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## Changing Perspectives of the Indus Civilization: New Discoveries and Challenges<sup>1</sup>

JONATHAN MARK KENOYER\*

*It is a great honor for me to be able to address this distinguished audience of leading scholars from India and other countries. I want to thank Sri K. N. Dikshit and the organizing committee for inviting me to present this presidential address. I also want to thank all my colleagues in India, Pakistan and other countries who have provided me valuable information resulting from their own research. Without this type of constructive and collegial interchange of knowledge and ideas our field cannot progress. In my presentation today I want to emphasize that the field of Indus Studies is continuously changing, and all of us need to continue to rigorously test our interpretations and make modifications as new data come to light. I for one am humbled by the many new discoveries being made on many fronts. When I read some of my early articles from the 1980s and early 1990s, I realize how little we knew about Indus trade, technology, socio-economic organization and ideology. And even though we do know a lot more today, there is so much more to discover through surveys and excavation, as well as more detailed analyses. We must continue to refine our research strategies and expand our knowledge of this intriguing and thought provoking culture.*

*The following presentation will focus on some of the major new perspectives on the Indus Civilization that are the result of new discoveries at sites in both the core regions of the Indus Civilization that are found in Pakistan and India. New research in adjacent regions are also revealing evidence of ancient interactions between the Indus region and the territories of modern Afghanistan, Turkmenistan, Iran, Oman, the United Arab Emirates, Bahrain, Kuwait, Iraq, Syria, and even further afield. A few of these important discoveries will be discussed to highlight the challenges that we face in understanding the complex networks of exchange and interaction that were present in the 3<sup>rd</sup> millennium BCE.*

Ever since its discovery in the 1920s, the Indus Civilization has been regarded as one of the earliest urban societies, but there have been many misconceptions about its origins, character and decline. Even today, in general cross cultural comparisons with other early civilizations, the Indus tends to be viewed as an anomaly

and generally less developed than other early state level societies. One of the main reasons for this situation can be attributed to the use of different interpretive frameworks and different definitions of what constitutes a state level society. Using the overarching and broader framework of "Cultural Traditions" (Shaffer 1991:442 after Willey

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<sup>1</sup> Presidential Address of the Indian Archaeological Society

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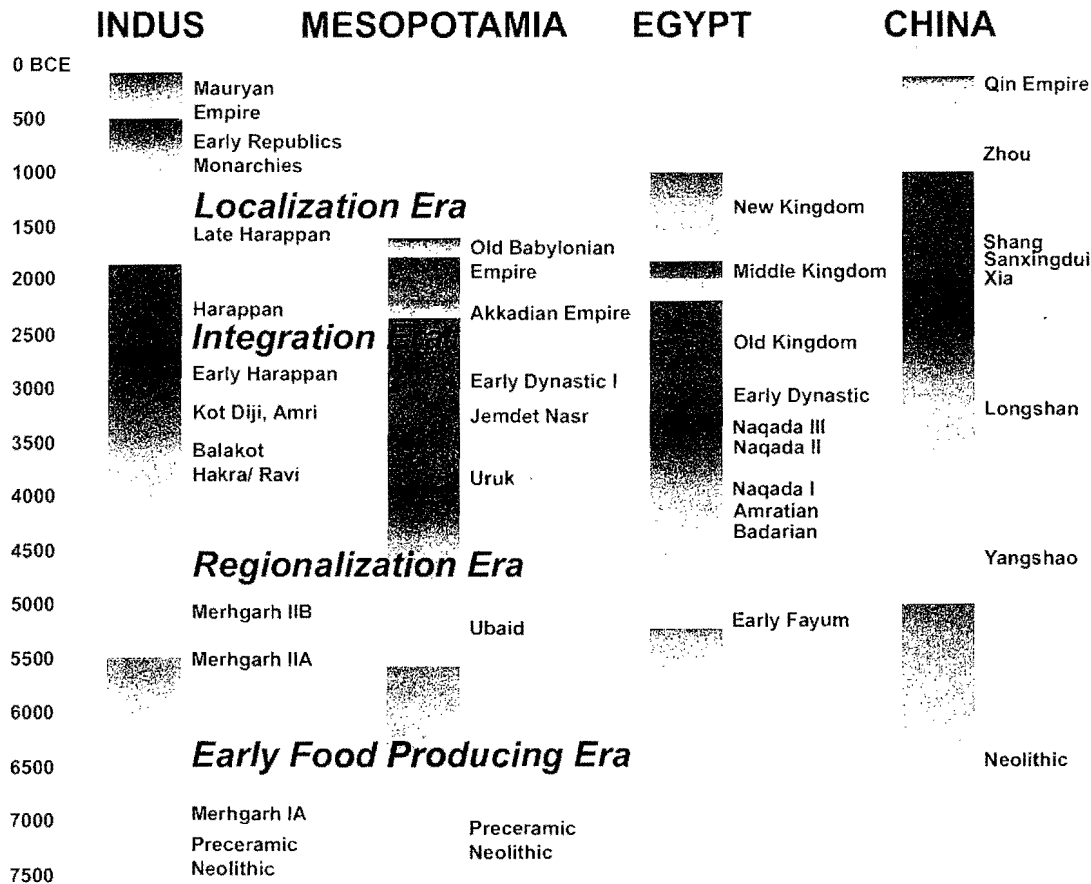


Fig. 1: General Chronological comparison between early Old World Civilizations

and Phillips, 1958:37, Kenoyer 2008), it is clear that the Indus Civilization was developing along a similar trajectory as Mesopotamian and Egyptian cultures (Fig. 1). Differences in chronology in terms of the adoption of domesticated plants and animals, or the emergence of centralized towns or cities can be attributed to the fact that environmental factors, availability of resources, population factors, etc. provided other alternatives for adaptation. The simplistic diffusion model of early domestication, or specific technologies, urbanism and writing emerging first in Mesopotamia, and then spreading to Egypt and the Indus Valley region is no longer supported by the recent discoveries in each of these regions. These discoveries result from the work

of many different groups of scholars working in India and Pakistan as well as in surrounding regions.

### Indus Cultural Tradition: General Framework and Chronology

An important new development in the study of the Indus has been the conceptualization of spheres of interaction. At the macro level we can use the concept of Cultural Traditions that refer to long-term trajectories involving the development of specific technologies and cultural systems that are associated with each other within a specific geographical area, and demonstrate a long-term continuity. This approach is relevant to



Fig. 2: Major Cultural Traditions of South Asia

all periods of human history, but in the context of this presentation I will focus on the major cultural traditions that relate to the initial emergence of cities and urban culture in the northwestern sub-continent. The Indus, Baluchistan, and Helmand Traditions have been the ories

most closely associated with the rise of Indus urbanism. However, there is increasing evidence to suggest that the Bactro-Margiana, Malwa, Ganga-Vindhya, and Deccan Traditions also played some role in the rise of the Indus cities (Kenoyer 2008, Ajithprasad 2002, Shinde 2002,

Tewari *et. al.* 2008) (Fig. 2). Each of these traditions is represented by various Eras and Phases, and all of them are linked during their respective Integration Eras to the later Indo-Gangetic Tradition. The Indo-Gangetic Tradition is situated throughout most of the peninsular subcontinent and represents a period when urbanism spread to the Yamuna-Ganga region and to the Malwa and Deccan areas. This period is commonly referred to as the Early Historic Period, and ongoing research suggests that there is in fact a continuity of urbanism from 2600 BC through to the later time periods (Kenoyer 1995, 2006a, 2006b, 2010).

**Table 1: Indus Tradition**

Foraging Era	10,000 to 2000 BCE
Mesolithic and Microlithic	
Early Food Producing Era	7000 to 5500 BCE
Mehrgarh Phase	
Regionalization Era	5500 to 2600 BCE
Early Harappan Phases	
Hakra, Ravi, Sheri Khan Tarakai,	
Balakot, Amri, Kot Diji, Amri,	
Nal, Sothi, Tochi-Gomal, etc.	
Integration Era	
Harappan Phase	2600 to 1900 BCE
Localization Era	
Late Harappan Phases	1900 to 1300 BCE
Punjab, Jhukar, Rangpur	

Each of the major traditions can be subdivided into Eras and Phases, which have been discussed in more detail in other articles (Kenoyer 1991, 2008; Shaffer 1992) (Table 1). It is important to note however that mobile and/or sedentary foraging communities were clearly present in all areas of the Indus valley, prior to the emergence of urbanism and that there is no need to see an influx of new populations bringing a new way of life to the alluvial plains. At Harappa, recent discoveries of geometric microliths in the lowest levels

of the site suggest that there may have been an earlier Epi-Palaeolithic or Microlithic occupation at the site (Kenoyer 2011). This discovery should not be surprising given the common use of geometric microliths at the site of Mehrgarh during the Early Food Producing Era (circa 7000 BCE), the report of microlithic tools at the lowest levels of sites such as Allahdino (Fairservis 1982) and Amri (Casal 1964), and the recent report of sites with microlithic tools in the Thar Desert in Sindh (Mallah 2008a). The well-known data from Mesolithic sites such as Bagor (Shinde, Deshpande and Yasuda 2004) and Tilwara (Misra 2007) in Rajasthan now make much more sense as there appears to have been a long tradition of interaction between settled communities and foraging communities throughout the northwestern subcontinent.

These data indicate that foragers were present in the exact locations where we later see the emergence of settled agro-pastoral communities during the Early Food Producing Era (7000-5500 BCE) and the Regionalization Era (5500-2800 BCE). Future excavations are needed at sites with significant stratigraphic deposits and multiple periods of occupation in order to determine the impact of these indigenous foraging communities on the processes that led to domestication and sedentism, and eventually to the establishment of urban centers. Unfortunately the deposits of this type are often buried deeply beneath later occupation deposits as is the case at Mehrgarh, Harappa, Amri and Allahdino. However, we can assume that foraging communities continued to exist in the vicinity of settled towns that they probably participated in some aspects of the economy of major urban centers during the Integration Era (2600-1900 BCE).

The site of Harappa is one of the sites where we can follow the gradual emergence of a major urban center, and the major discoveries at the site can be used to compare with recent discoveries in surrounding regions. The overall chronology of the site is based on both radiocarbon dates and detailed studies of architecture, pottery, and other diagnostic artifacts (Meadow and

Kenoyer 2008, Kenoyer 2008) (Table 2). This general chronological framework can be applied to surrounding regions in order to better understand similarities and differences in local processes.

**Table 2:** Prehistoric Chronology for Harappa

Regionalization Era	
Period 1A and 1B – Early Harappan/ Ravi Phase	c. >3700 – 2800 BC
Period 2 – Early Harappan/ Kot Diji Phase	c. 2800 – 2600 BC
Integration Era	
Period 3A – Harappan Phase	c. 2600 – 2450 BC
Period 3B – Harappan Phase	c. 2450 – 2200 BC
Period 3C – Harappan Phase	c. 2200 – 1900 BC
Localization Era	
Period 4 – Harappan/Late Harappan Transitional	c. 1900 - 1800 BC(?)
Period 5 – Late Harappan Phase (Cemetery H)	c. 1800 (?) – 1700 BC

### Regionalization Era: Ravi and Kot Diji Phases

The first evidence for settled agro-pastoral communities at Harappa is associated with the Ravi Phase (>3700-2800 BC) (Kenoyer and Meadow 2000), which is broadly comparable to what has been referred to as the Hakra Phase (Shaffer 1992, Mughal 1991) (Fig. 3). While it is not possible to present all of the arguments in this paper, the Ravi and the Hakra drainage areas are geographically distinct and it would be better to differentiate sites from these two regions in order to better define the nature of specific cultural and socio-economic networks during this general time period (Kenoyer 2011 in press). The Hakra drainage area itself could be separated into at least three zones, Eastern Hakra, Cholistan-Hakra, and Nara-Hakra (Mallah 2008a, Uesugi 2011 in press), which would make it much easier to study and compare the local adaptations in the different regions.

Based on the excavations at Harappa, the Ravi Phase occupation covered approximately 10 hectares with a possible division of the site into two sectors (Kenoyer and Meadow 2000). Two other smaller Ravi Phase sites located to the north and south of Harappa indicate that Harappa may have been a major node in a more extensive trade network linking the upper Indus valley to the southern plains. Jalilpur is located some 28 km to the south (Mughal 1972, 1974), and the site of Rajanpur is on the opposite bank of the Ravi around 77 km to the northeast (Mughal *et. al.* 1996). The analysis of rocks and minerals from the Ravi occupation at Harappa by Randall Law (2005, 2011) indicate that most of the grinding stones come from the Kirana Hills just north of Rajanpur, and other exotic minerals, such as steatite, copper, and grey chert, come from regions even further to the north in the Salt Range, as well as the mountainous regions of

Hazara, Mohmand, Bajaur, Jammu/Kashmir, and Afghanistan. Other rocks such as Pab sandstone for grinding stones come from the Suleiman range to the west and tan-brown chert come from the Rohri hills to the south. While many of the source areas for these rocks can now be identified, archaeological sites dating from this period have not been reported from many of the northern areas. This means that much additional research needs to be carried out in order to find the evidence for the communities who were accessing the important mineral resources along the periphery of the Indus valley.

The Ravi Phase itself can be divided into two sub-phases based on the presence of hand-built ceramics in Period 1A and a small percentage of wheel thrown pottery in Period 1B. Pottery was decorated with white, red, black or brown paint with some use of a deep red, dark brown, or black slip. Many of the motifs were

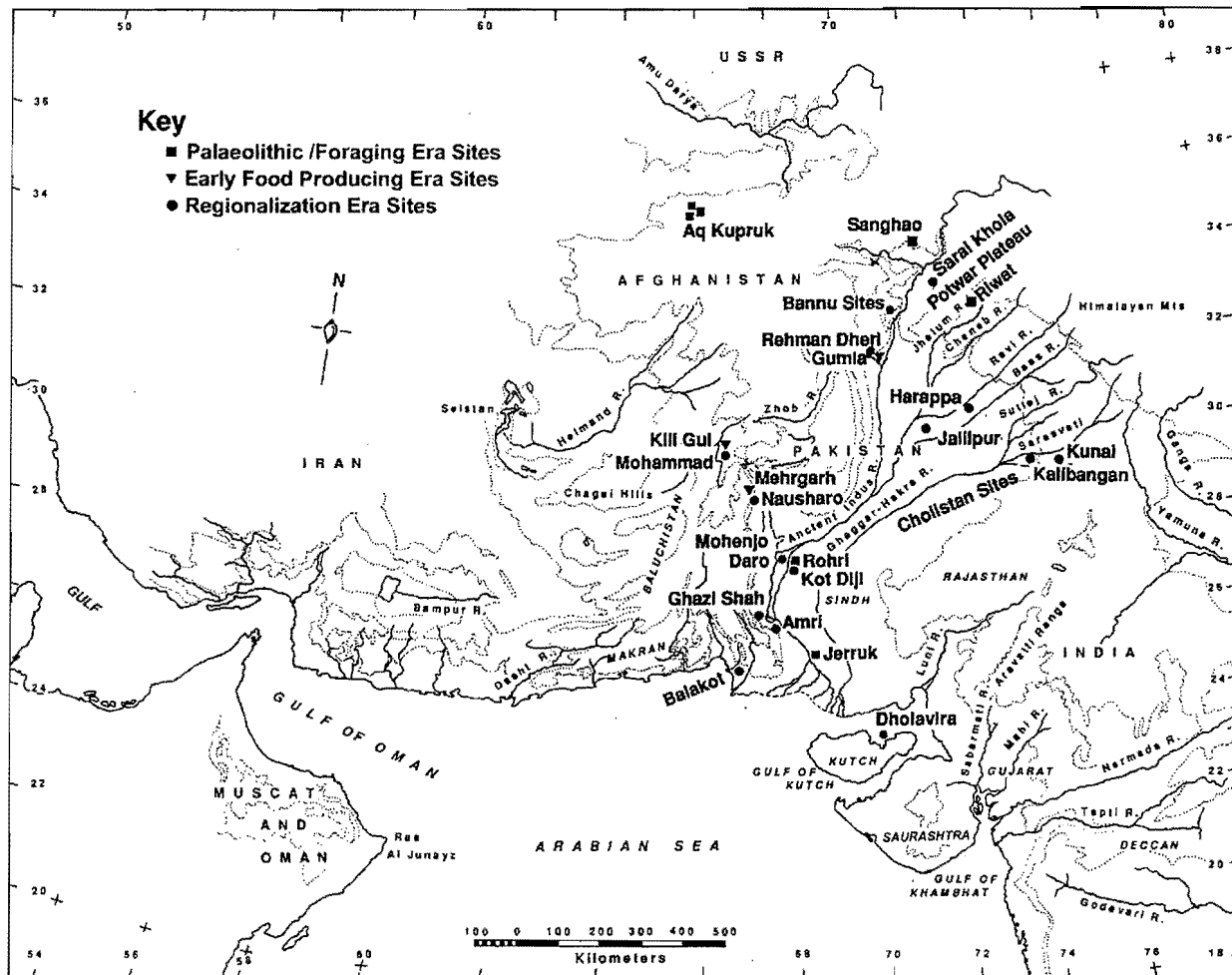


Fig. 3: Regionalization Era Sites

floral or geometric motifs, but some bird shapes were also found. Some of the cooking vessels and storage jars were coated on the exterior with a thick layer of coarse appliqué, made with coarse sand, calcium carbonate nodules and some crushed pottery or grog. This is the type of pottery that Mughal refers to as “Hakra Mud Applique Ware” (Mughal 1982). This general type of pottery is actually quite widespread in the greater Indus region and Baluchistan, and further studies need to be carried out to understand regional styles and variations. During the Ravi Phase there is evidence for both pre-firing potter’s marks and post-firing graffiti on pottery. Some of the signs appear to be early forms of the Indus

script (Kenoyer and Meadow 2008).

Pottery and other artifacts have been found in circular hearths lined with clay and associated with small, constricted mouth storage pits that were plastered with red-ocher clay. Larger circular storage pits were lined with vegetable temper plaster. Some structures were made with posts and the overall layout appears to be north-south and east west. A dump of hand formed mud brick, and some partial mud-brick walls (also oriented in the cardinal directions) have bricks that were made in a thickness : width : length ratio of 1:2:4 ratio. This indicates that the classic Harappan brick size ratio



can be traced to the early Ravi phase occupation at sites such as Harappa. Mughal does report the presence of mud-brick structures at Jalilpur, but does not provide the sizes of the bricks.

In addition to brick and pottery making, a wide variety of crafts were being carried out at the site. Terracotta figurines of both animals and humans have been found. A fragment of what might be a toy terracotta cart and a large terracotta wheel may represent the earliest evidence for cart technology in the Indus region (Kenoyer 2009). The discovery of terracotta wheels at the site of Girawad, Haryana (Shinde *et. al.* 2008), from a similar chronological period suggests that wheeled carts may have been used in many areas of the Indus region. Textile production can be identified on the basis of fabric impressions on clay beads, as well as the discovery of spindle whorls and bone weaving tools. Copper prills suggest a limited amount of copper working to make small pins, rings and arrowheads. Shell bangle manufacturing waste indicates that marine shells of *Turbinella pyrum* were brought to the site and processed there. Manufacturing waste for fired and glazed steatite beads, stone beads, chert and agate drills, chipped stone tools and various ground stone objects has also been recovered (Kenoyer and Meadow 2008, Kenoyer 2011 in Press).

There is no stratigraphic break between the Ravi and the Kot Diji Phase (2800-2600 BCE) occupation levels in the areas that were excavated. Overall there appears to have been a process of continuous development and gradual growth of the site. The Kot Diji Phase occupation is found directly above the Ravi occupations on both Mound AB and the northwestern corner of Mound E. The size of the Kot Diji site however is around 27 hectares and the two different mounded areas were surrounded by massive mud brick walls. The overall proportion of the mud bricks stays the same, but the bricks were made using molds and not by hand forming. A smaller size of brick (7 x 12 x 24 cm) was

used for domestic architecture and a larger size (10 x 20 x 40 cm) was used for platforms and city walls. The construction of walls around the site, along with the provision of major gateways indicates direct control of access into and out of the site. The walls also may have functioned to protect the site from attack by bandits or other communities, but so far there is no indication that such attacks took place.

All of the craft technologies found in the Ravi Phase continued into the subsequent Kot Diji Phase, but there were some significant modifications and technological improvements. Pottery began to be produced on a fast wheel and only a few vessel forms were made by hand building. Many of the same motifs appear on the pottery, such as intersecting circle motifs, fish scale, and floral designs, but at Harappa, the common polychrome decorations were generally replaced with black on red slip. New forms of surface treatment become common and include fine horizontal grooved or combed surfaces along with combed wavy designs on plain, cream or red slipped surfaces. Although pottery with incised lines and decorations is common in the Hakra area, this feature is not common at Harappa during either the Ravi or the Kot Diji Phases. Pottery with pre-firing, potter's marks and post-firing graffiti continue, but during the Kot Diji Phase there are more examples of two or more signs combined to make more complex inscriptions (Kenoyer and Meadow 2000, 2008). Along with the construction of city walls, the invention of cubical stone weights and carved seals with animal motifs and Early Indus script indicate that some communities were beginning to dominate both economically and politically (Kenoyer and Meadow 1999).

The evidence for continuity from the Kot Diji to Harappan period that has been documented at Harappa was previously known from smaller settlements such as Kalibangan (Lal *et. al.* 2003) and Kot Diji (Khan 1964, 1965, Mughal 1970) so it is not really that surprising to find this evidence confirmed at Harappa. However,

the importance of this pattern from Harappa increases when seen in the context of new regional surveys in the surrounding region. In the past it was thought that Harappa was a relatively isolated site in the northern areas of the Indus valley, with a hinterland filled with pastoral nomads (Possehl 1984), but the discovery of numerous smaller Kot Diji phase settlements along the Ravi and Beas River Valleys (Mughal *et. al.* 1996, Wright *et. al.* 2005) indicate that during the Kot Diji Phase itself, Harappa was a substantial urban center linked to a hierarchy of smaller sites in the Punjab plain. These sites also had links to settlements in the piedmont zone of Baluchistan and the southern Indus valley, probably even to Mohenjo-daro.

Although it is not possible to reach the lowest levels of Mohenjo-daro, the discovery of Kot Diji pottery in the lowest levels by Wheeler (Alcock 1986, Chaolong 1990) suggests that this site also had a long developmental sequence like Harappa and was not the result of master urban planners who decided to lay out a majestic city as has been proposed by Jansen (Jansen 1989, 1993). The presence of sites such as Amri, Kot Diji and many other Kot Dijian Phase settlements in Sindh (Mughal 1992), along with newly discovered sites along the lower Hakra River Valley in the Thar region (Mallah 2008b) could indicate that Mohenjo-daro was probably a central urban center during the Kot Diji Phase (Kenoyer 2008).

Surveys by Mughal in Cholistan revealed a clear hierarchy of Kot Dijian settlements with large central sites (Mughal 1991, 1992), and surveys and excavations in the upper Ghaggar Hakra region have revealed Kot Dijian occupations at Banawali (Bisht 1978, 1997a) and Rakhigarhi (Nath 1998, 2001). Kot Dijian Phase occupation levels have also been reported at Dholavira (Bisht 1997b). Further studies need to be carried out to confirm the specific relationships between these regional centers and hinterland sites, but it appears as if the initial phase of urbanism in each major region of the starts during the Kot Diji Phase at around 2800

BCE. These early urban centers become more closely integrated during the subsequent Harappan phase and future research needs to focus on trying to define how this integration occurred.

### Integration Era: Harappa Phase

Since we do not have any written records, Indus archaeologists must use purely archaeological and scientific methods to try and understand the mechanisms that led to the integration of major cities throughout the Indus and Ghaggar-Hakra-Sarawati River Valley (Fig. 4). In the past, it has been assumed that the major cities were spaced quite far apart, between 300 to 450 km (Mughal 1992). This spacing and the surrounding hinterland filled with smaller sites was thought to reflect a relative dispersed settlement pattern over a very large geographical area. The lack of clear evidence for warfare or destruction at Kot Dijian sites has led me and others to argue that warfare was not the major mechanism for integration in the Indus region (Kenoyer 1998). I have also suggested that Indus cities such as Mohenjo-daro and Harappa were organized as relatively independent city-states, with direct control over their surrounding rural communities and resources. These cities may have been ruled by corporate groups of competing elites, such as landowners, merchants and ritual specialists, rather than by monarchical elites. This pattern of governance would fit well with the overall layout of the cities, in multiple walled sectors and the lack of centralized palaces. Sites such as Dholavira, with its concentric walled citadel (Bisht 1997b), and other smaller settlements in Gujarat and Baluchistan with massive walled sectors may have been organized along different lines, and were probably governed by a single family. While there may have been some competition and potential for conflict in the peripheral regions, there are no indications that the larger cities were ever attacked or destroyed throughout the 700 year period from 2600-1900 BCE.

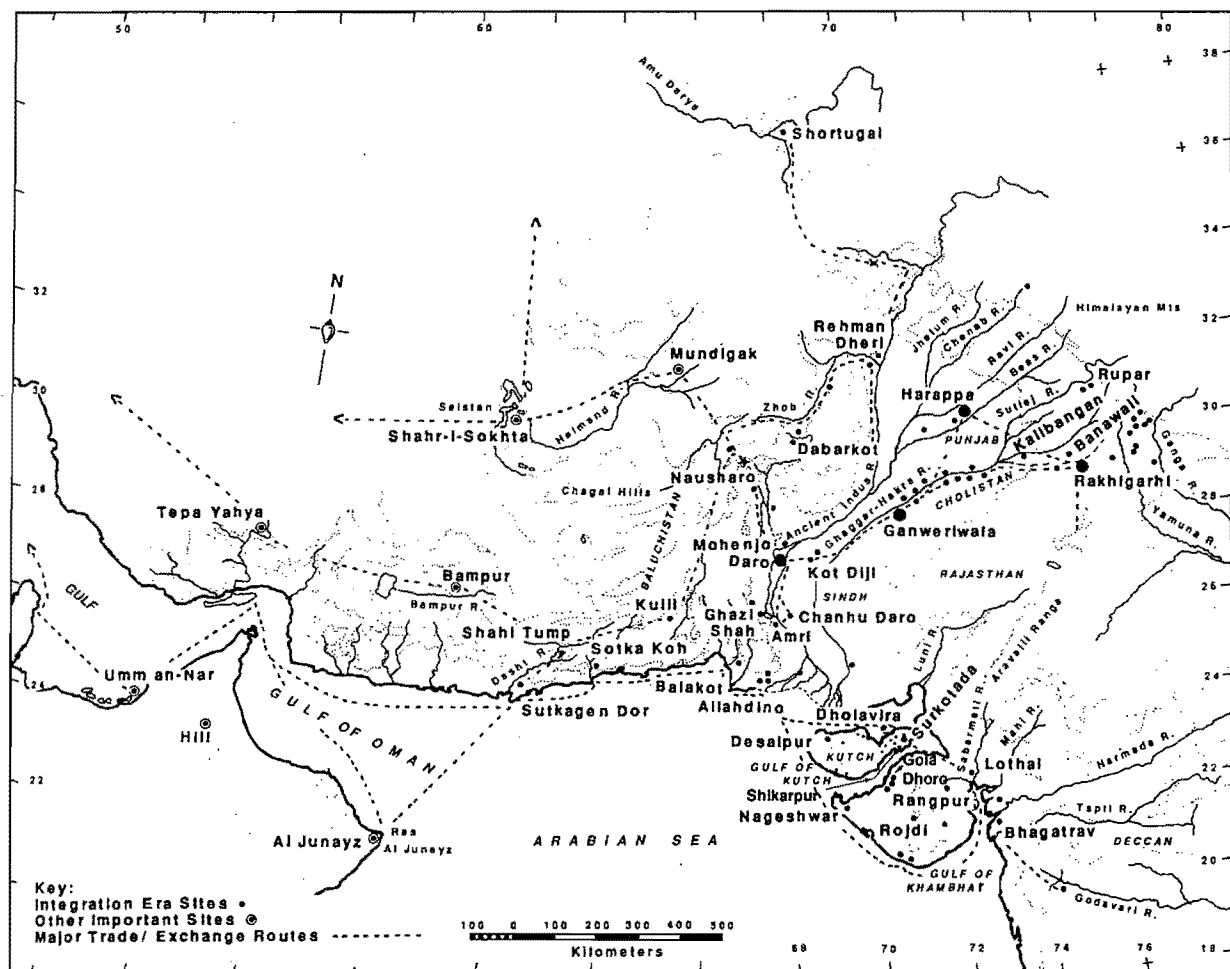


Fig. 4: Integration Era Sites

New discoveries however, are going to require that we rethink some of the models used to understand the settlement patterns and the overall political and economic structure of Indus urbanism. For example, the recent excavations in different parts of the modern city of Sukkur, Sindh, have revealed a Harappa Phase site called Lakhano-daro that is spread out over an area of around 250 to 300 hectares (Nilofer Shaikh and Qasid Mallah 2010 Personal Communication). If the site size and chronology is confirmed, this is as large, if not larger than the site of Mohenjo-daro. Mohenjo-daro, at around 250 hectares has long been considered the largest Indus cities and yet it is located only 80 km

from Lakhano-daro. All the evidence suggests that both cities were occupied during the same general period of time and one can only assume that there would have been strong competition for resources and land, which in turn increases the potential for conflict.

### Indus Seals and Writing

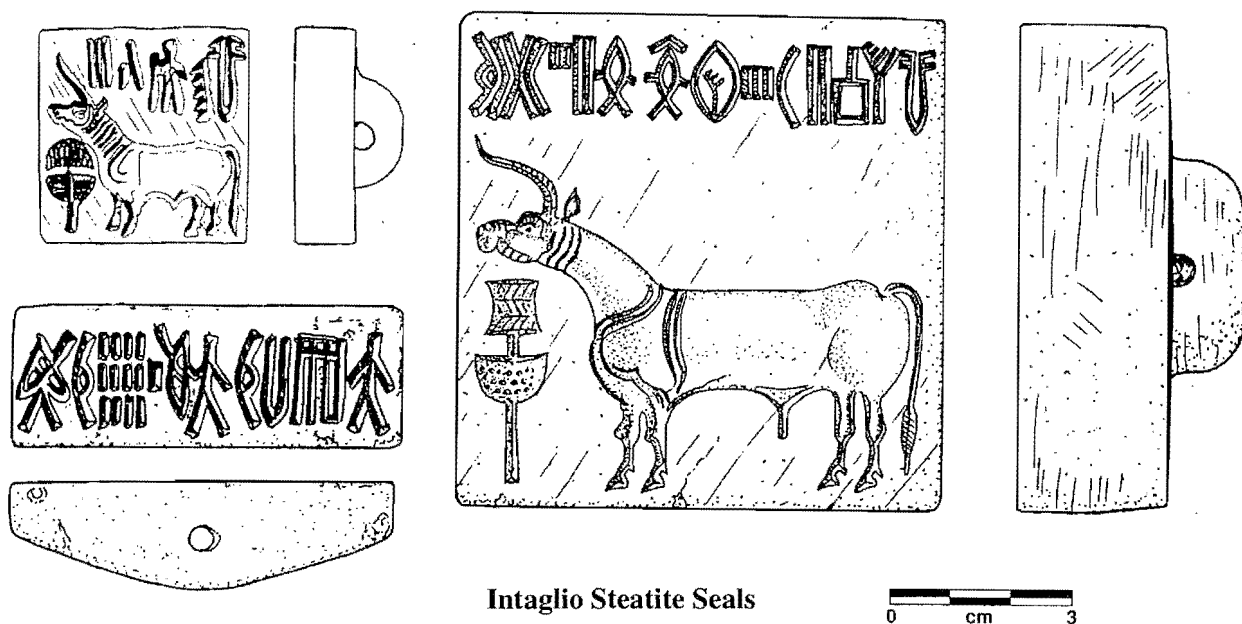
One of the key indicators of elite power in the Indus cities is the manufacture and use of seals and writing (Fig. 5). The recovery of seals from stratigraphic contexts at Harappa, Dholavira, Farmana and other sites allows for a new understanding of the chronology

of seal types and contexts for the use of writing. The earliest square Indus type seal with a perforated boss was discovered in the Kot Diji layers at Harappa along with Kot Diji pottery and other artifacts. The front of the broken and unfinished seal has an elephant motif, but the area where the script would have appeared is missing. A clay sealing of a square seal that did have script along with some plant or geometric motifs was found in the same area and dates to about the same time period, around 2600 BC. These discoveries indicate that script was used on seals, and that animal motifs were beginning to be used during the Kot Diji Phase (Kenoyer and Meadow 2008, 2010).

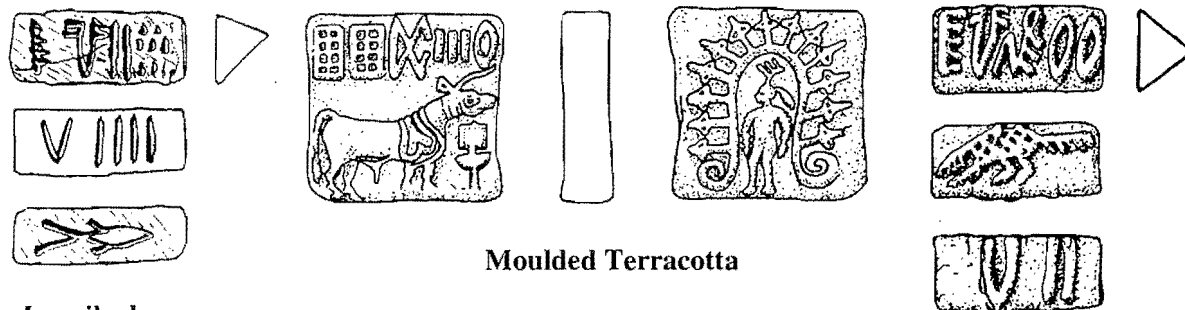
The earliest Harappan Phase seals from Harappa (circa 2600 BC, Period 3a) associated with distinctive Harappan pottery are both broken. One depicts the rear portion of an elephant motif, and the other depicts the rear end of an animal that we can now identify as a water buffalo, based on the complete seal discovered from the site of Farmana (Shinde *et. al.* 2008). At Farmana, a seal with a humped zebu bull and the sealing of a unicorn seal date to the same general time period as the water buffalo seal. Based on the distinctive carving style and square shape of the boss, these seals from Harappa and Farmana appear to reflect the earliest form of Indus square seal. If this early seal style can be confirmed through the discovery of more well dated seals from secure stratigraphic contexts, it would indicate that the elephant, the water buffalo, the humped zebu bull and the mythical unicorn motifs, begin to appear on seals starting around 2600-2450 BCE (Harappa period 3A) (Kenoyer and Meadow 2010). The animal motifs on the seals are thought to represent powerful clans or officials who controlled trade and political organization. The discovery of similar motifs such as the water buffalo at two different sites suggests that there is a shared ideology among the emerging elites in the northern regions of the Indus and Ghaggar-Hakra River Valleys. We still need to find well-dated early seals from Mohenjo-daro and Dholavira, in order to see what the

common motifs are at these sites.

At Harappa during Period 3B (2450-2200 BCE) and at comparable sites such as Mohenjo-daro, and Dholavira, many more varieties of animal motifs are found on the seals, including the tiger, ram, goat, short horned bull, rhinoceros, and animals with multiple combined motifs. The animals are carved in a more naturalistic form, while the script carving tends to become more angular. The boss on the back is made with rounded edges and a central groove. During Period 3B a number of new inscribed objects are found, including molded terracotta tablets and molded faience tablets, and incised steatite tablets (Kenoyer and Meadow 2010). It is during this time period that there circular Indus style seals are found in major Indus sites like Mohenjo-daro, Dholavira and Lothal. These circular seals, particularly ones with script and short horned bull motifs are found at many sites in the Arabian Gulf region, Iran and Mesopotamia (Vidale 2005, Laursen 2010). This time period also sees the first use of seals and molded tablets with narrative motifs and the first use of square seals with only script and no animal motif. The increasing varieties of seal motifs and the new types of inscribed objects that begin to appear during this time period could indicate the emergence of diverse competing communities of elites and new ways of communicating using writing. More research in this area is needed to sort out the distribution of distinct varieties of seals, and to identify the workshops in which they were being produced. Perhaps the most exciting new discoveries regarding Indus seals are the revisions in decipherment of Indus type seals that have been found in Mesopotamia bearing Akkadian inscriptions. These seals have been known for many years (Collon 1994, Reade 1995), but recent developments in Akkadian decipherment suggest that the original translations need to be revised (G. Marchesi 2011, Personal Communication). If the Akkadian inscription is a direct translation of Indus language or ways of writing, then the revised translations may provide new insights into the possible meaning of



Intaglio Steatite Seals



Inscribed  
Steatite  
Tablet

Moulded Terracotta

Moulded  
Faience  
Tablet

Fig. 5: Major Forms of Indus Seals

Indus seals inscriptions. However, it is also possible that the Akkadians distorted the Indus language much the same way that names of people and places in India have been modified in translation to other languages, Chandragupta to Sandracottus, or Takshashilla to Taxila.

The final phase of seal use during the Harappan

period can be dated to between 2200-1900 BCE at Harappa (Period 3C). Square seals with well carved unicorn motifs as well as other animals, and narrative scenes continued to be made, but the script carving becomes quite formal and is generally limited to a uniform linear section at the top of the seal. This style of script carving is also seen on long rectangular seals

that are made without any animal motif. It is during this period that the distinctive pointed base goblets become common at the largest urban centers and some of these goblets are impressed with a square or rectangular form of inscribed seal. Animal motif seals were not used for impressing into pointed base goblets. Fine incised steatite tablets and molded terracotta and faience tablets continued to be produced during this period. Throughout the entire Harappa Phase, pottery vessels were being inscribed using a variety of techniques. Most commonly the script was incised onto the rim, body or base of a vessel after it had been fired. There are some examples of painted script that would have been applied prior to firing, and some pottery vessels have molded or pre-firing inscriptions.

During the Late Harappan Phase at Harappa (1900-1700 BCE, Periods 4 and 5) the use of seals with geometric motifs continues but seals with inscriptions are no longer being produced. Indus script is also not found on Later Harappan pottery or on any other types of objects. Because of the massive disturbance of the Late Harappan levels from brick robbing at Harappa, it is not known if this disappearance was abrupt or gradual. However, it can be correlated to the disappearance of many other aspects of material culture that is associated with the Harappa Phase, including cubical chert weights, the unicorn motif, and many styles of painted pottery. Many other features of Harappan technology do continue to be used, such as faience bangles, beads and other ornaments. There have been some claims for the continuity of Indus script in the Later Harappan and post-Harappan periods, but so far no conclusive evidence has been put forth. This is clearly a topic that still needs further research through the excavation and dating of well stratified occupation deposits.

### **Harappan Burial Traditions**

The final aspect of Harappan traditions that will be presented here relates to the burial traditions of the

Harappans and the evidence for social differentiation and status. Excavations of the Harappan cemetery at Harappa, often referred to as Cemetery R-37 have revealed a very limited number of burials in a relative restricted area (Fig. 6). This cemetery is located to the south of Mound AB and to the southwest of Mound E (Dales and Kenoyer 1991, 1993). Based on extensive test trenches and surveys at Harappa, we can suggest that the area containing Harappan burials covers an area between 0.8 to 1.2 hectares, and extends between 100 to 150 meters east-west and around 80 meters north-south. The highest concentrations of burials are located in an area approximately 60 x 80 meters (0.48 hectares), at the center of the overall cemetery location. It is difficult to calculate the density of burials in unexcavated areas, but from all the excavations conducted so far the minimum number of individuals is around 170 to 200 depending on how different body parts are counted. Several hundred more burials may be preserved in the total cemetery area, but all together they can only reflect a very small proportion of the overall population of ancient Harappa. Radiocarbon dates from the cemetery along with studies of the pottery and artifacts associated with the burials, indicate that the burials date from between 2600 and 1900 BC, spanning the entire seven hundred years of the Harappa Phase. Analyses of the burials themselves indicate that some individuals had caries and abscesses, and some had arthritis. A few individuals, predominantly women individuals show what might be evidence for some malnutrition in childhood but it could also reflect a genetic problem. A few individuals have indicators that might point to diseases that resulted in high fever such as malaria, but there is no evidence for cause of death or massive trauma. Overall, the people buried in the Harappan cemetery were relatively healthy.

Most individuals were buried with pottery vessels that may have been filled with food offerings, including one example of a perforated vessel placed inside a large pot that could have been used to make beer (Kenoyer 1998). Females were often buried with shell bangles

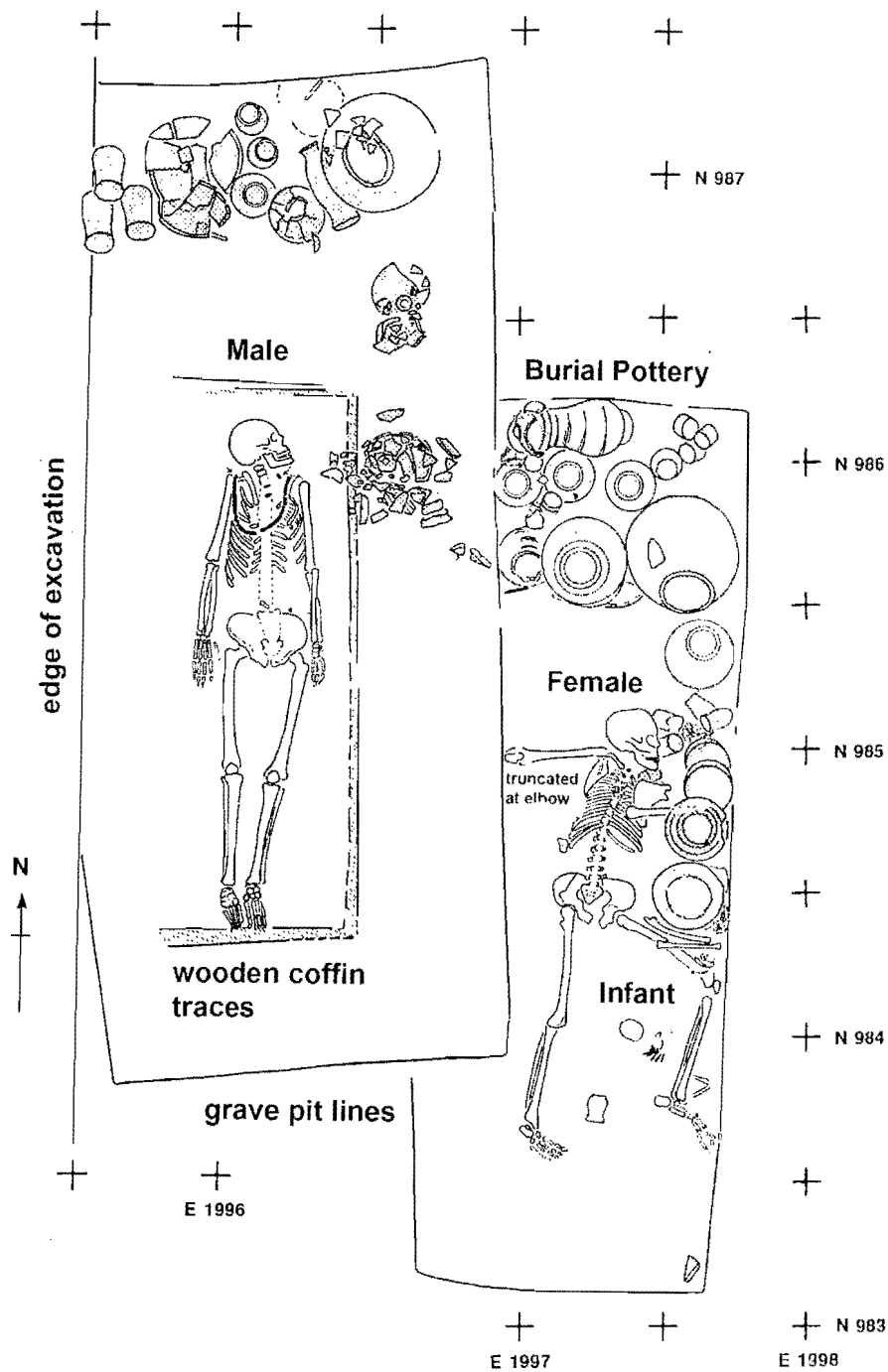


Fig. 6: Harappan Burials

on their left arm, and the earlier burials tend to have slightly wider bangles while the later burials have very thin and fragile bangles. This could indicate that these later women were less involved with manual labor and that over time some Harappan women were able to enjoy a relatively leisurely life. Some female burials also had a bronze mirror and one burial had what was originally thought to be a lead rod for applying surma. This has now been analyzed by Randall Law, who suggests that it is in fact surma itself that was made from lead that comes from somewhere to the north of Harappa in Jammu (Law 2011). Some females also wore a small black or green stone pendant around their neck. This type of tapered cylindrical pendant is found at many Harappan sites and was originally thought to be a gaming piece or a type of weight.

The male burials were generally buried only with pottery, but one individual had an elaborate head ornament made of thousands of steatite micro-beads tied into the hair along with a shell bangle and a jasper bead. Another male was buried with a long steatite necklace and three distinctive barrel shaped beads of banded agate, turquoise, orbicular jasper and three tiny gold beads. A workshop on Mound E at Harappa revealed an unfinished agate bead blocklet made from the same type of banded agate found in this burial. Recent studies of raw materials and beads from Dholavira have identified large amounts of this same raw material, suggesting that it originated in the agate deposits being mined by Harappans living in Gujarat (R.S. Bisht and V.N. Prabhakar, Personal Communication, Law 2011).

While most of the pottery and other artifacts found in the burials could have been made at Harappa, the raw materials other than clay all derive from regions that are quite distant from Harappa. For example, agate, turquoise, jasper, carnelian, and steatite beads, black stone amulets, shell bangles, copper/bronze objects, and lead eye liner, come from all different parts of the Indus

Valley and adjacent regions. The trade networks that brought these raw material to Harappa were undoubtedly controlled by the merchants and other elites at the site. Given the limited number of burials at Harappa and most other Indus sites, it is highly likely that these individuals represent one of the powerful elite groups who ruled the city or controlled some of its wealth. Most Harappans were not being buried and therefore it is also possible that other elite communities were cremated, exposed or disposed of in other ways. We will never know anything about these other communities, but it is possible to study the burials that we do have in order to determine their genetic affinities and to get a better idea of where they may have originated. Multivariate genetic trait analysis using detailed measurements of teeth, as well as cranial and post-cranial skeletal elements has been carried out by the physical anthropologists who worked with the Harappa project (Hemphill *et al.* 1991). These studies provided some important preliminary results that suggested the women of the Harappa burial were more related to each other than the men. Unfortunately, the numbers of individuals studied was too small to apply any statistical significance to the pattern.

More recently we have begun to undertake analysis of the strontium signature found in the enamel of the teeth to determine which individuals were born and raised at Harappa and which were born in other regions (ongoing study being carried out by J. M. Kenoyer, T. Douglas Price, and James Burton). Preliminary results show that some of the women in the core area of the cemetery were born and raised in the vicinity of Harappa while others were not. The same pattern is seen with the males. The patterns that have been discovered need to be carefully checked against additional data sets of local animal teeth and bones, but it does appear that some non-local people came to Harappa and were either married to local Harappans or were well integrated into their communities. These non-locals were eventually buried at Harappa alongside local inhabitants. In many



traditional societies, agricultural communities marry within a short distance of their land, and use this strategy to keep land holdings in the family or close relatives. Long distance marriage traditions are more common among elites and trading communities in order to strengthen long distance relationships for economic or political purposes. This new information from Harappa, suggests that some of these people actually settled at Harappan and this type of interaction would have been an important strategy for social, economic and political integration. Strontium isotope studies can also be used to trace movements of Indus traders to Mesopotamia or identify non-local traders at Harappa itself. The trade of exotic materials from all regions of the Indus to Harappa and to most other Indus sites can only have happened through the actual movement of people themselves. These detailed patterns of interaction can only be determined if we can sample tooth enamel and some bone from all burials found throughout the Indus and adjacent regions. A long-term project to collect a comprehensive strontium, oxygen, and lead isotope data-base from all sites in India, Pakistan and surrounding regions would undoubtedly change our understanding of both internal and external interactions of the prehistoric period.

### **Conclusion**

In this presentation I have tried to highlight a small sample of the many important new discoveries that are changing our perspectives of the past. The field of Indus studies is rapidly evolving and changing as new sites are excavated and new analytical techniques are developed. It is exciting to be a part of this process but the most important message that I want to emphasize is the need to salvage whatever data we can before it is all destroyed through development projects and advancement. We need to educate the general public about the importance of our collective heritage and encourage those who have the resources to support more research and preservation.

Our main challenge today is to collect and preserve data and with these new sets of we can continue to expand our knowledge of the past.

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