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Archaeological Research at Sisupalgarh, an Early Historic City in Eastern India

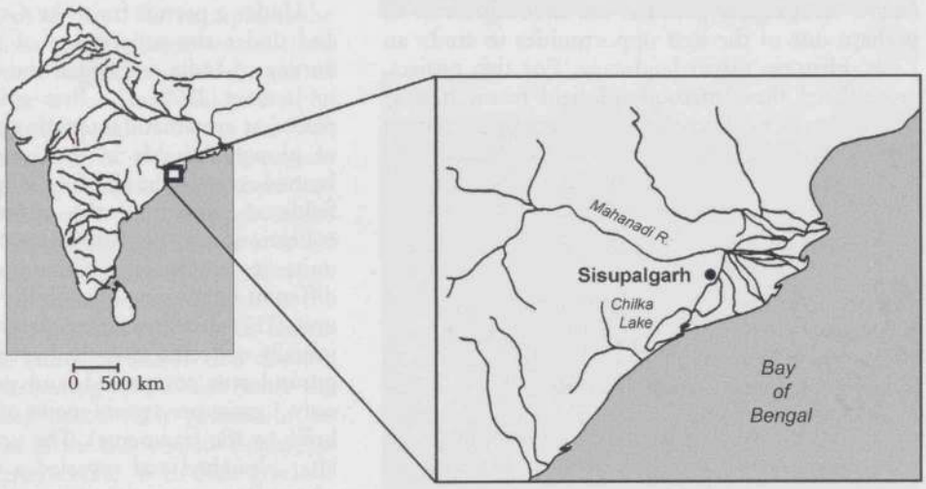


Fig. 1. Location of Sisupalgarh in India.

Abstract

Sisupalgarh is a walled city of the Early Historic period (c. 3rd century BC to 4th century AD) located on the south-eastern edge of modern Bhubaneswar in eastern India. The site measures 130 hectares in size and is delineated by a rectilinear rampart-and-moat configuration and eight formal gateways. In addition to these ramparts, the ancient urban centre of Sisupalgarh contains other large-scale architecture such as stone columns and stone-lined ponds concentrated at the centre of the site. This project was developed to assess how an ancient South Asian city was built and utilized by many different types of people in the formation of a fully urban social sphere. Through systematic surface-survey and mapping, we have examined the distribution of artefacts and architectural remains. Some types of artefacts, such as fine ceramics, are widely distributed suggesting that inhabitants had a minimum standard of what constituted basic and appropriate household possessions. Other types of materials, such as durable architectural remains, suggest that there were disparities in standards of living above and beyond that basic household repertoire. Perhaps the most surprising of our observations is that the site's archaeological remains are of an overwhelmingly local character. With almost no indications of exchange from distances beyond about 10 kms from the site, the city appears to have been extremely self-sufficient. Evidence from the site of Sisupalgarh thus enables us to build a model of Early Historic cities being successful because of local-level interactions rather than because of long-distance contacts or exchanges.

Introduction

The ancient city of Sisupalgarh is one of several dozen large fortified sites of the South Asian Early Historic period (c. 3rd century BC to 4th century AD). Located on the south-eastern edge of modern Bhubaneswar in eastern India (fig. 1), the site's most prominent architectural feature is the still-preserved rampart that forms a nearly square outline encompassing 130 hectares of dense ancient urban occupation. Within the rampart walls, the site contains numerous additional indicators of Early Historic labour investment, including stone columns and stone-lined ponds concentrated at the centre of the site.

Sisupalgarh was chosen for a whole-site survey and mapping approach on the basis of earlier investigations that indicated that the site was occupied throughout the Early Historic period (Lal 1949, 67; 1991). Until very recently the site has been occupied only by a small village, meaning that large portions of the ancient urban centre now consist of seasonally fallow fields in which artefacts from the Early Historic period can be seen and recovered on the present-day surface. These conditions of visibility make Sisupalgarh distinct from other Early Historic urban sites, for example in the Ganges Valley, where the Early Historic materials are significantly obscured by subsequent occupations including modern habitation. As a result, Sisupalgarh presents the investigator with perhaps one of the best opportunities to study an Early Historic urban landscape. For this project, we utilized three methods of field research: systematic surface collections, mapping of the rampart surface, and measuring of the rampart height with a theodolite.

Systematic surface collections

The project utilized a systematic surface-survey and collection program to gather data for a study of artefact distributions at the site of Sisupalgarh. Systematic surface-survey has been successfully utilized at South Asian sites of the Harappan (e. g. Miller 1994; Vidale 1990), Early Historic (e. g. Smith 2000; 2001), and medieval periods (e. g. Morrison 1990; Sinopoli/Morrison 1995). The method consists of making collections of surface materials at regularly spaced intervals throughout an archaeological site. The collected materials are then counted, weighed and sorted, and the information is noted on forms and charts that enables the investigator to map the distribution of different artefacts.

Through systematic surface collection, the artefacts on the surface of a site can be assessed as a proxy for the distribution of archaeological remains. This strategy is particularly suited to sites in which the archaeological remains are free from subsequent deposits such as water-borne deposits, wind-borne deposits, or subsequent human occupations. Because cultural features have sometimes been exposed by storms or other activity over the past three years of fieldwork, our team has observed that intact architectural remains of the pre-modern period are very close to the surface at Sisupalgarh (i. e., 15–20 cm below the ploughed surface). In addition, the Early Historic architecture exposed by the excavations of 1948 (Lal 1949) can still be seen today, where the uppermost level of the preserved stone architecture lies only 20–30 cm below the surrounding unexcavated farmland. These circumstances, along with the excellent visibility provided by ploughed surfaces, result in a high surface artefact density suited to a systematic collection methodology.

Our project's systematic surface-collection program at Sisupalgarh utilized collection areas that were typically 5 × 5 m in size, spaced every 50 m throughout the site. Rather than using an exactly regular grid that might have enhanced or obscured underlying archaeological regularities, the units were placed using a systematic, non-aligned random sample procedure (see Smith 2001, 42–50). A string square was used to demarcate the area of each collection, with the NW corner of the unit at the exact location of the prescribed survey point. The string square served as the precise boundary for collection activities, and also made the collection area easily visible to individuals visiting our work area.

Under a permit from the Government of India and under the supervision of the Archaeological Survey of India, we began the collection program in January 2001. The first collection units were placed at systematic intervals throughout the areas of ploughed fields in the southern and western farmed areas of the site. The emphasis on ploughed fields as presenting the optimal conditions for collections was confirmed by the re-collection of units in exactly the same locations but under different conditions of visibility. For example, one unit (I17) in the western portion of the site was initially collected after the harvest season when the ground was compacted, and produced a total of only 1 gram per square meter of artefacts (ceramic, brick or tile fragments). The unit was re-collected after ploughed and revealed a total of 138 grams of artefacts per square meter. These observations emphasize the necessity of making collections under optimal levels of visibility in order to fully evaluate the surface artefact record.

Throughout the site, each collection unit was walked over by a team of 2–5 people standing or kneeling shoulder-to-shoulder. All items that could be discerned as artefacts, regardless of size, were collected. The unit was first traversed in an east-west direction and then in a north-south direction. In practice, the second pass yielded about 20% of the total collection weight of the unit (continued traverses would be counterproductive as walking itself often revealed new artefacts as clods of earth were turned over; the purpose of the collection was to get a thorough and representative sample, not to collect all of the potential artefacts in the topsoil of the site). As some areas of the site had very dense quantities of artefacts, the standard collection size was sometimes adjusted to produce a range of materials from 2–4 kg per collection square.

The majority of items collected consisted of artefacts made of clay: ceramics, brick, and tile. Other architectural fragments made of laterite and sandstone were also abundant. Portable items included metal fragments. If there was doubt about an item, it was collected so that it could be washed and its status as an artefact or non-artefact could

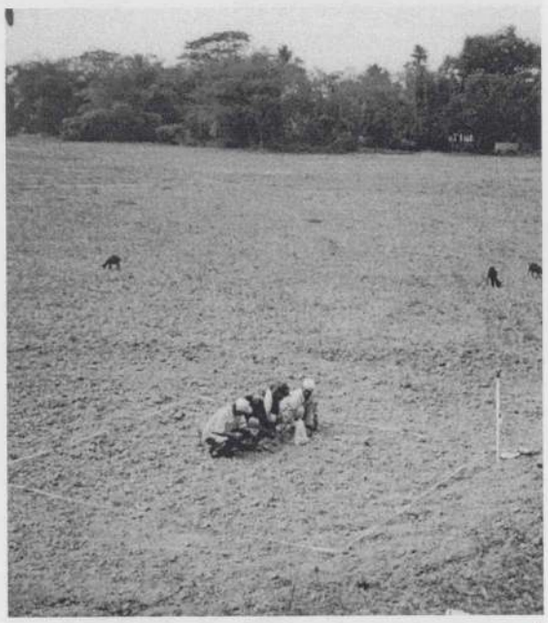
be determined. This very intensive method resulted in a comprehensive examination of the surface, but was relatively time-consuming. In freshly-ploughed areas, collection units 5 m × 5 m in size required approximately 2 hours each when collected by 5 persons; a larger or smaller crew size resulted in correspondingly adjusted times for collection. All crew resources were concentrated on a single square at a time; there were no concurrent collections.

As the survey team worked at the site in all seasons of the year except for the monsoon months of July and August, for the most part we were able to collect from agricultural fields at times that coincided with the local farmers' ploughed schedules. In some areas of the site, for example in the spaces between houses in the village, we collected samples wherever they might be visible, such as in kitchen gardens or other small fields. By the spring of 2003, the only portion of the site that did not have collection units was in the eastern zone between the two gateways, where there had never been any agricultural activity throughout the project's duration. The fallow land of this area did not appear to have any surface artefacts, although we knew from our re-collection experiment in the western portion of the site that fallow areas collect water and silt in the monsoon season that obscure surface remains. Accordingly, we met with the local landowners and asked their permission to plough selected areas of the many small fields that are present in the eastern zone. With their gracious consent, we hired a local man with a bullock-drawn plough to plough the areas, proceeding to a motorized tractor when the ground proved too hardened to be broken by animal traction alone (fig. 2).

For the four project seasons, we collected a total of 209 units, with a combined total area of 7,964 m². For each collection unit, a standardized form was used to record information about the unit and its artefacts. The archaeological materials were bagged in the field using two tags (exterior and interior, each with the same information) for each bag. Tags were marked with the site name, collection unit number, collector(s) name, date collected, and type of material. The tags were made of Tyvek material (a plastic "paper") and the information was written with permanent ink. This system enabled tags to become wet or humid without loss of information. It should be noted, however, that even in the good storage conditions provided for these artefacts there can be rodent damage to Tyvek. For permanent long-term storage, it would probably be best to secure bags with aluminium tags in which information can be punched into the metal itself, and our team plans to attach such tags prior to final storage of these collections.

The analysis of our surface collections indicated that the majority of the artefacts were consistent

a



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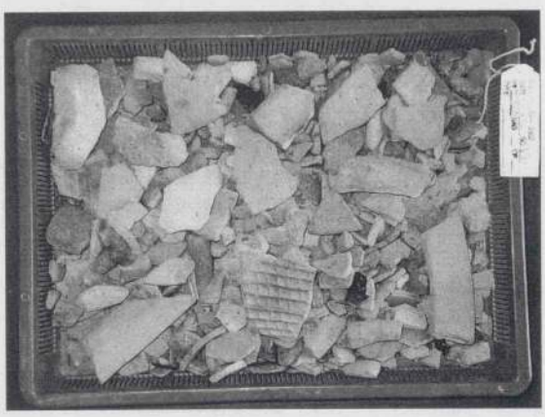

c

Fig. 2. a. b. Plowing and subsequent collection of units in the southeastern protion of the site. – c. Typical collection unit from Sisupalgarh, after washing, showing the types of ceramics recovered from a unit square collected from a plowed area.

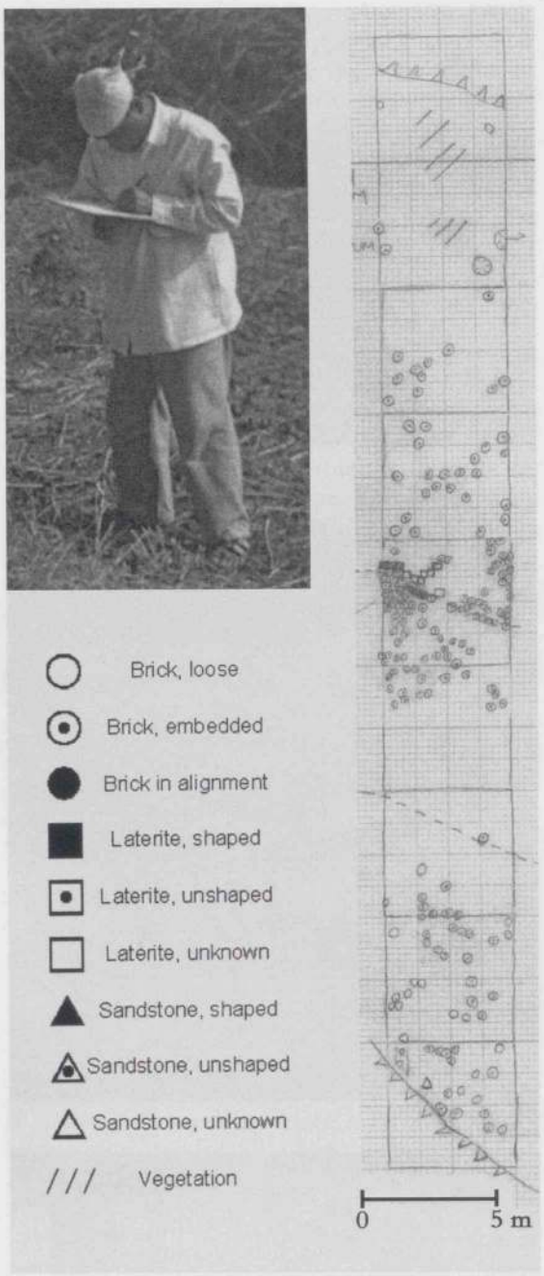

Fig. 3. Mapping of rampart surface, showing mapping code and mapping strip with concentration of architecture at the apex of the rampart.

with the Early Historic chronology of the artefacts found in the 1948 excavation (see Lal 1949). A small number of this project's collection units showed materials of a distinctly different type, including elaborately flared rims similar to those on display at the museum in Ratnagiri (Orissa State) and dated to the early medieval period c. 9th century AD. The small number of these ceramics (less than 1% of the surface remains) indicate a very limited medieval presence at Sisupalgarh, probably consisting of isolated households or farmsteads associated with the resurgence of architectural activity starting in the 7th century AD in the Old Town region of Bhubaneswar located 2 kms northwest of Sisupalgarh (e. g. Panigrahi 1981).

The analysis of surface-collected artefacts was undertaken to assess the distinctions and similarities between material culture usage in different areas of the site. Although the ceramics and other artefacts were often highly fragmentary, we were able to consistently measure the thickness, firing conditions (oxidized/red or reduced/blackened), temper (from silty to coarse sand), and decoration on the more than 120,000 ceramic sherds collected in the course of our systematic surveys. We will utilize this information to construct maps of the different distributions at the site, correlating those distributions with patterns in architectural remains and manufacturing debris to reconstruct the variety of activities that can be documented for the ancient city.

Mapping of the rampart surface

At Sisupalgarh, the rampart is in an excellent state of preservation. The excavations of 1948 (Lal 1949, 67) revealed that the construction of the rampart was started after the initial habitation of the site, probably around the 2nd century BC. The excavations of 1948 included a cross-section through the western rampart, revealing layers of earthen embankment to which were later added subsequent layers of earth and gravel as well as walls of baked brick (Lal 1949, 67. 73). Because the chronology of the surface materials, as well as the 1948 excavated artefacts, indicate a nearly uniform Early Historic date for the site, we can also assign this consistent Early Historic date to the ramparts.

Initial examinations as part of the present surface survey project indicated that a pattern of uppermost brick construction was evident throughout the rampart. Our goal was to create detailed maps of the architectural surface remains to see whether there were significant differences in upper-rampart construction that would indicate changing patterns of rampart augmentation and maintenance after its initial construction. Through cooperation with the Archaeological Survey of India, several portions of rampart wall were cleared of brush so that the surface was easily visible (no earth was removed during the clearance). This enabled us to clearly see the architectural remains visible on the surface.

The methodology utilized to record these remains was a "low-technology" mapping strategy in which individuals mapped each brick and stone fragment onto millimetre graph paper, utilizing a standardized code (fig. 3). After a north-south grid was established on the rampart, each individual

was responsible for a five-meter-wide strip of the rampart. At the end of each day of mapping, a copy of the strips was made and then pasted together to form a composite map of that section of the rampart. With a crew of 5–7 people mapping, the team required approximately two days to map a 50-meter length of rampart. We mapped nine different sections of the rampart (over 16,000 m² of representative rampart coverage). When we returned to the lab in our home country, we then digitised the graph-paper maps using "Grab It!" software (www.datatrendsoftware.com), a program that utilizes scanned images and a standard computer mouse to render points into a digitised image that can be printed, enlarged and analysed (fig. 4).

The rampart surface map shows that there was a substantial amount of architectural material present on the rampart's upper surface. This architecture appears to consist not only of a linear arrangement of bricks suggestive of a wall, but also clusters of debris that may represent structures such as rooms at the top of the rampart. As with the materials collected from the interior of the site, we also measured any complete bricks found on the rampart, on the idea that we would be able to discern if the production of bricks for civic (rampart) architecture was of a different dimension than residential (presumably private) architecture. While the sum total of all bricks that could be measured was low, the interesting results of this comparison show that the overall pattern of brick usage in the interior of the site was distinct from the generally larger bricks utilized in the rampart (fig. 5).

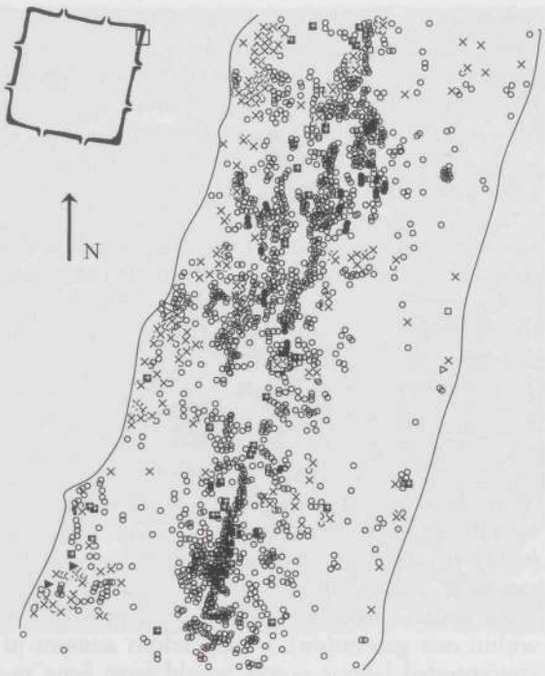

Fig. 4. Mapped portion of the NE rampart.

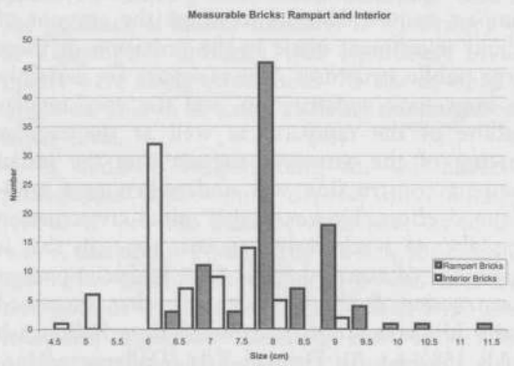

Fig. 5. Distribution of brick sizes from the rampart and the interior habitation area of Sisupalgarh. Drawing by S. Matossian.

Measuring of the rampart height with a theodolite

The surface mapping of the rampart was one means by which to analyse the labour investment and construction techniques of the structure. However, to analyse labour investment and the time required for such a construction required the calculation of overall rampart volume. We acquired these calculations through theodolite mapping of numerous representative sections of the rampart. The maps showed that at present, the rampart measures from 4.6 m to 9.2 m in height above the present ground level of the exterior (with the height of the rampart relative to the interior being artificially elevated by the cultural layers of habitation).

Using surface data to analyse urban patterns at Sisupalgarh

The data from the three methods of surface analysis can be combined to assess the Early Historic occupation of Sisupalgarh at three different levels: urban, neighbourhood, and household.

The urban level of organization

Our investigations indicate that the area within the rampart walls was a fully occupied urban zone, as seen by the presence of significant amounts of architectural debris (bricks and tiles), artefacts (ceramics, terracotta fragments), and raw materials (sandstone) throughout our collection units. In addition, there are architectural remains of reservoirs, pillared structures, and laterite ring wells that show group efforts for constructions larger than what would have been utilized by individual households.

One way in which these remains can tell us about the ancient urban organization of Sisupalgarh is through calculations of the labour requirements represented by these different constructions. Calculations of labour expenditure enable us to assess how many people would have been required, but also allow us to put into perspective a larger social picture of the number of tasks that would have been simultaneously undertaken in the city, including provisioning of food and other needed materials from beyond the city walls, and the allocation of labour time between civic labour and household requirements.

Because the rampart appears to have been initially constructed early in the city's occupation, we can also envision the mechanisms by which large numbers of people were incited, invited, or coerced to a central location in which the new city would be built. Because we estimate that the highly regular and rectilinear outline of the city's ramparts could only have been achieved if the construction process was relatively rapid (i. e. within one generation), a tremendous amount of concentrated labour power would have been required in a relatively short period of time. The concentration of labour investment is even greater when we eliminate three months of the year for the monsoon, during which outdoor work is impractical.

The theodolite information and the surface rampart maps enable us to assess the amount of labour investment made in the provision of these large public structures. The ramparts are certainly an impressive construction, and the very regular outline of the ramparts as well as the regular spacing of the gateways suggest that the initial rampart construction was undertaken as a well-planned effort. However, this initial construction was also of a relatively low-cost type, in that it was made of rammed earth. This multicomponent construction method is seen in other excavated Early Historic rampart sites including Balirajgarh (IAR 1962–63, 5); Drupad Kila (Dallaporta/Marcato 1999, 42), and Rajgir (IAR 1962–63, 5). This type of construction would require minimal supervision (consisting only of the need to keep the line straight), and could be undertaken by unskilled workers. At Sisupalgarh and other rampart sites, the materials for the bulk of the rampart were obtained by digging a nearby ditch on the exterior of the wall, thus providing a moat as a defensive complement to the earthen embankment.

It was not until the cities had been inhabited for some time that the upper construction of the rampart began to include much more time-consuming types of construction. Later stages of construction utilizing brick and stone architecture constituted a form of labour investment that was significantly more complex, involving the preparation of materials and their transportation to the construction site, as well as more supervision in construction compared to the rammed earth substrate. While our surface mapping project produced evidence of stone and brick superstructures throughout the rampart, the 1948 excavations showed that brick walls represented the last phase of rampart construction (Lal 1949).

The relatively late augmentation of brick walls is also seen at other fortified sites of the Early Historic period such as Mahasthangarh (Smith 2003, 280) and Balirajgarh (IAR 1962–63). Additional observations at Mahasthangarh suggest that this upper-rampart architecture may have varied in different portions of the city. While the initial outline of ramparts in Early Historic cities therefore appears to have been a uniform building exercise, the uppermost portions of the wall represented occasional and non-uniform augmentation. Our mapping of the rampart surface at Sisupalgarh similarly indicated that additions to the uppermost rampart wall varied from one part of the site to another, so that the uppermost constructions did not appear to represent a uniform plan of activity and instead represented smaller-scale efforts built upon the already-impressive earthen rampart.

The combined information from our rampart surface maps and the urban collection units indicates that the city's growth appears to have been matched by increased amounts of architectural investment in the ramparts. The continued investment in rampart structures as well as in private dwellings represented by the uppermost levels of occupational debris suggests that the city was well organized and secure in the late Early Historic period. The evidence for prosperity makes the question of the city's abandonment even more striking, since one would not expect an otherwise thriving place to be so quickly depopulated as to leave most of the architecture intact.

Our survey of the interior of the rampart walls also enabled us to document other types of labour intensive urban constructions. Stone-lined reservoirs, a large bunded pond, and the remains of at least three large structures marked by stone pillars are found in the interior central portion of the site. One of these pillar groupings may be the "Great Victory Palace" mentioned in the first-century Hathigumpha inscription of King Kharavela at the nearby Jain cave site of Udayagiri (Sahu 1984, 340).

The neighbourhood level of organization

Neighbourhoods can be defined as "a limited territory within a larger urban area where people inhabit dwellings and interact socially" (Hallman 1984, 13). In a neighbourhood, the physical proximity among households helps to define and constrain social interactions. The neighbourhood as a localized, concentrated zone of population within a larger city is a concept that is increasingly being recognized in the archaeological record (e. g. Keith

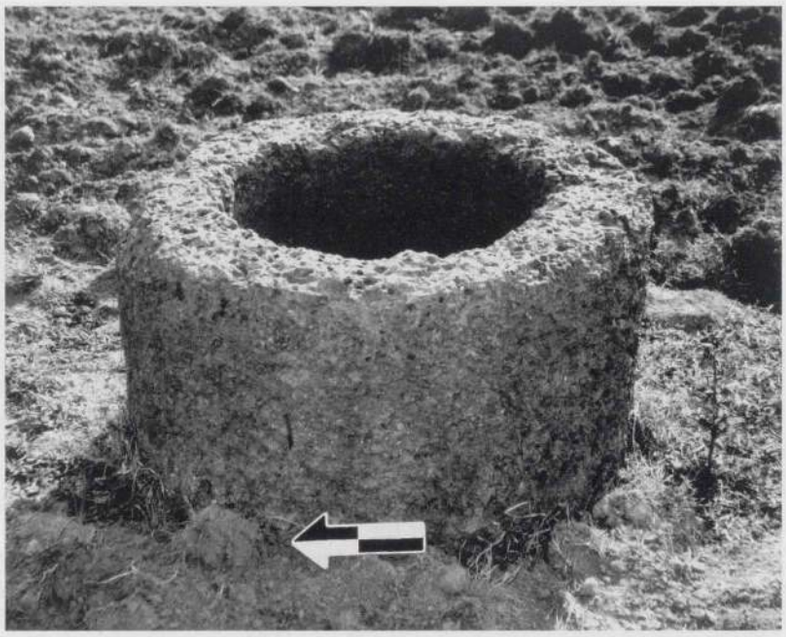

Fig. 6. Laterite ring well (scale is 20 cm).

2003; Lightfoot/Schiff/Wake 1997; Stone 1995, 240–242).

At a neighbourhood level of analysis, archaeological and architectural remains enable archaeologists to evaluate the way in which various types of group projects are accomplished. The bureaucracy of an urban-level authority (in the case of Sisupalgarh, the personage of the king or other ruler) may be sufficient to understand some portions of urban activities, such as the initial layout of rampart walls or the planning of large-scale structures such as tanks and monumental pillared halls. However, many other urban activities would have taken place at a level intermediate between the highest central authority and the autonomous household. These intermediate needs would have included construction projects that evolved up from household level needs (such as food storage, neighbourhood markets, and cleaning out human and animal waste) or devolved downwards from the largest-scale concerns (overall patterns of streets, drains and gateways).

In the course of the systematic survey, we documented the presence of over 30 laterite ring wells, some of which remain in use today (fig. 6). The rings are found throughout the site, in all of the areas where the survey has also documented Early Historic pottery and architectural fragments. The laterite ring wells have their counterpart in terracotta ring wells that are a consistent component of Early Historic sites throughout the subcontinent (Allchin 1995). Laterite is a soft, crumbling stone that is easily worked when first quarried, but afterwards hardens to a brittle consistency. The quantity of ring wells recovered at Sisupalgarh is considerably smaller than the number of ancient households represented by the artefacts, but their distribution throughout the site does not indicate centralized planning. Instead, the presence of labour-intensive laterite ring wells at Sisupalgarh indicates that significant investments were made throughout the site at what we might be able to describe as being the neighbourhood level.

In addition to providing for the needs of households who would depend on communal labour to provide basic services such as potable water, the labour potential of the neighbourhood's assembled individuals would have been an attractive pool of workers for larger, urban-level activities, and might have been the basis upon which labour was requisitioned or collected for larger urban projects. The neighbourhood, as a localized group of interdwelling individuals, would have been a locale from which labour could easily be pooled both for self-serving needs (such as the construction of a well for neighbourhood residents) and larger, occasional building projects (such as repairing and augmenting the city's rampart wall). In other words, leaders at different levels required labour, and that labour was probably most easily recognized and managed at the neighbourhood level.

The household level of organization

The ceramics, architectural debris and other materials from the systematic surface collections enable us to look at the role of households in the city. The artefacts from the systematic collection can be

utilized to ascertain broad patterns of occupation and activities of the Early Historic period at Sisupalgarh, in which there were probably significant social, ethnic and economic distinctions. Studies of ceramics indicate that there was a great similarity of composition (paste and fabric), a visual assessment that has been supported by X-ray diffraction analysis by V. Gogte of Deccan College (Gogte 2002). All of the ceramics analysed thus far seem to have been manufactured close to the site, which is not surprising given the widespread local availability of clay in the large alluvial region of the Mahanadi River delta in which the site is located.

The distribution of different types of ceramics suggests that there was differential use or access to goods within the urban community. For example, all of the collection units had about the same proportion of very thin wares, but the proportion of thick wares was considerably elevated in some units. Thus we can suggest that all households at the site had some fine pottery, and that it may have been one of the markers of an urban household to own at least some well-made dishes. The distribution of thick wares, however, may signal the presence of activities that were not part of every household's repertoire. Thick vessels, being made of greater amounts of clay and requiring more energy in firing and transportation, were also larger in circumference and had a larger capacity than small vessels. Large vessels were likely to be used for storage rather than for individual use; while they may indicate households with substantial resources and thus serve as a wealth marker, a higher proportion of storage vessels may also mark the presence of a special purpose zone such as a market where either raw or prepared foodstuffs were stocked.

The distribution of decorated wares also indicates some distinction in ceramic use in the Early Historic period. While nearly every unit produced evidence for designs such as grooves and ridges, other types of decoration were more rarely found. There was a composite approach to some wares such as those with appliqué design, which often combined a coarse paste in the body fabric with a very fine paste consistency in the appliqué portion. These types of composite pottery, with greater labour investment in design, had a more limited distribution and were generally concentrated in the centre of the site (analysis of the decorated wares is ongoing). Although the sum total of decorated pottery was low, we can propose that these distributions can help us to identify economic and social groups. It should be emphasized that no single category of data will be sufficient to assess the activities of the Early Historic period, but our initial stages of data analysis indicate that the surface survey and mapping program will enable us to evaluate the broad patterns of ancient city life.

Sisupalgarh and its hinterlands

The regional context of Sisupalgarh indicates that these city patterns were anchored in a rich hinterland. The site is located within several kilometres of Early Historic religious monuments such as Dhauli (site of an Ashokan inscription) and the carved Jain caves at Udayagiri and Khandagiri (Mitra 1992). The ideological and stylistic links between these religious sites and others in the subcontinent is clear, and their designs can be linked with religious iconography found elsewhere in the subcontinent. This shared iconography may have developed through the presence of travelling skilled artisans in the same manner that Wayman/Rosen (1990, 52–53) have suggested for the parallels of art style at other contemporary Early Historic sites such as Mathura, Ujjain and Nagarjunakonda.

At the same time, the analysis of the artefacts from our collection units at Sisupalgarh shows a very local basis of activities in raw materials and consumed goods. It appears that while Sisupalgarh and its immediate hinterland were fully integrated into a larger sphere of ideological activities in the Early Historic period, they did not depend on that larger sphere for anything *but* ideology, and were very self-sufficient in economic activities related to the production and consumption of architecture and portable goods. This highly local system is contrary to our general expectations of urban life in the Early Historic period. It is also contrary to our expectations based on the site's excellent geographic placement for trade as it is located 2 kms northeast of an E-S split of the Daya River, whose main branch would have provided important trade links to the Bay of Bengal only 50 kms away.

Conclusions

The ongoing research at Sisupalgarh indicates that our evaluation of Early Historic cities, and perhaps cities in general, should balance a focus on exotic trade and foreign goods with a stronger consideration of the local developments and circumstances that made city life viable and necessary for large numbers of people. The initial construction of ramparts and gateways at Sisupalgarh indicate the presence of a considerable population in the region, a population that continued to sustain urban life through activities archaeologically visible at the household, neighbourhood and urban level throughout the Early Historic period.

Acknowledgements

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