

# Excavations at Harappa 2000-2001: New Insights on Chronology and City Organization

RICHARD H. MEADOW & JONATHAN MARK KENOYER

## Introduction

During the past several seasons of research at Harappa, we have oriented our excavations toward answering questions of two kinds – temporal and spatial (Kenoyer & Meadow 2000; Meadow & Kenoyer 2000, in press). First, we have chosen areas suitable for identifying and characterizing the critical transitional phases of the ancient settlement, beginning with the earliest village on the alluvial plain (Period 1), through the phases of urban development and florescence (Periods 2 & 3), and into the phase of decline (Periods 4 & 5) (Table 1). Although we still require information about the final occupations at the site, the outline of the early phases of development seems clear. As a result, we can begin to address specific questions regarding, for example, the origin and development of craft technologies and writing in the period preceding the emergence of Harappa as a major urban center of the Indus Civilization.

Period	Phase	calibrated years BC
1	Ravi (aspect of the Hakra)	c. 3300(?) – 2800(?) BC
2	Kot Diji (Early Harappa)	c. 2800(?) – 2600/2500 BC
3A	Harappa A	c. 2600/2500 – 2450/2400 BC
3B	Harappa B	c. 2450/2400 – 2200 BC
3C	Harappa C	c. 2200 – 1900 BC
4	Transitional	c. 1900 – 1800(?) BC
5	Late Harappa	c. 1800(?) – <1500 BC

Table 1 – Harappa Chronology.

Second, we have carried out horizontal exposures in various parts of Harappa in order to gain more insight into the nature of settlement organization as well as into relationships between different sectors of the site during any given phase of the occupation. As a result, we now

have a good idea of how the site grew and renewed itself through time. Key to this understanding for the Harappa Phase has been the distribution of inscribed tablets (for Period 3B & 3C) and impressed pointed-base goblets (for Period 3C). In addition, excavation of an area of steatite and faience working has served to confirm not only that these materials were crafted in the same locus, but that incised and molded tablets were manufactured in localized workshops and distributed across the site in an uneven fashion.

During the 2000 and 2001 seasons, we undertook major excavations on Mound AB, on Mound F, and on both the western and eastern sides of Mound E (Fig. 1; Meadow *et al.* 2001). On the north side of Mound AB (Trench 39N), clearing continued in the lowest Ravi Phase deposits (Period 1A) where we could complete exposure of the earliest occupation levels and, in so doing, recover the remains of significant craft activities. In the middle levels of this trench, excavations of Kot Diji Phase (Period 2) occupation areas resulted in the discovery of important new inscribed objects and information about the layout of the settlement.

Excavations on the western side of Mound F focused on the architecture and habitation layers of Periods 3B, 3C, and 4, expanding south from the large-scale horizontal exposure begun in 1998 and 1999 (Meadow & Kenoyer, in press). In the same area (Trench 43), we resumed work in and around the circular platform discovered in 1998 in order to collect additional information about this still enigmatic structure.

On Mound E, we selected a large area on the west side (Trench 54) for both horizontal and deep excava-

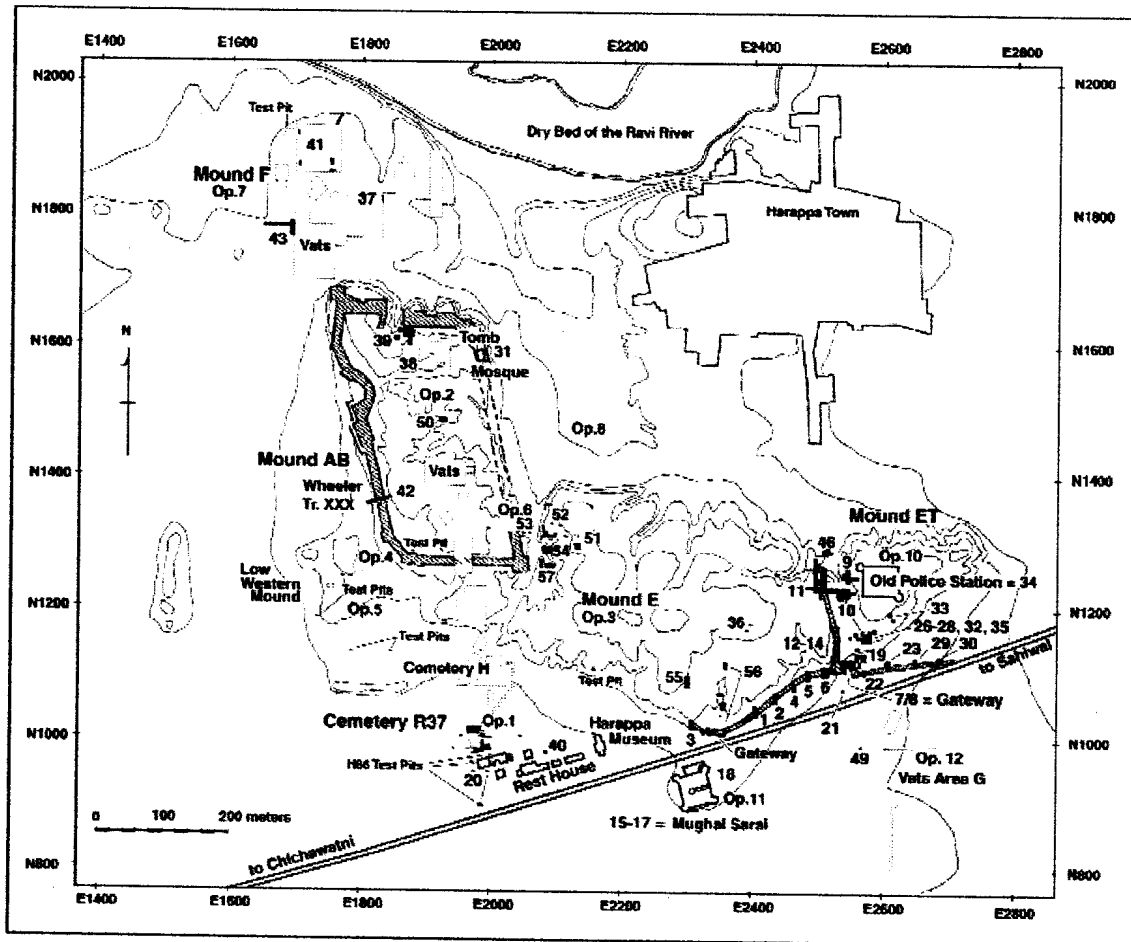


Fig. 1 – Harappa Excavations 1986-2001, showing location of trenches.

tions. Situated to the south of trenches excavated between 1987 and 1990 (Dales & Kenoyer 1991; Kenoyer 1991), this zone had been so heavily eroded that we could obtain architectural, chronological, and artifactual information about the poorly known first part of the Harappa Phase (Period 3A). On the slopes to the north and south of this area are preserved Period 3B installations, of which the faience and steatite tablet workshop, alluded to above, is of particular note. Also on the west side of Mound E, we began excavation of a large area containing remnants of a massive city wall and extensive house platforms (Trench 57). The relationship of these structures to portions of the perimeter wall excavated in other parts of the mound, however, remains unclear.

On the east side of Mound E, we continued investigation of the city wall and habitation areas previously

explored between 1993 and 1999 (Trench 11). At least three building levels of Harappa Phase Period 3C architectural remains can now be defined. Soundings in two street areas have provided important information on the transition from Period 3B to Period 3C, parallel to that recovered from Mound F in 1996 (Meadow & Kenoyer 2000).

### Chronology

Eleven new radiocarbon dates from all of the major periods of Harappa provide additional information on the chronology of the site (Table 2). Including these, as of August 2002 we have 105 determinations covering most periods of occupation. A breakdown by period, as determined by stratigraphic location of the dated sample, is as

follows: Period 1: 9 (3 new), Period 2: 13 (4 new), Period 2/3: 6, Period 3: 73 (3 new), Period 5: 2 (1 new), Historical: 2.

In earlier reports we suggested that the Ravi phase (Period 1) may have begun at *c.* 3500 calBC or even earlier (Kenoyer & Meadow 2000; Meadow & Kenoyer, in press). Most of the relevant dates, however, are not older than *c.* 3300 calBC even if one takes the earliest extreme of the 2-sigma calibrated range. This is true for determinations of even the stratigraphically earliest samples. It should be noted, however, that the Period 1 carbon samples come from the northern margin of where the site was at that time, and it is possible that there are earlier Ravi Phase occupations buried in the center of Mound AB.

Beta#	Year/Lot[feature]	Period	bp(5568)	*calBC p≥90%
163719	H2000/11,036[686]	1A	4480±50	3355-3015
163715	H2000/9525[454]	1A	4430±40	3330-2920
163717	H2000/9942[582]	1A	4390±40	3100-2900
163718	H2000/11,009[658]	2	4000±40	2600-2455
163712	H1999/8949[166]	2	3780±40	2310-2040**
163710	H1998/8414[16]	2	4040±40	2670-2465
163711	H1998/8570[72]	2	3930±40	2500-2290
163714	H2000/2127[46]	3A	3910±40	2475-2285
163720	H2001/9036[532]	3B/3C	3760±40	2290-2035
163721	H2001/11,756[956]	3C	3800±40	2350-2130
163713	H1999/9803[410]	5	3440±40	1880-1680

\* calibrated BC age ranges from probability distribution (Method B) using University of Washington Radiocarbon Calibration Program Rev. 4.3 based on Stuiver & Reimer (1993).

\*\* date appears to be considerably too late for its stratigraphic context.

Table 2 – 2001 Radiocarbon Dates (in stratigraphic order).

The beginning of the Kot Diji Phase (Period 2) remains largely undated at Harappa. The most recent determinations, however, suggest that proto-Indus seals were being made and multiple Indus characters being inscribed on ceramic vessels by *c.* 2600 calBC. The transformation of the Kot Dijian into the Harappan seems to have taken place at Harappa between *c.* 2600 and 2500 calBC, although, many more determinations are necessary to better date this process.

The breakdown of the Harappa Phase into Periods 3A, 3B, and 3C is now reasonably well dated. The chronological framework (Table 1) is supported by changes in the types of inscribed pieces (including seals) being used, in the construction and repair of the city walls and gateways, and in the appearance of new forms of pottery, particularly pointed-base goblets in Period 3C. More work needs to be carried out to clarify the Harappan to Late Harappan transition. Our recent samples

confirm that this transition was relatively short, taking place between *c.* 1900 and *c.* 1800 calBC, with the Cemetery H “culture” firmly established by 1700 calBC. Given the badly preserved nature of the Late Harappa Phase levels, however, it is unlikely that we will be able to obtain a terminal date for Period 5.

### Ravi and Kot Diji Phases

On the northern part of Mound AB (Trench 39), excavations were undertaken in occupation levels of both the Ravi (aspect of the Hakra) Phase (Period 1) and the Kot Diji Phase (Period 2). These early occupations at Harappa were first identified during the 1996 season (Trenches 39N and 39S: Kenoyer & Meadow 2000).

The Ravi Phase excavations along the lower portion of the northern end of Mound AB during the 1998 season revealed a series of wash layers and living surfaces into which were dug clay-lined pits, postholes with post casts, a pit containing burned clay lumps with reed impressions, and hearths filled with blackened pottery and nodules (Meadow *et al.* 1998). In the final days of that season, numerous jasper drills, agate flakes, and unfinished agate beads were recovered from the edges of those living surfaces and wash layers. Continued work in 2000 completed the excavation of a full sequence of cultural deposits in this area. Meticulous uncovering of material *in situ* and water screening of sediment from all excavation units led to the identification and recovery of high concentrations of agate flakes and jasper drills in the lowest occupational levels. Microstratigraphic analysis carried out by Brad Chase revealed the existence of numerous surfaces with lithic debris separated by layers of silty wash (Meadow *et al.* 2001). The first agate bead-making activities occurred directly on the natural surface of the ancient levee or terrace and were associated with the earliest hearths, pits, postholes, and kiln debris of the Ravi Phase (see Kenoyer, this volume, for more detailed discussion of the bead technology).

Excavations in the Kot Diji levels during the 2000 field season continued work in Trench 39N that was first begun in 1996 and then continued in 1998 and 1999. After four seasons of excavation in an area of 10 × 10 m and approximately 2 m in depth, it is now possible to provide a general picture of the nature of this occupation

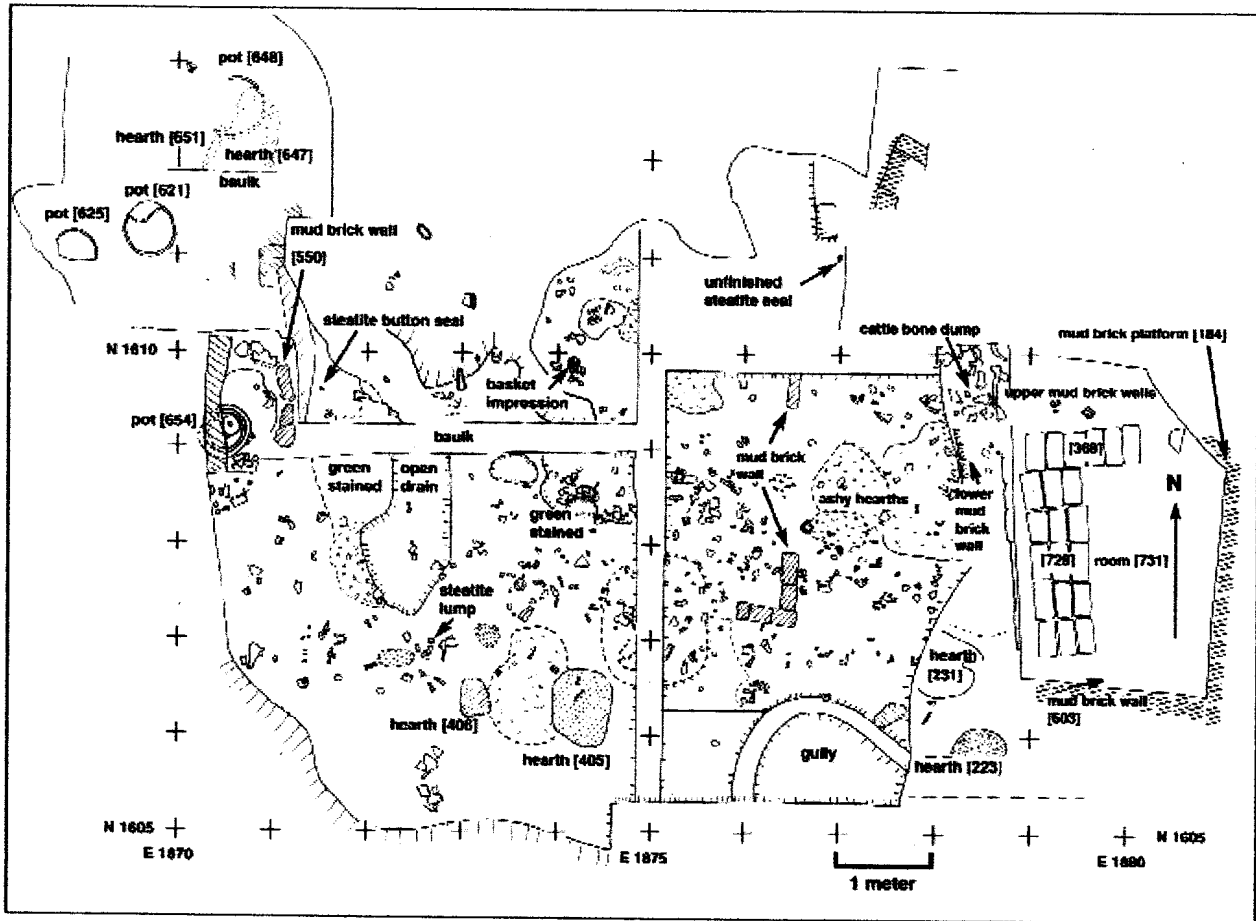


Fig. 2 – Harappa 2000, Mound AB North, Trench 39N, Kot Diji Phase, plan view of lower levels.

just prior to the beginning of the Harappan period. In this part of the mound we see a wide, open gully (or street with an open drain) and patches of debris lying between what appears to be two domestic areas (Fig. 2-3). To the west are fragmentary mud-brick walls of houses, with large pots set into the floors. Some of these pots had been used as hearths and others may have been used for storage of water or dry goods. Eventually all of the pots were filled with trash as the floor levels were raised and new habitation levels established. Some of the hearths were lined with mud-brick or clay, and all of them contained large numbers of triangular- and oval-shaped terracotta cakes. No baked-brick fragments have been found in these levels. The pottery from these strata falls within the range of Kot Diji pottery that is found at other excavated sites, such as Kot Diji (Khan 1965), Sarai Khola (Mughal & Halim 1972), Rehman Dheri II (Durrani 1988), and Jalilpur II (Mughal 1967, 1972, 1974).

The wide, shallow gully (or street with open drain) flowed from south to north as an irregular shallow channel. In the bed of the channel, patches of ashy dump were found interspersed with pottery scatters and green stained silty wash. The green staining indicates the presence of stagnant water. One important discovery in this area was an impression from the base of a coiled grass basket, and the gully contained significant artifacts such as gold beads and sequins; steatite, terracotta, and faience beads; gray-fired and red-fired terracotta bangles; and terracotta figurines. Other objects that reveal an increase in long distance trade include chert blades from Rohri, sandstone pestles and grinding stones that probably came from the Sulaiman ranges to the west, and debris from steatite manufacture. Some of the large sawn steatite fragments appear to have been used to make bead blanks, while other fragments may have been used in seal manufacture. On the northeast margin of the gully, part of an

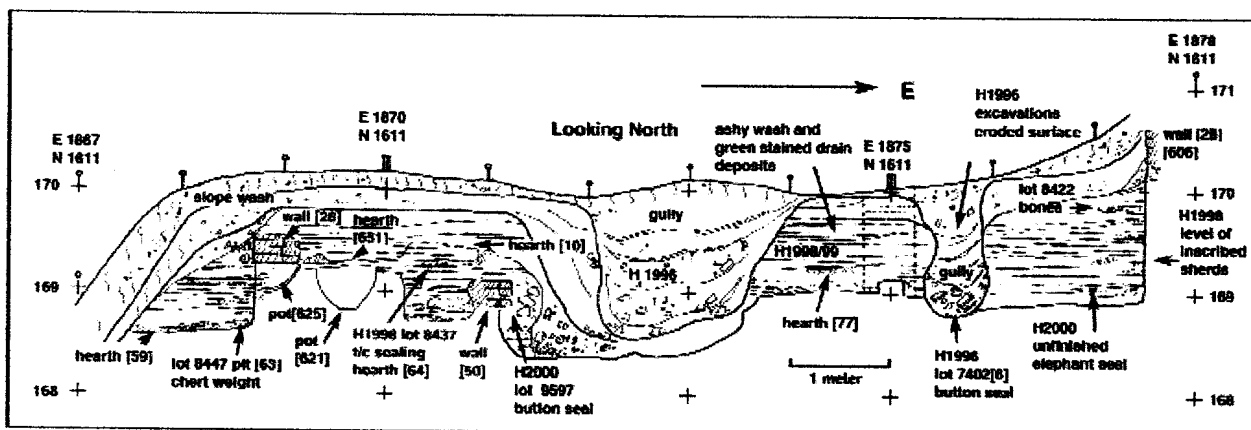


Fig. 3 – Harappa 1996–2000, Mound AB North, Trench 39N, Kot Diji Phase, east-west section at N1611.

unfinished steatite seal was found bearing an engraved elephant (Fig. 4.1). This is the earliest example at Harappa of an animal motif on a Harappan-style square seal with boss. Since the upper portion of the seal was missing, it is not certain if it had script, but another square sealing found in a domestic pit to the west does bear Early Indus script, and there are many examples of script on pottery found in the same levels as the seals.

The large collection of pottery from this area reveals a clear transition from the earlier Ravi Phase pottery to what is commonly referred to as Kot Diji pottery. However some of the shapes and surface treatments appear to be unique to Harappa. Many of the pottery forms found in the upper Kot Diji levels show a gradual transformation into what is commonly referred to as “Harappan pottery.” The evidence of the pottery combined with that of other artifact types (such as terracotta cakes, bangles, figurines, and even architecture and bricks) makes it possible to be quite confident that Harappan material culture at Harappa developed out of the earlier Kot Diji Phase material culture and that it was not introduced to the area from an outside region.

Of particular importance in this regard is the first appearance of a form of Early Indus script engraved on pottery, the sealing of a square seal with possible Early Indus script, and a cubical limestone weight that conforms to the Harappan weight system (Kenoyer & Meadow 1999). During the H2000 season, a complete button seal with circle and dot motifs was discovered at the western edge of the gully (Fig. 4.2). This seal was made from fired steatite and is almost identical to ones found at the site of Rehman Dheri (Durrani *et al.* 1995). It is difficult to determine where this distinctive button

seal was made since there are no unfinished examples at Harappa, but the discovery of the unfinished steatite seal carved with an elephant motif, noted above, does indicate that seals were being made at Harappa during the Kot Diji Phase.

The new developments in site organization and specialized craft activities during the Kot Diji Phase are likely to have been linked to the emergence of a more highly differentiated society. In particular, the use and elaboration of writing, seals, and standardized weights implies the development of an increasingly complex socio-economic organization that would have required these means of communication and administration.

#### Harappa Phase: Mound F Excavations

On the basis of our excavations in different areas of Mound F that were conducted between 1996 and 2000, it appears that this part of the site was settled only during the middle of the Harappa Phase (Period 3B) (Meadow & Kenoyer in press). During the Kot Diji and initial Harappa Phases (Period 3A), much of the clay used to build the city walls and houses of Mound AB appears to have been obtained from areas adjacent to that mound. The area of Mound F was heavily mined for clay, and all traces of any sandy levee that may have extended there were removed. Eventually, these low-lying areas to the north of Mound AB filled with garbage and debris from the initial Harappan occupation (Period 3A), and gradually became inhabited. During Period 3B, beginning *c.* 2450/2400 calBC, we see substantial occupation of the area and the construction of a massive mud-brick

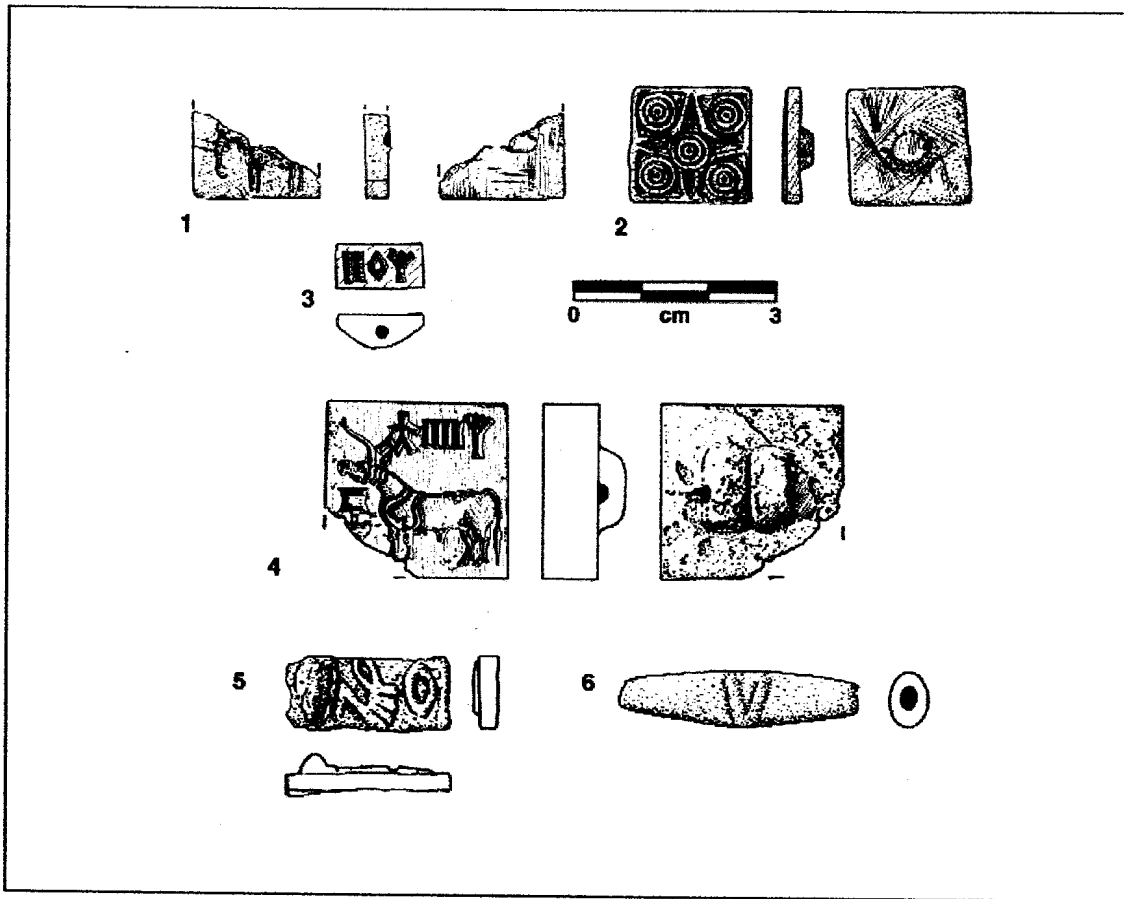


Fig. 4 – Harappa 2000, Mound AB North, Trench 39N (1-3) and Mound F, Trench 43 (4-6), seals and inscribed objects:

#	Accession	Lot	Artifact Type	Material	Shape	Period	Context
4.01	H2000-4474/	8994-01	Seal, broken (Elephant)	unfired steatite	square with boss	2	floor fill
4.02	H2000-4495/	9597-01	Button Seal	fired steatite	square with boss	2	floor fill
4.03	H2000-4487/	9438-01	Seal	fired steatite	perforated rectangular	3C?	surface wash
4.04	H2000-4500/	10007-01	Seal, broken (Unicorn)	fired steatite	square with boss	3C	floor fill
4.05	H2000-4498/	9889-01	Tablet (raised script), broken	copper	flat rectangular, raised script	3C	floor fill
4.06	H2000-4494/	9881-01	Inscribed Bead (molded)	terracotta	flat bicone	3C	floor fill

perimeter wall (Meadow & Kenoyer, in press). At least by Period 3C, this northern suburb came to be inhabited by prosperous individuals who were interacting with communities in other parts of the city (to judge from the distribution of inscribed materials) as well as with distant resource areas such as Central Asia and the Arabian Sea (Meadow 2002). Overall, Mound F appears to have been occupied during the last two-thirds of the Harappa Phase (Periods 3B & 3C) and into the Late Harappa Phase (Periods 4 & 5).

In 2000, the excavations of Trench 43 (Fig. 5) were expanded to recover more of the Harappan occupation floors and to locate additional Late Harappa Phase features. Although most of the larger baked-brick walls in this area had been robbed, occupational deposits, including living surfaces and house floors, were relatively intact. In some areas, pots *in situ* were uncovered, and numerous craft items and inscribed objects were discovered in well-stratified contexts, often sealed by smaller fallen walls. Many of the inscribed objects can be

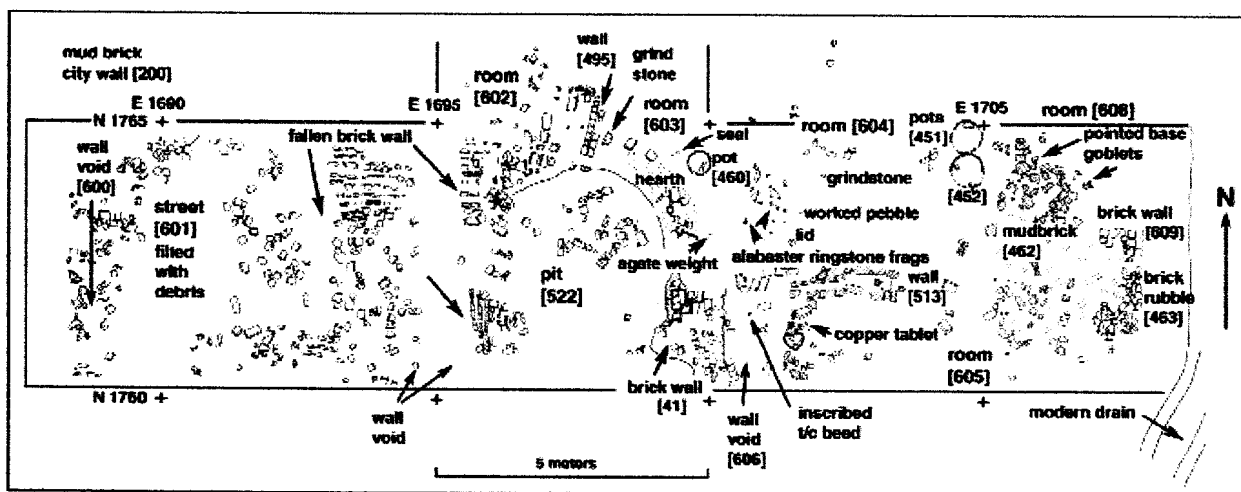


Fig. 5 – Harappa 2000, Mound F, Trench 43, plan view.

compared with similar pieces from excavations in other areas of Mound F as well as from other parts of the site (Meadow & Kenoyer, in press).

A steatite seal with the unicorn motif (Fig. 4.4) was found on the floor of a large room or courtyard next to a hearth made in the lower part of a storage jar. Stratigraphically, this area is contemporaneous with the area to the south where, in 1999, a much larger unicorn seal, measuring 5.2 × 5.2 cm square, with a long inscription in the Indus script was recovered (Meadow & Kenoyer, in press).

Another important discovery was a copper tablet with raised script (Fig. 4.5) that was found on a sealed floor that can be dated to Harappa Period 3C. Identical mold-made copper tablets were first reported by Vats (1940), and over the past five years, identical examples have been recovered from the surface of the site by local workmen (Kenoyer & Meadow 1997) and in the eroded deposits to the west of Mound F (Meadow *et al.* 1998). Now, for the first time, it is possible to place this important form of inscribed object into a firm chronological position. The fact that these tablets are all the same size and have identical raised script suggests that they may have had specific value beyond their function as a communication device, such as is common with metal coins. Copper tablets from Mohenjo-daro were also made in standardized shapes and weights, but with incised inscriptions and animal motifs (Kenoyer 1998). Like the Harappa molded copper

tablets, the Mohenjo-daro incised copper tablets are found in the later levels of the site, i.e. near the end of the third millennium calBC. At this point there is no evidence for the widespread use of such tablets either within or between cities. Nevertheless, it is possible that the parallel emergence of distinct copper tablets with inscriptions at both Harappa and Mohenjo-daro could indicate an early experiment in a kind of metal coinage.

Another important new example of script use is seen on a terracotta bead with molded inscription (Fig. 4.6). Additional discoveries from Trench 43 include a complete stoneware bangle with no inscription, a truncated spherical agate weight, alabaster (gypsum) ring stone or mace fragments, numerous terracotta figurines, stone beads, and shell inlay pieces. The pottery from this area is dominated by pointed-base goblets and associated vessel forms from Period 3C, but some forms may belong to Period 4 (transitional to the Late Harappa Phase) as was noted in excavations to the southwest in 1999 (Meadow *et al.* 1999).

Excavations of the circular brick platform first exposed in 1998 (Meadow & Kenoyer, in press) were continued in order to clarify the function of this structure. No trace of an earlier platform was discovered beneath the existing platform, and the fill directly below the platform was found to consist of ashy layers filled with nodule fragments and some pottery, including pointed-base goblets. Some straw impressions were

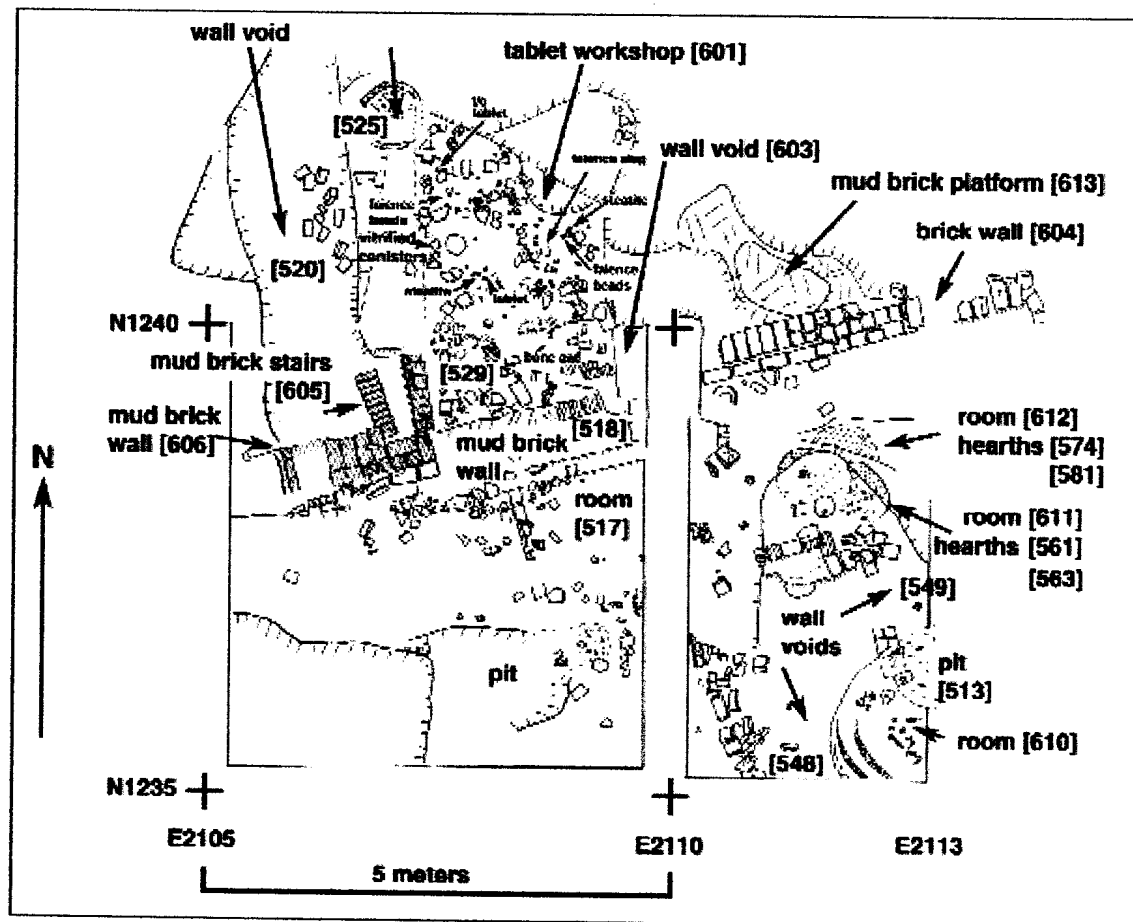


Fig. 6 – Harappa 2001, Mound E West, Trench 54, South Extension, plan view of faience and tablet workshop.

found on the floor to the south of the platform, but microscopic examination by Dr. Steven Weber confirmed that these impressions were of straw and not of chaff or grain processing byproducts. The function of these platforms is still unclear, but there is still no evidence to suggest that they were used for processing grain as was proposed by Wheeler (1947).

#### Harappa Phase: Mound E Excavations: Trench 54

In 1988–1990, excavations on the northwest corner of Mound E revealed portions of the Harappa Phase city wall that surrounded Mound E and numerous mud-brick platforms built up along the edge of the mound (Dales & Kenoyer 1991; Kenoyer 1991). These platforms were used for the construction of houses and contained con-

siderable information on the domestic lives of people living during Harappa Periods 3B and 3C. In this area, a large Harappan kiln was discovered along with pottery workshop debris. Earlier levels contained smaller kilns or hearths. The deepest excavations in this area during the 1989 and 1990 seasons revealed the presence of the Kot Diji Phase (now Period 2) occupation, but due to the overburden of later occupation levels, it was not possible to expose very large areas of these earlier remains.

The area selected in 2000 for excavation on the west side of Mound E is due south of the earlier trenches excavated from 1987 to 1990 (Fig. 1). This part of the mound had been heavily eroded, essentially removing all of the overlying deposits of Period 3B and 3C, thus making the initial Harappa Phase levels of Period 3A as well as the underlying Kot Diji Phase occupations accessible. Before excavation, the entire southwestern portion of Mound E was surveyed and a detailed contour map was prepared.



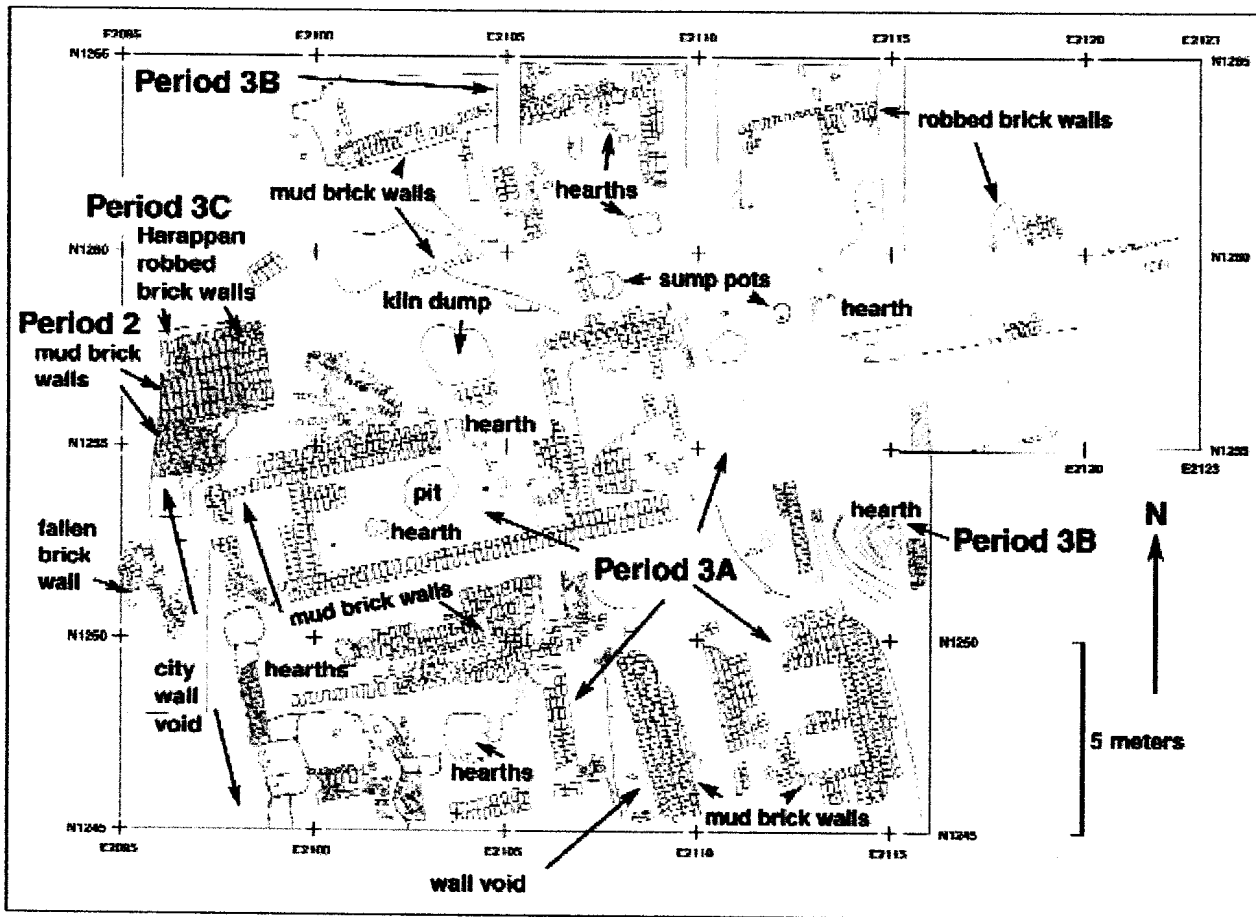


Fig. 7 – Harappa 2000-2001, Mound E West, Trench 54, plan view.

In the course of the initial surveys and clearing of eroded wash levels, many inscribed objects including steatite and faience tablets (Fig. 6, 11) were discovered including a terracotta, molded tablet identical to ones recovered from the eastern edge of Mound E, from Mound ET, and from Mound F (Fig. 11.6; see also Meadow & Kenoyer 2000: 330-331 & Fig. 3.11-12) and a copper tablet fragment (Fig. 11.5) identical to one found in Mound F, Trench 43 (Fig. 4.5). These discoveries of identical tablets in different areas of the site confirm the contemporaneous occupation of these sections of the city during Periods 3B and 3C and also indicate social, ritual, and/or economic interaction between individuals living in each of the different individually walled mounds. Numerous chert blades and other indicators of craft activities, as well as an unusually large number of small gold beads, were recovered from the surface and sub-surface layers. Much of this material appears to have come from eroded Period

3B and Period 3C deposits. In addition, some traces of Period 4/5 (Late Harappa Phase) were found at the top of the mound, and Late Harappa Phase pottery was recovered from some of the erosion gully debris.

After surface scraping it was possible to discern numerous mud-brick structures and lines of walls, pits, and hearths. Removal of the final traces of gully erosion revealed a large complex of rectangular rooms enclosed by mud-brick walls, with small divider walls and intervening streets or alleyways (Fig. 7). The baked-brick walls belonging to later structures in this area had been largely removed by brick robbing. The mud-brick structures appear to belong to the initial part of the Harappa Phase (Period 3A), to judge from the painted pottery and from specific vessel shapes that are similar to those of Kot Diji Phase pottery. Some of the rooms had hearths and trash pits, while in the area between two blocks of houses was a large pit filled with pottery kiln debris. At the edge

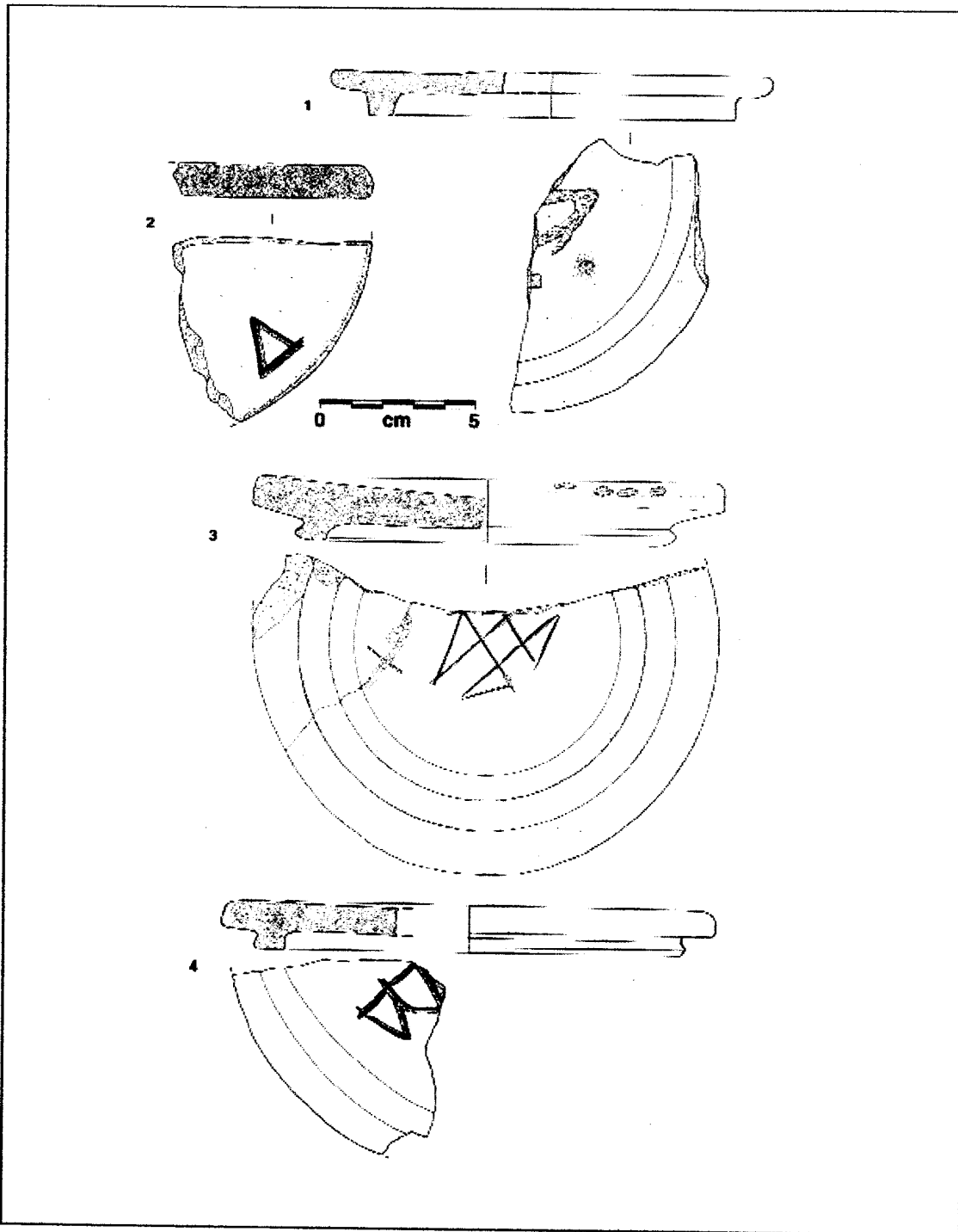


Fig. 8 – Harappa 2000, Mound E, Trench 54, inscribed pottery bats:

#	Accession	Lot	Artifact Type	Material	Shape	Period	Context
8.1	H2000/	2198-12	Inscribed Potter's bat	terracotta	impressed on base	3A?	surface
8.2	H2000/	2339-09	Inscribed Potter's bat	terracotta	impressed on base	3A	kiln dump
8.3	H2000-5050/	2102-1811	Inscribed Potter's bat	terracotta	incised on base	3A?	surface
8.4	H2000/	2339-01	Inscribed Potter's bat	terracotta	incised on base	3A	kiln dump

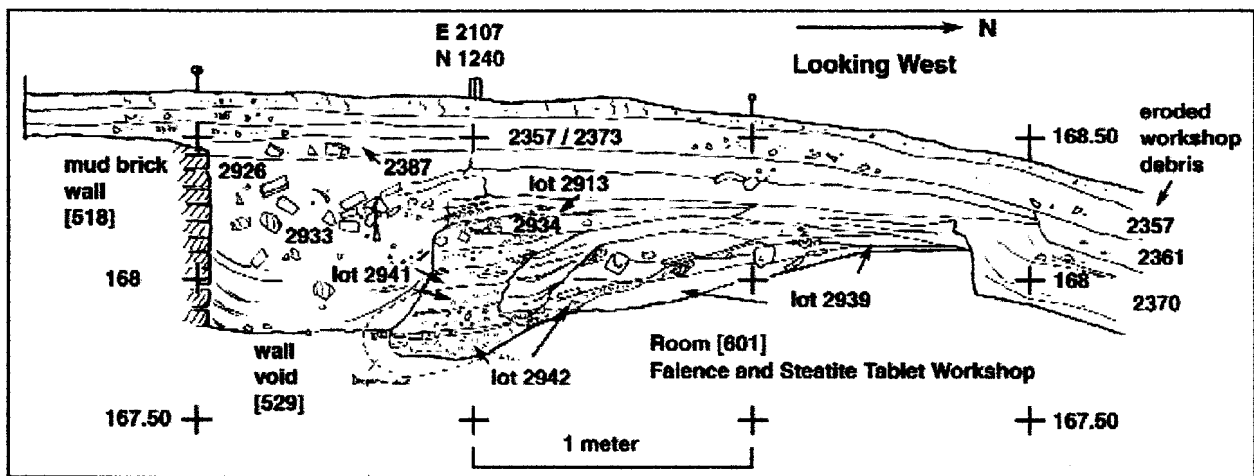


Fig. 9 – Harappa 2000-2001, Mound E West, Trench 54, South Extension, section view of faience and tablet workshop area.

of that pit a layer of ashy debris contained hundreds of fragments of sawn and drilled steatite bead fragments. These deposits appear to represent a steatite workshop dump on the margins of a pottery kiln dump.

Of considerable interest is the fact that no inscribed tablets or seals were found inside any of the rooms or in the associated street deposits of the Period 3A occupation. However, it is clear that writing was being used by people living in this part of the site during Period 3A because fragments of inscribed vessels, including inscribed pottery bats (Fig. 8), inscribed molds for making large jars, and pottery with graffiti were found in the pottery kiln dump. Once again the 2000 excavations show that the distribution of inscribed seals and tablets is not uniform across the site. Other areas without seals and tablets but with inscribed sherds and molds include the Harappa Phase kiln area located at the northwest corner of Mound E that was excavated from 1988 to 1990 (Dales & Kenoyer 1991; Kenoyer 1991) and the Trench 9 area on the west side of Mound ET excavated between 1993 and 1997 (Meadow & Kenoyer 1993; Meadow *et al.* 1994, 1995, 1997).

#### Harappa Phase: Mound E Excavations, Trench 54 South

Surface survey along the eroded slope at the southern edge of Trench 54 revealed the presence of workshop debris from faience production along with faience tablets and large numbers of faience beads. At the end of the 2000 season and during a month in 2001, this area was excavated (Fig. 6, 9) in order to recover all aspects of

faience manufacture and production. No faience workshop has ever been excavated at Harappa or Mohenjodaro, and this is the first tablet workshop to be discovered at any Indus site.

The excavations of this area revealed several distinct layers of “faience slag” with canisters and large quantities of complete and broken faience beads. Among the beads were also some faience and steatite tablets (Fig. 10) and vitrified faience wasters that indicate dump from a primary production area. Large wall voids were defined and cleared out while the more time-consuming documentation of the faience workshop dump was going on. This process involved mapping all significant artifacts using triangulation, leveling, and digital photography. All sediment from these excavations was sifted and then wet sieved to recover microdebitage from bead and tablet manufacture.

In addition to pottery and brick fragments, artifacts found in the workshop include chert blades, lumps of sawn steatite, bone tools, terracotta cakes, and large masses of vitrified faience slag with whitened bone, some of which had drops of greenish to light blue glaze. Large fragments of vegetable tempered canisters, conical setters with splayed ends and thick disc-shaped lumps that may have been used as kiln setters were also recovered. The surfaces of many canisters and setters were partially vitrified, indicating that they were used in the firing of faience and steatite objects.

To date, no actual kiln has been identified at Harappa that could have been used to reach the high temperatures required for the glazing of faience and the firing of steatite. Instead, a careful analysis of the canisters and vitrified setters suggests that they were employed in a

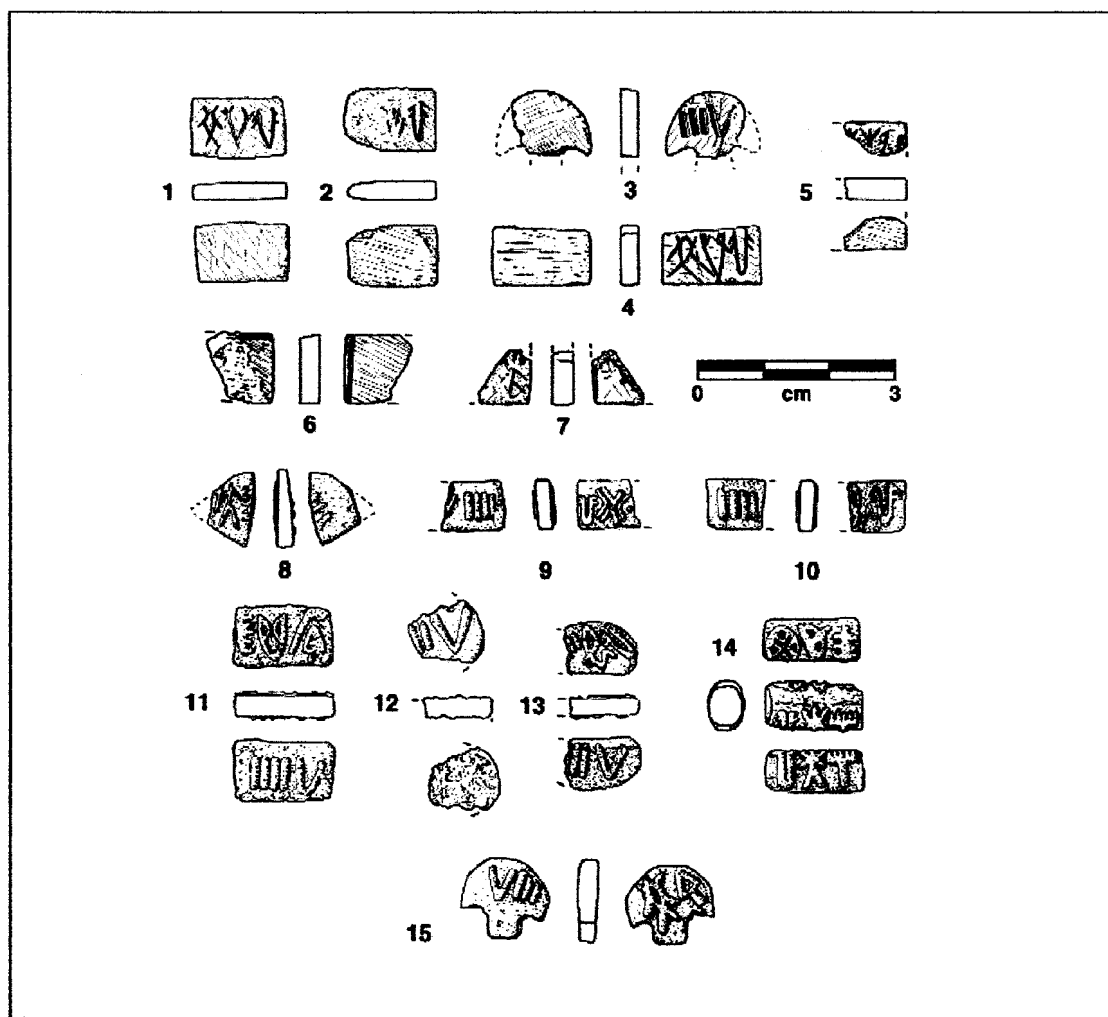


Fig. 10 – Harappa 2001, Mound E West, Trench 54, South Extension, Period 3B, from manufacturing dump in workshop area, steatite and faience tablets:

#	Accession	Lot	Artifact Type	Material	Shape
10.1	H2001-5084/	2913-07	Tablet (incised)	unfired steatite	flat rectangular
10.2	H2001-5087/	2934-01	Tablet (incised), eroded	fired steatite	flat rectangular
10.3	H2001-5069/	2913-02	Tablet (incised), broken ?mold	unfired steatite	flat, fan-shaped
10.4	H2001-5068/	2913-01	Tablet (incised)	unfired steatite	flat rectangular
10.5	H2001-5074/	2913-04	Tablet (incised), broken	unfired steatite	lenticular, rectangular
10.6	H2001-5187/	2934-270	Tablet (not incised), broken	unfired steatite	flat rectangular
10.7	H2001-5135/	2913-210	Tablet (scratches), broken	unfired steatite	flat rectangular
10.8	H2001-5064/	2373-01	Tablet (molded), broken	faience	flat triangular
10.9	H2001-5065/	2373-02	Tablet (molded), broken	faience	flat rectangular
10.10	H2001-5077/	2913-05	Tablet (molded), broken	faience (bicolor)	flat rectangular
10.11	H2001-5083/	2913-06	Tablet (molded)	faience	flat rectangular
10.12	H2001-5089/	2913-08	Tablet (molded), broken	faience	flat irregular
10.13	H2001-5090/	2913-09	Tablet (molded), broken	faience (bicolor)	flat semi-circular
10.14	H2000-5042/	2357-13	Tablet (molded)	faience	oval, rectangular
10.15	H2000-5041/	2360-01	Tablet (molded)	faience	flat, fan-shaped

makeshift mini-kiln. Such an installation would have used two canisters and a bonfire that could have reached sufficiently high temperatures (c. 940°C) to glaze faience. During the summer of 2001 it was possible to produce glazed faience and steatite tablets in an experimental firing using canisters and setters that were made with approximately the same materials as those found at Harappa.

The types of manufacturing debris recovered from the Trench 54 South Extension excavations indicate that both faience and steatite production were being undertaken in the same workshop and that the craftsmen who were manufacturing inscribed tablets were also producing a variety of faience and steatite beads. The discovery of a tiny faience bull figurine leg (Fig. 11.7) in the erosion gully adjacent to the workshop suggests that they may have also been involved in the production of other types of objects for elite consumption or trade. The faience bull leg is made using two different colors of faience, a yellowish-white color for the hoof and a darker grey-black faience for the leg itself. Several of the faience tablets found in the workshop were made from the same two colors of faience. This makes it all the more likely that the bull figurine leg was made in the same workshop and possibly even by the same craftsmen.

The types of steatite fragments found in the workshop debris indicate that various colors of raw steatite were being processed, including tan, grey, grey-black, and whitish. Thin slabs were cut and shaped into rectangular tablet blanks. Two fragments of uninscribed tablet blanks were found in the ashy debris within the workshop (e.g. Fig. 10.6 & 7). Four partly inscribed tablets all having the same inscription were also uncovered there (Fig. 10.1, 2, 4-5). A broken fan-shaped steatite tablet with deeply incised script was also found (Fig. 10.3). It corresponds precisely, but with the signs in reverse order, to a fan-shaped molded faience tablet (Fig. 10.15). The techniques used to make faience tablets have long been a mystery as no clay or steatite molds had ever been recovered. This new discovery suggests that some of the unfired and apparently unfinished steatite "seals" may in fact be molds for faience tablets (for example, compare the steatite seal H670 and the tablet H775 in Shah & Parpola 1991).

As alluded to above, an important aspect of the production in this workshop was the use of two colors of

faience to make tablets. Four tablets were made using a combination of a yellowish-white faience with a wide central band of grey-black faience. Three of these were formed using the same mold, but were produced in two different shapes. One shape was flat rectangular (Fig. 10.10 & 11.1), while the other was a flat lozenge shape (Fig. 10.13). The fourth tablet was long rectangular with a lenticular section (Fig. 11.2). This last example has an inscription that is identical to that found on three additional two-colored faience tablets recovered during excavations at Harappa in the 1930s (Shah & Parpola 1991: H773 & H774; Joshi & Parpola 1987: H194). These other tablets come from Area D, which is only about 150 meters west-southwest of the workshop, and from Mound F. These new discoveries confirm the strong links between Mound E and Mound F, but for the first time we now have evidence linking Mound E with Area D. Furthermore, we can now date the period of such interactions to Harappa Period 3B (c. 2450/2400-2200 calBC).

Given space limitations, it is not possible to go into all of the other details that have come to light through the study of the workshop materials, but the general implications are quite significant. This restricted area of the site was the center of manufacture for some of the most distinctive types of artifacts used in the cultural life of ancient Harappa. The faience tablets may have been used as a form of credit or communication, for economic and possibly even for ritual purposes. The workshop may have served as a type of mint, producing tokens that were then redistributed throughout the site.

#### Harappa Phase: Mound E Excavations, Trench 11

Excavations in Trench 11 at the northeastern corner of Mound E (Fig. 12) were continued during the 2001 season to better understand the context from which large numbers of inscribed objects had been recovered in earlier seasons. This part of the site had previously been excavated between 1993 and 1999 (Meadow & Kenoyer 2000, in press). From 1993 to 1997, work was concentrated outside the massive mud-brick perimeter wall [250], where more than 150 inscribed pieces were found. These seals and tablets, together with trash from inside

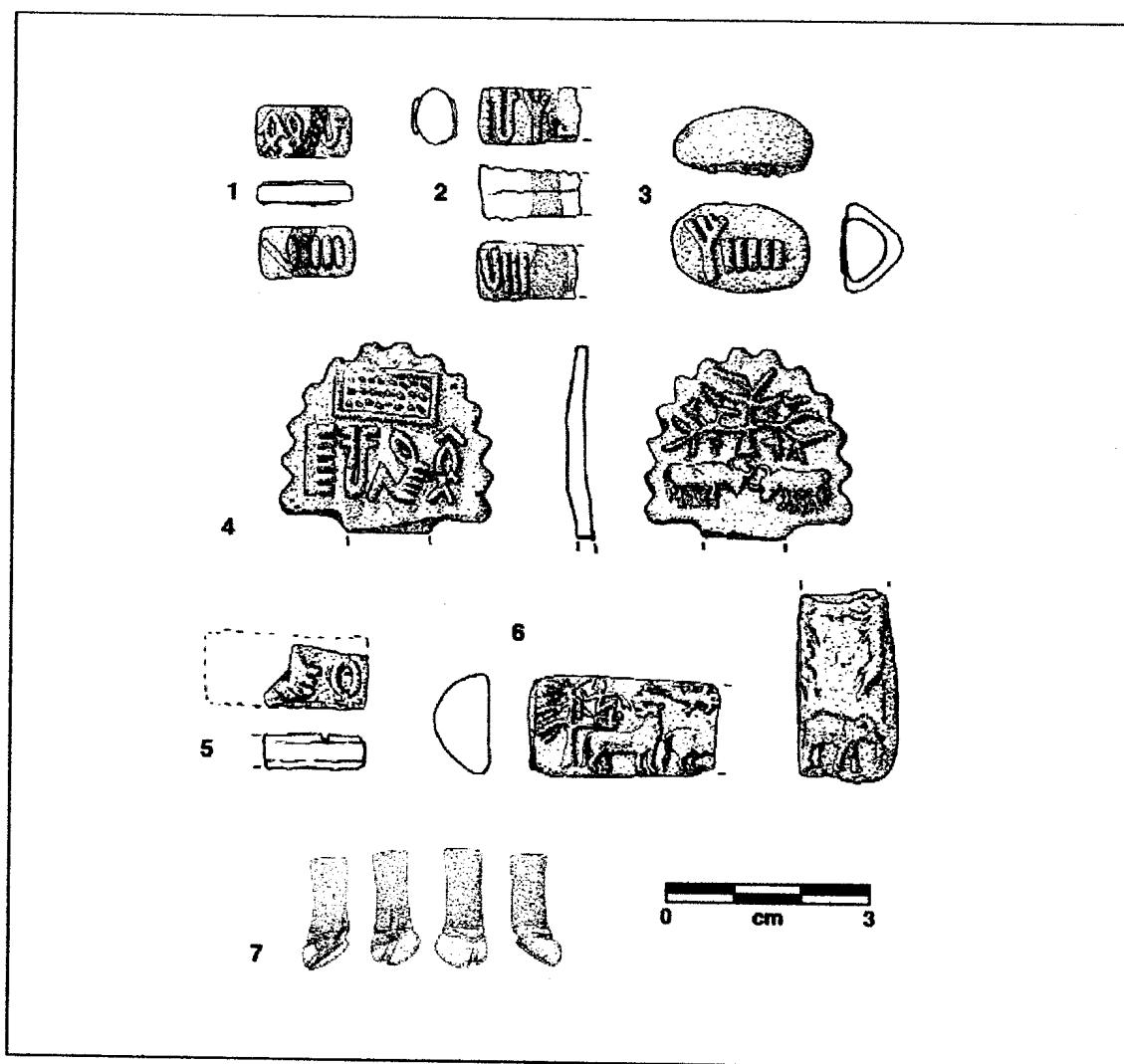


Fig. 11 – Harappa 2000-2001, Mound E West, Trench 54, faience, terracotta, and copper tablets and faience bovid leg:

#	Accession	Lot	Artifact Type	Material	Shape	Period	Context
11.1	H2001-5082/	2920-02	Tablet (molded)	faience (bicolor)	flat rectangular	3B	eroded from room
11.2	H2000-4385/	2087-05	Tablet (molded), broken	faience (bicolor)	lenticular, rectangular	3B	eroded from room
11.3	H2000-4388/	2089-03	Tablet (molded)	terracotta	trinagular, oval	3B?	surface
11.4	H2000-4483/	2342-01	Tablet (molded), broken	faience	flat, spreading tree shape	3B/3C	brick robber fill
11.5	H2001-5080/	2923-01	Tablet (raised script), broken	copper	flat rectangular	3C?	surface
11.6	H2001-5075/	2922-01	Tablet (molded), broken	terracotta	piano-convex, rectangular	3B?	surface
11.7	H2000-4440/	2121-90	Leg of composite bovid figure	faience (bicolor)	in the round	3B/3C	surface

the city itself, appear to have been dumped over the wall that was serving as a *pushta* or retaining wall at the eastern edge of Mound E. During the 1997 season, a large area outside the wall was cleared to reveal the long curve of the wall, and excavations were expanded to the higher

portions of Mound E that were located on the interior of the wall. During the 1998 and 1999 seasons, the interior areas revealed domestic architectural remains and large wall voids of robbed baked-brick structures dating to Period 3C (c. 2200-1900 calBC). Inscribed pieces were

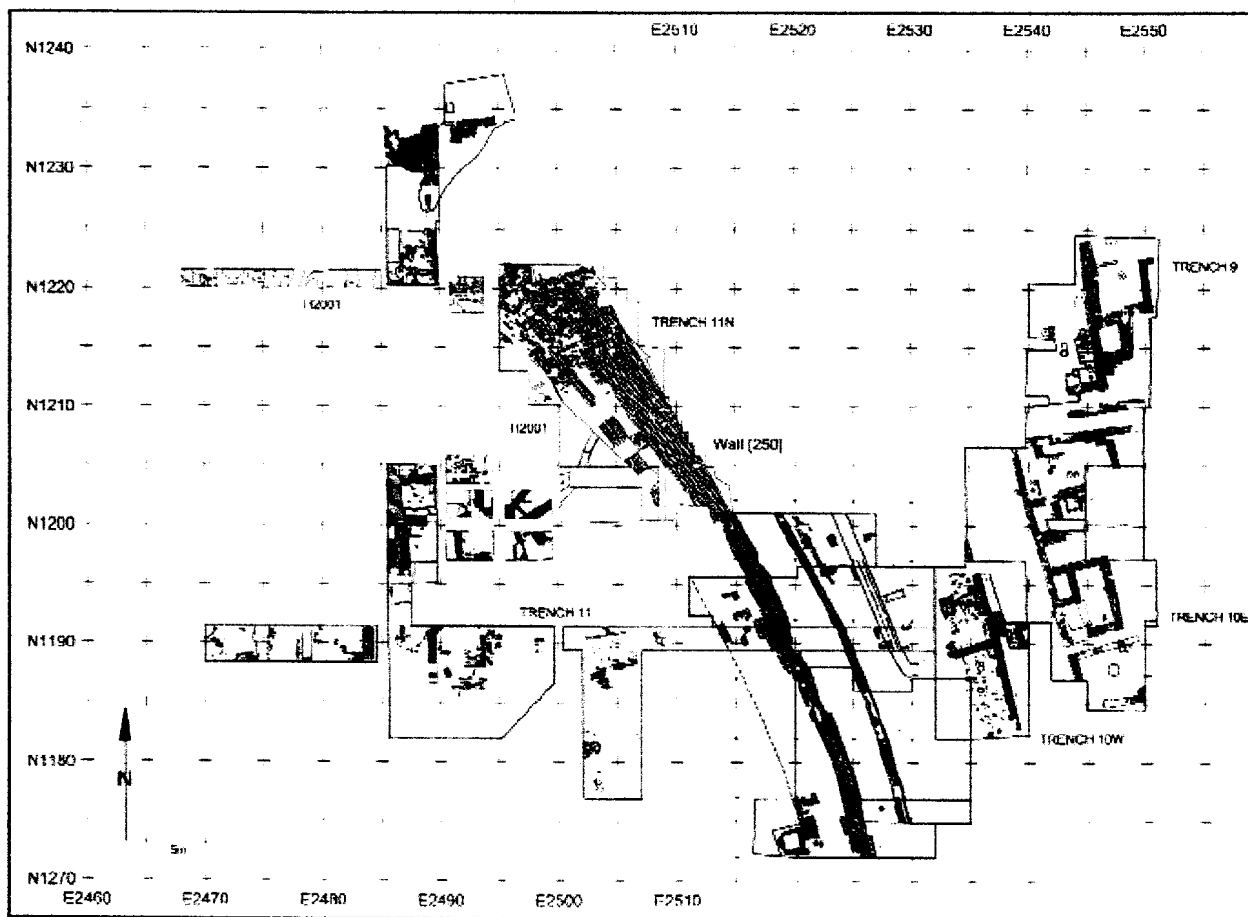


Fig. 12 – Harappa 1993-2001, Mound E East and Mound ET West, Trenches 9, 10, and 11, plan view.

found in the floors of these houses along with pottery, beads, and important copper artifacts. During the 2001 season, in addition to continuing with the excavation of domestic contexts, further investigations were made of the curving city wall and its extension to the north.

The city wall excavations revealed that the curving wall [250] continues to curve only slightly to a NW/SE orientation and then terminates abruptly, with a large offset to the west (Fig. 12). The western edge of this offset had been uncovered in the 1999 season, and it may be that the wall continues to the north for some distance. The northeastern corner of this wall and its possible articulation with the mud-brick perimeter wall of Mound ET remain to be defined.

Along the inner face of mud-brick perimeter wall [250] there may have been a large baked-brick structure built into the wall or against which the mud-brick wall was originally built. This structure had been completely robbed at some point in the past, but its construction

would seem to date at least to the second half of Period 3B. Perimeter wall [250] was built of a mix of yellow-brown, greenish yellow-brown, red-brown, and “garbage” bricks. With one exception, there are no apparent groupings of these different colors, although further analysis is necessary to determine if patterns are present. There do seem to be lines of greenish bricks on the *outside* of the mud-brick perimeter wall, however, marking a repair or rebuilding in Period 3C. This confirms a feature noted in 1996 and 1997 farther to the south. Within wall [250] itself, there are various brick alignments indicating that the wall was probably constructed in segments.

Abutting the wall void that is inside perimeter wall [250] there are layer upon layer of street deposits that contain a sequence of artifactual remains going back through Period 3C into the earlier Period 3B. These include five incised steatite and two molded faience tablets (Fig. 13.1-7). This sequence parallels that of

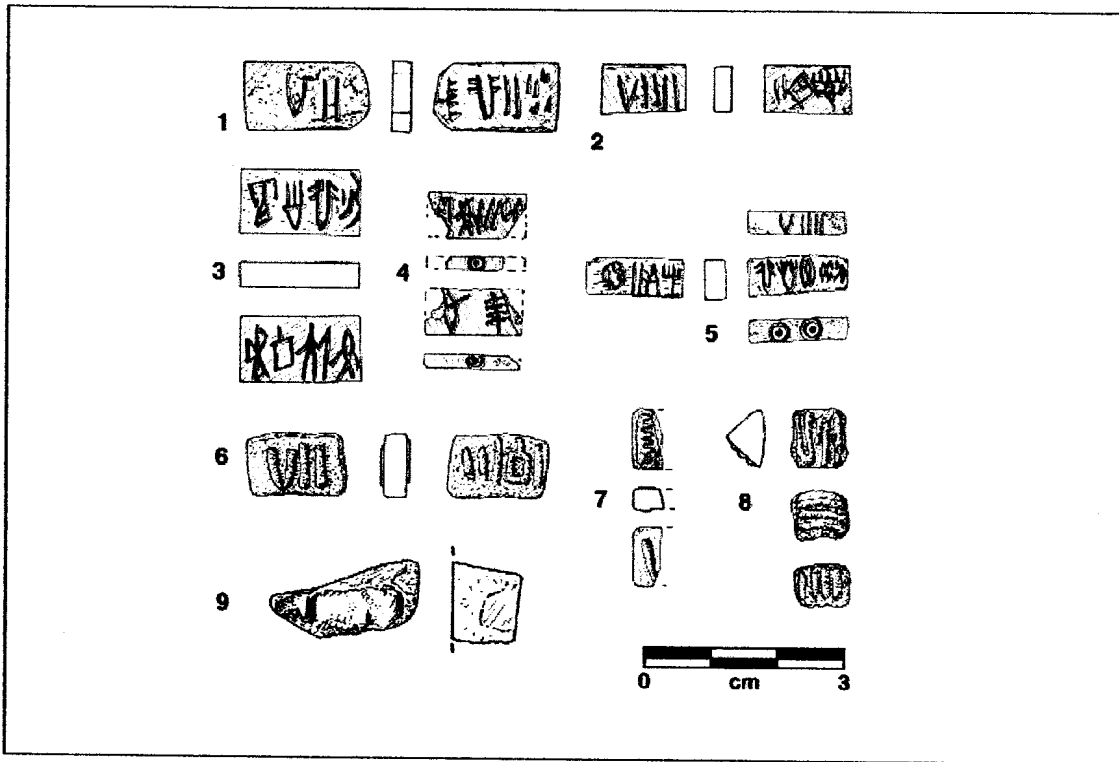


Fig. 13 – Harappa 1999-2001, Mound E, Trench 11, Period 3C, seals, tablets and inscribed objects:

#	Accession	Lot	Artifact Type	Material	Shape	Context
13.1	H2001-5200/	9067-01	Tablet (incised)	fired steatite	flat rectangular, rounded end	fill against city wall
13.2	H2001-5134/	9059-01	Tablet (incised)	fired steatite	flat rectangular	street deposits inside city wall
13.3	H2001-5201/	9067-02	Tablet (incised)	fired steatite	flat rectangular	fill against city wall
13.4	H2001-5250/	9067-03	Tablet (incised), broken	fired steatite	flat rectangular	fill against city wall
13.5	H2001-5145/	9043-01	Tablet (incised)	fired steatite	flat rectangular	fill inside city wall
13.6	H2001-5136/	9079-01	Tablet (molded)	faience	flat rectangular	disturbed deposits
13.7	H2001-5138/	9057-01	Tablet (molded), broken	faience	flat rectangular	street deposits inside city wall
13.8	H2001-5133/	9004-01	Tablet (molded), broken	faience	rectangular, triangular	surface wash
13.9	H1999-4422/	8885-23	Seal, broken (Unicorn)	fired steatite	square with boss	room fill

Trench 37 on Mound F (Vats Trench I) that was excavated in 1996 (Meadow *et al.* 1996; Meadow & Kenoyer 2000), and it will be instructive to compare the findings from the two areas in detail. Already it has been possible to note the development of pointed-base goblets through this sequence, with some (complete) vessels showing composite features of the earlier ledged-shouldered jars and the later pointed-base goblets that are characteristic of Period 3C.

At least three major building levels of architecture were uncovered inside the city wall. All date to Period 3C. In the upper two levels, the walls run north-south and east-west. There were some significant structures among them, although almost all baked-bricks have been robbed. This circumstance, together with the Harappan practice of

mixing baked-bricks and mud-bricks in the same wall, made excavations difficult, with the architectural configuration in soundings being particularly troublesome to define. In a deposit that had been dumped over the latest of the preserved walls was found part of a large ring-stone, much damaged, and broken into 3 pieces.

In the lowest architectural level uncovered this season, the mud-brick walls were found to be running radially, almost like the spokes of a wheel, making the transition from the orientation of the northwest-southeast running city wall to the north-south/east-west grid axis. The spaces between these walls were packed with rubble deposits containing huge amounts of charcoal and ash and large numbers of nodules, terracotta cakes, and potsherds. Three inscribed pieces, including one unicorn



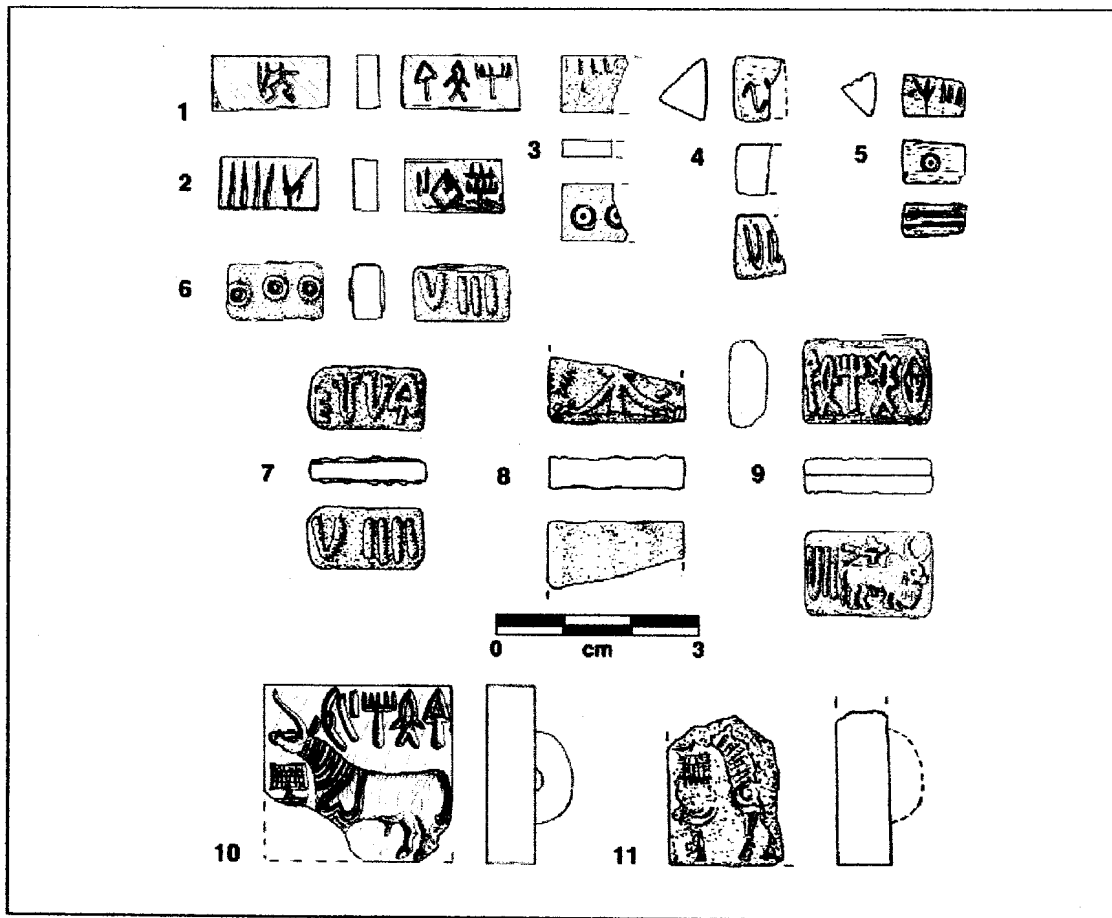


Fig. 14 – Harappa 2001, Mound E East, Trench 11, Period 3C, seals, tablets and inscribed objects:

#	Accession	Lot	Artifact Type	Material	Shape	Context
14.1	H2001-5142/	11759-01	Tablet (incised)	fired steatite	flat rectangular	foundation rubble
14.2	H2001-5193/	11909-01	Tablet (incised)	fired steatite	flat rectangular	foundation rubble
14.3	H2001-5147/	11700-04	Tablet (incised), broken	fired steatite	flat rectangular	surface clearing
14.4	H2001-5149/	11530-01	Tablet (incised), broken	fired steatite	flat rectangular	mixed fill
14.5	H2001-5198/	11587-01	Tablet (incised)	fired steatite	rectangular, triangular	floor deposits
14.6	H2001-5150/	11801-09	Tablet (molded)	faience	flat rectangular	sub-surface deposits
14.7	H2001-5141/	11528-01	Tablet (molded)	faience	flat rectangular	mixed fill
14.8	H2001-5199/	11560-22	Tablet (molded), broken	terracotta	flat rectangular	mixed fill
14.9	H2001-5148/	11900-01	Tablet (molded)	terracotta	flat rectangular	brick robber fill
14.10	H2001-5139/	11756-01	Seal, broken (Unicorn)	fired steatite	square with perforated boss	foundation rubble
14.11	H2001-5360/	11590-01	Seal, broken (Unicorn)	fired steatite	square with perforated boss	mixed fill

seal (Fig. 14.10) and two incised steatite tablets (Fig. 14.01-02), were found in these fill deposits. This complex served as a foundation for baked-brick and mud-brick structures now largely eroded.

There are significant architectural remains farther into the mound to the west of the northern offset to perimeter wall [250]. Wall voids in the 22-meter long trench dug in that area (east-west along grid-line N1220)

indicate the existence of significant baked-brick walls that run north-south and east-west as well as a wide, north-south running street, all dating to Period 3C. Between the wall voids were found *in situ* cultural remains including floor deposits and installations such as hearths and baked-brick features. Because much of the overburden of this area has been eroded, it should be possible in the future to uncover a good exposure of early Period 3C

architecture and to examine the transition from Period 3B into 3C. In addition, there seems to have been a significant large baked-brick structure of some sort at the western terminus of the perimeter wall [250] offset, now completely robbed away. This feature also requires future investigation.

### Conclusion

The 2000 and 2001 seasons at Harappa have been extremely significant. Not only were new discoveries made, but, for the Harappa Phase in particular, finds made during these years can be closely linked to discoveries from earlier seasons, including those of the 1920s and 1930s.

In the report above we have presented some of the important changes and continuities that characterize the development of Harappa as a city beginning with its origins during the Ravi (aspect of the Hakra) Phase (Period 1) and its growth and expansion during the Kot Diji Phase (Period 2). During the initial period of occupation during the Ravi Phase, settlers at Harappa undertook the specialized production of beads and ornaments that presumably would have been important for defining and maintaining social status. Until further excavations of the Ravi Phase occupation can be undertaken, however, it will not be possible to define the scale of production or the variety of crafts being developed at the site. Nevertheless, it is evident that whatever these earlier settlers did was successful and eventually led to the emergence of a substantial town during the subsequent Period 2, Kot Diji Phase, occupation.

During the Kot Diji Phase, we see evidence for the emergence of administrative objects such as seals, writing, and standardized weights. These objects are even more significant because they are found along with a wide range of trade items from distant regions and elite objects such as exotic stone and gold beads. The size of the site also grew significantly during this phase, both vertically

and horizontally, encompassing two separately walled settlements (Mound AB & Mound E).

There are still many questions remaining about the transition between the Kot Diji and the Harappa Phase, but the recent work in Trench 54 on Mound E confirms that there was a strong continuity in architectural orientation between the earlier city walls of Period 2 and the massive city walls of Period 3. Additional excavations below the Period 3A levels will be necessary to determine the types of changes and continuities in domestic structures and craft activities in this part of the site. Even now we can say that there were some important changes in architecture, with the introduction of fired brick used in walls and drains. The other major developments are seen in the mass production of pottery in large kilns, the association of numerous different crafts in one area of the site, and most importantly, the restricted nature of steatite and faience tablet manufacture within this larger craft area.

As we continue with the comparative study of the artifacts, pottery, architecture, faunal, and botanical remains from Harappa, we are obtaining an increasingly sophisticated view of the complex and dynamic political, ideological, and economic processes that were an integral part of Harappan urban society, some of which continued on into the Late Harappa Phase (Periods 4 & 5).

*Acknowledgements* The 2000 and 2001 seasons were the 14th and 15th seasons of research at Harappa, currently under the auspices of the Harappa Archaeological Research Project, directed by Dr. Richard H. Meadow (Harvard University) and Dr. J. Mark Kenoyer (University of Wisconsin-Madison) with the assistance of Dr. Rita P. Wright (New York University). Excavations by HARP are conducted in collaboration with the Department of Archaeology and Museums, Government of Pakistan. Financial support for the 2000 and 2001 seasons was provided by the following American institutions: National Endowment for the Humanities (RZ-20248-98), Peabody Museum of Archaeology and Ethnology of Harvard University, the American School of Prehistoric Research, the University of Wisconsin, the Smithsonian Institution, and the Kress Foundation. Donations from private individuals have also been extremely helpful. The directors of the Harappa Archaeological Research Project are most grateful for the efforts made on behalf of the project by all Pakistani and foreign staff. The success of the project is entirely due to their efforts and expertise. We particularly regret that due to world events, there could be no excavations in the winters of 2001/2002 – 2004/2005.

REFERENCES

- Dales, G.F. & Kenoyer, J.M. (1991) Summaries of five seasons of research at Harappa (District Sahiwal, Punjab, Pakistan) 1986-1990. *Harappa Excavations 1986-1990*, ed. R.H. Meadow. Madison, pp. 185-262.
- Durrani, F.A. (1988) Excavations in the Gomal Valley: Rehman Dheri excavations, Report No. 1. *Ancient Pakistan* 6, pp. 1-232.
- Durrani, F.A., Ali, I. & Erdosy, G. (1995) Seals and inscribed sherds of Rehman Dheri. *Ancient Pakistan* 10, pp. 198-233.
- Joshi, J.P. & Parpola, A. (1987) *Corpus of Indus Seals and Inscriptions. 1. Collections in India*. Helsinki.
- Kenoyer, J.M. (1991) Urban process in the Indus Tradition: a preliminary model from Harappa. *Harappa Excavations 1986-1990*, ed. R.H. Meadow. Madison, pp. 29-60.
- Kenoyer, J.M. (1998) *Ancient Cities of the Indus Valley Civilization*. Karachi.
- Kenoyer, J.M. & Meadow, R.H. (1997) New inscribed objects from Harappa. *Lahore Museum Bulletin* 11(1), pp. 1-20.
- Kenoyer, J.M. & Meadow, R.H. (1999) Harappa: New discoveries on its origins and growth. *Lahore Museum Bulletin* 12(1), pp. 1-12.
- Kenoyer, J.M. & Meadow, R.H. (2000) The Ravi Phase: a new cultural manifestation at Harappa (Pakistan). *South Asian Archaeology 1997*, ed. †M. Taddei & G. De Marco. Rome, pp. 55-76.
- Khan, F.A. (1965) Excavations at Kot Diji. *Pakistan Archaeology* 2, pp. 11-85.
- Meadow, R.H. (2002) The chronological and cultural significance of a steatite wig from Harappa. *Iranica Antiqua* 37, pp. 189-200.
- Meadow, R.H. & Kenoyer, J.M. (1993) Harappa Archaeological Research Project: 1993 Excavations. Report submitted to the Director-General, Department of Archaeology and Museums, Government of Pakistan, 1 November 1993.
- Meadow, R.H. & Kenoyer, J.M. (2000) The "tiny steatite seals" (incised steatite tablets) of Harappa: some observations on their context and dating. *South Asian Archaeology 1997*, ed. †M. Taddei & G. De Marco. Rome, pp. 321-340.
- Meadow, R.H. & Kenoyer, J.M. (in press) Harappa Excavations 1998-1999: New evidence for the development and manifestation of the Harappan phenomenon. *South Asian Archaeology 1999*, ed. E.M. Raven & G.L. Possehl. Groningen.
- Meadow, R.H., Kenoyer, J.M. & Wright, R.P. (1994) Harappa Archaeological Research Project: Harappa Excavations 1994. Report submitted to the Director-General, Department of Archaeology and Museums, Government of Pakistan, 30 August 1994.
- Meadow, R.H., Kenoyer, J.M. & Wright, R.P. (1995) Harappa Archaeological Research Project: Harappa Excavations 1995. Report submitted to the Director-General, Department of Archaeology and Museums, Government of Pakistan, 15 November 1995.
- Meadow, R.H., Kenoyer, J.M. & Wright, R.P. (1996) Harappa Archaeological Research Project: Harappa Excavations 1996. Report submitted to the Director-General, Department of Archaeology and Museums, Government of Pakistan, 17 December 1996.
- Meadow, R.H., Kenoyer, J.M. & Wright, R.P. (1997) Harappa Archaeological Research Project: Harappa Excavations 1997. Report submitted to the Director-General, Department of Archaeology and Museums, Government of Pakistan, 25 March 1998.
- Meadow, R.H., Kenoyer, J.M. & Wright, R.P. (1998) Harappa Archaeological Research Project: Harappa Excavations 1998. Report submitted to the Director-General, Department of Archaeology and Museums, Government of Pakistan, 30 March 1999.
- Meadow, R.H., Kenoyer, J.M. & Wright, R.P. (1999) Harappa Archaeological Research Project: Harappa Excavations 1999. Report submitted to the Director-General, Department of Archaeology and Museums, Government of Pakistan, 30 July 2000.
- Meadow, R.H., Kenoyer, J.M. & Wright, R.P. (2001) Harappa Archaeological Research Project: Harappa Excavations 2000 and 2001. Report submitted to the Director-General, Department of Archaeology and Museums, Government of Pakistan, December 2001.
- Mughal, M.R. (1967) Jalilpur. *Pakistan Archaeology* 4, pp. 7-10.
- Mughal, M.R. (1972) Excavation at Jalilpur. *Pakistan Archaeology* 8, pp. 117-124.
- Mughal, M.R. (1974) New evidence of the Early Harappan culture from Jalilpur, Pakistan. *Archaeology* 27(2), pp. 106-113.
- Mughal, M.R. & Halim, M.A. (1972) The pottery. Excavations at Sarai Khola - Part II. *Pakistan Archaeology* 8, pp. 34-110.
- Shah, S.G.M. & Parpola, A. (1991) *Corpus of Indus Seals and Inscriptions. 2. Collections in Pakistan*. Helsinki.
- Stuiver, M. & Reimer, P.J. (1993) Extended 14C data base and revised Calib 3.0 14C age calibration program. *Radiocarbon* 35, pp. 215-230.
- Vats, M.S. (1940) *Excavations at Harappa*. Delhi.
- Wheeler, R.E.M. (1947) Harappa 1946: the defenses and Cemetery R37. *Ancient India* 3: 58-130.