

*Late Prehistoric & Early Historic Landscapes
of the Tungabhadra Corridor:
Report of the 2009 Season*

Kathleen D. Morrison

Department of Anthropology
1126 E. 59th St.
University of Chicago
Chicago, IL 60605 USA

Carla M. Sinopoli

Museum of Anthropology
University of Michigan
Ann Arbor, MI 48109 USA

B.R. Gopal

Directorate of Archaeology and Museums
Palace Complex
Mysore, Karnataka, India

with contributions by **Andrew Bauer, Gwen Kelly, Mudit Trivedi, Kelly Wilcox, and Brian Wilson**, and with the assistance of **Deeksha Bhardwaj, Eduard Fanthome, Kanika Kalra, and Dr. Sharada Srinivasin**

Abstract

This report details preliminary results of the 2009 field season of the *Late Prehistoric and Early Historic Landscapes of the Tungabhadra Valley* (EHLTC) project, focused on documentation and excavation of settlement and mortuary sites located near the Tungabhadra River in a 38.5 square kilometer region in Koppal and Bellary Districts, Karnataka, India. Our primary research efforts focus on the excavation and documentation of five sites¹ and associated features initially identified and documented by the Vijayanagara Metropolitan Survey project, directed by Morrison and Sinopoli from 1987-1997 (in collaboration with the Karnataka Department of Archaeology and Museums, and with approval of the Government of India). This project is directed by Gopal, Morrison, and Sinopoli, and is a joint project between the Karnataka State Directorate of Archaeology and Museums (India), the University of Chicago (USA), and the University of Michigan (USA).

In the 2009 season, we continued excavation work at the largest of these five sites, VMS-530 (Kadebakele), a habitation site of more than 40 hectares with an occupation span that appears to run from the Southern Neolithic to the Middle Period. Most of our work was concentrated on Iron Age deposits of the Upper Terrace, though an unexpected large-scale disturbance of River Terrace deposits prompted us to clean back a deep section there and excavate a small test unit adjacent to it. Following an introduction to the goals and potential significance of the larger project, this report describes the excavations undertaken in 2009. Artifact, botanical and sedimentological analyses are in progress. Finally, we report on the newest radiocarbon dates from Kadebakele.

Acknowledgments

Many thanks to the Government of India, the Archaeological Survey of India, and the State of Karnataka for permission to carry out research. Research in 2009 was funded by grants from the National Science Foundation and the University of Chicago; many thanks to both. Morrison and Sinopoli extend their thanks to colleagues at the Directorate of Archaeology and Museums and to the dedicated student volunteers from India who joined the project. Last, but certainly not least, we thank U.V. Srinivas and all of the residents of Kadebakele village.

¹Kadebakale (VMS-530), Koppal District, Karnataka
VMS-579, Koppal District, Karnataka, N 15°22'14.4" E76°28'53.6"
VMS-634, Bellary District, Karnataka, N 15°21'25.7" E76°31'32.9"
VMS-541, Koppal District, Karnataka, N 15°22'55.2" E76°30'56.6"
VMS-543, Koppal District, Karnataka, N 15°22'48.1" E76°31'8.6"

Introduction: Issues, Contexts, Significance

Research Issues

In this project we examine continuity and change in economic, social, and political organization in northern Karnataka (India) between c. 1000 BC-AD 300, focusing on material patterning at multiple spatial scales. The Iron Age and Early Historic periods marked a time of remarkable change in peninsular India, changes that included the development and expansion of regional polities and formalized relations of social inequality as well as the intensification of specialized craft production and long distance trade. Around the same time, the introduction and expansion of rice agriculture and its integration with existing strategies of dry farming, herding, and foraging led to the emergence of complex new agricultural regimes and transformed regional landscapes. Please note that the following introductory sections can also be found in Morrison, et al. 2005.

While there is no doubt that Early Historic centuries (c. 300 BC-AD 300) differed in important ways from the preceding Iron Age (c. 1000-300 BC), existing frameworks which posit population replacement and diffusion as primary mechanisms of change ignore continuity in existing local practices such as megalith-building, dry farming, herding, and stone tool production, or of the ways in which both continuity and change were negotiated and materialized in settlements, mortuary sites, and regional landscapes. In this project, we investigate the ways in which introduced political and religious forms, cultigens, and trade objects enlarged and transformed South Indian worlds and, at the same time, how such objects and organizations were themselves made local.

Although southern India became increasingly integrated with the north at this time, variability in the nature of this integration has not been fully investigated. Buddhism, for example, never became as important in this area as it did elsewhere in the south in spite of the expansion of South Asia's first empire, the Mauryans, into this region. Associated with both writing and Buddhism, this polity was based on the distant Gangetic plain and yet made some claim to authority over our region through the erection of "minor rock edicts," inscriptions promoting a vision of both rule and Buddhist *dharma*. At this same time, both the material and the new text-based record indicate that the entire peninsula was involved in long-distance exchange networks extending from the Mediterranean to East Asia. Ultimately, we seek to understand both the nature of external political claims as well as the structure of local polities, though in this initial phase of work we begin with more proximate questions of material production, circulation, and consumption: how production of craft goods such as iron and ceramics were locally organized and how local residents interacted within larger spheres of circulation.

The expansion of rice agriculture, which appears to have begun in earnest during the Early Historic and perhaps earlier, worked to transform local diets, vegetation dynamics, hydrology, labor organization, ritual practice, and even soil structure. We are investigating the initiation and nature of rice agriculture, as well as rice consumption patterns and the integration of paddy production into existing regimes of production and use. Some changes associated with changing settlement and production regimes were probably unintentional, and we are also concerned with processes of landscape anthropogenesis associated with deforestation and

erosion, two probable consequences of the expansion and intensification of rice farming, iron smelting, and settlement nucleation.

In addition to our concern with landscape dynamics, we also seek to understand both how production of craft goods was organized on local basis—residents of this area seem to have produced iron goods, for example—and how local residents interacted within larger spheres of craft circulation. We are addressing these concern studying evidence for local production wherever encountered and by carrying out chemical and mineralogical analyses on artifacts (ceramics, metal, beads) and their raw material sources in order to locate their points of origin.

On a smaller spatial scale, we are interested in documenting aspects of newly-emerging economic and social stratification in detail, especially as these relate to people's everyday life and consumption. We are just beginning to accomplish this by intensive spatial analysis of settlement surface contexts, close excavation of domestic contexts, evidence for diet and food processing, and by comparing artifact assemblages and layout between houses, between different areas of larger settlements, and between the residents of larger and smaller settlements occupied at the same time. Finally, we plan to extend our previous work on the structure of regional landscapes through additional survey and close documentation of the construction, modification and use of megaliths and other features. Although we maintain an interest in new and non-local political forms, text, cultigens, artifacts, and religious practices, we are primarily concerned to investigate the ways in which these are (or are not) adopted, how such forms and materials are remade and articulated within complex political economies and ecologies such as that of the Early Historic Tungabhadra corridor.

Contexts

Although there exists a large body of research in anthropology into issues of state formation and imperial expansion, social differentiation and its institutionalization, religious conversion and ritual practice, long-distance exchange and the production and consumption of local and exotic goods, agricultural change, and anthropogenic landscape transformation (e.g. Costin and Wright 1998; Ehrenreich et al. 1995; Schopen 1997; Alcock et al. 2001; Melville 1997; see reviews by Stein 1998; Sinopoli 2001), few of these concerns have been explicitly addressed to the material record of Early Historic Karnataka. As such, we will draw on theoretical and methodological insights derived from work on other regions and time periods, including our own previous work in the region. At the same time, there is a large body of systematic archaeological evidence directly relevant to this investigation. Much of this information is couched in terms of culture-historical frameworks which stress the role of southern India as a passive recipient of cultural 'influences' from the north, changes which derive either through actual populations movement or, less often, through vaguely-defined forms of diffusion (e.g. Agrawal 1982; Allchin and Allchin 1982, Dhavalikar 1988; but see Chakrabarti 1999). In this vein, institutionalized religions, states and empires, caste-like forms of social differentiation, rice agriculture, and specific artifact forms have all been represented as northern imports. On the other hand, iron production, some forms of millet farming and cattle domestication, and megalith-building have all been recognized as South Indian practices, some of which moved in the other direction (Allchin 1963; Sharma 1983; Wheeler 1947). One of our goals is to help move the interpretation of South Indian history beyond such frameworks. For example, we are working to redefine ideas of artifact variation beyond that of the modal 'type'

seen as ethnic or racial markers. Building on earlier work (Morrison 2005), we are conducting attribute-based artifact analyses that can incorporate variability in specific combinations of attribute states while at the same time conducting sourcing and technological studies that establish the empirical groundwork for basic questions of pattern, process, and the organization of production and consumption (cf. Inzizan and Lechevallier 1997; Miller 1997; Kenoyer 1989).

Without belaboring the many conceptual problems of culture-historical frameworks, we might point out that it is also possible, even within this perspective, to view the material record of the Early Historic Tungabhadra corridor as that of a dynamic junction where, for example, the distributions of several widely-distributed ceramic types, Northern Black Polished Ware from the Gangetic region, Rouletted Ware from Bengal, and Red Polished Ware from Gujarat, overlap (Gogte 1997; Morrison 1997; Orton 1991), suggesting the importance of this region in regional routes of movement and exchange. Further, the presence of a cluster of rock edicts powerfully demonstrates that this region held some interest for the Mauryan empire (Thapar 1997). In spite of this, there has been no systematic study of local political and economic organization; thus it is difficult to evaluate any account of either change or stability. In addressing such issues, we also hope to contribute to the literature on imperial expansion and its local consequences (e.g. Alcock, et al. 2001), as well as to understandings of interregional networks of politics and exchange (e.g. Schortman and Urban 1992; Smith 1999; Stein 1999) and to the small but important body of scholarship on the social and political organization of the pre-medieval south (e.g. Begely 1996; Champakalakshmi 1996; Parasher-Sen 1993; Ray 1986, 1994; Ray and Salles 1996).

Both regional-scale research programs and horizontal excavation strategies are rare in South Asia; important exceptions include Shaw and Sutcliffe (2002), Chakrabarti (2002), and Erdosy (1998), among others. Although we have already completed one of the first systematic surface surveys in India, this project will represent a refinement of our previous regional focus to a smaller spatial scale and to a combination of surface and subsurface distributions. Finally, there exists little paleoenvironmental information on Early Historic South India (but see Caratini et al. 1991); our work should establish important information on vegetation history, erosional regimes, and plant and animal use in this period.

Significance

In this project we begin to address a series of issues of primary anthropological interest in a context never before subject to anthropological analysis. Situated in a region between what are usually defined as North and South India, a crossroads of long-distance exchange, and an object of political interest and religious proselytization, the Tungabhadra region in the Early Historic period presents an excellent opportunity to studies processes of change and patterns of stability including initial state formation, the processes and consequences of imperial expansion, the extension of long-distance exchange, and the development and institutionalization of social inequalities. In particular, we are interested in the material consequences of these processes at a number of spatial scales; questions that require the construction of specific links between past action and contemporary archaeological patterning. Anthropologists, too, have been critically concerned with relationships between humans and the natural world—in our focus on agricultural change and regional paleoecology we draw on traditions of anthropological and historical ecology while at the same time attending to the culturally-inflected political economies

that inform local power dynamics. On a more mundane level, these parameters are key to understanding what the opportunities for various people in a complex and changing society will be—who can grow, process and consume rice or other foodstuffs, the extent to which social differences will be marked in material ways, the forms of production and consumption of exotic and local craft goods. Methodologically, this project represents the extension of certain analytical strategies and techniques (horizontal excavation, attribute analysis of artifacts, paleoenvironmental analyses, sourcing studies, microspatial study of surfaces) to an area where they are not generally practiced, work which we hope will help change basic conceptions of the South Asian past (away from typologies which encode ‘race,’ language, and culture, for example) as well as improve substantive historical understandings of both change and stability in this important period.

The Study Area and the Sites

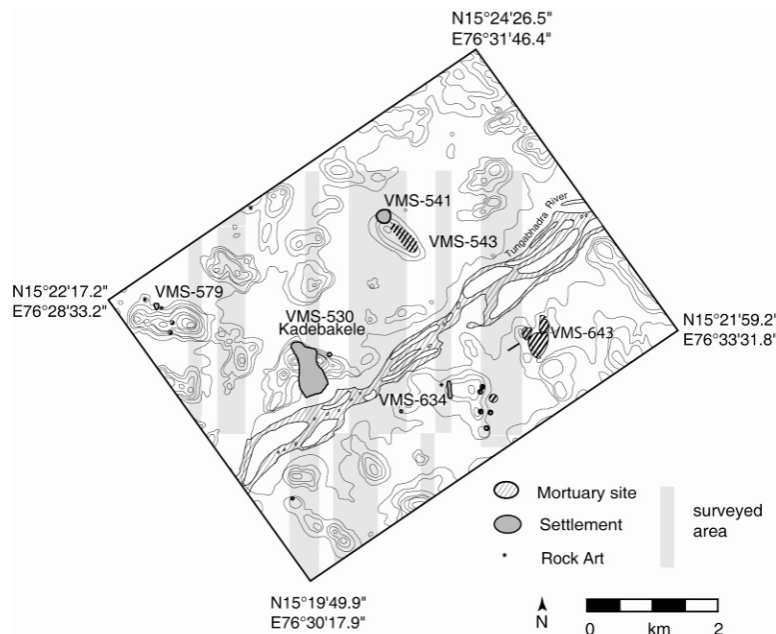


Figure 1: Project Area, showing location of sites

Although northern Karnataka is justly famous for the remains of the fourteenth to sixteenth century Vijayanagara empire, including its eponymous capital city, numerous prehistoric and historic sites have also been identified in Koppal and Bellary Districts over the last century. In his 1914 catalogue Bruce Foote described fourteen artifacts he collected from “..an old site on the left bank of the Tungabhadra, opposite to Hampasagara, collected by self in October 1889.” (1914:187). It is difficult to say if this material is actually from Kadebakale, but it does point to the longstanding awareness of the deep history of the Tungabhadra valley in this region. The artifacts in question includes both chipped stone flakes and cores, iron slag, and polished and unpolished redware sherds.

All of the sites appear, on ceramic evidence, to be at least partly contemporaneous. One radiocarbon date from VMS-634 (Morrison et al. 2005), puts it at the very end of the Southern Neolithic period, in the transition to the Iron Age, which makes it earlier than the portions of Kadebakele so far excavated. Together, these locations provide evidence of a dense and complex occupation of this region during the Iron Age and Early Historic. Settlements differed markedly in size and complexity. However, all were located on the tops of outcrop hills in protected locales. All have associated water control facilities, that were likely associated with securing drinking water as well as with agricultural activities. Kadebakale was far and away the largest settlement of the period, several times larger than any of the other sites documented. Our research seeks to explore the economic and social relations among these settlements, and to provide a detailed fine-scaled reconstruction of chronology, economy, and settlement organization during the Iron Age and Early Historic periods. Previous reports have described all the project area sites in detail, so this information will not be repeated here.

The 2009 Excavation Season

Research carried out in January and February of 2009 represented a continuation of work begun in 2003 and 2005. Most of our efforts centered on the Upper Terrace of VMS-530 (Figure 2), Kadebakele, and all of this was in areas previously excavated. Blocks A and B, opened in 2005, were re-opened and a deep 1 by 2 m test unit in the reservoir, quite close to a similar unit (1 by 1 m) excavated in 2003, was completed this season. The unexpected appearance of a large (25 by 30 m , ca. 3 meters deep) machine-cut disturbance trench in the cultural deposits of the Kadebakele River Terrace prompted us to clear back a 2.2 m wide section of this trench to prepare a stratigraphic section. We also extended this section just over a meter using a small test unit adjacent to the section. No additional mapping was carried out in 2009.

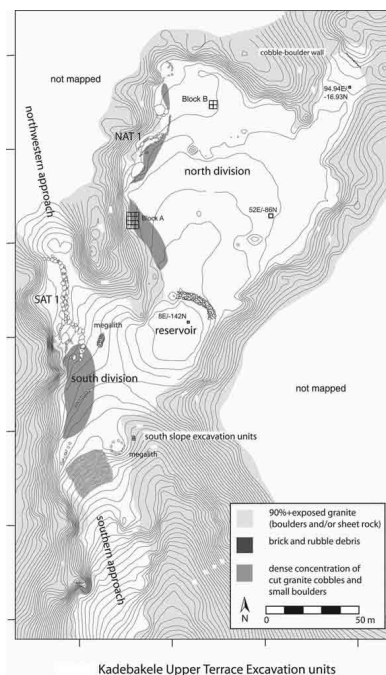


Figure 1 Figure 2: Upper Terrace

Block A: Upper Terrace Zone of Memorial Features

The 6 x 4 meter excavation area designated as Block A is located on the western edge of the Upper Terrace area, in an area of low outcropping boulders and limited sedimentation. Several small wall alignments are visible on the ground surface, and excavations were oriented toward exposing architectural complexes in this area. Excavations in this area in 2005 and again in 2009 have revealed a complex sequence of small architectural alignments associated with three major stable ground surfaces and several shorter-term surfaces. Rather than domestic architecture, these features were the remains of small ‘megalithic’ alignments – stone circles, lines, and other arrangements of cobbles – that largely post-date the early first millennium BCE habitation of the Upper Terrace. They appear to be the result of multiple commemorative events or activities that occurred on the Upper Terrace after primary habitation had shifted down to the northern River Terrace area.

Excavations in 2005 exposed a portion of a large semi-circular alignment (Feature 9) of medium to large unmodified and modified boulders that appeared to contain an internal stone cist of fine slab masonry not unlike those found at Brahmagiri. This feature, which had clearly been built in multiple episodes, was associated both with surface 2 and the lower surface 3. On surface 3 there were also a series of small features, many associated with ash and burning, including a tiny stone oval containing a cow jaw and an iron point. Only half of this feature, down to surface 2 was exposed in 2005, so in 2009 we returned to the area to bring the southern half of the feature to the same level.



Figure 1 Photo 1: Block A at beginning of excavation, facing SE

What appeared at the end of the 2005 season to be a large stone circle enclosing a sub-rectangular masonry cist turned out to be much more complex and unusual. The stacked slab masonry of the ‘cist,’ rather than continuing, actually formed an arc of about a meter long, defining the northern edge of a small square raised area – a clay platform (Feature 18) – bounded on the west by more informal stone alignments and elsewhere distinguished primarily by its texture. Furthermore, the stone ‘circle’ (Feature 17) enclosing the postulated cist turned out to be rather straight, more of a long alignment of slabs, boulders, and even stacked ceramic sherds. Importantly, this alignment was carefully maintained over a long period of time, with new elements added as the ground surface aggraded. Thus, instead of a simple burial cist inside a stone circle, we found a much-modified sequence of structures featuring a small platform just south of a long alignment. A key observation this season was the existence of a carefully prepared and plastered floor *on top of* this small elevated square platform. This floor was associated with burned daub, indicating the existence of a structure here, clearly built as part of this megalithic feature. To date, this is the only evidence we have for structures built and used as part of megalithic memorial practices. All around the platform was a less formal but still very clear surface, part of Surface 2 exposed in 2005 in the units to the north (Figure 3).

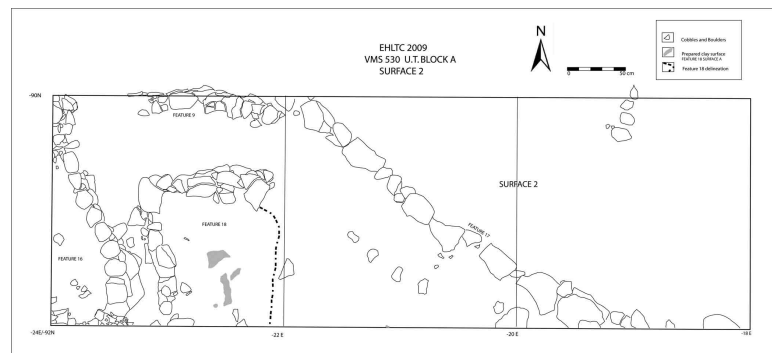


Figure 1Figure 3: Block A, S2



Figure 1Photo 2: Bl. A/F19 floor fragments

While the structure sitting atop the small platform (Feature 19) was associated with Surface 2, it clearly had its beginnings earlier, at the time of the lower Surface 3. The base of the ‘cist’ wall sits on Surface 3; the platform and structure must have been added later. Removing

the platform exposed Surface 3 as well as a few aligned boulders sitting on Surface 3 that appear to follow the curve of the ‘cist’ wall (the north edge of Feature 18), defining an area of



about 2 m east-west.

Underneath the small clay platform we exposed the top of a pit (Feature 20), sealed beneath Surface 3 (Figure 4). The content of this pit will be determined in 2010, but if the aligned boulders on Surface 3 lie at its edges, then this might be an inhumation. Artifacts found in this area include a number of small unbaked clay balls as well as ceramics and metal artifacts, though the latter were not as common as in the areas excavated in 2005.

Block B: Upper Terrace Residential Zone

Located in the north central portion of the Upper Terrace, excavations in Block B have revealed rich evidence for Iron Age residential architecture at Kadabakele. Excavations in a 2 by 2 m unit began in this area in 2003, and at the end of that field season, had exposed a portion of a circular or oval structure (ca. 1.6 m below the modern ground surface) and associated external surfaces and pits (Sinopoli et al. 2003). In 2005, excavations expanded to the north, northeast, and east of the original unit to expose a 4 x 4 meter square area. These excavations yielded the remains of two additional structures, associated with external surfaces uncovered in 2003 at levels above the structure (Morrison, et al. 2005). In 2009 excavations continued in this area, with the goal bring the entire 4 by 4 m area to the level of the structure exposed at the end of 2003.

Block B is a horizontal exposure consisting of 4 adjacent 2 by 2 meter excavation units located in a fallow agricultural field near the northwest corner of the Upper Terrace. During the 2009 season, the block was excavated from January, 15 to February, 14. All four of the units (20E/-28N, 20E/-26N, 22E/-28N, and 22E/-26N) that comprise the block were excavated in previous seasons. Thus, after backfill was removed, excavation level numbers and feature designations in 2009 were continued sequentially from the ending assignments of the 2003 and 2005 seasons. In unit 20E/-26N, levels 12 through 16 were excavated, in unit 22E/-26N, levels 12 through 15, and in unit 22E/-28N, levels 9 through 15. In unit 20E/-28N, only one level was excavated – level 1 of Feature 6. Fifteen new storage, refuse, and architectural features (Feature numbers 16-30) were assigned in Block B during the 2009 excavation season (see Table 1 below). Vertical control in 2009 was measured from sub-datum P (21.80E/-23.17N, 98.63 m).

The 2009 excavations of Block B were focused on: (1) the continued documentation of

the interior of Feature 13, a well preserved (ca. 2.4 by 1.4 m) rectangular wattle-and-daub structure supported by posts first exposed in 2005; and (2) the removal of exterior Surface 2, also first exposed in 2005, and the documentation of earlier phases of occupation below.

Feature-13, Internal Surfaces. Much of the first half of the 2009 excavation season of in Block B was spent documenting and removing features associated with external Surface 2 that were initially exposed in 2005 but not fully excavated. Chief among these was Feature 13, a well preserved (~2.4 x 1.4 m) rectilinear wattle-and-daub structure supported by posts with an internally plastered floor exposed in excavation units 20E/-26N and 22E-26N. This feature was encountered in association with Surface 2 toward the end of the 2005 excavation season, at which time excavations ceased due to time constraints. The excavations of 2009 documented a very complex use life for this structure, indicated by hundreds of resurfacing episodes and both subtle and major changes in the plan of the structure and its internal features. In 2009 three major phases of Feature 13 were exposed and assigned -- designated by well-preserved surfaces B, C, and D internal to the structure. The latest internal surface of the structure exposed in 2005 was retroactively designated surface A.

Surface A of this structure was exposed in 2005 after the removal of a thick level of burned and differentially composed structural material. Among the debris removed from the floor were portions of the structure's walls, a matting made from woven plant fibers, and what was probably portions of the structure's roof. The plan of the structure exposed at surface A was evident by 13 post-holes that demarcated the exterior of the feature. Feature 15, a small shallow hearth, was set into the plastered flooring of surface A.

In 2009, Surface A was removed in a thin level of 3-7 cm that exposed a better preserved, more compact underlying flooring of compact fine-sandy silt with a thin overlying layer of fibrous material (possibly dung). This underlying surface, designated surface B, showed a similar architectural plan to the surface immediately above. However, its exposure and subsequent removal revealed a long continuous use life for the feature. The removal of surface B occurred in an excavation level of variable thickness, ranging from 1 to 9 cm, that exposed a lower major surface phase of the feature (Surface C). When removed, the surface B composition showed a matting of silty and fibrous material, very light in color (10YR 8/1-8/2), overlying a compact floor of fine-sandy silt and plaster (10YR 4/2). In the few centimeters intervening between Surface B and Surface C, there were multiple "laminations" of compact earth and plaster representing numerous resurfacing episodes. These multiple surfaces interdigitate with each other, meaning that the entirety of the area internal to the structure was not always repaired or resurfaced at exactly the same time in the past.

The underlying Surface C was easily followed along its cleavage with the compact base of Surface B. In following surface C, it became clear that Surface C interdigitated with Surface B in the southwestern portion of the feature. In the extreme northeastern exposure of Feature 13, Surface C was followed underneath wall-fall and found to articulate with external Surface 2. Thus, it is clear that internal surfaces B and C of Feature 13 were in use at the same time as the upper portions of external Surface 2.

The exposure of Surface C is also noteworthy for evidence of several minor changes in the architectural plan of the Feature 13. For example, the removal of Surface B revealed an earlier hearth (Feature 19) that was located about 30 cm west of that associated with the later surface (Feature 15). This earlier hearth was a shallow pit some 40 cm in diameter and 7 cm deep containing unconsolidated, dark ashy fill (10YR 4/2). The feature was set into Surface C

but then plastered over in the construction of the later phases of Surface B. In addition to the difference in hearth location, Surface C also evidenced several additional postholes in the western portion of the structure that were later plastered over, indicating minor modifications to the wattle-daub structure between phases.

The earliest major phase of occupation of Feature 13 was Surface D, situated 3-8 cm below Surface C. Similar to the relationship between Surfaces B and C, there were multiple “laminations” or replastering episodes between these major phases. Indeed, an estimated 30 interdigitating resurfacing events were visible in the section exposed between surface phases C and D. Surface D was recognized as the next major phase of Feature 13 by the presence of a well preserved plaster surface containing a ceramic-herd mosaic paving. The mosaic was composed of Black Ware and Red Ware sherds pressed into the plaster floor. Although the ceramic paving was not contiguous across the interior of the feature, surface D could be easily followed across the feature. To the East, this surface articulated with the lower portions of external Surface 2, and thus represents the earliest phase of occupation of Feature 13 associated with external Surface 2. Three soil micromorphology samples were taken from strata of Feature 13 surfaces A through D, which will be analyzed to further document the detailed practices that contributed to this feature’s use life.

Surface D was excavated in a level 10 to 20 cm in depth that entirely removed Feature 13 from the excavation block. The removal of plaster Surface D, which was a fibrous, fine sandy-silt matrix when broken up, exposed an exterior surface (Surface 2A; *Figure 5*) that could be followed across the block, and was found to be underlying the basal packing of Surface 2 elsewhere in the block (see below). Two post-holes were found with adjacent support stones in the western half of unit 20E/-26N set into Surface 2A. These posts almost certainly belong to an earlier structure that extends into the unexcavated area west or north from unit 20E/-26N.

Exterior Surfaces and Associated Features. In addition to documenting Feature 13, in 2009 we also continued to document other surfaces and features associated with external Surface 2. Feature 14 was partially exposed in 2005 and characterized as a wattle-and-daub structure built in association with Surface 2 in unit 22E/-26N, east of Feature 13. Excavations in 2009 sought to more clearly define the relationship between Feature 14 and Surface 2. Work proceeded by removing 5 to 10 cm of material from the designated surface stopped at in 2005. The material removed was a fine-sandy silt (10YR 5/2-5/3) that showed weakly-developed fine to medium blocky structure. Although evidencing some blocky structure, the material was not compact or surface like. Artifacts recovered in this matrix were recognized as a mix of ceramics and fauna, variably sized and at variable orientations (i.e.,g not ‘flat-lying’ material). Thus, this excavated material was interpreted as a mix of collapse debris and archaeological fill. Underneath the excavated fill, lower portions of Surface 2 were encountered, which could be followed to the west and south and were contiguous with portions of the surface elsewhere in the block. Hence, Feature 14 appears to have been built with the latest occupation of Surface 2, and clearly lacks the long and earlier use life that is evident for Feature 13. Furthermore, Feature 14 appears to have been an external structure/feature (e.g., sun or wind shade,) associated with the latest occupation of Surface 2, and not a well maintained domestic structure.

In removing the fill of Feature 14, a small pit (ca. 25 cm in diameter, 10 cm deep) was encountered at the base of the deposit that was dug into Surface 2. This feature was designated Feature 18. The fill was an unconsolidated, sandy-silt loam (10YR 4/2). Other features

associated with Surface 2 were Feature 16, an east-west linear trench that cut Surface 2 south of Feature 13, and Feature 20, a small pit cutting Surface 2. Feature 20 is particularly noteworthy because it appears to have been a planned feature when Surface 2 was constructed – evidenced by the fact that the pit was built into the prepared clay under-packing of Surface 2 and ringed with stones at lower levels. The fill matrix of this pit was a loose, single-grain deposit of coarse-sand and small pebbles with occasional concentrations of silt. After documenting features associated with Surface 2, excavation proceeded by removing Surface 2 across all of Block B. Surface 2 was a compact earth surface of fine-sandy silt with occasional concentrations of clay. Plastering episodes gave it a distinctive white color (10YR 8/2-7/2). Its removal in the southeastern most unit of the block (22E/-28N) showed an underlying layer of soft, unconsolidated fine-sandy silt – burned and ashy in places – that could be seen intruding into the surface where several large rodent burrows were present. However, this softer layer of underlying ashy fill was not uniformly found across Block B. In unit 22E/-26N, Surface 2 was underlain by a fill matrix with a slightly higher clay content, perhaps composed as a deliberate base-packing for the initial construction of Surface 2. The fill underneath Surface 2 contained very high artifact densities of ceramic and fauna.

Below the fill underlying Surface 2, excavations in 2009 documented four earlier external occupational surfaces of compact earth -- designated 2A, 3, 4, and 5 from latest to earliest. Surface 2A, a compact earthen matrix with traces of lime plaster and dung, had several features associated with it that are suggestive of occupation similar to that found on Surface 2.

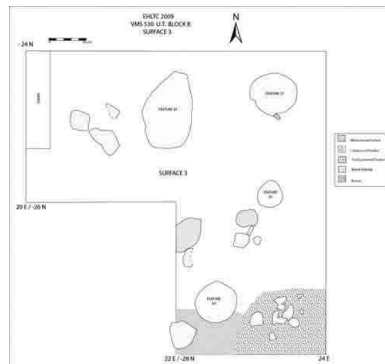


Figure 1 Figure 6: Block B S3

Of particular note are a semi-circular wattle-and-daub structure (Feature 21) exposed in the southeast quadrant of the block, a prepared plaster surface with structural posts (Feature 22), and the partial remains of another wattle-and-daub structure below Feature 13 in the northwest quadrant of the block that was only marginally exposed near the western edge of the excavation unit. In addition, two pits were found cutting Surface 2A but sealed by Surface 2. These features (Feature 24 and Feature 25) were both relatively small and shallow, neither extending more than 10 cm in depth. The fills were unconsolidated materials with moderate amounts of ceramic and faunal remains. Both were probably a deposit of refuse, although some other function – such as storage – cannot be ruled out. The base of both pits was marked by Surface 3.

Surface 3, a compact earth surface with traces of plaster approximately 5-10 cm below surface 2A was characterized by a series of external pits (Features 26-27; *Figure 6*). It is

noteworthy that Surface 3 clearly sealed the masonry stones and burned granitic deposits of Feature 7 – a large oval structure of coursed granite masonry that was partly exposed in Unit 20E/-28N during 2003 excavations (Sinopoli et al. 2003). However, only 5 cm below Surface 3 excavations encountered Surface 4, which did not entirely seal Feature 7. Surface 4 was a compact deposit of silty-fine sand with traces of plaster and animal dung, similar to that of Surface 3 but recognized by its cleavage from the lower levels of Surface 3. Surface 4 sealed several of the masonry elements of Feature 7, but also abutted or lapped onto others. Thus, it appears that Surface 4 was an external surface in use toward the end of Feature 7's use life, sealing some its latest elements, but not all of them. Surface 5 (*Figure 7*), nearly identical in composition to Surface 4 but exposed approximately 5 cm below, showed traces of plastering against the second course of masonry of Feature 7 across the block, and thus represents a phase of occupation contemporaneous with that of Feature 7.



Figure 7: Block B S5/F7



Photo 3: Block B, S5/F7 round structure

The removal of Surfaces 3 and 4 exposed the continuation of Feature 7 from unit 20E/-28N to the east into units 22E/-28N and 22E/-26N and to the north into unit 20E/-26N. As documented in 2003, Feature 7 continued to be characterized by an enclosure of coursed masonry. This structure is clearly quite large, filling most of 4 by 4 m Block B excavation area. Immediately inside the masonry enclosure is a deposit of very coarse and compact granitic sand, occasionally showing evidence of firing, with regular postholes set within it. The inside of the feature was marked by a partially preserved compact earth and plaster surface, designated Surface A of Feature 7, that has been cut by several pits, including one very large pit (Feature 30) in the center of the structure nearly 2 m in diameter. Excavations in 2009 ended with the exposure of Surface 5, external to Feature 7, and the interior surface (A) and features of Feature 7. However, Feature 7 and its internal features were not completely excavated due to time constraints. Thus, a more detailed understanding of Feature 7 and its function must await its excavation in upcoming seasons.

Feature #	Unit	Description
16	20E/- 26N	Foundation trench cutting Surface 2 south of Feature 13
17	22E/- 28N	Removal of sheet midden fill above lower portions of Surface 2
18	22E/- 26N	Small pit within Feature 14 and cutting Surface 2
19	20E/- 26N	Hearth set in floor C of Feature 13
20	22E/- 26N	Pit cutting Surface 2
21	22E/- 28N	Semi-circular wattle-and-daub structure built on Surface 2A
22	22E/- 26N	Well prepared plaster surface with three e-w linear post holes, associated with Surface 2A
23	22E/- 28N	Pit cutting Surface 2A
24	22E/- 28N	Pit cutting Surface 2A
25	22E/- 26N	Small pit set within Surface of Feature 22
26	20E/- 26N	Pit cutting Surface 3
27	22E/- 26N	Pit cutting Surface 3
28	20E/- 26N	Subsided deposit of roof-fall/collapsed below Surface A of F7, originally assigned as a pit.
29	20E/- 26N	Small pit cutting Surface A of F7
30	22E/- 26N	Large pit within F7 Surface A, exposed but unexcavated in 2009

Table 1: Block B Features

General Significance of 2009 Block B Excavations. The 2009 excavations in Block B contributed to our detailed documentation of the occupational history of Iron Age habitation at Kadabakele. Contrary to arguments for a seasonal and mobile settlement system during the Iron Age, the 2009 EHLTC excavations of Block B attest to components of a more permanent settlement regime. Importantly, the excavations showed that Iron Age habitation of the Upper Terrace at Kadabakele was characterized by the continual modification and maintenance of individual structures (although the presence of continually occupied structures does not preclude

a subset of mobile strategies and practices as a component of the settlement system). Indeed, tens to hundreds of inter-digitating resurfacing episodes of Feature 13 indicate that the structure was lived in and maintained for much longer than most ephemeral settlement models suggest. Moreover, the presence of multiple contemporaneous structures and habitation features in Block B suggest that much of the upper terrace of Kadabakele was densely occupied during the Iron Age. The excavation results indicate that there was continuity in the use of residential space at Kadabakele through time; not only were certain structures regularly maintained (e.g., Feature 13), but likewise specific places for settlement within the site were enduring, even in periods of more substantial rebuilding. This is attested by the presence of apparently similar (although not fully exposed) wattle-and-daub structures below those associated with Surface 2 and under its clay base packing. More specifically, Surface 2A shows several features similar to those of Surface 2, and implies an earlier phase of similar occupation. Lastly, the 2009 excavations did show a change in architecture and possible use of space in Block B below Surface 3, with the exposure of Feature 7 across much of the block. However, a comprehensive understanding of Feature 7 and both its function and relationship to the later use of space in the Block B requires additional excavation of the structure and its internal features.

Upper Terrace Reservoir Excavation (8E/-145N)

At the center of Kadabakele's Upper Terrace is a small water catchment feature ca. 30 m in diameter consisting of a roughly circular depression augmented by a raised collar of sediment (perhaps from its initial excavation?) revetted with small cobbles and granite slabs. This feature collects and holds monsoon rainfall and runoff, drying out completely in the winter months but supporting somewhat more vegetation than the rest of the Upper Terrace. Test excavations in this area were designed both to document the history of this feature and to collect data on paleoclimate and land use over the last two millennia. An initial excavation unit was placed in the center of the feature in 2003; excavations stopped at c. 2.0 meters in depth. Radiocarbon assessments from the 2003 excavations indicated that these excavations had uncovered the last 1000 years of deposition in the reservoir. Pollen analysis of this record has been completed, helping to document the vegetation history of the region from A.D. 1000 to the present (Morrison and Bauer in press).

In the 2009 field season, an additional excavation unit was placed in the sedimented reservoir in order to recover a more complete sequence of samples for analysis. The unit was excavated from January 15 to February 3, 2009. The primary objective of the excavation was to obtain a stratigraphic sequence from which pollen, carbon isotope, phytolith, and micromorphology samples could be collected, and to correlate their analyses with those of an adjacent 1 meter by 1 meter unit excavated during the 2003 field season. The unit excavated in 2003 (8E/-142N) documented more than 2 meters of alternating low and high energy depositional events. Radiocarbon assessments indicate that the 2003 excavations uncovered the last 1000 years of deposition in the reservoir, from which pollen has been analyzed to document the vegetation history of the region from ca. A.D. 1000 to the present. The 2009 reservoir unit was excavated to obtain additional paleoecological proxy datasets from even deeper and older deposits, with the hope that basal levels of the reservoir would be reached.

The unit was placed adjacent to the 2003 excavation unit in the reservoir to minimize complications with correlating both sedimentation stratigraphy and environmental proxies

between the 2009 and 2003 excavations. The initial size of the unit was 2 by 1m. Because the primary objective was to obtain sediment samples from a deeply stratified deposit, the unit was excavated in relatively coarse 20cm arbitrary levels. To expedite excavation, the unit was reduced to the southern square meter of the original 2 by 1 meter unit at the beginning of level 6 (123 cm bsd R). From there, the excavation continued to a final depth of 442.5 cm bsd R, exposing more than 4.10 m of sedimentation in the reservoir feature. Excavation was closed for safety concerns at this depth. However, the continued presence of cultural materials indicate that excavations did not reach sterile soil, nor the base of sedimentation in the reservoir feature. The recovered artifacts suggest that the lowest levels reached in the excavation probably correspond to the Iron Age, although more definite dates are pending the results of radiocarbon assessments.

Sediment descriptions and interpretations were recorded during the process of excavation; however, more detailed description and analysis of the sedimentary/pedogenic sequence evidenced in the unit was reserved until the end of the excavation, when the boundaries between the natural depositional and pedogenic strata were obvious in section. After documenting the stratigraphic profile, soil samples were collected at arbitrary 5 cm intervals and included every defined stratum. Three soil micromorphology samples were extracted from the reservoir profile to more fully analyze and document the nature of sedimentation in the feature, as well its potential cultural function. After completing the collection of samples, the unit was backfilled.

General Significance of Reservoir Excavations. A total of 18 distinct sediment strata were defined in the excavated profile. Similar to the 2003 findings, the sedimentation sequence showed clay-rich, low-energy standing water deposits punctuated with occasional higher energy flows, represented by poorly-sorted sub-rounded to angular coarser materials (e.g., medium sand to small pebbles) derived from the granitic core stones of the Kadabakele inselberg. The upper ~1 m of the sequence shows well developed signs of pedogenic activity (e.g., moderate to well developed sub-angular blocky structure, rootlets, insect burrows), suggesting that sedimentation in the reservoir was likely decreasing in rate, and that the reservoir was more regularly drying out completely by the mid-2nd millennium AD. However, prior to the mid-2nd millennium AD, and potentially as early as the 1st millennium BC, the reservoir feature more regularly held low energy standing water for sustained periods of time. This interpretation of the sediments was preliminarily corroborated by pollen analysis of sediment samples collected in 2003, which showed the highest concentrations of aquatic taxa in the lowest excavated levels of that season. The deeper sediments exposed during the 2009 excavations support this interpretation further by showing thicker strata of more clay rich textures (e.g., clay as opposed to clayey loams) toward the base of the excavated unit. Moreover, several of the clay rich strata toward the base of the sequence show faint traces of mottling due to differential oxidation of waterlogged sediments (e.g., Strata 16, Strata 18), providing additional support for the interpretation of more sustained standing water in the feature prior to the 2nd millennium AD. Three micromorphology samples were extracted from Strata 16 to more fully analyze and document the nature of sedimentation in the feature and its potential cultural function (e.g., perhaps it was used to grow irrigated cultigens such as rice). Phytoliths, carbon isotopes, and pollen samples will also be analyzed to further detail the history and use of this feature, as well the relationships between long term human habitation and the environmental history of the region.

River Terrace: Section Documentation and Test Unit (8.8E/-449.8N)

Partway through the 2009 season, we discovered a large rectangular trench extending at least 25 by 30 m on the River Terrace of VMS-530, between the Southern Slope and the Tungabhadra River. This large excavation, according to local informants, made by residents of Anagondi without the knowledge or permission of KDAM or the ASI. This large hole, evidently meant as the beginning of an irrigation reservoir, has caused very significant damage to the site of Kadebakele, as evidence by the vast scatter of artifacts and construction debris all around the hole. Ceramics, beads, bones, tiles, and brick fragments lie in untidy heaps, remnants of the now-destroyed archaeological deposits in this area. We notified the Karnataka Directorate of Archaeology and Museums of this development.



Photo 4: Disturbance trench, NW corner, showing area of section cleaning

The ceramics and other artifacts in the spoil heaps included Black-and-Red Ware, Black-and-Red-slipped wares, Russet-Coated-Painted Ware, and Medieval earthenwares. Thus, it seems likely that this area contained both Early Historic, Medieval, and possibly Iron Age deposits. We took the opportunity of this large-scale site destruction to cut back and clean a small area along the western side of the rectangular trench, and to extend the depth of the exposed profile by placing an abutting test unit at its base. Because the disturbed area, which had clearly been made with heavy machinery, was stepped back, we followed this profile in cleaning the section, an area measuring 2.20 m north to south. This section was drawn and mapped, and several charcoal samples were extracted for radiocarbon dating. Excavations and profile cleaning activities revealed a high density of cultural materials, including ceramics, bone, charcoal, beads, iron, lithics and shell.

Because of the irregular shape of the disturbance trench, our small test unit at the base of the cleaned section was trapezoidal, measuring 1 by 2 by 1.74 m with a hypotenuse of 2.14 m. For consistency, the River Terrace unit is identified by its southwest coordinate 8.8E/-449.8N, despite the fact that this point was actually inside the western profile and excavations never fully extended to this coordinate. Recording and excavation took place between February 3, 2009 and February 13, 2009. We excavated in natural levels, though where there was no clear stratigraphic break, we employed arbitrary 20 cm levels. Elevations were measured in cm below sub-datum S, the latter shot into the site grid with a transit. We excavated six levels, each approximately 20 cm in depth, noting changes in matrix content and artifact distribution, documenting the presence any features and other occupationally related structures. All sediment was screened through 1/8"

mesh, and artifacts were collected and registered for future analysis in the lab season.

Levels 1 and 2 were the only levels containing structural features (a prepared floor surface and a single pit). All levels exhibited a high concentration of cultural materials including ceramics, bone, charcoal, beads, iron, lithics, and shell. Daub and brick fragments were present at low densities within the first few levels; however, these materials were noticeably absent in the lower levels. In general, artifact density was high though much of it, especially in the lowest excavated levels, appears to be occupational debris washing down from the top of the hill. The distribution and density of cultural material, as well as alternating layers of compact clay and sub-angular gravel sand, strongly suggests that the materials found within this area of the River Terrace were washed down from the hilltop, as opposed to flooding sequences or in proximate occupational activity.

Level 1. Level 1 began at the base of the disturbed area, and is thus near the base of the recorded profile. The initial centimeters of Level 1 were very loose and uncompacted, consisting of a fine, poorly sorted silty sand (10 YR 5/2) with occasional lenses of gravel and ash. These initial centimeters of Level 1 may have contained material from the profile cleaning. Grain shape varied from sub-rounded to sub-angular with sub-rounded sand found within loam and sandy silt matrices, while sub angular sand characterized the gravel lenses. Sand color ranges from 10YR 3/2 (sub rounded sand), 10YR 4/2 and 10YR 4/3 (very coarse sub-angular sand).

Compaction increased at around 8-10cm within Level 1 and matrix changed from a fine silty sand to a medium sub-rounded sand and clay mixture with small lenses of charcoal. Beneath the sandy-clay mixture in the northwest corner, we exposed a light gray, prepared clay surface measuring 40 by 35 cm. The surface was removed and we sampled 100% of it for flotation. Beneath the prepared surface was a very coarse, subangular granite sand similar to the lenses observed throughout previously excavated deposits.

Within sandy-clay matrix, Level 1 continued to have lenses of medium to very coarse sub-angular sand gravel without any silt or clay present. This was consistently observed down to the base of Level 1. The base of Level 1 was a loosely compact, brown loam (10YR 4/3) with the lenses of sub-angular granite sand occurring along the 9.8E line and to the West, ultimately hitting the unit profile. Artifact density was very high in Level 1.

Feature 1. At the base of level 1, we encountered an ashy pit in the northeast corner of the unit. It contained a soft, very loose mixture of ash and fine sand (10YR 7/1) with a distinctive burned layer towards the bottom. Pit fill was screened separately. Charcoal from the pit was sampled for radiocarbon and a flotation sample was taken. Within the pit, we found the well preserved base of a Black-and-Red Ware bowl. A large cow bone was also found within the southern edge of the pit.

Beneath the ashy fill of the pit was a very fine, almost powder-like, dark yellowish-brown sand (10YR 3/4) surrounded by a softer, brown deposit containing well preserved ceramics. Initially, this was deemed separate from the pit fill and cut, and was recorded as part of Level 2. However, it was probably the case that this was actually part of the pit and should have been included in the separate removal and screening for Feature 1. As a result, there is likely a slight mixture of contents from Feature 1 within Level 2; however, ceramics removed for analysis were point provenienced.

Level 2. Level 2 began as a compact medium to fine loam (10YR 4/3), with some clay. Sand

within this matrix was sub-rounded. Clay content increased with depth. After about 5 cm, the matrix became a well-sorted medium sand with a mixture of silt and some clay. This loam (10YR 3/3) included regularly occurring stone chips. The matrix remained fairly consistent; however, towards the base of the level, the sediment became increasingly sandy. Base matrix was a medium sub-rounded to sub-angular sand with some silt. Within the center of the unit, patches of nearly pure sand lenses emerged and color varied across the base of the unit from brown to dark brown (10YR 3/3 and 10YR 5/3). Artifact density in Level 2 was high, but lower than Level 1. Ceramics and bone were extremely eroded, especially at the base of the level, and river pebbles were more abundant than in Level 1.

Level 3. The initial 10 cm of Level 3 was a compact, clay-rich loam with a mixture of medium and coarse sub-angular sand (10YR 3/3) and infrequently occurring stone chips. Changes within the bottom 10 cm of level 3 included the occurrence of very coarse sub-angular sand gravel lenses, and increasingly frequent granite chips, cobbles, and river pebbles. The base of Level 3 (10YR 3/3 and 10YR 3/2) was a very compact clay with just a few patches of coarse sub-angular granite sand in the northern part of the unit. Level 3 clearly illustrated the oscillation of clay-rich and of sand deposits, both throughout excavation and as observed in profile. Furthermore, it became clear that there was a relationship between sediment type and artifact density, with artifact concentrations very low within clay-rich deposits, and higher in both the loam and the sand-gravel deposits. Level 3 yielded both Black-and-Red Ware with graffiti, as well as RCPW.

Level 4. Like Level 3, Level 4 was excavated in two 10 cm sweeps. In the southwest corner, where the unit abuts the western profile, Level 4 began as very coarse sub-angular granite sand with pebble inclusions. This 5 cm thick layer was clearly represented in profile and sat atop a very compact clay matrix. Clay-rich deposit continued to alternate with pure sub-angular sand gravel layers in thick bands throughout the unit. Consistent with the overall trend, as the depth increased, artifact density continued to decrease. However, Level 4 produced much larger and more well-preserved ceramic fragments compared to previous levels. One large brick fragment was recovered.

The base of Level 4 (10YR 3/3), was a compact clay containing no sand, but small traces of silt. Similar to the patterns in upper levels, Level 4 exhibited lenses of very coarse sub-angular granite sand (10YR 4/2) with a higher volume of river pebbles than in any other level. Lenses of fine, sub-rounded sand were also documented in this level. The base of the level showed an increasingly compact, dark brown (10YR 2/2) clay content, marbled with a less compact clay (10YR 3/3).

Level 5. Level 5 maintained the marbled clay-matrix noted at the base of Level 4 for approximately 5 cm before transitioning to a coarse sub-angular granite sand matrix. At 10 cm, we continued to see the same alternating pattern of clay-rich and pure sand gravel deposits. Artifact concentration was moderate and recovered bone fragments were highly eroded. The first 10 cm sweep of Level 5 revealed several lenses of fine sub-rounded sand; along the northwest side of the unit, the clay matrix was very dense and uninterrupted by sand lenses. Within the dense clay matrix in the northwest corner, we recovered a carbonized seed and took an additional flotation sample in the same area.

The base of Level 5 revealed a very dark (10YR 2/2) compact clay with very low artifact

density. Sand content increased slightly at the base of the level. Deposits ranged from dark yellowish-brown sand lenses (10YR 4/4), to pure clay (10YR 2/2) and sandy clay (10YR 3/3).

Level 6. In this level, we reduced the size of the excavation area of the unit, taking down the triangular section of the unit (everything from the west of the 9.8E line up to the Western profile) to 137cm bsd S. In this level, we recorded a less-compact, black, silty clay (10YR 2/1) in the unit's northwest corner. Elsewhere, the dark brown compact clay previously recorded above continued. Large cobbles and river pebbles occurred frequently and the base matrix of the level was a compact to moderately-compact dark clay (10YR 2/2) with loam (10YR 3/3) and sand lenses. Excavation ceased due to time constraints; it is not known if earlier intact deposits underlie the lowest exposed levels.

Discussion: River Terrace

The River Terrace profile, including the section cleaned back from the disturbance trench and the excavated test unit 8.8E/-449.8N, reveals a sequence of cultural deposits beginning with some inwashed Iron Age debris from up slope (note that sterile soil was not reached) – not *in situ* – followed by several meters of Early Historic cultural material, including the remains of multiple floors and construction debris. This material was deposited very quickly between about 200 and 100 BCE, about 3 m of sedimentation in just a few hundred years (see section on radiocarbon dates; at a 95 % confidence interval, the pre-Medieval dates show a range between

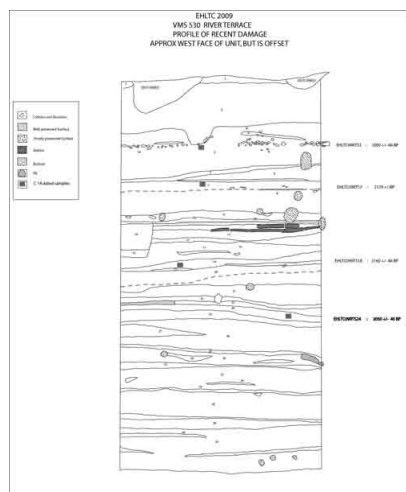


Figure 8: Preliminary draft, river terrace profile

ca. 350 to 50 BCE, and 200 to 100 BCE at a one-sigma confidence interval). Preliminary ceramic analysis shows a clear decrease in the proportion of RCPW with depth in the test unit. RCPW is never very common, less than 1% of the identifiable ceramics in the level where it is most abundant (Level 1); but it definitely patterns stratigraphically. It is most common in Level 1, and consistently found (in lower frequencies) in Level 2. There were a few very tiny fragments from level 3, even less from levels 4 and 5, and none by Level 6.

There then appears to be a gap in occupation after about 100 BCE, with renewed use of the area in the Early Middle period. Both surface remains and the exposed section show evidence for Middle Period structures the latter dating around CE 1000, based on one radiocarbon date,

and somewhat earlier based on the remains of a nearby temple.

Given that landscape dynamics and anthropogenesis are among the project's concerns, understanding the scope of human and environmental activity on the River Terrace is pivotal. We know areas of the River Terrace would have been subject to flooding prior to the construction of the Tungabhadra dam (Morrison, Sinopoli, and Gopal 2005: 5-6, 28). However, the excavation and analysis of unit 8.8E/-449.8N on the River Terrace showed us that we were working in an area which may not have been reached by flooding episodes from the Tungabhadra River. The sub-angular nature of the matrix, which tended to be mixed with high concentrations of artifacts, instead suggests that these deposits accumulated as a result of wash from up slope. By contrast, we would expect to see a higher occurrence of sub-rounded sandy matrices in the event that the area was subject to flooding episodes; however, sub-rounded sand was only observed in the initial centimeters of Level 1, and in small lenses throughout Levels 2 through 6. However, the clay deposits observed throughout potentially suggest that flooding activity did sometimes reach the base of the hill.

Evidence from this area suggests that our initial notion of an occupational shift down the hill, with Iron Age habitation in the higher areas and Early Historic habitation along the flood plain, appears to be correct. Although the focus of Early Historic settlement was apparently on the flood plain, residents of the area were clearly using the Upper Terrace for memorial activities involving Block A. The rate of deposition at the base of the hill during the first few centuries BCE was very high, suggesting not only intensive settlement, but also accelerated erosion up slope.

Data Analysis

Radiocarbon calibrations. A major effort of the project is to refine the extremely rough chronologies for the South Indian Iron Age period – which now is divided into a single period of about a thousand years long. To this end, obtaining a strong suite of radiocarbon dates has been an important focus of our work. Several more samples were run over the last year, and project member Andrew Bauer has applied a Bayesian statistical analysis to attempt to refine the date ranges characteristic of the mid-first millennium BCE calibration curve. Bauer's efforts in two excavation areas of Kadabakele's upper terrace resulted in such a refinement, and indicate that the most intensive occupation of the upper terrace area can be bracketed between c. 800 and 550 cal BC. Later use of the upper terrace is evident in both the western commemorative (megalithic) activities documented in Block A and deposits in the Southern Slope part of the upper terrace excavated in 2005. Our current interpretations point to a pattern of shifting settlement at Kadabakele, with the earliest occupation focusing on the protected upper terrace region in the first half of the first millennium BCE, with settlement shifting downslope to the more open and accessible river terrace area subsequently.

Artifact Analyses. Analysis of ceramics, beads, clay objects, and stone tools is in progress. More detail is given in Morrison et. al. 2005 and Sinopoli et al, in prep. A ceramic chronology is currently under development.

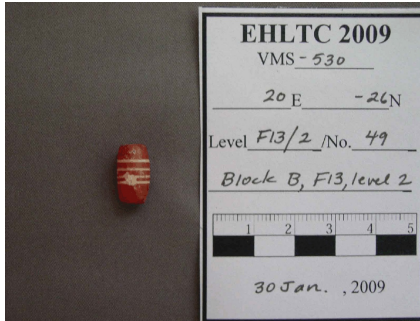


Photo 5: Carnelian bead from Iron Age structure, Block B, F13, level 2

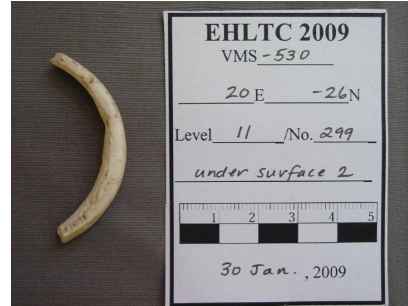


Photo 6: shell bangle from Iron Age residential area, Block B, level 11, beneath Surface 2

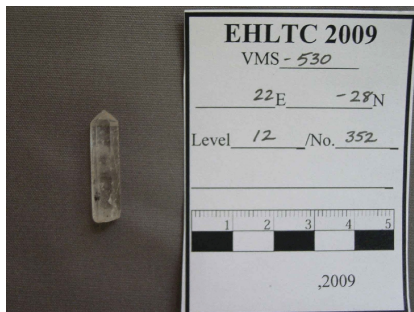
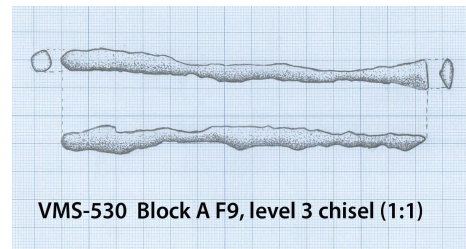


Photo 7: Quartz crystal from Iron Age residential area, Block B, level 12



Paleoenvironmental Analyses. Pollen analysis of the 2005 reservoir excavations is complete (Morrison and Bauer in press) and phytolith analysis of the Upper Terrace midden deposits excavation from 2003 are complete. Macrobotanical and stable isotope analyses are in progress. Faunal analyses from all seasons are complete.

Archaeometallurgical Analyses. Project collaborator Dr. Sharada Srinivasan continued her work on the iron artifacts and slag from Kadabakele. Results confirm the presence of medium and high carbon scale from early first millennium BCE strata at the site – this is some of the earliest known steel production in the world. To date however, we have only finished artifacts and no evidence for in-situ production.

APPENDIX 1: ANTIQUITIES REGISTER

APPENDIX 2: LABORATORY CHECK-IN RECORD (all artifacts)