, so that the waste water and sewage could drain out to a sump pot or brick-lined drain in the street. Bathing platforms were generally made with bricks set on edge and fitted tightly together to avoid seepage into the rest of the house. Drains leading out of the house connected to

larger lined drains in the streets that were equipped with sump pits. Small drains connected to larger covered drains that eventually led to the city wall or gateway, where they would empty out into the surrounding fields (Kenoyer 1998) (Fig. 1.25.5). At Dholavira, drains for wastewater were separate from those that were used to collect rainwater for large reservoirs (Bisht 2005). This type of dual drainage system is not documented for sites such as Mohenjo-daro and Harappa. Latrines were generally simple commodes made by burying an old storage pot into the ground. They would have to be cleaned out periodically, but some had a small drain leading outside to a second sump pot. Although bathing platforms were connected to the main city drains, there is no evidence of the overflow sewage water from commodes flowing directly into city drains.

## Wells and Reservoirs

Some of the smaller towns and villages obtained their water from the nearby rivers or oxbow lakes, but one of the outstanding features of the Indus cities is the technology of water management through the construction of wells and reservoirs. Specialised wedge-shaped bricks were used in the construction of wells, and the shapes were calibrated to different well

diameters. When the well casing was in place, lateral pressure from the surrounding soil created a strong and durable structure. Water was collected with containers of leather, pottery or metal, using ropes. At Mohenjo-daro, every major block of houses was equipped with a well, and wells were also constructed along public streets (Jansen 1993). In contrast, sites such as Harappa had very few wells, but a large open space in the middle of the city may have been used as a reservoir that was filled by rainwater and possibly a canal from the nearby Ravi River (Kenoyer 1998). The system of constructing and maintaining reservoirs is best documented at the sites of Lothal and Dholavira, which are located in regions that get very little annual rainfall. A large brick-lined tank at Lothal appears to have been connected by a small canal to the nearby river and, at Dholavira, two perennial rivers were dammed in order to divert their waters into a series of stone-lined reservoirs within the walled city. The tank at Lothal has been interpreted by some scholars as a dock (Rao 1979), but so far there is no conclusive evidence that boats were brought into this structure. At Dholavira, the tanks were built with siltation chambers to keep sediments from entering the system, and many of the tanks were connected to each other so that they were filled sequentially whenever there was a major period of rainfall. One of the largest tanks had steps leading into the structure, and a well dug into one side so that water could be collected even after the tank was dry (Bisht 2005).

The evidence for water management in the cities suggests that Indus farmers would also have been able to develop complex systems of irrigation and water conservation for use in agriculture. In the piedmont of Balochistan, there is evidence for the use of small dams called *gabarbands* that would have collected run-off and sediments to both store water and eventually create fertile fields (Flam 1993). Small channels that may have been constructed by Harappan Phase settlers have been located at Shortughai in the Oxus River Valley (Francfort 1989) and also in the Upper Ghaggar-Hakra region (Courty 1989). So far, no evidence of larger irrigation systems has been discovered in the main alluvial plain, and it is assumed that most fields were watered either by the winter or summer rains or by flooding during the spring melt and the summer monsoon. Oxbow lakes are found throughout the Indus and Ghaggar-Hakra alluvium, and they may have been the major source of water during the dry seasons.

## City Walls and Gateways

The layout of Harappan cities follows the pattern established during the earlier Kot Diji Phase, with houses built in discrete blocks along north-south and east-west streets. Many of the major streets were over 8 m wide and some had a central divider that would have controlled traffic movement. Smaller streets were 4 to 5 m wide and would have allowed foot traffic in addition to the movement of carts. The narrow lanes leading into smaller neighbourhoods were for pedestrian traffic alone. The

gateways of the cities were generally 2.5 to 3 m wide, which would have allowed only a single cart to pass through at a time (Kenoyer 1998).

Most sites were made up of two or more walled sectors that gradually built up into mounds over time. At Mohenjo-daro, a higher walled mound on the west has been referred to as the “citadel” and the series of lower mounds on the east as the “lower town”. This division of sites into two or more sectors is a common feature throughout the Indus region, and even small sites such as Surkotada had a higher walled sector on the west and a lower residential sector to the east. Dholavira and Banawali are regional exceptions to this pattern, as both of them have the higher “citadel” mound in the south.

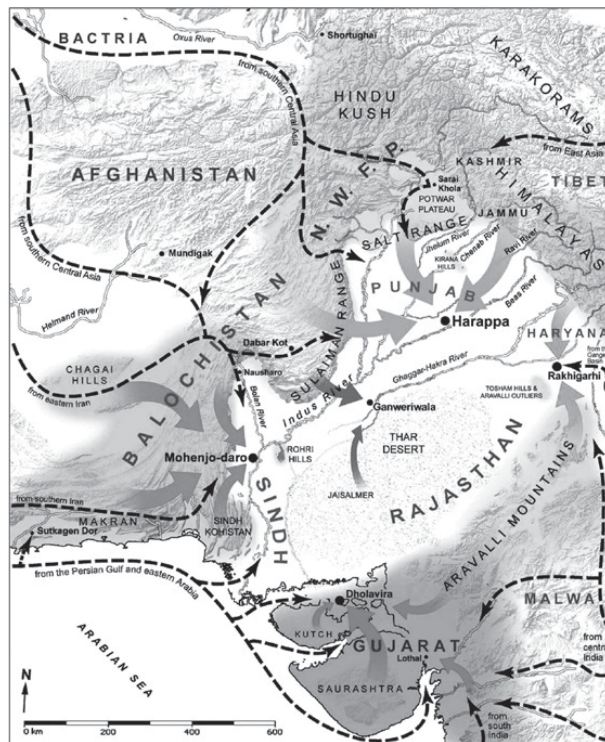
The massive perimeter walls were constructed from large mud bricks and faced with fired brick or stone. At Harappa, the perimeter walls and gateways were maintained for over seven hundred years, and the entire city wall of each sector of the site appears to have been repaired at that same time. Large-scale construction of this type would have taken several months and was probably undertaken during the winter season, after the crops had been planted (Kenoyer 2008a). Gateways were generally made of fired brick or stone, and settlements such as Harappa had small caravanserais or rest areas located outside the city wall and opposite the main gateways. Most gateways in the cities located in the alluvial plain open directly onto a major city street, allowing immediate access to the centre of the city or any of its neighbourhoods (Fig. 1.25.5). In contrast, the gateways of Surkotada are constructed with L-shaped defensive entryways, with stairways leading up to the top of the city wall. The lower city at Dholavira has open gateways, but the citadel has a defensive gateway with side rooms that could have held guards. These two types of gateways suggest that the walls and gateways had two major functions.

The primary function of the walls was probably to control access into and out of the main settlement for trade and administrative purposes. Some settlements, particularly those located in remote regions such as Kutch, also had defensive gateways for protection from raiders and bandits. However, it is important to point out that there is no evidence of the cities having been attacked or destroyed through warfare. One reason for the absence of conflict may be the wide dispersal of settlements and the relatively large buffer zones that surrounded the larger settlements. The distance from Harappa to Rakhigarhi is around 350 km and from Harappa to Mohenjo-daro is 570 km. Coastal sites such as Dholavira and Surkotada may have been less secure, and this may be the reason for their defensive architecture (Map 1.25 3).

## Internal and External Trade

Indus trade networks were expanded from earlier exchange systems of the Regionalisation Era. The construction of large





MAP 1.25.4. Indus rock and mineral source areas. (Courtesy Randall Law; Law 2008: fig. 12.10, p. 58.)

cities out on the alluvial plain would have required a wide range of raw materials from surrounding resource areas, including timber, rock, copper and exotic foodstuffs. Due to the distribution of specific types of resources around the Indus Valley, it is often possible to trace the general area that is the source of most objects (Map 1.25.4). Studies of the rocks and minerals from all phases of the occupation at Harappa have shown that most of these raw materials were acquired from the regions of Balochistan to the west and north. Other distinctive materials were obtained from the Himalayas to the north, the Aravalli to the east and the Rohri Hills to the south (Law 2008). Marine shells and dried fish were brought inland from the coast, probably in exchange for grain and finished products from Harappan landowners and craft workshops.

These internal trade networks appear to have been highly stratified, with larger urban centres being connected directly to distant resource areas, or to other major cities that funnelled goods to major consumers. For example, the steatite used for making Indus seals can be identified with a source area in Hazara, north of modern Islamabad (Law 2008). This same material was used at Harappa, Mohenjo-daro and Dholavira, and was probably traded directly to both Mohenjo-daro and Harappa, but indirectly through one of these cities to Dholavira. Marine-shell objects from smaller workshops such as Nageshwar on the Saurashtra coast may have been traded to Dholavira and then shipped on to either Mohenjo-daro or Harappa. Intraregional exchange networks connected each of these major urban centres to smaller towns and villages. At the local level, farmers, pastoralists, hunters and fisherfolk would

have provisioned the cities in exchange for essential commodities such as pottery, metal tools and ornaments produced in the big city workshops.

Much of the exchange during the Harappan Period may have been based on the barter system or on reciprocal exchange between landowners and craft specialists. These forms of exchange are not visible archaeologically and would have been indirectly controlled through the construction of city walls that monitored access to and from the settlements. More direct evidence for internal trade and exchange is revealed by the use of seals with Indus script that were used to make sealings on storage containers, doors and bundles of goods. Pottery used as containers for trade commodities was often incised with Indus script, and some pots were produced with pre-firing seal impressions or moulded script. In addition to seals and sealing, another direct indicator of trade is standardised cubic stone weights, which have been found at all major sites within the Indus region. Recent analysis of the weights from Harappa and other sites suggests that, although the weight system was relatively standardised within each settlement, there may have been some variation in the absolute weight categories between settlements (Kenoyer 2010).

These stone weights were probably not used for everyday commodity exchange. At Harappa, weights have been found in higher proportions near the major gateways and workshop areas of the city, which suggests that they were used for taxation of trade items coming into and out of the settlements. Sets of truncated spherical weights made of agate, as well as biconical weights made from basalt, may represent non-Indus weight systems used by international traders in the cities. These standardised weight systems may reflect a centralised authority or a coalition of merchants that maintained the standardised system to control the trade of specific commodities. Indus cities had long-distance or external trade connections throughout the Arabian Gulf, Afghanistan, Central Asia and distant Mesopotamia. Indus-derived items, such as seals, stone beads, marine shells, and trade pottery, have been recorded from sites in Oman, the United Arab Emirates, Bahrain, Iraq, Iran, Afghanistan and Turkmenistan. It is not clear whether Indus traders were themselves engaged in these trading expeditions or whether they were being undertaken by middlemen from the Gulf or Balochistan. The textual evidence from Mesopotamia does, however, refer to the presence of individuals from Meluhha (Parpola, Parpola & Brunswig 1977), a term associated with the Indus Valley. It is also possible that Indus craftsmen, particularly those who were making long carnelian beads, may have set up workshops in Mesopotamian cities such as Ur and Kish (Kenoyer 2008b). Exotic items found at Indus sites include various rocks from outside the Indus region (e.g., lapis lazuli, turquoise), copper tools, flaked arrow points, copper seals, cylinder seals and sealings that derive from Balochistan and Afghanistan. Marine shells and copper may have come from the Arabian Gulf sites, but there is relatively little primary evidence for goods produced in Mesopotamia itself. These patterns suggest that Mesopotamian goods being traded to the Indus were primarily perishable (oils, textiles, food items) or raw materials (gold, silver, copper) that were reworked into

Indus objects. So far, no depictions of seagoing vessels have been found, but a gradually expanding programme of underwater archaeology may eventually turn up some evidence along the coasts or in the estuaries near major seaports or river port cities.

Both internal and external exchange were critical to the power of urban elites, and there is no question that fluctuation in trade can be closely linked to the emergence and decline of the Indus urban centres (Ratnagar 2004). Exotic materials would have been used for status differentiation, and basic raw materials such as metal, rock, wood and food stuffs were essential for maintaining the urban centres. In most cases, there are multiple sources for most of the raw materials needed by Indus craftsmen and merchants. These sources are distributed in the mountainous regions and deserts surrounding the Indus Valley or across the Gulf in Oman. The expansion of Harappan Phase settlements into Balochistan, Afghanistan, Jammu, Kutch and Saurashtra may have been stimulated in part by the quest for new resources to supply a competitive urban market. This unique distribution of resources would have provided an opportunity for competition between suppliers and merchants and also allowed some settlements and cities to benefit through the control of specific commodities or their transshipment.

## Craft Specialisation and Urbanism

Many of the basic technologies related to subsistence and domestic activities that were developed in earlier periods continued relatively unchanged with the rise of urban centres. Specialised crafts that were used to create stone beads, shell ornaments, pottery and figurines, lithic tools, copper objects and such also had their foundations in the earlier Regionalisation Period. The major change that is evident during the last part of the Kot Diji and then the Harappan Phase is the development of mechanisms to control the production and distribution of specific types of objects, particularly those that would bring status or economic benefit to elites. Cities such as Harappa and Mohenjo-daro were far removed from all raw-material source areas, and yet merchants in these cities were able to transport raw materials directly to the city to be produced in workshops that could be indirectly or directly controlled. Walled settlements provided an optimal mechanism to control all production indirectly within the settlement and also the trade of raw materials or finished goods into and out of the settlement. Studies of Indus crafts have focused on determining the organisation of craft production to establish which crafts were being most rigidly controlled by the elites.

Four major categories of crafts can be identified in the cities based on the accessibility of the raw materials and the complexity of technology used to produce specific objects. The first category includes locally available raw materials such as wood, clay and animal products that could have been processed using relatively simple technologies. There is little evidence for the

direct control of everyday ceramic wares, bone or woodworking. The second category includes raw materials that were not locally available, but which were processed using relatively simple technologies. Ground-stone and chipped-stone tools are quite widely distributed throughout Indus settlements, and there is no evidence for standardisation or control of production. A third category includes complex technologies that use local materials, such as clay, wood or textiles. High-fired stoneware bangles were very carefully controlled at all stages of production, and inlaid wooden furniture using shell or coloured stones may have been more closely monitored. Dying and weaving of textiles would also fall into this category, though the evidence for these materials is very fragmentary. The main textiles used in the Indus Valley were cotton, wool and plant bark fibres such as hemp/jute and flax (Kenoyer 1998), but the recent identification of wild silk fibres used to string beads or copper ornaments suggests that other fibres may also have been used for textiles (Good, Kenoyer & Meadow 2009). The fourth category includes the use of non-local raw materials and complex technologies, such as steatite seal production, copper/copper alloy manufacture, hard stone bead production, precious metalworking, glazed faience manufacture and shell working. The latter two categories appear to have been those that were most closely monitored and controlled by elites to produce high-status items and for local or long-distance exchange (Kenoyer 2000; Vidale & Miller 2000; Bhan, Vidale & Kenoyer 2002).

Within the walled settlements, pyrotechnological crafts such as pottery firing and copperworking were often segregated to the edges of the settlement to prevent the spread of fire and noxious fumes as well as to facilitate the discard of manufacturing debris and waste. These crafts tend to be segregated from other craft categories, and the same area of the site was used for many generations. Other crafts were often located along major streets or in close association near major gateways. The actual production activities took place in segregated areas of larger domestic structures or in the streets between structures. Discarded manufacturing waste has been found scattered along major streets as well as in specially prepared pits that were probably located in abandoned rooms or alleyways. Each of the major walled areas of Harappa has evidence of the same basic sets of crafts, including steatite seal production and chert weight manufacture. Similar patterns are noted from sites such as Dholavira and Mohenjo-daro. The co-occurrence of crafts such as bead making, shell and ivory working, faience and steatite seal production and precious metal processing could be the result of various factors. On the one hand, it is more efficient to have crafts that use similar raw materials or fuels located in proximity. This makes for ease of delivery and also sharing of resources when needed. It also makes it easier for elites to monitor specific crafts if they are all located in the same part of the city.

Craft production was probably organised in many different ways depending on the specific craft and its importance to the urban elite. The long-term use of pottery working areas probably reflects the presence of hereditary craft communities that lived and worked in specific areas of the cities for many generations. In contrast, the short-term association of multiple



small- and large-scale production areas near gateways could indicate economic and political control of crafts that were essential for the urban economy. The most highly controlled crafts were the production of inscribed seals, moulded faience tablets with Indus script and stoneware bangles that were incised with Indus script. A stoneware bangle workshop excavated at Mohenjo-daro revealed multiple stages of production that appear to have been carefully controlled with sealed containers, and the final bangles themselves were inscribed (Halim & Vidale 1984). Stoneware bangles were also manufactured at Harappa; and though they have been found at Dholavira, Lothal and Ganweriwala, it is not known whether they were produced at these other sites. Relatively few seal workshops have been found in the course of excavation at Chanhudaro and Mohenjo-daro, and only one faience tablet workshop has been excavated at Harappa using careful stratigraphic recording and documentation. The Harappa workshop appears to have started out as a faience bead workshop, and then eventually was used to produce fired steatite tablets and moulded faience tablets. The debris was not dumped out in the street, but was concentrated in a single room or courtyard area, suggesting that even the debris from production was carefully controlled (Kenoyer 2005b; Kenoyer & Miller 2007).

While sites in the alluvial plain may have had more rigid control of production of crafts such as bead making and shell working, sites located closer to the raw-material resource areas may have been less rigid. Along the coast of Saurashtra, shell-working debris and partly finished objects were scattered throughout the site of Nageshwar, with piles of shell columellae and half-finished ladles spread around the site (Bhan & Kenoyer 1984). Farther along the Little Rann of Kutch, the site of Gola Dhoro had stockpiles of agate and jasper blocklets, and nearby was a large pile of unworked marine shell and a basket full of thousands of partly worked shell bangles (*Turbinella pyrum*) (Bhan *et al.* 2005). Ongoing studies of the bead manufacturing areas of Dholavira reveal multiple locations for bead working, drilling and polishing, with raw-material and manufacturing debris scattered over large areas of the settlement (R. S. Bisht & V. N. Prabhakar 2009, pers. comm.). The quantities of stockpiled materials and the lack of any order in their disposition, plus the fact that they were abandoned and buried by later occupations, present a very different picture from that seen in the sites of the alluvium. The pattern could be likened to a gold rush or diamond mining camp, where an abundance of resources are rapidly being processed for shipment back to some urban centre. Abandonment and burial in such situations are equally rapid in the face of economic and political fluctuations.

## Subsistence Strategies

Agriculture and animal husbandry provided the solid foundation on which Indus cities and towns, their trade and crafts and their entire political system were based. The basic subsistence strategies of the Regionalisation Era continued to be practised during the urban phase, with the addition of some new summer crops such as millets and rice (Weber 2003; Madella &

Fuller 2006), and the domestication of the water buffalo (Patel & Meadow 1998). If rainfall and seasonal flooding were stable, two major crops could have been harvested in some regions each year. Wheat and barley were the main winter-spring crops, supplemented by pulses, sesame, peas and vegetables. Sorghum, millets and rice would have been the major grains cultivated in the summer-autumn cycle, but so far rice is documented only in Gujarat. Other summer crops include cotton, mustard, sesame, dates, melon and peas. Cattle and water buffalo were the predominant animals in the alluvial plains and Gujarat, supplemented with sheep and goat herding (Meadow & Patel 2003). Pigs were also kept in the cities, but they were not an important part of the diet and may have been used primarily as scavengers. There is no concrete evidence of the presence of camel, donkey or horse during the Harappan Phase, but these animals were already domesticated and used in parts of Central Asia and the Pontic-Caspian Steppes by around 3500 BCE if not earlier (Anthony 2007). It is not unlikely that Indus traders may have encountered these animals, and some may have even been brought back to the Indus Valley, but no physical remains have been found and they were clearly not used for subsistence or traction.

Fishing was also an important component of both urban and rural subsistence strategies, particularly for settlements located near rivers, oxbow lakes or the coast. Various fishing strategies can be documented through the study of fish species and also the use of fishhooks and net weights. Most fishing was probably done from the shore or in shallow waters using fishing lines or nets. Some very large fish, such as the 2 m long catfish reported from Harappa, were probably captured by spearing (Belcher 1998).

Wild animals were also important for subsistence strategies of the urban populations, and some wild meat may have been specially prized by elites. Wild animals were also depicted on inscribed seals and were featured prominently in narrative seals and terracotta figurines. Large game that is now extinct in the Indus Valley includes the Indian elephant, single-horned rhinoceros, tiger, leopard, wild cattle and wild water buffalo. The wild ass was hunted in the regions of Kutch and Sindh, while various types of elk, deer and antelope would have been available in different ecosystems. These latter species are still present in game reserves, but are extremely rare in other regions. The discovery of terracotta figurines depicting Macaque monkeys, squirrels and a variety of birds suggests that many smaller animals were also hunted, and some may have been kept as pets. It is not known if the elephant was domesticated at this time, but narrative seals show figures standing above an elephant, and there are numerous examples of elephant figurines, one of which is painted with red and white pigments (Kenoyer 1998).

## Indus Script, Seals and Tablets

One of the most important developments during the Harappan Phase is the widespread use of a fairly standardised writing

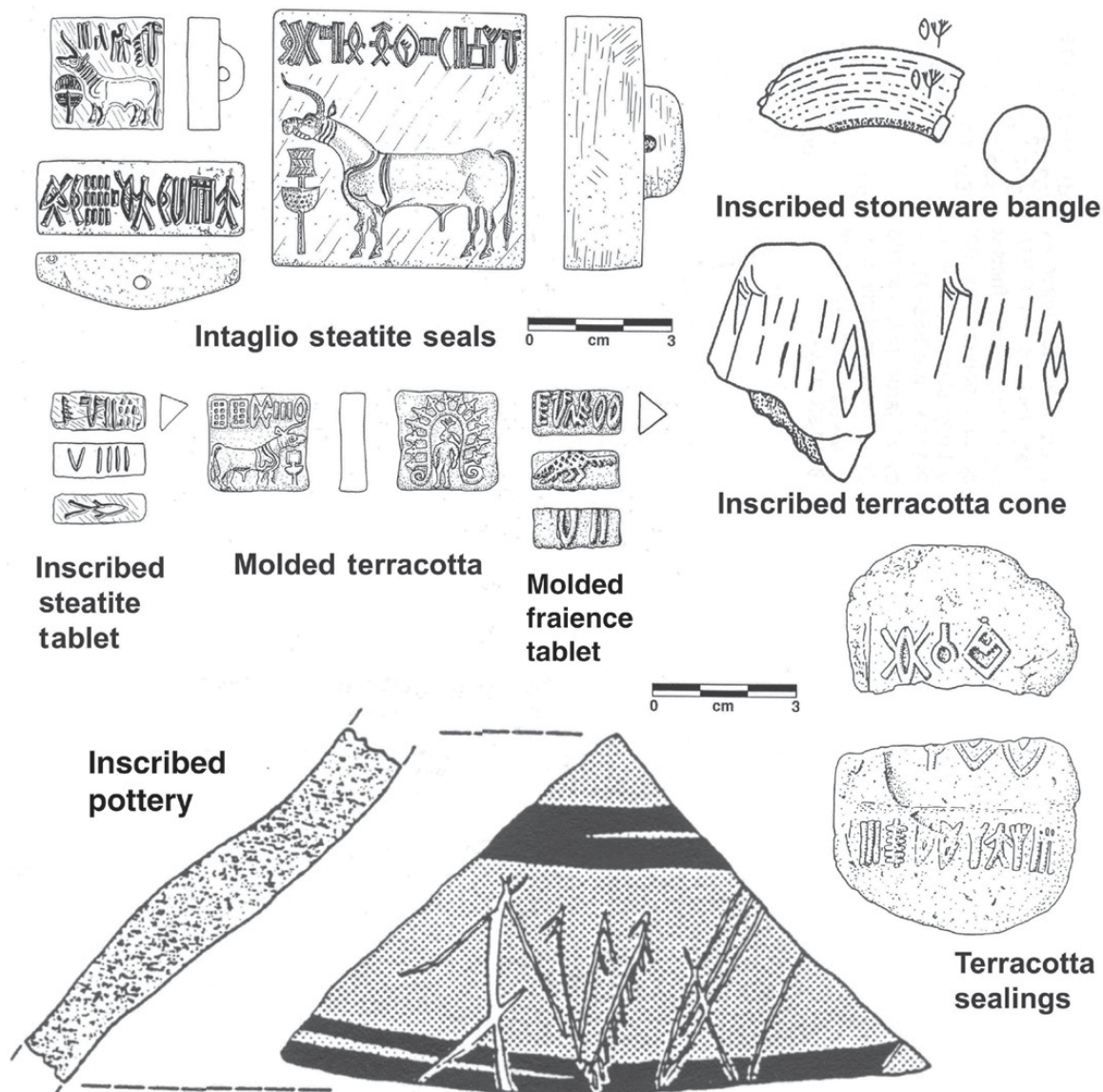


FIGURE 1.25.6. Harappan seals and tablets, Harappa, Pakistan. (Courtesy the Harappa Archaeological Research Project.)

system referred to as the Indus script. As noted previously, this script evolved out of the Early Indus script and probably had some regional variations that still need to be defined. Based on the analysis of sign sequences and orthography, it appears that the writing was generally made from right to left. There are between 400 and 450 signs, with many more variations, and the average length of a seal inscription is around five signs. Most scholars agree that the signs represent a logosyllabic (morphemic) system, where a single sign can mean either a word, a syllable or a sound (Parpola 1994). Some signs appear to be pictographic, depicting tools, animals, plants or even people holding different types of objects. Other signs, such as the stepped cross, circle or swastika, could be ideograms. Several major language families are represented in the place names of rivers, mountains and ancient regions of the Indus Valley, including Dravidian, Mundari (Austro-Asiatic), Indo-Aryan, Sino-Tibetan and language “X” of the Neolithic Period (Fairservis & Southworth 1989; Southworth 2005). It is

not unlikely that ancestral forms of these languages were spoken in the prehistoric past, and the Indus script may have been used to write names or commodities from any or all of these languages. The lack of any bilingual texts has made it impossible to decipher the writing system, but it has been possible to reconstruct some basic function through contextual studies.

The writing was used for economic, political and ideological purposes and is found inscribed on a wide variety of objects. Most examples of script are found on pottery vessels used for trade or as storage containers. Writing is also found on personal ornaments, metal and bone tools, bone and ivory rods, stone vessels and bricks and very rarely incised on pieces of previously broken pottery. Perhaps the most important use of the script is seen on intaglio seals used to stamp pottery, or lumps of clay that were used to seal containers, storerooms or possibly even other documents (Fig. 1.25.6). Some impressed clay lumps had more than one seal impression, which indicates that multiple officials or owners were involved in the process of sealing a container

or storeroom. There are also a few rare examples of Indus seal impressions on one side of a clay disc and a Bactro-Margiana compartmented seal impression on the opposite side. This type of token may have been used as a passport for traders who would travel between the Indus Valley and Central Asia.

The most common form of Indus seal has an animal motif with writing along the top. A manger or offering stand was often carved beneath the head of the animal. The most common animal motif is a unicorn, which is clearly a mythical animal invented by Indus elites to represent a person's office or perhaps a larger ethnic community. Other animal motifs include humped and nonhumped cattle, elephant, rhinoceros, tiger, and a variety of antelope, sheep and goat. During the final Harappan Phase (3C at Harappa), a distinctive form of rectangular seal was introduced with only script and no animal motif. These seals were also used for sealing goods, but they may represent a distinctive community that was not associated with traditional official positions or ethnic communities.

The other important category of impressed and inscribed objects are small tokens or tablets that were made by incising steatite or moulding terracotta or faience (Fig. 1.25.6). These small tokens were probably used for keeping accounts and maintaining trade contacts between the larger cities. Some seals and moulded tablets have writing in combination with narrative depictions of myths and religious ceremonies. This suggests that the writing was used to identify the name of the ritual or deity, or possibly the person who sponsored a specific ceremony. Distinctive moulded copper tablets with script are found only at Harappa, and incised copper tablets with script and animal motifs are found only at Mohenjo-daro. These examples of metal tokens with writing may have been used as a form of city coinage during the last part of the Harappan Phase. At the site of Dholavira, a large signboard with inlaid script was found in a side room of the northern gateway of the citadel. Excavations at Harappa have confirmed that the types of objects that were being inscribed changed over time (Kenoyer & Meadow 2008), and ongoing analysis of the script on different types of seals suggests that there were contextual or chronological changes in the actual writing itself (M. Vahia and N. Yadav 2010, pers. comm.).

The multiple contexts and ways in which writing was used suggest that the script could be used to encode a range of messages relating to various aspects of economic, political and ideological life. What is most intriguing is that inscribed Indus seals and tablets disappear from use at all Indus sites around 1900 BCE. Modified forms of graffiti are seen on pottery in some regions, but many of the signs do not appear to derive from the Indus script. This disappearance of the Indus script can be correlated with other changes that will be discussed in more detail later in this chapter, but it is probably linked to changing ideologies and a disruption of the political and economic system.

## Art and Religion

Urban and rural communities of the Indus region appear to have shared some basic beliefs that are reflected in architectural

orientation, ornament and burial traditions, art and decorative motifs, figurines, painted pottery designs and a wide range of abstract symbols that are reproduced in a variety of media. There is also some variation in the decorative arts and various types of symbolic objects over time as well as across different regions. No evidence exists for a dominant religious tradition, and no formal permanent temples have been identified at any Indus site. However, during the Middle and Late Harappan Phase (3B and 3C at Harappa), narrative seals with depictions of worshipers and ritual processions confirm that the people living in the cities practised various types of ceremonies. Worshipers are depicted kneeling with one knee on the ground and the other raised, presenting offerings to horned deities who are standing in a sacred fig or pipal tree (*Ficus religiosa*) (Fig. 1.25.7). The use of horned headdresses to depict deities is well attested in Mesopotamia (Potts 1997), and this tradition probably extended throughout the Indus region as well. The narrative seals also depict scenes of drumming in front of a large tiger image, and processions with people carrying banners and images of a unicorn. Rituals may have been performed in other contexts, such as around the hearth, at doorways or simply in a clear space, but so far no preserved ritual space has been discovered, and claims for the widespread use of fire-altars cannot be confirmed with archaeological evidence (Kenoyer 2006).

Indus craftsmen used a variety of abstract motifs, such as the stepped cross, swastika, circle and dot, intersecting circle and the endless knot. These motifs were painted on pottery or incorporated into ornament design, and often inlaid into wooden furniture using shell or stone inlay. Such geometric and abstract floral diagrams probably represented concepts of cosmological order, protection or control. They may have functioned in the same way that mandalas are used to sanctify space or serve as a focus of meditation in later Hindu, Jain and Buddhist traditions.

Animal and human figurines were made from terracotta, copper/bronze, faience and stone. Some figurines combine both animal and human forms, and in some examples up to three different animals were combined into one figure. Animal figurines include various domestic and wild animals as well as the mythical unicorn. Some scholars have argued that the unicorn depicted on the seals was actually a bull seen in profile, but the three-dimensional unicorn figurines confirm that the Indus craftsmen intended to depict a single horned animal. Stone sculptures are relatively rare, but some show standing or dancing male figures and examples of seated males and possibly one female figure have been found at Mohenjo-daro and also at Dholavira. The most famous of these stone figures was originally referred to as the "Priest-King" (Fig. 1.25.8) based on similar images from Mesopotamia, but there is no way to confirm this identification without the aid of written texts.

Many of the human figurines can be grouped into male or female categories based on ornaments and headdress styles, beards, breasts and diagnostic genitalia. There are, however, some figurines that are androgynous or of ambiguous sex. Traditionally such figurines are thought to have been used for



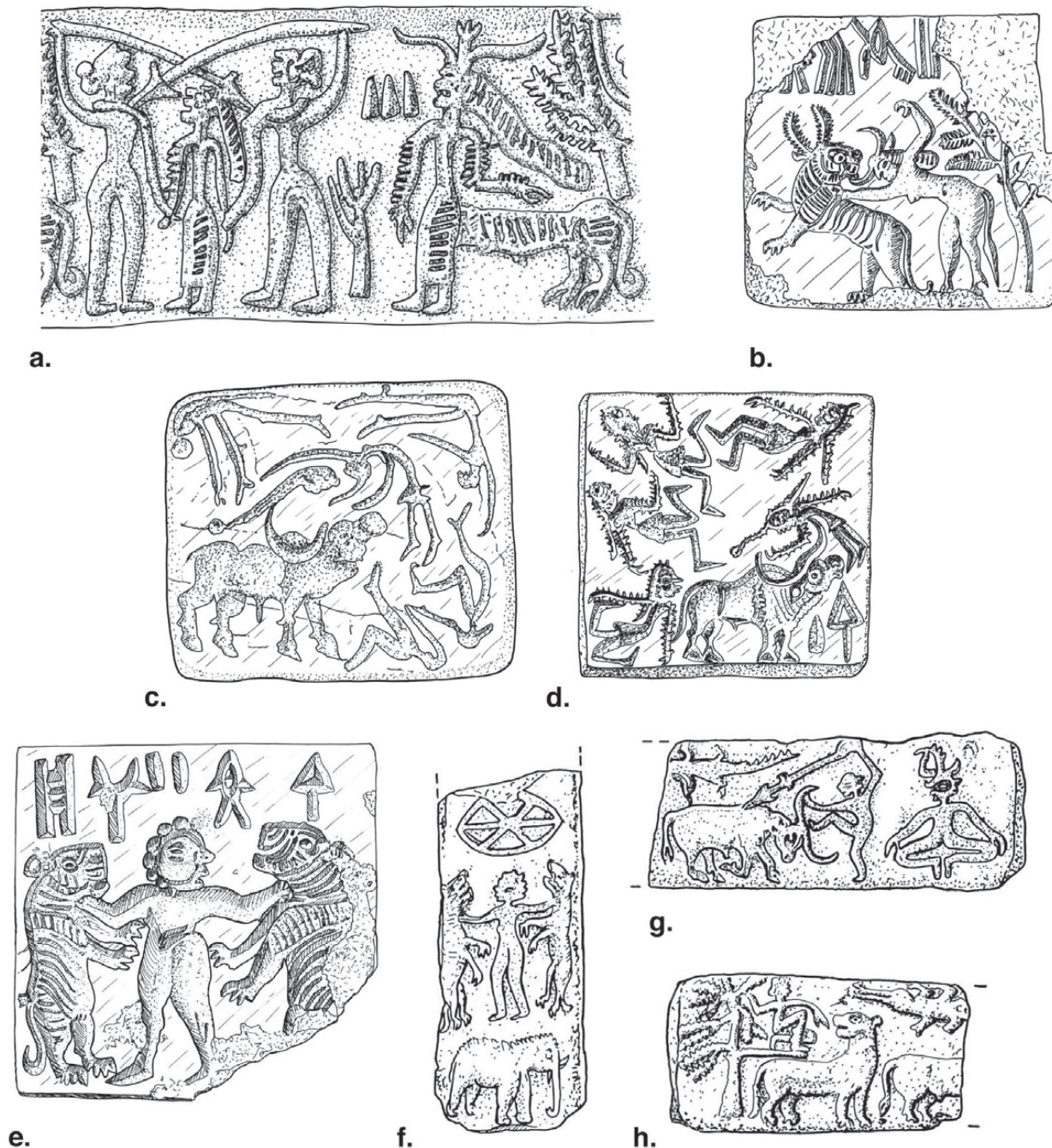


FIGURE 1.25.7. Harappan narrative seals and tablets (not to scale): a. Cylinder seal, horned female with bull-tiger body, cylinder seal, Kalibangan, c. 2 cm ht (after Joshi & Parpola 1987: KB-65); b. Seal, horned deity attacking horned tiger, Mohenjo-daro, c. 4 × 4 cm (after Parpola, Pande & Koskikallio 2010: M-1919); c. Seal, buffalo attack scene, Mohenjo-daro, c. 2 × 2.5 cm (after Joshi & Parpola 1987: M-312); d. Seal, buffalo attack or bull-leaping scene, Banawali, c. 3 × 3 cm (after Umesao 2000: 88, cat. no. 335); e. Seal, hero and tigers contest scene, Mohenjo-daro, c. 3.34 × 3.4 cm (after Joshi & Parpola 1987: M-308); f. Moulded terracotta tablet, hero or heroine and tigers contest scene, Harappa, obverse, 3.9 × 1.6 cm (H95-2486/4651-10); g. Moulded terracotta tablet, deity and water buffalo sacrifice, Harappa, reverse, 3.9 × 1.6 cm (H95-2486/4651-10); h. Moulded terracotta tablet, narrative of man in tree and tiger, Harappa, obverse, 2.8 × 1.5 cm (H2001-5075/922-01).

fertility rituals, but careful study of their contexts suggests that they may have had multiple functions and meanings (Clark 2005). These figurines were most likely used in special rituals or sacrificial offerings, but they have never been found in

a permanent shrine or on an altar. Invariably they are found in the refuse dumps, sump pits or street debris. In many parts of South Asia today, similar figurines are prepared for a specific ritual and then given to children as toys or simply abandoned





FIGURE 1.25.8. “Priest King” sculpture, Mohenjo-daro, Pakistan. (Photo J. Mark Kenoyer, courtesy the Department of Archaeology, Government of Pakistan.)

to the elements. There is evidence for the use of dice and various types of board games as well as games that involved stacks of pottery discs and possibly some form of ball. While games are often seen as recreation today, in many traditional societies they have specific ritual meaning and serve as a mechanism to indoctrinate and socialise young children.

The most direct evidence for religious beliefs is Indus burials, which are generally quite similar at all of the major sites. Cemeteries were normally located to the south or west of the site and have been found in each of the major regions at sites such as Harappa, Dholavira, Lothal, Rupar, Farmana and Kalibangan. Graves were oriented north-south with the head to the north (Fig. 1.25.9). Bodies were usually wrapped in a shroud with a few personal ornaments and placed in a wooden coffin lying on their back. No valuable ornaments of gold, bronze or precious stone beads were included in the burials. Women were often buried with shell bangles on their left hand and occasionally a small bronze mirror. At Harappa, most female burials had one or more stone beads or an amulet. Men were buried with a few beads and occasionally a long necklace or beaded head ornament. Most burials also included various quantities of pottery vessels that would have been filled with food or drink.

Studies of the skeletal remains at Harappa and other sites suggest that the people who were buried were relatively healthy and well fed during their life (Lovell & Kennedy 1989; Hemphill, Lukacs & Kennedy 1991; Kennedy 2002). Some had

evidence for caries and tooth loss from abscesses and a few had arthritic joints. There is some rare evidence for porotic hyperostosis of the crania that could result from anaemia due to malaria. Genetic trait analysis of the skeletal remains has shown that there may have been increased gene flow between populations in the Subcontinent and West Asia as a result of increased trade and small-scale regional migration (Hemphill, Lukacs & Kennedy 1991), but these patterns need to be tested with DNA analysis. Newly developed techniques for obtaining DNA from heavily weathered human bone and teeth may allow some insight into the linkages between the Indus people and other contemporaneous cultures, but so far they have not been successful. Strontium isotope studies of the burials from Harappa and other sites are currently under way, and judging by their success in other regions of the world (Price 2000), they should shed light on residence and migration patterns at sites such as Harappa. The few burials that have been recovered from the cemeteries represent only a small portion of the population and, based on the distinctive pottery and ornaments, these individuals can be identified as members of the Indus elite (Kenoyer 2000). The remainder of the urban and rural populations were not buried and must have been disposed of through water burial in the rivers, exposure in the jungles or possibly cremation. During the Late Harappan Phase, at sites such as Harappa and Dholavira, the extended coffin burials were replaced by secondary pot burials and cist or tumuli burials.

## Localisation Era: Late Harappan Transformation and Reorganisation

After more than seven hundred years, the Harappa Phase urban integration began to change during the Localisation Era (1900–1300 BCE). The processes going on in different parts of the Indus Valley are collectively referred to as Late Harappan, but each region had distinctive settlement and pottery styles as well as evidence for new subsistence systems and ideologies. The major Harappan Phase cities and their supporting settlements were affected by a wide range of variables, including environmental degradation, changing river systems, fluctuations in rainfall, population pressures in some cities and abandonment in others. The drying up of the Ghaggar-Hakra-Saraswati River and shifting river systems on the Indus led to the disruption of agriculture and the eventual breakdown of trade and political networks (Kenoyer 1998; Possehl 2002b).

The gradual reorganisation of trade and technology, along with other social and ideological changes, contributed to the emergence of new cultural, political and religious traditions. These changes can be traced to as late as 1000 BCE, where Late Harappan cultures overlap with later traditions, particularly in Balochistan, the Punjab and parts of the Upper Ganga-Yamuna

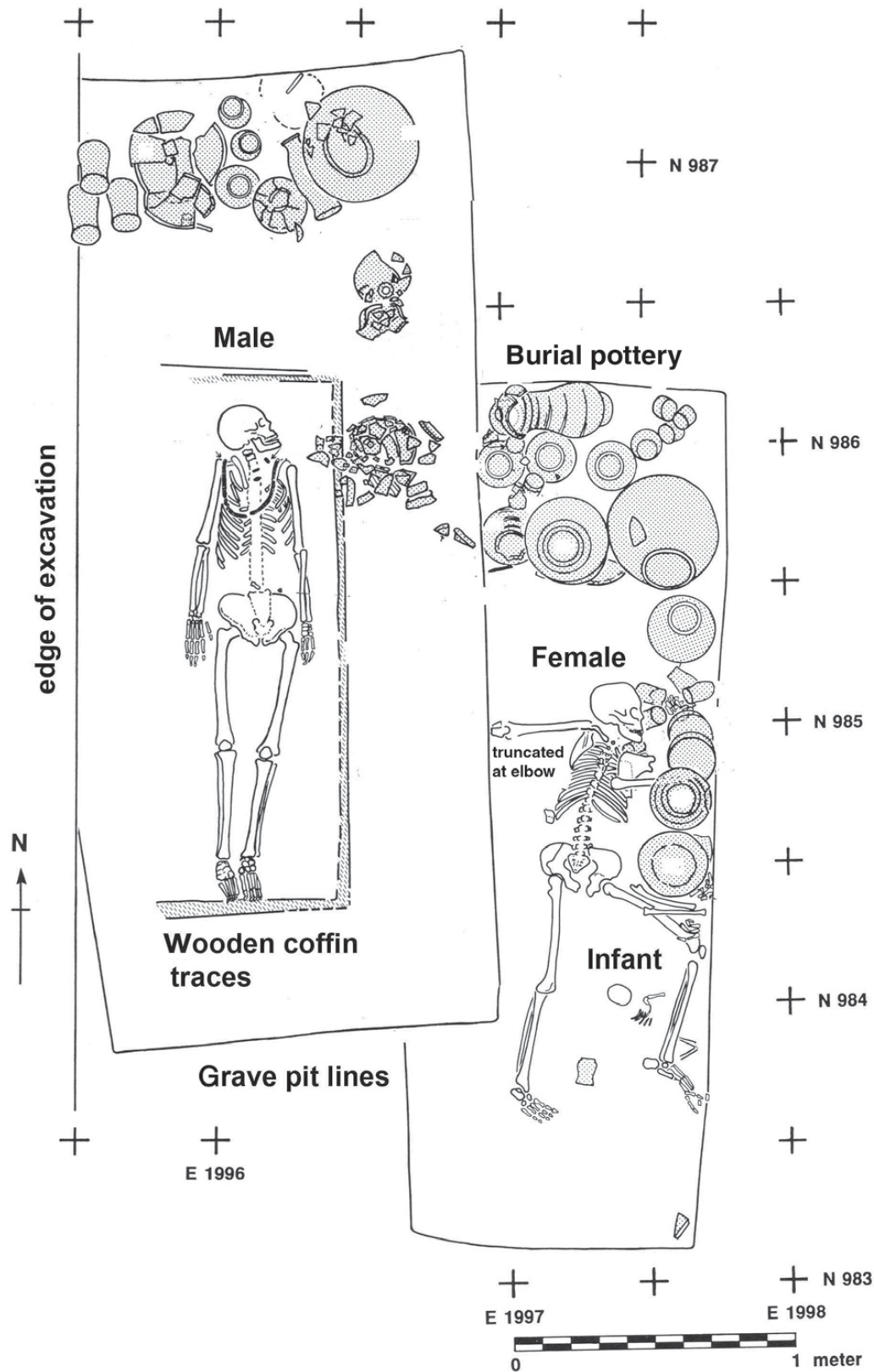
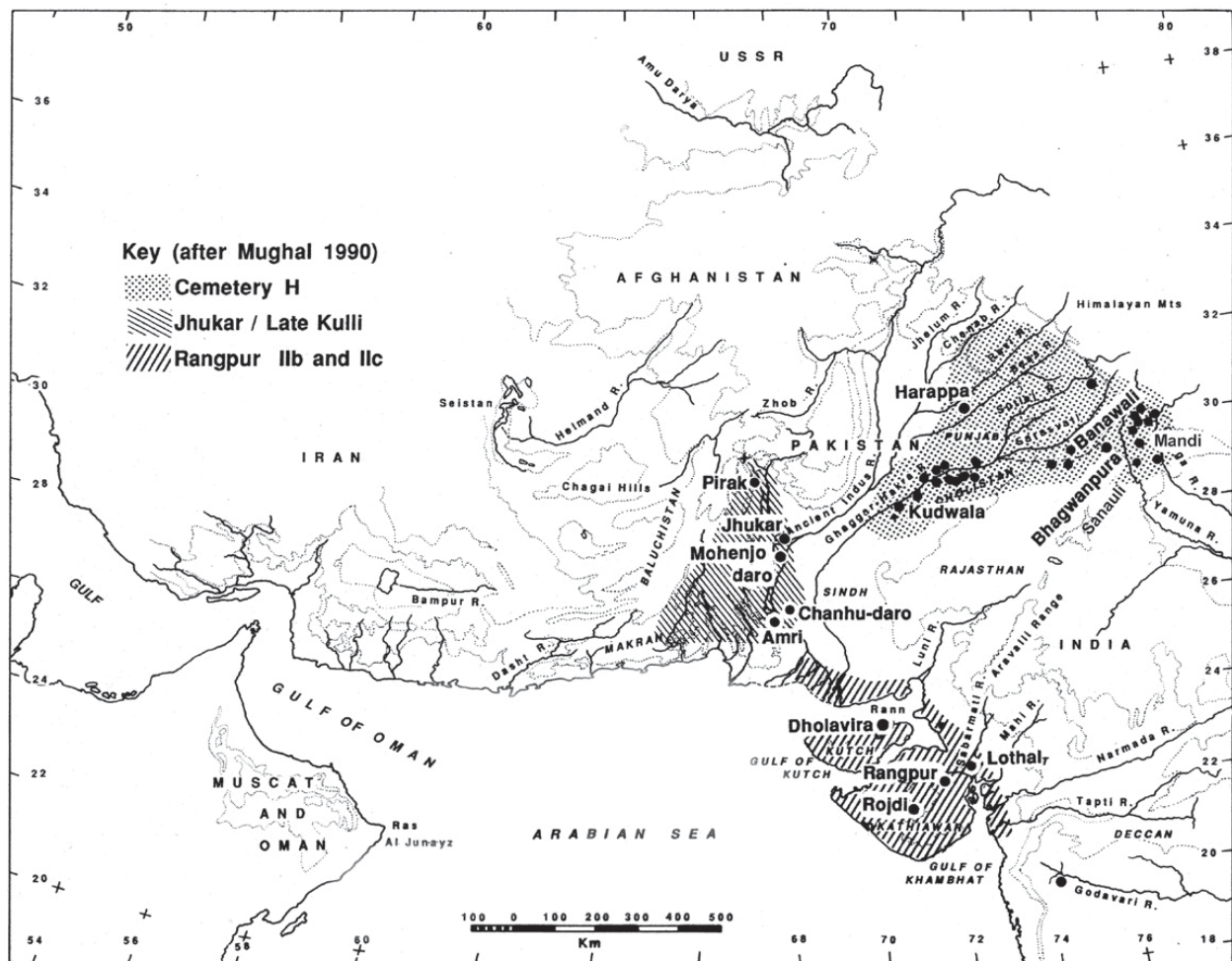


FIGURE 1.25.9. Harappan burials, Harappa, Pakistan. (Courtesy the Harappa Archaeological Research Project.)



MAP 1.25.5. Indus Tradition: Localisation Era sites.

River Valley. Various Late Harappan cultural phases have been identified throughout the greater Indus region, and more will be defined as new surveys and excavations are undertaken (Map 1.25.5). The Punjab or Cemetery H Phase can be identified throughout the Punjab and Ganga-Yamuna region, the Jhukar and related phases are found in Sindh and Balochistan and the Rangpur or Lustrous Red Ware Phase and associated black-and-red ware ceramic styles are seen in Gujarat, Rajasthan and the Malwa Plateau.

While some scholars refer to this period as the decline of the Indus civilisation (Wheeler 1968; Allchin & Allchin 1982; Ratnagar 2000), it can also be seen as a period of transformation and reorganisation leading eventually to a new phase of urban development during the 1st millennium BCE (Lal 2002; Possehl 2002b; Kenoyer 2006; Wright 2010). Earlier models attributed the decline of the Indus cities to the migration or even invasion of Indo-Aryan speaking communities into the Subcontinent. So far, there is no archaeological evidence of invasion or warfare during the Late Harappan Period, but the Vedic oral traditions do confirm that Indo-Aryan-speaking communities were present in the northern Indus Valley during or just after the Late Harappan Period (Bryant 2001). Since the old models of

migration and invasion have been refuted, new models for explaining the presence or spread of this language family need to be correlated to the meagre archaeological record (see Chapters 1.26 and 1.27).

## Unanswered Questions and Future Challenges

Many of the questions regarding the origin and development of the Indus urbanism have been partly answered through new surveys and excavations, meticulous scientific research and the reanalysis of previously excavated materials. New discoveries are always possible in the Indus region itself, but new discoveries are also being made in Iran, Central Asia, the Gulf and possibly peninsular India. Somewhere there must be a bilingual inscription that will make it possible to start deciphering the Indus writing system and to determine the language or languages that it represents. Another question that needs to be addressed is the genetic history of the Indus people. With increasingly powerful scientific techniques, it might be



possible to obtain DNA from the heavily weathered human bone and teeth from Indus burials. The main challenge, however, will be to link these data with later populations, who predominantly practised cremation and for whom we therefore have no human skeletal remains. Finally, we need to meet the challenges of educating individuals and communities who can help to protect the rapidly disappearing archaeological record so that future generations can continue to build our knowledge of the earliest urban civilisation in South Asia and its contributions to the modern world.

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