The Anuradhapura (Sri Lanka) Project: The Hinterland (phase II), Preliminary Report of the First Season 2005

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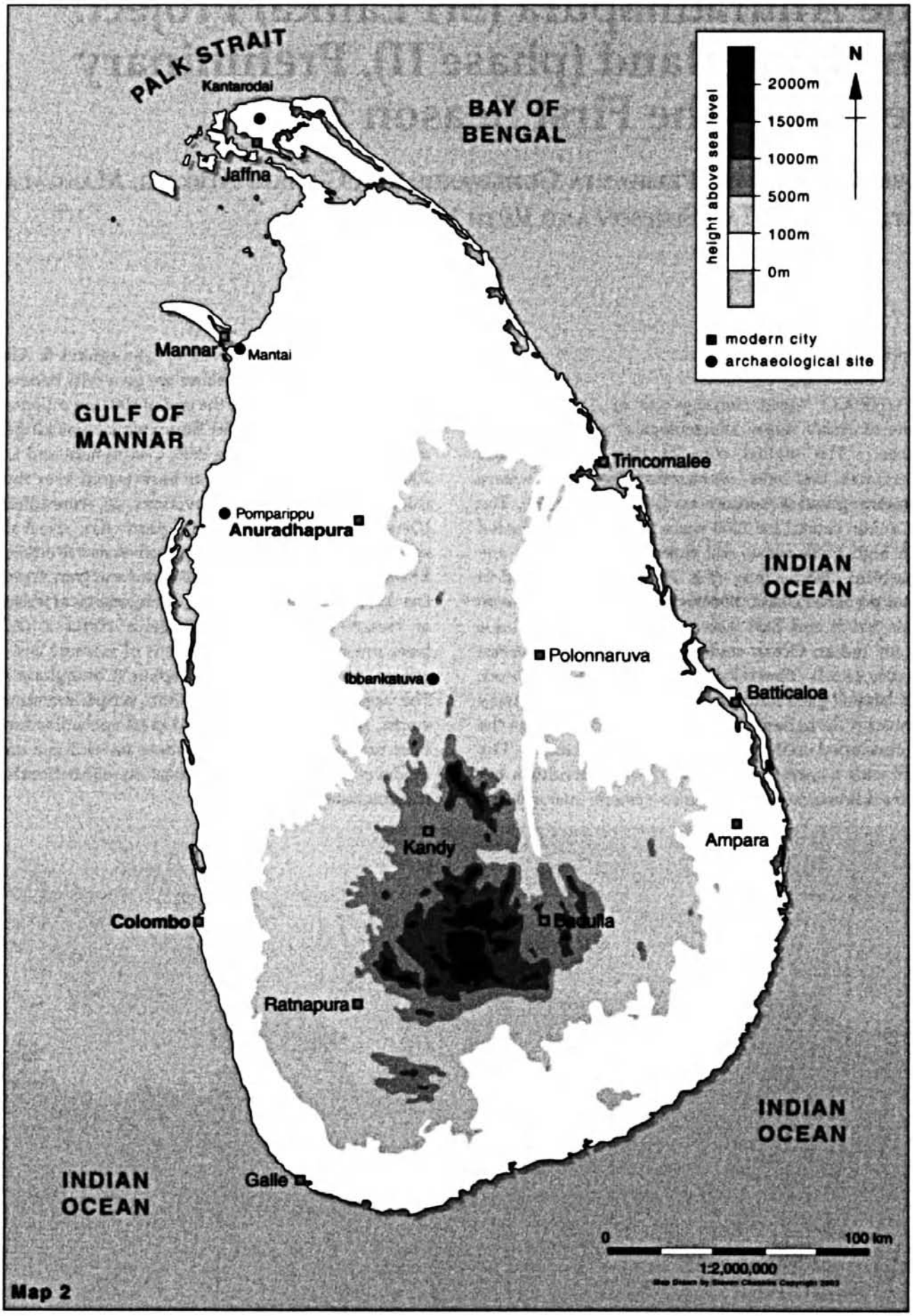
Introduction

The UNESCO World Heritage site of Anuradhapura is one of Asia's major archaeological and pilgrimage centres. The walled core of the city measured 100 hectares and was surrounded by a 25 square kilometre spread of monasteries (Seneviratne 1994). The Sri Lankan capital for 1500 years, its kings constructed 100m high brick *stupas* and three vast reservoirs, one containing 1288 hectares (Fig. 1). Although located in the centre of the island, the city attracted pilgrims from across South and East Asia and also functioned as a hub for Indian Ocean trade as indicated by evidence of lapis lazuli, Greco-Roman glass and metalwork, early Islamic glass and glazed ceramics and East Asian ceramics (Coningham 1999, 2006) (Fig. 2). Although the city developed on the northern plain of Sri Lanka's 'Dry Zone' with a carrying capacity of 0.4 individuals per square kilometre, its hydraulic system ensured the supply of water (Brohier 1954; Coningham & Allchin 1995). The city and hinterland are generally believed to have been abandoned at the end of the first millennium AD due to pressure from the expansionist kingdoms of South Indian (De Silva 1981; Coningham and Lewer 2000). The city's growth has been traced over the last thirty years through excavations at Anuradhapura (Deraniyagala 1992), and in particular, excavations sponsored by the Society for South Asian Studies, The British Academy, The Ancient India and Iran Trust and the McDonald Institute for Archaeological Research at trench Anuradhapura Salgaha Watta 2 (ASW2) have presented the development of a small Iron Age village into a mediaeval metropolis (Coningham 1999). The appearance of early Brahmi script, monumental works, irrigation, imports and craft specialisation has been mapped against this process, providing a unique model of Early Historic urbanisation within South Asia (Coningham 2006).

1. View of Ruvanvalisaya or Mahathupa across the Basavakulam at Anuradhapura.



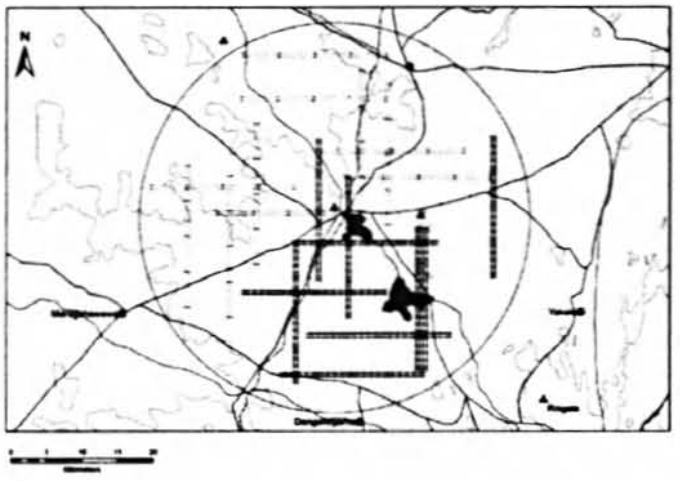
2. Map of Sri Lanka showing the location of the City of Anuradhapura.

3. View of the survey universe from the summit of Mihintale.

Despite our understanding of the urban process in the core of Anuradhapura, knowledge of the role played by communities outside the city in this process is extremely poor. Indeed, the majority of Early Historic excavations and research projects in Sri Lanka have been focused on either urban forms or monastic sites (Coningham & Allchin 1995). This makes it extremely difficult to link the individual urban sites of Anuradhapura, Mantai, Tissamaharama and Kantarodai into any form of meaningful understanding of their function within the landscape as a whole. This pattern is by no means restricted to Sri Lanka and the same could be said of the landscapes of the Early Historic *Mahajanapadas*, or territories, of South Asia as a whole. In this vacuum, our project represents the first multi-disciplinary attempt to model the development of an Early Historic city in South Asia, and to assess its impact on communities outside its wall and the environment within its hinterland. Moreover, it differs significantly from the surveys of Erdosy (1987) in the Ganges and Ragupathy in the Jaffna Peninsula (1987) and Bandaranayake in Sigirya-Dambulla region (1990) because, although productive, all lacked the tight artefactual and structural sequence linking hinterland to urban core, as offered by the findings from trench ASW2 (Coningham 1999, 2006). As a result of this general lacuna, we framed the following research questions: how did settlement and land use patterns respond to urbanisation; was the plain's environmental context altered during urbanisation; did certain traits, such as writing, monuments, and imports become restricted to the city; how did urbanisation affect the organisation of craft production; and, finally, was the plain surrounding the city entirely abandoned in the eleventh century AD?

Aim, Objectives and Methodology

In order to answer these five questions, we developed a project which aims to model the networks between urban and non-urban communities and the environment within the plain of Anuradhapura over the course of two millennia. During our five years of funding we will define and interpret the following objectives: the spatial location and sequence of urban and non-urban communities; the morphology and function of urban and non-urban communities; the subsistence



4. Map of the survey universe showing the location of the random transects.

5. View of random transect survey in progress.

base of urban and non-urban communities; soils and sedimentary sequences within the plain; and resource patterns and enhancement within the plain. In line with the project's aim and objectives, our methodology will map the nature and location of non-urban sites, soils and resources with a sample of sites later subject to geophysical survey and excavation. The latter two will confirm sequences, morphology, size, subsistence and craft-working set within a context of environmental change. Our sample universe is a 50 km circle centred on trench ASW2 within the Citadel of Anuradhapura, and includes rocky outcrops and ridges, streams and rivers, grasslands, forests, tanks, villages, *chena* (swidden agriculture) and paddyfields (Coningham 1999)(Fig. 3).

Settlement Identification

Our first survey method, recording sites on random transects, is a simple random sample of 25 transects of 20 km each, designed to allow us to draw reliable general conclusions about the sample universe from the areas sampled. Transect lines were distributed within the research area by random assignment (Fig. 4). During our pilot field season in Easter 2005, we surveyed the first transect line of 20 km and recorded topography, vegetation, land use, resources and cultural features. Teams of 10 archaeologists walked in a line and sites were defined by a feature, lithic find spot or scatter of more than 5 sherds per square metre, and located by GPS, photographed and sketched (Fig. 5). Chronological indicators and diagnostic material, such as debitage, slag and wasters, were returned to Anuradhapura for processing. As we were surveying, we decided to expand our methods and started a parallel non-probabilistic survey of the banks of the Malwatu Oya (river) in order to identify possible settlements and break of bulk points for transport along the conduit which linked the city with the coast and was the likely source

6. View of the coring of ceramic scatter site B009 using a soil auger.

of many of the exotic materials identified in the Citadel of Anuradhapura. We surveyed the first 5 km section of river from the city of Anuradhapura downstream during our pilot field season.

Site evaluation

Following their discovery and initial recording, sites were then subject to evaluation and sampling through auger coring, geophysical survey and excavation. Auger

coring quickly allowed us to identify the depth and extent of the sites as well as giving us the ability to record general macro-stratigraphic details (Fig. 6). The next tier of evaluation will be geophysical survey, utilising fluxgate gradiometer measurements in order to define site size and morphology. The results of the survey and coring will then be utilised to decide which sites to sample by excavation and where to place the trench or trenches. In accordance with our methodology, we will excavate a total of 4 square metres at each selected site in future seasons. Deposits will be sieved to collect smaller artifacts, such as hammer scale and debitage, and environmental sampling conducted to collect plant macrofossils and animal bones. Cultural sediments will also be studied using thin-section micromorphology and associated X-ray microprobe analytical techniques for further definition. Excavation proper and geophysical survey will only commence during the second season of the project but we found the auger coring to be an extremely efficient tool for evaluating the archaeological sequence of sites during this first season, we plan to auger additional sites where appropriate.

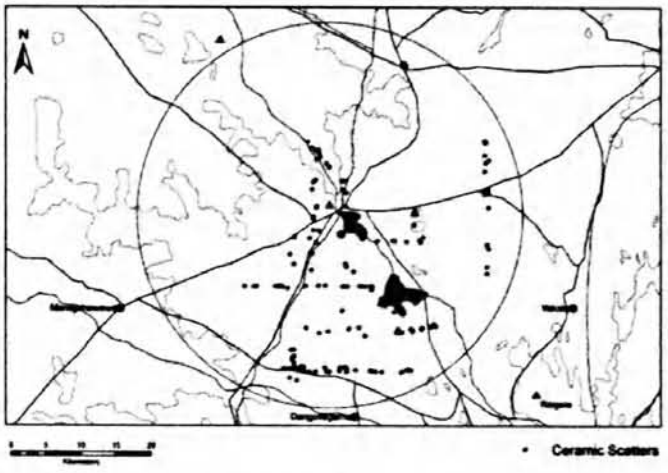
Pedological and geomorphological survey

Soil and sedimentary sequences for the survey area are being mapped using UN-FAO classification procedures through a combination of remote sensing, from existing sources, and field survey. The survey will allow soil and geomorphological mapping to provide a basis for detailed sampling of 10 pedological and sedimentary stratigraphies to develop chronologies of environmental change/manipulation. Stratigraphies will be examined through field observation, thin section micromorphology analyses with associated X-ray microprobe techniques, and particle size distribution analyses, permitting the phased mapping of land use/enhancement activities. Chronologies for the geomorphological survey element of the project will be established through combined AMS radiocarbon dates and OSL measurements.

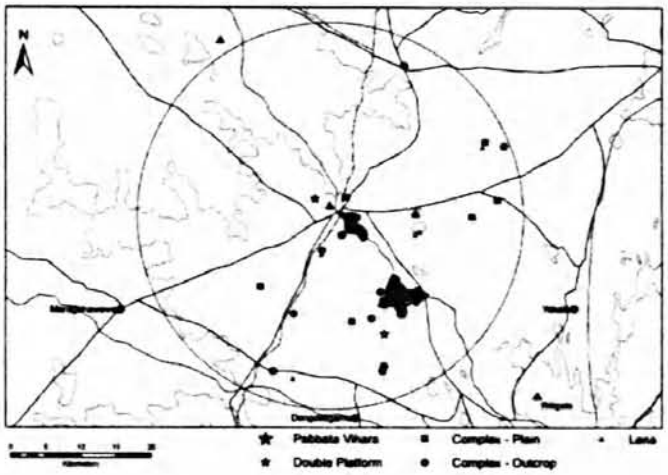
Laboratory analyses

The analysis of cultural material is being carried out at Anuradhapura and compared with the resident ASW2 collection. Most artefacts are photographed, studied and drawn in Anuradhapura but Dr Krishnan from the MS University of Baroda, Dr Young from Leicester University, and Dr McDonnell, Dr Stern and Professor Heron from Bradford University will select samples of ceramics, archaeobotanical and archaeozoological materials, metals, metal-working residues, and ceramics with evidence of residues for further analysis.

Metallurgical study, for example, will involve thin-sectioning and SEM analysis of slag in order to identify



7. Map of the survey universe showing the location of ceramic scatters.



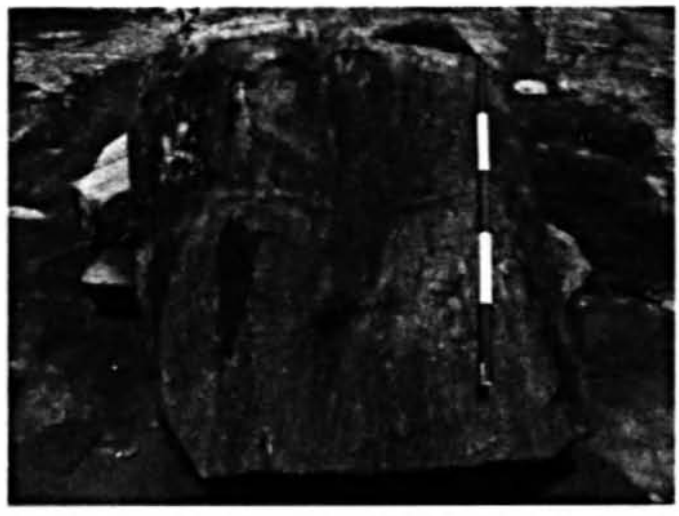
8. Map of the survey universe showing the location of monastic sites.

diachronic technological change and, as a pilot study of sherds from Coningham's excavations at Anuradhapura has successfully identified bitumens, sherds from the survey will be subject to GC-MS analysis to identify access to exotic resources, such as bitumens & resins, and local ones, such as fats and beeswax. Building on completed analysis of sherds from ASW2 (Ford et al. 2005), we will also chemically characterise additional ceramic samples through ICP-MS and thin-section petrography to enhance our macroscopic knowledge of the development of ceramic product standardisation and networks between urban and non-urban communities.

The Results of the Pilot Survey 2005

A total of 190 sites were recorded by the survey teams during our pilot season in 2005, including 155 recorded on the four random survey transects to the south of Mihintale, 12 recorded on the systematic survey of the river banks, and 23 sites recorded off-transect. Of these

9. View of the stone built stupa at Thalaguru Vihara.



10. View of the Naga guardian stone at Aliththawa Vihara.

sites, 147 were archaeological, 27 were tanks, 11 were quarry sites and five were modern features such as potters' villages. For ease of discussion and comparison with other regional surveys (Manatunga 1990, p.78), the sites have been divided into 91 ceramic scatters, 22 monastic sites, 11 metal-working sites, nine possible megalithic tombs, six conical holes, two bridges and six undiagnostic sites with stone pillars or blocks.

Ceramic scatters

As with the findings of the Settlement Archaeology Research and Training Project in the Sigiriya-Dambulla region (Bandaranayake, Mogren and Epitawatte 1990), the vast majority of archaeological sites identified during our pilot season were simple scatters of ceramics with few visible associated features (Fig. 7). Indeed, these included a total of 91 of our total 149 archaeological sites, representing over 60 percent. In addition to the ceramic scatters near metal-working sites which are recorded elsewhere, we recorded 62 of these sites. A total of 17 ceramic scatters were also associated with brickbat fragments and seven others with scatters of stone blocks. Ceramic scatters in association with tile fragments were also recorded at a further four sites. As a typical site category, their size extended from small scatters of 1 m by 5 m, as at A016, to large scatters of 25 m by 35 m, as at A021 but most were about 15 m by 15 m. Some were recent, as indicated by scatters of bone china at Wellaragama (B004), but other were much more ancient. In an attempt to identify more about the characteristics and antiquity of the sites represented by the ceramic scatters, hand soil auger cores were taken at three sites, B004, B009 and C033. Site B009 was a potentially significant site in terms of size, as it had concentrations of 100 sherds per metre within the core of its 15 m by 15 m spread, however, we were surprised not to encountered sherds below a depth of 0.2 m. This shallowness of occupation material supports a proposal that many of these ceramic scatters represent very short-lived settlement. Site B004, the old village site of Wellaragama, comprised a field of low mounds with thick ceramic scatters over an area of 70 m by 30 m. Local farmers reported that the village was founded at the beginning of the last century during the general recolonisation of the plain and that it had been abandoned 60 years previously - providing a short lifespan of some 40-50 years. Auger cores within the vicinity of the old house mounds failed to identify ceramics below a depth of 0.2 m, reinforcing the lack of a deep stratigraphy.

However, not all sites lacked stratigraphy as 0.8 m of cultural deposits were identified at the site of C033. This site, Sembukulama, comprised a 1.2 m high mound of brick and ashlar blocks from which a number of 'in situ' stone pillars protruded.

A 30 m transect of cores across the mound identified the presence of a thick layer of brickbats, representing the monumental construction phase, but sealed below them, a layer of eroded ceramics. As small fragments of charcoal were also recorded (potentially allowing tight dating of the sequence), it is suggested that this site be further investigated through geophysics and excavation. As a corpus, we hypothesise that this category of site represents the occupation of a short-lived settlement and it is notable that although some were constructed with brick, stone and tile, there was no evidence of the presence of the exotic traded materials which typify the sequence at Anuradhapura. The dating and function of these sites will be a matter of further investigation.

6.3 Monastic sites

The 22 monastic sites encountered during our pilot season of the UMOEP can be divided into 15 rockshelters, two monastic complexes with linked stupas on hilltops, three monastic complexes on granite outcrops, one

11. View of the stupa of the Pabbata Vihara at Parthigala.

12. View of the image house at Parthigala.

monastic complex in the plain and a example of a single *Pabbata Vihara* (Fig. 8). Eight rock shelters with Early Brahmi inscriptions cut into their drip ledges were noted at Katu Potha Kanda and at the restored rock shelter with Early Brahmi inscription at Getalagamakanda (B013). Another seven were abandoned or restored rock shelters without inscriptions. Two stupas crowning outcrops were observed at Thalaguru (A030) and at Getalagamakanda, close to B013. The most striking was the example above the Thalaguru *Vihara* complex at A030, as one can see all the major stupas at Anuradhapura and Mihintale to the north and northwest from the summit. The stupa measured some 30 m in diameter and was 15 m high but very badly damaged by treasure hunters. The section cut by them through the centre exposed a foundation stage of stone with brickwork above. The hillside below was also terraced with substantial walls of stone blocks (Fig. 9).

Three monastic complexes on outcrops of boulders were also recorded including the largely abandoned complex at Weelapokuna Walagamba *Vihara* (B040), which consisted of a two metre high ridge measuring some 50 m by 40 m with the ruins of a 4 m high stone and brick stupa, pillar bases, large stone blocks, brickbat and ceramic fragments and a conical hole drilled into the outcrop. Similar examples were identified at Aliththawa *Vihara* (D005) and at D013. At D005, rectangular stone foundations, tile, brickbat and ceramic fragments, stone pillars, conical hole and a 4.2 m high stone and brick stupa stretched along the 10 m high outcrop for a distance of 200 m and width of 50 m. The site, on the edge of a tank, also contained a *Naga* guardian stone (Fig. 10). A lone guardian stone, close to a tank, was also recorded at D049. A similar monastic site was recorded at D013, and comprised an ancient stupa and brick and stone foundations within the compound of a recently restored *Vihara* on a 4 m high outcrop measuring some 100 m by 5 m. The site still possessed an extremely worn but recognisable *Sri Pada* as also recorded at B037. Site C19 was an example of a monastic site located within a flat plain and incorporated prone stone pillars and a limestone lotus statue base.

One of the largest new monastic complexes identified during the pilot season was the site of Parthigala on the southern edge of Nachchaduwa Wewa at the southern edge of our sample universe. Covering some 480 m east to west and 440 m north to south and only accessible by canoe during the wet season, this complex included a central group of monuments including pillared halls, stupa and image houses. The stupa (Z002) had a diameter of 36 m and a height of 6.5 m but had been very badly damaged by treasure hunters who had cut a pit into its centre (Fig. 11). However, the section exposed by this pit demonstrated that its core was formed by a foundation of 3 m of stone blocks with 3.5 m of brickwork above. 70 m to the west of the stupa, treasure hunters had damaged a low mound of 7 m square, exposing a 1.4 m long *Asana* (Z004), and 50 m to the south of the stupa, an alignment of three rows of seven pillars marked the location of a large pillared hall (Z003). 100 m south of the *Asana* was a north facing image house (Z011) measuring some 14 m by 7 m with a sanctuary at the southern side marked by fragments of a lotus *Asana* and *Yantragala*, both very badly damaged by treasure hunters (Fig. 12). Less than 60 m to the southeast of this image house was a very substantial building of numerous rooms, measuring 32 m by 22 m, marked by stone foundations and pillar bases (Z012). Additional features of the complex at Parthigala were two large ponds to the west of the stupa, one measuring 57 m by 53 m (Z010) and one 30 m by 35 m (Z009), and pillared halls to the southwest of the complex (Z006 & Z007) and a conical hole to its south. Our current working interpretation of this complex is that it represents a *Pabbata Vihara* with major buildings clustered within a sacred precinct although its stupa is located to the north-east rather than the southeast of the central cluster of buildings (Bandaranayake 1974; Wijesuriya 1998). As such, its date

may be attributed to between the mid-eighth and twelfth centuries AD (Bandaranayake 1974, p. 81).

Sites with stone pillars and walls

Six sites were also indicated by standing or prone pillars or by wall alignments of stone blocks. These sites are not necessarily identifiable as monastic and thus have been given a separate category. They include, C033, which has already been discussed above, C032 C037, C042, C043 and D001 and all but D001 are accompanied by ceramics and tile fragments.

Metal-working sites

Metal-working sites were one of the categories of sites identified by the Settlement Archaeology Research and Training Project in the Sigiriya-Dambulla region (Bandaranayake, Mogren & Epitawatte 1990). They also proved to be a feature of our own survey with the identification of 11 sites, with a distinct cluster around Nachchaduwa Wewa (Fig. 13). Slag was recovered from Site A032, part of the Thalaguru *Vihara* complex, in association with a 30 m by 10 m scatter of bricks, brickbats, tile and ceramics fragments and stone slabs, along the western edge of a large outcrop crowned by stupa A030. B022 comprised a spread of ceramic and slag fragments over an area of some 50m2. Site B027 comprised a scatter of ceramic fragments and slag covering an area of 10 m by 5 m and was very similar to the ceramic and slag scatter at B028, covering 10 m by 10 m.

Site B44 comprised a rock shelter with Early Brahmi inscription on a hillside as well as a spread of ceramic and slag fragments covering an area of 10 m by 7 m. Site B059 was located on the east bank of the Malwatu Oya and comprised a scatter of brick, ceramic and slag fragments covering an area of 5 m by 10 m and C018 was located close to the Nachchaduwa Wewa with a scatter of tile, ceramic and slag fragments covering an area of 25 m by 25 m. C029 comprised a scatter of slag covering an area of 5 m by 5 m and C043 a 6 m by 10 m scatter of ceramic, tile, brick and slag fragments around four fallen and one standing stone pillars. To the southern edge of the transect, D003 comprised a scatter of ceramic fragments and slag covering an area of 20 m by 10 m and D009 a scatter of ceramic, brick and slag fragments over an area of 20 m by 10 m. We will characterise these slags into copper and iron working and into smithing or smelting by-product during our second season.

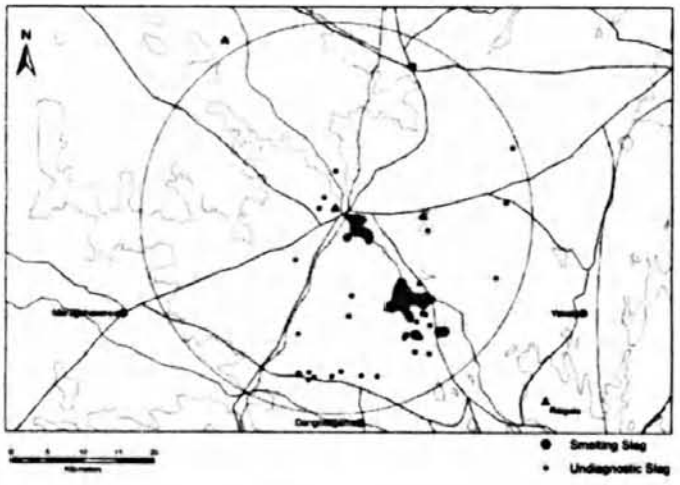
Megalithic burial sites

During the pilot survey, the teams also recorded nine possible megalithic sites. As field monuments they were difficult to assess as they might have represented natural or artificial clusters of boulders. As a result, we decided to sample three by auger coring in order to understand the stratigraphy of the individual sites better. Site A038 was in the overgrown garden of a house and comprised six clusters of boulders, possibly identified in the survey as cists without capstones of the same type as the numerous cist burials in the Dry Zone at sites such as Yatigalpoththa, near Dambulla (Seneviratne 1984).

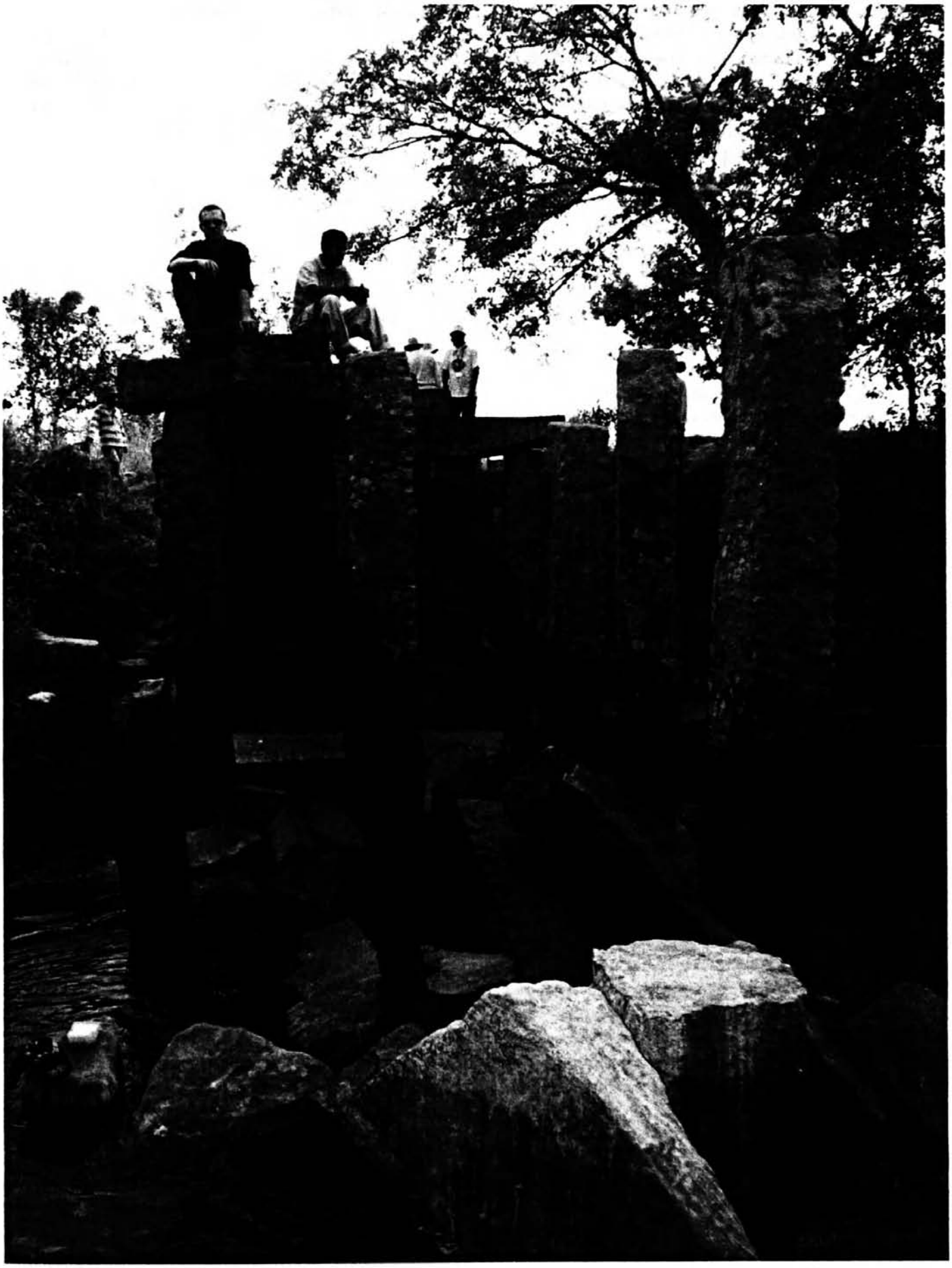
When the centres of three of the clusters were auger cored, the resultant soil profile revealed 0.2 m of humus sealing 0.3 m of degraded bedrock, confirming that the possible megalithic cists at A038 were in fact natural features. Site B017 proved to be more complex and comprised low rectangular clearing demarked by two 2 m high parallel ridges of outcrop. The clearing was much lower than the surrounding ridges and was filled with low grass through which a series of clusters of stone slabs and blocks were visible. Some of the clusters appeared to represent rectangular cists as at Ibbankatuva and Yatigalpoththa. Two of these clusters were auger cored and, unlike A038, proved to have soil profiles of 1 m. However, no cultural material was found within the profile and much of the profile was consistent with waterlogged gley soils. Our interpretation of this site is that it represents a natural seasonal pond and that due to its proximity to the outcrops, a natural source of building materials, stone blocks have become incorporated into the soil profile. We will continue to take soil cores from the other possible megalithic sites in order to similarly test them.

Conical holes

Conical holes drilled into gneiss outcrops and boulders are well known features in the North Central plains and were reported during the survey of the Sigiriya-Dambulla region (Manatunga 1990, p. 80). During our pilot season, we identified six sites with conical holes. They are frequently associated with monastic



13. Map of the survey universe showing the location of metalworking sites.



14. View of the stone bridge near Kiribat Vihara.

complexes, and four of our five examples (A033, B040, D005 & Z005), appear to have functioned as postholes for structures, including a bridge or platform as at C053. Part of the Thalaguru *Vihara* complex, A033 was a small boulder measuring 2m by 10m cut by a single conical hole with a diameter of 0.2 m and a depth of 0.15 m.

Site C047 comprised of a scatter of ceramics to the immediate west of a low outcrop cut by two conical holes 1 m apart and both measuring 0.16 m in diameter and 0.15 m in depth. C053 was located on the rocky bed of the western side of the Malwatu Oya and comprised four large postholes (0.25 m in diameter and 0.2 m deep) forming a rectangle, presumably the foundations for a bridge or platform. Conical hole D005 measured 0.16 m in diameter and 0.15 m in depth and was located in the centre of the ridge occupied by the Aliththawa *Vihara* complex. Conical hole Z005 measured 0.19 m in diameter and 0.14 m in depth and was within the Parathigala monastic complex.

Stone bridges and annicuts

The Malwatu Oya is crossed by a number of stone bridges in the vicinity of the city of Anuradhapura with three to the east of the Citadel and a further three to its north (Hocart 1924). Two of the latter, close to Kiribat *Vihara*, appear to have served the same route way (Coningham 1999, p. 26) (Fig. 14). Constructed of tenoned pillars supporting cross-beams on which the roadway slabs rest, Seneviranta suggests that they are late monuments dating to the late Anuradhapura period (Seneviratne 1994, p. 183). Our survey along the banks of the river to the north of the Citadel of Anuradhapura identified a complex of ashlar masonry at B062, close to the branching of the Malwattu Oya. Partially encased within a modern concrete wall, it probably represents an annicut, or water diverting device, and bridge complex. In addition, it should be noted that the rectangular arrangement of conical holes at C053 on the rocky bed of the western side of the Malwatu Oya may have also represented a bridge, but one built of timber elements rather than stone.

Modern sites

Whilst on survey, the team also recorded the presence of specific resource utilisation in order to develop a better understanding of the resources in the hinterland and to consider the archaeological visibility of these products within the sequences of the Citadel of Anuradhapura. These included the recording of five modern potters' villages, the presence of 27 tanks on the transects and 11 stone quarrying sites. In addition, the survey teams recorded examples of other hinterland activities such as hunting, brick-making, logging, fishing and the recovery of honey in order to better understand the possible economic contribution of the hinterland to the urban complex at its heart.

Geoarchaeological investigations

Desk-based assessments and field-work focussed on the identification of soil and sedimentary stratigraphies within the defined study area, from which interpretations of early land use and site formation can be made. Existing mapped evidence of soils, current land use and early irrigation-tank systems has been collected and is being integrated with the ongoing archaeological survey work of the project using Arc-View GIS. The emerging integration of these spatial data has so far established a complex, finely patterned, cultural landscape with three basic land units identified. One of these land units is characterised by low humic gley soils associated with paddy and tanks systems, some of which are abandoned, and with post-harvest grazing by domestic livestock. The second land unit is characterised by red earth soils associated with *chena* - a system of slash and burn agriculture - with associated grazing and forest production activity; archaeological survey work so far suggests that early settlement sites are more likely to be found in this land unit. The third land unit within the study area is the granitic outcrops - inselbergs - with shallow soils and upon which much of the early and current religious activity of the region is focussed.

Geoarchaeological field work was carried out to determine the occurrence of soil and sediment stratigraphies that could be used to develop models of early land use and management. Within the low humic gley land units, a transect was taken through an abandoned tank-bund (earthen dam) - paddy field system with three sections and a deep auger core (C009). The section taken through the bund revealed a pre-bund landscape which may indicate catchment sedimentary processes prior bund formation and which included (undiagnostic) pottery scatters, evidence of bund construction, including repairs and surface erosion of the bund indicating the relative stability of the bund. Within the abandoned tank area there was again evidence of pre-tank sedimentary sequences, micro-stratigraphic sequences which may reflect the wider catchment landscape during the life of the tank and evidence of post-abandonment soil formation processes. Soils within the associated paddy field indicate substantial mixing processes, but evidence of long-term additions to the soil. Within the red earth landscape unit, one profile was exposed adjacent to one of the major potter scatters identified during archaeological survey (B009). This revealed that the concentration of archaeological activity was at the surface of the soil, with the soil profile formed through a combination of long-term slope wash activity and granite weathering. To obtain more detailed evidence of early land management activity, soil and sediment samples have been taken from the profiles, and will be subject to a range of analyses, including thin

section micromorphology, particle size distribution and total phosphorus.

The preliminary field investigations have demonstrated that there are soil and sediment stratigraphies within the study area that are likely to assist in discussion of early land management associated with the emergence and development of Anuradhapura. These investigations have also revealed a number of issues to take forward into the next phase of geoarchaeological investigation. Given the large number of tank-bund systems and the considerable number of sites being identified by the archaeological survey, appropriate sampling is crucial. This issue will be addressed through stratified random sampling based on the land units discussed above, and mediated though discussion with team members to optimise integration of the project elements. Dating and chronology is also emerging as a key issue, and as carbon-based material suitable for radiocarbon dating is limited, an emphasis is likely to be placed on optically stimulated luminescence (OSL); we are revising field-work procedures in light of this. Establishing a pre-settlement base-line against which cultural activity in soils and sediments can be assessed is a third emerging issue; discussion are underway to re-open Trench Anuradhapura Salgaha Watta 2 to allow sampling from below the cultural horizons. In doing so, sampling for geoarchaeological investigation of the cultural sediments will also be undertaken and related to the findings of earlier excavation.

Conclusion

On the basis of this first season of survey, we can make a number of preliminary conclusions as to the nature of non-urban settlement within the hinterland of the city of Anuradhapura. Firstly, the most numerous category of site (91 examples) is that of ceramic scatters and we assume that they represent small rural communities, presumably undertaking farming or livestock activities as there is no evidence for metal or stone-working although this assumption will be tested by geophysical survey and excavation during our second season. As the sites are small and fairly transitory in nature, it is assumed also that they were only occupied for a short period of time, but again this will be tested by ceramic typologies and radiocarbon dates obtained from excavation. The second most numerous category of site (22 examples) is monastic, and sites range in size from individual rock shelters with Early Brahmi inscriptions on their drip ledges to later monumental formal constructions, such as the *Pabbata Vihara* at Parthigala. Metal-working sites are also numerous (11 examples) as are concentrations of stone pillars (6 examples), although as the latter are usually associated with roof tiles, they are also probably monastic in nature. Although these three main categories of sites correspond with those recorded in the vicinity of urban form of Sigiriya to the south (Manatunga 1990), our findings are in contrast with those of Erdosy (1987) who identified the presence of a five-tier settlement hierarchy between c. 400 and 100 BC in the hinterland of the Early Historic *Mahajanapada* of Vatsa in northern India.

Indeed, Erdosy's five tiers included the political capital (Kausambi)(>50 hectares), secondary centre or towns with administrative and processing functions (10 - 49.99 hectares), minor manufacturing centres (6 - 9.99 hectares), primary administrative settlements (3 - 5.99 hectares) and villages (0 - 5.99 hectares) (Erdosy 1995, pp. 107-108). Moreover, Erdosy suggested that these categories of settlement are to be found within a number of the other *Mahajanapada* of north India and that they represent "integrated networks of settlements graded by size and the range of their functions" (ibid., p.109). This strict hierarchy is also supported by Kautiliya's *Arthashastra*, which indicates that the fortified capital should ideally be supported by two divisional headquarters, four sub-divisional headquarters, 80 local centres and 800 villages (Allchin 1995, p.196).

One would expect such centralisation within the Anuradhapura kingdom as rock-cut Early Brahmi inscriptions and the Mahavamsa chronicles make reference to a clear hierarchy of officials and post holders from the royal overlord and down through the ranks of the army commander, ministers, chiefs, village headmen, householders and merchants (Paranavitana 1970, Coningham 1995, Dias 2001), but such a physical division within the settlement categories of Anuradhapura's hinterland is unclear. Now noted, this initial contrast will be further examined in our subsequent seasons, which will also utilise excavation and geophysical survey, but it does appear that categories of towns and lower order administrative and manufacturing centres are missing from our survey universe. We will also continue to conduct our survey along the banks of the Malwatu Oya as well, as it may be that towns, if they existed within the plain, were located along this major arterial route way from the coast and the great port of Mantai (Carswell & Prickett 1984), through the monastic complex of Tantrimale to the political and religious centre of the state - Anuradhapura. We shall also investigate the possibility that the plain's numerous Buddhist monasteries performed the administrative, economic and political functions usually associated with towns, presenting a very different geo-political landscape from that to the north of the Subcontinent.

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