History of India-1 , Ancient History
Dr .Susmita Mohapatra,

Pre –History Hunter Gatherers, the advent of food production, the Harppan civilization, Cultures in transition

RECONSTRUCTION OF ANCIENT INDIAN HISTORY

I consider it a great honour and privilege to have been ask speak on the occasion of the forty-eighth anniversary of the dea Ramakrishna Gopal Bhandarkar. I am grateful to Professor Dand and his colleagues for having given me this rare opportunity. I join you in paying my respectful tributes to the memory of a sc who did so much not only for the revival of ancient Indian learni also for the reform of Hindu society in the late 19th and the earl century. Bhandarkar was not an ivory-tower scholar. His Col Works show that he was keenly aware of the problems of his t which enabled him to study the past more objectively and intellig We all owe a deep debt of gratitude to him, which can be repaid by sustained work in the field of historical and other studies. Bhandarkar was one of the earliest Indian scholars who tried to construct ancient Indian history on sound lines, and his example was followed by a host of other scholars. But the discovery of new source and the appearance of new historical ideas and methods make it impera tive that we have a fresh look at our past. The work done in this direction by foreign scholars has not been always satisfactory ; the primary responsibility of reconstructing Indian history is that of Indian historians. In the case of ancient India, during the first century of their.

history. As a reaction to the old line of study, during the last twenty years or so social and economic history has received some attention. But our real need is total history. The chronological and political frame- work of early Indian history has been established, but its non-political content is not only poor but also unrelated to political and chronological aspects. We, therefore, require an integrated study of the different aspects of life as a whole. If we confine ourselves to one or the other branches of history, this purpose will not be served. We have to study each period of our history and the history of each region and the country as a whole and to highlight important developments in relation to time, place and circumstances {desa, kãla and pãtra). Our knowledge of ancient Indian history is mostly based on written sources, but these have not been always used critically. Except in the case of political history no serious effort has been made to corre- late diverse sources bearing on a period or a theme, or a geographical region. A good deal of our study of non-political history has been source-wise. This could be justified in relation to frhe Vedic period for which Vedic literature is our main source unless we take into account the written Iranian sources. But from the age of the Buddha onwards each period of Indian history can claim a number of diverse sources such as Pali, Prakrit, Sanskrit, Greek, Latin, Chinese, etc., which have not been co-ordinated with one another. Many a source has been studied independently. The tone was set in the late 19th century by E. W. Hopkins, who wrote Position of the Ruling Glass in the Epie. Later Rhys Davids produced Buddhist India

based on the study of the Pali sources. We have such books as Life in the Orhyasutras by V. M. Apte, Life in Kalpasütras by Ram Gopal, India as known to Panini by V. S. Agrawala, Bhãsa-A Study by A. D. Pusalker, India in Kãlidãsa by B. S. Upadhyaya, Life as depicted in the Jain Canons by J. C. Jain and similar many other books. The History of Dharmasãstra by P. Y. Kane is the best example of such a study. It is a. monumental and encyclopaedic compilation which can be put to good use by.

Several themes in the history of society and polity have been studied, but their treatment ignores the time factor which is so vital to historical studies. In books on polity many authors proceed on the assumption that there had been no changes in the political structure of India from early times to the 12th century A. D. Although a pioneer work, Hindu Polity by K. P. Jaiswal suffers from this defect. The same is true of a book on Position of Women in Hindu Civilzcation by A. S. Altekar, who however surveys the position of women in chronological order at the end of his book. There could be some justification for such studies on the ground that social and political ideas and institutions Ěeconstruction of Ancient Indian History â were the products of various schools of thought which continued in the country for a long time. But undoubtedly over long periods of time changes did occur in social and political values and outlook according to time, place and circumstances, and they cannot be ignored in any worth- while historical study of ancient society and polity.

The one difficulty in utilising ancient texts is lack of firm chrono- logy. Many ancient texts are not homogeneous books ; they do not always belong to the authors, periods and places to which they are commonly assigned. Till recently the Rg Veda , the Arthasãstra of 4 Annals öf the Bhandarkar Oriental Research Institute Kautilya, the Mahãbhãrata and the Puränas were thought to be the work of a single author, but now it is established that each one ofv them consists of several strata, and each stratum is the contribution of a different author at a different time. Any historical study of the Rg Veda will have to take into account not only its earlier and later portions but also the hymns composed by different families. Modern authors hanker^ after individal names and prominent identities, but ancient authors completely identified themselves with the existing social order and its values and preferred anonymity. Interpolation is a well-known practice in regard to ancient texts, and it was easier to insert new matter either at the beginning or at the end of a text. That is why the first and the last books of many a text including the Rg Veda , the Rãmãyana and the Mahãbhãrata are later compositions. The monumental work done on the critical edition of the Mahãbhãrata has still to be used in a big way for the reconstruction of social, religious and cultural history. The critical edition explodes the myth of one single Mãhãbhãrata society, although several dissertations have been written on it. In fact the text covers the period roughly from the 10th century B. 0. to about the 4th century A. D. when the number of Šlokas in the Mahãbhãrata finally rose from 24,000 to 100,000. Obviously the stuff regarding social, economic and religious

history from the Sabhãparvan cannot be consi- dered to be of the same genre as that from the Éãntiparvan , which is one of the latest additions to the great epic. Several people including me had suggested that the Arthaéãstra of Kautitya was the work of several hands, and now as a result of computer analysis it has been shown that Parts II and III of the text were written much earlier while the other parts were composed later by different hands.

The insights gained from sociology can be of great use to the Study of ancient Indian society. Social laws which operate at a parti- cular stage of technological development can be also applied to ancient Reconstruction of Ancient Indian History t Indian society at this stage. For example although the Hara ppa culturre spread in a wide area, it would be wrong to think of an empire embrac- ing one-third of the Indian sub-continent. It has been calculated that not more than half a million people can be governed by one political authority in a society which is based on pre-iron field agriculture. In any case cities cannot be maintained for Jong without the knowledge of intensive agriculture and of iron ploughshare and manuring. The Harappans, therefore, could not have formed a very large populated state. Even a rough idea of the size of population lends a new dimension to * early social and economic history. If we do something of sociology and demography, we can have a reasonable guess about ancient population. It is true that in ancient times the Mauryas achieved quite a lot and they certainly unified the whole of the country, but what could be the.

Finally, it is necessary to draw your attention to the application of statistics to the study of ancient Indian history. In order to identify the mannerisms typical of the style of an author and to establish the various strata of a text on that basis, we have to find the frequency of the favourite words used by the author. In any case the counting of words of particular ^erms will be always useful. I did so when I wrote an article on vidatha , If we want to know whether society has any 8 Annálš of the Bhandarkar Oriental Research Institute matriarchal or patriarchal features it may be necessary to count the words relating to father and mother in a particular text. If the stati- stical method is used our generalization would be less impressionistic and more realistic. What has been suggested here may not revolutionize the study of ancient* Indian

history, but I would like to underline the need for developing a more critical attitude based oti the principles of textual criticism towards our sources and using the insights and methods provided by sister disciplines. If we are able to do this there is no doubt that ancient Indian history would become more useful and meaningful.

Pre –History Hunter Gatherers

Introduction

Paleolithic Period, ancient cultural stage, or level, of human development, characterized by the use of rudimentary chipped stone tools. The popular Paleo diet, or Stone Age diet, is based on foods humans presumably would have consumed during the Paleolithic Period.

The onset of the Paleolithic Period has traditionally coincided with the first evidence of tool construction and use by Homo some 2.58 million years ago, near the beginning of the Pleistocene Epoch (about 2.58 million to 11,700 years ago). In 2015, however, researchers excavating a dry riverbed near Kenya's Lake Turkana discovered primitive stone tools embedded in rocks dating to 3.3 million years ago—the middle of the Pliocene Epoch (some 5.3 million to 2.58 million years ago). Those tools predate the oldest confirmed specimens of Homo by almost a million years, which raises the possibility that toolmaking originated with Australopithecus or its contemporaries and that the timing of the onset of this cultural stage should be reevaluated.

At sites dating from the Lower Paleolithic Period, simple pebble tools have been found in association with the remains of what may have been some of the earliest human ancestors. A somewhat more-sophisticated Lower Paleolithic tradition, known as the Chopper chopping-tool industry, is widely distributed in the Eastern Hemisphere, and it is thought to have been the work of the hominin species named Homo erectus. It is believed that H. erectus probably made tools of wood and bone, although no such fossil tools have yet been found, as well as of stone.

The Upper Paleolithic Period was characterized by the emergence of regional stone tool industries, such as the Perigordian, Aurignacian, Solutrean, and Magdalenian of Europe as well as other localized industries of the Old World

and the oldest known cultures of the New World. Principally associated with the fossil remains of such anatomically modern humans as Cro-Magnons, Upper Paleolithic industries exhibit greater complexity, specialization, and variety of tool types, such as those made of bone, ivory, and antlers, and the emergence of distinctive regional artistic traditions involving paintings and sculpture and musical instruments.

Stone toolsReplica stone tools of the Acheulean industry, used by *Homo erectus* and early modern humans, and of the Mousterian industry, used by Neanderthals. (Top, from left) Mid-Acheulean bifacial hand ax and Acheulean banded-flint hand ax. (Center) Acheulean hand tool. (Bottom, from left) Mousterian bifacial hand ax, scraper, and bifacial point.(more)

About 700,000 years ago a new Lower Paleolithic tool, the hand ax, appeared. The earliest European hand axes are assigned to the Abbevillian industry, which developed in northern France in the valley of the Somme River. A later, more-refined hand ax tradition is seen in the Acheulean industry, evidence of which has been found in Europe, Africa, the Middle East, and Asia. Some of the earliest known hand axes were found at Olduvai Gorge (Tanzania) in association with remains of *H. erectus.* Alongside the hand-ax tradition there developed a distinct and very different stone tool industry, based on flakes of stone: special tools were made from worked (carefully shaped) flakes of flint. In Europe the Clactonian industry is one example of a flake tradition. The early flake industries probably contributed to the development of the Middle Paleolithic flake tools of the Mousterian industry, which is associated with the remains of Neanderthals. Other items dating to the Middle Paleolithic are shell beads found in both North and South Africa. In Taforalt, Morocco, the beads were dated to approximately 82,000 years ago, and other, younger examples were encountered in Blombos Cave, Blombosfontein Nature Reserve, on the southern coast of South Africa. Experts determined that the patterns of wear seem to indicate that some of these shells were suspended, some were engraved, and examples from both sites were covered with red ochre.

HARAPPAN CIVILIZATION 3.1

INTRODUCTION

Harappan Archaeological Research dates back to the year 1922 with the advent ofthe finding of Mohen-jo-Daro, the 'mound of dead', in Sindh. Because of its extraordinary urban character, the discovery raised immense interest world-over. Since then, the archaeology of the Harappan Civilization has been growing, both in terms of geographic factors and cultural dynamics. By the time archaeologists found that the Indus Civilization is no longer confined to the Indus Valley, archaeologists have redesignated it as 'Harappan Culture' or 'Harappan Civilization' after the type site namely Harappa (The naming of related sites after the one that was first discovered is a common convention in Archaeology.) discovered in 1921. From 1950 onwards, this study has been occupying paramount place in the archaeology of South Asia and the last twenty five years, in particular, have witnessed excavation of the scores of Harappan sites, which have brought to light the most exciting results. Intensive explorations and excavations of several sites of entire Harappan domain (known) have caused a tremendous knowledge explosion, facilitating a far better understanding ofthe fundamentals ofits "origin", its efflorescence and ofits ultimate "end". Archaeologists from India and Pakistan, either independently or in collaboration with western scholars, have launched multidisciplinary investigations to reconstruct the spatio-temporal framework of this civilization. The radiocarbon determinations and the evidence of the early food producing cultures in the entire Harappan domain have put this civilization in the perspective ofindigenous origins.

Before going into the details, it is necessary here to define some ofthe terms, which are used in this and next (fourth) chapter. The name Indus Valley Civilization/Harappan Culture signifies not only the sites limited to the Indus Valley proper but also to the similar kind of sites found in other parts ofIndia, Pakistan and Afghanistan. Pre-Harappan is the culture, preceding the Harappans but different from it. Early/Pre-Urban Harappan means the earlier phase ofthe Harappan culture, which paved the base stone for urban phase. Mature/Urban Harappan denotes the urban phase (prosperous period) of the Harappan culture. Late/Post-Urban Harappan represents the late period of the Harappan culture, which marks decline and deurbanization. Regional Chalcolithic cultures/traditions indicate the cultures other than the Harappans, which have their own identity and existed separately or co-existed with the Harappans in Gujarat during various phases ofthe above mentioned periods. The term period is defined as a bracket or interval, for example — a particular cultural event that endured for 900 years between 3500-2600 B.C. Cultural transformation or change is a continuous process with a varying degree of intensity. It involves factors like human adjustments to prevailing environmental and social condition ofthe region. Cultural change is also multi-directional and the degree and nature of change vary in time and space. Precisely, therefore, the beginning, growth and decline ofthe Harappan culture like other cultures, have been categorized into separate phases termed differently by various scholars (Rao 1963; Mughal 1970; Possehl 1977, 1980, 1984, 1993). Whatever the case or term may be; these terms indicate socio-cultural and technological development in various stages of Harappan development. Although Mature/Urban Harappan phase is well defined through type fossils and several other settlement features, but Pre Urban Harappan and Post Urban Harappan phases are not so clearly defined. There's definite lack of consistency in the material relics from different sites of both Pre-Harappan and Post Urban Harappan phases. Moreover, it must be noted here that these Pre Harappan, Pre-Urban Harappan, Mature/Urban Harappan and Late/Post Urban Harappan divisions are not necessarily time brackets applicable throughout the entire Harappan region. As regard to the chronology ofthe Harappan Civilization, it may be useful to take the cultural sequence as revealed by recent excavations on different sites supported by number of radiocarbon

(C14) dating samples. Beginning with the earliest level at the bottom of the sequence, we have: Post Urban Harappan**.**

After the partition ofBritish India, massive amount of archaeological explorations and additional excavations in the present Indian frontiers confirmed numerous Indus Valley Civilization sites. According to Possehl (2002) and Setter and Korisettar (2002), relentless survey conducted both in India and Pakistan during the last seventy odd years has thrown up a list ofnot less than 1,022 Mature-Harappan sites. Ofthese, 406 sites are located in Pakistan while 616 are in India. About 96 ofthese sites have been excavated so far: 41 in Pakistan and 55 in India. Research oh Indus Civilization in India, changed the position regarding the extent, culture-contents, regional variations, etc. In spite of the fact, that considerable regional variations within the entire Harappan domain have been discovered, the following diagnostic traits of the culture can be postulated, which give it a unified character throughout, perhaps with central authority. Some ofthese traits are-- 1. Planned cities and towns with basic layout of citadel and lower town, Dholavira being the exceptional as it has middle town also. Use of the burnt bricks in pre-Harappan phase is 1:2:3, whereas, in mature phase it is 1:2:4. 2. Red Ware pottery painted with black designs, well fired, paintings consisting of floral and geometric patterns and shapes including dish-on-stand, "S" shaped jars, beakers, goblets, perforated jars etc., 3. Beads ofFaience and steatite and long tubular bead.

4. Terracotta Mother Goddess (?), 5. Triangular Terracotta cakes and Mushtikas, 6. Terracotta and Faience Bangles, 7. Rohri chert blades, 8. Seals and Sealings, 9. Writing system/inscriptions, 10. Chert and agate weights and 11. Copper and Bronze objects.

GEOGRAPHY AND SALIENT FEATURES OF THE HARAPPAN CIVILIZATION

One ofthe important aspects ofthe Harappan civilization is its apparent mobility and proliferation over a large area consisting of number of ecozones with diverse environmental variables and economic incentives. Number of sources has affirmed that environment of the regions covered by the peoples of Harappan civilization during the period was quite different from today. There may have been little climatic change between then and now, but the environment, and hence the ecology, of this vast region is none less the different (Possehl 1999). The remains of the Harappan civilization, dating from 2600 B.C. to 2000-1800 B.C., include cities and villages, craft centers, river stations, camp sites, fortified palaces and probable ports, spread over a vast geographic area of 1.25 million Square Kilometers. Extreme cardinal limits ofthis civilization were Sutkagendor (Makran) in the west, Alamgirpur (Uttar Pradesh) in the east, Manda (Jammu and Kashmir) in the North and Daimabad in South Gujarat. But, when we talk of the scenario of Indian Subcontinent (entire Harappan culture domain) we will see that Shortughai on the left bank of Oxus, in Badakhshan, is the extreme northern limit. Whereas,

the sites ofthis civilization are found in Sind, Makran, Baluchistan, Punjab, Haryana, north Rajasthan, Uttar Pradesh, Gujarat, Maharashtra and Badakhshan, in the modem states of Pakistan, India and Afghanista.

Indus Valley, by and large, is devoid of basic raw material to meet some of their needs on its own. However, Harappans evolved in a magnificent civilization mainly because oftheir expansionist nature towards resource areas situated far apart by their ability to mobilize economic potentials. The discovery of Harappan settlement at Shortughai in Badakhshan province ofnorthern Afghanistan for lapis lazuli (Francfort 1984), Balakot on the Somani bay in Pakistan for marine gastropods (Dales and Kenoyer 1977), Cholistan region in Bhawalpur District of Pakistan for copper (Mughal 1980), Limestone hills at Sukkur Rohri in upper Sindh region ofPakistan for flint/chert (Allchin and Allchin 1982 1996-97) and Manda in Jammu and Kashmir for Timber (Thapar 1985) are some ofthe explicit indicators oftheir hunt for procuring desired raw material. The penetration of Harappans further south into Gujarat demonstrates a similar enterprising character exploiting rich deposits ofsemi-precious.

stones and marine gastropods (Sonawane 1992, 2005). Thus, enterprising Harappans demonstrated their skill in selecting suitable environmental niches during their multidirectional expansion. These factors and accessibility to natural resources were largely responsible for the growth, expansion and long survival of the Harappan culture. The spread of this civilization was therefore governed by the areas of attraction, depending upon the availability of resources and geographical factors conducive to their cultural dynamics. These factors partly explain not only the regional diversities in the manifestation of the Harappa culture but also the innate capacity of the Harappans to mobilize different subsistence systems by integrating them into their economic structure.

TOWN PLANNING AND LAYOUT OF THE SETTLEMENTS The most noteworthy feature, unheard elsewhere during the second half of third millennium B.C., is the remarkable town planning ofthe Harappan civilization, with a probable margin on either side. Dholavira being the exception with middle town as the extra feature ofthe settlement, every other small cities and towns ofthe Harappan civilization consist of the basic layout out of citadel and lower town. Recent excavations have proved that Harappan town planning does not represent uniform pattern. The evidence from Lothal (Fig. 3.1), Surkotada (Fig. 3.2), Dholavira (Fig. 3.3) and Banawali (Fig. 3.4) has shown different settlement pattern than that of Mohen-jo-Daro (Fig. 3.5), Harappa (Fig. 3.6) and Kalibangan (Fig. 3.7). With the excavation ofMohen-jo-Daro, Harappa and Kalibangan, archaeologists earlier had the conception oftwin mounds, higher ones located on the west acted as the citadels and.

lower towns occupying relatively less elevated area situated towards the east. In the absence of large scale excavation at Rakhigarhi, covering entire site, precise plan of the settlement is yet to be known. Based on the evidence of excavations, the majority ofthe Harappan cities and towns are composed of a series ofwalled mounds or sectors oriented in different directions. Harappa and Mohen-jo-Daro both

have rectangular mound on the west and extensive mounds to the north, south and east whereas the settlement ofKalibangan is confined to two separate mounds with the citadel on the west, represented by a smaller mound and the lower city towards the east, marked by a fairly extensive mound. Citadel was situated over the remains ofthe preceding occupation to gain eminence over the lower.

town, which was laid out on the natural plain towards the leaving the gap of over 40 meter between the two. Harappa is remarkably similar to that of Kalibangan in layout having fortifications—parallelogram on plan. Mohen-jo-Daro also appears to have a similar layout, despite the fact that flood erosions have obscured the evidence. The lower town of Harappa and Mohen-jo-Daro spreading out on different mounds also appear to have separately fortified. However, lower town of Kalibangan gives clear indication offortification—parallelogram in shape. In contrast, Lothal and Surkotada follow a different expression for the layout of the settlement. In these two sites, a common periphery wall encloses both the citadel and the lower town. In case of Lothal, which is roughly rectangular on plan, with longer axis running north to south was surrounded by a massive brick wall, probably to protect from flood, as the site is situated on the low-lying area ofBhogava, a tributary of Sabarmati. There is no wall as such to separate the lower town from the acropolis; the latter is situated in on the southeast, a unique location. The layout of the Lothal also claims distinction because of a rectangular brick basin, interpreted as dockyard, attached with a wharf along the eastern side ofthe settlement. Whereas, fortification of Surkotada is built of mud and mud bricks having stone rubble veneer and also has a partition wall separating the citadel from the residential annexe in such a way that settlement gets divided into almost two equal squarish halves, with an intercommunicating passage between the two. The western half retains its identity as the citadel. Among all, Dholavira, on account of its unique city planning indeed enjoys a pre-eminent position. The city is basically oriented in the traditional cardinal directions, but the layout of the settlement, especially ofthe walls and sectors are quite different from that ofthe other Harappan settlements. The salient components of the full-grown cityscape consisted.

of bipartite citadel, middle town and lower town. These three sectors are set within gargantuan fortification constructed entirely of mud bricks, running on all four sides. The citadel of Dholavira, unlike its counterparts at Harappa, Mohen-jo-Daro and Kalibangan was laid out in the south ofthe city area. Like Kalibangan and Surkotada, Dholavira too has conjoined subdivisions, identified as castle and bailey, located on the east and west respectively, on the top of a low hill with fortification. Impregnable defences most zealously guard the former, being the most important unit, while the latter is lower in height and enclosed by comparatively less thick walls. A broad and long ground between the citadel and middle town has been interpreted as a ceremonial ground. Further north, was located the enwalled middle town and to the east of it was 50 Mf jf \\ /, ' \ founded lower town. The lower town though did not have its own fopifcaii6%\;vyas', : set within the general circumvallation running around the entire city^flTiese€h§ee:/ major built-up divisions made together an L-shaped design: the citadel and the middle " town forming the shorter line from the north-south and the middle town and theTdWef town forming the longer stroke along the east west axis. Besides, to the south of the castle, across the adjoining reservoir, there was raised another built-up area running along the city wall. On the other hand, the Harappan town at Banawali stands apart for its unusual town planning which the Harappans accepted in bequest. Belying the accepted norms it had an apsidal citadel within a trapezoidal town,

both fortified by brick separately and securely, following natural elevation, resulting in an unusual layout. The citadel of course, enjoyed pre-eminently vantage location within the town.

From the above mentioned data it is quite obvious that the centralized planning ofthe Harappan settlements is one ofthe distinctive features and the earliest advanced urban civilizations of the world. Although they were not strictly laid on chessboard or grid patterns with invariably straight roads, they do show many signs of careful planning. Sites like Mohen-jo-Daro, Harappa and Kalibangan had low, large eastern sectors and separately fortified higher but smaller western sectors, known as lower towns and citadels respectively. There is a clear evidence that the buildings of the citadel were laid on a high podium fortified with bastions and towers whereas the eastern one too lay within a fortification though of high magnitude but less impressive. Though some of the settlements were fortified even during the Early Harappan phase, their actual division into separate enclosed units evidently appears to coincide with the Mature Harappan phase only, obviously denoting socio-political stratification. On the contrary Surkotada shows no such divisions but has only a single sector on the model of western sector of Kalibangan. Though, Lothal and Banawali each lay within a single enclosure, the latter shows distinctly fortified apsidal citadel within a trapezoidal town. Of the two, Lothal has distinction of having a dockyard. On the.

other hand, Rakhigarhi, though not fully exposed show signs ofpossessing more than two walled residential sectors. However, Dholavira stands apart and show three divisions within the general enclosing wall consisting of bipartite citadel (Castle and Bailey), middle town and lower town, which temptingly sound analogous respectively to three different categories ofthe settlement or buildings. An open space between the citadel and the middle town served as stadium. However most amazing is the layout of gates and provision of larger reservoirs in the drought prone area of Kutch, integrating the use of two local streams into the overall civic planning. However, despite variations in details, all settlements were well integrated to suit into the landscape under one platform. Unlike the haphazard arrangement of Mesopotamian cities, Harappan settlements followed the same basic plan everywhere.

FORTIFICATION One ofthe important aspects ofthe Harappan town planning is the provision offorts. Archaeological evidences has brought into notice the concept of development of fortification during pre and early Harappan phase, it became more pronounced and standardized during the Mature phase with the emergence of earliest towns and cities, as a measure to safeguard their settlements. The massive fortification walls were in fact solid structures made of proportionately moulded bricks set in mud mortar. Successive courses of brick were laid in recessed manner as a result both the faces registered a marked taper, which resulted into the raised wall from a border base to a lofty narrow top forming trapezoidal cross section and often indicating the evidence of clay plastering. On the other hand, in areas where the availability of stones are easy, i.e. Dholavira and Surkotada, both inner and outer faces were provided with stone facing to sustain the strength ofsusceptible portions. It appears that special care was taken for the construction ofthe comers, gates and bastions ofthe fortification. In Harappa, one ofthe walls around mound AB, was 14 meter wide at the base and the exterior face ofthe wall was ofbaked bricks. Whereas, in Kalibangan the width ofthe fort wall ofthe citadel complex varies from 9 to 11 meters. At Dholavira, the basal width ofthe fort wall ofthe castle is 11 meter whereas at Banawali, the basal width of the fort walls ofthe citadel ranges from 5.4 to 7 meter. At Surkotada, the width ofthe

fortification wall of citadel is 7 meter whereas residential annexe is 4.25 meter. At Lothal, despite the fact of a relatively small settlement .

Archaeologists are still not very sure of the precise number of gates provided in different walled sectors both at Harappa and Mohen-jo-Daro. Mound E at Harappa, gives the evidence in one ofthe gates to be only 2.8 meter wide, just large enough to allow movement of one bullock-cart to get in or out ofthe city, at a time. It seems that the top of the gate was perhaps covered and may have had rooms or sentinel posts. The second most important gateway of mound E found near the junction at mound E and ET, is much more complex. The actual gate opening is only 2.6 meters in width but it has pylons and side rooms. Around mound AB, the excavated walls revealed four gates, three on the western face and larger one on the northern side of the wall with a ramp leading down to a lower suburb in the north ofmound F. Recent studies at Mohen-jo-Daro seems to have confirmed that similar to that of Harappa, each major mound at Mohen-jo-Daro was surrounded by an enormous mud brick walls with gateways at locations (Kenoyer 1998: 55-56). As said earlier, the fortified citadel complex of Kalibangan consists of two almost equal but separately patterned parts, rhomboid on plan, has revealed four gates, three in the northern half and one in the southern half. In addition, the separation wall, dividing citadel and lower town, also has a gate in the form of stairway between the two centrally located salient, connecting both the entity. Three gates ofthe northern half (occupied by the elites) and one each on eastern, western and northern side, are simple ones without a ramp, 53 exceptional being the eastern one with a brick pavement on the edge. In addition to these, the southern gate situated between central salient and the southern corner tower has revealed 2.65 meter wide stairway passage. Similarly, two entrances of the fortified lower town were found on the northern and western sides, Of these, the western entrance was controlled by a guardroom (Thapar 1979: 200-01). In Lothal, there is not a single evidence oftower or gateway built in the periphery wall. On the contrary, the extent of excavated areas has revealed a slanting entrance passage to the acropolis on the southern outer wall further west ofthe warehouse. At the same time scenario at Surkotada is quite different. Being a garrison defense outpost, it has elaborate gateway complexes with guardrooms. Here, citadel as well as residential area was provided with separate entrance, each 1.70 meter wide, constructed in the middle between the comer and central bastion ofthe southern rampart. In addition, a 4m wide passage for intercommunication was provided in a partition wall between citadel and the residential annexe (Joshi 1990: 51-57). Similarly, Banawali has an elaborate gate complex constructed in the thick outer eastern wall was found where five major streets met with the passage ofthe gate on a broad piazza. It was flanked by bastions having a moat in front. Most noteworthy of all the Harappan settlements, Dholavira accounts for most ofthe gateways unparallel to be seen elsewhere. Overall, 14 gates have been laid bare in different fortified habitational areas. The divisions of all these 14 gates are: Castle-5; Bailey-2; Stadium-4; Middle town-1 and Annexe-2. All the five gates of the Castle bear distinct designs. Of these, eastern arm of the fortification wall has yielded two gates while one each in remaining three sides of the walls. The south gate has a concealed passage with an ordinary doorway. Gate on the western arm, which was connected with the Bailey, has a 9 meter long and 2.2 meter wide passage with a guardroom. The eastern gate (Fig. 3.8), one of the two major ones, had a large elevated side chamber on the south and a passage on the north. The passage was interconnected with the flight of 14 steps at the inner end while the other end was fitted with a doorsill made of large limestone slab. On the either ends ofthe floor of chamber was found a set of

smooth, nicely cut and polished limestone blocks of rectangular shape. Thus, it is quite possible that both the ends have been provided with huge doors. In these blocks, the topmost block bore two long sockets, one each on two sides, parallel to each other. Each pair ofthe blocks served as the base for the

STREETS Streets are of the utmost importance in any of the civilization and the layout of the streets can tell us about the nature of the settlement. During Harappan period too, streets played vital role in the urban planning. The overall layout of the Harappan settlements is distinguished by the orientation of streets according to cardinal directions. The prime streets at best were laid out running north-south and east-west cutting at right angles forming a grid pattern in such a manner that it divided the settlements into square or rectangular blocks. Though, in its stricter sense Mohen-joDaro does not have precise alignment and the widest street measures 9.1 meter, running across the lower town, from north to south. Excavations at Kalibangan have confirmed the existence of four arterial thoroughfares, running north-south and three running east-west. While the former were found to run without hindrance, the latter did not come across the former but were staggered and possibly served as entrance lanes for certain house blocks. Yet again, while the former were not equally spaced, the latter were situated on an average of 70 meter from each other. The width of the 56 thoroughfares and streets corresponded to the multiple of 1.8 meter and range from 1.8 to 7.2 meter. To prevent damage from vehicular traffic, fender posts were provided at some street comers. Throughout the occupation, the width of these thoroughfares appears to be maintained, the only encroachments ofthe structures into the streets were rectangular platforms immediately outside some houses. Archaeological evidences suggest that the streets were unmetalled, except in the late phase. The layout ofthe city shows that the alignments ofthe streets were at variance with that offortification walls. It seems fortifications and streets had been planned at the same time (Thapar 1979: 200-201). In the same manner the streets of 4-6 meter wide and narrow lanes of 2-3 meter divided the principal living area of Lothal with main-street running from north to south. Surk.

9 DRAINAGE NETWORK

One ofthe most excellent features ofthe Harappan town planning is the well laid out streets and side lanes geared up with drainage network. As a matter offact, discharge of polluted water and sewage was an important part ofthe concerns ofthe Harappans, which is reflected not only in the cities but also in smaller towns and villages having impressive drainage system. Baked bricks were the important part for the construction of the drains. Bathing platforms and latrines of the houses were connected to the medium sized drains in the side streets. These medium sized drains flowed into larger sewers along with the main streets, which were covered with bricks or dressed stone blocks. Corbelled arches allowed the larger drains to cut beneath streets or buildings until they finally exit under the city wall. One completely preserved drain found at Harappa has a magnificent corbelled arch- 1.6 meter high, 60 centimeter wide and extends from 6.5 meter beneath a major city street. Rectangular sump pits, for collecting solid waste, were aided with main sewage, at regular intervals. Harappans seems to be through with the art of management ofwaste water inside the houses. As evident from excavations, there were provisions of intramural drains, vertical drain pipes in the walls, chutes through walls to the streets and drains from bathing floors into the street drains. The Great Bath at Mohen-jo-Daro was provided with that largest of all the Harappan culverts. Water from inside houses was sometime led directly into a street drain, but

there are other facilities, which were used as well, like brick-lined cesspits and pottery jars along the streets.

HOUSES AND BUILDINGS

Groups ofresidential houses and public buildings were constructed close together and formed larger blocks that were bordered by lanes and wide streets. Most of the houses opened on the narrower streets and lanes and rarely on the main street. An average house centered around an open courtyard from which access was provided to the various rooms to meet basic requirements as modules seen in traditional houses even today. Apart from bathroom, latrine, and drains for sewage in almost every house, hearth was also a common feature and quite a few of the houses having their own well. Floors of the houses were either made up of rammed earth or moulded mud bricks. Quite a few houses have provided evidence of staircases, which suggests the 59 possibility of upper storey; though it is quite likely that in most of the cases these might be the openings for the roof. On an average, house walls were 70 centimeter thick and ceilings were probably three meter high. Clay models of houses show that some ofthe doorframes were painted and possibly carved with simple decoration and. also suggest a kind of locking device. Windows were reported to have normally formed by lattice brickwork. Besides the common types of houses, barrack like quarters, arranged in two parallel back to back north-south rows, separated by a narrow passage were evident from the HR area ofMohen-jo-Daro. Here, each quarter had two rooms, one at the back and the other in the front. These barracks are

WATER RESERVES Depending upon the geographical position and environmental setting of the site, wells, tanks and reservoirs were built to ascertain various necessities related to water. Jansen estimated that Mohen-jo-Daro may have had more than 700 wells (Jansen 1989: 252). Comparatively, Harappa may have had as few as 30 wells. In the same manner excavations at Chanhudaro, Kalibangan, Lothal and Dholavira also had furnished evidence of wells restricted to very few in counts. Majority ofthese wells were lined with specially made wedged-shaped bricks) to form a structurally sound cylinder, with the depth of almost 10-15 meter, which would not cave in under pressure from the adjacent earth. On the top edge of the well made of bricks had deep grooves, except that of Dholavira where such marks are seen on the basal stone slab of the trough indicating use of ropes to lift the water, probably with leather bags. At Mohen-jo-Daro, diameter ofthe wells ranged from 60 centimeter (being the smallest) to 2.1 meter (the largest one). Whereas, in the castle area ofDholavira, with highly skilled masonry work employed in the construction of the well is the largest, ofwhich the inner diameter measures 4.12 meter.