DE GRUYTER

Derek Kennet, J.Varaprasada Rao, M. Kasturi Bai

EXCAVATIONS AT PAITHAN, MAHARASHTRA

TRANSFORMATIONS IN EARLY HISTORIC AND EARLY MEDIEVAL INDIA

BEYOND BOUNDARIES: RELIGION, REGION, LANGUAGE AND THE STATE

DE G

Derek Kennet, J. Varaprasada Rao, and M. Kasturi Bai
Excavations at Paithan, Maharashtra

Beyond Boundaries

Religion, Region, Language and the State

Edited by
Michael Willis, Sam van Schaik
and Lewis Doney

Volume 5

Derek Kennet, J. Varaprasada Rao and M. Kasturi Bai

Excavations at Paithan, Maharashtra

Transformations in Early Historic and Early Medieval India

With contributions by
Shailendra Bhandare, Dorian Fuller, Jason Hawkes,
Peter Rowley-Conwy, P. K. Thomas and Michael Willis

DE GRUYTER

Published with support of the European Research Council
Beyond Boundaries: Religion, Region, Language and the State
(Project No. 609823)

ISBN 978-3-11-065353-3
e-ISBN (PDF) 978-3-11-065354-0
ISSN 2510-4446

Library of Congress Control Number: 2019952751

Bibliographic information published by the Deutsche Nationalbibliothek
The Deutsche Nationalbibliothek lists this publication in the Deutsche Nationalbibliografie; detailed bibliographic data are available in the Internet at http://dnb.dnb.de.

Cover: "Lintel," circa 475 CE, in Sārnāth, Uttar Pradesh, India. Photograph by Michael Willis
Typesetting: Michael Peschke, Berlin
Printing and binding: CPI books GmbH, Leck

www.degruyter.com

This volume is dedicated to the fond memory of Shri Ajai Shankar (1943–2000), Director General of the Archaeological Survey of India from September 1996, who encouraged and supported this project. His dear friendship, open mind, and deep love of Indian culture are remembered and missed by those who knew him.

Preface

This volume reports on the excavations carried out at the Early Historic and Medieval site of Paithan in Maharashtra between 1996 and 1999 as part of a collaborative project between the Archaeological Survey of India (ASI) and the Society for South Asian Studies (SSAS) of the British Academy (now the British Association for South Asian Studies or BASAS).

The town of Paithan is known to have been an important Satavahana centre and must also have had something of an international reputation in the Early Historic period as it is one of the few inland sites in India mentioned in the mid 1st-century AD Periplus of the Erythraean Sea. It is also known to have been an important centre in the Medieval period. This is reflected in the fact that it remains a centre of religious pilgrimage to the present day, attracting pilgrims from across Maharashtra and beyond to its annual festival.

Some limited archaeological excavation had been conducted at the site in 1937 and later in 1965, resulting in three very brief published reports, but there has been no further work published and no systematic attempts have been made at investigating the site's archaeology. The importance of the site and the opportunity it provides to investigate a number of key questions relating to the archaeology of the Early Historic and Early Medieval periods in India led, in 1996, to the conception of a joint Indian-British excavation project. At the broadest level, the project was aimed at providing more information on the nature, chronology and development of an Early Historic and Early Medieval town in central India, an issue that is key to our understanding of these periods but about which, up to now, there is a real paucity of concrete archaeological evidence.

The project for the excavation of Paithan was therefore initiated by a formal agreement between the Archaeological Survey of India and the Society for South Asian Studies of the British Academy, which was implemented on 15 February 1996. The project is one of a series of collaborations between these two organizations, others include the excavations of the Buddhist stupa at Sannathi in Gulbarga District, Karnataka, from 1986 to 1989 (Howell 1995) and the excavations at Sopara in Thane District, Maharashtra, carried out in 1992. The Paithan agreement outlined a five-year excavation project, to be carried out under the co-directorship of the Superintending Archaeologist of the Aurangabad Circle, the Archaeological Survey of India, and the Research Fellow of the Society for South Asian Studies. In the event, four seasons of yearly excavation took place from 1996 until 1999.

Related Publications

In the course of the Paithan project, two lengthy unpublished interim reports were produced and circulated to relevant parties (Rao *et al*. 1998; Rao and Kennet 1999). These incorporate the field reports written by the trench supervisors at the end of each field season. Copies of these reports are lodged with the ASI in Delhi and also at the Goa Circle of the ASI, and are also lodged in Durham University library in the UK. They provide the basis of much of Part I of the present monograph which describes the site and the excavations. After the end of the project a short paper was published by Kennet and Rao (2003) in *South Asian Studies* summarizing the development of the two Early Hindu brick temples at the site. In addition, a number of spin-off publications has been produced related to the problems of investigating the nature of Medieval urbanism in India, for example Kennet 2004b and Kennet 2013.

Report Structure and Format

This volume is made up of fifteen chapters divided into five parts. Part I includes an introduction to the project's research aims and their background along with a description of the site's geographical location and context (Chapter 1). This is followed by a discussion of some key historical texts related to Paithan (Chapter 2) and a summary of previous archaeological work at the site (Chapter 3). Part II covers the 1996–1998 excavations, beginning with Trench A, the largest and most significant trench (Chapter 4), followed by the smaller trenches that were excavated at various locations across the site (Chapter 5). Finally, Chapter 6 summarizes the site's phasing and chronology. Part III covers the finds from the excavations, including pottery (Chapter 7), small finds and glass (Chapter 8), coins (Chapter 9) and a summary of the key finds from the first two seasons of excavations (Chapter 10). In addition Chapter 11 describes significant finds from the Balasaheb Patil Government Museum at Paithan, many of which come from the site and the immediately surrounding region. Part IV presents the environmental evidence, including a report on the large

https://doi.org/10.1515/9783110653540-201

archaeobotanical assemblage (Chapter 12), and a report on the faunal remains (Chapter 13). Part V contains the conclusions which bring together and contextualise the key themes and results of the project. A single appendix lists the excavated contexts described by the project. Further stratigraphical detail whose incorporation into a printed volume such as this would be impractical, for example data tables and Harris matrices, are deposited with the Archaeological Data Service and are available online (http://dx.doi.org/10.5284/1017460).

Authorship

A number of specialists and collaborators has been involved in the present project in various ways. Authorship is indicated on each of the chapters throughout the volume. The role of J. Varaprasda Rao in the project and its final publication needs to be explained. He was the joint director of the project, along with D. Kennet, during the 1998 and 1999 seasons and took an equal part in key decisions about strategy, priorities, and research questions related to the excavations. He also played a major role in the study season of February 2000 and traveled to Durham University, together with M. Kasturi Bai, for three weeks during September 2002 in order to advance work on the final publication. It was during this time that the final format of the publication and many of the key themes were agreed. He was also closely involved in the study of the small finds, coins, and the Balasaheb Patil Collection. Due to his tragic death in a car accident on 12 June 2006 the final writing up of the project – much of which took place in Dharwad, Karnataka, between October and December 2006 – very sadly took place without his wisdom, knowledge, and huge experience. It is for this reason that none of the final chapters are credited to his authorship, although he made a major intellectual and practical contribution to every one of them as well as to the fieldwork and research that underlies them. His contribution to the final production of this volume was much missed.

Parts of Chapters 4 and 5 of this report have been compiled from edited versions of original field reports written by the excavators: E. Eastaugh, G. Halder, M. Kasturi Bai, D. Kennet, L. Lloyd-Smith, J. Martin, J. Varaprasada Rao, M. Saxena and N. Wells.

Conventions

Transliteration: aside from Chapter 2, diacritical marks have not been used in the transliteration of words from Sanskrit or other languages. This includes architectural terms as well as other terms and the names of people, places, dynasties, and texts. Although some readers may find this unscholarly, it was decided that the inclusion of diacriticals, whilst presenting certain technical difficulties, would have added nothing to the clarity or content of the text and that their absence did not risk creating any confusion or obfuscation of meaning at any point.

Terminology: for the purposes of the present volume, the terms 'Early Historic' and 'Early Medieval' will be used to refer to the following periods:

- Early Historic: 5th century BC to 5th century AD,
- Early Medieval: 6th century AD to 9th century AD.

These dates are not precise, however, and acknowledge a degree of overlap between the two periods. The authors see no value in entering into a detailed discussion of the definition of these historical periods at this point. On the use and meaning of these terms in Indian history, see Chattopadhyaya 1994.

Acknowledgements

The authors would like to express their thanks to all of the Directors General of the ASI that have held post since the project was begun in 1996. Most important amongst these is Shri Ajai Shankar, who was Director General during the key 1998 and 1999 seasons and who provided enthusiastic support and assistance. It is to his memory that the authors have dedicated this volume.

The following senior officers of the ASI were of particular help to the project: Smt Achala Moulik, Dr R. S. Bisht, Dr Amarendra Nath, Dr S. V. Venkateshaiah and Mr P. N. Kamble. Thanks should also be expressed to Mr Colin Perchard, former Minister (Cultural Affairs) of the British Council, Delhi, and Mrs. Sushma Bahl and Mrs. Chandrika Grover both of the British Council, Delhi, for constant help and advice during the time of the project.

In the UK the Society for South Asian Studies, now the British Association for South Asian Studies, provided generous funding, without which the project would not have gone ahead. The following officers of the then SSAS were particularly involved with the work: Dr G. Tillotson, Sir Oliver Forster, and Dr D. MacDowall. We would also like to thank Mr James Howell for his support and advice

and Mr R. Knox, former Keeper of the Dept. of Oriental Antiquities of the British Museum.

Throughout the project Dr Michael Willis was a guiding light in all aspects of work from the organizational and administrative to the academic. A great debt of gratitude is owed him.

We are grateful to all the members of the excavation teams, especially Mr Manoj Saxena, Mr Goutam Haldar, Shri M. Mahadeviah (Dy. S. A.), Shri M. R. Dhekane and Dr D. N. Sinha (assistant archaeologists), Shri D. T. Asar and Shri S. B. Rindhe (surveyors), Shri D. L. Sirdeshpande and Shri R. D. Ingle (draughtsmen), Shri G. L. Gaikwad and Shri V. R. Satbhai (photographers), Shri R. L. Shaik (L.D.C.), Mr Nazimuddin and Mr Samad, Shri B. S. Tadvi and Shri S. L. Magre (attendants) and Shri Sheik Chand (monument attendant) from Archaeological Survey of India, and to Nicholas Perchard, Lindsay Lloyd-Smith, Ed Eastaugh, John Martin and Nick Wells from the Society for South Asian Studies. All team members worked with dedication, commitment and high levels of professional skill.

During the October to December 2006 writing up season Basavaraj Badiger, Basavaraj R. Mayachari, Anita S. Hegde and Prashant L. Gadre made an important contribution to the work; the kind assistance of Dr S. V. Venkateshaiah was once again very much appreciated.

We would also like to thank Professor Hans Bakker for his advice on certain aspects of Medieval texts, Dr Paul Dundas for his advice on Jain texts and Ran Zhang for his comments on the Chinese pottery from the site. Thanks are due to Dr Michael Willis, Prof. Chris Gerrard and Prof. Graham Philip for reading and commenting on drafts of some or all of the chapters.

Many local people in Paithan and Aurangabad helped us with this work and we would like to thank all of them for their friendly welcome and kind assistance. We hope that they will feel that this study does justice to the history of their town.

Derek Kennet
Durham University

Table of Contents

List of Tables

https://doi.org/10.1515/9783110653540-203

List of Figures

https://doi.org/10.1515/9783110653540-204

Part I

Background to the project

Derek Kennet

Chapter 1
The Scope of the Project and Its Background

The study of Early Historic and Early Medieval India

The Early Historic to Early Medieval transition is a key formative period in India's history. This is particularly true in terms of the emerging economic and political role of temples, the nature of urbanism, the role of Brahmins and the emergence of Hindu kingship, but also in relation to broader debates about transformations in economy and society. In recent years, the study of this transitional period has itself undergone significant transformation amongst historians (e.g. Chattopadhyaya 1994; Kulke 1995b; Bakker 1997; Willis 2009; Bronkhorst 2011). At the same time it has been notable that – aside from the debate about late Early Historic urban decline (Sharma 1987) – the archaeological contribution to our understanding of the transition has been relatively thin. It was a keen awareness of this point, as well as a clear vision of the potential that archaeological evidence has to address many of the key issues that surround the transition, that drove the two directors of the present project (J. V. P. Rao and D. Kennet) to steer the Paithan excavation project in this direction when they jointly took it over in 1998. However, before going into the research aims and objectives that formed the underlying rationale of the present excavations, it may be useful to provide a short background to the study of the Early Historic/Early Medieval transition in order to set out the research context.

The traditional scholarly view of Indian history that had emerged by the early 20th century divided India's past into 'ancient', 'medieval' and 'modern' periods, effectively replicating the older scheme of 'Hindu', 'Islamic' and 'British' that had been developed by 19th century Orientalists. Within this 'ancient-medieval-modern' conceptualisation of history, the transition from ancient to Medieval was seen as marking the end of a glorious age of ancient empires and the beginning of a degenerative Medieval period during which the great Mauryan and Gupta empires fragmented into numerous regional kingdoms. These epochal changes were generally perceived as being accompanied by the decline of philosophical traditions and the degeneration of classical, naturalistic art styles into more stylised, ornamental forms alongside the emergence of more populist forms of religious worship.

After independence and into the 1960s, a more analytical and critical approach to Indian history emerged, with a closer focus on economic and social issues, particularly amongst Marxist historians. This approach was based on the view that the ancient empires were highly centralized, that they incorporated numerous, large urban centres and were based around a highly monetized economy in which manufacture and trade were very significant. It was argued that these structures came to an end during or after the Gupta period, at which time manufacturing and the minting and circulation of coins dwindled whilst urban centres declined in size and wealth. These changes were accompanied by a proliferation of copper-plate inscriptions recording royal grants of land to temples and Brahmins, reflecting – it is argued –the decreasing significance of coinage. A number of scholars argued for the development of feudal economic and political structures in India at this time, partly on the basis that land grants were indicative of the decline of centralized political power that was also reflected in the emergence of smaller, localised Medieval kingdoms.

There is no doubt that the emphasis on the study of economic and social history was one of the most important innovations of this phase in Indian historiography. At the same time, the notion of a period of feudalism in Indian history continued to be widely debated through the 1960s and 1970s. By the 1980s, however, much of the evidence on which this argument was based had been challenged by scholars such as D. C. Sircar (1974), B. D. Chattopadhyaya (1986) and J. S. Deyell (1990), and it is fair to say that the idea has now largely lost currency amongst scholars, at least as a formal concept. At the same time, other scholars began to question the level of centralization and cohesion of the Early Historic states such as the Mauryan empire, bringing into doubt the very starting point from which Early Medieval formations are supposed to have developed.

https://doi.org/10.1515/9783110653540-001

Emerging from this debate, the work of B. D. Chattopadhyaya was key to the formulation of a new way of seeing Early Medieval Indian society in the 1980s, challenging many of the views held by earlier scholars. Using epigraphic evidence, he drew attention to the development of new Medieval urban centres and to the level of social complexity in and around them (Chattopadhyaya 1986). Nonetheless, the Early Medieval towns he identified are seen as having been fundamentally different to their Early Historic predecessors. As Daud Ali has put it, 'whereas the great cities of ancient India were linked "horizontally" in a "thin", but geographically dispersed network of regular exchange, urban centres of post-Gupta India seem to have been more rooted in regional context and local exchange networks' (Ali 2012, 9).

By the late 1980s, a new model of Early Medieval state formation, known as the 'processural' model, had become the dominant approach. It developed partly from the work of Chattopadhyaya and partly from multi-disciplinary research of historians and anthropologists such as A. Eschmann, H. Kulke and others (Eschmann *et al*. 1978; Kulke 1995b). This model, which focuses particularly on the spread of Medieval kingdoms into south and east India, poses a three-stage development of Early Medieval states, from isolated nuclear areas to the emergence of imperial kingdoms through a constant process of agrarian expansion and integration. It involves the deliberate horizontal spread of agrarian settlements into peripheral, forested areas incorporating hunter-gatherer groups and their cults into pan-Indian structures involving the settlement of Brahmins and the foundation of temples. Because this model does not assume the existence of highly centralized Early Historic imperial structures, Early Medieval society can be seen not as a fragmentation of earlier structures but rather the continued development of the same processes which had given rise to Early Historic states. That is to say that agrarian expansion, urban change, localisation and regional state formation can be seen as productive rather than regressive or fragmenting developments (Ali 2012: 10).

However, whilst Chattopadhyaya and Kulke's processural model works well to explain the integration of newly cleared forested regions into Early Medieval states, it works much less well when we turn to regions which had been cultivated and urbanized since Early Historic times – the core agrarian areas – where the urbanized and sedentary economic and social structures were deeply embedded in traditions going back 800 years or more.

According to the processural model, it was core agrarian areas that formed the nuclear areas of future Medieval kingdoms. In such areas, the upper Godavari basin around Paithan being a good example, it is acknowledged that processes are likely to have been quite different to marginal, forested areas, but little is known of actual developments and practically no systematic investigation has been undertaken (Bakker 1992: 88–90; Kulke 1995b: 235). It is generally assumed, on the basis of general trends, that towns in these areas experienced something of a contraction in the Early Medieval period. But apart from occasional epigraphic evidence of land grants consisting of a field, a well or a disused orchard, there is almost no evidence available with which to assess the nature or depth of the transformations that took place at this time. This is clearly problematic. The danger is that the research agenda is driven almost entirely by the peripheral zones and attention is drawn away from what Bakker calls the 'political, religious and economic fundament', where many of the key social and political structures were being negotiated (Bakker 1992: 88–90).

From an archaeological perspective, there are numerous ways in which it might be possible to use excavation or survey evidence to redress this imbalance and investigate some of the developments that took place in the core agrarian areas. For example, the quantified results of systematic field surveys in the territories around Early Historic cities might be expected to record changes in the organization and intensity of rural settlement that reflect population levels and the scale of the agricultural economy. Alternatively, it might be possible to look at the plans of excavated Early Historic and Early Medieval towns to consider how their layouts reflect changing standards of municipal authority or levels of urban population and wealth. Published archaeobotanical or palaeofaunal sequences from excavated Early Historic/Early Medieval sites might be examined for quantitative changes that reflect changing agricultural strategies. In addition, studies of pottery sequences might be interrogated for quantified information on the changing nature of production and distribution systems. Unfortunately, at present, there is very little evidence of this nature available from EarlyHistoric/Early Medieval sites in India, despite the large number of excavations that have taken place. There are a number of reasons for this.

Firstly, whilst the archaeological excavation of Early Historic sites in India has been going on for over 100 years and has provided information on hundreds

of such sites, the archaeological investigation of Medieval sites is still very much in its infancy. Secondly, much of the considerable energy that has been devoted to excavating Early Historic sites has been concentrated on deep soundings of limited extent that are designed to elucidate the stratigraphic sequence of a small part of the site rather than investigating its spatial layout and development, and the sequences thus retrieved tend to have been pushed 'cookie-cutter' style into established chronological and typological frameworks (Chakrabarti 1997: 267–270; Neuss 2012). Thirdly, systematic field survey designed to elucidate rural settlement patterns is not widely enough practiced in India. Fourthly, quantified studies of archaeobotanical, palaeofaunal or ceramic sequences related to the Early Historic and Early Medieval periods are almost non-existent. Add to this the enduring problems of the archaeological chronology of the Early Historic and Early Medieval periods, and it starts to become clear why archaeology has had so little to contribute to the issues surrounding the Early Historic/Early Medieval transition. Until these problems are resolved there are many questions in relation to the transition that will remain obscure. As B. D. Chattopadhyaya himself has acknowledged, however, archaeology is the only discipline that can unravel the real story of developments during this time (Chattopadhyaya 1986: 22). Without it, the evidence for Early Medieval towns and their economy is overwhelmingly based on epigraphic evidence.

When the two directors of the present project took over the Paithan excavations in 1998, they were presented with two remarkably well-preserved Early Hindu brick temples (partially excavated in 1937) which were located in the midst of an extensive Early Historic and Early Medieval town of regional significance that was located in the middle of the Godavari valley – without doubt a core agrarian heartland. Early Hindu temples being, as has been mentioned above, a key component of the formation of Early Medieval kingdoms according to the processural model, it was immediately clear that this was a unique and important opportunity to apply a wide range of archaeological techniques to elucidating the changing nature of Early Historic and Early Medieval occupation at Paithan in relation to the construction and use of the temples.

On this basis, the following research questions were defined:[1]

- When were the temples built and how did they develop architecturally?
- Does a quantified analysis of the archaeological sequence associated with the temples reveal information about the nature of the economy through the Early Historic and Early Medieval periods in the period before the temples' foundation, during their use and after their abandonment?
- What was the nature of the agricultural economy? Can the archaeological record tell us anything about crop cultivation and the nature of landholding? Can it tell us anything about the relationship of the town to the surrounding agrarian hinterland and about how this relationship may have changed over time?
- Is it possible to gain any insights into the possible link between the temples and changes that occurred at the site at the time they were constructed and used?
- Is it possible to say anything about the nature and extent of occupation at the site during the Early Historic and Early Medieval periods?

At a more specific level, these questions led the project towards a detailed re-excavation and re-examination of the two temples, including their structure and what remained of the surrounding archaeological deposits. They also led to the establishment of a systematic programme of environmental sampling and a large-scale programme of flotation of archaeobotanical samples that was carried out alongside the excavation of stratigraphic soundings around the temples from which the sequence of samples was obtained. Given the relatively small scale of the project, the general strategy was to make full use of small quantities of good-quality information. Careful attention was therefore paid to systematic sampling strategies and quantified analysis of all aspects of the post-excavation study of pottery, finds and environmental evidence. In many of these methodologies, the project cuts new ground in Indian archaeology using procedures and techniques that have never or only rarely been applied to the archaeology of Early Historic and Early Medieval sites in the region.

The research questions set out above were broken down into the following three objectives:

- The excavation, recording and analysis of two early Hindu brick temples including a detailed

1 Many of the ideas in this section derive from discussions and circulation of draft papers (particularly Ali 2002) in 2002 amongst the Vidisha Research Group organized by Michael Willis and consisting, in addition, of Daud Ali, Hans Bakker, Dorian Fuller, Isabelle Onians, Julia Shaw and the present author.

analysis of the construction, phasing and layout of the temples through their period of use. Very few temples of this key formative period of Indian temple architecture have ever been excavated, recorded and analysed to the level of detail that was achieved at Paithan and it was therefore expected that an investigation of these structures was likely to provide important insights into the early development of temple architecture, our understanding of which has, to date, been based almost entirely on the evidence from standing monuments.

– The excavation and analysis of a deep, stratified sequence close to the Hindu temples that would allow the retrieval of a complete and systematic environmental and artefact sequence through the Early Historic and Early Medieval periods which could be linked to the early development of the site and the later construction and use of the temples.
– The excavation of a number of smaller trenches at different locations across the site with the intention of clarifying the nature and extent of occupation.

Background of the project

The first stage of the present project ran for two seasons (1996 and 1997) as a small-scale excavation and survey directed by P. N. Kamble, then Superintending Archaeologist of Aurangabad Circle of the Archaeological Survey of India (ASI), and J. Howell, then Research Fellow of the Society for South Asian Studies. In 1998 the project was reconfigured and the directorship passed to J. V. P. Rao and D. Kennet. A further two seasons of excavation took place in 1998 and 1999 under their direction. These were funded by a major research grant from the British Association for South Asian Studies (then the Society for South Asian Studies) and an excavation budget from the Archaeological Survey of India.

The aims of the first-stage project (1996–97) were a preliminary investigation of the site and the excavation of a stratigraphic sequence intended to clarify the chronology of the Early Historic to Early Medieval period. By the end of the 1997 season, the initial aims of the first stage had been achieved. In 1998 a second-stage research programme was developed and implemented on the basis that has been set out above.

Paithan's location, geography, climate and form

The town of Paithan is known from historical sources to have an ancient heritage dating back possibly as early as the Mauryan period and is believed to have been a locality of some importance from at least the Satavahana period. The town has been associated with several well-known religious personalities in its long past, and the Ek Nath *mandir* in the town is still today a regional pilgrimage destination of some significance.

The town lies on the left bank of the River Godavari about 50 km south of Aurangabad (19°27'45"N 75°22'55"E) (Figs 1.1 and 1.2). It is a *taluka* headquarters in the Aurangabad District of Maharashtra and is a bustling modern town. It is situated at a crossing of the river in the upper Godavari basin, in one of a number of eastward-running valleys that cut the great lava plateaus of the western Deccan into sections. These leave only the dramatic, flat-topped tablelands of lava that mark the watersheds between valleys as the highest points in an otherwise homogeneous, wide and open landscape.

At this point, the flat central part of the Godavari basin is almost 20 km wide. In the valley basin around Paithan the soils are deep, mature black cotton soils or regurs, which traditionally supported large areas of stable cultivation although they are difficult to irrigate as they become very heavy and sticky when wet.

The area has unreliable rainfall of around 600 mm annually. It lies in the rain shadow of the western Ghats outside the eastern limit of the zone where some rainfall regularly spills over from the Arabian Sea, but still some distance west of the Nagpur area where rainfall from the Bay of Bengal monsoons is still a regular factor.

Traditionally the area cultivated jowar, wheat, cotton, linseed and pulses and there was relatively little double-cropping. Modern irrigation infrastructure was put in place in the 1960s at the time of the construction of the dam and the creation of the Nath Sagar power and irrigation scheme immediately above the modern town, and this has profoundly changed the nature of local agriculture (Spate and Learmonth 1967: 103–105, 690–700).

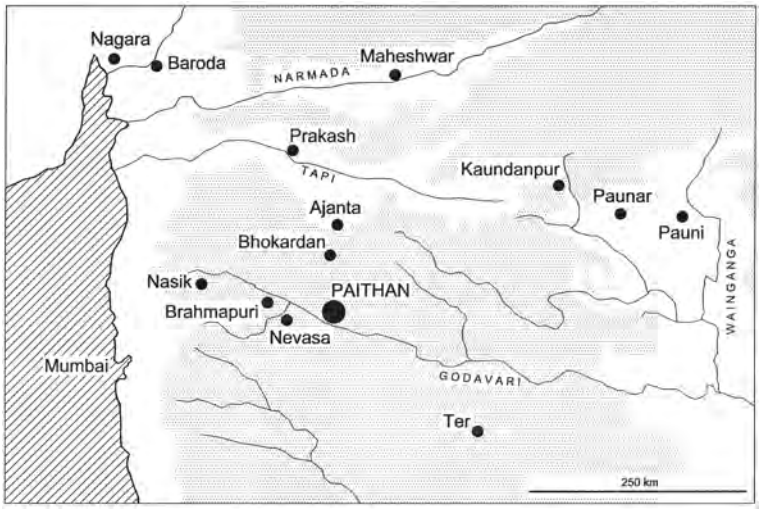


Fig. 1.1: Paithan and other Early Historic sites mentioned in the text.

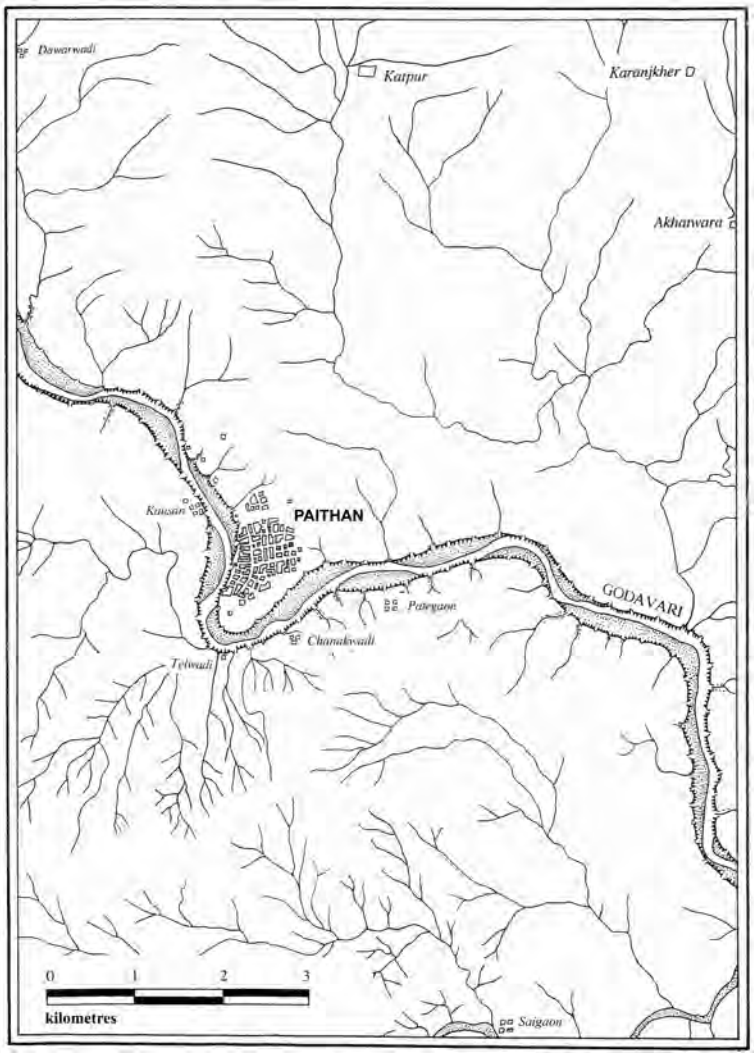


Fig. 1.2: Paithan and surrounding area.

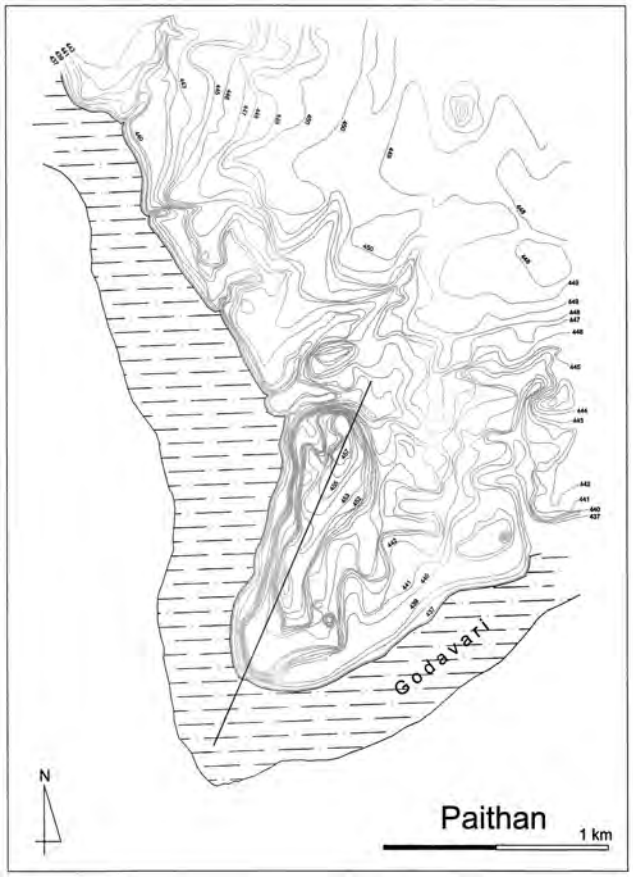


Fig. 1.3: Topographic map of Paithan with contours at 1-m intervals. The location of the section shown in Fig. 1.7 is also shown.

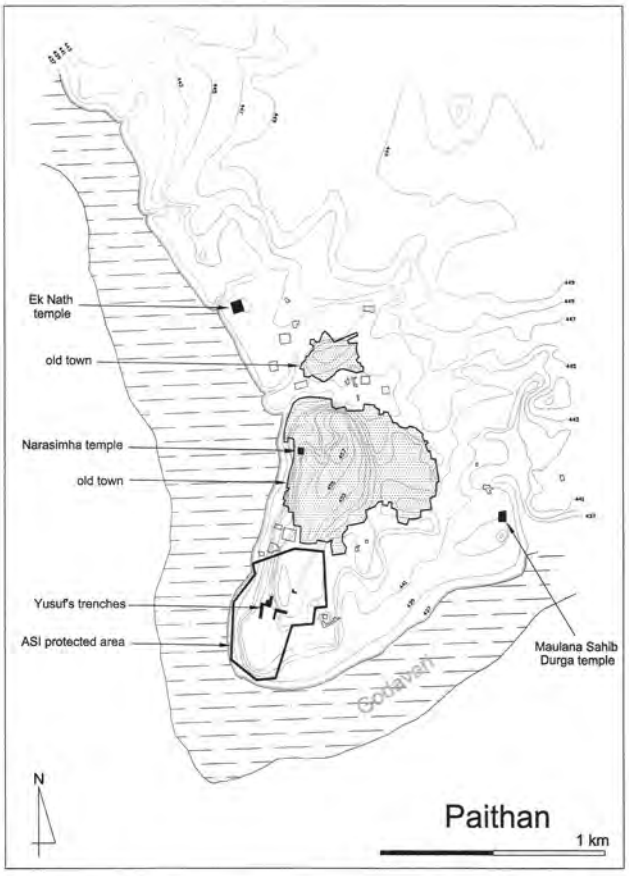


Fig. 1.4: Map of Paithan showing key landmarks, the ASI protected area and the location of the old town.

The core of the ancient site is a large mound lying immediately on the left bank of the Godavari. In this place the river makes a sharp turn towards the north-east after having run southwards for 2 km or so and the archaeological mound nestles tightly into the bend (Figs 1.2–1.6). The mound itself measures between 1.1 and 1.3 km from north to south and is about 390 m wide from east to west at its widest extent. At its highest point it stands about 15 m above the surrounding plain, although not all of this is formed of archaeological deposit (Fig. 1.7). On the west side, the river is eroding into the mound, leaving steep cliffs directly above the river banks. To the north, a very steep slope drops down from the top of the mound to a narrow 'V'-shaped gully between the main mound and a lower, smaller mounded area to the north. To the east the mound slopes steeply down to the level of the surrounding plain, whilst to the south, the mound gradually narrows and peters out about 250 m from the bend in the river, leaving a lower area of small mounds between itself and the river bank.

Most of the upper part of the mound is occupied by buildings – mostly housing – belonging to the older part of modern Paithan. The only exception is an archaeological reserve of about 9.3 hectares located at the extreme southern end of the mound which is supervised by the Archaeological Survey of India and which is where most of the present excavation trenches were located.

Technical matters

Excavation season dates

The first season of excavation at Paithan was inaugurated by Shri Balasahib Patil on 10 March 1996 and closed on 29 March 1996. The second season was carried out in February and March 1997. The third season began on 21 February 1998 and ended on 26 March 1998. The fourth season of excavations at Paithan took place between 15 January and 15 March 1999.

Fig. 1.5: Satellite image of Paithan (Google Earth).

Fig. 1.6: A view of the ASI protected area at Paithan, looking north from the south bank of the Godavari.

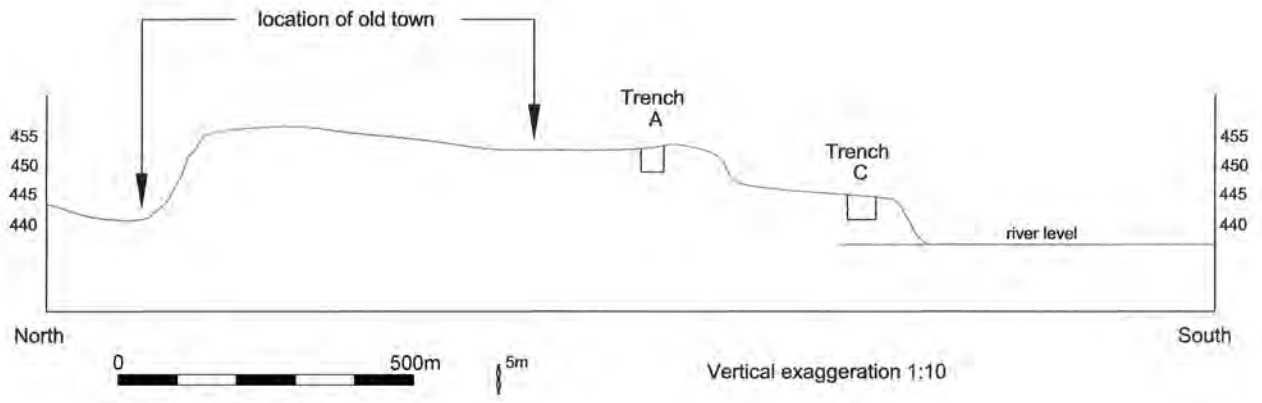


Fig. 1.7: Section through the ASI protected area and the main part of the old town.

Excavation strategy and recording system

Where appropriate, the excavation was conducted as an 'area-excavation' rather than as a grid of small square 'box' trenches separated by baulks. This was particularly useful in Trench A around the temples, where box-trenching would have obscured the architectural layout of the structures (see the discussion in Barker 1982: 44–52).

The excavations were recorded using single-context planning according to the method set out by the Museum of London Archaeology Service (1994). Such practice is now standard in most countries and provides the only acceptable record of an archaeological excavation. Each context was planned on a separate sheet of tracing paper, photographed, described, levelled and given an individual context number against which all finds and other evidence were recorded. Phasing of the contexts took place only at the post-excavation stage based on an evaluation of the stratigraphic and pottery evidence (Chapter 6).

During excavation, all earth was sieved through a 5-mm mesh for artefact and bone collection. A flotation sample was taken from all excavated layers in selected trenches in order to make certain that a complete stratified archaeobotanical sequence was retrieved.

A large palaeobotanical sampling programme was organized during the excavations, and a 'Siraf'-type flotation machine was run constantly through the 1999 season, producing what is now the largest palaeobotanical assemblage from any Early Historic site in India (Chapter 12). Together with the detailed faunal report (Chapter 13), this provides a unique insight into the development of the agricultural economy during the Early Historic and Early Medieval periods.

Site datum

An approximation of mean sea level (MSL) was taken from the one inch sheet 47 M/7 (first edition, reprinted 1948) published by the Surveyor General of India in 1917. From this, a local datum was established at the site. It was not possible to check the accuracy of the measurement in relation to MSL, but all site measurements were taken from the same datum and their relative accuracy is expected to be within 1 cm.

Finds storage, interim reports, data storage

The bulk of the finds from the excavations are stored with the Goa Mini Circle of the Archaeological Survey of India, although those from the 1996 and 1997 seasons are stored with the Aurangabad Circle. Two unpublished interim reports were produced (Rao *et al*. 1998; Rao and Kennet 1999). Copies of these were lodged with the Archaeological Survey of India, the Society for South Asian Studies and the University of Durham main library.

Some aspects of the archaeological documentation that are not possible to publish here, for example data tables, Harris matrices, interim reports and images, will be lodged with the Archaeology Data Service at the University of York with the following reference: http://dx.doi. org/10.5284/1017460 (Kennet 2012).

Shailendra Bhandare

Chapter 2
Historical Context

The name Paithan derives from the town's Sanskrit name 'Pratishṭhāna', literally translated as 'respectful abode'. The name also has Prakrit variants such as 'Patiṭhāna', 'Patiṭṭhāṇa', 'Paëṭhāṇa', etc. Immediately prior to Indian independence in 1947, Paithan was part of the state of the Nizam of Hyderabad. It became part of the Indian Union in 1948, when the Dominion of the Nizam was attached to the union following a police action.

The study of the history of Paithan can be approached mainly from literary and material sources such as inscriptions. These sources help trace it back to the Early Historic period (c. 350 BC).

Literary sources

Paithan finds extensive mentions in indigenous genre of ancient literature such as Buddhist, Jaina and Brahmanic texts. Amongst non-indigenous sources, its name also features in certain Western texts such as the *Periplus of the Erythraen Sea* and the *Geography* of Ptolemy. Myths and folklore have also grown up around the town, and some of these, that incorporate historical strands, are worth a mention.

Buddhist sources

It is generally believed that Buddhist texts like the *jatakas* make references to Paithan. Morwanchikar lists the *Chulla Kalinga*, *Baveru* and *Assaka Jatakas* as amongst those which contain such references (Morwanchikar 1985: 10). A reexamination of these sources indicates, however, that the *Chulla Kalinga* and *Assaka Jataka* do not mention Paithan. Instead, they mention the country (*janapada*) of Assaka and the King of Assaka. Morwanchikar has obviously inferred, albeit indirectly, this mention to stand for Paithan.

Assaka (Skt. *Aśmaka*) is one of the 16 *Mahājanapadas* mentioned in another Buddhist text, the *Anguttara Nikāya* (I: 213; IV: 252, 256, 261). It is described as being located along the banks of River Godavari and the only *janapada* to be situated to the south of the Vindhya Mountains. Its 'capital' was a city named Potali, Potana or Podana. The same is referred to as 'Paudanya' in the *Mahabharata* (1.122; 1.197). Some early scholars like Bhandarkar identified this name with Paithan (see below), and this seems to be the reason Paithan is often associated with the Assaka *janapada*. But judging by the fact that Paithan was known by its Prakrit name 'Patiṭṭhāṇa' and its variations, it is unlikely that Potali or Potana could have been its historical name.

As for the *Baveru Jataka* mentioned by Morwanchikar, it is evident that he has confounded this reference (Morwanchikar 1985: 10, note 24). It is not the *Baveru Jataka* but the story of Bāvari, the orthodox philosopher, featuring in the *Sutta Nipāta*, that mentions Paithan (*Sutta Nipāta* 5th chapter, *Pārāyaa Vagga*; Sircar 1960: 189). According to this story, Bāvari, having heard of the Buddha and his preaching of a new philosophical doctrine, sent 16 of his chosen disciples to debate it with the Buddha. Bāvari resided in the country ruled by the King of Assaka and his students travelled to the north, to the city of Sāvatthī, to meet the Buddha. The intellectual encounter of Bāvari's students with the Buddha ended in the latter's victory and he managed to convert the students to the very doctrine they had come to debate. The story outlines the route they took to travel northwards by mentioning towns that lay en route, and *Patiṭṭhāṇa* features as the first town in the list. If Bodhan is regarded as the capital city of Assaka, namely Podana or Potana, this description fits well as Bodhan lies southeast of Paithan and one would indeed travel north to travel from Bodhan to Paithan, thereby also adding further strength to the argument that these are different places.

Paithan is often associated with another *janapada* named 'Mūlaka' (Morwanchikar 1985: 8; Sircar 1960: 193, 273, note 1). The *janapada*-names 'Aśmaka' and 'Mūlaka' are often referred to conjointly (possibly due to their occurrence as such in a Satavahana inscription, of a date much later than the Buddha) and it is commonly understood that the mention of Mūlaka, like Aśmaka, is also of aBuddhist origin. It has to be empha-

https://doi.org/10.1515/9783110653540-002

sized that Mūlaka does not feature amongst the 16 *Mahājanapadas* listed in the *Anguttara Nikāya* (I: 213; IV: 252, 256, 261). Its mention as a *janapada* is definitively from Brahmanic sources, such as *Puranas*, which date considerably later than the Buddhist canon. Much like Aśmaka, the country of Mūlaka was also apparently located along the banks of the Godavari and there is nothing to suggest that Paithan was a part of the *janapada* apart from the fact that it, too, is situated on the Godavari. We find, however, that some mentions of Paithan are reported entirely out of an implied and indirect association with Mūlaka. Yazdani not only suggests that Paithan was located in Mūlaka but he also asserts that it was the 'capital' of this *janapada* (Yazdani 1960: 25). D. C. Sircar follows Yazdani in reiterating the same contention (Sircar 1960: 189).

It is thus evident that many instances where Paithan is reported as being mentioned in Buddhist literature are inferential and not substantive, the only exception being the story of Bāvari and his students from the *Sutta Nipāta*. Amongst later Buddhist texts, the *Mahāmayurī*, a lexicon of Yaksha cults and their locations, mentions Paithan as the abode of a Yaksha named Khandaka (Agrawal 1942: 24–25).

Jaina sources

The major source of information on Paithan from Jaina sources is J. C. Jain's *Life in Ancient India as Described in the Jain Canon and Commentaries* (Jain 1984: 400–401). The Jaina texts *Bṛhatkalpabhāṣya* (vv. 6244–6249) and *Vasudeva Hindi* (354, 8) describe Paithan as the chief city of Maharashtra. The *Kalpasūtra* mentions Paithan as a seat of learning (4, 90a) and the *GacchācārṾrtti* (208) states that great scholars like Bhadrabahu and Varahamihira were residents of Paithan. Many Jaina texts mention Paithan explicitly in connection with the Satavahanas. For example, according to the *Kālakāchārya Kathānaka*, a Satavahana king (Sālivāhana) was ruling at *Patiṭhāṇa* when the Jaina monk Kālakāchārya visited him (Morwanchikar 1985: 19). According to another story that features in a text named *Niśīthacūrṇi* (v. 3153), king Sālivāhana pleaded with Kālakāchārya to move the dates of *Pajjusaṇa*, a Jaina festival. A text named *Piṇḍadaniryukti* (v. 494, 498) states that a Jaina monk named Pādalitta Sūri cured the headache of a 'Murunda' king of Paithan (Bollée 1994: 29). The Murundas were an ancient tribe of North India, and their association with Paithan is otherwise unknown.

Jaina texts are replete with references to the Satavahana-Kshaharata conflict. According to the *Brhatkalpa-Bhāśsya Pīṭikā*, king Sālivāhana of Paithan lay siege to the Kshaharata capital Bharukachha (Skt *Bhṛgukachchha*, or modern Bharuch) every monsoon (Deo 1975: 3). A text named *Tiloya-Paṇṇati* states that a king named 'Naravahana' (Nahapana) ruled at Bharukachha and provides a chronology up to his rule, making a mention about his war with the 'Sālivāhana' of Paithan (Rajgor 1991: 34). In the Āvaśyakaniryukti (v. 1304), the Jaina scholar Bhadrabahu narrates an interesting story involving 'Nahavana', the king of Bharukachha, whose enemy was 'Satavahana', the king of Patiṭṭhāṇa. Satavahana besieged Bharuch for 2 years but could not take it, because Navahana could endure the siege owing to the riches he had accumulated through trade passing through the port of Bharuch. Satavahana then retreated and employed stealth tactics: he sent one of his ministers, named Kharaga, to Nahavana pretending he was defecting. Kharaga sought asylum at Bharuch and won over Nahavana's confidence. He influenced Nahavana's religious beliefs and encouraged him to give his wealth away in piety. Nahavana followed his advice and gave large donations to various sects. When he was thus impoverished, Satavahana attacked and defeated him.

There are a further two stories involving 'the Satavahana king' and Paithan. The first is about the king and his associate Śūdraka, while the second narrates origins of the cult of a local goddess named 'Pīṭhajādevī', practiced by married women (*Jinaprabhasūri* 61–64). Both stories mention many topographical features of the town and incorporate certain elements of the 'Satavahana myth' (see below).

Brahmanic sources

In the Early Medieval period, Paithan emerged as a pre-eminent centre of Brahmanic religion and thus finds a mention in several Brahmanic texts. These include the early *Purāṇas*, such as the *Matsya* and *BrahmaPurāṇa*, and later *Purāṇas*, such as the *Padma* and *LingaPurāṇa* (Morwanchikar 1985: 1, 11). The epic *Mahabharata* mentions a *Pratishṭhāna-pura* but it has been identified with Jhusi near Allahabad, known in Jaina sources as *Poyanapura* (Dey 1899: 71; Deo 1975: 1). In the *BrahmaPurāṇa*, the story is told of the son of king Surasena of Pratisthana, who is a Naga or snake (*BrahmaPurāṇa* 111). This son marries the daughter of king Vijaya, named Bhogavati, who finally discov-

ers the divine, snake nature of her husband. They both go to the Gautami River to bathe. Eventually, the Naga rules the country together with his wife Bhogavati. At the death of his father (Surasena), he and Bhogavati go back to Sivapura (heaven).

It is considered important to perform Brahmanic rites such as Śrāddha for the deceased at *Tīrthas* (literally 'fords' for the soul to cross over to *Moksha*, its escape from the cycle of rebirths) where such rites could be held under Brahmanic supervision. A number of these evolved along the riverfront at Paithan so that it became a centre of pilgrimage and a '*SthalaPurāṇa*' or religious site-guide named *Pratishṭhāna-Mahātmya* for Paithan is also known and is included within the *BrahmaPurāṇa* text (Morwanchikar 1985: 11, 58).

Secular Prakrit literature

Paithan is mentioned in the *Bṛhatkathā*, a prominent Prakrit literary work attributed to a poet named Gunāḍhya and dated to the early Satavahana period, c. 100 BC–AD 100. Guṇāḍhya was not only a resident of Paithan but also had a Naga-Brahmana ancestry, similar to what was mythically claimed for the Satavahanas. Indeed, the *Bṛhatkath*ā makes a mention of the Satavahana king, resident at Paithan, and contains a famous story about his ignorance of the Sanskrit language. It was also the first to incorporate a myth about the origins of the Satavahanas into a literary form. From Guṇāḍhya's *Bṛhatkathā*, the literary lore surrounding Paithan was transmitted to *Kathā-Saritsāgara* of Somadeva and *Bṛhatkathā-Manjirī* of Kshemendra, which are dated roughly to the mid-first millennium AD, and treat the *Bṛhatkathā* as their antecedent (Penzer 1968: 60ff).

The *Gāthā Saptaśati*, or *Sattasaë* as it is called in Prakrit, is a prominent Prakrit anthology said to have been patronized by the Satavahana ruler Hāla (around the early 1st century AD). It has references to the River Godavari and urban life that flourished on its banks (Ketkar 1963: 397, 422).

Western texts

There is a general belief that many classical scholars like Arrian, Strabo and Pliny mention Paithan in various capacities. A fresh look at these sources confirms, however, that no direct reference to Paithan features in them. Many of the so-called references are mere implications based on mentions of other facts that subsequently became associated with Paithan. Yusuf's statement that Pliny mentions Paithan as the 'glorious capital of the Andhras' may serve as a case to illustrate this (Yusuf 1939: 39). The fact remains that Pliny mentions only the 'Andarae' but not Paithan while describing the peoples of India, following Megasthenes' description of Indian tribes (Pliny VI, 22). The 'Andarae' are identified with the 'Andhras', which in turn is the term that sources like the *Purāṇas* employ to describe the Satavahanas. A general belief prevails that the Satavahana 'capital' was located at Paithan (discussed below). It is evident that Yusuf has conflated all these disparate aspects to attribute a mention of Paithan to Pliny.

Specific references to Paithan are found in two Greek texts: first the *Geographike Uphegesis* (or *General Geography*) of Ptolemy and, second, the *Periplus Maris Erythraei*, a seafaring manual attributed to an unnamed Hellenic Egyptian who seems to have regularly plied the maritime trade route between the Red Sea and the Indian coastline. Both sources are roughly contemporary: the *Periplus* is dated to around AD 60–70, while Ptolemy's geography was written only a few decades later, in the late 1st to early 2nd centuries AD (Schoff 1974: 7–15).

Chapter 51 of the Periplus describes Paithan as follows:

> *Of the trading centres in the region of Dachinabades, two are the most outstanding: Paithana, twenty days' travels to the south from Barygaza; and from Paithana, about ten days to the east, another very large city, Tagara. From these there is brought to Barygaza, by conveyance in wagons over very great road-less stretches, from Paithana large quantities of onyx, and from Tagara large quantities of cloth of ordinary quality, all kinds of cotton garments, garments of Molochinon and certain other merchandise from the coastal parts that finds a market locally there.*
>
> (Casson 1989: 82–83).

Here, 'Dachinabades' is evidently *Dakshinapatha*, the traditional Sanskrit term for the 'Southern Country'. 'Barygaza' is the Greek version of 'Bharukachha', the Prakrit name of modern Bharuch, and 'Tagara' is identified with Ter, an important emporium located in the Deccan hinterland.

Ptolemy's *Geography* (McCrindle 1885: 152) describes 'Baethana' as the 'royal seat' of a ruler named 'Siro Polemaios' – conceivably, the Satavahana ruler Vasithiputa Siri Pulumavi. This reference has been widely interpreted to identify Paithan as a 'capital' of the Satavahanas. In the same section, Ptolemy also mentions

two other cities as 'royal seats': 'Ozene' as the seat of 'Tiastenes' and 'Hippokoura' as that of 'Baleokouros'. These rulers are respectively identified as the western Kshatrapa ruler Chashtana and a local ruler named Vilivayakura. Ptolemy thus affords a valuable 'isochronism' linking these three rulers and indicating their contemporaneity. While 'Ozene' is certainly Ujjayini or modern Ujjain, the identity of 'Hippokoura' is uncertain. This name features once more in Ptolemy's geography as that of a port on the western coast near 'Semylla/Tiamulla', or modern Chaul (McCrindle 1885: 359). In this instance, it can be safely identified with Kuda, a harbour-town south of Chaul, known for a complex of rock-cut caves. But based on Ptolemy's description, it is plausible to identify the 'Hippokoura' where 'Baleokouros' reigned as located not on the coast, but in the hinterland. Possibly, it was a Greek name of Brahmapuri near Kolhapur, which was a prominent emporium on trade routes that traversed the Deccan plateau and where a large number of coins of the Kura dynasty, to which two rulers named 'Vilivayakura' belonged, have been found (Rapson 1908: lxxxvi-lxxxvii).

Marathi sources

The town of Paithan is closely associated with the flourishing of Marathi literature in the late Yadava period (c. 12th–13th centuries AD). The Yadava capital at Devagiri (Daulatabad of present) was not situated very far from Paithan and the fact that Paithan had evolved as a prominent centre of Brahmanic religion in the centuries prior to Yadava rule meant it attracted the attention of the Yadavas, who patronized Brahmanism in a major way. The chief Marathi source for information on Paithan in this period is, however, the literature associated with the heterodox *Mahānubhāva* sect, which was founded by a seer named Śri Chakradhara in the mid-13th century AD (Morwanchikar 1985: 11).

Chakradhara travelled widely across the Marathwada and Vidarbha regions to preach his doctrines and won many followers. During these travels, he also visited Paithan and lived there for a while. It was at Paithan that he took vows of renunciation and became a *Sanyāsin* (mendicant). Early *Mahānubhāva* literature, such as *Leelā-Charitra*, Chakradhara's spiritual biography, *Sthānpothī* or the gazetteer of *Mahānubhāva* pilgrimage and *Smṛtisthala*, a compilation of Chakradhara's memoirs, mentions Paithan at various instances (Raeside 1976: 587, 594).

Another religious sect that contributed widely to Marathi literature of the Yadava and post-Yadava or Sultanate periods was the egalitarian Varkari sect, which surrounded the cult of Vitthala or Vithoba, regarded as a form of Vishnu. A progenitor of the sect and pioneer of Marathi literature, Dnyaneshwara, was a resident of Paithan in his early life, where his father held a tenurial office of the 'Kulkarni'. Though many of Dnyaneshwara's early activities took place in Paithan, he himself does not mention the town in his literary works. The association with Dnayneshwara, however, meant that Paithan was noted in subsequent Varkari literature, starting with Dnyaneshwara's posthumous biography by his associate Namdeva (Morwanchikar 1985: 78–80).

In the late 15th to early 16th centuries, a noted Marathi 'saint' Eknath resided at Paithan. Eknath was a Brahmin and a follower of the egalitarian Vitthala sect. He was also acquainted with heterodox doctrines such as Sufism. He contributed immensely to Medieval Marathi poetic literature on the theme of *Bhakti*. Some events of his 'saintly' life, that live in the popular memory of Maharashtrians, took place at Paithan. Noteworthy amongst these is his embracement of a low-caste child along the banks of Godavari and another where he took a long journey back to the river so he could water a thirsty donkey (Morwanchikar 1985: 82–86).

Folklore

The folklore surrounding the origins of the Satavahana dynasty is intricately linked with Paithan. According to a folk story, a Brahmin lady lived in Paithan. When she went to fetch water at a place called 'Nagaḍoha' along the River Godavari, the Naga (serpent) king Śésha impregnated her. The child born out of this encounter was named Sālivāhana. As a child, he would make terracotta horses and soldiers to play with. When Vikrama, the ruler of Avanti (Ujjain), attacked the city of Paithan, Sālivāhana brought his toy army to life by sprinkling the magical nectar *Amṛta* on it (according to mythical belief, the Nagas guarded repositories of *Amṛta* in the Netherworld and Sālivāhana had access to it owing to his Naga parentage). He defeated Vikrama with the help of this army and subsequently became the first king of the Sālivāhana (or Satavahana) dynasty (Morwanchikar 1985: 9–10).

Another Medieval myth connects Vikrama with Sālivāhana of Paithan in a different way. According

to this story, astrologers at Vikrama's court predicted that Vikrama would be slain at the hands of a man born in the Southern Country or *Dakshiṇāpatha*. They also pronounced the tell-tale 'signs' of the killer. Disturbed by the oracle, Vikrama commanded Vetāla, the king of *Bhūta* spirits, to recognize and find him so he could be killed. Vetāla came to Paithan in his search and discovered that the 'signs' matched a boy named Sālivāhana, who lived in the city quarters inhabited by potters and mud-workers. He was playing with a terracotta army of horses and elephants when Vetāla spotted him. Vetāla reported his discovery to Vikrama, whereupon Vikrama launched an attack on Paithan. But Sālivāhana brought his toy army to life by magic and with its help defeated and killed Vikrama, thus fulfilling the prophecy (Ketkar 1963: 80–101).

These myths contain a curious combination of legend and reality. They surely refer, in an indirect manner, to the rivalry between Satavahanas and the Kshatrapas of Ujjain, but pose Vikrama, the mythical hero of Avanti, as the Satavahana enemy. The second version described above assimilates another well-known 'Vikrama' myth – that of his association with the spirit-king Vetāla – into the Satavahana thread. The reference to the toy army seems to reflect popular memory about artefacts such as terracotta horses, elephants and human figurines being regularly unearthed at Paithan. It is also plausible that the Naga-Brahmana root of the Satavahanas was a historical reality, Nagas being a well-known ancient clan who were, in the course of time, mythified as the 'dwellers of the Netherworld' (Fergusson 1868: 125).

A popular belief that Paithan is a 'city turned upside down' (*Ultī Nagarī* to quote the Marathi term) reflects the archaeological reality of encountering older anthropogenic remains such as bricks under the ground during later-day construction and agricultural activities (Yusuf 1938: 3). Similar beliefs also exist about other ancient cities like Ujjain and usually a local myth flourishes around the causes of the city being turned upside down.

Material sources

Stone inscriptions

The inscriptional sources on Paithan are rather limited. Asoka, the great Mauryan emperor, mentions a people named 'Petenikas' or 'Pitinikas'. This mention has been widely recognized as a reference to the people of Paithan (Bhandarkar 1925: 32–33), the appellation deriving from a 'Prakritised' version of Paithan's Sanskrit name 'Pratishthana'. Two other peoples, namely the 'Rathikas' and 'Bhojakas', find a mention alongside the 'Petenikas' in the same edict. As these are identified amongst the early ethnic inhabitants of the Deccan plateau, their mention alongside the Petenikas helps the latter to be located in the same geopolitical region and thus adds support to the identification of the 'Petenikas' as the residents of Paithan. This claim, however, has been debated, mainly based on different ways the word could be derived from Sanskrit/Prakrit (Bhandarkar 1925: 32–33).

Amongst the inscriptions from Buddhist sites such as the cave temples of the Deccan, Paithan finds mention as 'Patithana', a Prakrit version of its Sanskrit name. Three inscriptions of a votive nature, one in Kanheri cave no. 3 and the other two in the Pitalkhora Chaitya cave, refer to residents of Paithan. The Kanheri inscription mentions the establishment of a monastery at Paithan (Lueders 1909–1910: 102, no. 988). The first of the Pitalkhora inscriptions makes note of a donation of a pillar by an unnamed 'Son of Saghaka', a resident of Paithan, while the second mentions the gift of a pillar by Mitadeva, from a perfumer (*Gandhika*) family of Paithan (Lueders 1909–1910: 137, nos. 1187–1188).

Although Paithan is widely regarded as a capital of the Satavahana dynasty (see below), it is not mentioned in any capacity in any Satavahana inscriptions. The names of ancient geopolitical regions Aśmaka and Mūlaka feature in the eulogy of Gotamiputa Siri Satakani inscribed in Nasik cave no. 3 by his son and successor Vasithiputa Siri Pulumavi (Lueders 1909–1910: 122, no. 1123). But we have already seen the fallacies involved in associating Paithan with such ancient regions.

Copper-plates

An administrative division or Āhāra named *Supratishṭhaāhāra* is mentioned in two Vakataka copper-plate charters, namely the Jamb copper-plate and the Wadegaon copper-plate of Pravarasena II (c. AD 400–440) (Mirashi 1963: 10–15, 53–56). The first copper-plate is dated to his 2nd regnal year, and the second, to the 25th. The language of these plates is Sanskrit. V. V. Mirashi, while discussing the place names mentioned in the charters, tried to identify them using a 'structuralist linguistic' method, i.e. tracing the 'Sanskritisation' roots of modern place names. He therefore contended

that the administrative division should be identified with the area surrounding the village Pothra in Hinganghat Taluka of Nagpur District. H. S. Thosar challenged this attribution and tried to show, following the same methodology as Mirashi, that the places mentioned in the plates can be located in the Marathwada region, and thus, the region around Paithan should be identified as *Supratishṭha-āhāra* (for details of Thosar's arguments against Mirashi, see Morwanchikar 1985: 29–30). To further substantiate his claims, Thosar drew on secondary evidence from the *Kathā-Saritsāgara* (see above in the section on literary evidence), which refers to Paithan as *Supratishṭha Nagari*. Thosar's contention that places mentioned in the copper-plates do exist in the Marathwada region is worthy of consideration. The fact remains, however, that *Supratishṭha-āhāra* and *Supratishṭhita Nagari* are two essentially different words, and even if one is linked to Paithan, to what extent the other can be linked in the same way is open to inquiry. Thosar's identification of *Supratishṭha-āhāra* is therefore not conclusive.

Two copper-plate charters of the Rashtrakutas are associated with Paithan. The first, given by king Govind III (c. AD 793–814) in AD 794 and known as the 'Paithan copper-plates', records the donation of a village to a group of Brahmins (Kielhorn 1894–1895: 103–110). This village, named 'Limbārāmikā' in the plates, was part of an administrative division named *Pratishṭhāna Bhukti*, conceivably comprising the area around Paithan. Limbārāmikā is noted to have been a part of a group of 12 villages, known as 'Sārākachchha'. The second copper-plate charter given under the Rashtrakutas dates to the reign of king Indra III (c. AD 914–929) and is known as the 'Jambgaon copper-plates' (Mirashi 1966: 223–238). It records the gift of a village named 'Khaërondhi', in celebration of the anniversary of Indra's coronation in AD 915. Khaërondhi is identified with Khirai, located a short distance to the north-west of Paithan. This copper-plate charter refers to Paithan by its Apabhramsa/Prakrit name variant 'Paëṭṭhāṇa'.

The Satavahanas and Paithan

As shown above, Paithan is recognized widely as the capital of the Satavahanas, mainly on the basis of textual sources. Most convincing amongst these is Ptolemy, who mentions 'Baithana' as the 'royal seat' of a king named 'Siro Polemaios' (Majumdar 1960: 376). It is to be noted that Ptolemy does not explicitly mention the town as the 'capital' of these kings; the term he uses is translated by McCrindle as 'royal seat', which may not necessarily mean a 'capital' in its true sense. Indeed, the modern connotations of the word 'capital' were unknown to classical writers such as Ptolemy.

What prompted Paithan's identification as a Satavahana 'capital' are the secondary corroborations to Ptolemy's reference which come from Indian sources. Chief amongst these are some of the Jaina sources described above but some substantiation is also to be found in the myths surrounding the origins of the Satavahana dynasty. The Prakrit secular literature described above also makes similar connections. It is worth noting, however, that both these sources hardly make a distinction between 'Satavahana' (and 'Salivahana' to use the term widely employed in the texts) as a dynasty and a person. As evident in these texts, 'Satavahana' as a dynastic name is non-existent; to them, it means only a personal name. This is rather ambiguous and undermines the reliability of such sources in drawing firm historical conclusions. Furthermore, it is also true that even these secondary sources do not explicitly mention Paithan as the 'capital'.

Inscriptional evidence from the Satavahana period is silent about Paithan and its association with the dynasty. The name of the town does not feature in any of the known Satavahana inscriptions, let alone there being a direct reference to the seat of government being there. The ancient regions Aśmaka and Mūlaka feature amongst those mentioned in the eulogy of Gotamiputa Siri Satakani inscribed in Nasik cave no. 3 and could, only indirectly and inferentially, be taken as a reference to Paithan. But we have already seen the fallacy of associating Paithan with these regions, owing to a general lack of evidence.

Archaeologically, there exists enough evidence to indicate that Paithan flourished under the Satavahana rule, but it does not offer any indications of the town being a capital. Recently, a sealing of a 'Royal Minister', or *Rājāmātya*, named Mahasenadata has been reported from Paithan (Godbole 2002–2003: pls II-III). Of the four sealings published by Godbole, two are fakes, whilst the other two are genuine but have been misread. Correct readings are 'Sivadatasa' ('of Sivadata', the name of an individual) and 'Rajamachasa Mahasenadatasa' (of the 'Royal Minister' Mahasenadata).

They can be dated on palaeographical grounds to the mid- or late-Satavahana period (c. 2nd–3rd centuries AD) and could be taken as evidence of individuals with governmental responsibilities having resided at

Paithan during the Satavahana period. This, however, still does not offer a full substantiation of the 'capital' being situated at Paithan. In this respect, it is worth noting that a *Rājāmātya* named Hala is mentioned in an inscription at Kuda (Lueders 1909–1910: 112, no. 1057), and other *Amātyas*, such as Sivakhadila and Vinhupalita, are known from Nasik inscriptions (Lueders 1909–10: 123–124, no. 1125). These do not necessarily indicate that both places were 'capitals'.

Notwithstanding this, the identification of Paithan as the Satavahana capital is often accepted without question. The reading and interpretations of certain epigraphic sources in conjunction with textual references (predominantly Ptolemy) have contributed to it, and in general to the debate.

R. G. Bhandarkar drew the inference that Dhanyakataka (present-day Dharanikota in the lower-Godavari or 'Amaravati' region of Andhra Pradesh) was a Satavahana 'capital' on the basis of a mention of a word which he read as *Dhanakaṭakasāminehi* in an inscription of Gotamiputa Siri Satakani at Nasik. R. G. Bhandarkar took the word as an adjective for the king's name and translated it 'by the Lord of Dhanyakataka', thereby inferring that the capital of Siri Satakani was situated at Dhanyakataka (Bhandarkar 1895: 41). But Senart, who edited and published this inscription in the late 19th century, read the word as *Benakataka* and not *Dhanakataka* (Senart 1905–1906: 7). V. V. Mirashi subsequently proved that the word was indeed *Benakataka* and corrected Bhandarkar's reading to *Benākaṭakasamanehi*, referring not to 'the Lord of Dhanyakataka' but to the monks (*Samaṇa*, Skt. *Śramaṇa*) from the region of Benakataka, or the valley of River Bena in Vidarbha (Mirashi 1979: [9]).

While successive researchers accepted this correction, Bhandarkar's assertion that Dhanyakataka was a Satavahana 'capital' has survived in the literature. Added to this was the need to accommodate Ptolemy's mention of Paithan. A curious assertion of historical detail followed this need – that of the Satavahana Empire having two capitals, one at Dhanyakataka and the other at Paithan (Yazdani 1960: 132). But it is evident that this has been inferred from erroneous data, namely the wrong reading of a word by Bhandarkar, and we have no further evidence that either city was Satavahana 'capital'.

To conclude, Paithan may have been a Satavahana city par excellence, and its early flourishing might be attributed to the Satavahana period. By the time of Ptolemy, it certainly seems to have become an emporium and was evidently a 'royal seat' of the Satavahana king Siri Pulumavi. The folklore and myths that surround the city may even have roots in the city's Satavahana past. It is important to emphasize, however, that there is no clear and unequivocal evidence that Paithan was the capital of the Satavahanas at any time.

Derek Kennet

Chapter 3
Previous Archaeological Work at Paithan

A considerable number of archaeological sites have been excavated and published in the western Deccan and the region surrounding Paithan. Although none was specifically aimed at investigating Early Medieval levels or the Early Historic/Early Medieval transition, many quite significant Early Historic sites have been explored in some detail (Fig. 1.1). In fact, it was H. D. Sankalia and his colleagues from Deccan College Pune who initiated this work with the excavations at Brahmapuri in the mid–1940s (Sankalia and Dikshit 1952), continuing with Nasik, Maheshwar and Nevasa through the 1950s (Sankalia and Deo 1955; Sankalia *et al*. 1958, 1960). At around the same time, excavations had been taken up at Baroda (Subbarao 1953) and at Prakash in the Tapti Valley (Thapar 1967). From then until the early 1970s, there was an almost constant stream of excavations at sites such as Kayatha (Wakankar 1967; Ansari and Dhavalikar 1975), Kaundanpur (Dikshit 1968), Nagara (Mehta and Shah 1968), Paunar (Deo and Dhavalikar 1968), Ter (Chapekar 1969), Pauli (Deo and Joshi 1972) and Bhokardan (Deo and Gupte 1974), with Pauni also having been reexcavated in the 1990s (Nath 1998), highlighting the fact that the quantity of excavations appears to have trailed off in recent years. In addition to the Early Historic levels that they revealed, many of the excavation projects mentioned above uncovered some evidence of Medieval occupation, although this is for the most part 14th century and later as a lack of evidence is reported at many sites from the Early Medieval period. This is a phenomenon which appears to be partly due to problems on chronology and interpretation but may also have some validity as an indicator of a general lack of urban continuity through this period (Sharma 1987; Kennet 2004b, 2013).

Given the number of Early Historic excavations that have been carried out in the region, the lack of any synthetic regional analysis of the results is notable. This seems partly to be due to problems with chronology, which is still very poorly defined, making it difficult to link phases of activity at different sites with any reliability, and partly due to the way in which the data are presented, making intersite comparisons difficult. Nonetheless, the excavated sites that have been published do act as a useful repository of comparative information which has been drawn on in different places in the present volume. Meanwhile, systematic field survey and mapping of rural settlement of the type that has been standard practice in Europe, the Mediterranean and the Near East since the 1950s are still relatively rare in India, and unfortunately, no such projects have been undertaken and published in the vicinity of Paithan that might help to contextualise the site within its broader landscape, with the exceptions of Shaw's work in the vicinity of Sanchi, some distance to the north (Shaw 2007) and recent work in Vidarbha reported on in Chapter 15 of this volume.

At Paithan, previous to the excavations reported in this volume, there had already been at least three campaigns of excavation, two of which have been published. The first was conducted by the Archaeological Department, H. E. H. The Nizam's Government under the directorship of Syed Yusuf, beginning in May 1937 (Yusuf 1938, 1939). The second was undertaken in 1965 in advance of the construction of the nearby Jayakwadi dam and was directed by Dr M. G. Dikshit of the Department of Archaeology, Government of Maharashtra. Dikshit undertook a rescue survey in the area that was to be submerged and also opened a small trench in the vicinity of the Narasimha Temple on top of the ancient mound in order to check the stratigraphic sequence (Dikshit 1973). A third, limited excavation was carried out at Paithan in 1995 by the Department of Archaeology and Museums of the Government of Maharashtra in collaboration with the Department of History and Ancient Indian Culture of the Dr Babasahib Ambedkar Marathwada University, Aurangabad at the Son-Tekadi mound, but the results of this excavation are not published.

The two published excavations both revealed deep occupation sequences of four to six phases and throw some light on the history of occupation at the site. Their results are summarized below.

https://doi.org/10.1515/9783110653540-003

Yusuf's 1937 excavations

The first excavations at the site began in 1937 when four trenches were opened by Yusuf on the northern bank of the Godavari (Yusuf 1938, 1939). The location of his trenches is shown in Fig. 1.4. In some places, these were excavated to a depth of 7.5 m. The excavations identified six *strata* or layers of occupation, which can be summarized as follows according to Yusuf's report:

- Sixth *Stratum*. This layer, dated to the Satavahana period on the basis of coins, was characterised by a monumental architectural phase with the richest cultural assemblage of the sequence. Two rectangular brick structures were uncovered side by side, with a narrow passage between them; the walls of these structures are said by Yusuf to have survived to a height of 1.06 m. These structures are the two Early Hindu temples that became a key focus of the present excavations (see Chapter 4). To the south, at a slightly greater depth, a length of drain was discovered, constructed of very large bricks (10 × 24 × 62 cm) and no lime mortar. Three cylindrical brick structures, each 1.37 m in diameter, were found in line with the drain. Copper-alloy coins of the Satavahana kings, including a conglomerated lump of 10 square coins, with the emblem of the Bodhi tree stamped on one face, were found with traces of a cloth wrapped around them. Numbers of individual similar square coins came from the same layers. Barrel-shaped, globular and discoid terracotta beads are reported as having been found in large numbers at a very low depth in the trench, which is probably intended to mean this period.
- Fifth *Stratum*. This layer appears to represent a gap in occupation or a major re-levelling of the site. It is up to 2.4 m deep and contained only a few minor antiquities of the Satavahana period. Above this layer, the collapsed structures of the fourth *stratum* were found. At this point, there is some ambiguity in Yusuf's description about the number of structural layers and their relationship to the Fifth *Stratum*.
- Fourth *Stratum*. This is a large destruction layer, possibly associated with a flood according to Yusuf. Building remains were found tilting, slanted or collapsed over the remains of the Fifth *Stratum*, which caused Yusuf to suggest that they had been destroyed by flood water. Antiquities included Tughluq and Bahmani coins, which suggest a date of late 14th or 15th century.
- Third *Stratum*. This layer contained antiquities and silver and copper coins of the Mughal Period.
- Second *Stratum*. This layer can be dated to the 18th and 19th centuries as it yielded coins of the Asif Jahi monarchs together with other objects. No details of the nature of occupation are given.
- First *Stratum*. This is the topmost layer consisting of buildings constructed in stone and lime, and brick and mud, found together with British silver rupees, gold and silver jewellery, copper and pottery utensils.

Despite bringing to light the historical importance of the site, excavations were not continued the following year and the disruptions caused by the outbreak of the Second World War meant that the project was never resuscitated. Yusuf's results are further discussed in Chapter 14.

Dikshit's 1965 excavations

Dikshit's 1965 excavations in the vicinity of the Narasimha Temple on top of the ancient mound revealed a four-period sequence (Fig. 1.4; Dikshit 1973). These periods are summarized from Dikshit's report as follows:

- Period I. In these layers, two supposedly early Satavahana coins with a Gaja-Lakshmi motif were found together with glass beads, crystal ear-reels, legged querns, a fine bone or ivory lion capital, kaolin figurines of a nude goddess and an ivory kohl applicator. Small fragments of worn Northern Black Polished ware (NBP) were also found in the upper levels. This period is dated by Dikshit roughly to 300 BC–AD 100, probably based on the coins and NBP, although this is not specified by him.
- Period II. At this level, thick deposits of mud and silt came to light to a depth of 1.22 m. These are interpreted by Dikshit as flood deposits, but it is unclear whether this is correct. This period is dated c. AD 100–500, but no evidence is presented to support this date and it is not further discussed.
- Period III. A portion of a brick temple in a ruined condition came to light in these levels. The plinth and *jangha* were built of very large bricks, but the size is unfortunately not stated. Iron objects and slag were found in the foundations of the structure. This phase is tentatively ascribed to the Rashtrakuta

period (AD 600–800), but no evidence is cited to support this date.
– Period IV. A disturbed layer in which an underground chamber of a house, approached by a flight of steps in the walls, was found. The finds included crude and poorly fired pottery, generally of the common red variety. The period is dated AD 1700–1800 but again, no supporting evidence is given.

These two excavations throw some useful light on the history of occupation at Paithan, although it is not very precise and the evidence for the interpretations given by the two authors is not always clear. The presence of Satavahana coins is of no surprise and would appear to confirm Satavahana-period occupation at the site. In fact, both excavations report Satavahana coins in the lowest excavated levels, which suggests that – in these two particular locations at least – this may have been the earliest period of occupation. However, in neither case is the excavation report detailed enough to be certain that traces of earlier occupation were not also present. Both excavations also report a thick layer of abandonment or 'flood deposits' immediately above these levels, which is then followed by Medieval and post-Medieval occupation levels. The significance of these results, along with a reinterpretation, is discussed in more detail in Chapter 14.

Part II

The Excavations

Derek Kennet

Introductory Remarks on the Excavations

The Paithan excavation project has a slightly complex history. It was begun under the directorship of P. N. Kamble and J. Howell, who directed the project during its 1996 and 1997 seasons. In 1998, it was handed over to J. V. P. Rao and D. Kennet, who formulated a new set of research questions and aims (see Chapter 1) and directed the 1998 and 1999 seasons.

Some limited survey of the site and its environs was undertaken during the 1996 and 1997 seasons, and pottery and other minor antiquities were found at a number of localities. During this work it was noted that the low plain to the east of the main mound within the area enclosed by the bend in the river yielded a notable amount of scattered occupational material, suggesting that this area may have been quite densely occupied at some periods of the site's history. In addition to this, it was noted that there are several smaller mounds around the main mound, which have ancient archaeological material associated with them. There was speculation that these sites might be early monastic or religious centres but they have never been explored archaeologically and they may also result from other types of structures on the site's margins. The most significant of them is a mound on the bank of the river to the north of the Ek Nath temple, which has now been partially levelled to create a sports field, and a second mound, also on the river bank but to the east of the town, upon which there now stands the Maulana Sahib Durga temple (Fig. 1.4).

In the first (1996) season, an excavation trench was positioned on the edge of the occupation mound at the southern end of the ASI archaeological area. This area was chosen because it appeared to be free from the later Medieval layers that cover the higher areas of the protected area to the north. The depression in which the excavation was positioned appeared to be enclosed within some form of wall or rampart which could be seen in section at the edge of the mound. Some brick structures that were eroding out of the side of the mound were also exposed.

After the end of the 1996 season, the Institute of Archaeology in New Delhi undertook a training excavation at the site, opening a trench, 35 × 5 m, close to the area where excavation had already been started (Trench C). The results of this work are not included in the present report, but after further work in the 1997 season, a rough occupation sequence was elucidated and is described under Trench C in Chapter 5.

In the second (1997) season, one of the excavation trenches dug by Yusuf in 1937 was cleared to allow further investigation of the two brick structures uncovered by him. The southern section of Yusuf's trench was cut back in an attempt to link the stratigraphic position of the buildings with later material, and a test pit was excavated to establish the dating of earlier occupation in this area (Trench A).

During this season, the Institute of Archaeology trench at the southern end of the site (Trench C) was cleaned and excavated down to natural across a 2-m-wide section in each of the seven sectors; the baulks were also cut back to provide a rough sequence which is reported in Chapter 5. The fortification that surrounds the southern end of the site was also examined in this season. The fortification wall stands as a large mound at least 4 m above the surrounding area and is capped with a post-Medieval wall.

The main focus of work during the third (1998) and fourth (1999) seasons was Trench A focussing on the brick structures revealed by Yusuf that had by this time been identified as Early Hindu temples. Trenches B, D, E and F were also excavated at various locations around the site to gain insights into the occupation history of the site (Chapters 4 and 5).

https://doi.org/10.1515/9783110653540-004

Derek Kennet

Chapter 4
The Brick Temples in Trench A

This chapter describes the excavation of the two Early Hindu brick temples in Trench A. These two temples were the focus of two key research objectives of the second stage of the project. The first was to take advantage of this rare opportunity to gain an understanding of the way in which Early Hindu brick temples such as these were laid out and constructed and to see whether they underwent any significant alterations to their plans or superstructures throughout their period of use. The second was to investigate the context of the construction and use of the two temples in relation to the stratigraphic history of the site, including the environmental and economic developments recorded in the adjoining excavated sequence. It was hoped that the answers to these questions would provide new insights into the changing nature of the relationship between religion, society and economy through this crucial period in India's history.

Most of the known temples of this early period are presented in the literature as complete and finished buildings that were planned and constructed exactly as they now are (e.g. Meister *et al*. 1988: 36–37). In fact, it is quite possible – even probable – that in many cases, these buildings underwent quite complex architectural developments through a number of phases of enlargement, alteration and adaptation. It is impossible to know, however, whether this is the case or not as very few Early Hindu temples have been excavated, recorded and analysed anywhere in India to the necessary level of detail. This is because relatively few temples remain, and many that do are still largely complete buildings, meaning that it is impossible to gain insights into the nature of their construction and into how their architectural layout might have changed through time. By contrast, the two Paithan temples had already been badly damaged by ancient brick robbing and the digging of foundation trenches for later Medieval buildings. For all the damage they have caused, these disturbances do provide some crucial 'windows' into the core of the structures, and it is these which have allowed the elucidation of the details of the construction and the architectural phases through which each of the temples passed. In addition, because the temples are no longer in use, it was possible to excavate soundings underneath the floor levels and up against the exterior walls, thereby gaining evidence for changing floor levels and the nature of the foundations that were put down during the temples' construction.

The archaeological techniques of meticulous, brick-by-brick recording and detailed, single-context excavation and planning used at Paithan provide crucial evidence which helps to elucidate the complex architectural development of the two temples. Although there are inevitably still many points of uncertainty, it will be seen that the work has provided numerous insights into their architectural development. These insights are unique and important; they not only are relevant to the history of the Paithan temples but also provide information that will improve our understanding of the development of the Early Hindu temple more generally. This is because these two structures, rather than being grand architectural projects and the focus of royal patronage, appear to have been modest buildings, typical of many thousands of such temples that must have been in use right across northern India at this time. Most importantly, it will be seen that the two temples were not static, but that they were dynamic structures that underwent constant and, in some cases, fairly major changes and alterations, changes that must have reflected the changing nature of temple practice as well as the requirements of the community that used them. The excavations have also served to illustrate the distinctive nature of the temples' physical construction and have provided a unique insight into the sophisticated nature of the foundations that were laid down underneath the two structures.

By necessity, this chapter goes into considerable archaeological detail in describing the temples' construction and the results of the excavations in words, drawings and photographs. For ease of use, the chapter is divided into two sections: the first gives a detailed description and overview of the development of each of the temples, and the second provides summaries of the excavated trenches that were written up by the individual excavators at the end of the fieldwork seasons;

it is envisaged that these reports will be of interest only to those with specific questions about the details of the excavation. In addition, Table 4.4 provides details of each of the 36 principal walls that were recorded. Reference is also made to Appendix I, where all the layers ('contexts') recorded by the excavation project are listed and described. Meanwhile, Chapter 14 presents further discussion of the context and significance of the two temples.

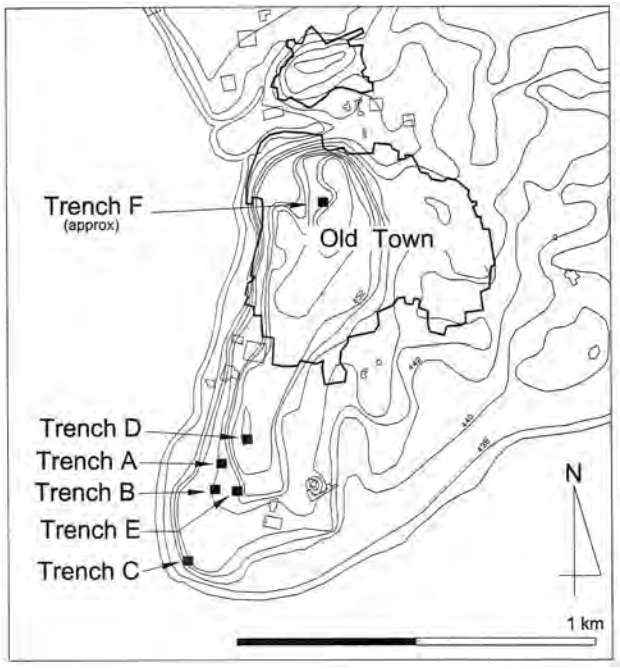


Fig. 4.1: Plan showing the central mound at Paithan and the location of the main trenches. Note that the trenches are not shown to scale in this plan.

Section 1: Trench A, The Brick Temples

Trench A was opened in the 1997 season in the remains of one of the larger of the four trenches that had been excavated by Syed Yusuf in 1937. It is located towards the northern extent of the area now administered by the ASI, close to the top of the steep slopes that drop down to the Godavari (Figs 4.1–4.3). Plates I and II in Yusuf's 1938 report appear to show the early stages of the excavation of this trench.

The photographs that Yusuf published of the same trench at the end of excavation suggest that the two brick structures that he uncovered at the lowest level of excavation were two early temples (Yusuf 1938: pl. V; 1939: pls XVb, XVIa, XVII a–b) (Fig. 4.4). As they were still visible in 1997, it was decided to clean, record and study what appeared to be two potentially very interesting and important monuments. The information published by Yusuf on the two temples was restricted to the two black-and-white photographs mentioned above, plus a brief paragraph containing a few details on brick sizes and construction (Yusuf 1938: 4; 1939: 41).

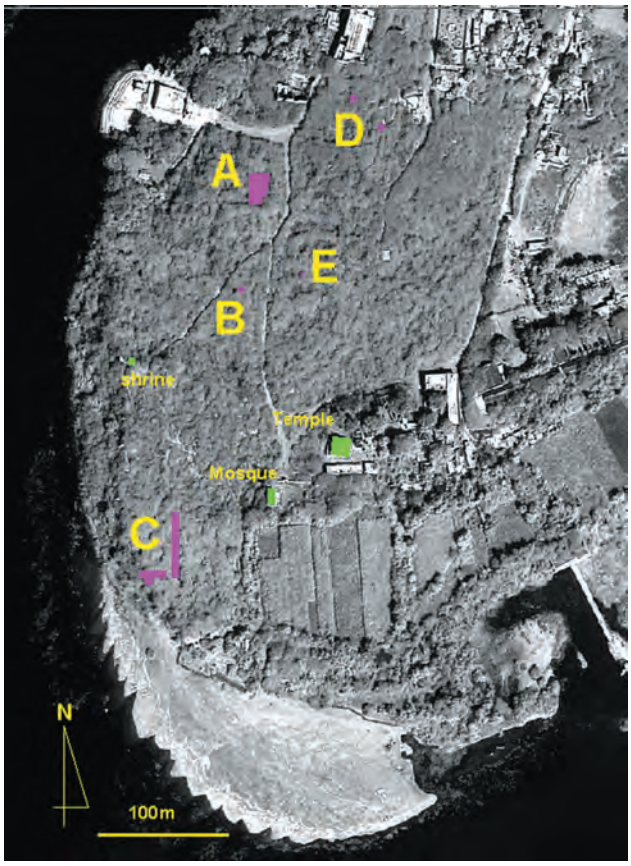


Fig. 4.2: Satellite image of the ASI protected area showing the location of the trenches.

Yusuf's trench originally measured about 30 metres along each side, with supplementary trenches going off to the south-west and the north-east, whereas Trench A of the present excavations was restricted to an irregularly shaped area with maximum dimensions of 23 m north-south and 15 m east-west centred around the two temples (Fig. 4.5).

In the 1998 season, the two temples were carefully cleaned (Fig. 4.6). Brick-by-brick plans and elevations were made of both of them at a scale of 1:20 using an archaeological drawing frame. The temples were photographed and studied in detail and a preliminary architectural phasing was worked out. In the 1999

Fig. 4.3: View of Trench A from the south-west at the end of the 1998 season.

Fig. 4.4: Yusuf's photograph of the 1937 excavations showing the two brick temples from the south (from Yusuf 1938: pl. v; 1939: pl. XVIIb).

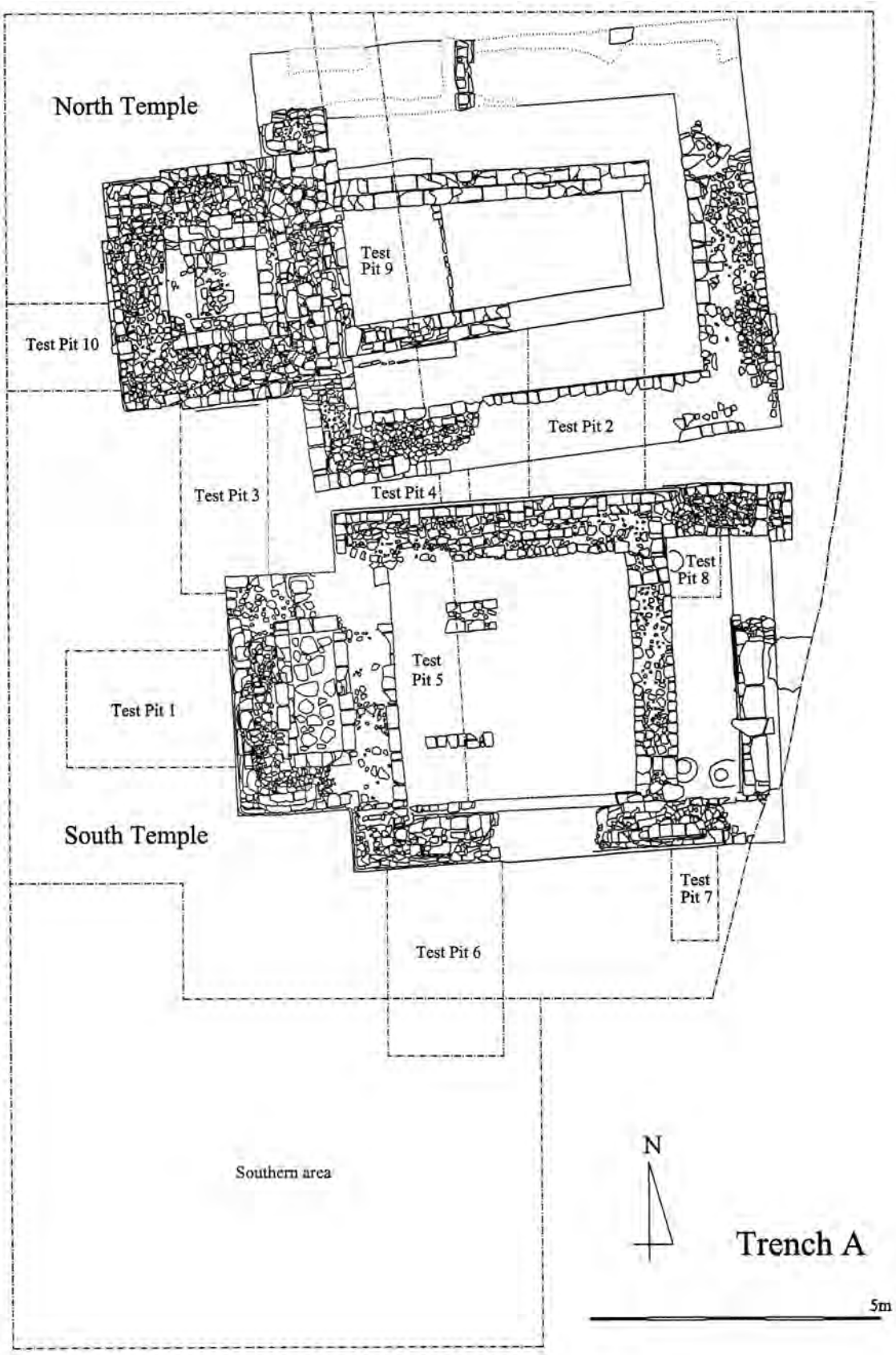


Fig. 4.5: Plan of Trench A showing the location of test pits and excavation areas.

season, efforts were directed towards excavation of 10 test pits in and around the structures together with some limited area-excavations adjacent to them. These soundings had numerous aims: the first was to elucidate details of the foundations and construction of the temples as well as to clarify any remaining uncertainties relating to the structural history of the two buildings; the second was to locate the temples within a stratified occupation sequence; and the third was to establish the nature and date of the pre-temple occupation in this part of the site. A brief report setting out the main findings of the excavations in Trench A has already been published (Kennet and Rao 2003).

Table 4.1: List of test pits and areas excavated in Trench A (see Section 2 of this chapter).

Area Code/Test Pit	Description
NWNT	Layers related to the robbing of the north wall of the North Temple.
EEST	Eastern end of the South Temple east of wall 344.
W Area	West of the North Temple.
South or Southern Area	An area 9 m × 6 to 8 m in the south of Trench A.
GG North	The *garbhagriha* of the North Temple.
S Wall of N	Limited excavation on the robbed-out south wall of the North Temple (later TP2).
S of S Temple	The area immediately to the south of the South Temple (later TP6).
TP1	To west of the South Temple to investigate stratigraphic sequence against and below temple.
TP2	To south of North Temple to investigate robbed out southern wall and possible stratigraphic relationship between temples (originally 'S Wall of N').
TP3	Between outer walls of *garbhagrihas* of both temples to investigate stratigraphic relationship between temples.
TP4	Between remaining walls of both temples to investigate stratigraphic relationship.
TP5	Across the interior of the *mandapa* of the South Temple to investigate flooring, wall construction and foundation deposits.
TP6	To south of South Temple to investigate deposition history in this area (originally 'S of S Temple').
TP7	Against the southern wall of the South Temple at east end to investigate the development of wall and foundations.
TP8	Inside the east end of the South Temple to investigate the relationship between walls.
TP9	Across the interior of the *mandapa* of the North Temple to investigate the succession of shrines, flooring, wall construction and foundation deposits.
TP10	To the western end of the North Temple to investigate stratigraphic accumulation against the temple wall.

Much of the work of the present project involved recording and removing layers that had been deposited since the temples went out of use. These can be divided into three groups: those resulting from the ancient collapse and robbing of the temple structures; those resulting from Yusuf's 1937 excavations or from the restoration of the temples that was carried out by the ASI in 1967; and deposits that have accumulated naturally over the structures since 1967.

One of the biggest problems faced by the present excavation was to distinguish between layers and other features that are a part of the temples' ancient history and those resulting more from the recent excavations and restoration. As far as the present authors are aware, no detailed documentation of either Yusuf's work or the 1967 restoration exists. Yusuf's work, particularly, removed almost all information relating to the later phases of use and abandonment of the temples. One especially significant problem is what at first appeared to be drainage ditches or wall-chasing trenches that had been excavated along the base of the outer walls of the temples, probably by Yusuf. These effectively sever

any stratigraphic connection between the foundation cuts of the temples and the uppermost layers through which they were cut, making it impossible to know precisely from which level the temples were constructed.

The two temples are referred to in this report as the 'North Temple' and the 'South Temple'. The locations of the test pits in Trench A are shown in Fig. 4.5, whilst the area-excavations and test-pits referred to in the text are listed in Table 4.1.

Descriptions of the two temples and their phasing are presented first, followed by more detailed field reports from the test pits and area-excavations in Section 2 of this chapter. Detailed descriptions of the principal walls are presented in numerical order in Table 4.4. Within the text, reference is made to the context numbers allocated to each of the layers, walls, cuts and features defined during excavation; a list of these can be found in Appendix I.

Fig. 4.6: General view of the temples from the north at the end of the 1998 season.

The North Temple

The North Temple consists of a square sanctum with a tapering *mandapa* attached to its eastern side (Figs 4.7 and 4.8). The *mandapa* is subdivided by an internal wall which abuts the eastern face of the sanctum and forms a narrow passageway between itself and the *mandapa* wall. The maximum dimensions of the whole structure are 11.30 m east-west and 7.64 m north-south. Full dimensions are given in Fig. 4.9. Although Yusuf states that a feature of both of these structures is that they were placed 'in strict regard to cardinal points' (Yusuf 1938: 4; 1939: 41), in fact each is on a slightly different orientation that, in the case of the North Temple, is just under five degrees south of magnetic west (265° measured with a prismatic compass in February 1998).

The temple is built entirely of fired bricks and mud mortar. In a few places, traces of lime mortar are present, but these are almost certainly the result of the 1967 restoration mentioned above. This is confirmed by Yusuf's statement that no mortar was found on either of the buildings in 1937 (Yusuf 1938: 4, 1939: 41). The state of preservation is variable; in some places, the walls are preserved to a height of 1.6 m, whilst in others, such as the north wall and parts of

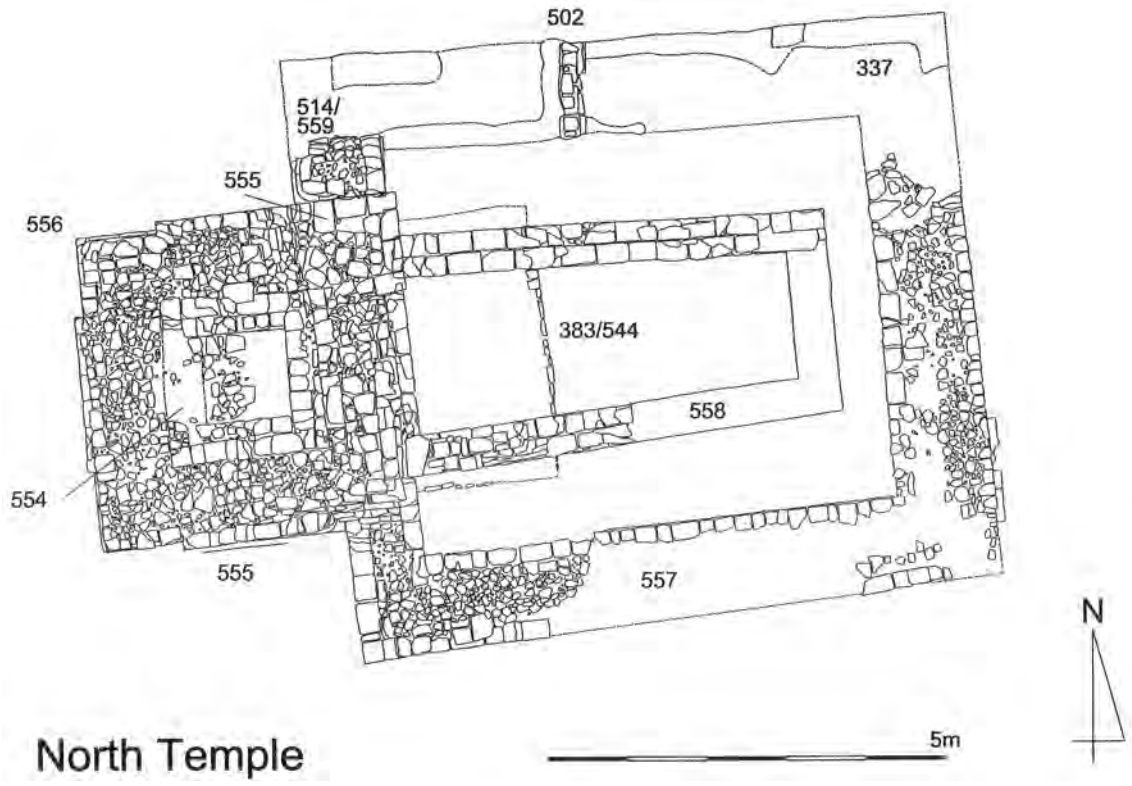


Fig. 4.7: Plan of the North Temple showing the locations of the main walls.

Fig. 4.8: The North Temple from the north-east.

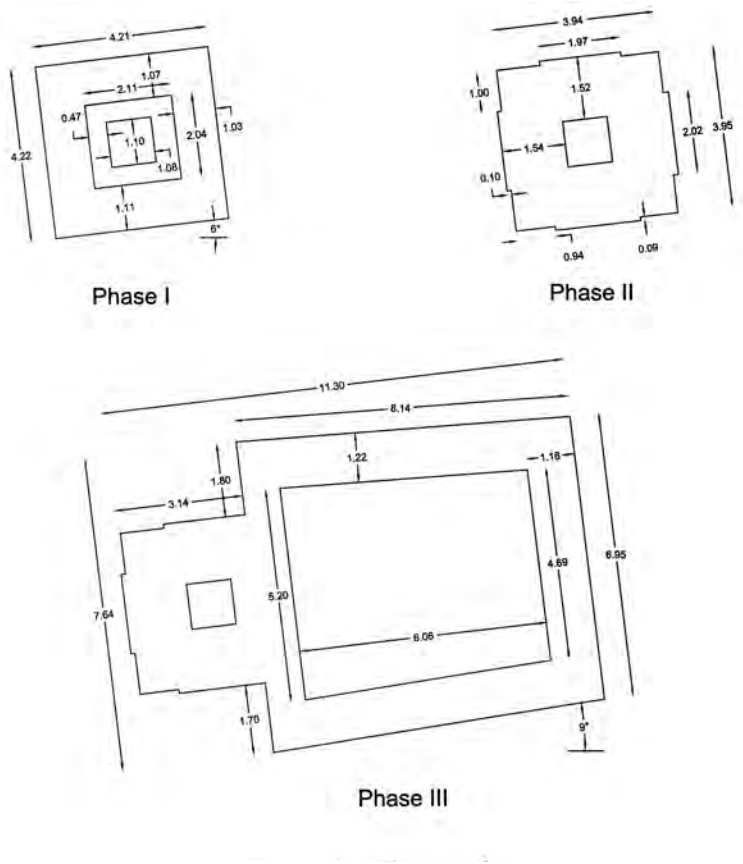


Fig. 4.9: Dimensions of the North Temple.

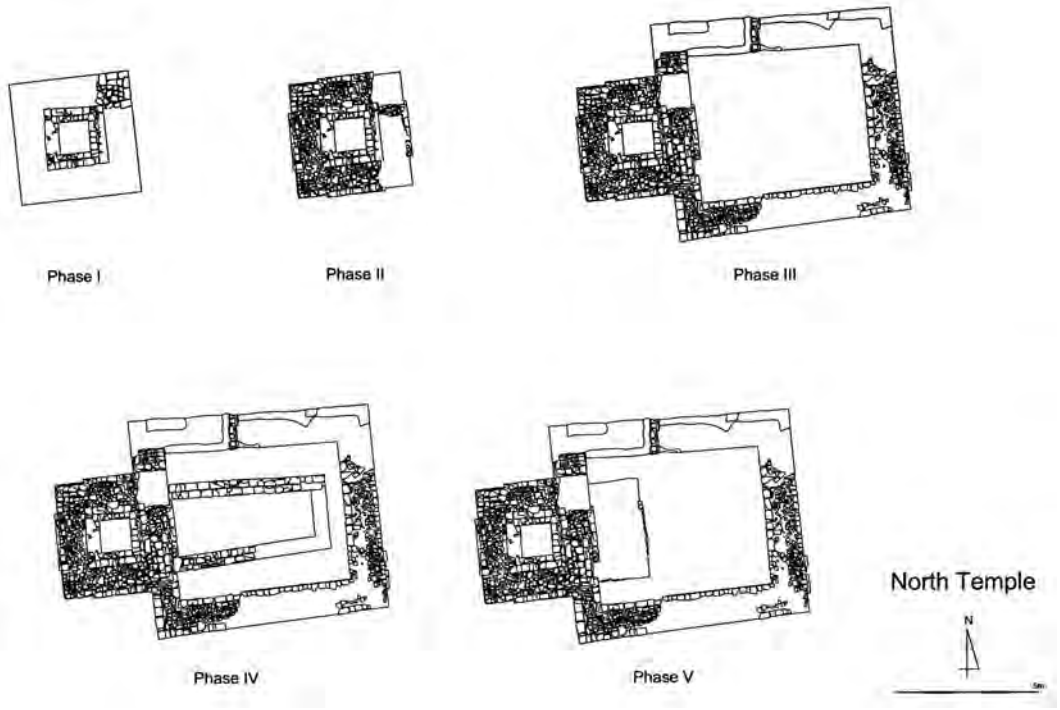


Fig. 4.10: Phases of the North Temple.

Fig. 4.11: The west end of the North Temple from the west.

the south wall of the *mandapa*, they have been completely removed by brick robbers and by pits and construction cuts from overlying occupation levels.

Five distinct phases of development can be discerned in the temple: Phases I to V (Fig. 4.10), and these are each described below.

Phase I

The earliest phase consists of a small square shrine (wall 554) measuring about 2 m along each side, which is situated in the centre of a square brick platform (walls 555, 969) that was 0.55 m high and 4.2 m along each side (Fig. 4.11). The original height of the shrine is unknown as only 20 courses of the wall are preserved and no indications remain of the way in which it was roofed. In fact not very much of the structure is now visible as it is largely concealed by the thick Phase II wall (556) that was built on top of it. A later pit (341), however, has cut into the north-east corner of the Phase II wall and has exposed the construction of the Phase I shrine and platform. In addition, excavation of the fill of the *garbhagriha* and the levels below it has exposed the foundations of the shrine, as has Test Pit 3 that was excavated against the south wall of the platform (see TP3 in Section 2 of this chapter). These insights provide enough information to compile the schematic section through the shrine and platform that is shown in Fig. 4.12.

The foundations of the shrine are of considerable interest. Before construction began, a large and probably square hole was excavated, measuring just over 6 m wide at the base and about 30 cm less at the top due to the fact that the sides slope inwards. The original depth of the hole was probably around 1.5 m, although Yusuf's excavations have removed any precise indication of the level from which the foundations were cut. The cut was deep enough to cut through all underlying layers containing anthropogenic deposits and to reach undisturbed natural soil.

The eastern and western limits of the foundations were not exposed, so it is impossible to be certain of the precise shape and size of the foundation trench. On the north side, the cut was exposed by Test Pit 9, where it has been shown to be 1.64 m from the corner of the platform (wall 969). This is more than twice the 80 cm distance on the southern side as exposed in Test Pit 3. The reason for this difference is not clear, but it may be that the cut had a different shape on the north

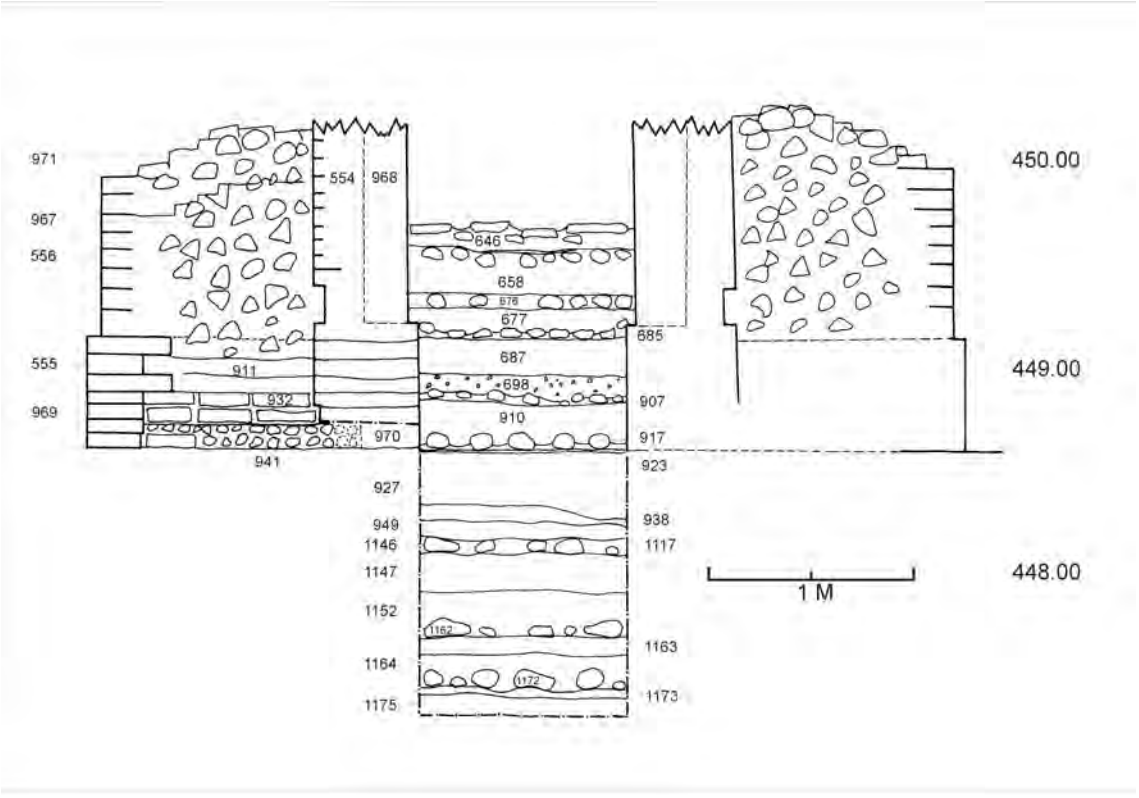


Fig. 4.12: Schematic section through the *garbhagriha* of the North Temple from the north.

side. Another possibility is that the foundation cut broadened out towards the east to incorporate a porch or *mandapa* that was attached to the original shrine and platform. It will be noted that the section line of Test Pit 9 is 1.5 m further east than the section in Test Pit 3. No evidence of any such structure has yet come to light, however. Unfortunately, time did not allow deeper excavation of Test Pit 9, which would certainly have clarified the shape of the Phase I foundation cut.

The foundation trench was then systematically filled with layers of subrounded cobbles and small boulders of igneous rock, on average 20 to 30 cm in size, in a matrix of loose silt alternating with layers of more compact silt. Some of these layers contained fragments of bricks and pottery and charcoal flecks, but on the whole, the anthropogenic content was lower than would be expected in a redeposited layer from an archaeological site, suggesting that the earth was excavated some distance away from any focus of occupation.

The surface of the topmost compact silty layer (927) preserves a shallow rectangular depression about 50 cm × 40 cm and less than 1 cm deep that is situated just towards the south-east corner of the *garbhagriha*. It seems as if something heavy must once have stood here, although this is more likely to have been during the construction of the temple than during its use, as this feature it is overlain by a brick-jelly layer (923) that underlies the walls of the *garbhagriha*. The foundation levels were then covered with the layer of brick-jelly (923), 3 cm thick, and it is onto this that the platform and shrine walls were built.

Construction probably began with the lowest two courses of wall 554 (labelled 970) where the solid brick wall is thinner than it is above and the lowest courses of wall 555 (labelled 969) (Fig. 4.12). Once these walls were in place, loose rubble made up of silt, stone and brick (941) was deposited in between them and flattened. The upper part of wall 554 was then constructed, against which a two-course brick surface (932) was put down on top of 941. It is possible that construction of the platform stopped at this point, at which time it would have been about 30 cm high, and that the upper part of wall 555 and the related fill (911) represent a later phase of construction. Alternatively, it is possible that the platform was simply built in two stages. The top of 911 was destroyed by the cut of the pit

that exposed it, so it is not possible to say how regular its upper brick surface was.

The bricks used in this phase measure, on average, 7 × 25 × 40 cm and are soft-fired and an orange or red colour.

Fig. 4.13: The Phase I structure of the North Temple showing wall 554 and the simple 'Ramtek-like' moulding exposed in a post-Medieval pit cut.

Wall 554, the wall of the central shrine or *garbhagriha*, presents two notable features. Firstly, the wall is two-bricks wide until the eighth course, at which point it thins to a single brick width, leaving a 26-cm-wide ledge on the interior that was later filled by wall 968, which, to judge by the bricks used, is of a much later date. At the same height, there is a simple two-brick-high recess running around the exterior of the shrine, which is 5 cm deep on the northern face and 2 cm deep on the eastern face (Figs 4.13 and 4.15). A decorative feature such as this almost certainly indicates that this wall was intended as a free-standing structure, although the outer surfaces of the bricks show no traces of weathering. This simple recess may represent an early stage in the development of *adhisthana* mouldings. It seems to be most closely paralleled at Ramtek, where, on the Kevala-Narasimha temple at least, it seems to be datable to the 5th century (Meister *et al*. 1988: fig. 30). This point is further discussed below.

Fig. 4.14: The *garbhagriha* of the North Temple after excavation to the lowest foundation fill of boulders. Note the vertical incised lines in the middle of each wall beneath the level of the blackboard.

Shrine 554 measures 2.11 m east-west and 2.04 m north-south on the exterior whilst the interior space measures 1.08 m east-west and 1.10 m north-south. It still stands to a height of about 20 courses, although it must originally have stood much higher.

Once the shrine had been constructed, two thin lines were incised into the brick-jelly floor (923) of the *garbhagriha* interior, one crossing the centre of the *garbhagriha* between the middle of the north and south walls and the other, similarly, between the middle of the east and west walls, the two lines crossing in the centre of the chamber. The incised lines continue vertically up the middle of the walls to the eighth course (Fig. 4.14). The function of these lines is not clear, but they may have been related to the layout and definition of the sacred geometry of the temple.

The brick-jelly surface and incised lines were then covered with further fills within the *garbhagriha* consisting, once again, of alternating layers of stones and compact and loose silt at least up to the level of the eighth course of the wall. The stones used in these levels are somewhat smaller than those used in the lower foundations. These fills were probably intended as a base for the original floor of the shrine, but they may have been deposited at a much later date; it is impossible to be certain. There is certainly no evidence of floor surfaces

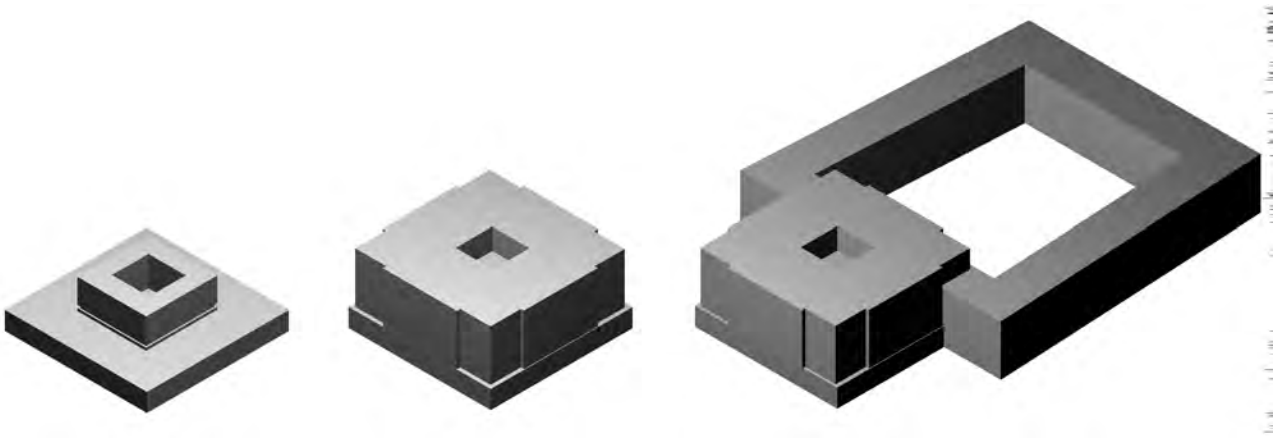


Fig. 4.15: Isometric reconstruction of Phases I, II and III of the North Temple from the south-west.

below this point – the brick-jelly surface 923 being too friable to have served as a floor. Above the eighth course of the wall, further stone/silt fills continue to about the 12th or 13th course, but these abut wall 968 and are therefore of a much later date.

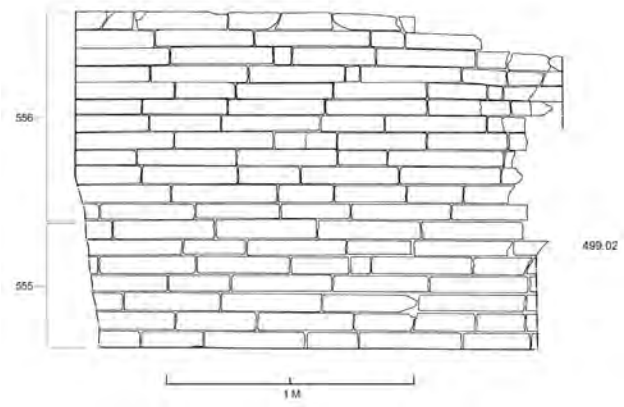


Fig. 4.16: Elevation of walls 555 and 556.

Having described the Phase I shrine, two key questions emerge. The first is from which direction was the original shrine entered? It is impossible to answer this question with any certainty because so little of the upper part of wall 554 is visible. Clearly, there was no opening in any direction below the eighth course of the wall as all four walls are clearly intact and interbonded up to this level. Above this, it seems that all four faces of the wall stand to at least about the 16th course, but it is impossible to be certain because, as has been mentioned, the inner face of the wall is concealed by later wall 968 above this point and the outer faces are concealed by the later Phase II wall. These later walls may conceal an original opening in the

Fig. 4.17: The robbing on the north side of the North Temple from the east.

garbhagriha that was subsequently sealed. Above this level, the *garbhagriha* may have been open to the west,

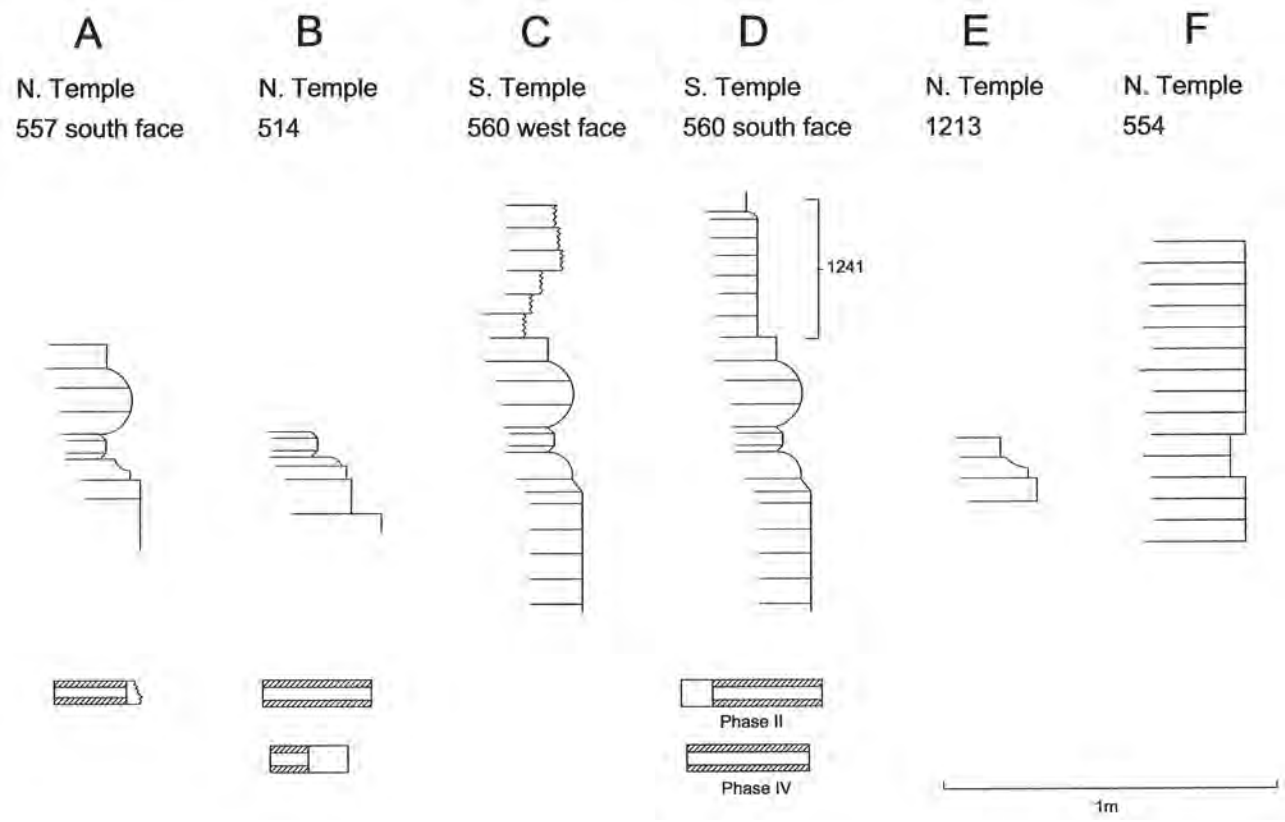


Fig. 4.18: Details of plinth mouldings from various walls from both the North and South Temples.

where the wall is now four of five courses lower than it is on the other three sides. It may also have been open to the east from a few courses higher, but the western wall of the Phase III *mandapa* stands to at least this height, demonstrating that there was clearly no communication between the *mandapa* and the *garbhagriha* at the time the *mandapa* was constructed. It is possible, although rather unlikely, that this Phase III wall may conceal an earlier opening to the east that was closed during Phase III or before (see discussion below under Phase III). So, although it therefore seems likely that the entrance to the *garbhagriha* was from the west, it is not possible to be certain of this. It is, however, possible to be certain that the floor level of the shrine would have been between 60 cm and 1 m higher than the ground surface surrounding the temple.

The second question regards whether or not there were two phases of construction in the Phase I platform (walls 969 and 555) or do these walls and their associated fills simply represent two stages in the construction of a single-phase platform. Unfortunately, it is impossible to answer this question without dismantling the whole shrine and it must therefore remain unanswered.

Phase II

Phase II represents the construction of a structure (556) directly upon the Phase I platform, encasing the free-standing *garbhagriha*. The resulting construction is square, about 4.2 m along each side, with a *triratha* pattern of 10-cm projections along the central two metres of each face (Figs 4.7, 4.9, 4.11, 4.15). The wall is one-brick thick and stands on the outer edge of the Phase I platform. The space between this wall and the wall of the Phase I *garbhagriha* is filled with a thick hearting of roughly coursed brick bats and silt, resulting in a wall with a total thickness of about 1.5 m. Up to 13 courses of the wall are preserved on the south face, the lowest course being a levelling course resting directly upon the Phase I platform, some of the bricks of which have been thinned in order to establish a level base. There is evidence of a later rebuilding in the upper courses of the wall, which is discussed below (see 'Later use and robbing').

The jointing of wall 556 is a little finer than that of the Phase I walls 554 and 555, the courses of fine silt measuring around 0.5 cm. The eastern face is well preserved, showing a pattern of predominantly stretchers (Fig.

4.16). There is a small offset of around 6 cm between the top of wall 555 and the base of 556. There also appears to be a slight difference in orientation of about 0º 43' between the two structures.

The bricks used in this phase are very similar in feel and firing to those used in Phase I, measuring, on average, 7 × 25 × 40 cm.

Phase II effectively represents the encasing of the Phase I *garbhagriha* and platform within a more substantial and elaborate *mulaprasada*, which continued to be free-standing and unattached to a *mandapa* so far as it is possible to tell. There is no indication of the nature of the roof, although the massive walls were possibly intended to support a fairly substantial superstructure such as a brick *shikhara*. Indeed, the completed temple may not have been dissimilar at this time to the well-known brick temple at Bhitargaon (Meister *et al*. 1988: 36–37), although, of course, on a much more modest scale.

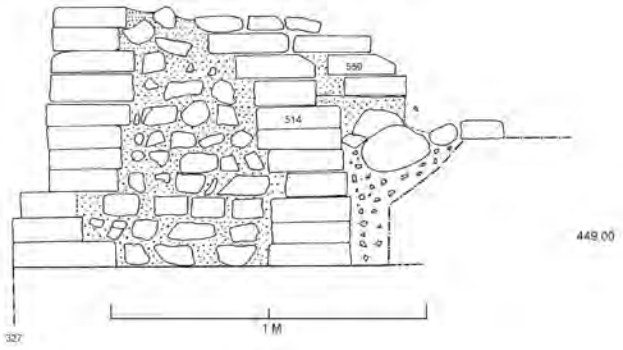


Fig. 4.19: East-west section through wall 514 showing extra face 559/1213.

The Phase II structure presents two questions, both quite similar to those posed by the Phase I shrine. The first is the question of the entrance to the shrine. As has been stated above, there is absolutely no sign within the fine brickwork of the eastern face of wall 556 that there could once have been an entrance in that wall. It must therefore be assumed that the entrance to the Phase II shrine was from the west (e.g. towards the river) in this phase.

The second question is whether the Phase I structure was ever actually used as a shrine or temple, or whether it simply represents a stage in the construction of the Phase II structure. It is difficult to be certain, but the absence of any inter-bonding between walls of the two phases, the slight difference in alignment and the difference in the quality of the brickwork and jointing all strongly suggest that the two phases are actually quite separate and that Phase I was a free-standing shrine for a period of time before Phase II was constructed.

Phase III

Phase III represents the addition of a substantial *mandapa* to the east of the Phase II shrine. The *mandapa* consists of a brick wall (557), 1.22 m thick, in the shape of a tapered rectangle enclosing an internal area that measures 5.20 m north-south at its widest point and 6.06 m east-west.

Wall 557 is preserved only in a few places. On the north side, it was removed by robbing, leaving only two stumps standing (502 and 514) (Fig. 4.17). The exact location of the original wall is, however, discernible due to the preservation of the lowest course of mud mortar in the bottom of the robber cut. At the east end, the wall has not been robbed but it has been damaged and partly concealed by later rebuilding and restoration. Along the south side, most of the south face of the wall has also been removed by robbing so that only two stretches of the original outer face are preserved. At the west end of the south side, where the wall abuts the Phase II structure, the wall is better preserved and stands a maximum of 11 courses high.

In this same south-west corner of the *mandapa*, a 24-cm-long section of *adhisthana* mouldings is preserved. The moulding is very similar to the better-preserved mouldings of Phase II/IV of the South Temple (Fig. 4.18A). A short section of the same moulding is also preserved on the small surviving section of the wall on the north side (514; Figs 4.18B and 4.19), suggesting that these are the remains of the original *mandapa* mouldings.

As can be seen in Fig. 4.19, a crude later facing (559) was added to wall 514 which included similar mouldings at the same height, although the base of the facing is much higher than the base of the original wall. This represents a later thickening of the wall to the west, the reason for which is not known. This part of the wall has had its stratigraphic relationships removed by robbing and later excavation, making it impossible to understand the circumstances or date of this development. There is no evidence for a similar thickening anywhere else on the wall.

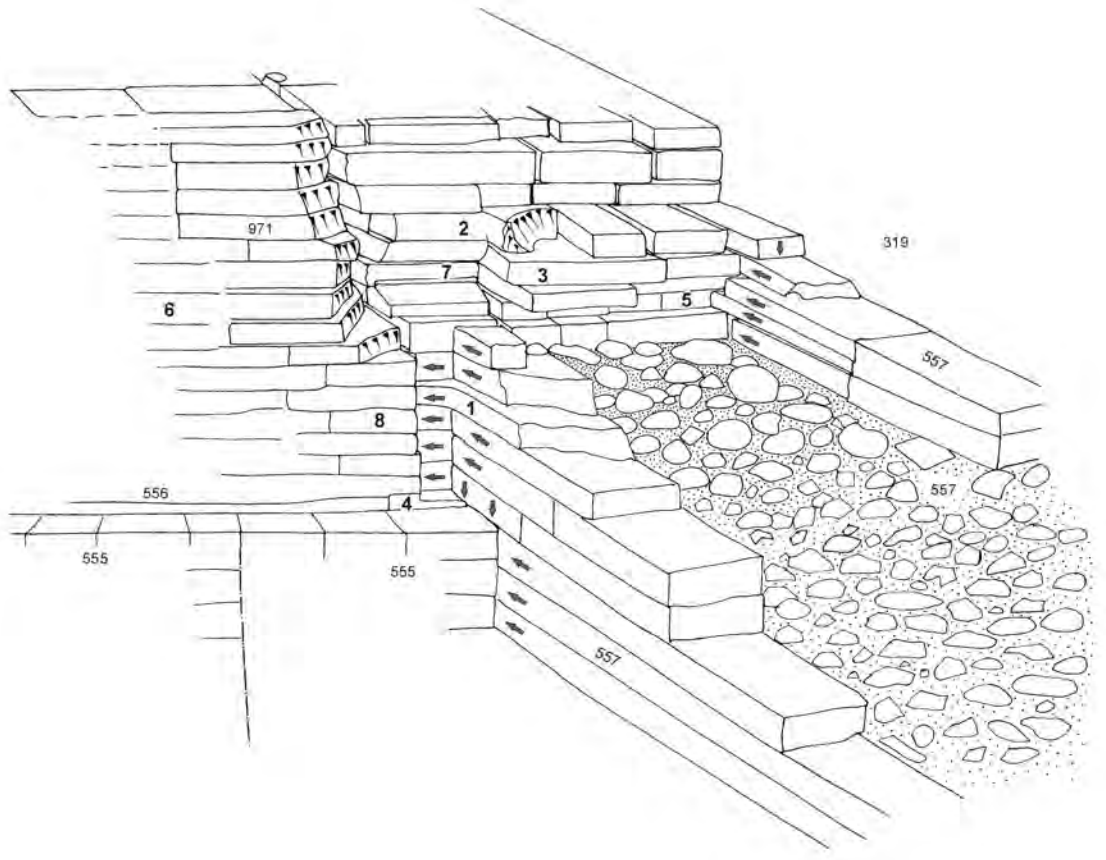


Fig. 4.20: Sketch of the joint between walls 556 and 557 at the southwest corner of the North Temple from the south-west. Arrows indicate where a brick abuts another.

1. This irregular 'T' or 'L' shaped brick with a curved corner protrudes from the west face of 557 and abuts the *triratha* offset of wall 556, the curve of the brick protruding out above the right-angled corner made by the lower three courses of 557 that abut 556 and sit on top of it. Is this simply poor finishing suggesting that these courses were originally below ground?
2. Although broken, this brick, in the middle of the curved moulding, is 'L' shaped, suggesting that it turned the corner from the south face to the west face. It is too broken to be certain.
3. Here, three bricks seem to make up a short section of the western face of the wall, which the moulding courses now abut (e.g. (7) and above). There is no suggestion of the mouldings turning to the west face of 557 here, but it is not clear how this would have been organized. The west face (3) is 18 cm to the east of the lower face of wall 557.
4. As in Fig. 4.21, the lower levelling course of wall 556 has been cut into to provide a base for wall 557.
5. Here, as can be seen in Fig. 4.21, the upper courses of wall 557 seem to have been inter-bonded/threaded into the face of wall 556. It is very difficult to understand which was the original face of wall 556. The question arises, was there an earlier *mandapa*-type structure built onto or with wall 556 underneath wall 557? As the northern relationship is destroyed, it is only here that the evidence remains but it is unclear.
6. The upper courses of purple bricks are clearly part of a later rebuilding (wall 971). The weathering suggests that these bricks have stood exposed for some time. The upper courses of wall 557 appear to abut this, but it seems difficult to imagine that this could have been the case.
7. This is a moulded brick with a 'hammer head' chamfer as on the plinth mouldings of the South Temple. It has been cut into to the west.
8. These bricks, which appear to be the eastern end of the *triratha* offset in wall 556, actually abut the face of wall 556. This is not the case on the west side of the *triratha* offset, where they are inter-bonded. This suggests a rebuilding or something more complicated which is hidden.

The overall impression is that wall 557 has been inter-bonded into wall 556, which required some rebuilding of wall 556 itself. It seems that wall 557 originally had mouldings on its outer face and there may be a more complicated sequence of phasing here that could only be unravelled by dismantling the structure.

Fig. 4.21: The joint between the Phase II and Phase III brickwork of the North Temple, looking west in the southern half of the *mandapa*, with wall 558 to the immediate right.

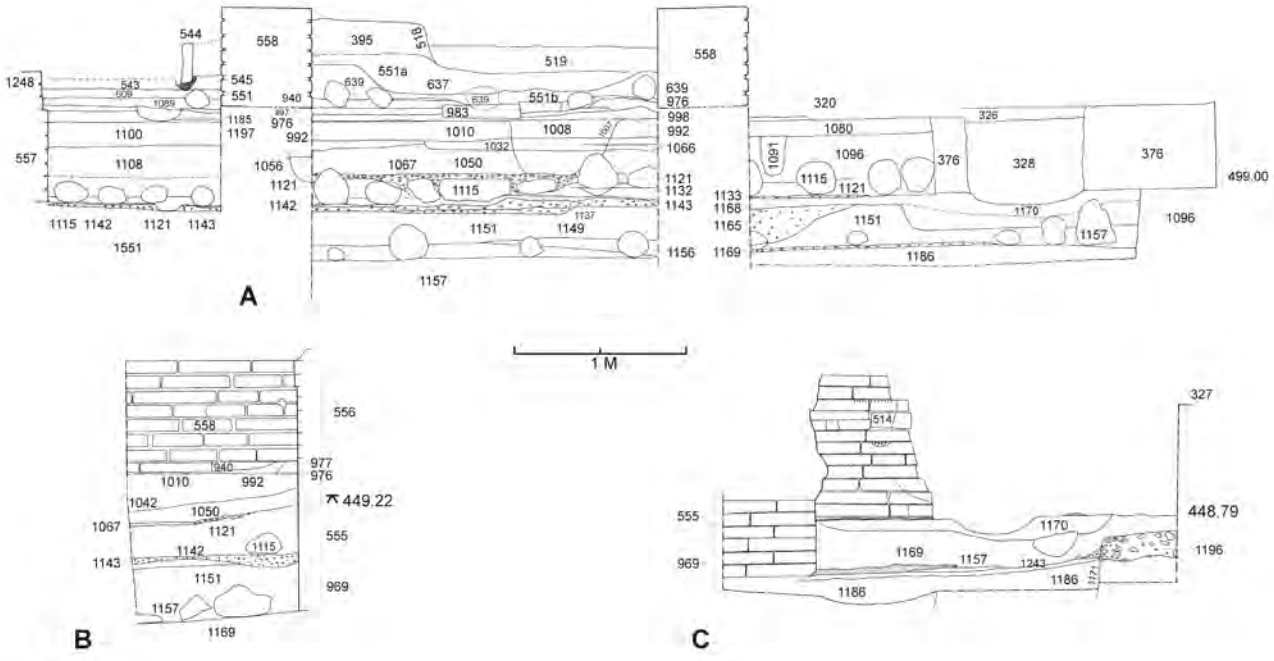


Fig. 4.22: Test Pit 9 sections. (A) Composite section across the whole test pit and the *mandapa* of the North Temple looking west. (B) East-west section against wall 556 below the southern part of wall 558 where it crosses the test pit. (C) The western section of the test pit to the north of the Phase I structure showing the edge of foundation cut 1171.

In the south-west corner of the *mandapa*, the join between the Phase II (556) and Phase III (557) walls is partly preserved. This is a complicated relationship, made more difficult to understand by later rebuildings of the upper courses of both walls, which have obscured or destroyed the original brickwork. The three-dimensional sketch in Fig. 4.20 shows the visible details as they are. It seems that wall 557 was keyed into wall 556 and this process involved the removal and replacement of bricks from some parts of the face of 556. Much later, the upper seven or eight courses of the eastern face of wall 557 appear to have been rebuilt, leaving only a thin face of this wall sandwiched between the rebuilding and a much later rebuilding of the upper 10 courses of wall 556 (971). There are some problems with this interpretation, however, such as the brick labelled '1' in Fig. 4.20, which must be a part of wall 557 but which projects beyond itswestern face.

Fig. 4.21 shows the same joint between the two phases, this time looking towards the west from the interior of the southern aisle of the *mandapa*. Here it can be seen that the lower courses of the *mandapa* clearly abut and overlie the Phase II wall and platform, with some brick cutting and inter-keying that must have been achieved by the removal and replacement of bricks in wall 556. In Fig. 4.21, a slight decline in the quality of the jointing of the Phase II brickwork is evident above about the 10th or 11th course, which may be indicative of a later rebuilding above at this point.

Although a relationship between the two phases has been proposed above, without dismantling the walls it is impossible to be certain of having a full understanding of this rather complex situation.

From the plan, it can be seen that the westerly face of 557 has a slightly different orientation from that of the original Phase I structure 554 (Fig. 4.7). This must be deliberate, but the reason for it is unknown.

Once again, the bricks used in this phase are very similar in feel and firing to those used in Phases I and II, measuring, on average, 7 × 25 × 40 cm.

The latest internal surface of the *mandapa* that was exposed by excavation was designated layer 550 along the north side of the temple. It appears to be the equivalent of surfaces 1010, 1100 and 1080 in Test Pit 9 and layer 319 in Test Pit 2. It consists of a compact grey silt with possible lime inclusions at a height of 449.42–449.47 in relation to the site datum. There may well have been later surfaces that were removed by Yusuf, and there certainly seem to have been earlier surfaces.

Fig. 4.23: Feature 1137, the earliest evidence for a possible shrine in the west end of the *mandapa* of the North Temple.

Fig. 4.24: North Temple, showing the remains of a possible simple shrine 983 against the western wall of the Phase III *mandapa*.

The addition of a *mandapa* to the east of the Phase II shrine is problematic because it would appear to indicate that the entrance to the Phase II shrine was from the same direction. As has been noted above, however, there is absolutely no evidence that the Phase II shrine was ever open to the east; indeed, it is more likely that the entrance was from the west, towards the river. In this respect, the traces of possible cultic activity uncovered by Test Pit 9 from the earliest levels inside the west end of the *mandapa* are very important (Fig. 4.22) (see Section 2 of this chapter). Although no sculpture has come to light, a stratigraphic succession of at least three rectangular impressions or arrangements of bricks against the eastern wall of the Phase II structure within the *mandapa* indicates that this place was most likely used for cultic activity, albeit consisting of simple, crude constructions. The earliest shrine (1137), a simple rectangular depression, is located directly on top of the *mandapa* foundation deposits (Fig. 4.23). Evidence for a second shrine was found immediately

above but higher up in the sequence (983). This indicates that the location was already being used for simple cultic activity immediately after construction of the *mandapa* and that it continued to be used for some time (Fig. 4.24). The third shrine (551) is again in the same location but is a part of Phase IV and will be discussed in the section below. The question posed by these shrines is, why should they have been located against the back of the Phase II structure? There are two obvious possibilities. One is the cultic activity originally related to a subsidiary deity that was located in a niche in the upper part of the outer walls of the Phase II structure. If this were the case, it is possible that this location at the back of the Phase II structure had already become important for worship before the construction of the *mandapa*. The *mandapa* may then have been constructed to formalise the cult and to enclose it within the temple. Unfortunately, it is impossible to know whether this is the case because the foundation cut for the *mandapa* would have destroyed any evidence for earlier cultic activity in this location. A second possibility is that, for some unknown reason, construction of the *mandapa* was deliberately intended to relocate worship to the eastern side of the Phase II structure, although it is notable that no attempt was made to open a connection between the *garbhagriha* and the *mandapa* during the Phase III construction. In the absence of any further evidence, this is the most that can be said about the rationale behind the Phase III *mandapa*.

The foundation cut for the *mandapa* was also revealed by Test Pit 9. It is much shallower than the foundation cut of the Phase I structure, although the precise level from which it was dug is not known as the relevant levels were destroyed by Yusuf's excavations. The foundations consist of only one layer of igneous rocks and silt, rather than the multiple sequence of silt/rocks/silt found in the Phase I foundations. The reason for this difference is not clear. It may be that the importance of such foundations had diminished by the time the *mandapa* was constructed. Alternatively, because the *mandapa* did not include a *garbhagriha*, it may have been felt that such elaborate foundations were unnecessary.

Fuller details of the shrines and the sequence excavated within the *mandapa*, as well as the foundations, are given in the Test Pit 9 report in Section 2 of this chapter.

Phase IV

Phase IV represents the subdivision of the interior of the *mandapa* by the construction of wall 558, creating what was either a trapezoidal inner chamber or a raised platform around the shrine and a narrow ambulatory between itself and the *mandapa* wall (Fig. 4.7). Wall 558 encloses a space measuring 2 m north-south at the widest point and 4.8 m east-west. The entrance was probably to the east, although no trace of it survives.

Fig. 4.25: Photo of the rectangular depression in layer 551 that might indicate the location of a shrine.

Fig. 4.26: Wall 383/544 of Phase IV in the North Temple before the excavation of Test Pit 9.

The wall is preserved up to seven courses high, although the entire south-east corner above the lowest two courses is part of the 1967 reconstruction. The wall is about 52 cm wide and is of a different type of construction to any of the earlier walls in the temple. It is a solid brick wall with no rubble fill, consisting of a double row of bricks. The silt jointing is quite crude – certainly much cruder than the Phase II wall. Most significantly, the bricks of this wall are of a larger size

than any used in the previous phases measuring 6.5 × 26 × 42/43 cm. The introduction of a new construction technique and a larger brick size is significant for linking together the chronology and phasing of the North and South Temples.

The construction of wall 558 follows the deliberate raising of the floor within the *mandapa* by about 50 cm to the level of surface 1010, which was achieved through the deposition of a further sequence of silt and stone foundation levels (1050, 1115). It is not certain, however, that the raising of the floor level and the construction of wall 558 occurred at the same time. The detailed stratigraphic evidence discussed under Phase III above, and also in the report on Test Pit 9 in Section 2 of this chapter, suggests that shrine 983 may have been in use on floor 1010 for a period of time before wall 558 was built. This suggests that wall 558 was built with the intention of enclosing the already existing shrine 983 or of raising a low platform on which the shrine could then be placed.

Shrine 983 was subsequently buried by the deliberate deposition of a further level of silt and stone foundation deposits (639) upon which a 20-cm-thick layer of black cotton soil was laid down (551). On the upper surface of 551, a large rectangular sunken area was noted against the western end of the *mandapa* (Figs 4.22 and 4.25). The sunken area measures 140 cm north-south by 90 cm east-west and is 15–20 cm in depth. It is thought that this represents the location of a large rectangular object or structure that must have been part of a third successive shrine in the same location. It is also possible, however, that layers 639 and 551 were deposited around the base of a shrine or idol that stood on bricks 983, and that the depression in 551 was caused by the removal of this object at a later date. To judge by the location of the stones in layer 639, the latter scenario appears to be more likely, but in effect, there is not much difference between the two interpretations; in both cases, the shrine continued to be used and the level of the interior of the *mandapa* continued to be raised.

Phase V

Elucidation of the developments of Phase V is extremely difficult, due partly to the nature of the relevant black cotton soil deposits (1252 and 395) and also to later disturbance. At some point, a crude wall (383/544) appears to have been constructed of brick bats and broken tiles in order to surround the earlier shrine within a small rectangle, apparently ignoring the existence of the Phase IV wall 558, which was probably therefore already destroyed. The area enclosed measures 3.40 m north-south and 1.70 m east-west.

The best record of this wall is the photograph taken by Yusuf in 1937 shortly after the structure was first revealed (Fig. 4.4). In this photograph, it is clear that wall 383/544 still stood higher than the top of wall 556. Since then, the wall has survived very badly, possibly because it was not well made in the first place, and all that remained to be recorded in 1998 was a row of

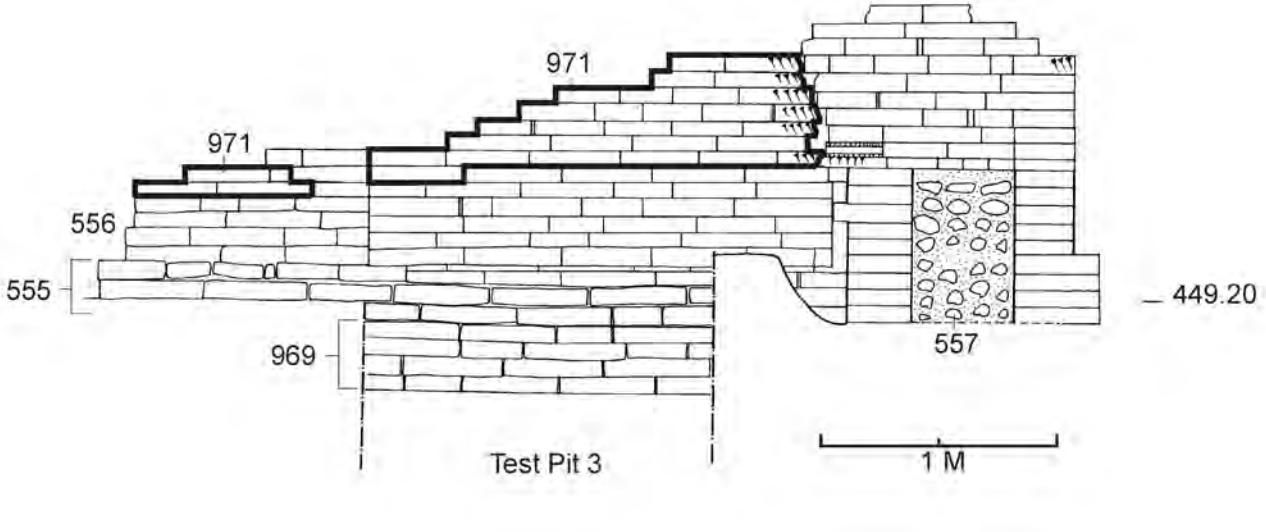


Fig. 4.27: Schematic section/view of the *garbhagriha* wall of the North Temple looking north showing the extent of later rebuild 971.

Fig. 4.28: The *garbhagriha* of the North Temple from the west showing possible evidence of late use.

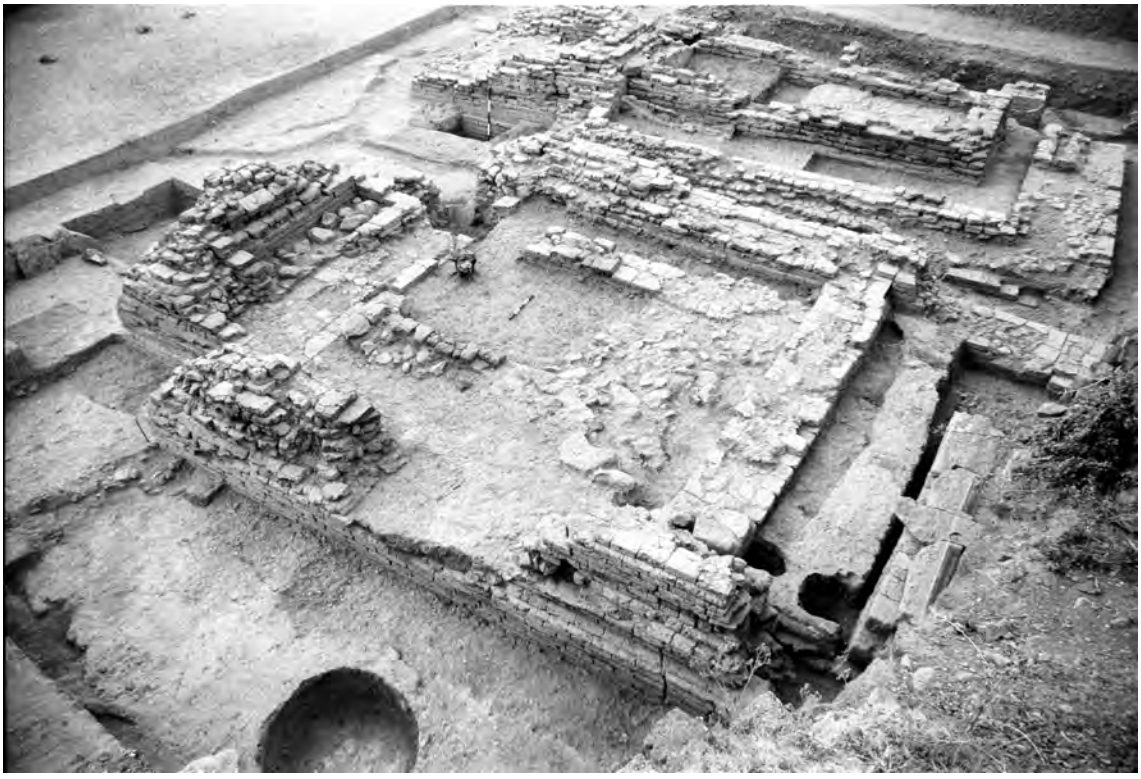


Fig. 4.29: General view of the South Temple from the southeast during excavation.

bricks and tiles standing on end in lime mortar within a shallow cut and a row of brick bats and tiles lying on the soil retained behind them (Figs 4.22 and 4.26). The presence of lime mortar demonstrates that these were placed here during the 1967 restoration and probably represent a rather desperate attempt to preserve an already very badly damaged structure. They serve only to indicate the approximate location of the wall, and perhaps the bricks and tiles from which it was built.

Whether this wall formed a small earth-filled platform, as seems most likely, or a small chamber is unknown. The platform would have effectively raised the level of the shrine by creating a raised surface that has now been completely destroyed. As has been stated, the fact that wall 383/544 ran over the top of the Phase IV wall 558 demonstrates that this earlier wall had already been destroyed and its upper courses had been removed by this time, but the condition of the rest of the temple during Phase V is unknown. It is probably no coincidence that wall 558 is much better preserved underneath the Phase V structure than it is to the east, as can be clearly seen in Fig. 4.26. This may indicate that the western part of the wall was incorporated into the Phase V structure and that the rest of the wall was removed.

It is impossible to know with certainty the nature of the temple during this latest phase of its use. The very fragile remains of Phase V have been exposed to 60 years of weathering and erosion as well as undocumented excavation and restoration. All that can be said with confidence is that the temple continued in use as a place of cultic activity through the construction of what was probably a crude earth-filled platform located against the eastern wall of the *garbhagriha* structure in a place that had already been in use as a shrine, possibly for as long as several hundred years, but that had certainly once seen distinctly better days. Wall 558 no longer existed, and it is impossible to be certain that rest of the *mandapa* walls were still standing – they may also have been demolished and robbed by this time. The crude Phase V structure seems most likely to represent rather sporadic and unstructured use of an already old and established shrine that was now located within the half-standing remains of an old, ruined temple.

Later use and robbing

There is evidence of later rebuilding of the upper courses of some of the temple walls, for example wall 1248, which is a rebuilding of the upper three courses of the south side of the Phase III *mandapa* wall 557, and wall 559, which is a later facing to *mandapa* wall 514. The most significant rebuilding is wall 971, which is a rebuild of the upper parts of the Phase II structure 556 (Figs 4.20 and 4.27). From around the seventh course of wall 556, the bricks are notably thicker, measuring 7/7.5 × 20 × 33/35 cm. They tend to have a purple colouration and are fired to a much higher temperature than the bricks in earlier parts of the temple. They also often show traces of vitrification on the surface. These bricks are similar to the bricks used in the rebuild of wall 561 of the South Temple and seem to represent a later phase of reconstruction and repair of both temples, the date of which is not known but which probably took place between the 9th and the 11th or 12th centuries, although it could have been later. Robbing and erosion of the structure make it impossible to say very much about the construction of which these bricks form part. They are found on the north, south and west sides of the Phase II structure but not on the east face. It is possible that the whole of the superstructure of the *garbhagriha* needed replacing at some point in time. The bricks of the rebuilding are now badly weathered, suggesting that they have been exposed to the elements for much longer than the lower parts of the structure.

Excavation along the course of the north wall of the *mandapa* has revealed that this wall was systematically robbed out after the temple fell into disuse. The date of the robbing is unknown, as is the level from which it occurred, as all related levels were removed by Yusuf's excavations. The precise course of the original wall is shown by the lowest level of mud mortar, which is still visible in the base of the robber cut (Fig. 4.17). The details of the robbing are discussed in Section 2 of this chapter (NWNT).

A series of rough brick-bat steps over the top of the remains of wall 556 indicate that there has been access to the ruined *garbhagriha* from the west or river side for some time (Figs 4.11 and 4.28). This may of course relate only to the period since the 1937 excavations, but the height of the walls surrounding the *garbhagriha* indicates that this is the only direction from which it could have been approached, at least during its final form. It therefore seems most likely that the shrine was also approached from this direction during its early stages of use, but it would be impossible to verify this without dismantling some of the later walls.

The last phase of activity identified in this temple is associated with the restoration of the buildings in 1967. At this time, a shallow scoop was dug against the

outside face of the eastern length of wall 557. It seems that along the line of the robbed wall, a shallow ditch was dug (337). The presence of lime-mortared bricks within this cut makes it clear that it results from the 1967 restoration. The surviving stumps of wall that were discovered along the length of the *mandapa* wall were also conserved with mortar pointing. After restoration, it appears that the related trenches were backfilled to some degree, after which silt had accumulated across the area to a depth of about 30 cm before the 1998 excavations began.

The South Temple

The South Temple consists of a rectangular *garbhagriha* with a rectangular *mandapa* attached to its eastern side (Figs 4.29 and 4.30). The *mandapa* was once subdivided by a north-south wall towards its eastern end, and the fragmentary remains of further internal walls are also preserved. The maximum dimensions of the whole structure are 9.4 m east-west and 6.25 m north-south (Fig. 4.31). As with the North Temple, this temple is not oriented precisely east-west. The main axis is oriented just under 4° south of magnetic west (266° measured with a prismatic compass in February 1998), which is about 1° different from the orientation of the North Temple. The reason for this difference is not clear. The South Temple is located immediately to the south of the North Temple, being separated by a minimum distance of less than 1 m from the southern wall of the North Temple.

As with the North Temple, this temple is built almost entirely of fired bricks and mud mortar, although stone has been used in some later parts of the structure. The state of preservation is also variable; in some places, the walls are preserved to a height of 1.35 m above the present ground surface, whilst in others, such as the eastern walls, they are preserved only in plan. In contrast to the North Temple, the outer walls of the *mandapa* are on the whole better preserved and have been less damaged by robbing, but the internal walls that once subdivided the interior of the *mandapa* are very badly preserved, having been almost completely removed by the foundations of much later post-Medieval houses that once stood on this spot.

Five distinct phases of development can be discerned in the temple's history: Phases I–V (Fig. 4.32). This is the same number of phases as the North Temple but this is purely coincidental because the temple underwent a very different set of developments to its northern neighbour and each of the South Temple phases is certainly not contemporary with the equivalent of the North Temple. The problem of the removal by Yusuf of archaeological deposits relating to the later periods of use and abandonment applies equally to this temple. The five phases are described in turn below.

Phase I

As with the North Temple, the foundations of the structure are of considerable interest. They consist of a large – presumably rectangular – pit that is just under 8 m wide and at least 9 m long, although the precise length is unknown. The sides of this pit slope steeply down to a flat bottom that is 6.9 m wide and 20–25 cm below the level at which layers of archaeological deposits of the surrounding area containing anthropogenic deposits sit upon underlying natural soil (Fig. 4.33). The pit was then carefully back-filled with a repeating sequence of layers of small boulders of igneous rock packed into a very clean silt matrix followed by a thinner compact clayey layer. This sequence was repeated five times before a thin, even mud surface was spread across the entire foundation trench and it is directly onto this surface that the temple walls were constructed (Figs 4.33–4.36). Once the walls had been completed, a further sequence of stone and silt layers was deposited inside them to raise up the interior level to what is thought to have been the floor of the Phase I temple. Outside the walls, the upper 50 cm of the foundation cut flares outwards and the resulting space between this and the outer face of the temple wall was filled with layers of silt or compact rubble.

Excavation below the base of the standing walls of the temple in Test Pit 5 during the 1999 season revealed the presence of an early phase (Phase I) that was not otherwise visible (Fig. 4.32). All that remains of the Phase I structure is a five or six course solid brick wall (1224) which sits directly on top of the mud surface on top of the foundation fills described above. During Phase I, the temple consisted of a large rectangular *garbhagriha* (2.7 m wide and 1.42 m deep) that was attached to an almost square *mandapa* (4.49 m wide and 4.08 m deep) which was open along most of its eastern face. The *garbhagriha* and the *mandapa* were connected by an opening 1.47 m wide. This opening, which is now completely buried, can be seen in Figs 4.37 and 4.38 underneath the Phase II walls. In the middle of it, a

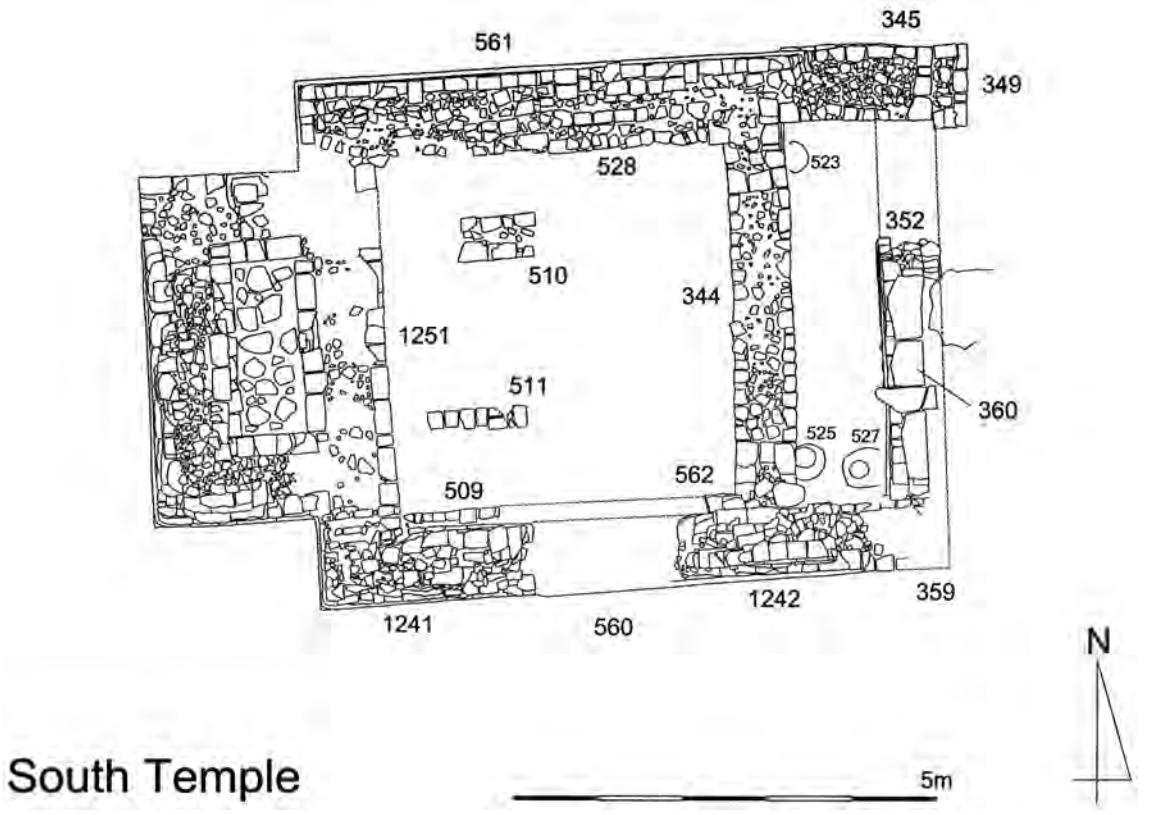


Fig. 4.30: Plan of the South Temple showing the location of the main walls.

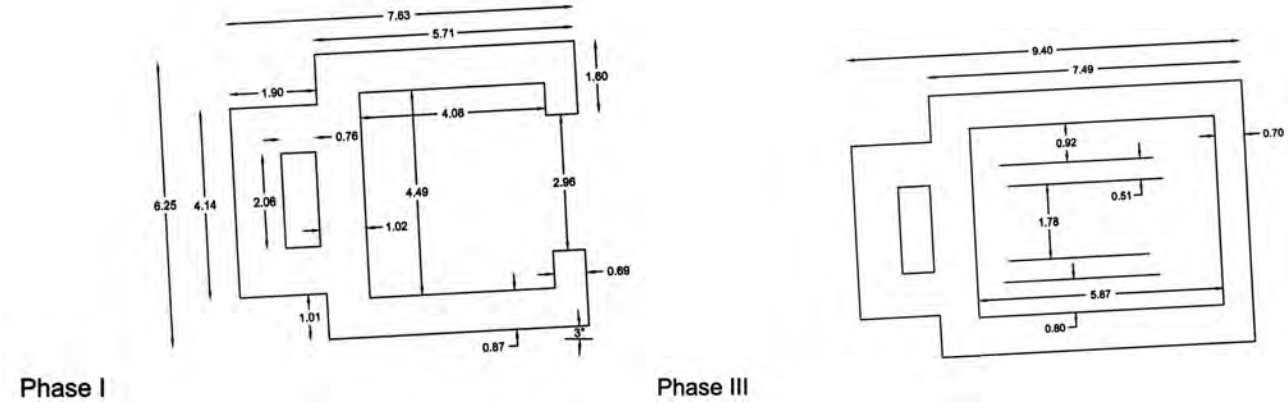


Fig. 4.31: Dimension plan of the South Temple.

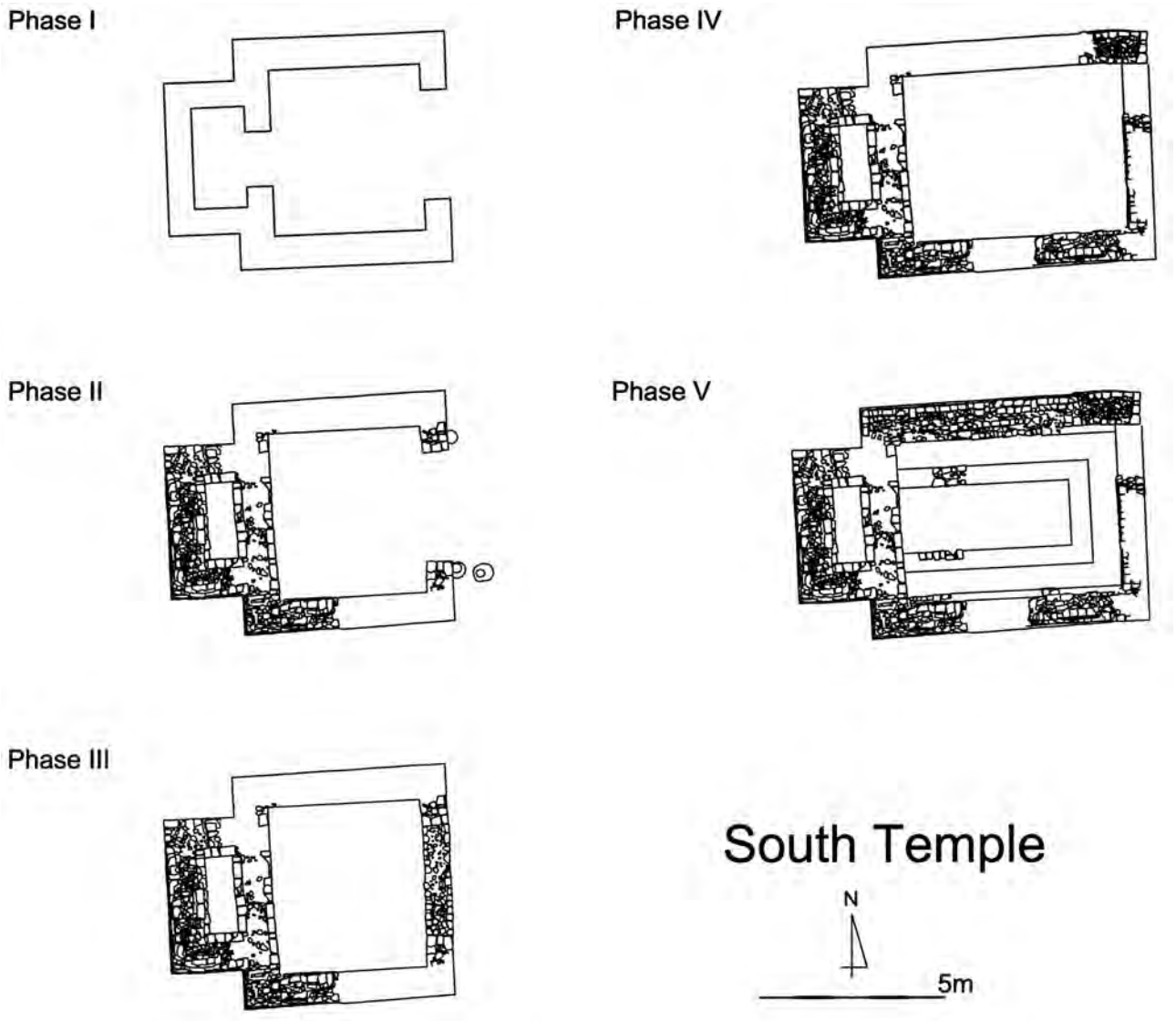


Fig. 4.32: Phases of the South Temple.

large, heavily vitrified brick is visible which may have been a step or part of a threshold between the two chambers. The layer underneath was probably the floor level related to this phase of the temple.

The brick masonry of the Phase I wall is similar to that of the later walls of the temple, and for the most part, the wall thickness is identical. In the area around the *garbhagriha*, the Phase I wall is, however, as much as 35 cm thinner than the later walls, which means that the interior space of the *garbhagriha* would have been up to 70 cm wider in Phase I than it was in Phase II. A section through these walls is shown in Figs 4.36 and 4.39.

It is important to note that Phase I is represented only by the foundation courses of the wall – absolutely no evidence of the superstructure remains. This is probably because the temple was completely rebuilt after this time, but it is not absolutely certain that a temple of this phase ever actually existed. There is a possibility that wall 1224 is simply the foundation course for the Phase II temple. This seems very unlikely, however, given the differences in plan between the structures of Phase I and those of Phase II, especially around the *garbhagriha*, unless the layout of the temple was changed halfway through construction. It seems most likely that the superstructure of the Phase I temple was completely dismantled before the Phase II temple was constructed.

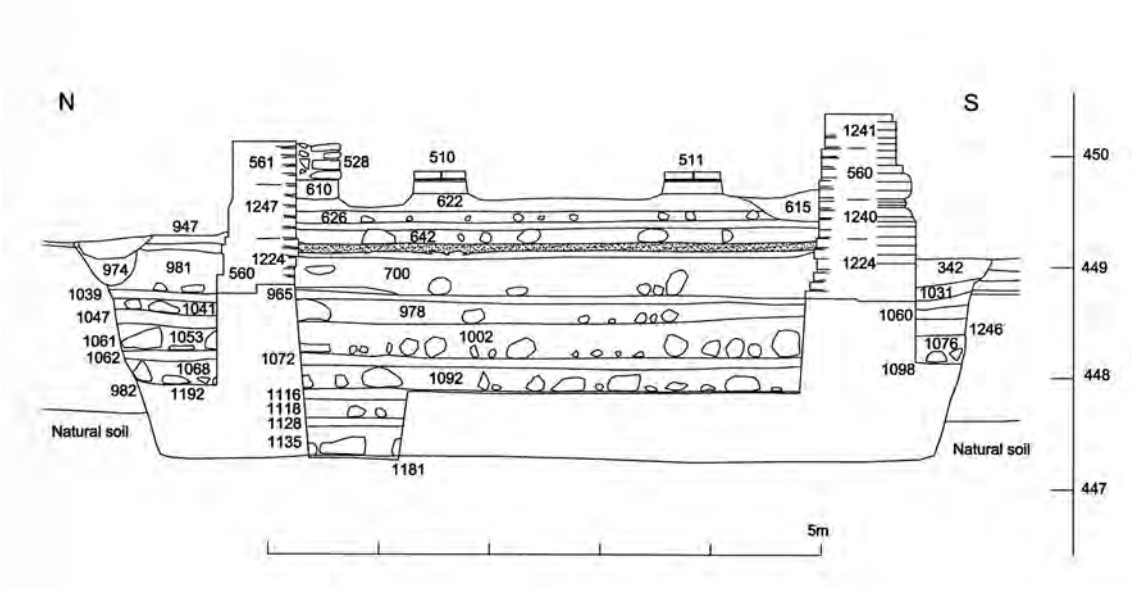


Fig. 4.33: West-facing composite section across the South Temple showing foundations.

Fig. 4.34: View of the eastern section of Test Pit 5 across the interior of the South Temple looking south-east showing the successive foundation fills.

Fig. 4.35: Interior of the South Temple during excavation of Test Pit 5 showing a level of foundation fill consisting of small boulders.

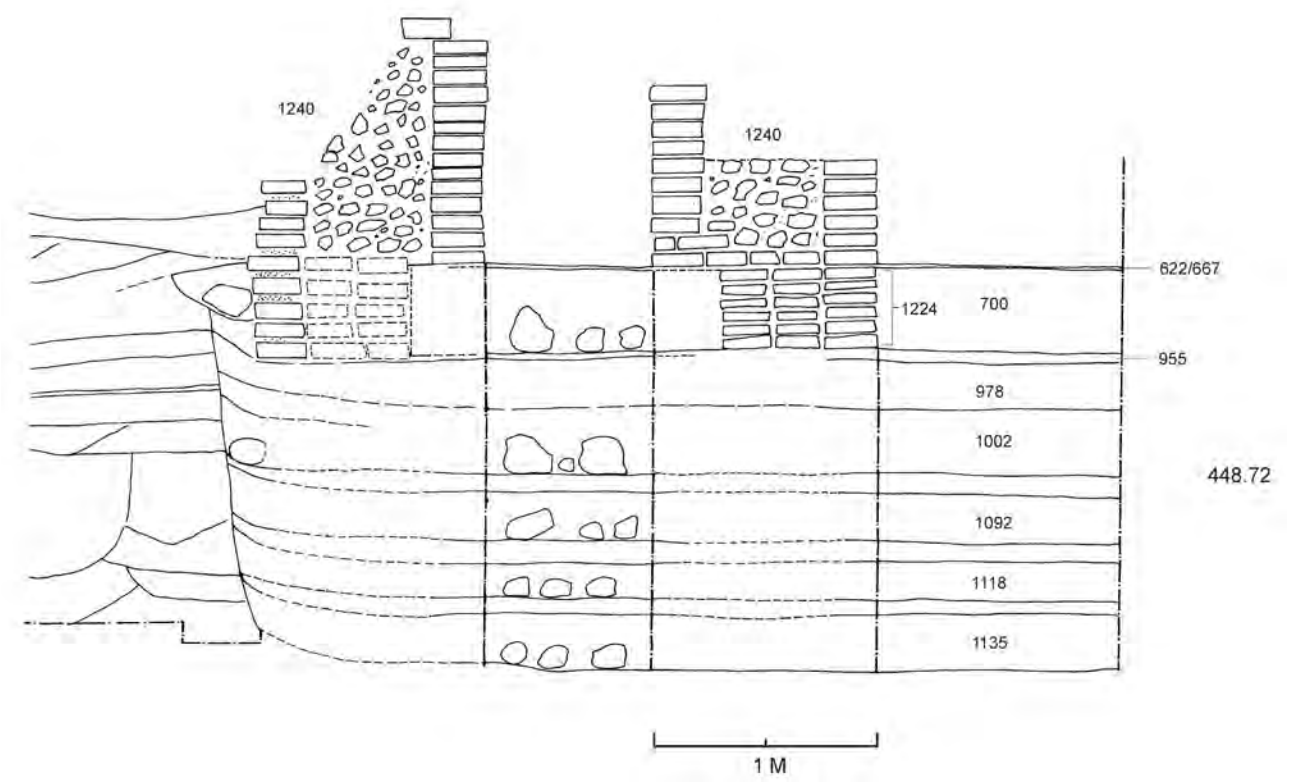


Fig. 4.36: Composite east-west section through the west end of the South Temple looking north.

Fig. 4.37: The wall between the *mandapa* and the *garbhagriha* in the South Temple looking west during the excavation of Test Pit 5. The Phase I gap in this wall can be clearly seen below the Phase II wall.

Phase II

Phase II of the South Temple consists of the reconstruction of the same temple on the foundation walls of the Phase I structure, but with some relatively minor changes to the layout.

Upon excavation, it became clear that the first four brick courses above foundation wall 1240 are built of a different masonry to the higher superstructure of the temple (Fig. 4.39). The lowest of these is a levelling course, using split or wedge-shaped bricks to create a level platform out of the Phase I wall. After the construction of the Phase II walls, the interior was raised using another sequence of silt/stone foundation layers similar to those described above, which was then capped by a floor, some 20 cm higher than the Phase I floor.

As has been mentioned above, the Phase II walls around the *garbhagriha* are as much as 35 cm thicker than the Phase I walls (Fig. 4.36). This caused the space within the *garbhagriha* to be considerably reduced during Phase II. In Phase I, there had also been a wide opening between the *garbhagriha* and the *mandapa*, but this opening may have been narrowed during Phase II by the construction of wall 1251, which probably supported the walls on either side of a doorway, but there is no trace of the doorway so it is impossible to know how wide the opening was during this phase.

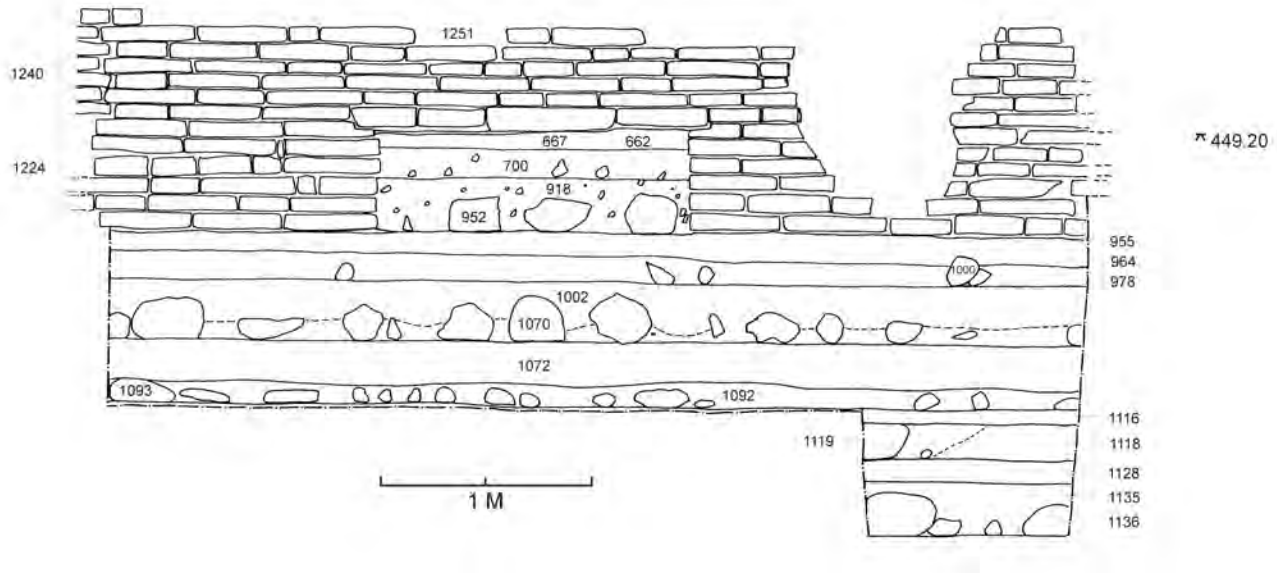


Fig. 4.38: Western section of Test Pit 5 across the South Temple in front of the wall between the *garbhagriha* and the *mandapa*.

Walls 1240/1247 and 1251 are crudely inter-bonded (Fig. 4.40), suggesting that the Phase II structure was built in stages, but it is difficult to establish exactly what the sequence was and why it should have been built in this way.

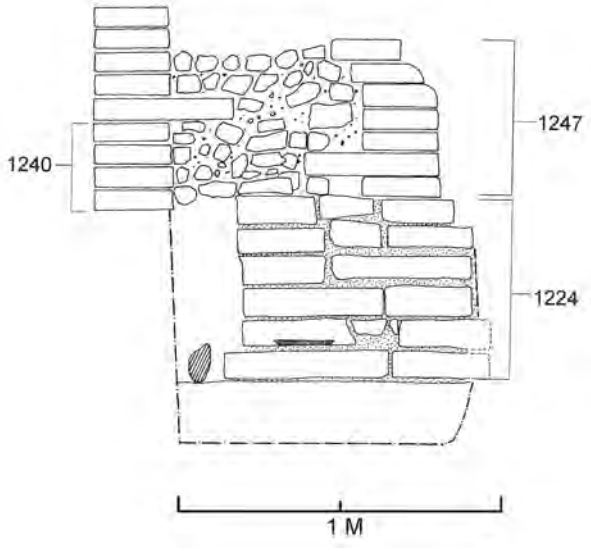


Fig. 4.39: Cross-section of walls 1247 and 1224 South Temple.

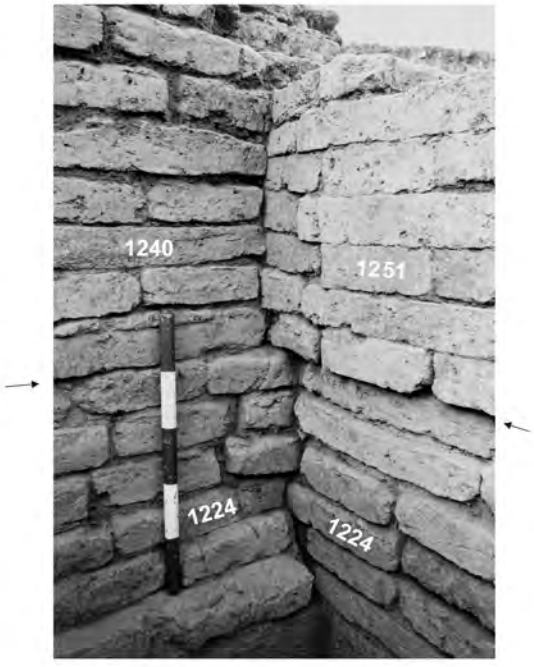


Fig. 4.40: View of the corner formed by walls 1240/1251 and 1224 in the southwest corner of Test Pit 5 looking southwest. The arrows show the boundaries between the upper and lower walls. The inter-bonding between walls 1240 and 1251 is clearly visible just to the right of the corner and the difference in the quality of the brickwork of the two walls is also clear.

That the Phase II temple was adorned with *adhisthana* mouldings is made clear by the fact that three courses of them are preserved on the south-east corner of the temple and for short sections on either side of the opening in the eastern face (Fig. 4.41). In the south-east corner, three remaining courses of the mouldings can be seen (Fig. 4.42). Here they are abutted and overlain by the mouldings of the Phase IV rebuilding of

the upper parts of the wall on this side of the temple. The Phase II mouldings ran around the corner onto the short walls on either side of the eastern face for about 111 cm (Fig. 4.43). There was then a 41-cm section of wall with no mouldings on either side of the entrance to the *mandapa*, which may have been left free for column bases to be placed against the wall. The mouldings appear to have had a very similar pattern to those of Phase IV, which are described in detail below.

Phase III

Phase III represents a relatively minor alteration to the Phase II temple. It involves the construction of a wall (344) across the eastern opening of the *mandapa*. This wall is of a much cruder construction than any that had been built up to this time in either of the two temples. It consists of two faces of brick bats rather than complete bricks, the space between them being filled with brick rubble and silt. The wall now survives to a height of four courses.

Fig. 4.41: Remains of mouldings in wall 1240 at the eastern end of the South Temple looking west.

The reason for the construction of this wall is not clear and, as will be noted below in the report on the eastern end of the South Temple (Section 2 below: EEST), neither is it absolutely clear to which phase it belongs. It may have been built to close off the wide eastern entrance to the *mandapa* completely, or as the foundation for a wall which included a narrower entranceway. No trace of any such entrance remains in the wall, however, so it is impossible to be certain of this or to have any idea how wide any such entrance may have been. The wall may not ever have been built beyond a few courses high and may have been intended only as a base to support a wooden screen or some such other arrangement for closing off the *mandapa* to the outside. This may explain its cruder construction style; alternatively, it may simply reflect the fact that it was built to less exacting standards.

It seems most likely that the wall was built before the eastern extension to the temple (Phase IV), and this is certainly what is indicated by the wall's stratigraphic relationship with compact silt surface 346 to its east (Section 2 below: EEST). It therefore seems sensible to include it as a separate phase in its own right, as it does reflect a significant re-design of the temple's layout.

During this phase, three post-holes were cut into the same silt surface 346 that abuts wall 344 outside the eastern end of the temple. These are numbered 358, 523 and 525. The two that have been excavated have revealed that they were the bases of posts measuring 20 to 25 cm across. It seems most likely that these were wooden posts, although there is no proof of this. Two of the posts were situated against the eastern face of the temple symmetrically on either side of the eastern opening to the *mandapa* and seem likely, therefore, to have been part of a wooden entrance or façade structure immediately in front of the temple. The third post is situated 70 cm or so in front of the temple to the south and it is not matched by another in a similar location to the north.

Fig. 4.42: View showing the eastern end of the south wall of the South Temple looking north (see Fig. 4.46 for a key to wall numbers).

By Phase III, the surface level of the building had clearly risen considerably since the time of the original construction, partly by natural accumulation and partly by deliberate raising. Surface 346, which was an external surface to the temple until it was enclosed by the Phase IV walls, is at a much higher level than the

surfaces outside the building that are assumed to be the original floor surfaces.

Phase IV

Of all the phases, Phase IV represents the most significant transformation of the South Temple's original plan. During this time, the temple was extended to the east by about 1.75 m, which involved the construction of extensions to the northern and southern walls of the *mandapa*, as well as a new eastern wall. It also appears to have involved reconstruction of substantial parts of the upper walls of much of the temple.

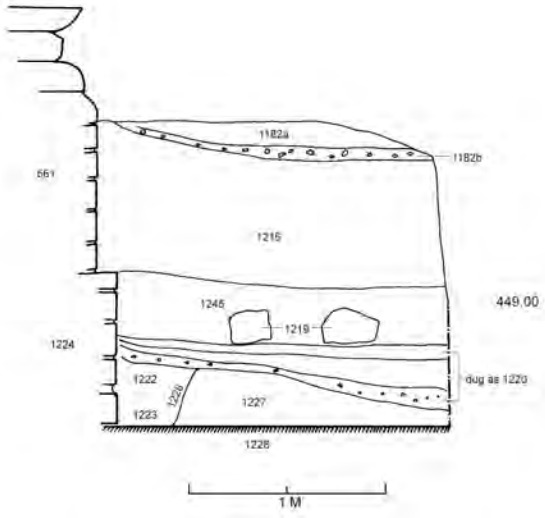


Fig. 4.43: South-facing section of Test Pit 8 showing the sequence of floors that abut the eastern face of the Phase I – III walls of the South Temple.

The three new walls to the east (345, 359 and 352) are all of roughly similar construction (Fig. 4.30). Although little is preserved of walls 345 and 352, it can be seen that the lower five courses are faced with crudely jointed brick bats above which the upper courses are of a much better construction with finer joins. Only wall 359 on the south side is preserved to any height; here, the lower courses are again crude and badly jointed, but those of the upper courses are finer and continue the Phase II mouldings. As can be seen in Fig. 4.42, wall 359 abuts wall 1247 of Phase II. However, the abutment does not continue above the chamfered course of the mouldings, which indicates that the whole of the wall was reconstructed from above this level after the construction of wall 359. This upper wall is labelled 560 in order to distinguish it stratigraphically. Although it is impossible to be certain, it seems most likely that this reconstruction happened at the same time as the Phase IV extension, although it could in fact have happened at any time thereafter. The most likely scenario seems to be that, at this time, the whole temple, or large parts of it, was dismantled down to about the height of the chamfered course of the mouldings. The three new extension walls were then built to the same height as the standing bases of the Phase II walls, and then the whole of the temple superstructure was rebuilt on top of this base (Fig. 4.44).

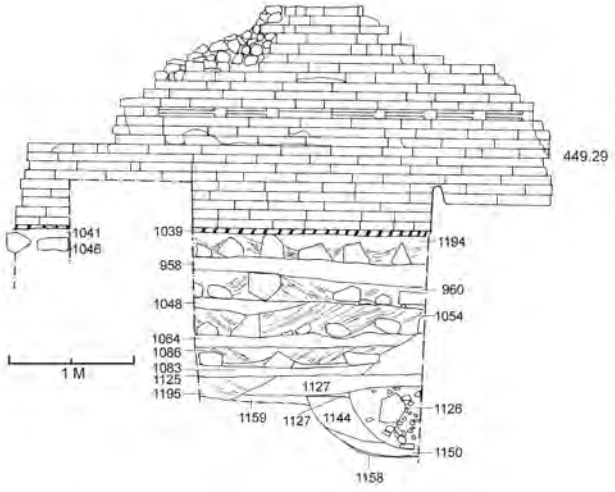


Fig. 4.44: Elevation of the western wall of the South Temple above the eastern section of Test Pit 1 showing the fills of the temple foundations.

Phase IV involved no discernible changes to the plan or size of the *garbhagriha*, but the shape and size of the *mandapa* were quite different. It now became a rectangle 4.49 m north-south by 5.87 m east-west. There is no trace or indication of the location or size of the entrance to the temple in the remains of wall 352, but the absence of any entrance in the north and south walls demonstrates that the entrance continued to be from the east, as may have been expected. The extension increased the internal space of the *mandapa* from 18.3 m^2 to 26.3 m^2. Why this was done is unknown, but it may be that much of the temple superstructure was in need of repair at this time and the extension was only a part of a bigger project of repair and rebuilding.

By Phase IV, the floor levels of the temple had once again risen, partly through natural accumulation and partly deliberately. This makes it likely that the remains of the Phase III wall 344 would already have been buried during Phase IV and would no longer

have been visible within the temple. A small section of brick-bat flooring (353) is preserved to the eastern side of wall 352, and this may indicate the floor level of Phase IV, although it may also be somewhat later. Wall 352 was much later robbed out along its northern half, revealing details of construction and foundation (Fig. 4.45).

Fig. 4.45: The robbed-out wall 352 at the east end of the South Temple looking south.

Adhisthana mouldings

The earliest extant *adhisthana* mouldings on the exterior of the temple walls belong to Phase II. It is unknown whether or not the Phase I structure was adorned with them as nothing survives of the superstructure of this phase. However, only the lowest three courses of the chamfered bricks of the Phase II mouldings are preserved below the Phase IV rebuilding mentioned above, whereas the whole of the Phase IV mouldings are still extant (Fig. 4.42). It is also clear, as has been stated above, that the mouldings on the western and southern walls of the temple are most likely to date to the time of the Phase-IV extension and rebuilding (Fig. 4.18C and D). This is confirmed by the fact that the character of the brick masonry changes notably above the first inter-bonded course between the Phase II walls and the Phase IV extension. So far as it is possible to be certain, the Phase II and Phase IV mouldings were identical, with only one minor difference that will be described below.

The first 10 courses below the Phase IV mouldings have a Header-Stretcher-Stretcher-Header pattern which is varied at the corners, then, from the 11th course, the moulding consists of two courses of bricks with a single chamfer or curve on their upper edge, followed by one slightly recessed course with a double chamfer (one on the top and one on the bottom edge), above which is a three-course curved moulding (Figs 4.18D, 4.42 and 4.46). Above this, the wall is badly eroded but there are some indications that further mouldings were present.

It should be noted that the double chamfered bricks of the Phase II walls have a particular feature that is not present in the Phase IV mouldings. At one end of each brick, a short 9-cm section has been left unchamfered (Fig. 4.18D). This end is always laid towards the south on the west face and towards the east on the south face. These bricks have the appearance of a simple fluted pilaster with a square base laid on its side. The equivalent bricks of the Phase IV mouldings are chamfered along their whole length.

The mouldings are very similar to the small section of moulding preserved in Phase III of the North Temple (wall 514), with only a few minor differences.

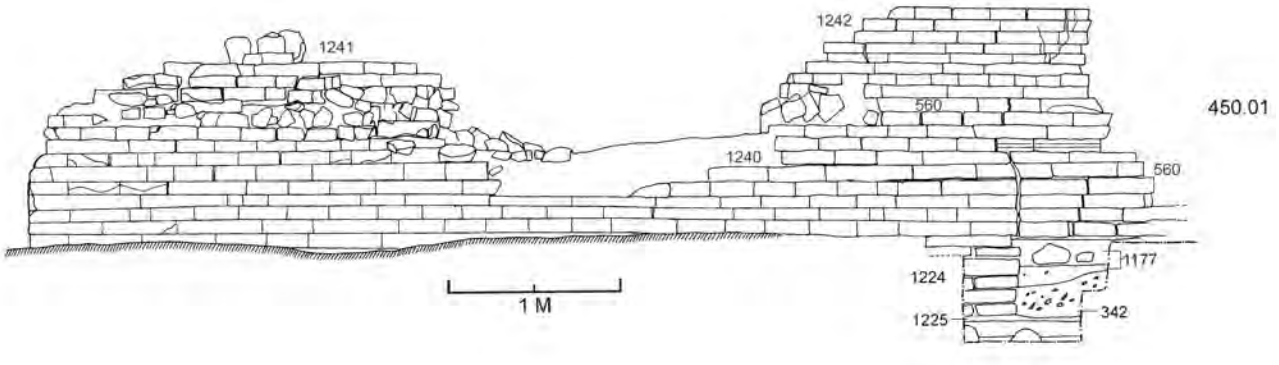


Fig. 4.46: Elevation of the southern face of the southern wall of the South Temple (wall 560).

Phase V

There are four walls inside the *mandapa* of the South Temple which all appear to belong to a final phase of internal re-organization. These consist of two fragmentary parallel internal walls (510 and 511), which divided the *mandapa* into three aisles, and an interior thickening of both the southern and the northern walls (509/562 on the south side and 528 on the north). These latter walls are each one-brick thick and the space between them and the original temple walls is filled with silt. Wall 562 seems to have been inter-bonded with the upper courses of the Phase IV wall 359, but the two walls are unlikely to be contemporary. The relationship between the Phase IV North Temple wall and Phase V wall 528 is not clear as the upper parts of the north wall have been reconstructed. The Phase V walls are of very poor construction and preservation: only one or two courses of each of them have been preserved. They are all built on rather shallow and crude foundations of clay and stone.

As can be seen in Fig. 4.33, all of these walls were constructed from around the same floor level and they appear to have been part of a crude re-organization of the internal space of the *mandapa* during the last period of the temple's use. It is not clear how far 510 and 511 originally extended to the east; in the reconstruction (Fig. 4.32), they are shown as forming an internal unit similar to wall 558 in Phase IV of the North Temple, but this is purely speculative based on comparison with the North Temple.

It is possible that Phase V should also include the later rebuilding of the upper courses of the external walls of the temple (561, 1241, 1242; see below), but this seems unlikely because a very different type of brick was used in these rebuildings, which have therefore been included in the next section 'Later use and robbing'.

It should be stressed that there is no stratigraphic evidence which proves that the Phase V walls are later than the Phase IV extension. Indeed, it should be noted that the internal thickening of the north and south walls (509/562 and 528) does not, at present, extend further east than the eastern end of the Phase III structure. This may be an accident of survival, as seems most likely, but it is nonetheless possible that Phase V is actually an internal re-organization of the Phase III structure and that it preceded the Phase IV extension. If this were the case, then walls 510/511 obviously would not have extended so far to the east as they are shown on the reconstruction. There is, unfortunately, no way of verifying the sequence and the order given here is based on relative floor levels and comparative quality of construction.

Later use and robbing

After Phase V, a number of minor changes and additions were made, before the temple finally fell into disrepair and was robbed of its building materials, buried and damaged by later construction activity on the site. As has already been stated, the latest phases of the temple's use are the least well understood because the related stratigraphic layers were largely removed by Yusuf's excavations in 1937.

There is evidence that substantial parts of the temple superstructure were rebuilt once again after the Phase IV rebuilding. The upper courses of the north wall (561) and the surviving upper parts the south wall (1241, 1242) are made of a very different type of brick to that used in earlier phases. These are 'purple' highly fired bricks of a notably smaller size than those used elsewhere in the building. They measure 6/7 × 17 × 27 cm and they are often so highly fired that they show signs of vitrification on the surface. Similar bricks, although of a slightly different size, were used in the latest rebuilding of the North Temple *garbhagriha* (wall 971). This late rebuilding of the north wall of the South Temple is interesting as it has a very simple type of moulding consisting of one brick with a deeply chamfered upper edge inset by about 4.5 cm, five courses above which there is a further 2 cm recess. This 'moulding' continues over the abutment between walls 560 and 345, thus proving that it occurred later than the Phase IV extension. The simple moulding seems to have been intended as a crude imitation of the original Phase II/IV mouldings, which are found at the same height on the other walls of the temple. From a photograph published by Yusuf (1939: pl. XVIIa), it is clear that this wall stood much higher at that time and had at least two more offsets in upper courses, which have collapsed or been removed since 1937.

It is impossible to suggest a date for this late rebuilding. So far as it is possible to tell, it did not involve any change in the plan of the temple, and it has not therefore been allocated a separate phase number. As was mentioned above, it is possible that the rebuilding is contemporary with the internal changes of Phase V, although this seems unlikely as the bricks used in the Phase V walls are of a completely different type.

As is described below in more detail, excavation at the eastern end of the South Temple (Section 2 below: EEST) revealed a number of features that provide some brief insights into further changes that took place during the very latest phases of the temple's life. They include a crude wall built of large architectural stone fragments on top of the Phase IV eastern wall 352. In addition, wall 349 is abutted to the east by a now fragmentary silt and brick-bat alignment (354) that once continued to the north and which may indicate that the South Temple was once incorporated into a larger architectural complex. There is also a group of large flat stones to the east of wall 352, which continue beyond the edge of the trench. The use or re-use of stone is important, as stone was not used as a building material in any of the temple's earlier phases. Where the re-used architectural fragments noted above came from is unknown, but it is possible that the two brick temples described here were in fact part of a larger temple complex, the rest of which still lies buried in the vicinity.

Once the temple had fallen out of use and been buried, occupation returned to the area in the form of large post-Medieval town houses, the fragmentary remains of which can be seen across the area today. The construction of these substantial houses involved the excavation of deep foundation trenches that caused a lot of damage to underlying archaeological layers.

The possible boundary wall

In the area to the south and west of the temples some rather fragmentary evidence has come to light of a possible stone boundary wall or walls that may have been built to surround the two temples at a late date (see Section 2 below: South Area and W Area; and context numbers 691, 699/578, 688, 671, 616, 903, 617) (Fig. 4.47). The evidence for the presence of walls is strong, but given the little that remains, the function of the walls, their date and the full plan of any complex that they may have been a part of are purely speculative. Fig. 4.48 shows these walls and gives some idea of their layout so far as it is known, but it should be remembered that these are badly disturbed levels where preservation is poor. It should also be noted that excavation to the north and east was not possible due to the limits of Yusuf's trench, and it is therefore quite possible that similar walls also existed on the other side of the two-temple complex but that they have not come to light. The walls that have been excavated clearly extend beyond the limits of the present excavation.

Fig. 4.47: Foundations of the Early Medieval perimeter wall 699 in the South Area of Trench A looking north. The stones of wall 691 are visible immediately to the west. At the top of the photograph, the foundations of 699 turn to butt the south-west corner of the South Temple.

These walls were constructed at least partly of stone, or so it seems, and they are obviously quite crude – they are not straight or regular and they have clearly not been carefully planned. They give the impression of a rather piecemeal construction. They were probably constructed very late in the temples' history and, if they did form a boundary to the complex, they may reflect some important changes in the way that the temples were used and considered.

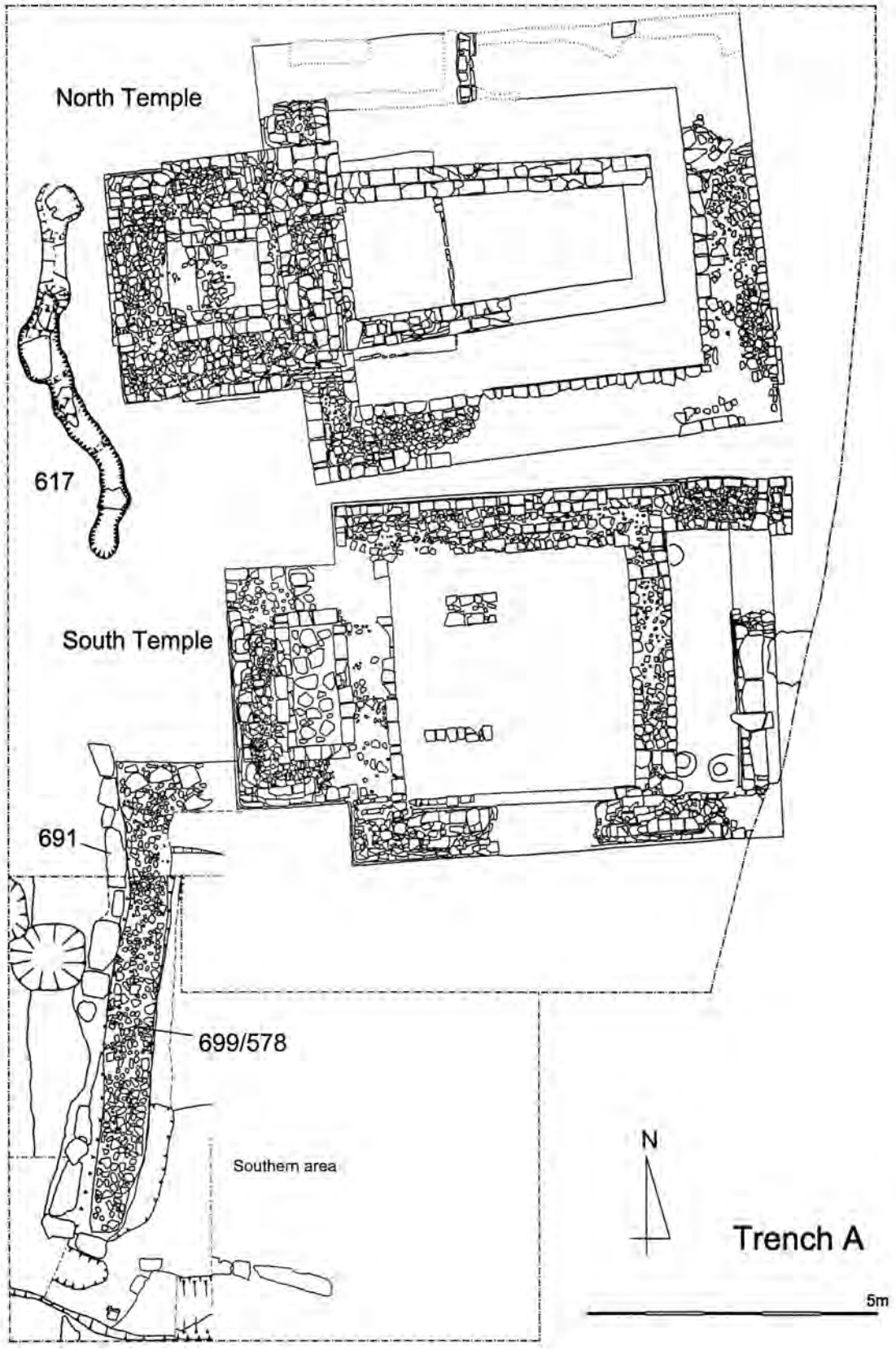


Fig. 4.48: Trench A showing the remains of the possible late enclosure walls 578/699 and 691 and associated features to the south of the South Temple and feature 617 to the west of the North Temple.

General discussion

Although no inscriptions or images were found directly in association with the two temples, either by the present excavations or by Yusuf, it seems fairly certain from their design and development that these are 'Early Hindu' temples – a term that is used with recognition of the associated terminological problems (see Flood 2003 for a discussion).

Having said this, a fragmentary stone sculpture of a female was found in Trench B, some 70 m to the south of Trench A, and the Balasaheb Patil Government Museum at Paithan contains a number of terracotta, kaolin and stone figurines that apparently come from Paithan, although it is not known exactly whereabouts they were found. These are illustrated in Chapter 8 (Figs 8.17 and 8.18) and Chapter 11 (Figs 11.6 and 11.7) and further discussed in Chapter 14.

Construction

Both of the temples are constructed entirely from fired brick and silt. Silt was used for the pointing of the bricks and there is no evidence for the use of lime mortar before the 1967 restoration. The only stone used was in the foundation deposits and in what are certainly later additions and alterations to the temples, such as some of the walls at the east end of the South Temple (EEST) and the possible boundary walls. The quality of the brickwork and jointing varied at different periods; the finest jointing is probably to be seen in the middle phases of the temples' lives, with the earlier and later work being of a lower quality. The crudest construction certainly occurred towards the end of the temples' lives in the later rebuildings and alterations, such as Phase V of the South Temple and Phase V of the North Temple, of which relatively little evidence remains. The size and type of bricks varied throughout the period that the temples were in use. The earliest bricks were smaller than those used in the middle period of the temples' lives, whilst the latest bricks used for rebuilding were not only the smallest used in the structures but also the highest fired. This subject of brick sizes is dealt with in more detail below as it is key to the linking of the phasing of the two structures.

There is no clear evidence to indicate how the temples were roofed. Some fragments of tiles were retrieved here and there during the excavation, but it seems likely that these were used for flooring rather than roofing as the quantity is so low. Had the temples been roofed by tile, a very large quantity of tile would have been expected.

Foundations

One of the most interesting insights into the construction of the temples that was discovered during the excavations relates to the foundations. In both temples it seems that the foundations are much more substantial than would be structurally required for brick buildings of this size. As has been stated, they consist of massive, vertically sided rectangular pits, in each case slightly larger than the temple (Fig. 4.49). The foundation pits are 2 m deep and are cut down into virgin soil. The foundation pits have been carefully back-filled with successive layers of boulders (up to about 30 cm) and silt, alternating with layers

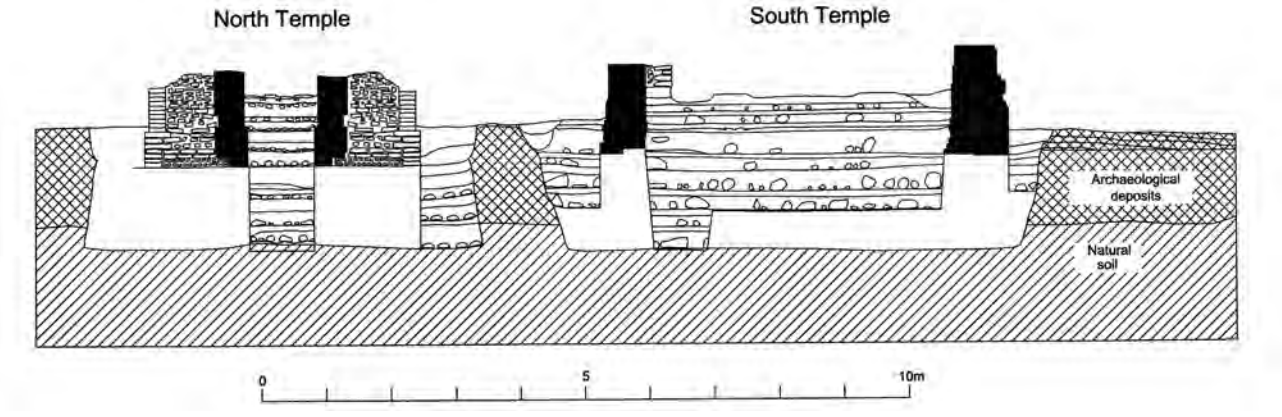


Fig. 4.49: A composite section through the two temples and their foundations.

of compact silt. This sequence of layers was repeated five times before the walls were constructed on the uppermost level of compact silt. After the construction of the walls, a further sequence of slightly thinner layers of boulders and silt was deposited within the temple before the floors were laid. Judging by the finds contained within the silt layers, the silt was dug from nearby on the site and incorporates residual artefacts such as pottery, bone and other materials that are commonplace in all soil at Paithan.

There are slight differences between the nature of the foundations of the North and South Temples. The stones used in the North Temple are smaller and more angular, and the silt surrounding them seems to be less compact and less pure than that used in the South Temple.

It seems certain that the rationale behind these very substantial foundations was sacred rather than structural. Indeed, it will be seen that the Paithan foundations follow the Brahminical literature precisely in all aspects. It is worth citing Kramrisch's translation of the relevant source to demonstrate this:

> *in extent the foundation pit is coterminous with the boundaries of the Prasada; in depth it is equal to the height of man standing with raised arms, or it is dug to the rock-bottom or until gravel is reached or the water level according to the geographical conditions of the site. After the pit is dug, it should be filled with pure earth, eight finger widths (angula) high; on this layer another one is placed, one cubit in height and composed of layers of strong stones each embedded in wet earth and separated one from the other by sand and earth; when the foundation has been laid so far, it is moistened with water, trodden by elephants, and levelled with heavy wooden stampers. On top of this, it is firmly packed and when one fourth of the pit remains the first bricks are laid.*
>
> (Kramrisch 1946, I: 105).

This passage is from the *Isanasivagurudevapaddhati* (vol. III). This is a *Paddhati*, or a ritual compendium in which all sorts of rituals are systematically treated and which is partly based on earlier texts such as *Agamas*. These *Paddhatis* served as handbooks for priests in the first place, but not so much for architects. They became popular from the 11th century onwards and the *Paddhati* at issue is probably dated to the 12th century and was probably written in South India.

There is a remarkable correspondence between the details given in this text and the foundations of the Paithan temples, even down to the proportions and heights given. Not only does this text therefore help to explain the complex nature of the Paithan foundations, but it also offers incontrovertible proof that the traditions that it sets out are clearly much older than the actual text itself. The text also suggests that there is significance in the fact the Paithan foundations are cut down to natural soil, thereby reaching pure earth uncontaminated with human artefacts.

This is not the first time that such elaborate, ritual foundations have been reported from the excavation of a temple in India. I. K. Sarma recorded similar foundation deposits below the Chalukyan Sangameshvara temple and Papanasi group of temples in Alampur district, Andhra Pradesh (Sarma 1993: 356–361) and similar foundations have also been reported, more recently, underneath a Rashtrakuta Jaina temple at Pattadakal in Karnataka (Venkateshaiah *et al*. 2006: 337–340). A search through the archaeological literature, however, also reveals that a less elaborate but otherwise very similar foundation technique had been used for domestic structures in the north-western Deccan since at least Early Historic times. For example at Brahmagiri (Kolhapur), the following description is given of the foundations of domestic structures of the Early Historic period.

> *Two or more sides of a house were raised on a foundation prepared by embedding large pebbles, in two layers at least, of sticky clay. The latter was either regur or brownish river mud. It has not been possible to ascertain whether these foundations were made by cutting a trench in the earth. Over these clay and pebble bases the brick walls were erected. In order to strengthen the building, and to have a hard level surface, the intervening space, between the four walls, was at times covered with roughly dressed stone slabs, and the whole filled up with layers of sticky clay, mixed with lumps of laterite up to a height of three to four feet above the foundation.*
>
> *It appears that this method of preparing the foundation was purely a local feature, and probably confined to the riverine tracts of the Deccan.*
>
> (Sankalia and Dikshit 1952: 135).

Sankalia and Dikshit then go on to describe a few similar types of foundations from other parts of India, such as Bihar, where slightly different materials were used but the concept was the same (Sankalia and Dikshit 1952: 135–137).

At Bhokardan a similar type of foundation was described for a platform structure of the Early Historic period:

> *Here was noticed a big platform paved with rubble rammed in black earth ... It consisted of 3 layers of rubble interspaced with black earth, the third layer of rubbles being comparatively of bigger size than those on the surface.*
>
> (Deo and Gupte 1974: 13).

And finally at Nevasa, 'elaborate foundations' are mentioned, again for domestic structures of the Early Historic period. These were much shallower than those brought to light at Paithan, but the concept is identical:

> *The foundation for these structures varied in depth between 1 ft. 7 in. and 1 ft. 2 in. The first course consisted of black sticky clay of a thickness of 4 in. to 7 in. Over this came the second course comprising undressed stones which were capped with black clay. The thickness of the latter was so adjusted as to present a level surface for laying the bricks.*
>
> (Sankalia *et al.* 1960: 53).

The evidence from these three sites suggests very strongly that the method of foundations used in the Paithan temples is a sacred elaboration of a domestic tradition that has been prevalent in this part of the Deccan since at least the Early Historic period. The fact that the foundation technique is so accurately described by the *Isanasivagurudevapaddhati* suggests that the rituals of temple construction as set out in the Brahminical literature are probably sacred formalisations of much older domestic construction techniques that, in this case at least, may have had a quite specific geographical origin. This is a potentially useful insight into how, and perhaps where, some of the Brahminical rules related to temple construction were developed.

At the same time, it should be noted that the more or less contemporary Gupta brick temples excavated at Bhitari appear to have quite different foundations. Temple 1 at Bhitari is partly constructed on a raised plinth created by a grid of brick walls, the spaces between the walls are filled with 60 cm of compact clay, whilst other parts of the temple have a foundation of eight courses of brick sunk into natural soil (Jayaswal 2001: 50, 73). The foundations of Structure 1 of Temple 2 at Bhitari, which shares close structural parallels with Phase II of the North Temple at Paithan, were not fully explored, however. It can be seen from Fig. 14 in the Bhitari publication (Jayaswal 2001: 84) that there is a foundation cut for the *trirathа* plan sanctum which cuts two layers, but unfortunately, it seems that excavation was not continued to a sufficient depth to ascertain whether or not the foundations are similar to those at Paithan.

Two further points need to be made in relation to the temple foundations. Firstly, no evidence of ritual offering was found beneath the *garbhagriha* of either temple, despite the fact that they were both completely excavated. Secondly, an examination of the section from Test Pit 3 shows that the top of the foundation cuts widen out quite markedly and this suggests that they may have been re-cut at a later date, perhaps in order to repair and re-point the lower part of the walls (Fig. 4.50). This is quite a common phenomenon, which unfortunately makes it impossible to establish from which level the original cuts were made. It will have been noted, however, that exactly the same form and depth of re-cut are a uniform feature of all of the foundation cuts on all sides of both temples; this suggests that these widenings might actually be part of the original foundation cuts.

The dating of the temples

Relative chronology

Both temples underwent five separate phases of development. Although the absolute dating evidence for these developments is still rather limited, it is possible to set out a relative chronology based on some aspects of the construction.

It has been noted above that the first three phases of the North Temple are built of bricks measuring 7 × 25 × 40 cm, but Phase IV was constructed of larger bricks measuring 6.5 × 26 × 42/43 cm. The larger sized bricks were also used to construct Phase I of the South Temple and all later phases of that temple. This suggests that Phase I of the South Temple was constructed later than Phase III of the North Temple, after the introduction of a larger brick size.

Brick sizes do not indicate whether Phase IV of the North Temple was built before or after Phase I of the South Temple. However, the walls dividing the interior of the *mandapa* in Phase IV of the North Temple are very similar to those of Phase V of the South Temple and are therefore likely to have been roughly contemporary. In addition, the *adhisthana* mouldings of Phase III of the North Temple are very similar to the mouldings of Phase IV of the South Temple, but it is possible that Phases I to III of the South Temple had similar mouldings. Based on these observations, a relative chronology has been set out in Table 4.2.

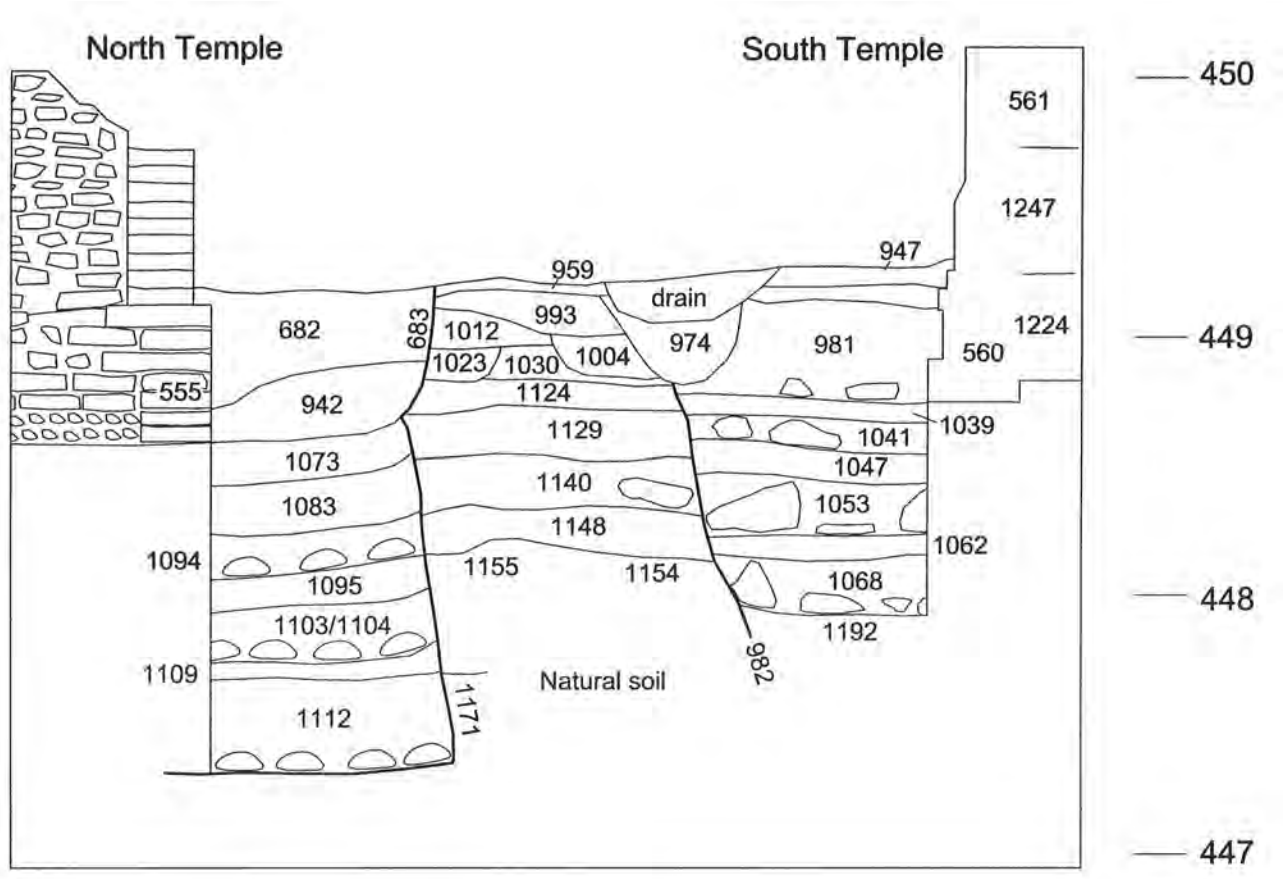


Fig. 4.50: West-facing section of Test Pit 3 showing the foundation cuts for both buildings.

Table 4.2: The proposed relative and absolute chronology of the two temples.

Phase	Development	Proposed date
North Temple Phase I	Simple shrine	5th century or earlier
North Temple Phase II	*Shikhara* construction	Mid–5th century
North Temple Phase III	*Mandapa* and *adhisthana* mouldings	Late 6th or early 7th century or later
South Temple Phase I	Change in brick size	7th century or later
South Temple Phase II		
South Temple Phase III		
South Temple Phase IV		
North Temple Phase IV and South Temple Phase V	Interior walls subdivide *mandapa* in both temples	
North Temple Phase V		
Abandonment		Later than the 8th century

This sequence is supported by the admittedly uncertain evidence from the test pits where it was shown to be most likely that the South Temple was built after the construction of Phase I of the North Temple. In Test Pit 3, to judge by the height of the Phase I wall and the level from which it was constructed, layers above 1129 or 1124 (probably including the latter) very possibly accumulated between the construction of the North

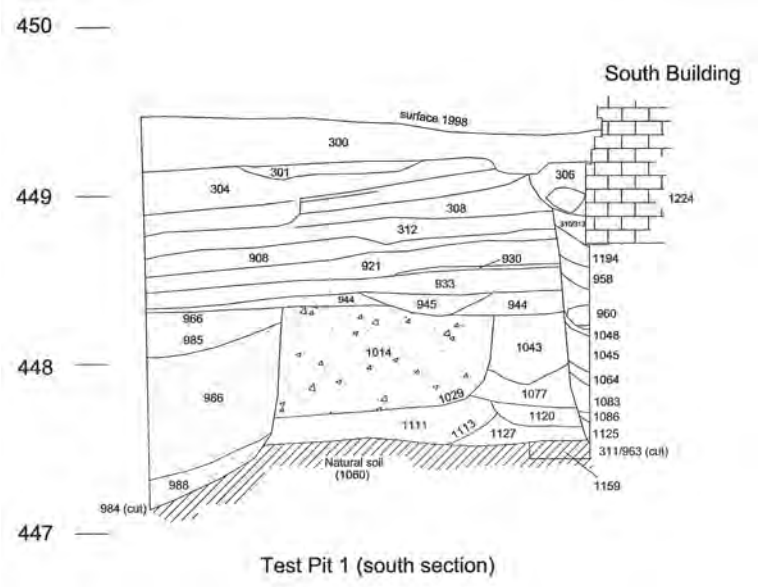


Fig. 4.51: South-facing section of Test Pit 1, Trench A, showing the foundation cut for the South Temple.

and South Temples, but there is no way of being absolutely certain of this. Unfortunately, the stratigraphy is not well enough preserved to contribute very much more to our understanding of the relative chronology of the two temples. It can, however, provide something of a broader context for the construction of the temples at this location. Test Pits 1 and 3 both revealed sections through the pre-temple deposits in the area of Trench A (see Section 2 below). These deposits were about 1.5 m deep (Fig. 4.51) and can be subdivided into two broad phases; the first deposits tend to be rich in brick rubble and other debris from construction or demolition activity. Above this, the deposits become silty and contain pottery and bone but little building material. Above these deposits, the temples were built. This evidence suggests that, although there was other building activity going on not far away, the temples are the earliest substantial constructions at this precise location. The silty deposits suggest a period of time when the area was a weed-covered dump close to a larger settlement immediately before the temples were built.

Absolute chronology

The absolute chronology of these structures and their sub-phases is problematic because almost all of the associated stratigraphic levels were removed without record by Yusuf's excavations, especially the stratigraphic connection between the excavation of the foundation cut for the temples and the surrounding pre-temple deposits.

At the very broadest level, the structures can be dated between the 4th/5th and the 8th centuries AD, during which time the architectural form of the Hindu temple emerged, but a more accurate chronology of the individual phases is required in order to situate their development within an historical context. This can only be achieved through parallels between architectural elements of the Paithan temples and dated buildings elsewhere. There are four stages in the development of the two temples for which such parallels can be proposed:

1. The recess in the wall of Phase I of the North Temple appears to be a very early form of plinth moulding that can be compared to the deep recesses in the mouldings of the Rudra-Narasimha, Bhogarama and Kevala-Narasimha temples at Ramtek, the latter of which is dated to the 5th century by an inscription (Fig. 4.52) (Meister *et al*. 1988: 66–70). A similar recess is also present in the earliest phase of the Kapoteshvara temple at Chejerla (Fig. 4.53), which I. K. Sarma has dated to between the 2nd and the 4th century AD, although he does not specify the evidence for this (1982: 138–139). The extreme simplicity of the Paithan moulding might suggest that Phase I of the North Temple should be dated to the early 5th century AD, or possibly somewhat earlier.

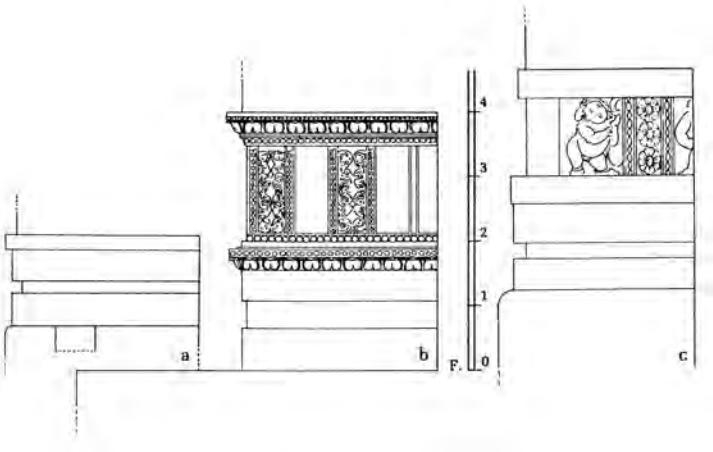


Fig. 4.52: Plinth mouldings from Ramtek: (a) Rudra-Narasimha temple; (b) Kevla-Narasimha temple; (c) Bhogarama temple (after Meister *et al.* 1988: fig. 40).

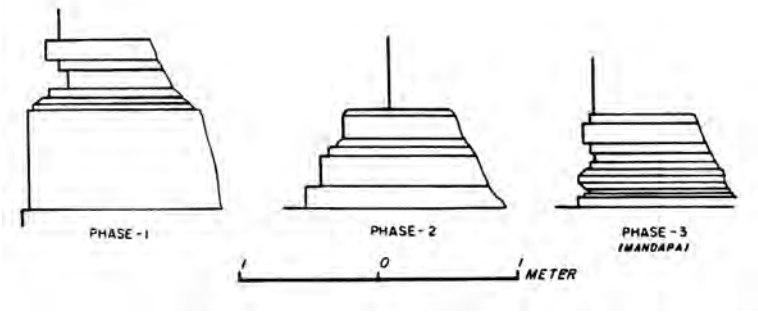


Fig. 4.53: Plinth mouldings on the main temple at Chejerla (from Sarma 1982: fig. 18).

2. The thickened walls of Phase II of the North Temple were clearly intended to support a *shikhara* over the *garbhagriha*. It has been suggested that the construction of *shikharas* is a stage of Gupta temple development that can be dated to the second half of the 5th century on the basis of parallels with Bhitargaon, Deogarh and the brick temple at Bodhgaya (Meister *et al*. 1988: 23). The *triratha* plan of Phase II of the North Temple is also closely comparable to Structure 1 of Temple 2 at Bhitari, which has been dated to the second half of the 5th century AD on the basis of similarities with the Parvati Temple of Nachana, as well as the re-use of broken bricks that, it is thought, were left over from the construction of nearby Temple 1 in the first half of the 5th century AD (Jayaswal 2001: 125–127).
3. The *adhisthana* mouldings in the walls of North Phase III and South Phases II to IV are quite sophisticated. In North India, the rounded *kumuda* (or *kalasa*) commonly occurs on structures dated towards the end of the 5th century AD or later, such as Nachana, Bhumara, Sakor, Elephanta Cave 1 and the stupa in Ajanta Cave 26 (Meister *et al*. 1988: 39–40, 52–54, 74–75, 90–91), whilst it does not appear to occur on structures built earlier than about 475 AD such as Bhitargaon, Kunda, Tigawa, Bhitari and Darra (Meister *et al*. 1988: 30–32, 35–37). This, however, serves only as a *terminus post quem* for the construction of the *mandapa* walls – the Paithan mouldings could have been built considerably later, because similar rounded *kumudas* continued to be built for some centuries. It is difficult to date the Paithan mouldings more accurately than this as the detailed scheme of development of *adhisthana* mouldings has not yet been fully elucidated in North India. Similar mouldings are known from the third stage of the Kapotesvara temple at Chejerla in Andhra Pradesh, where a date in the 7th century AD has been suggested, although there is no independent evidence for this (Longhurst 1917–1918). Similar mouldings

also can be seen on the pedestal in the sanctum of the Trivikrama temple at Ter, the precise date of which is also unknown (Mate 1957).

4. A date for the addition of a *mandapa* to the *mul-aprasada* in Phase III of the North Temple can also be suggested. It could be said that the earliest known *mandapas* are the *gudhamandapas* on the Rudra-Narasimha and Kevala-Narasimha temples at Ramtek, but these are quite particular, as they are part of the same structure as the *sandhara garbhagriha,* and can therefore be ignored as relevant parallels. The first *mandapas* that resemble Phase III of the North Temple at Paithan, in that the *mandapa* is more clearly separate from the *mul-aprasada*, first occurred at the end of the 6th or the early 7th century on temples such as the Laksmana and Rama temples at Sirpur, the Rajivalocana temple at Rajim, and the Parasuramesvara, Mohini, and Uttaresvara temples at Bhuvaneshvara (Meister *et al*. 1988: 230–236, 256–260, 265–267) in North India, and began to develop in the later 7th and early 8th centuries in the Karnata-Dravida tradition (Hardy 1995: 67, 71, fig. 46).

The presence of a degraded copy of the coins of the Sarvva-Bhattaraka and Maitraka dynasties in the foundation deposits of the South Temple (coin No. 34, context 700; see Chapter 9), which can be tentatively dated to the 7th century, provides a *terminus post quem* for the construction of this temple.

The final abandonment of the Paithan temples cannot be dated accurately because the relevant levels are so badly preserved. An impressionistic evaluation of the limited amount of pottery from the South Area, where a few layers related to the later use of the temples have been excavated, might suggest a date of about the 8th century AD for these levels, but it should be stressed that the pottery chronology for the Early Medieval period in India is still very imprecise and badly understood.

The proposed dating described above is incorporated into Table 4.2 to give a dated summary of the development of the two buildings. Further discussion of the significance of the Paithan temples can be found in Chapter 14.

Section 2: test pit and area-excavation reports from Trench A

After an initial cleaning and recording in the 1998 season, the full extent of Trench A was not excavated because it was too large to have been properly investigated with the time and resources available. Instead, targeted smaller-scale excavations were used to elucidate specific details of the temples' construction and phasing and to answer specific questions or to clarify areas of uncertainty. To this end, 10 test pits were excavated (Test Pits 1–10) (Fig. 4.5) and area-excavation was conducted in six different parts of the trench (see Table 4.1).

The reports presented below are edited versions of the end-of-season field reports written by the individual excavators after completion of excavation. They present the details of the stratigraphy which forms the basis for the more interpretive phasing and description of the temples that have been presented above. They also present the thoughts, impressions and doubts of the excavators. Numbers in brackets are excavation context numbers that are listed in Appendix I.

Test Pit 1 (TP1): the western wall of the South Temple (Figs 4.44, 4.51 and 4.54)

The sequence in this test pit was initially divided into a number of horizons, which are described below. These were then allocated to the site's periods as is described. The key layers mentioned in the description below are shown in Fig. 4.51.

This test pit was begun in the 1998 season during which time the upper 0.80 cm was excavated. The topmost layer consisted of fairly clean silt (300) that had probably been deposited since the 1937 excavations. Beneath this part of a collapsed brick wall was encountered (304) that looked like it might have fallen from the upper courses of the west wall of the South Temple. More horizontal layers were revealed below this that were cut by 311/963, the foundation cut of the South Temple. Deposits 300, 301, 304, 305 and 307 overlaid the foundation cut for the South Temple, whilst 306, 310 and 313 were fills within it. Layers 308, 312, 316 and 318 predate the foundation cut and are roughly equivalent to layers 908, 912, 913 and 922 that were excavated in 1999 (see Horizon 4 below).

Excavations were continued in Test Pit 1 in 1999 with the aim of investigating pre-temple deposits down

to natural soil. The following four horizons of deposition were noted:

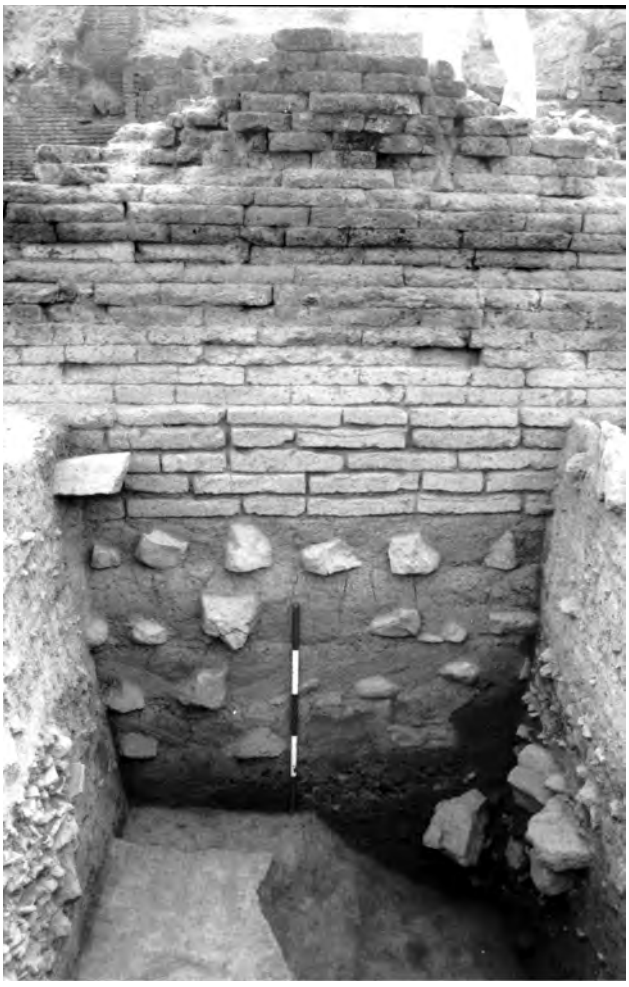


Fig. 4.54: Eastern section of Test Pit 1 showing the foundation fills under the west end of the South Temple.

Horizon 4, the latest horizon, marks a period of reduced human activity compared to the lower deposits. It consists of a series of water-deposited silt washes (908, 912, 913, 921 and 930) which contained occasional ash washes/dumps. Two top-soil-like deposits (933 and 922) were also noted. All of these deposits have been allocated to Period 4.

Horizon 3 marks the most intensive activity within this sequence. It is defined by a series of rubble layers into which a large number of pits were cut. The earliest of these was cut 1113 and sump 1114, which was filled with deposits rich in building debris (1110 and 1099). Two rubble deposits, 1077 and 1063/1052, accumulated prior to pits 1057 and 1075 being dug. Pit 1075 was filled with brick and tile (1074). More rubble layers (1040 and 1013) were dumped here before ash pits (e.g. 984), post-holes and pot/tile pits (e.g. 1029) were cut. Following this, more rubble layers were laid down (e.g. 966, 944). The upper surface (944) showed evidence of compaction and represents the only truly consolidated surface horizon identified in this area. A small ash pit (946) and ash dump (948) were recorded on this surface. The deposits of this horizon have been allocated to Period 2.

Horizon 2 consists of two clay-rich deposits with frequent grit and small stones (1127 and 1120). Deposit 1127 was cut by a large pit (1145). After this pit had been filled and covered, a second pit was cut (1131), which was filled with a pot and tile dump 1126. These deposits have been assigned a separate horizon principally due to the lack of brick in layers 1127 and 1120, as brick rubble is such a notable feature of the layers of Horizon 3 above. A small patch of burning (1141) was also noted next to pit 1131. Layers below 1127 in this horizon have been allocated to Period 1, whilst 1127 and the layers above have been allocated to Period 2.

Horizon 1, the earliest horizon, consisted of a black cotton soil with occasional pottery fragments (1159) to a depth of 0.44 m directly above natural soil (1160). It is thought that this may represent a buried plough soil.

The only additional feature excavated in this area was the foundation cut to the South Temple 963 (=982). This cut is slightly offset from the foundation courses, the southern end being closer to the building. It was filled with a number of alternating silt/stone and compact clay layers which formed a thick platform. This cut was not quite bottomed as it disappeared under the east section. It was, however, recorded as cutting a low ash layer 1159. Its greatest observed distance from the foundation courses of the wall was 0.14 m.

Test Pit 2 (TP2): the south wall of the North Temple

A test pit was opened over the remains of the south *mandapa* wall of the North Temple in order to investigate a possible robber trench. A sequence of very late surfaces and cuts was revealed.

Test Pit 3 (TP3): the foundation cuts of the two temples (Fig. 4.50)

The sequence in Test Pit 3 consists of a series of pre-temple deposits sandwiched between two cuts: the foundation cuts for Phase I of the North Temple (1171)

and the foundation cut of Phase I of the South Temple (982). The former is complicated by re-cut 683.

The top fill of the re-cut (682), a loose black cotton soil, seems to be cut by 339, which may be the foundation cut for the North Temple Phase III *mandapa* (see 'W Area' below). Below 682 is a brick-jelly fill (942) sitting over what were at first thought to be more layers extending over the length of the trench. It became apparent that this hard compact layer was itself a fill of a much deeper cut (1171), 683 being a re-cut more or less exactly on the same line and cut from 959, the highest homogenous layer. There is, however, some uncertainty about cut 339; firstly, it is not certain that it is the cut for the *mandapa* wall, and secondly, it is not absolutely certain that it cuts layer 682.

Similarly for the South Temple, after the removal of some superficial layers, a homogenous fill (981) was revealed. It was crammed full of pottery and the cut went down to a hard layer, at first thought to be the base of the feature. After allowing this to weather, it is fairly certain that feature 974/975 is actually the same as 981/982. In any case, both are cut from 993, although it was at first thought that 975 cut 981. A similar feature was found in Test Pits 1 and 5. Removing the hard layer 1039 revealed a repeating sequence of deposits familiar from other parts of the trench as temple foundation deposits, namely a silty-clay matrix surrounding small boulders, often with gravel tip lines, lying over a compacted clayey layer upon which the stones were set. Excavation was stopped at the third layer of boulders beneath the wall (1068/1069), revealing the next clay layer (1192). Therefore, cut 982 was not bottomed in this test pit.

Foundation cut 1171 showed a similar pattern. After removing the hard layer (1073), a sequence of a silty matrix surrounding boulders set on a more compact clayey layer followed. The third hard layer of boulders (1112) lay at the base of the cut. The foundation cut (1171) was originally dug 40 cm into natural soil.

The similarities between the two cuts are obvious; both contain the same broad sequence of deposits, both cut down into natural soil and both have a very compact upper layer on which the temple walls are built. The boulder layers in 1171, however, are much more patchy than in 982, while the layers in 1171 are more compact than in 982 and contain more small abraded brick fragments. Gravel tip lines in the silty-clay matrix are evident in the fills of 982, but not in 1171, and a break in the homogeneity of deposits in 1171 is shown in layer 1103/1104, which is a mixed layer of black cotton soil and a greenish-brown silty clay. While we can be fairly certain that 982 is cut from 993, it is not possible to be certain of this with 1171. All that can be said is that it can be no earlier than 1129, although comparison with Test Pit 10 may resolve this question. For what it is worth, it does seem that the cut curves inwards at the level of 1129 and probably was cut from about there.

The layers in between the two cuts form two distinct groups. The uppermost are quite disturbed by cuts (1011/1012, 1004/1005 and 994/993), coming down to an occupation layer (1030) cut by a series of features (1016, 1018, 1020, 1022, 1024, 1026 and 1028). Below 1030, the situation is simpler, consisting of thicker homogenous layers, e.g. 1124, 1129, 1140 and 1148, only one of which (1134) has a post-hole cutting it (1139). These layers are sometimes ashy (e.g. 1036, 1134) and sometimes result from a build-up of soil with rubble inclusions (e.g. 1148). Unfortunately, it was not possible to say much about them due to their being truncated by the two foundation cuts 982 and 1171. Excavation was stopped after the removal of layer 1148.

Test Pit 4 (TP4): the stratigraphic relationship between the two temples

Test Pit 4 was dug in an abortive attempt to establish the stratigraphic relationship between the foundation cuts of the North and South Temples. A 50-cm-wide sondage was excavated between the two buildings to a depth of about 50 cm. Work was abandoned when it became clear that no stratigraphic relationship remains between the two foundation cuts in this area, the crucial information having been removed by Yusuf's excavations. During the excavation of Test Pit 4, no context numbers were assigned or finds collected.

Test Pit 5 (TP5): the interior and foundations of the South Temple (Figs 4.33–4.38)

Two parallel foundation trenches belonging to post-Medieval buildings (594, 595) had disturbed the temple from above and had been mostly removed by Yusuf, but the bottom of their fills still remained. Their alignment and length were made clear by the cut into the south wall of the South Temple. A standing brick wall forms the eastern limit of Trench A running parallel to these cuts, and this wall was probably part of the same building for which the foundation trenches were dug. The relationship between westerly cut 594 and pit 335,

which cuts the north-west corner of the South Temple, was removed by Yusuf. The pit is probably earlier than the foundation cuts. It is similar to pit 341, which is cut into the north-west corner of North Temple, but this is probably coincidental.

The foundation cut for Phase I of the South Temple has been numbered 982, 1250 and 1181 in different places. It is a flat-bottomed cut with its base 20–25 cm below the level of natural soil (as seen in Test Pit 1 to the west of the temple). The first fill consisted of small boulders of igneous rock packed into a very clean silt matrix (Fig. 4.35). This was overlain by a thin (c. 10 cm) compact clayey layer containing numerous small weathered pottery and rubble fragments on to which a further layer of stones has been laid. The silt surrounding the stones is less compact and rammed level to prepare for the following stone layer. A total of five boulder/silt/compact clay sequences were laid down before a thin mud surface was spread across the entire foundation trench (953/955).

There were few notable differences in the boulder, silt or compact clayey layers throughout the fill, which was remarkably uniform. The first two stone layers consisted of tightly packed small to medium-sized boulders. The third and fourth layers consisted of evenly spaced larger boulders, each of which needed two people to lift. The fourth stone layer (1070/1071) was contained in compact silt (978/979) rather than a loose silt matrix. But the matrix of the fifth layer (1002/1003) was very loose by comparison. Upon this, an 8-cm-thick compact clayey silt layer (964/965) and mud surface were laid (953/955).

The foundation wall of the building (1224) is represented by the first six courses of brick, which were laid directly upon the mud surface covering the foundation fill. Above this within the *mandapa* walls, the nature of the foundation fill changes, becoming dirtier with numerous inclusions of rubble and broken pottery (952/918/700). The same is not true of the equivalent level within *garbhagriha* (919), which does not contain much pottery. This suggests that the fills are not the same and were deliberately kept separate from each other. A dark grey layer, 667, was deposited above 700 and runs underneath the Phase II walls (1240/1247), as can clearly be seen where there is a gap or entrance way in the Phase I wall (1224), which divided the *mandapa* from the *garbhagriha* (Fig. 4.37). Here, layer 667 abuts a large, heavily vitrified brick situated in the middle of the entrance, suggesting that the brick may have been a step or part of a threshold between the two spaces. This suggests that 667 must have been the floor level of Phase I of the temple.

Following this, the temple was reconstructed on a slightly different plan. The Phase I temple appears to have been knocked down, leaving only the lowest six courses remaining as a foundation base. Nothing therefore remains of the upper courses of the Phase I wall, and neither is there any concrete evidence that a temple of this phase ever existed, aside from the difference in plan between the Phase I wall and the Phase II walls (see discussion above).

Subsequently, the brick-jelly layer 661 must represent the rebuilding of the temple during Phase II, when walls 1240 and 1247 were constructed using the Phase I wall as a foundation. From the section, it is quite clear that the brick-jelly has been trampled into the clay surface 667, probably during the construction process.

After the construction of the Phase II walls, the interior was raised up to the level of mud floor 634 using a similar pattern of alternating boulder stones/loose silt/compact silt layers (654/642/638) that was capped by the floor. Through this process, the height of the floor was raised by 20 cm.

As can be seen in Fig. 4.36, the Phase II walls around the *garbhagriha* are as much as 35 cm thicker than the Phase I walls below them. This means that the interior width of the *garbhagriha* was reduced by 70 cm in Phase II. The *garbhagriha* was then filled with another sequence of stone and silt foundation layers (979/666/653). As they are physically separated from each other by the interior wall of the temple, it is not possible to say precisely how the layers in the *garbhagriha* relate to those in the *mandapa*. It is notable, however, that the fills within the *garbhagriha* are purer when compared to the construction fills inside the *mandapa*; that is to say they contain fewer pot sherds, stones and other inclusions (e.g. 642/638/626/622).

It proved to be much more difficult to isolate possible floor surfaces within the *garbhagriha* than within the *mandapa*. There are three 'stone and silt' foundation sequences in the Phase II *garbhagriha*, but there appears to be no definite surface between any of them.

Within the *mandapa*, there is evidence that the level was raised once more to create a floor using the same silt and stone foundation sequence (626/622). This later raising of the floor seems to relate to Phase V of the temple, a much later reorganization of the *mandapa* interior when the walls were thickened on the interior (509, 528). The south-side thickening is not shown in the section in Fig. 4.33 but a possible foun-

dation cut and fill (615/620) are visible. The two Phase V interior dividing walls (510, 511) are shown in Fig. 4.33. Other evidence relating to Phase V was removed by Yusuf's excavations.

Test Pit 6 (TP6): south of the South Temple (Fig. 4.55)

Test Pit 6 was opened against the southern wall of the South Temple in order to investigate the nature of the surfaces related to the temple and to reveal the foundation cut in this area.

The sequence revealed consists of a succession of hard clay/silt surfaces (650, 926, 373, 987) above some looser clayey silt deposits (1035, 1051). The lower of these are clearly cut by the foundation cut for the South Temple (1246 in this area), but because the upper portion of the foundations might have been disturbed by a possible later recut (372), it is impossible to be absolutely certain from which level the foundations were originally cut. Cut 372 describes the rubble-filled broadening out of the foundation cut in the top 20 cm. It is very similar to the form of temple foundation cuts in other parts of the trench (e.g. Test Pit 3; Fig. 4.50), and it is not clear whether this is a later re-cut or whether this was the original form of the foundation cut. Because the uppermost foundation fill (1031) that is clearly part of the original cut also seems to fill the lower part of 372, it seems likely that, in this case, this was the form of the original cut. In this case, most of the horizontal silt/clay deposits shown in Fig. 4.55 were deposited before the temple was constructed. The upper part of the foundation cut is filled with a compact rubble packing (342). Below this, a succession of silt/boulder stone foundation deposits fills the foundation trench, closely matching those uncovered in Test Pits 1 and 5.

A number of minor cut features such as pits and post-holes were cut into the pre-temple compact silt surfaces next to the temple, but nothing significant enough to warrant a fuller description was located. A thick, compact grey clayey siltwash (deposit 300) that has accumulated since Yusuf's excavations covered all the contexts in this area.

Test Pit 7 (TP7): the south-east corner of the South Temple

This small test pit was excavated to investigate the foundation cut of the eastern extension of the *mandapa* wall on the south side of the South Temple and also the original foundation cut for the Phase I wall. The test pit showed the existence of cut 372 which runs along the south wall of the temple, cutting surface 373. The stratigraphic relationship between this cut, the original foundation cut for the temple (1230) and the Phase IV *mandapa* extension cut (1178) was impossible to verify with certainty. It may be that cut 372 cuts 1230 and its later fills and is then cut by 1178. But it is impossible to be certain that cut 372 and the original temple foundation are not one and the same. Three hard surfaces (1190, 1191 and 1231) were noted underneath surface 373. The test pit was excavated only to a shallow depth due to lack of time and no further significant results were obtained.

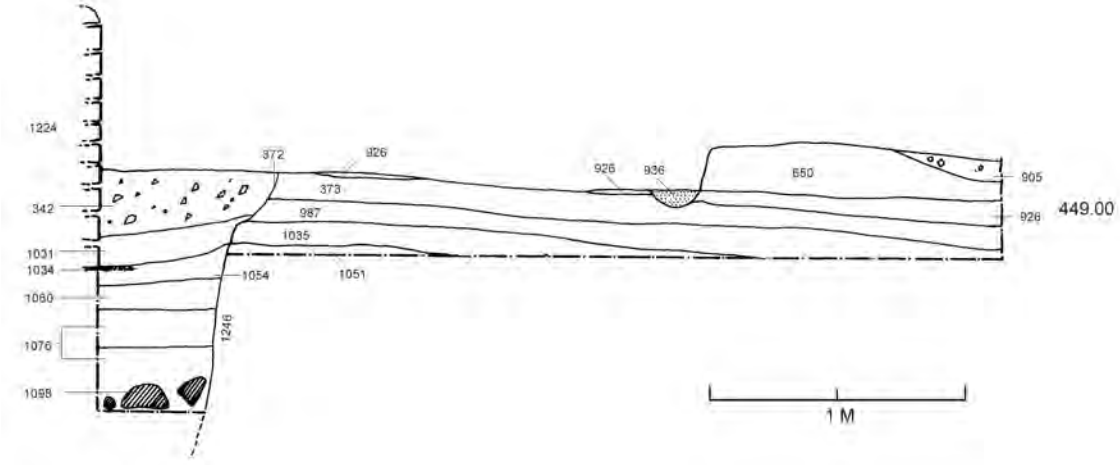


Fig. 4.55: South-facing section, Test Pit 6.

Test Pit 8 (TP8): the EEST (Fig. 4.43)

Test Pit 8 is a very small sounding that was excavated in 1999 in order to investigate the stratigraphic sequence against the eastern wall of the Phase I–III South Temple (Fig. 4.43). The uppermost level encountered below the level reached in the 1998 season was a hard floor (1182) that abuts the eastern face of Phase II wall just below the mouldings. This suggests that it is related to quite a late phase of use of the temple. It overlies packing 1216 that raised the level of the floor by about 70 cm. Below this, another compact floor surface (1245) was encountered, this time abutting the top course of the Phase I wall 1224, but which could be related to Phase I or to a later phase. It overlies packing 1219, which itself overlies an earlier floor (1220) that is also related to the Phase I temple or later. Below this, a number of thin silt and brick-jelly layers (dug as 1220) overlie another hard surface 1227, which must have originally abutted the Phase I wall 1224, but which has been cut by 1226. Surface 1227 is the earliest surface that was uncovered here and must relate to the initial use of the Phase I temple. Cut 1226, which was filled with rubble and stone layers 1222 and 1223, is a re-cut against the wall of the temple from slightly later in time. The reason for this re-cut is not clear. Underneath 1227, a flat compact layer, 1228, was revealed that underlies the Phase I wall and must therefore be the top fill of the original foundation cut of the temple, the precise location of which was not revealed in this small test pit.

Test Pit 9 (TP9): the *mandapa* of the North Temple (Figs 4.22–4.25)

In order to investigate the interior of the *mandapa* of the North Temple, a long, 1-m-wide slit trench was excavated across the building from the south wall, across the robber trench to the northern section of Trench A. The trench was positioned against the eastern wall of the Phase II structure (556). The sections in Fig. 4.22 show the stratigraphic contexts and their relationship to the Phase III, IV and V walls (557, 558 and 383/544, respectively).

The uppermost remaining layers in the interior of the *mandapa* were excavated in the 1998 season. At that time, Phase V walls 383/544 and the thick loose black cotton soil that it retained (395, 551, 1252) were removed. The presence of lime mortar in the crude Phase V wall 383/544 demonstrates that the 1967 restoration had disturbed this area, and this made it difficult to be certain which features originally related to the Phase V temple and which related to the restoration. These problems were compounded by the fact that the fills behind wall 383/544 were of loose black cotton soil within which it is difficult to discern cuts. Nonetheless, upon excavation, a large rectangular sunken area was located against the western end of the *mandapa* in the surface of deposit 551 (Figs 4.22A and 4.25). Measuring 140 cm north-south by 90 cm east-west and 15 to 20 cm in depth, it is thought that this depression may represent the location of a large rectangular object or structure that might have been part of a shrine. It is difficult to suggest another interpretation for it. It certainly abuts the Phase IV wall (558), but its stratigraphic relationship with wall 383/544 is much more difficult to ascertain for the reasons given above. It is thought most likely that shrine 551 was constructed within the space defined by wall 558 but that in Phase V wall 383/544 eventually enclosed this shrine or a later shrine on the same spot, possibly after the partial destruction of the Phase IV wall 558.

Below 551, a single course of boulder stones in loose silt was revealed (639). This is clearly a foundation deposit, similar to those that have been revealed in the North and South Temples. It abuts wall 558 and appears to have been laid down as a foundation for the 551 'shrine' described above.

Upon removal of 639 three bricks (983) were uncovered positioned close to the western wall 556 and associated with compact surface 940 (Fig. 4.24). They were situated upon some very distinctive deposits of compact, clean silt with green and red hues (976 and 977). It seems likely that these bricks and the associated surface and silts are the remains of an earlier shrine. This overlies a succession of trodden silt surfaces (1010) that accumulated over what appears to be another foundation sequence (1121, 1115, 1050) consisting of a layer of medium-sized, semi-rounded boulders of local igneous rock in a fine silt matrix similar to deposits found elsewhere in the foundations of both temples. It is possible that the upper level of 1050 was used as a surface for a period of time, but the related deposits (1049, 1032, etc.) do not offer conclusive proof of this. Before the bricks of the 983 shrine were laid down, a small cut (1007) was made against the wall through the trodden surface 1010. It is not known why this cut was made.

Wall 558, the Phase IV wall of the temple, was built from the level of layers 940 and 976. It was built directly on top of these layers without any foundations. It is impossible to be absolutely certain whether this wall

was built before or after the shrine 983. The wall overlies 940, which appears to abut the bricks of the shrine. Also, as can be seen from the east-west section along the face of the southern part of the wall (Fig. 4.22B), two bricks of the lowest course of the wall have been omitted, where it abuts wall 556, apparently to avoid disturbing deposit 976, which is associated with the shrine. This suggests that the wall was built after a shrine was already in use at this level; the wall being built perhaps to enclose the shrine.

The foundation deposits (1121, 1115, 1050) abut the *mandapa* wall 557 to the south and therefore can be regarded as packing for a major raising of the floor level of the *mandapa* (1010). Below these deposits, another surface came to light (1142), this time covered with a coarse brick-jelly (1132) within which a very clear 1-m-square impression (1137) is visible against the middle of the eastern face of wall 556 (Fig. 4.23). Again, this suggests that a large rectangular object was placed here against the western end of the *mandapa* and that surface 1142 accumulated against this object. The most obvious interpretation is that this results from the use of this location as a shrine. Surface 1142 is the first floor level of the *mandapa* that came to light in this sequence.

Below 1142, another foundation sequence of boulders and silt came to light (1151, 1157). This time these foundation deposits underlie *mandapa* wall 557, indicating that they are related to the original construction of the *mandapa*. They are deposited within cut 1243, which is the foundation cut for the *mandapa*. They directly overlie the upper foundation deposit for the Phase I structure (927/1186), the surface of which was cut by 1243. This demonstrates that the foundations of the Phase III *mandapa* were not excavated to the same depth as the Phase I foundations. This may be because the *mandapa* is later or because, as an addition to the *garbhagriha*, the sacred element of the construction may not have been taken so seriously.

The cut for the Phase III *mandapa* (1243) is shown in the northern part of the section of the test pit. On this side, the cut of the Phase I structure (1171) is 1.64 m from the corner of the Phase I wall, which is much further than the distance on the south side of the Phase I structure as exposed in Test Pit 3. The Phase III *mandapa* foundation cut was probably excavated from a higher level than the Phase I cut due to deposits that had accumulated in the intervening period. Unfortunately, these deposits were removed by Yusuf so it is now impossible to know from what height this cut was made. As is shown in Fig. 4.22C, cut 1243 is thought to have shaved the top corner of cut 1171 and then to have followed the uppermost deposit within the Phase I foundations (927). Unfortunately, time did not allow deeper excavation of Test Pit 9, which would have clarified the shape of both cuts and the relationship between them.

Table 4.3: Stages in the development and use of the shrine within the *mandapa* of the North Temple.

Stage	
1	Possible use of a shrine against the eastern wall of the Phase II structure before construction of the Phase III *mandapa*.
2	Phase III *mandapa* constructed.
3	Shrine 1137 was constructed on top of boulder/silt foundations within the *mandapa*.
4	Further stone/silt foundation sequence apparently in preparation for raising the interior floor to surface 1010. Possible use from the level of 1049 and above.
5	Accumulation of trodden surface 1010. The *mandapa* was clearly in use at this time but there is no evidence for a related shrine. Had it gone out of use or was there a shrine of which no trace remains?
6	Shrine 983 was constructed. This seems to have involved the cutting of a small pit 1007 against the eastern wall, the purpose of which is not known.
7	The Phase IV wall 558 was constructed around shrine 983 in order to enclose it.
9	Shrine 551 was constructed on top of stone/silt foundations within the Phase IV inner structure.
10	Phase V wall was constructed around shrine 551 or a later shrine, the remains of which have disappeared. It is possible that this occurred after the collapse and robbing of Phase IV wall 558.

On the south side of Test Pit 9, the join between walls 556 and 557 is exposed (Fig. 4.21). This demonstrates very clearly that wall 557 abuts wall 556 but that some of the bricks in the upper courses of wall 556 were removed in order to allow the much cruder brickwork of the *mandapa* wall 557 to be keyed into it. It can also be seen that one of the bricks in the lower courses of 556 has been cut into for the same reason.

The most important information to come from the excavation of Test Pit 9, apart from elucidating the construction of the Phase III *mandapa* and its physical relationship with the Phase II walls, is the evidence of at least three successive shrines within the western end of the *mandapa* against the wall of the Phase II structure. No evidence came to light to indicate that the eastern wall of the Phase II building had been used in this way before the construction of the *mandapa*, but any such evidence would in any case have been destroyed by the construction of the *mandapa*.

Table 4.3 sets out the probable sequence of developments related to this shrine.

Test Pit 10 (TP10): the west end of the North Temple

Test Pit 10 was opened to the west of the North Temple after the upper levels in the area had been subjected to an area-excavation (see 'W Area' below). The test pit was excavated to a maximum depth of 40 cm in order to explore a shallow cut (909) that runs along the western face of the Phase I structure. Three fills were removed from this cut (943, 928 and 920). The cut was shown to become shallower in the middle of the building, where an entrance to the structure might be expected (see also 617 in 'W Area' below). Excavation of the fills revealed what appears to be the foundation cut for the North Temple *garbhagriha* only 10 cm from the wall, which is markedly different from 1171 on the south side (see Test Pit 3 above). It was confirmed that the fill of the foundation cut (an un-numbered brick-rubble matrix) was sealed by the layer cut by 909 and that the foundation cut cuts an ashy matrix below it (un-numbered).

The *garbhagriha* of the North Temple (GG North) (Figs 4.11, 4.12 and 4.15)

In the 1999 season, investigation of the western end of the North Temple (Fig. 4.11) involved the excavation of the *garbhagriha* as well as cutting into the Phase I wall, where it had already been damaged by later robbing. Some limited cleaning and recording were also carried out on the western face of the structure.

The uppermost fill within the *garbhagriha* consisted of brick bats and silt (646). This layer seems to result from post-collapse, or possibly post-Yusuf use of the area. Beneath this layer begins a succession of silt/boulder foundation deposits similar to those in the foundations of the South Temple (see Test Pit 5 above). These consist of alternate layers of cobble-sized stones of igneous rock within a matrix of compact silt (Fig. 4.12). The stones are notably smaller than those used in the fill of the South Temple, and they are also smaller than those used further down in the foundation deposits of this building.

Having removed five successive silt/stone sequences (658/676, 677/685, 687/698/907, 910/917), a fine, compact clay surface 927 was exposed. This surface was covered with a dusting of brick-jelly less than 1 cm thick (923). Both 923 and 927 extended underneath the earliest wall of the Phase I shrine (970/554). Clearly incised into the four walls of the *garbhagriha* and onto the surface of 923 were four lines, running vertically down the middle of the interior face of each of the four walls and continuing across the surface of 923, forming a cross at the exact centre of the *garbhagriha*. These scratches are just visible on the walls in Fig. 4.14, below the blackboard. It seems that the scratches relate to the laying out of the sacred geometry of the *garbhagriha* and the marking of its precise centre.

Below this level, the silt/stone foundation layers extend underneath the walls of the shrine. A small trench was therefore cut by the present excavators from the base of the walls downwards for a further 1.2 m until natural soil was encountered. Within this 1.2-m sequence, three further successive silt/boulder sequences were revealed. The boulder stones in these layers are slightly larger than those in the layers above. Some minor variations in the composition and texture of the silt deposits were noted. These were given separate context numbers which are marked on the section. As can be seen in Fig. 4.49, this succession of layers links closely to that excavated to the south of the shrine in Test Pit 3 (see above). It is absolutely clear that these layers represent a deliberate filling of the large foundation cut 1171, which underlies the entire Phase I structure of the North Temple. The western, northern and southern limits of this cut were located, allowing the size to be calculated and to demonstrate that it may have been rather unevenly shaped and is at varying distances from the Phase I walls: about 80 cm

to the south, where it is most reliably defined, possibly 10 cm to the west and possibly 160 cm to the north. Once cut 1171 had been filled by silt/stone foundation sequences, the compact, level clay surface 927 was put down. This was then dusted with brick-jelly and the walls of the Phase I shrine (970, 554) were built in stages directly onto this. Once these had been completed, the platform wall was built, possibly in two distinct stages (969, 555) and the gap between the outer platform walls and the shrine walls was filled with brick-bat rubble (941) and layers of bricks (932, 911), thus completing the construction of the Phase I structure.

Robbing of the northern wall of the North Temple (NWNT) (Fig. 4.17)

Excavation along the northern wall of the North Temple demonstrated that after the temple had fallen into disuse the northern wall of the *mandapa* was completely robbed out.

The first activity after the abandonment of the North Temple was the cutting of two almost circular pits (533 and 541), each measuring about 1.50 m wide, both of which have been partly destroyed by the later robbing cut. The remains of one is visible to the left side of the main robber cut (Fig. 4.17), where it partly cuts into adjacent layers. Because the upper levels had been removed by Yusuf's excavations, it is not known from which height these were cut. Both had nearly vertical edges rounding to flat bases and were dug down to approximately the same level. Both had very similar fills, consisting of very soft, light grey, ashy silt containing large pieces of broken pottery. Across the base of both pits, a thin layer of white organic fibres was preserved. Both pits were severely truncated by later robbing of wall 557, and their shape was only evident as they were dug deeper than the lowest course of bricks in the wall.

In the size, shape and nature of their fills, these pits are very similar to pit 369 located to the south of the South Temple. Both pits cut into wall 557. The bricks of the wall were cut to maintain the circular shape of the pits, indicating that the pit diggers were not interested in robbing bricks. One slightly problematic aspect is that these pits cut into wall 557, although it is certain that the wall was still visible on the surface because it was laterrobbed out. The pits must therefore have been deliberately cut into a wall, but it is not clear why this should have been done.

A wide robber trench (377) was later dug along the entire length of wall 557 (Fig. 4.17). Due to later interventions, it is not possible to ascertain whether the robbing took out the upper courses of 557 in the east and it is also not known from what level the robber trench was dug. It seems to have been dug from the north side, as the southern edge was almost flush along the inner brick line of the wall. The robbing was very thorough; all but two or three bricks of the inner and outer wall face and the hearting material were robbed. A few of the bricks that were left *in situ* in the middle of the wall's length by the robbers were actually consolidated in their position with lime mortar during the 1967 restoration, probably because the restorers mistakenly believed that they were a free-standing wall (see 'wall' 502, which is visible in the background of Fig. 4.17). The precise location of the original *mandapa* wall is known because the lowest course of mud mortar is preserved in the bottom of the robber cut, within which the shapes of the bricks can still be seen.

The infilling of the robber trench follows broadly the same pattern along its length: firstly, a probably deliberate back-filling with a compact silt and rubble (fills: 549, 505, 535 and 529) was followed by a loosely compacted natural silting (fills: 327, 376). Where the robber trench cut through the softer fill of pit 541 some mixing of fills occurred.

To the west, a smaller robber trench (386) was cut into wall 557 just north-east of Phase II wall 556. The fill is very similar to the upper, looser silt fills in the main robber trench 377; it therefore seems likely that both robber trenches are contemporary. This robbing left a small section of the original *mandapa* wall *in situ*, and this has been numbered 514.

The robber trench had been completely backfilled before the next phase of activity took place in this area. A thin east-west trench (329, 396) was cut through the earlier robber trench fill along the same alignment. This cut ran from the north edge of the remaining stump of wall 557, eastwards to brick pedestal 375. The interpretation of this cut is problematic. It is most likely to have been cut by Yusuf or by the 1967 restorers hoping to locate the missing northern wall of the *mandapa*.

One feature that is not understood is the mysterious square brick pedestal 375, which stands exactly within the robber cut and which is visible in the foreground of Fig. 4.17. It is properly faced on all four sides and is clearly therefore not simply a remaining fragment of the robbed *mandapa* wall. It may be related to the foundations of much later post-Medieval build-

ings in the overlying layers. There is lime mortar in the upper four courses of this feature, indicating that it was partly consolidated by the 1967 restorers.

The area west of the temples (W Area) (Fig. 4.48)

After removing some superficial silt layers, several archaeological layers and features were revealed in the area to the immediate west of the North Temple. Layer 612/618/644 is an irregular deposit stretching along the west section. At one time in the past, it had been a muddy surface as a footprint was preserved in it. Removal revealed a very hard surface 657 into which two post-holes (656, 660) were cut. The surface appears to have been contemporary with a probable robbed-out stone wall that was originally contained within cut 617, but it also sealed part of the fill of the cut (616), though the remaining stones from the wall (903) jutted up through it. 'Wall' is probably the wrong description for 616/903/617 as the original form is unknown, it may have been the stone base of a fence or some similar boundary. Slightly S-shaped, it ran in a north-south direction to the west of the end of the Phase I/II walls of the North Temple and south towards the possible large stone enclosure wall excavated in the South Area (see below) (Fig. 4.48). It is possible that the two structures are contemporary and related. Interestingly, the cut became markedly shallower at just the point in front of the west end of the *garbhagriha* where an entrance way would have been expected. It is also notable that the stones of 903 on either side of this shallow section are very deeply set compared to the others in the possible wall, which were flat-bottomed. This might represent a gateway or passageway through the boundary wall, if that is what this is. The northernmost stone had a V-shaped socket cut in it.

Cut 681, aligned east-west, cut through the fill of the boundary wall. It is assumed that this was a later burial of some sort as a few fragments of human skull, although no other bones, were found in the fill (680).

Around the west, north and south sides of the North Temple *garbhagriha*, a peculiar square C-shaped cut was observed, two sections of which were excavated (909, 939). Layer 904 may have been a fill of this cut, but the first proper fill was 920, a brick rubble layer concentrated particularly on the west side of the *garbhagriha*. Very well structured, it was probably laid to provide a firm footing for access into the *garbhagriha*, although the number and quality of bricks peters out to the south. After removal, this feature was excavated in two segments in Test Pits 3 and 10 (see above). At the junction between the south wall of the *mandapa* of the North Temple and the *garbhagriha*, cut 339 had been partially excavated in 1998, removing fill 338 and leaving further probable brick rubble matrix 640. Although it is impossible to be certain, it seems possible that this was the foundation cut for the *mandapa*.

The southern wall of the North Temple (S Wall of N)

In this area, two cuts were identified relating to the south wall of the *mandapa*: 585 and 569, the former being on the south-east corner of the structure and the other, larger cut running along the central part of the wall. This cut contained two fills; a silty-clay loam (573), evidently backfill/in-wash material, and a rubble matrix (577), probably collapse from the wall's hearting. Cut 585 contained only one fill (584). Both were cut down to the bottom course of bricks in the wall and had thereby erased any evidence of the original foundation cut except for a thin yellowish brown silty clay lying directly beneath the lowest course of bricks. In the area between the two cuts, however, a narrow cut, filled with brick rubble, was visible.

The EEST (Figs 4.30 and 4.45)

During the 1998 season, cleaning and excavation of a number of features were undertaken at the eastern end of the South Temple, such as the foundation trench (347) of wall 352, and a few post-holes and cuts. This was followed in the 1999 season by the excavation of Test Pit 8 in this area, which has already been reported above.

The sequence in this area is key to the interpretation of Phases III and IV of the South Temple. Although the broader picture is fairly clear, there are still some unresolved stratigraphic relationships and interpretations. Essentially, over a period of time, four major walls were added to the eastern end of the temple: 344, 345, 352, and 359 adjoining the already existing Phase II walls 1240 and 1247 (Fig. 4.30).

The uncertainty revolves around the precise order in which these four walls were built. This is indicated, to some degree, by their stratigraphic relationship with a compact silt surface (346) that covers the interior of the eastern end of the temple. Walls 1240, 1247 and 344

are all abutted by surface 346 and are therefore obviously earlier than it, whilst walls 345, 352 and 359 are later as their foundation trenches can be seen cutting through the surface. The foundation trench for wall 352 was excavated and very clearly cuts through this floor. Cuts 521 and 527 of walls 345 and 359 respectively were not, however, excavated and it is not therefore possible to be absolutely certain that they are foundation cuts. They are very narrow (4 cm wide) and it is possible that they might have been cut to hold some sort of wooden facing against the walls, in which case the walls might be earlier than the surface. Given the fact that walls 359 and 352 are inter-bonded, albeit crudely, and the three walls obviously form part of single extension of the temple towards the east, this seems quite unlikely.

The sequence is thus reasonably certain; walls 345, 359 and 352 were added to the east of the temple to lengthen the structure. But wall 344 could have been built before, at the same time as or later than these walls and it is impossible to establish the order with certainty. It has been included as a separate phase, Phase III, because it does not seem to make sense anywhere else.

Three post-holes were then dug in this area. Two are almost certainly contemporary (523, 525) as they are located symmetrically on either side of the wide entrance to the *mandapa*. The posts they contained must have been part of some sort of entrance structure, again probably made of wood. The third post-hole (358) is not matched on the other side of the temple and may be related to something quite different. It is cut by the foundation cut for wall 352 (347).

In addition, a number of apparently later features in the area, mostly 'islands' of stratigraphy, now stand in isolation since they were revealed by Yusuf's excavations. It is therefore impossible to place them in a sequence or to link them together. They do, however, provide some useful insights into the latest phases of the temple's life. They include wall 360, which consists of some very large broken carved stone architectural fragments that have been placed on a layer of silt on top of wall 352 (Fig. 4.56), apparently as part of a crude rebuilding of the wall. There is a small rectangle of a solid brick wall (349) abutting the eastern end of wall 345, the purpose of which is unclear. It is also unclear whether it was matched by a similar wall against the eastern face of wall 359 on the south side – although it seems likely that it was – as this is outside the limits of the trench excavated by Yusuf. Wall 349 is likewise abutted to the east by a truncated silt and brickbat alignment (354) that once continued to the north. This may indicate that the South Temple was later incorporated into a larger architectural complex that extends beyond the limits of the trench. There is a small patch of a brick-bat and silt floor surface (353) abutting wall 352 to the east, indicating the level of at least one phase of later use. Finally, a series of large flat stones was recorded to the east of wall 352, where they disappear beyond the limits of the trench.

All of these features are clearly much later than Phases I–IV and give a limited and unfortunately rather fragmentary insight into the changing style of construction and manner of use of the temple in its latest phases.

The area to the south of the temples (South Area) (Fig. 4.48)

A large area was cleared to the south of the South Temple as there were some suggestions that this area preserved information relating to the later use of the temples and their surrounding area which had not been disturbed by Yusuf's excavations. The area is an irregular shape, measuring between 6 and 8 m north-south and 9 m east-west. Unfortunately, on excavation, it was found that the area had in fact been subject to Yusuf's excavations and probably also the 1967 restoration, one or both of which involved the cutting of 'wall-chasing' trenches, drains and other features. Nonetheless, excavation was continued in the hope that some useful information might be retrieved from the heavily truncated stratigraphy.

The deposits in the south-east consisted of a series of laminated water-sorted silts and coarse sands (592, 605, 635, 678 and 670) and a number of loose rubble tumble deposits (613, 619 and 663). These all existed east of a linear flat-bottomed cut, 692, which ran north-south along the entire length of this area. The slope-wash and rubble tumble deposits mentioned above all post-date this feature. It should be noted, however, that whilst this cut was clear in the north, its southern limit is obscure and difficult to define and was therefore not fully excavated. It is thought that this cut may represent an old section line or trench edge of Yusuf's excavations. It effectively divides the area into two sections to the east and west, each with a distinct depositional history.

The deposits to the east were markedly different, consisting of a number of architectural and negative features. The principal features of this area were two

parallel walls 691 and 699/578 (Fig. 4.47) and a ditch (688) with a re-cut (671) running parallel that may represent the line of another wall (Fig. 4.48). These features all semi-enclose an area to the south of the South Temple, although they were not visible in the west of the area, possibly because they were removed by Yusuf's excavations.

The two walls are of a very different nature; 691 consists of a single line of large semi-dressed igneous boulders set on their sides or ends. It starts 2.1 m west of the south-west corner of the South Temple and runs in a discontinuous line for 8.7 m roughly south before returning eastward for 4.6 m. It appears to have a foundation cut (673), although as this was not excavated, it remains unverified.

Wall 699, which was severely robbed by cut 577, runs approximately 0.1 m east of wall 691. It starts in the south-west corner of wall 691 and runs for 8.7 m, it then returns east to abut the south-west corner of the South Temple. It consists of a single course of broken bricks and stones, which are presumably the foundations of the original wall. This wall was left unexcavated. No relationship could be observed between the two walls due to disturbance by robbing activity, which appears to have removed the original foundation cut of wall (699), if one ever existed.

Another possible wall (578) was recorded superimposed on the alignment of wall 699 above the robber-cut fills 591 and 608. This was crudely constructed from sub-angular stones laid randomly and surviving to two courses in height. This is either a wall or the uppermost fill of the robbing cut 577 of wall 699.

To the west and south of the large boulder wall 691 was a shallow V-shaped ditch (688), 1 m wide by 0.2 m deep. Its primary fill was a thin calcareous wash (679), possibly resulting from the erosion of a plastered wall somewhere close by to the south. The ditch's other fills consisted of loose rubble (675 and 663). This ditch was only partially excavated. It was re-cut by ditch 671. It is thought that these ditches are later than boulder wall 691, as ditch 688 clearly cuts the foundation cut of 691.

All of the above features, with the possible exception of wall 578, are presumed to relate to a late period of use of the South Temple.

The abandonment of these features is marked by extensive pitting in this area. Two large round pits 628 and 631, filled with dumps rich in pottery sherds (fills 629 and 632 respectively), were cut into the top of the ashy fill (672) of ditch 671. Two amorphous pits were also cut into this ditch (623 and 669). Two small pottery-filled pits (588 and 587) were cut into the top of wall 578, as was a rectilinear pit 607. The fills of these pits contain Early Medieval grey wares (see Chapter 7: 'Thick Grey wares') and provide some indication of a possible *terminus ante quem* for the activity in this area.

It should be noted that some difficulty was experienced in understanding this complex and disturbed area, particularly in the south. Many of the early features were not excavated or were only semi-excavated and were interpreted through a section which was cut in the south-west corner of the area. No relationship could be established between walls 691 and 699 and the interpretation of cut 692 as the edge of Yusuf's 1937 excavation trench edge remains tentative.

The general sequence of events can, however, be given as follows with a fair degree of certainty:

An enclosure wall, either 691 or 699, whichever was earlier, was constructed to enclose an area to the south of the South Temple. This was consolidated or replaced by the addition of another wall (691 or 699). A ditch (688) was subsequently added on the outside of this enclosure. This was later re-cut (671).

Wall 699 was robbed by cut 577 sometime in this sequence, and possibly replaced by wall 578. The area then went out of use as an enclosure and this is marked by a sequence of pottery-filled pits. A large cut (692), possibly from the 1937 excavations, then truncated most of the deposits in the east of the area, which was then subsequently filled by a series of slope washes and rubble tumble deposits.

Table 4.4 lists and describes the 36 principal walls that were defined in the description and excavation of the two temples in Trench A. The location of these walls can be seen in Fig. 4.7 and Fig. 4.30 and other figures where stated.

Fig. 4.56: View of wall 360, built from re-used stone architectural fragments above wall 352 at the east end of the South Temple from the north-west.

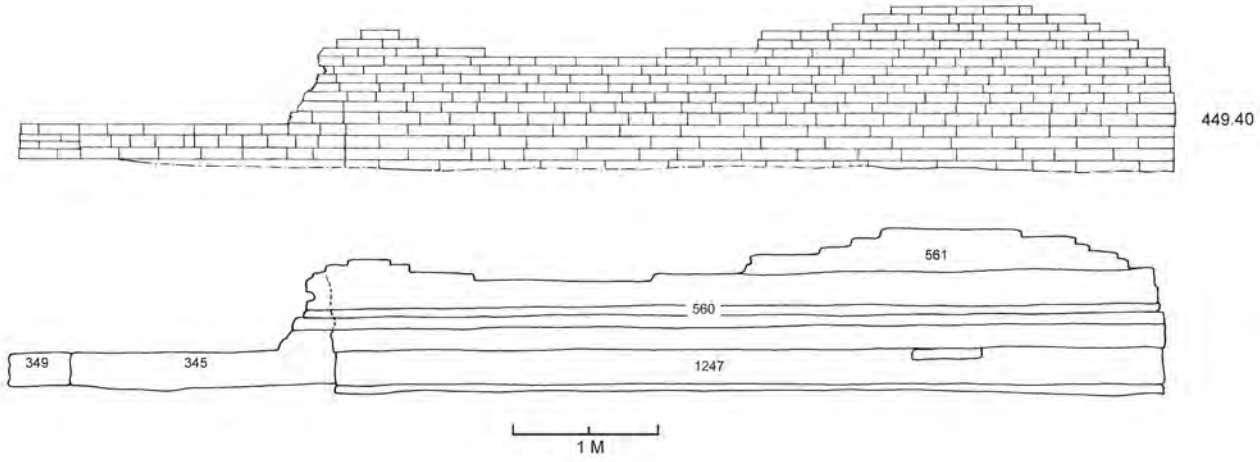


Fig. 4.57: Drawing of the north face of the north wall of the South Temple with an interpretive overlay.

Table 4.4: Detailed description of the principal walls in Trench A.

Wall Number	Temple/Area	Description	Phase	Brick size
344	S Temple	Phase III east wall of the South Temple.	South III	6/7.5 × ? × ? cm
This is a late addition blocking the opening in the east end of the Phase II South Temple. Only four courses survive; it is heavily restored and re-mortared and there may have been some reconstruction – it is now impossible to tell. The construction is crude, similar to 352, using mostly brick bats. The wall is 71 cm thick with c. 42 cm of rubble fill. Height as standing is 29 cm.				
345	A:S Temple	Phase IV extension to east end of north wall of South Temple.	South IV	Unclear
This is an eastern extension to the north side of the South Temple, equivalent to 359 on the south side. This wall extends the line of 560/561 to the east by 183 cm at the lowest course. For most of the wall's length, only the lowest three courses survive; at the west end, 11 courses are preserved, but above course five, the bricks are inter-bonded with wall 560. This demonstrates that the eastern extension was complete before the upper part of wall 561 was rebuilt. The most westerly five bricks of the lowest course are offset by about 5 cm in a very irregular fashion; the reason for this is not clear. The jointing is quite crude and the wall is made almost entirely of slightly weathered brick bats. The wall is between 89 and 92 cm wide with 55 cm of densely packed brick rubble in its core.				
349	A:S Temple	Short wall abutting wall 345 to east of South Temple (north side).	South – uncertain phase	Unclear
The width of this wall is 98 cm and the length 38 cm. It consists of four courses of brickwork which have been built on to the eastern end of wall 345. It is built of solid brick bats with no rubble fill.				
352	A:S Temple	Phase IV and V east wall of South Temple.	South IV South V	Variable
Eastern wall of Phases IV and V of the South Temple. The wall is robbed out along about 1.4 m at the north end and only about 2.4 m remain. It is overlain by a later stone alignment/wall 360. The wall is 70 cm in width with about 38 cm of brick bats and silt as a core. The wall has a stone foundation with a compact silt matrix (317) (Fig. 4.45). Only seven courses of the wall remain; the lowest five are foundation courses not intended for view and the bricks are variable in size and type and have crude jointing. The upper two courses are offset by about 3 cm and the silt jointing is a little finer. Still the brick types are quite variable and most of them appear to be brick bats rather than complete bricks. The largest are 24 cm in length.				
354	A:S Temple	Small, crude brick alignment abutting east end of wall 349.	South – uncertain phase	Unclear
Small alignment of brick bats abutting wall 349 at the eastern end of the South Temple. It is not clear if this is a wall or the remnant of a brick surface.				
359	A:S Temple	Phase IV extension to east of south wall of South Temple.	South IV	7 × 24 × 36 cm
Wall 560 was extended 1.56 m on the south side by the construction of this wall, which abuts 560 up to the 14th course, above which level it is inter-bonded (Fig. 4.42). The bricks of this wall are orange fired and measure 7 × 24/25 × 35/37 cm. This is the same size as the bricks of the inter-bonded courses above except that they are thinner (c. 6 cm). The jointing of these courses is also cruder than the inter-bonded courses above. The wall is 84 cm wide with about 40 cm of brick-bat and silt fill. The wall is inter-bonded with wall 252, which is of a slightly cruder construction.				
360	A:S Temple	Crude stone wall on top of wall 352, east of South Temple.	South IV South V	N/A
This wall consists of re-used carved stone architectural fragments lying in a rough alignment along the top of wall 352 (Fig. 4.56). It appears to be a late rebuild of wall 351 and may be related to the very latest phase of use of the temple. It is separated from wall 352 by a 5-cm deposit of silt, suggesting that the construction techniques of the period when the wall was built were extremely crude.				

Wall Number	Temple/Area	Description	Phase	Brick size
383	A: N Temple	Thin Phase V partition wall in west of *mandapa*, North Temple (equals 544).	North V	unclear
This wall consists of 10 or 11 brick bats crudely set on end into a thick, gravely mortar running across the *mandapa* of the North Temple, 1.64 m from the western end. The brick bats are of different heights but their bases are at roughly the same level. The wall continues to the south of wall 558 in the southern aisle of the *mandapa* as wall 544 where it turns and abuts the interior face of wall 557. The brick bats are 5.5/6.5 cm thick. The mortar must originate from the 1967 restoration of the temple because Yusuf clearly states that no mortar was used in the temple construction (Yusuf 1938: 4). But it is clear from his photograph (Fig. 4.4) that this structure existed and that it was considerably larger when it was first excavated in 1937. What remains now appears to be the 1967 restoration of a rather fragile structure excavated by Yusuf that acted as a retaining wall for a raised platform in the western part of the *mandapa*.				
509	A: TP5	Single course thickening of interior of south wall of South Temple.	South V	7 × 14 × 23 cm
Wall constructed against the interior face of the south wall of the South Temple as part of the Phase V alterations to the temple also involving walls 562 and 528. This is a one-brick wide wall constructed in a very crude fashion. Only about 17 bricks remain, not all of which are complete. There are four courses held together with a crude mud mortar. The face is irregular and badly laid. The wall is separated from the main temple wall by 7 cm of silt fill. Equals 562.				
510	A: TP5	Interior wall in South Temple *mandapa*.	South V	Unclear
Inside the *mandapa* of the South Temple, two badly preserved walls (510 and 511) appear to have originally subdivided the *mandapa* into three sections as part of the Phase V alterations. This wall is of a very crude construction, being built of brick bats on a rough, shallow foundation of small stones. The wall has been disturbed by later cutting from an unknown height and possibly also by Yusuf's excavations. Only one course of bricks now remains, none of which are complete. The wall is 50 cm wide.				
511	A: TP5	Interior wall in South Temple *mandapa*.	South V	Varies
Inside the *mandapa* of the South Temple, two badly preserved walls (510 and 511) appear to have originally subdivided the area into three sections as part of Phase V changes. Wall 511 is of a very crude construction, being built of brick bats on a rough, shallow foundation of small stones. The wall has been disturbed by later cutting from an unknown height and possibly also by Yusuf's excavations. Only two courses of bricks now remain, none of which are complete. The bricks are mixed, some being orange fired (7 × 22 × 38 cm) and some purple fired (7.5 × 20 × 33 cm). The wall is 50 cm wide.				
514	A:N Temple	Remaining portion of original northern wall abutting shrine, North Temple.	North III	Varies
This appears to be the original Phase III wall of the *mandapa* of the North Temple (557, see below). It is the only remaining section of this wall on the north side of the temple and is preserved between the edge of a robbing cut and a pit dug through the structure from above. The base of the wall is 107 cm wide thinning to 96 cm wide above the third course and 75 cm wide above the mouldings (Fig. 4.19). The wall consists of two brick faces with a 40-cm hearting of brick bats and silt. The northern face of the wall shows that it had *adhisthana* mouldings beginning with an offset in the eighth course, but these were later hidden by the addition of an outer face (wall 559/1213). Only the lowest three courses of the mouldings are preserved (Fig. 4.18B). The lowest courses of the wall are built of bricks 40/41 cm long, whilst the upper courses use variable brick sizes. The interior face of the wall is offset at the third course by 3 cm and at the fourth course by 9 cm. There is another very small offset of about 2 cm at the eighth course.				
528	A: TP5	Thickening to interior face of north wall, South Temple.	South V	Unclear
Wall constructed against the interior face of the north wall of the South Temple as part of the Phase V alterations to the temple also involving walls 562 and 509. This is a one-brick wide wall constructed in a very crude fashion from brick bats held together with a crude mud mortar on a thin foundation of small stones.				
544	A: N Temple	Thin Phase V partition wall in south aisle of *mandapa*, North Temple (equals 383).	North V	Unclear
See description of 383 above.				

Wall Number	Temple/Area	Description	Phase	Brick size
554	A:N Temple	Phase I wall, North Temple.	North I	7 × 25 × 40/41 & 33 cm

This is the wall of the shrine of Phase I of the North Temple. It is a solid brick wall, two-bricks wide at its base and one in the upper courses, with no hearting. The wall still stands to 19 or 20 courses or 160 cm high. The bricks are quite finely jointed with mud mortar, although only very little of this is exposed. The structure is quite complex (Fig. 4.12). The lowest two courses of the wall are only visible on the interior, on the exterior they cannot be seen because rubble fill 941 underlies the third course. This indicates that the construction of wall 554 and the deposition of 941 were simultaneous. The lowest two courses of 554 have therefore been labelled 970 (see below) in order to differentiate them stratigraphically. The width of 970 is not known as the outer face is not visible. Wall 554 is two-bricks, or 50 cm wide at its base, although the lowest (or 3rd on the interior) course is inset by about 3 cm on the exterior. Above the sixth (or eighth) course, the wall thins on the interior to a single brick thickness (about 30 cm) for the rest of its height, creating a 25-cm-wide ledge on the interior. Wall 968 (see below) was built into this space at a much later date to thicken the wall to 50 cm. The 7th and 8th (or 9th and 10th including 970) courses of the exterior are inset by 5 cm on the north face and 2 cm on the east face, creating what appears to have been a simple rectangular decorative inset moulding that probably ran around the whole shrine, although it is visible only in a limited area where it has been exposed by pit 341. The bricks are quite soft-fired and pinky-yellow or red in colour and vary in size, most measuring 7 × 25 × 40/41 cm, although some smaller examples measuring 7 × 25 × 33 cm were also noted. The coursing consists almost entirely of stretchers on the interior, which is the only face that is fully visible. The whole square structure measures 2.04 m N-S and 2.08 m E-W on the exterior, and the space in the centre measures 1.10 m N-S and 1.06 m E-W at the base. There is no discernible sign of weathering on the exterior wall surface that would demonstrate that the structure was exposed to the elements for any length of time.

555	A:N Temple	Phase I platform, North Temple.	North I	7 × 25 × 40.5 cm

Technically, this number refers only to the upper three brick courses of the platform of the Phase I shrine of the North Temple, although the number has also sometimes been used in general descriptions to refer more generally to the whole Phase I square platform including the lower part of the wall 969 (see below) and fills 941, 932 and 911 (see Fig. 4.12 and discussion). Wall 555 is exposed only in limited places. The bricks are soft and have a reddish colour and are jointed with a fine mud mortar less than 1 cm thick (Fig. 4.16). The top course is a levelling course in which the bricks are between 4.5 and 6 cm thick, suggesting that they have been deliberately thinned to level the surface of the platform. The wall retains a rubble fill that abuts wall 554, although it is not clear where the upper level of this fill originally was as it has been disturbed by the construction of wall 556 during Phase II. The platform measures 4.22 m N-S and 4.21 m E-W and is about 56 cm high, the upper 26 cm of which is technically wall 555.

556	A:N Temple	Phase II structure with offsets, North Temple.	North II	6.5 × 25 × 40 cm

Wall 556 refers to the Phase II *triratha* structure in the North Temple that is constructed upon the Phase I brick platform 555. The structure is square and about 20 cm smaller than platform 555, but the middle of each face projects out 10 cm along a 2-m section to the edge of platform 555 (Fig. 4.12). At least 13 courses of the outer structure are preserved, so that it stands 1.10 m above the top of platform 555. The wall consists of an outer face of brickwork, which is filled with a brick-bat and silt hearting. The lowest five courses of the wall are very finely jointed (less than 5 mm) using good-quality orange or orange-red bricks measuring 6.5 × 25 × 40 cm, although in the fifth or sixth course, the bricks are thicker (7 or 7.5 cm) but otherwise the same size. Above this course, 6 × 20 × 33 cm purple fired bricks with surface traces of vitrification are used and are part of a much later rebuild numbered 971 (see below). The bricks above this level are badly eroded, suggesting that they have been exposed for longer than the lower courses, perhaps since Yusuf's excavations. The coursing consists mostly of stretchers with occasional shorter bricks (Fig. 4.16). There are small offsets in the wall in some places, without apparent symmetry: there is a 3.5-cm offset above the third course at the south end of the west side and a 4 cm offset above the ninth course at the west end of the north side. The eastern side of the structure has been cut into above the sixth course for the addition of wall 557 (Phase III). This is a complex inter-bonding, that is discussed in more detail above.

557	A:N Temple	Phase III *mandapa* wall, North Temple.	North III	6.5 × 25 × 40 cm

This is the Phase III *mandapa* wall of the North Temple. It forms a large tapered rectangular structure that abuts wall 556 to the west. The wall is 120 cm thick along its south, east and north sides, but only 94 cm thick along the western side. The wall consists of two brick faces filled with a hearting of brick bats and silt. The bricks are orange and are finely jointed with silt. The wall has been almost completely robbed out along its northern side, the eastern side is preserved but has been built over during reconstruction and much of the south side has been robbed out or has been built over by reconstruction; the upper courses of the north face of this part of the wall consist of smaller-sized bricks jointed with mortar, almost certainly resulting from the 1967 restoration. It is not clear, however, if there was a later rebuild on top of this part of the wall before that time. This wall is the same as wall 514 (see above), which has a different number only because it has been isolated by later robbing. There is a 3-cm offset along the interior face above the seventh course which appears to run around the whole building. Above this offset, the jointing is noticeably cruder, especially at the west end, suggesting perhaps that the structure was rebuilt from this level. This is just above the later floor level (1010). *Adhisthana* mouldings are preserved along a 24-cm section of the west face (and also on the west face of wall 514), but probably once extended around the entire *mandapa*. The mouldings are of a very similar design to those on wall 560 of the South Temple (see Fig. 4.18A).

Wall Number	Temple/Area	Description	Phase	Brick size
558	A:N Temple	Phase IV interior wall, North Temple.	North IV	7 × 26 × 42 cm
This wall forms a sub-rectangular structure inside the *mandapa* of the North Temple and is part of the Phase IV alterations. The wall is 51–54 cm wide and consists of two rows of bricks with no hearting. The low-fired, crumbly orange bricks are quite crudely jointed with silt mortar (much cruder than wall 556). The wall sits on a compact clay foundation on the floor, which abuts wall 557. Wall 558 abuts wall 556 and 557 at the west end. At the west end of the south side of the wall, a 40-cm-long grey stone is built into the wall.				
559	A:N Temple	Rebuilding of outer face of wall 514.	North III?	Unclear
This wall (also numbered 1213) consists of three courses of soft-fired red bricks, finely jointed with a mud mortar, that have been added to the western face of wall 514. The bricks were clearly part of an *adhisthana* moulding, as they are offset and the brick in the middle course is chamfered (Fig. 4.19). The wall appears to have no substantial foundations, and the lowest brick sits on a deposit of silt that abuts the face of wall 519. The base of this wall is level with the eighth course of wall 514. This is a rather strange situation and it is difficult to understand, partly because only about 50 cm of this wall is preserved, and partly because the stratigraphic relationships and related deposits have been removed by previous excavations. This wall appears to represent a thickening of wall 514 by about 30 cm towards the west that preserves the mouldings. The chamfered course in the mouldings is at exactly the same level as the same course in wall 514. No similar thickening was observed on the opposite side of the temple.				
560	A:S Temple	Phase II wall of South Temple.	South II	6/7 × 22/24 × 43 cm
This is the upper part of the main wall of Phase IV of the South Temple. It is partly constructed upon the Phase II walls 1240 and 1247 (see below and the section in Fig. 4.33), except in the eastern extension, where it would have been constructed on top of walls 345, 359 and 352. This wall was originally numbered 351 (south side) and 361 (north side), and in the site documentation before Test Pit 5 was excavated, walls 560, 1224 and 1240 were considered to be the same. The wall is about 101 cm thick and has a 50–55-cm thick rubble hearting consisting of brick bats and silt. About five brick courses of wall 560 survive above wall 1247, although this may vary across the structure, with *adhisthana* mouldings beginning with a chamfered brick in the second course (Fig. 4.18C–D). The bricks of the moulding courses are slightly thicker than in the rest of the wall (7 × 22 × 40 cm), and appear to be slightly higher fired. See also elevations of the wall from different directions (Fig. 4.46). The jointing is cruder than 1240/1247 and the coursing consists mostly of headers. It is assumed that the top of the vertical abutment at the eastern end of the south wall marks the distinction between walls 560 and 1240/1247 (Fig. 4.42), but this is far from certain and it is impossible to verify because not all faces of the wall are exposed, and the difference between the two walls is not always apparent. It is also more than likely that the construction of wall 560 took place from slightly different levels across the trench and from different levels on the interior and exterior face of wall 1240/1247. That is to say that the top of 1240/1247 may not have been level when 560 was built upon it.				
561	A:S Temple	Late rebuilding of north wall, South Temple.	South V?	6 × 16 × 27 cm
This represents a late rebuild of wall 560 along the north side of the South Temple. The reconstruction took place from the 12th or 13th brick course above the lowest course of wall 1247 (Fig. 4.57). Above this level, the bricks are hard-fired and purple coloured with frequent signs of vitrification on the surface. These bricks are smaller than those used in the earlier walls. The jointing is quite fine. The lowest two courses are a little larger and these may represent an earlier rebuild of which no other evidence survives. The coursing pattern is HSSSSSHSSSSSH or HSSSSHSSSSH. There is a 2-cm offset in the sixth course of 561 that runs along the whole wall. Wall 561 has removed the upper courses of the *adhisthana* mouldings of wall 560 below, leaving only the first chamfered course, but no attempt has been made to re-create the mouldings. The type of bricks used in wall 561 is similar to those used in apparently later rebuilds of parts of the *garbhagriha* structure of the North Temple (see wall 971 below).				
562	A:S Temple	Phase V thickening of inner face of south wall, South Temple.	South V	7 × 18 × 35 cm
This wall consists of four courses of bricks built against the inner face of wall 560 and 359 on the south side of the South Temple *mandapa*. The wall is only one-brick wide and is separated from wall 560 by a 5-cm-thick silt deposit. One of the bricks is intact enough to measure and is 7 × 18 × 35 cm. The upper two courses of this wall are inter-bonded with wall 359, suggesting that some reconstruction of the temple superstructure occurred during the Phase V alterations. The base of the wall appears to rest on silt, although this was not excavated and it is likely that there is a shallow foundation deposit below as there is for wall 509. This wall is almost certainly the same as 509, but the two parts have been separated by the destruction of the middle part of the south wall.				
578	A:South Area	Wall foundation in cut 577.		N/A
691	A:South Area	Wall of large irregular igneous boulders.		N/A

Wall Number	Temple/Area	Description	Phase	Brick size
699	A:South Area	Broken-brick wall foundation cut by 577.		N/A
Together, these three deposits (578, 691, 699) represent a now completely robbed stone enclosure wall that appears to have abutted the south-west corner of the South Temple and then turned sharply towards the south, where it disappears out of the excavated area (Fig. 4.48). Deposit 578 consists of a very crude alignment of angular igneous rocks that were found within robber cut 577. It seems most likely that they represent some of the stones from the original wall that were left behind by the robbing and have been buried within the fill of the robber trench. What appears to have been the foundation of the original wall is represented by 699, a compact deposit of brick bats and stones at the base of the robber trench beneath 578 (Fig. 4.47). To the immediate west of the robber trench is another crude and discontinuous alignment of large stones (691) that may represent the course of a parallel wall or which may have been robbed from wall 578/699 but which were left at the site. There are two further cuts (671 and 688) close by and on the same alignment that might be the foundation cuts or robber cuts of related walls that have now completely disappeared. That there was a wall (or walls) here is in no doubt as the robbing and the foundations clearly show its course. Whether it was brick or stone is not certain, but the large amount of stone that is found in deposits 578 and 691 suggests that the wall was constructed of large blocks of igneous rock.				
968	A:GG North	Internal thickening of wall 554 of *garbhagriha*, North Temple.	North – uncertain phase	7.5/8 × 18/19 × 25/26 cm
This wall is an internal thickening of the Phase I *garbhagriha* wall of the North Temple (554). It is constructed on the internal inset in the eighth course wall 554 and continues to the height to which the *garbhagriha* is preserved today (Fig. 4.12). Ten courses of this wall are preserved standing to a height of 78 cm. The wall is built of bricks which are crudely jointed with silt. The construction is not of good quality, mostly stretchers are visible on the interior and they are not neatly arranged. The small brick size suggests a fairly late date of construction through comparison with other bricks in the two temples.				
969	A:GG North	Possible earlier phase of wall 555, North Temple.	North I	6.5/7 × 24/25 × 39/40 cm
This wall is the lower four courses of the outer edge of the Phase I platform of the North Temple 555 (Fig. 4.12). It forms a square exactly the same dimensions as 555 (4.22 m N-S and 4.21 m E-W). The build is exactly the same as 555 and it may have been built at the same time. It is built of bricks that are finely jointed with silt mortar. The top of the wall is level with the possible brick surface 932 with which one brick is inter-bonded. It is not clear whether this wall is separate from 555, in which case it represents an earlier, lower, platform of the Phase I shrine, or whether it is simply a stage in the construction of the Phase I platform.				
970	A:GG North	First two courses of wall 554, North Temple.	North I	Unclear
This wall is the lowest two-brick courses of wall 554. They are thinner than the upper courses of 554, although it is impossible to say by how much as the outer face of 970 is not visible. The wall was defined on a stratigraphic technicality because these bricks are clearly abutted by fill 941 upon which the upper courses of wall 554 rest. Whilst in reality the whole Phase I platform structure was probably constructed together, technically these two courses are an earlier part of the construction (see Fig. 4.12). Equals 554.				
971	A:GG North	Rebuilds to wall 556, North Temple using purple bricks.	North – uncertain phase	6.5 × 18/24 × 35/36 cm
Above the seventh or eighth course of the Phase II wall of the North Temple (556), the bricks change from softer-fired, larger orange bricks to smaller, harder-fired purple bricks similar in aspect but of a different size to those used in the construction of wall 561 on the South Temple (Fig. 4.27). Robbing and erosion of the structure make it impossible to say anything about the nature of the construction of which these bricks form a part. They are found on the north, south and west sides of the Phase II structure but not on the east face. The bricks are badly weathered, suggesting that they have been exposed to the elements for longer than the lower part of the structure.				
1213	See 559			
1224	A:S Temple	Foundation wall for Phase I of South Temple.	South I	6.5/7 × 24 × 42/43 cm
Wall 1224 is the lowest five or six courses of the Phase I walls of the South Temple (Fig. 4.39). The wall is 70 cm wide and is made of solid brick, three bricks wide, with no hearting. The bricks are orange or yellow in colour and are quite crude and soft-fired. They are quite crudely jointed with 2-cm-thick mud mortar. Certainly, the jointing is cruder than walls 1240/1247 and 560. Mostly, the courses are either completely headers or stretchers, but there is no apparent pattern in some places. In some places, the wall is 35 cm thinner than walls 1240 and 1247 that are built on top of it.				

Wall Number	Temple/Area	Description	Phase	Brick size
1240	A:S Temple	South Temple Phase II wall – north side.	South II	6.5 × 24 × 43/44 cm
Upon excavation, it became clear that the first four brick courses above foundation wall 1224 are built of a different masonry to the upper part of the wall. These courses are also crudely inter-bonded with wall 1251 (Fig. 4.40). The bricks are soft-fired and orange yellow in colour and measure 6.5 × 24 × 43/44 cm. The silt jointing is quite fine. The wall consists of two brick faces filled with brick-bat and silt hearting. The interior face shows mostly stretchers. The wall is 80 cm wide and is constructed upon wall 1224 (see above and the section in Fig. 4.39). The lowest course is a levelling course, using split or wedge-shaped bricks. It seems likely that the wall below the rebuild evident on the outer face of the south wall must be 1240 (Fig. 4.42). The original *adhisthana* mouldings in this wall continue around the corner of the eastern end of the Phase II temple, for a distance of about 111 cm, then there is a break of 41 cm before the entrance gap that is now filled by wall 344. These mouldings have been partly concealed by the later construction of walls 345 and 359 that extended the temple to the east during Phase IV. Equals 1247 on the south side.				
1241/ 1242	A:S Temple	Late rebuilding of south wall, South Temple.	South V?	6.5 × 24 × 33/34 cm
Wall 1241/1242 is the uppermost four to seven courses of the southern wall of the South Temple (Fig. 4.30). The two walls were clearly once part of the same rebuild but they are now separated by cut 595. The bricks on these walls are small and higher fired than those used in wall 560. The colour is slightly purple. The two walls appear to be on a slightly different alignment to wall 560 below, being a few degrees to the west. There are no associated floor levels, but it seems quite likely that the upper rebuild of the north wall (561) is part of the same rebuilding as these two walls.				
1247	A:S Temple	South Temple Phase II wall, south side.	South II	6.5 × 24 × 43/44 cm
This is the same wall as 1240 but on the south side of the temple. Although no visible join between the two walls has been exposed, it is clear that they must be part of the same wall. On this side of the temple the wall is directly overlain by wall 560.				
1248	A:N Temple	Late rebuild of *mandapa* wall 557, south side North Temple.	North – uncertain phase	7 × 25 × 42/43 cm
This is a late rebuild of the upper courses of wall 557 on the south side. Very little of this rebuild remains. The jointing is cruder than in the lower levels, but the bricks are not the vitrified purple variety used in very later rebuilds. Up to three courses remain.				
1251	A:S Temple	Phase II wall of *garbhagriha* of South Temple.	South II	6.5 × 24 × 43/44 cm
This wall was initially numbered 1240 until the join with 1240 was seen during excavation of TP5 (Figs 4.38 and 4.40). The wall is shown to have better quality masonry than 1240 and to be inter-bonded with it, 1251 having been constructed first, leaving open teeth at the ends into which bricks have been crudely slotted to bond 1240 to this wall. The jointing is very fine (<5 mm) and the bricks are the same size as wall 1240 being laid as stretchers with only occasional headers. As can be seen in Fig. 4.38, the wall incorporates a few vitrified bricks and some fragments of stone, most notably a large piece in the middle of the older entrance to the *garbhagriha* in wall 1240 that this wall effectively closes. A number of cut bricks are also evident where this wall was fitted onto wall 1240 below it. It is assumed that the wall encloses the whole of the *garbhagriha*, but each of the sections of wall abuts each other in the corners of the *garbhagriha*, at least on the outer face. This probably reflects the method of construction.				

J. Varaprasada Rao and Derek Kennet

Chapter 5
The Excavation of Trenches B, C, D, E and F

Although the excavations around the two temples in Trench A were the main focus of the project, a series of smaller trenches was opened across the mound in order to investigate the depth and nature of the stratigraphy and the chronology of occupation on different parts of the mound. The aim was to delimit the extent of the Early Historic urban centre and to understand the extent of Early Medieval occupation. These aims were only partly fulfilled due to the difficulty of excavating trenches in the centre of the modern town. In the event, five further trenches were excavated, with only one (Trench F) being located outside the ASI protected area at the south end of the site. Trench locations are shown in Fig. 4.1. This chapter consists of reports of each of the excavations in each of these five trenches. Reference is made throughout to the context numbers, which are listed and described in Appendix I. For period dating and phasing, see Chapter 6.

Trench B

(Figs 5.1–5.4)

Trench B was excavated during the 1998 and 1999 fieldwork seasons. It is located to the south of Trench A (Fig. 4.1). The trench was originally 4 m × 4 m but was reduced in size during the excavation to 2 × 2 m.

The corner of a stone structure (401) came to light immediately below the surface in the south-east corner of the trench (Figs 5.2 and 5.4). Sixty cm below this, six stone pillar bases were uncovered cut into floor 413 underneath the upper layers of dumping and pitting activity (403, 404, 408, 409, 411, 425). Two of these bases were outside the limits of the trench, the other two are covered by wall 401.

Below this, a succession of uneven floors or surfaces (417, 427, 429, 439) came to light associated with pits filled with pottery and other rubbish as well as an ash deposit (428) and thick dumping deposits such as 437, 438. A pit (432/433) associated with these levels had a white plaster base. These deposits, and those above them, can be allocated to Period 4. No Period 3 remains were found in this trench.

From deposit 440, where the Period 2 levels begin, a lot of ash and evidence for fire and burning came to light in contexts 441, 442, 443, 444, 445, 446 and 447. A large pot was found covered with a thick, burnt mud coating (441) together with a smaller pot (445), both of which were associated with a black burnt deposit (443). A number of fragments of burnt clay were also recovered from the floor (450). All of these layers together suggest that, for a period of time, this area was given over to some sort of industrial process involving fire. Unfortunately, no evidence was uncovered that gives any more precise indication of what this process might have been. At this point, the size of the trench was reduced to 2 × 2 m in the south-east corner in order to speed up the excavation.

Below this 'industrial' activity, the nature of the deposits in this trench changes significantly. A sequence of 23 more or less horizontal floor levels was revealed, beginning with floor 450 (Figs 5.3 and 5.4). Apart from the uppermost two floors, 450 and 451, the rest of this sequence is allocated to Period 1. All floor levels had a gentle slope downwards towards the west. Most of the floors are made of thick, semi-compact silt and clay, but some of the lower floors are thinner and have traces of lime on them. Some are associated with pits and postholes, and some with hearths, but the limited size of the trench did not allow the investigation of building styles or techniques or the nature of occupation throughout this period. A few coins were recovered from these levels.

Below the sequence of Period 1 floors, undisturbed natural soil (743) was reached at a depth of about 3.2 m from the surface. Natural soil seems to slope down towards the south-west. The archaeological deposits in Trench B are about 3.2 m in depth, with the Early Historic levels making up the lower 1.3 to 1.5 m of this.

https://doi.org/10.1515/9783110653540-005

Fig. 5.1: Trench B, view of the south and east sections of the trench at the end of excavation.

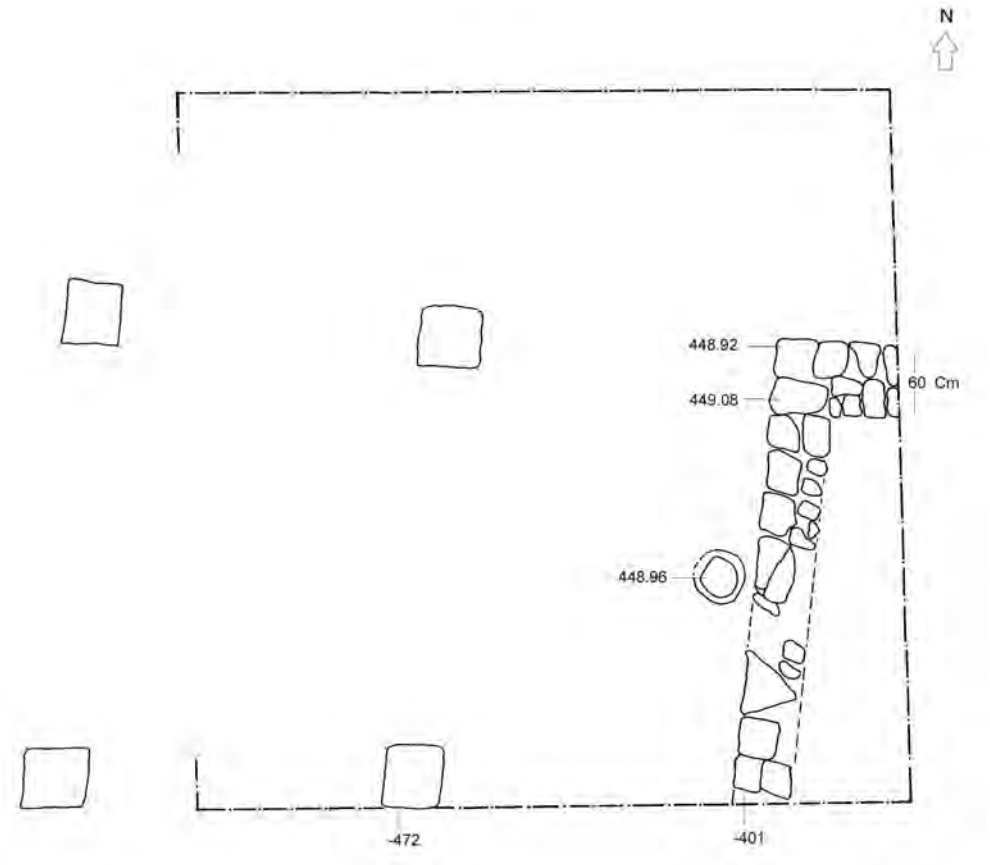


Fig. 5.2: Trench B showing wall 401 and related pillar bases to the west.

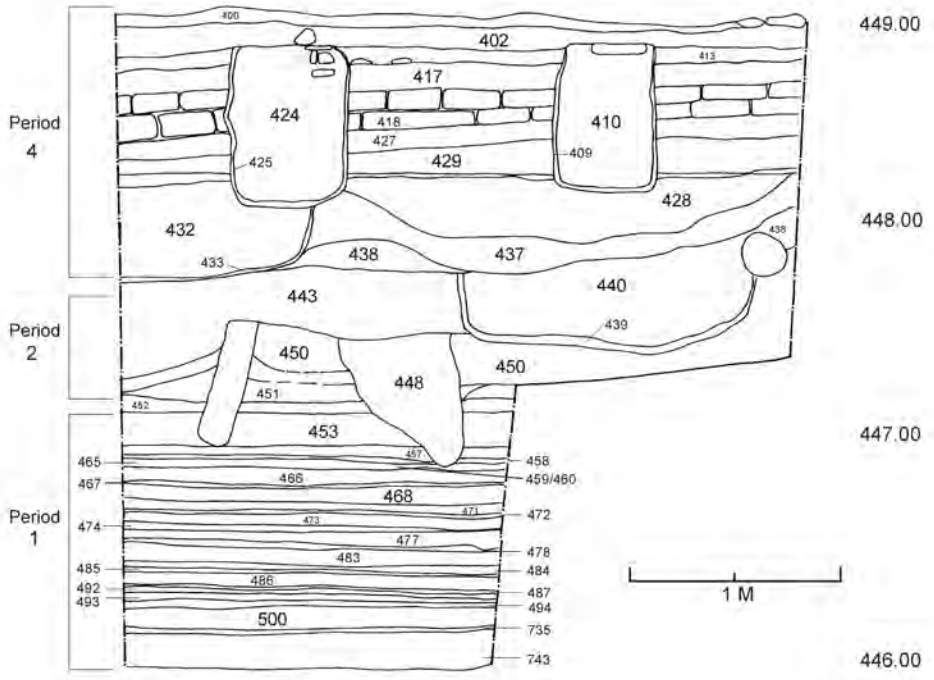


Fig. 5.3: Trench B, north-facing section.

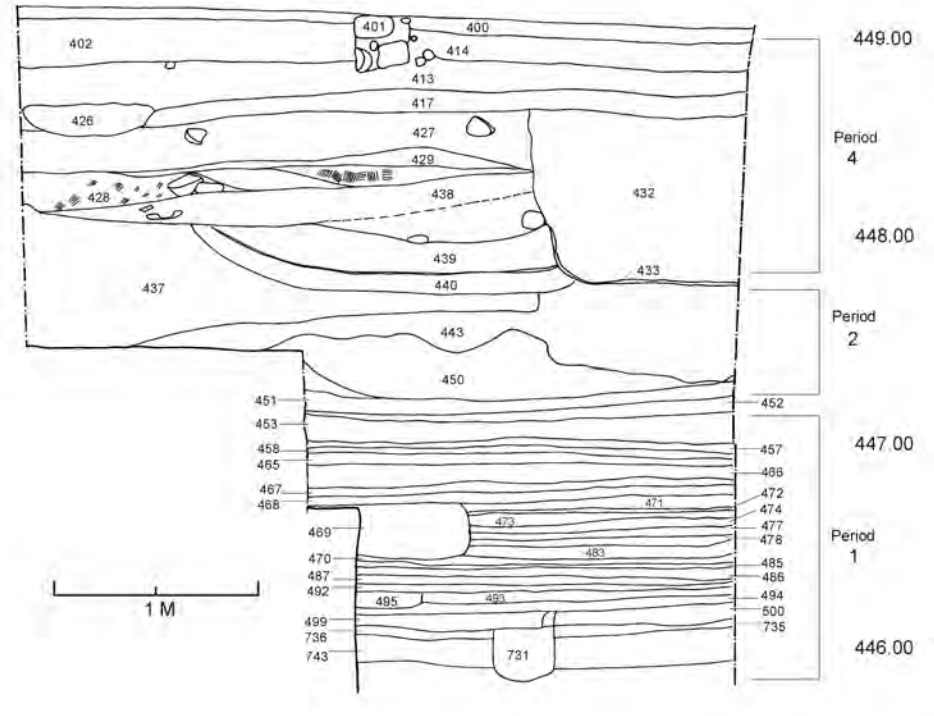


Fig. 5.4: Trench B, west-facing section.

Trench C

(Fig. 5.5)

In the 1996 season, a number of 5 × 5 m trenches were opened on the edge of the archaeological mound of Paithan towards the extreme south of the ASI protected area (Figs 4.1 and 4.2). This trench was excavated by J. Howell and A. Kumble in the 1996 and 1997 seasons. A summary report of the small finds and antiquities from this season is included in Chapter 10 of the present volume. It is impossible to incorporate the evidence from this trench into the periodisation proposed for the rest of the site due to the different methodology that was used. The following summary is intended only to give a sense of the nature of deposits in this part of the site and to suggest how these may relate to the site periodisation.

This area was chosen because it appeared to be free from the later Medieval structures and deposits that overlie the area to the north. At the edge of the mound, two brick ring-wells were visible in the cliff above the river bank and it was decided to expose these by cutting back the section and getting a preview of the entire archaeological deposit down to the natural soil. The trench was located in a low depression that appears to be enclosed within a low earthwork marking the location of a wall or rampart, probably of the Mughal period.

The coordinates of the five trenches according to the site grid are as follows: 130/450, 135/450, 140/450, 145/450 and 135/445. It is by these coordinates that they are referred to in the description below. Context numbers 1–41 were allocated during the 1996 season, and context numbers 42–203, during the 1997 season (see below).

The sequence elucidated by the trench is summarized below from the available excavation records:

Phase CI: The earliest phase is sealed by a large soil deposit, which includes a ditch and the material into which it is cut. In this phase, Thick Grey ware (Chapter 7) is present, but in comparatively small quantities compared to the wares that might be associated with the Early Historical period, including Red Polished ware. The principal types of finds were ceramic 'areca nut' beads, pendant loom weights, skin rubbers and copper-alloy coins (Chapter 10).

Phase CII: This includes a phase of structural activity overlying the deposits of the previous phase with a drain and earthen floors. The proportion of Thick Grey ware begins to drop in this phase, down to 12% of the total amount of pottery collected. The most significant find from this phase is a lead *bulla*.

Phase CIII: The thick soil layer of this phase is cut into by numerous pits and shallow troughs, which do not appear to be structural. The pottery is mixed, with Thick Grey ware and other wares occurring in almost equal amounts. The finds include beads, bangles and kohl applicators, as well as ceramic pendant loom weights and cylindrical counters.

Phase CIV: This phase is the topsoil and recent intrusive activity on the site. The only structural activity in this phase is the ring-well found in trenches 130/450 and 135/450, which is the latest of the four ring-wells found in the excavations. The predominant type of pottery is Thick Grey ware, which represents more than 30% of the sample. The finds from these deposits are probably mixed and contaminated, but the most significant are a ceramic seal and one of the lead-scrolled objects.

As can be seen, all of these layers would be allocated to Period 3 or later according to the present periodisation due to the presence of Thick Grey wares, but the material from this trench was not included in the final analysis of pottery.

A significant feature of this part of the site of Paithan is the large number of circular brick or terracotta structures, commonly referred to as ring-wells. At least eight of these features can be identified in the eroding sections of the mound along the river bank. Most are cut from relatively high levels on the mound and do not appear to be deep enough to reach down to the water table. This brings into question their interpretation as a device for drawing up drinking water. Other interpretations that have been offered are that these structures are either soak pits for dispersing excess water, or silos for underground storage. The large number of ring-wells at Paithan have various designs, and the bricks or terracotta rings used in their construction are not of a uniform form or size.

In total, four ring-wells were discovered within the area excavated, two of which were exposed to their entire depth, which was in excess of 2.1 m. They were constructed in brick and bottomed out just below the top of the natural soil. A third brick ring-well was found within trenches 130/450 and 135/450 and was not fully excavated. The fourth ring-well is constructed from terracotta rings, only two of which survived. It was in a very fragmentary condition on the edge of the mound and was not excavated. With the exception of these ring-wells, no structural evidence was found in these trenches. In trench 135/445, a series of inter-cutting

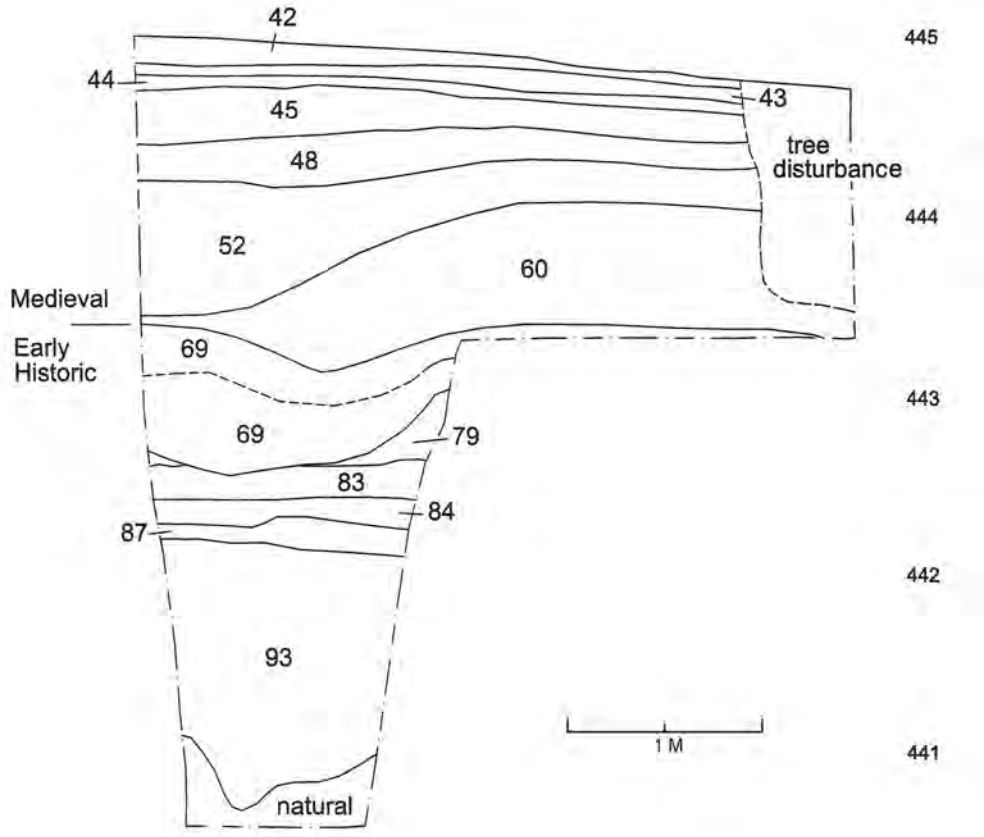


Fig. 5.5: Trench C section (155/450, south-facing).

features and later disturbances such as tree roots and animal burrows truncated all horizontal stratigraphy to a depth of 1.25 m.

During the 1997 season, a second area was located at the extreme south end of the site next to the 1996 excavations. Here, after the end of the 1996 season, students from the ASI Institute of Archaeology had undertaken a training excavation, opening a trench 35 × 5 m. In 1997, the same trench was cleaned and excavated down to natural across a 2-m-wide section in each of the seven sectors opened. This gave a 35-m-long section across this area of the site in which the sequence could be examined. In order to gain more information about the cultural assemblage, the baulks between the sectors were subsequently excavated. A series of terracotta and brick ring-wells and several pits were found cutting into the deposits, but no substantial structural activity was identified. The cultural material within the deposits can be dated to the Medieval and Early Historic periods. The deposits are interpreted as resulting from dumping and extra-mural activities such as gardening, herding and well-digging probably close to the city of Paithan but certainly outside it.

An example of one of the trench sections drawn and excavated is shown in Fig. 5.5 (from Trench C, 155/450). Within this sequence, which is fairly typical of the whole area, layers 60 and above contained Thick Grey ware and would therefore be allocated to Period 3 or later under the present periodisation system. Below this, the layers can be allocated to Period 2, with the exception of the lowest layer (93), which is probably dated to Period 1.

Trench D

Trench D is situated at the northernmost limit of the ASI reserve area, 50 m north-east of Trench A close to the modern-day Muslim quarter of the town (Fig. 4.1). A small L-shaped trench was excavated here, either by

Dikshit in 1965 or by Yusuf in 1937, which seems then to have been enlarged in the more recent past by the clandestine robbing of building materials which has now been halted. Three metres of Medieval and post-Medieval overburden had been removed by these activities, providing an ideal location, at the very northern limit of the archaeological area, for investigating the Early Historic layers of the site.

Trench D1

(Fig. 5.6)

Trench D1 was excavated down to a similar depth to Trench D2 and the results were broadly similar. D1 was opened as a 4 × 4 m trench but was reduced down to 2 × 4 m almost immediately in order to save time.

The sequence revealed by this trench is quite unremarkable for its structural remains or evidence of human activity. Below a lime floor (752) in the uppermost levels of the trench, two fairly deep deposits of compact black cotton soil and a loose silt layer with a large number of pottery sherds (753, 754) covered a further close sequence of four consecutive compact mud floor levels (759, 766, 767, 770) immediately above natural soil (777). Each of these floors was cut by a few post-holes or pits (e.g. 772), but none was associated with any brick structures. A large water storage jar (760/761) was found cut into floor 766, and evidence of burning and an ash filled pit were found associated with floor 759.

All of the deposits of Trench D1 have been allocated to Period 1 on the basis of the pottery that they contained, with the exception of floor 752, which is allocated to Period 2, and the loose wash on the surface (751) that is allocated to Period 3.

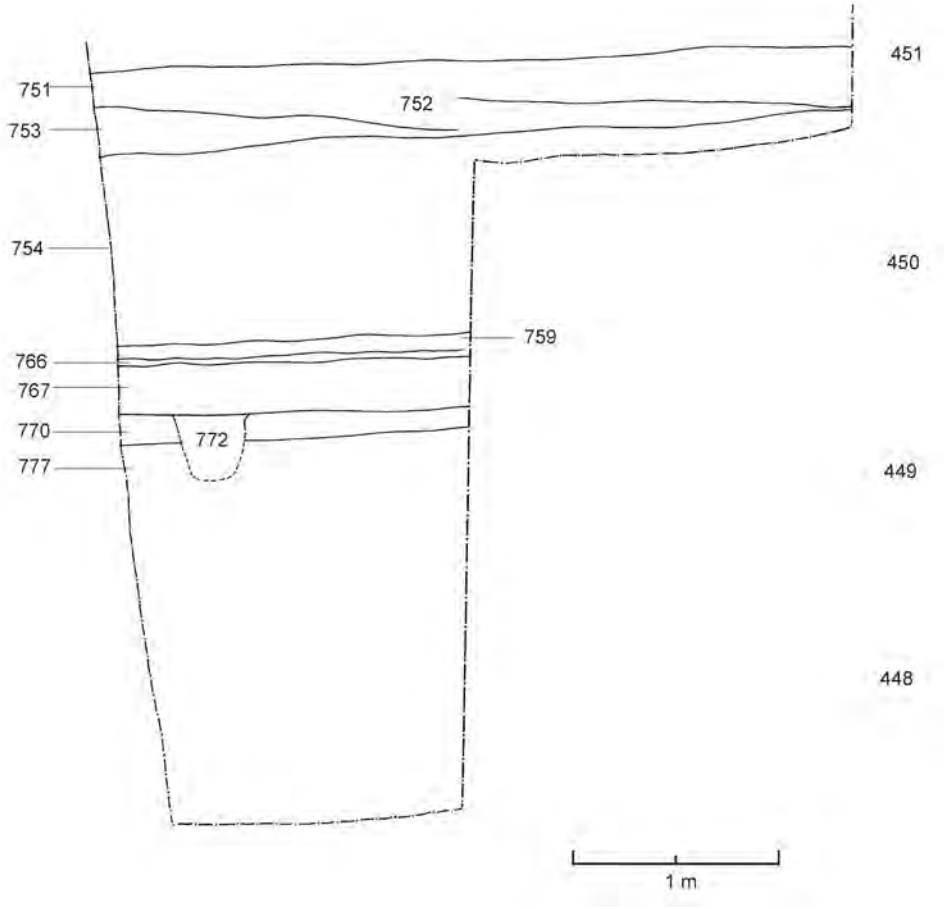


Fig. 5.6: Trench D1, east-facing section.

Trench D2

(Fig. 5.7)

The majority of the upper layers are dumps of pottery apparently deposited at different times when this area was inhabited during the Mughal and late Mughal times. Large town houses with cellars were built during this period by digging foundations into the Early Historic levels, thus explaining some reverse stratigraphy and a high degree of residuality in the finds from this area. Undisturbed archaeological layers occurred from around 450.00 m above site datum (711), whereas the height of the ground surface was 453.31 m.

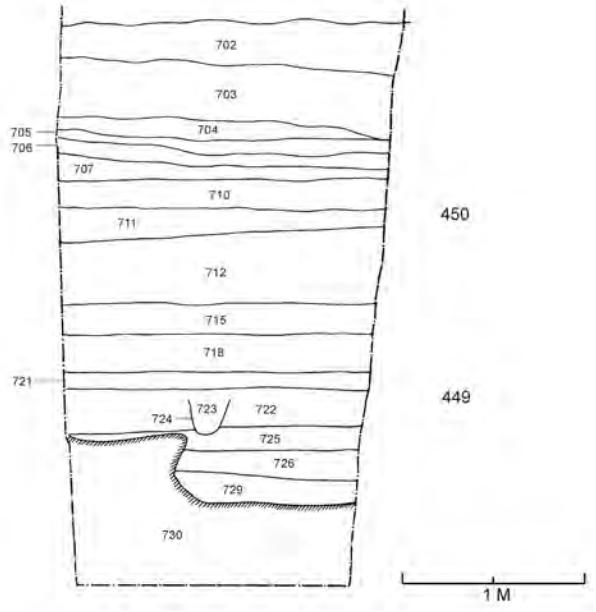


Fig. 5.7: Trench D2, south-facing section, as dug.

The earliest occupants settled down on the natural black cotton soil (730) in huts made of wooden posts with open fire places and with querns and mill-stones as part of the inventory of their daily lives. Bones were found associated with fire places where butchering and roasting perhaps took place. Eight or nine intact floor levels were encountered amongst the Early Historic period levels (711, 712, 715, 718, 721, 722, 725, 726, 729). A good number of bone points, arrowheads and beads of different material were also recovered from these layers.

The beginning of occupation seems to have been marked by simple living after which the economic standards gradually improved as signified by increased coinage, good-quality pottery, permanent hearths and rammed-earth floors.

The uppermost levels in this trench, down to floor 712, have been allocated to Period 2 on the basis of the pottery that they contained. Layers below this down to natural have been allocated to Period 1.

Trench E

Trench E is located just to the south-east of Trench A. Excavation was taken up to investigate the nature of the mounding here, which is considerably higher than the level of the surrounding area. A small 2.5 × 2.5 m trench was excavated to a depth of over 3 m, but natural soil was not reached. Excavation was stopped when it became clear that the mounding in this area is predominantly post-Medieval in date and consists largely of heavily disturbed or redeposited material. Fifty-five contexts were recorded, including pits, a few floors, one stone and one mud wall and a few hearths. Some Early Historic material came to light, but it seems mostly to be residual material from much later layers. No in situ Early Historic occupation was excavated here, although some of the lower levels encountered may be datable to the Early Medieval period. The trench produced some interesting and useful small finds that throw some light on the date of occupation of Paithan more generally. These are reported on in Chapter 8.

Trench F

(Figs 5.8 and 5.9)

Trench F (2 × 2 m) was opened up in the middle of the old town of Paithan on the top of the mound in an area known as the 'Nath Galli' (Fig. 4.1). The aim of the trench was to investigate the nature and chronology of the deposits in this area.

The trench was excavated to a depth of 3.5 m. The top 1.2 m of deposits consisted of later dumping (778). Below this, the deposits consisted of a series of clay floors with occasional post-holes, gravel spreads and hearths (784, 787, 788, 789). At a depth of 2.2 m (451.6 m above datum), a brick floor was encountered constructed of brick bats (790) and cut by two post-holes. This feature was by far the most substantial evidence of occupation encountered in the sequence here. Below the brick floor, further clay surfaces were found (846, 851, 852) before natural soil (853) was reached at a depth of 3.2 m (450.4 m above datum). The excavation continued into the black cotton soil that constitutes

the natural deposits of the river terrace to a depth of 15 cm.

The trench demonstrates that there does not seem to be a great deal of very substantial architecture of the Early Historic period in this particular part of the site, with the possible exception of the brick floor (790). The picture that is given is one of occupation on the river terrace dating back to perhaps as early as the 1st/2nd century BC, and from that point onwards, there is evidence of continual but not very substantial occupation.

The very lowest levels in this trench, pit 850 and floor 851 are allocated to Period 1 on the basis of the pottery that they contained. The rest of the sequence has been allocated to Period 2 with the exception of the surface layer (778), which contains material of Period 3.

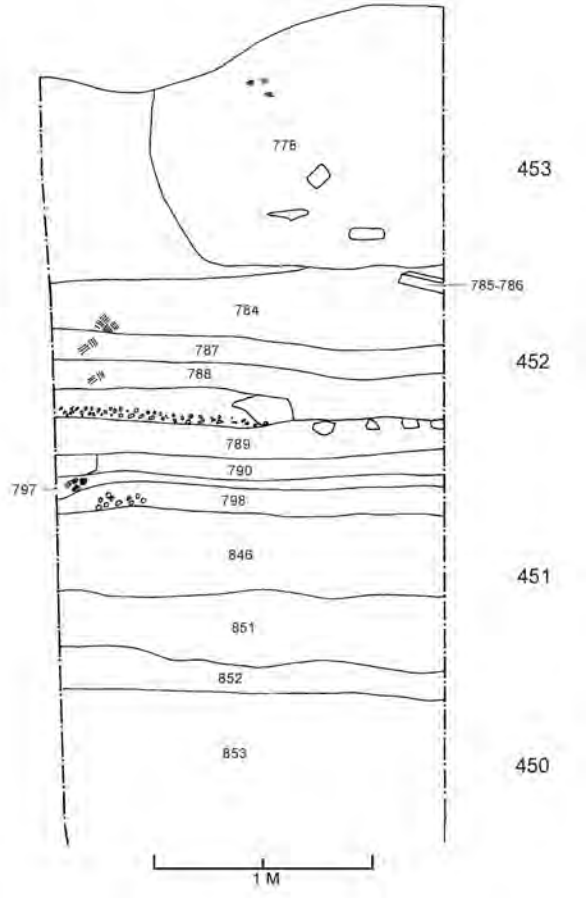


Fig. 5.8: Trench F, east-facing section.

Summary

The trenches reported on above have thrown some limited light on the history of occupation in certain parts of the mound, most notably in the ASI protected area, which is located towards the southern extent of what appears to be the main archaeological mounding of the site. Looking to the broader perspective, the results are unsatisfactory in the sense that they are too limited in size and number and do not give a clear and unambiguous picture of the development of occupation over the whole site. This is because of the difficulty of finding suitable excavation sites in the modern town, which today covers the highest part of the Early Historic mound.

Fig. 5.9: Trench F, view of the west-facing section.

The structural evidence from the Early Historic period has been shown to be very limited in all trenches, and in none of them can it be claimed that the archaeological deposits are consistent with a densely occupied urban centre of the Satavahana or Early Historic

period. Whether this reflects the nature of Satavahana/Early Historic urbanism in this region or simply the fact that it was not possible to excavate trenches in the right locations on the mound remains unclear.

The results from these trenches, earlier work at the site, Trench A and the antiquities and coins from the site are brought together in Chapter 14, where the history of occupation at Paithan is considered.

Derek Kennet

Chapter 6
Periodisation and Dating of the Sequence

Before outlining the periodisation of the stratigraphic sequences from Paithan, it is necessary to say a few words about how it was achieved and to put this into the context of the way in which periodisation has been carried out on other excavated Early Historic sites in India.

Problems with the periodisation of Early Historic sites in India

At Paithan, as at many excavated Early Historic sites, several trenches were excavated in different locations across the site. It should not be expected that the occupational history of each trench will be the same. As can be seen by observing any modern town or village anywhere in the world, some areas of a settlement may be left open and abandoned whilst adjacent areas are densely occupied. This situation may change in succeeding periods so that areas once built up turn to wasteland whilst areas once unused are built up. This seems obvious, but nonetheless, the way in which the stratigraphic sequences of many Early Historic excavations in India have been periodised implies a belief that all parts of each site will share a similar occupational and depositional history and that all periods of occupation will be present in all trenches.

Nevasa is a good illustration of this. An examination of the Nevasa report, published in 1960, shows that a four-period occupational history has been imposed on all of the trenches excavated at the site, including trenches I, X and Y, which are located at a considerable distance from the main trenches (A–H), despite the fact that a Qutubshahi coin and sherds of glazed ware were found in the levels of trench I that are otherwise ascribed to the 'Indo-Roman' period (Sankalia *et al*. 1960: 65, 204, 344–345). This is because the periodisation has failed to take into consideration that there may be 'voids' in the occupation history of some areas of the site and this has caused layers to be forced into periods where they do not belong, grouping material of different dates into the same period.

There are deeper problems with the periodisation of Nevasa. This is shown in Table 6.1, which is based on a detailed reading of the published report. It shows the occurrence of glazed wares that are not themselves specifically discussed by the excavators in the publication. It can be seen that the glazed wares and 'celadons', all of which date to the 11th/12th century and later to judge by the published photographs, occur in layers that have been attributed by the excavators to much earlier periods. For example, there are two sherds of glazed ware from layers attributed to Period IV (150–50 BC), which, although anomalous, may simply be intrusive. More worrying is the much larger quantity that was found in layers attributed to Period V, the so-called 'Indo-Roman' period, that is dated from 50 BC to AD 200. This is indicative of some fundamental problems with the periodisation of the Nevasa sequence and demonstrates the importance of taking a holistic and quantified view of the pottery, small find and coin assemblages and of applying rigorously the rule of *terminus post quem*. These problems are further compounded by the fact that the pottery from Nevasa is published by period rather than by layer. This makes it impossible to disentangle the pottery sequence from the flawed periodisation.

Table 6.1: Occurrence of glazed wares in the Nevasa sequence. Note that only one sherd of glazed ware is listed on page 339 of the report from Period IV, but two are listed on page 345.

Nevasa Period	Glaze a	Glaze b	Glaze c	Celadon	Total
VI (AD 1400–1700)	45	10		5	60
V (50 BC–AD 200)	14	5	4	7	30
IV (150–50 BC)		1	1		2

Similar problems can be shown to exist in the periodisation of many of the published Early Historic sites in India, although there is no space here to go into these in further detail. Nonetheless, much of the archaeological chronology of Early Historic India is still based on the periodisation of such sites. This chronology may have many serious flaws and is in need of a full-scale review.

https://doi.org/10.1515/9783110653540-006

A further problem is that quite often, the occurrence of a single coin, for example a Satavahana coin, is enough for a layer or for an entire period to be attributed to the Satavahana period. The rule of *terminus post quem* is thereby ignored. This rule states that any datable find, such as a coin, indicates that the layer within which it is contained was deposited at the time of the date of the coin *or at any time since that date*. Thus, a Satavahana coin in a layer indicates only that the layer was deposited in the Satavahana period, or at any time since. Indeed, it is well established that Satavahana coins continued in circulation into much later periods (Sircar 1974: 18; Shastri 1992: 291–292). The same concept applies equally to pottery; a single sherd of Northern Black Polished ware (NBP) or Red Polished ware (RPW) does not necessarily indicate that the layer within which it is contained is datable to the period of circulation of that ware. It may be that the sherd is residual and the layer may have been deposited at a much later date, often several centuries later. Quantification of the pottery assemblage can go some way towards resolving this issue by highlighting 'outliers' in the sequence that may be intrusive, or the tail-off of residual pottery beyond its main period of circulation. Quantification of pottery sequences is, however, rarely available in published reports.

Even when these points are taken into consideration, periodisation of a stratigraphic sequence is not an exact science; it is always an approximation, an attempt to impose an orderly chronological structure on what are in effect the results of sporadic and unstructured human activity. Periodisations should always, therefore, be open to criticism, review and revision as new evidence comes to light. For this reason, the material from a site should be published in enough detail for the reader to be able to re-assess the periodisation if required.

The above problems and considerations were taken into account when deciding the way in which the Paithan sequence was to be analysed and periodised.

Periodisation of the Paithan sequence

A total of seven trenches were excavated at Paithan during the 1996–1999 seasons (Trenches A, B, C, D1, D2, E and F). Each of these provided a stratigraphic sequence reflecting the particular history of occupation in the part of the site where it was located. Only Trenches A:TP1, B, D1, D2 and F were, however, fully incorporated into the site periodisation because the excavations in Trench C were not conducted by the present authors or according to the same system, and those in Trench E were exploratory and did not achieve great stratigraphic depth (see Chapter 5).

Taking into consideration the points that have been made above about the problems with the periodisation of Early Historic sites in India, careful thought was given to the best way of periodising the sequence from these five trenches. A number of datable objects or 'chronological markers' such as coins and sherds of known wares such as NBP and RPW are present in these sequences, but generally in very small quantities. The small quantity makes it very difficult to know whether or not any particular occurrence of such objects is residual, or indeed when they are absent, that the absence is not simply due to chance. It was therefore decided that such finds provide a very poor basis on which to correlate the five different trench sequences.

Instead, the periodisation was achieved through a combination of the quantified occurrence of known chronological markers: both the rarer examples such as NBP, RPW and glazed wares, as well as the more common examples such as Thick Grey ware (GREY) and Black and Red ware (B&R) Type 38 – but this was linked to a quantified analysis of the occurrence through the sequence of the key pottery types defined at Paithan such as Types 7, 19, 32 and 37, the absolute dating of which is not known but whose occurrence through the stratigraphic sequences can be more precisely charted. The reason for this is that, in being very common, their absence in any particular layer can more reliably be taken as an indication they were not in circulation at the time that the layer was deposited. Consideration was also taken of the 'percentage occurrence profiles' of some of the more common types and wares through the sequence (see below). All of this relied on a much more precise definition of pottery wares and types than is normally the case at Early Historic sites in India (see Chapter 7). On this basis, the following four periods were defined. The absolute dating of each period is discussed in the following section.

The stratigraphic matrices for Trenches A, A:TP1, B, D1, D2 and F have been lodged with the Archaeological Data Service (http://dx.doi. org/10.5284/1017460). The matrix for the smaller trenches shows the occurrence of Types 7, 32 and 37, GREY and glazed wares.

Period 1

In these layers, which occur in the lowest levels of all five trenches, a number of known chronological markers were found: 22 sherds of NBP occurred in eight out of 116 layers; 25 sherds of the very distinctive B&R Type 38 were present in 14 layers and occasional microliths also came to light in some of the lowest layers of trenches D1 and D2, together with some rolled sherds of Jorwe ware. This period was also defined by the complete absence of the key pottery markers of Period 2, namely RPW and Types 7, 19, 32 and 37 (see below).

These same layers also contained a relatively high percentage of B&R generally. Although there is considerable variation, the percentage of B&R Type 10 is consistently above 2% of the total sherd assemblage – in many cases much higher. The proportion of Type 1 can also be shown to have been increasing steadily throughout this period in each of the sequences (see below).

The lower part of the Trench F sequence has been allocated to this period on the basis of a single sherd of NBP and a high percentage of B&R Type 10.

There are three intrusive GREY sherds from layers attributed to Period 1 (see below).

Period 2

Of the 86 layers allocated to Period 2, only two contained sherds of RPW, both of which are from the Trench A:TP1 sequence. One sherd of NBP was also present in the same sequence, but this sherd was judged to be residual based on the presence of Types 19 and 32 in the same or in stratigraphically lower contexts.

The precise lower limits of the period are defined principally by the first occurrence of pottery Types 7, 19, 32 and 37. These types are all reasonably common in the levels where they occur but none of them occur below approximately the same level in each of the trench sequences.

Type 7 is a very distinctive form. Its precise absolute date is unknown, apart from being broadly attributable to the later Early Historic period. It occurs in the sequences of trenches A:TP1, B, D2 and F, but it does not occur in the lowest levels of any of these trenches except F, where it only occurs in layers stratigraphically later than the single sherd of NBP.

Type 19 occurs only in the Trench D2 and Trench A:TP1 sequences where it first occurs in levels very close to those where Types 7 and 32 first occur, suggesting that it was introduced into circulation at about the same time as these types.

Type 32 is the rim of a large storage jar. It occurs in the sequences from trenches A:TP 1, B, D1 and D2, in three cases (Trench A:TP1, B and D2) very close to the same level at which Type 7 first occurs.

Type 37 is a jar with an everted rim. It occurs in the sequences from trenches A:TP1 and D2 at very close to the same levels where Type 7 and the other types discussed here first occur.

There are a few later, intrusive objects in layers attributed to Period 2, including a porcelain peacock's head (No: 678) datable to the 16th century or later, and eight GREY sherds (see below).

Period 3

Period 3 is defined quite simply by the occurrence of the abundant GREY, Types 14, 15, 24, 26, 44, 45 and 46. This development is accompanied by a decline in the amount of Type 1 to below 5% of the total sherd assemblage in the trenches where the sequence continues this late (trenches A:TP1 and B). In fact, as mentioned above, three sherds of GREY are recorded from layers allocated to Period 1 and eight from layers allocated to Period 2. These are considered either mis-attributions or intrusive, that is to say, they were either erroneously recorded or they have made their way into early layers through soil disturbance of some kind. They have to be balanced against the 191 sherds of the same class that were found in the layers allocated to Period 3, and the 144 sherds in Period 4.

Period '3-temple'

Period '3-temple' is used to differentiate those layers within Trench A that are datable to Period 3 but that are part of the construction and foundations of the two brick temples. These deposits do not result from domestic occupation and neither do they contain very much material. The artefactual and ecofactual assemblages from these layers are therefore likely to be of a very particular nature. Because they make up such a large proportion of the excavated layers presented in this report, it was thought to be sensible to keep them separate from Period 3 so that reliable comparisons can be made between the Period 3 assemblages and those from Periods 1, 2 and 4.

Period 4

Period 4 is defined by the presence of late glaze wares such as Blue and White Frit (PERS), Slip-Painted Ware (SLIP) and Chinese Blue and White porcelain (CBW). These wares are not very common, and no other pottery types have been defined that can be used in association with them, thus making this period distinction perhaps the least reliable of those presented here.

Period 4?

'Period 4?' represents layers that were excavated in Trench A:NWNT which are clearly later than the abandonment and robbing of the temples and are most likely therefore to belong to Period 4, but there are no finds of glaze wares to demonstrate this unequivocally.

Further descriptions and discussions of the pottery types and wares can be found in Chapter 7, along with the relevant external dating evidence.

Periodisation based on occurrence profiles of key types

As has been stated above, there are various problems with using the presence of relatively rare datable finds such as coins and sherds of NBP or RPW as 'type fossils' with which to establish the periodisation of a sequence. One of these is that any one of these type fossils might be residual and the relevant layer might therefore be much later in date than some of the finds contained within it. A second problem is that the absence of a relatively rare find from any particular layer might be due to chance: it does not necessarily mean that the find was not in circulation when the layer was deposited. A third is what to do with those layers – often the majority – that do not contain any of the type fossils at all: which period should these be allocated to? These problems make it difficult to establish a reliable periodisation around what is often such a limited framework of datable evidence. The use of more common pottery types, such as those used above in the definition of Period 2, can help to reduce these problems, but they cannot resolve them entirely because of the paradox that the more common a type is, the more meaningful its absence from a layer is likely to be, but at the same time the more likely it is to occur residually in later levels.

One way to confront these problems is to calculate the percentage of the most common pottery types and wares as a part of the pottery assemblage and to use these figures as a comparative tool for aligning and periodising sequences. This was attempted at Paithan using Type 1, the most common single type from the site. Table 6.2 and Fig. 6.1 show the percentage occurrence of this type through the lower parts of the Trench B, D1 and D2 sequences – all of which are allocated to Period 1 as outlined above. There is a remarkable degree of correlation between the three sequences. Each of them contains percentages that are just under 10% in the lowest levels but which increase steadily to 25% and more towards the later Period 1 layers.

Of course, the percentage of a type in any particular layer or sequence is likely to be as much due to the activities that took place in the vicinity as it is to the chronological occurrence of the type, and these data must therefore be treated with some caution. Nonetheless, the pattern shown in Table 6.2 adds support to the periodisation that has been proposed.

Trench A: phases of temple construction and use

Within Trench A, the stratigraphy related to the construction and use of the temples was subdivided into architectural phases that are specific to each of the two temples and which have been described in detail in Chapter 4. These are distinct from the periods that are defined and described in the present chapter.

Absolute dating

Chronology is still the most significant problem faced by archaeologists of the Early Historic and Early Medieval periods in India. The archaeological chronology of the Early Historic period of the western Deccan region is based largely on 1950s excavations by the esteemed H. D. Sankalia and his colleagues at sites such as Brahmapuri, Nasik, Maheshwar and Nevasa (Sankalia and Dikshit 1952; Sankalia and Deo 1955; Sankalia *et al*. 1958, 1960). The dating of these sites is, in turn, based on earlier excavations at sites such as Arikamedu, Sisupalgarh, Brahmagiri, Chandravali and Taxila. The chronology that was established during this period has never been fully set out, critiqued and argued, but it has nonetheless become the received wisdom amongst archaeologists working in the region.

Table 6.2: Percentage occurrence of Type 1 in the lower parts of the sequences from Trenches B, D1 and D2 (the top three rows show the context numbers as grouped for this calculation, and the lower three show the amount of Type 1 as a % of the total sherd assemblage from those context groups).

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
B	743	736 735	733 731 734 732	494	497 498 495 496	493	492	487	486	485	484	483	478	479 480 481 482	477	474	473	472	471	469 470	468
D1	777			776 775		770		771 772 773 774			767		766			760 761 762 763 764 765 768 769		759			752
D2	729	727 728	726	725	722	723 724	721	719 720	718	716 717	715	713 714	712	711	710					709 708	

B	3.75	13.24	0.00	3.99	12.09	9.22	16.35	6.02	13.10	13.08	9.40	13.60	10.65	18.32	18.59	15.20	15.15	19.27	24.68	19.18	32.39
D1	10.34			2.30		6.52		18.75			11.15		22.02			0.00		30.56			33.33
D2	20.29	11.41	6.12	7.22	9.15	4.26	11.94	13.76	14.06	14.29	20.68	10.53	22.84		19.67						

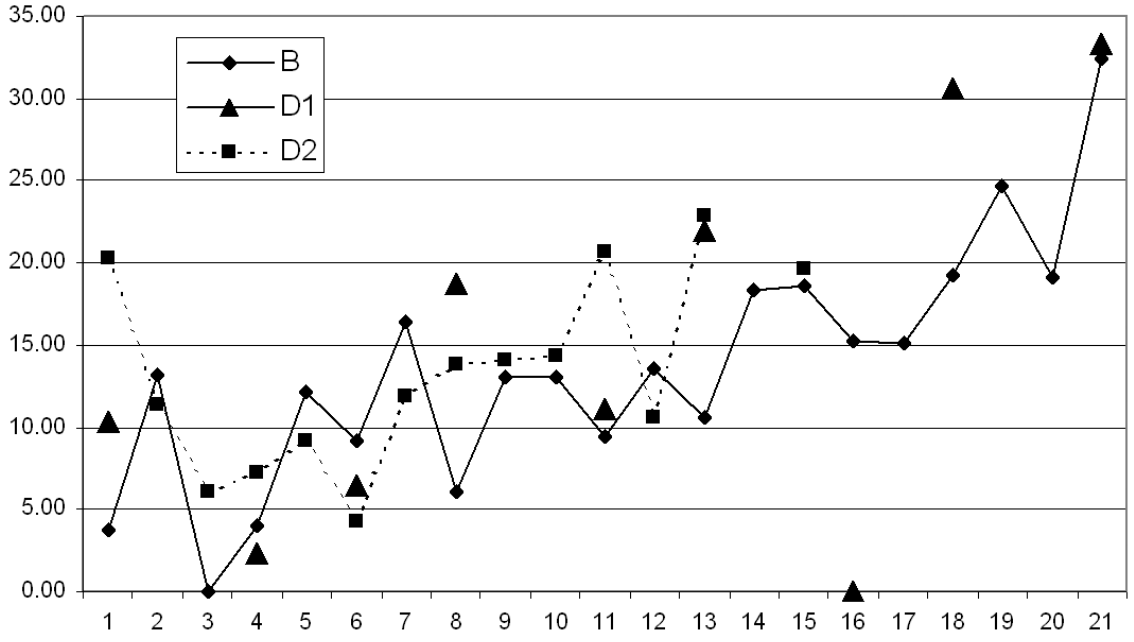


Fig. 6.1: Graph showing the percentage of Type 1 through the lower parts of the sequences from Trenches B, D1 and D2 (sherd count as % of total sherd assemblage).

It is, however, highly problematic and imprecise and is certainly now in need of thorough revision. The 'fixed points' are based almost entirely on identifications of coins, NBP, RPW and – at one or two sites – the presence of Roman amphorae. Other pottery wares, such as B&R, Painted Andhra Ware and GREY, are also used, but these wares are not themselves independently dated other than through stratigraphic associations with the 'fixed points' listed above.

On examination, it becomes clear that the absolute dating of all of the 'fixed points' noted above can now be called into question for one reason or another.

Firstly, the dating of pre-Satavahana coins is, for the most part, still relatively imprecise and provides only the broadest chronological framework, whilst the classification and dating of Satavahana coins, although they have improved and changed since the reports mentioned above were published, are still subject to debate and disagreement (see for example Bhandare 1998; Gupta 1999). But the two most significant problems related to coins are residuality and the failure to take the concept of *terminus post quem* into consideration. These points are particularly important in a region where low-denomination Satavahana coins are known to have continued in circulation in large quantities until much later periods, whilst coins of later dynasties (e.g. the Vakatakas) appear to be very rare on most sites (see Chapters 9 and 14). This means that in some cases, post-Satavahana layers can contain nothing other than low-denomination Satavahana coins, which has led archaeologists to assign a date to such layers which is far too early, often by as much as 300 or 400 years. This fact may help to explain the apparent absence of Vakataka layers at many sites in the region.

Secondly, the chronological span of NBP has been established for the Gangetic region of India where, on the basis of C^{14} dates, it can be shown to have in production for as long as 500 years (see Chapter 7). Nonetheless, the date when NBP first began to occur in significant quantities in the western Deccan region is not known, neither is it known how long NBP continued to be used in this part of India or when its use finally died out.

Thirdly, there are also problems with RPW. The introduction of this ware is generally placed in about the 1st century AD and the ware is thought to have gone out of use between the 4th and the 6th centuries AD (Chapter 7). Although neither date is firmly established, however, production can now be shown to have continued until the 8th century AD through its occurrence on archaeological sites in the Arabian/Persian Gulf (Kennet 2004a: 65–66).

Finally, at some sites such as Nevasa, the presence of Roman amphorae was used as dating evidence. Unfortunately, it has recently been shown that many of the Roman amphorae reported from India are, in fact, misidentifications of Mesopotamian 'torpedo jars'. These jars, although they are themselves quite imprecisely dated, are known to have continued in use and circulation beyond the 9th century AD (Kennet 2004a: 63; Tomber 2007).

The factors described above all demonstrate that the existing chronological framework for the Early Historic period in this region of India now needs to be carefully reviewed and the chronology proposed by the excavators of the sites mentioned above cannot be used as a reliable framework. This means that there is very little external evidence with which to establish the absolute dating of the Paithan sequence, which has therefore been based almost entirely on the 39 identifiable coins that were retrieved. The coins, which are presented in Chapter 9, were identified and dated according to the schema proposed by Bhandare (1998). The coins have been counted and tabulated so that patterns of occurrence and residuality are absolutely clear (see Chapter 9, Table 9.1).

In addition to the coins, there are two further elements of absolute dating, neither of which is very precise. The first is that provided by the temples themselves, which suggests that the North Temple was first constructed in the 4th or 5th century AD and the South Temple in the 6th or 7th (Chapter 4, Table 4.2). The second are two C^{14} dates taken from fragments of carbonized wood that were retrieved from the foundation deposits of each of the two temples (Table 6.3).

Both of the charcoal fragments, being datable to the 4th and 3rd centuries BC, are much older than the temple foundations, as is demonstrated by the coins from those layers and by the architectural dating of the temples, which has been mentioned above. At first glance, it might seem rather coincidental that the two charcoal fragments should give such similar dates, but it is obvious that the earth in the foundation deposits is likely to have been brought from the same source not far from the temples and will have contained artefacts and environmental material from earlier archaeological deposits. This issue is further discussed in relation to the coins in the foundation deposits in the Appendix to Chapter 9.

Table 6.3: C^{14} dates from the temple foundations.

Sample	Context	Measured C^{14} age	13C/12C ratio	Conventional C^{14} age	2 sigma calibration
Beta 227163	North Temple (927)	2240 ± 40BP	–24.8o/oo	2240 ± 40 BP	390–200 BC
Beta 227164	South Temple (1002)	2280 ± 40BP	–25.5o/oo	2270 ± 40BP	400–340 and 320–210 BC

Broadly speaking, the occurrence of coins through the sequence suggests the dates for the Paithan periodisation that are set out in the paragraphs below.

Pre-Period 1: (1400–4th century BC)

The rolled Jorwe sherds mentioned in Chapter 7 probably indicate a presence at the site roughly between 1400 and 700 BC at the broadest level. Following this, no silver punch-marked coins of the Magadha-Maurya 'Karshapana' series were found in excavated layers, although seven are present in the Balasaheb Patil Government Museum at Paithan (Chapter 11, 1–7). These might indicate activity at Paithan as early as 370 BC – a date which tallies with the earlier end of the date range of the C^{14} dates reported above – but, as the precise find spots of these coins are not known, it is impossible to be certain that they were originally found at Paithan.

Period 1: Pre-Satavahana (200–100 BC)

The eight pre-Satavahana 'hollow cross' type coins retrieved from levels of this period can be dated between 200 and 100 BC (Chapter 9). These are the earliest coins that came to light from the excavations. Technically, of course, they provide only a *terminus post quem* but, because eight such coins were found in these levels and no later coins were found with them, despite the fact that later coins can be shown to have been deposited in later layers at the site in quite large quantities, this dating can probably be taken as being reasonably reliable (see Chapter 9, Table 9.1).

Period 2: Satavahana (late 1st century BC to late 1st century AD although possibly as late as the 4th century AD)

All of the 18 identifiable Satavahana coins found at Paithan can be dated to the immediate pre- and post-Gotamiputa Satakani period suggesting activity at the site between the late 1st century BC until the late 1st century AD. The absence of coins actually attributed to Gotamiputa Satakani's reign (e.g. AD 55–79 or 66–90; Cribb 1992: 134; Bhandare 1998) is, however, notable. This absence might indicate that all or part of the site was abandoned through his reign, but it seems more likely that it results from a change in the pattern of coin circulation or deposition during the same period. At the same time, it is important to note that only one Satavahana coin (Chapter 9, coin 17) was actually found in the excavated layers of this period, along with two earlier 'hollow cross' type coins. The latter are clearly residual, but it should nonetheless be noted that, although the layers of Period 2 are likely to have been deposited during the late 1st century BC to late 1st century AD period (a period during which activity at the site is suggested by the coins that have been found in later layers), it is of course quite possible that coin 17 is residual and that the layers of Period 2 were actually deposited at a somewhat later date. This must have been before the 4th/5th century, as is shown by the stratigraphic relationship with Period 3 levels, but it could just as easily have been in the 2nd to 4th centuries AD.

Period 3 and Period 3-temple: post-Satavahana (4th/5th to 8th century AD)

The dating of Period 3-temple is provided by three pieces of evidence:

– the 4th/5th century AD architectural dating of the earliest construction of the North Temple;

- the 6th/7th AD architectural dating of the construction of South Temple (Chapter 4) and
- the latest of the two post-Satavahana coins in the South Temple foundation deposits (Chapter 9, coins 33 and 34), which is probably also datable to the 7th century AD (whilst the earlier of these two coins is obviously residual). The end of the period has been dated to about the 8th century AD but this is based largely on an estimation of how long the temples may have remained in use and is not reliable.

The dating of Period 3 is slightly more complicated. Analysis of the pottery indicates that it is contemporary with Period 3-temple, but post-Satavahana coins are only present in Period 3-temple levels. This is almost certainly due to the fact that, because post-Satavahana coins are much less common than Satavahana coins, they are generally found only in larger assemblages, but it does leave open the possibility, as does the stratigraphic sequence, that some Period 3 deposits were deposited somewhat earlier.

There appears to be no reliable evidence for the dating of the introduction of the so-called 'Early Medieval' grey wares (GREY) from the publication of any other excavated site. These wares are often suggested to have begun to circulate in the 8th century AD, but, if the dating of the Northern Temple here at Paithan is reliable, they can be shown to have been in circulation at Paithan by the 4th or 5th century or shortly thereafter.

It will be noted from the discussion above that there is no clear evidence from the excavations for activity between the end of the 1st century and the 4th/5th centuries AD. Again, this apparent void may be due to a decline in activity over all or part of the site, but it may also be due simply to a change in the pattern of coin circulation or deposition during this period.

Period 4: 14th/15th to 17th century and later

On the basis of the coins, Period 4 can be dated to the Late Medieval and British periods. Some of the pottery found in Period 4 levels, e.g. Blue and White Frit (PERS), might suggest that this rather loosely defined period encompasses activity as early as the 14th century, but the majority of datable finds such as coins and imported Chinese porcelain can be dated to the 15th to 18th centuries.

The apparent lack of activity between the abandonment of the temples and the 14th/15th centuries is something that has been noted at many sites. It is possible that occupation moved or contracted to a core that is now buried underneath the modern town of Paithan during this time. The relatively limited investigation of layers of this period does not allow further discussion of this point.

Derek Kennet

Summary Remarks on the Excavations

The three chapters in Part II have set out the results of past and present excavations at Paithan. These are brought together in Chapter 14 with the results of the studies of the artefacts and environmental evidence retrieved by the present excavations.

The research aims for the 1998 and 1999 seasons have already been set out in Chapter 1. For the most part, these were successfully dealt with and the results have provided a number of important insights into the chronological development of the site and particularly into the development of the two Early Hindu temples and the area of occupation immediately surrounding them. Indeed, Chapter 4 presents the most detailed stratigraphic analysis of the development of an Early Hindu brick temple that has yet been published from anywhere in India. The fact that it has been possible to link this to a systematic, stratigraphic and quantified study of artefacts and environmental samples presents us with the first archaeological study of the foundation and development of an Early Hindu temple within its environmental and economic context. The results of this work and its broader implications are further discussed in Chapter 14.

Most of the 1998 research aims were successfully dealt with, but, given the size and scope of the present research project, it was not possible to achieve completely satisfactory progress with the investigation of the geographic extent and development of the whole site. Some limited survey had been carried out during the 1996 season and this was continued during the 1998 and 1999 seasons, but only at a very limited scale due to lack of personnel. The results were not on the whole instructive or promising given the heavy overburden of modern occupation, soil movement, dumping, vegetation and general build-up of material. In addition, an attempt was made to excavate trenches across the whole site during the 1998 and 1999 seasons with the same aim. Despite the importance of this aspect of the research, the difficulty of finding suitable space and of negotiating access and permissions with private landowners proved extremely difficult. Thus, with the exception of Trench F and the trench excavated by Dikshit in 1965, the insights into the spatial development of Paithan that are provided in the present report are based entirely on the area within the present ASI protected area at the southern extent of the main mound. This is certainly not broad enough and may not present a fully representative picture, meaning that it has only been possible to sketch out in Chapter 14 a hypothetical outline of Paithan's development based on the information that is presently available. The present author has made the point elsewhere that until the practice of 'urban archaeology' becomes more widely established across India, allowing a more holistic approach to be taken to the study of archaeological sites such as Paithan that have continued to be occupied until the present day, our archaeological understanding of the development of ancient urbanism – especially Medieval urbanism – will not be able to achieve very much progress (Kennet 2013).

Part III

The Finds

Derek Kennet

Brief Remarks on the Finds

Part III of this volume presents five specialist reports on the artefactual evidence from the excavations (pottery, coins, glass, small finds) along with notes on related material from the Balasaheb Patil Government Museum at Paithan.

A key aim of the present project was to use a systematic approach to collection and a quantified approach to the study of all materials. This included sieving all excavated earth and the collection and counting of all finds. Although such approaches are generally regarded as having become standard practice with the advent of the 'new' or 'processual' archaeology of the 1960s, they are still rarely applied to the study of Early Historic and Medieval material from India. Most published excavation reports, such as those of Early Historic sites listed in Chapter 3, simply present a selection of material that is regarded by the excavator as being representative of the periods and phases that were defined at the site. Whilst this approach has a certain validity, it fails to make the most of the information contained within the material and it also makes inter-site comparisons difficult and less meaningful than they might be, thereby discouraging regional synthesis. Some may find the approach taken here, especially that taken in the pottery study (Chapter 7), quite a marked step away from the more traditional pottery studies, but it is hoped that the value of a more precise definition of wares and types and a full presentation of the quantified occurrence of each through the excavated sequence will be clear. It is also hoped that such an approach, if more widely adopted, will encourage and facilitate inter-site comparisons and regional synthesis of archaeological evidence, which is an aspect of archaeological analysis that is still relatively underdeveloped in Early Historic India.

The finds from the first two (1996 and 1997) seasons were not fully studied due to the way in which the project had to be organized at that time. Chapter 10 deals with the most important finds from these seasons, whilst Chapter 11 presents material from the private antiquity collection of the late Sri. Balasaheb Patil, who was a prominent local dignitary and collector of archaeological objects. Although none of this material can be attributed to Paithan with absolute certainty because the circumstances of its acquisition are not recorded, it seems likely that most of it was found at or close to Paithan and thereby provides a useful illustration of the type of material that is turned up in this locality by farming and construction work.

The key results of the studies presented in this part of the volume are further discussed and contextualised in the conclusions (Chapter 14).

https://doi.org/10.1515/9783110653540-007

Derek Kennet

Chapter 7
The Pottery

Introduction

A total assemblage of 205,267 sherds was retrieved from excavated contexts at Paithan during the 1998 and 1999 seasons. From this assemblage, the pottery from five trenches or test pits ('Main sequences'), along with a selection of assemblages from other trenches ('Secondary assemblages'), was selected as the study sample, comprising 86,787 sherds or about 42% of the total excavated assemblage. The remaining 58% was inspected for imported wares and other key diagnostics, but was not further studied. This includes most of the material from Trenches C and E plus material from Trench A other than TP1.

The 'Main sequences' were selected as providing the most reliable and complete overview of the Paithan sequence, whilst the 'Secondary assemblages' were selected in order to supplement these by covering aspects of the excavations that were not included in the 'Main sequences'.

The study of the Paithan pottery was undertaken during 3 weeks in February 2000. It included 75,990 sherds from the five 'Main sequences' and 10,797 sherds from nine 'Secondary assemblages', giving the total of 86,787 sherds mentioned above. The vast majority (72,201) of these were body sherds and were counted but not further classified (with the exception of a few wares) because they proved impossible to classify reliably using the naked eye and a ×10 hand lens (see the discussion on methodology below). The quantitative analysis was therefore carried out only on rim-sherds, a total of 14,586 of which were recorded from the studied assemblages. These are distributed across the periods in the following way: Period 1: 5,176; Period 2: 5,424, Period 3: 1,495, Period 3-temple: 407 and Period 4: 2,084. These are all reasonably good sized assemblages, with the exception of Period 3-temple, which is too small to allow reliable quantified comparisons in some cases. Details of the assemblage are set out in Table 7.1.

The main aims of the pottery study were to set out a clearly defined classification of types and fabrics and to provide a quantified analysis of their occurrence through the stratigraphic sequence. It was hoped that such an approach would provide a means with which to link the excavated sequences from the different trenches as well as providing a tool that might be of use to researchers working at other sites in the region.

Traditional methodology

The system of pottery description and analysis that is traditionally used in the publication of excavation reports in this region of India is to divide the pottery assemblage into what are loosely called 'wares', of which there are many, for example 'Red ware', 'Coarse Red ware', 'Black and Red ware' and 'Burnished and Slipped Red ware'. The problem with this approach is that, although most experienced archaeologists working in the region believe they know roughly what these ware names refer to, the terms have never been precisely and formally defined and neither has their chronology. Because of the lack of clear definitions, the ware names often appear to be used very loosely and in many cases refer to different wares at different sites. For example at Bhokardan, the term 'Drab black' ware is used, whilst at Maheshwar and Prakash, 'Coarse Black' or 'Darkish-grey' ware is reported (Sankalia *et al*. 1958: 140, 149, 154, 163; Thapar 1967: 93; Deo and Gupte 1974: 91). Similarly, at Nevasa, 'Tan slipped' ware is reported, whilst at Bhokardan, the name 'Mica-slipped tan ware' is used, and at Maheshwar, 'Tan' ware is reported (Sankalia *et al*. 1958: 87, 116, 146, 158, 164; Sankalia *et al*. 1960: 264, 287; Deo and Gupte 1974: 108). To give a further example of the problem, at Bhokardan, we hear of 'Mica-slipped red ware', which is not reported at Nevasa, Maheshwar or Prakash (Deo and Gupte 1974: 89, 99–100). By contrast, 'Thick coarse red' ware was found at Maheshwar but not at Bhokardan (Sankalia *et al*. 1958: 164). The question faced by the pottery analyst is: are the wares described by these names the same, sharing the same date and possibly even manufacturing centre? Alternatively, are they attempts by archaeologists to impose the same poorly defined classification system on to localised pottery traditions that are in reality quite different? Or are

they simply descriptive terms that are not suitable for making inter-site comparisons? Are these apparent differences indicative of regional or chronological variations between the sites in question, or are they simply the result of the use of imprecise and poorly defined terminology? The general consensus seems to be that there are broad patterns of technological and stylistic change in pottery manufacture that encompass large areas of Early Historic and Early Medieval India, by which 'Black and Red ware' precedes a variety of Red wares and then Grey wares. This is potentially a very important issue and one that certainly requires further investigation if we are to improve our understanding of the chronology and of the production and distribution systems of these periods. But how can the question be further investigated if a precise and coherent ware terminology does not exist?

Table 7.1: Sherd numbers for the main sequences and secondary assemblages included in the final pottery study.

Trench	Rims	Other sherds	Totals
Main sequences			
A:TP1	2,874	18,780	21,654
B	4,230	21,679	25,909
D1	810	3,287	4,097
D2	3,318	8,177	11,495
F	2,251	10,584	12,835
Secondary assemblages			
A:South Area	117	1,604	1,721
A:South Area, TP6	0	359	359
A:TP3	867	6,351	7,218
A:TP3, TP5	116	1,277	1,393
Other (E, GG North, NWNT, TP9)	3	103	106
Totals	**14,586**	**72,201**	**86,787**

The fact is that almost all of the 'wares' mentioned above and many others like them that are presented in excavation reports are loosely descriptive terms based entirely on observation of surface treatments and body colour rather than on clay fabrics, inclusions and tempers. In fact, the latter are not described to an acceptable standard in any of the excavation reports that have been examined by the present author.

It can therefore be said that the traditional system of pottery classification used in the region does not provide us with a mechanism for identifying chronological or regional variation between assemblages. This lack is clearly reflected in the lack of progress over the last 45 years or so towards a more precise ceramic chronology for the Early Historic period. The 300- to 400-year-long archaeological periods that are in use today are the same as those that were set out in the late 1950s and early 1960s by Sankalia and his colleagues and there has been no perceptible progress towards refining them.

Having said this, it should also be noted that local course wares of the Early Historic and Early Medieval period in India are particularly challenging to the ceramic analyst. Clear definition of fabrics is particularly difficult given the generally low degree of standardisation and the high levels of continuity between periods. These problems are especially obvious when compared to other regions of the world such as the Mediterranean or the Near East. Such differences may be related to different structures in the organization of production and distribution but further research is needed into this question.

Methodology at Paithan

The traditional classification system discussed above was initially tried at Paithan, but it was soon abandoned because it quickly became obvious that, as has been stated above, these terms are so vague and poorly defined as to prevent the identification of patterns of change within the sequence. The fabrics of traditional 'wares' such as 'Coarse red ware', 'Burnished and slipped red ware' and 'Slipped red ware' were compared and found to be indistinguishable with the use of a ×10 hand lens or the naked eye. Instead, it was clear that a number of coherent 'types' based on rim shapes were present in the sequence, some of which had discreet chronological patterns of occurrence. It was therefore decided that a formal typology based on rim forms linked to a more precise description of clay fabrics was the most promising method by which to classify the Paithan assemblage.

In developing and using this system, great care was taken to quantify the assemblage from each layer accurately. Only in this way has it been possible to gain a clear impression of the chronological life span of individual types. Quantification has also helped, at least to some degree, to overcome the perennial problem of multi-period sites, that of residuality. By quantifying

the assemblages, it is often possible to get a reasonable sense of when a type ceased to circulate from the point at which there is a notable decline in its overall proportion of the assemblage.

So, whilst it would be wrong to suggest that the system adopted at Paithan has provided us with the final key to the pottery chronology of the Early Historic period in this part of India, it certainly does offer a more precise and reliable method with greater potential for the identification of chronological and regional patterning within and between pottery assemblages.

In this study, a distinction is made between 'fabric', 'class' and 'ware'. The 'fabric' is the clay of which the pottery is made, including the temper and other mineral inclusions (natural and deliberately added). Fabrics were identified and described with the assistance of a ×10 hand lens and a Munsell soil colour chart. A 'class' is any group of pottery with consistently similar variables that allow it to be meaningfully grouped or classified together. 'Ware' has a the same meaning as 'class', although it should be noted that, in more general parlance, the use of the word 'ware' might be taken to indicate that the pottery was manufactured in the same locality or at the same kiln, whereas 'class' suggests only a working subdivision of material for the purposes of archaeological study.

It was found that the majority of the pottery at Paithan is made of a single, almost certainly local fabric (Fabric 1), or a variant thereof. It is quite variable in quality, firing and the nature of the inclusions, which probably reflects the loose organization of the manufacturing process rather than necessarily indicating the existence of distinct industries. Many of the other fabrics (e.g. Fabric 2 and 3) appear to be closely related to Fabric 1 but seem to have undergone different methods of levigation, tempering and firing. The highly variable nature of these fabrics makes it difficult, if not impossible, to identify the products of individual potters or industries consistently without the use of scientific techniques.

Pottery fabrics

Fabrics 1, 2 and 3 described below make up between 93% at the highest (Period 1) and 62% at the lowest (Period 4) of the pottery assemblage from each period, or 85% of the total pottery assemblage from the site. Fabrics 4 and 5 are much less common and tend to be specific to certain types and wares.

Fabric 1 (local buff fabric)

This is a coarse fabric that is quite variable in terms of the proportion of various inclusions, the firing temperature and colour, although other basic features do not change. The variability makes it difficult to define coherent sub-fabrics within the pottery using only a ×10 hand lens. It is possible that more sub-fabrics may exist than those that have been defined below.

As a whole, this fabric makes up between about 50% and 80% of the total pottery assemblage from each period (see Table 7.2).

Fabric 1a

Types: 1, 1a, 1b, 2, 3, 4, 5, 8, 12, 16, 17, 18, 22, 25, 27, 30, 31, 32, 33, 34, 35, 36, 37, 40, 41, 42, 47, 50.

– Traditional classification: Depending on the surface treatment, pottery made in this fabric might traditionally have been classified as 'Red', 'Buff', 'Burnished and slipped red' or 'Tan' ware.

Table 7.2: The occurrence of the main fabrics by period, by rim-sherd count above, and by rim-sherd count as a percentage of the total period rim-sherd count below.

Fabric	1	2	3	3-temple	4
1a	3,790	4,043	855	323	835
1b	129	137	34	5	73
1c	3	53	1	0	161
2	3	11	195	5	145
3	897	581	44	24	73
4	4	20	13	0	72
5	0	0	0	0	67
Other	350	579	353	50	658
Total	**5,176**	**5,424**	**1,495**	**407**	**2,084**
1a	73.2	74.5	57.2	79.4	40.1
1b	2.5	2.5	2.3	1.2	3.5
1c	0.1	1.0	0.1	0.0	7.7
2	0.1	0.2	13.0	1.2	7.0
3	17.3	10.7	2.9	5.9	3.5
4	0.1	0.4	0.9	0.0	3.5
5	0.0	0.0	0.0	0.0	3.2
Other	6.8	10.7	23.6	12.3	31.6

- Occurrence: This is the most common fabric in all periods at Paithan, making up over 70% of the pottery assemblage in Periods 1 and 2 (and 3-temple), dropping to 57% by Period 3 and 40% by Period 4.
- Description: The fabric colour varies from red through reddish yellow to very pale brown (2.5YR 6/6; 5YR 7/6; 7.5YR 6/5–7/6; 10 YR 6/4–8/4). It is normally poorly fired, very weak and breaks as easily as a stale biscuit, although there is a light snap in the better-fired examples. The fracture is very rough and the structure of the clay is notably blocky and grainy. The limited range of inclusions encompasses the following in varying proportions and amounts: (1) curved white laminar inclusions up to about 1 mm which appear to be the remains of seed husks; (2) small (1–2 mm) grey/white sub-angular or rounded inclusions; and (3) very fine sand inclusions that give the clay a grainy structure. There is considerable variation in the presence and especially proportions of these inclusions, but these variations do not appear to show any clear pattern in relation to the types that have been defined. They probably reflect an arbitrary range of clay treatments that were used by potters. An attempt was made to subdivide this fabric on the basis of the proportion of the inclusions. This might have yielded useful results with a greater investment of time than it was possible to give, but the apparently random variation that came to light suggested that this approach would not necessarily yield useful results and it was abandoned at a relatively early stage.
- Surface treatment: The core of the fabric is often a greyer colour than the surface. The surface treatments vary with type, the most common are reddish brown slips and washes that are sometimes burnished.

Fabric 1b

Types: 6, 7, 9, 43, 49.

- Description: This is the same fabric as Fabric 1a except that it has a high percentage of sand grains that are large enough to be visible to the naked eye (up to 0.3 mm). Chaff temper is also less evident. The fabric has a different feel to Fabric 1a, and once familiarity has been established, the two can easily be distinguished with the naked eye.

Fabric 1c

Types: 19, 41, 48, 55.

- Description: This is again the same fabric as Fabric 1a, but in this case, there is an absence of large inclusions and of vegetable temper, giving the fracture a slightly smoother and purer look, although the fine grainy structure is still readily visible with a ×10 hand lens.

Fabric 2

Types: 14, 15, 24, 26, 44, 45, 46.

- Traditional classification: Pottery made in this fabric would traditionally have been classified as ‘Grey’, ‘Thick grey’ or ‘Medieval grey’ ware.
- Description: This fabric is finer and better levigated than Fabric 1a and tends to have a smoother fracture as a result. The clay has a less blocky structure to it, and there are fewer large inclusions. On the whole, it is also denser, stronger and better fired. Vegetable or chaff tempering is present, but it is difficult to see in section and is normally only detectable as voids on the clay surface. Some sherds contain occasional large (<0.75 mm) rounded grains, that are probably quartz. This fabric is fired to between a very dark grey to an olive grey (5Y 3/1–4/1; 5Y4/2), normally being darker on the edges than at the core. There is some variation in the fabric, but this is less than for Fabric 1a. It seems quite likely that this clay came from the same source as Fabric 1 but that it was mixed and fired according to a different system.

Fabric 3

Types: 10, 11, 29, 38, 39, 58.

- Traditional classification: Pottery made in this fabric would traditionally have been classified as ‘Black and red’ ware or as ‘Burnished black’ ware depending on the colouring of the exterior.
- Description: This is a finer fabric than Fabric 1a. It breaks with a light snap and has a rough angular fracture and a very fine grainy structure due to a moderate amount of fine, badly sorted, sub-angular grey grits, the smallest of which are almost too small to see even with a ×10 hand lens. There are occasional signs of chaff or other vegetable temper, but these are not very common. The fabric

is fired to between a greyish brown and a very dark grey (2.5Y 5/2–3/1). The external surface of Types 10 and 38 is black, with the exception of the lower part of the exterior, from about 2 cm below the rim, where it is fired to between a yellowish red and a reddish yellow (5YR 5/6 to 7.5YR 7/6). These are the vessels that are traditionally referred to as 'Black and Red ware' (see below). Other vessels (Types 11, 29, 39, 58) are entirely black on the interior and exterior surfaces; these are the vessels that are traditionally referred to as 'Burnished black ware' (see below).

Fabric 4

Types: 20, 21.

- Traditional classification: Pottery made in this fabric would traditionally probably have been classified as 'Fine red' ware.
- Description: This fabric is weakly fired and breaks easily with hardly a snap. It is well levigated and has a smooth fracture. There are very few visible inclusions. The fabric has a fine grainy structure that is visible with a ×10 lens; it is caused by very dense, tiny, well-sorted grains that are almost too small to see with the ×10 lens. The fabric is fired to an even reddish yellow (5YR 6/6–7.5YR 6/6). All of the sherds are small jars or bowls with quite thin walls (<5 mm). They are all covered with a thin mat slip/paint (on the exterior only in the case of jars), which is red to weak red in colour (2.5YR5/4–5/6).

Fabric 5

Types: 51, 52 (and White and Red Painted [WARP] class).

- Traditional classification: Unknown.
- Description: This is a fine, well-levigated fabric with a smooth fracture. It is soft to medium fired and can break with a slight snap. There are no large inclusions, but there are occasional small (0.1 mm) unidentified white flecks in the clay. The clay also has a very fine grainy structure caused by fine grits that are almost too small to see with a ×10 lens. The fabric fires to an even reddish yellow (7.5YR 6/6–6/8).

Table 7.2 shows the occurrence of the main five fabrics through the sequence where chronological change can be noted. For example, Fabric 3 is clearly more common in Periods 1 and 2 and may have gone out of use by Period 3, the few remaining sherds being residual. Likewise, Fabric 2 seems to be datable predominantly to Period 3; the few examples from earlier layers may be misidentifications or intrusive sherds. The amount of Fabric 1a declines in Period 3 and Fabric 5 occurs only in Period 4.

Pottery wares

In addition to the typological and fabric classification, which formed the basis of the Paithan pottery study, a number of ceramic wares or classes were also identified or defined and these are described below. Some are already well known from the published literature and can be approximately dated by evidence from other sites, whilst others are defined here for the first time.

Jorwe ware

At Paithan, eight very small and heavily eroded sherds of a red, finely levigated, well-fired pottery ware came to light in the natural soil layer (777) that was excavated in the lowest levels of Trench D. These sherds seem to be related to a type of pottery noted in Proto Historic levels at other sites in the region, which is wheel-made and has a fine, well-levigated fabric with an orange-red core, thin walls and black-painted designs. This ware is variously called 'Jorwe ware', 'Jorwe Nevasa red ware', 'painted red ware b', 'painted black on red ware', 'black-painted red pottery of the Jorwe ware' or 'Jorwe Nevasa painted red ware' and has been found at Nasik, at Nevasa in Period III, at Navdatoli in Period III and at Prakash in Period Ib, amongst other sites (Sankalia and Deo 1955: 161–162; Sankalia *et al*. 1958: 85–86; Sankalia *et al*. 1960: 205–207; Thapar 1967: 36, 49–54). At Nevasa, which is close to Paithan, it made up 65% of the pottery of Period III, whilst at more distant Prakash, it made up only between 5% and 15% of the roughly contemporary Period 1b assemblage (Sankalia *et al*. 1960: 205; Thapar 1967: 26). The ware is normally dated to between about 1400 and 1000 BC, with a later 'degenerate' form said to continue as late as 700 BC, although some of this dating seems to be based on uncalibrated C^{14} dates (Ghosh 1989, I: 239).

As the sherds found at Paithan are very small and eroded and none of their shapes or original surface

decorations are preserved, it is impossible to be absolutely certain of this attribution, although it seems likely to be correct given the lack of alternatives and the predominance of this ware in Proto Historic levels at nearby Nevasa. A jar that is on display in the Balasaheb Patil Government Museum at Paithan is another example of this ware that is thought to have been found at Paithan (see Fig. 11.6, 1).

Northern Black Polished ware

Northern Black Polished ware (NBP) is a well-known fine, black-slipped ware that was probably manufactured in the Ganges region (Sankalia *et al*. 1958: 132–134; Thapar 1967: 71–75; Ghosh 1989, I: 251–257). The sherds found at Paithan have a very fine, well-levigated grey to light grey body (2.5YR 6/1–7/1) that is very strong and well fired and breaks with a snap. The fracture is conchoidal and there are not usually any visible inclusions, although in some cases, rare rounded red inclusions (grog?) are visible alongside occasional small angular air holes. The surface is covered with a high-quality, thin black slip that appears almost to have vitrified in some cases to a glaze, giving off a lustrous sheen (Figs 7.1–7.2).

The presence of NBP is often used as a chronological 'marker' in excavation reports. It is found over the whole of the Ganges area and into the western Deccan as far south as Brahmapuri (e.g. Thapar 1967: fig. 21). There is some discussion over the precise chronology of its production, but this has mostly centred on the date of its introduction. Erdosy has reviewed the C^{14} evidence for NBP production in the Ganges area around Kausambi, Sravasti, Rajghat and Vaisali. He places its introduction in the second half of the 6th century BC – although this has been arrived at by averaging dates from a number of different sites and contexts (Erdosy 1995: 104) – and the end of its production at about 100 BC, although this is based on unspecificied associated coins, seals and sealings (Erdosy 1995: 105). It is important to note two things in relation to Erdosy's chronology: firstly that the C^{14} dates on which it is based are not very precise due to the nature of the calibration curve at this period, and secondly, that the dating of the end of production is largely speculative and is not well supported by evidence (Erdosy 1995: 100–105). Even if Erdosy's dates are correct, they apply only to the core area of NBP production in the Ganges valley and the area immediately surrounding. It is possible – or even highly likely – that it came into use at different times in different regions (e.g. Sankalia *et al*. 1960: 69; Ray 1986: 47). The date at which it first began to circulate widely

Fig. 7.1: Northern Black Polished ware sherds (NBP) (scale in cm).

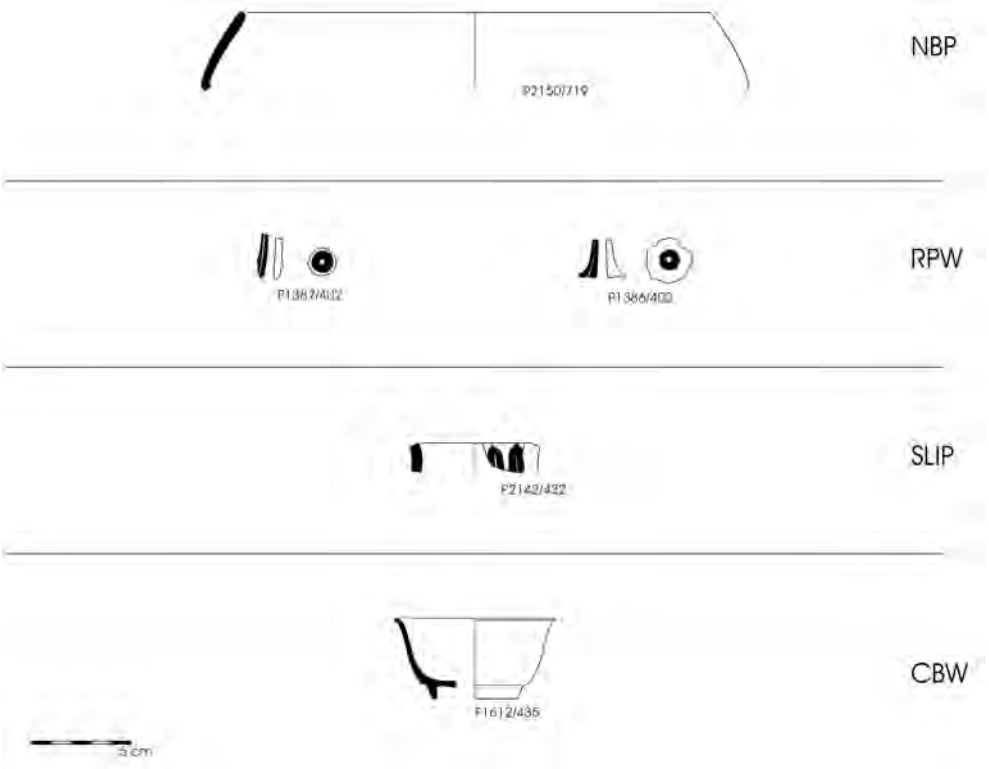


Fig. 7.2: Classes NBP, RPW, SLIP and CBW.

in the western Deccan and surrounding areas has never been accurately established, and neither has the date at which it ceased to circulate. To give some idea of the way in which NBP has been dated in this region, at Nevasa, it was dated to the 'late Mauryan period'; at Prakash, to the third/second or possibly 1st century BC; at Nasik, to 400–200 BC; at Maheshwar, 400 to 100 BC; and at Ter, between 200 BC and the 1st century BC (Sankalia and Deo 1955: 28; Sankalia *et al*. 1958: 19, 22; Sankalia *et al*. 1960: 69; Thapar 1967: 74–75; Chapekar 1969: 17). However, close inspection of these reports, as well as reports on other sites in the region where NBP has occurred, such as Brahmapuri, Mansar, Pauni and Nagara, reveals that none of these sequences contains any reliable dating evidence with which to establish the first or latest occurrence of NBP. Bearing in mind the lack of reliable evidence for the end of production in the Ganges area, this means that, at present, in the western Deccan NBP can, strictly speaking, only be used as a *terminus post quem* to date the layers in which it occurs to the mid–6th BC or later. Of course it is almost certain that it came into use somewhat later in the western Deccan, and, to judge from excavation reports, there was probably a period of time during which it circulated in reasonably large quantities, but, at present, the chronology of these developments is unknown. Therefore, although the circulation of NBP in the western Deccan region may one day be more accurately dated, until further evidence has come to light, any attempt to use it for more precise dating is purely speculative (Thapar 1967: 25).

Twenty-three sherds of NBP were recorded at Paithan, 22 of them in layers allocated to Period 1; the remaining sherd was found in a layer allocated to Period 2 and must therefore be residual (Tables 7.3 and 7.4).

Red Polished ware

This is another well-known ware about which much has been written (Pinto Orton 1991). It has a very fine, well-levigated, brick-red body covered by a thin orange-red slip, which is often burnished. The fracture is smooth with no visible inclusions. Mica is visible on the surface. The most common forms are a carinated pot with an almost horizontal out-turned rim that is notched on its outer face and a sprinkler (Figs 7.2–7.3).

Red Polished ware (RPW) is found over much of central and northern India, although some of it was probably produced in Gujarat, perhaps in the region around Amreli, the site which has yielded the greatest

number of types (Rao 1966: 51–59; Pinto Orton 1991). It was first defined at Baroda and is normally dated to between the 1st and anywhere between the 3rd and the 5th centuries AD, although sometimes as late as the late sixth (Subbarao 1953: 56–64; Sankalia *et al*. 1958: 161; Rao 1966: 52–53; Whitehouse and Williamson 1973: 39; Ghosh 1989, I: 259; Pinto Orton 1991: 46). The evidence for the first appearance of RPW in the western Deccan between the 1st BC and 3rd AD is demonstrated in Period V at Nevasa, where it is associated with reasonable numbers of confirmed Roman amphorae of a known date (Sankalia *et al*. 1960: 69, 280–281, 307; Gupta *et al*. 2001; Tomber 2007: table 1, 979). There are very few cases, however, where the dating evidence for its disappearance stands up to detailed critical scrutiny. For example, Rao proposes a 'lower limit' of the beginning of the 5th century based upon the fact that a coin datable to AD 380 was found in one of the layers containing RPW at Amreli (Rao 1966: 53), but there is clearly no reason, based on this evidence, that RPW could not have continued in use much later. A more convincing case is Period III at Paunar, which is dated to the 6th century and later by coins of the Kalachuris and Vishnukundins and Vakataka-style sculpture (Deo and Dhavalikar 1968: 7). No RPW is reported from layers 4 and 5 that make up Period III, whereas 52 sherds are reported from the preceding Period IIb (Deo and Dhavalikar 1968: 47–69). Another is Prakash, where RPW occurs only in levels 28–25 (Thapar 1967: 24), below levels containing figurines and coins dated to the 4th to 8th centuries, suggesting that it was out of circulation by the 6th/7th centuries. On the other hand, the evidence from the excavations at Kush in the United Arab Emirates (UAE) has suggested that RPW may have continued to circulate as late as the 8th century AD (Kennet 2004a: 65–66). It is possible that there are regional differences in the distribution of RPW and that Gujarati RPW continued to be manufactured and traded by sea later than RPW circulated in the western Deccan.

Only 10 sherds of RPW were recorded at Paithan, three occurred in Period 2, and the others occur in layers allocated to Period 3-temple, Period 4 or in layers that were not allocated a period (Tables 7.3 and 7.4).

Chinese wares (CBW and other)

All but one of the sherds of Chinese pottery are Chinese Blue and White porcelain (CBW), which is a well-known class of porcelain, covered with a transparent glaze and decorated with under-glaze cobalt. It is possible to subdivide CBW into different styles based on the decorative scheme (e.g. Swatow and Kraak) (Figs 7.2 and 7.4).

Large-scale production and export of CBW from China did not begin until the first or second quarter of the 14th century at the earliest (Medley 1976: 176; Guy 1986: 76; 1990: 26). It started to become common in elite circles in the Near East at the end of the 14th century (Lane 1947: 27–28; Gray 1948–49: 30; Krahl 1986, II: 482), but it did not begin to be traded widely until the mid to late 15th century and probably began to arrive in India in quantity at around the same time (Krahl 1986, II: 533; 1997: 154). It continued to be exported to the western Indian Ocean and Europe until the late 18th century, when imitations began to be manufactured in Europe (Lunsingh Scheurleer 1974: 37–38).

Thirty sherds of CBW occurred at Paithan, and their presence was used to define layers of Period 4 (Tables 7.3 and 7.4). Of these, 16 sherds, including all but two of those mentioned below, come from Trench B, between layers 402 and 435. One of the youngest sherds in this sequence (P1612) comes from the earliest layer (435), indicating high levels of re-deposition. Of the Trench B sherds, there are two that might be as early as the 15th century (P1614, P2165), and there are also two sherds of 16th century Kraak porcelain (P2167, P2168). The rest of the material is datable to the 16th/17th centuries, with the exception of two sherds (P1612, P2164) of the Kangxi period (AD 1662–1722).

In addition, there is one Chinese sherd that is not CBW, but that might conceivably be significantly older: P1613. This might possibly be a Southern Song Jingdezhen product of the 12th to 13th century, but it is probably a Ming or Qing period Fujian white ware. It was found in context 435 in Trench B associated with sherd P1612, which is 17th to 18th century in date, along with other sherds mentioned above that are datable to the 15th to 17th centuries. Sherds P2173 and P2174 (both datable to the Wanli period, AD 1573–1620) come from Trench A South Area.

Blue and White Frit (PERS)

This ware is made of a good-quality thick frit or stone-paste body; the interior and the exterior of the vessels are coated in a transparent glaze that covers under-glaze painting in cobalt blue. It is often mistaken for Chinese porcelain, although the body is notably different, as are the quality of the glaze and decoration. Frit

Table 7.3: Summary of selected ceramic classes from Paithan by period (rim-sherd counts above; percentages of total period rim-sherd assemblages below).

Ware \ Period	1	2	3	3-temple	4	Total
Black and Red	878	569	44	21	72	**1,584**
Black Burnished	19	12		3	1	**35**
NBP	5					**5**
RPW		1			1	**2**
GREY	3	11	195	5	144	**358**
PERS					1	**1**
WARP					69	**69**
CHIN					12	**12**
Other	4,271	4,831	1,256	378	1,784	**12,520**
Total	5,176	5,424	1,495	407	2,084	**14,586**
	%	%	%	%	%	
Black and Red	16.96	10.49	2.94	5.16	3.45	
Black Burnished	0.37	0.22		0.74	0.05	
NBP	0.10					
RPW		0.02			0.05	
GREY	0.06	0.20	13.04	1.23	6.91	
PERS					0.05	
WARP					3.31	
CHIN					0.58	

Table 7.4: Summary of body sherd counts of by period for those wares for which body sherds were counted separately.

	1	2	3	3-temple	4	No period	Total
Jorwe	8						**8**
NBP	17	1					**18**
RPW		2		2	3	1	**8**
CHIN					18		**18**
PERS					3	1	**4**
SLIP					7		**7**
WARP					6		**6**
Other	21,518	25,290	9,260	3,702	12,261	101	**72,132**
						Total	**72,201**

wares were produced in the Near East from about the 12th century onwards, but this style of frit ware, which closely imitates CBW porcelain, was produced in the Near East from the 14th until about the 19th century (Soustiel 1985: 214), and this is supported by excavation data from the UAE (Kennet 2004a: FRIT.BW). Only five sherds of PERS occurred at Paithan, all in layers allocated either to Period 4 or for which it was not possible to allocate a period (Tables 7.3 and 7.4, Fig. 7.5).

Fig. 7.3: Red Polished ware sherds (RPW).

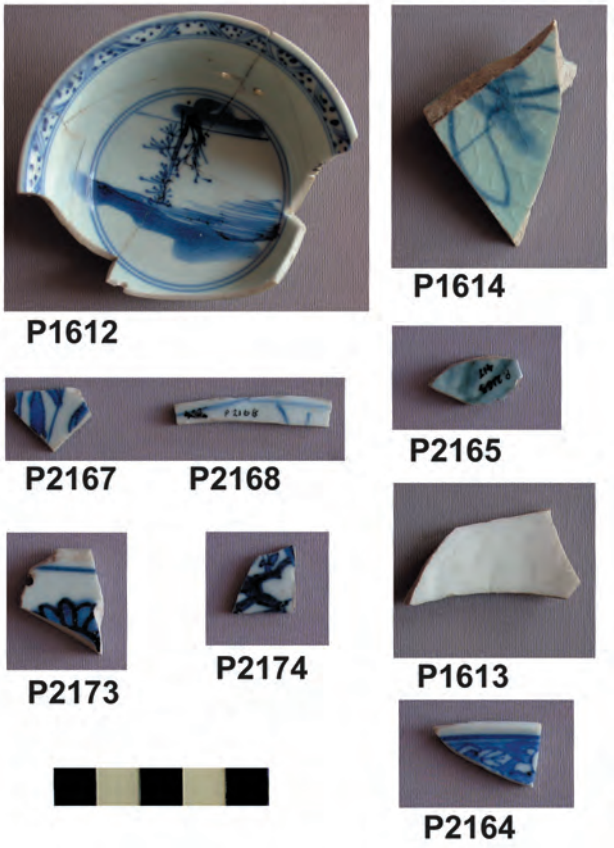


Fig. 7.4: Chinese Blue and White porcelain sherds (CBW).

Slip-painted ware (SLIP)

This is a glazed ware with a coarse red earthenware body that has a fine sandy texture. It has a smooth fracture and the body is fired an even red (2.5YR 5/8). The seven sherds retrieved all come from small closed vessels such as jars. They are all covered on the outside with a transparent lead glaze that contains some splashes of green. This covers decoration painted in a thick, cream yellow slip. The motives are lines and arches and foliage. There is no glazing or decoration on the interior surface or on the top of the flattened rim (Figs 7.2 and 7.6).

The date of this class is not known. Slip-painted ware first appeared in the Near East in around the 11th or 12th century AD, but these sherds are likely to be considerably later, probably datable to the 14th century or somewhat later. At Paithan, only seven sherds were recorded, all from layers allocated to Period 4 (Table 7.4).

White and Red Painted (WARP)

Types: 51, 52.

This is an unglazed painted earthenware that was defined by this study. It consists of small closed vessels such as jars that are made of Fabric 5 and are decorated on the outside and over the rim with a thin, white mat paint that is then decorated crudely with thin horizontal red bands of paint (Fig. 7.7).

This class includes types 51 and 52 as well as a number of unclassified body sherds. Seventy-five sherds were found at Paithan, these occurred only in layers allocated to Period 4 where it was quite common (Tables 7.3 and 7.4). The high number of rim-sherds relative to body sherds is caused by an anomalous find in context 435 of Trench B.

Thick Grey wares (GREY)

Types 14, 15, 24, 26, 44, 45, 46.

These types make up are very distinctive class of pottery that is known from excavations elsewhere in the region. They are all made of Fabric 2 and are large, grey, sturdy, mostly thick-walled carinated jars with everted rims of a variety of shapes. Most are burnished and many are decorated with ribbing on the outside. The types defined in this ware are all highly variable, suggesting a low level of standardisation. This might reflect the relatively informal organization of the industry that produced these wares.

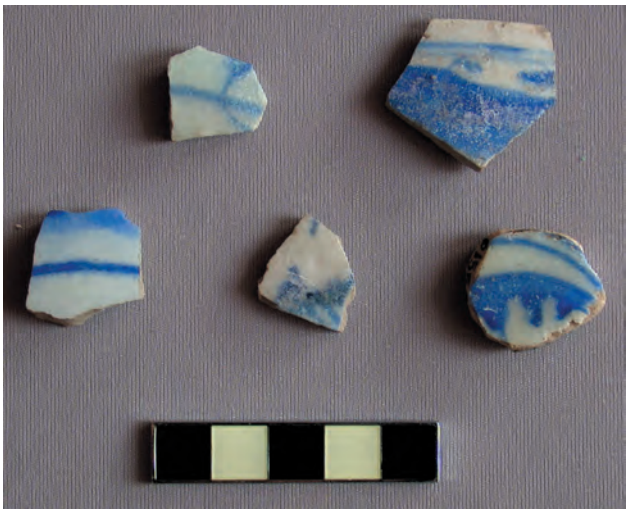


Fig. 7.5: Blue and White Frit sherds (PERS).

Fig. 7.6: Slip-painted ware sherds (SLIP).

At other sites in the region where they have been encountered, these types are referred to as 'Coarse Black ware', 'Black ware' (Nevasa, Maheshwar) or 'Darkish-Grey ware' (Prakash). They tend to appear in large quantities in the later Early Historic or Early Medieval layers, for example at Nevasa in Period VI (14th–18th century AD), at Maheshwar in Period VI (AD 100–500) and at Prakash in Period IV (6th–11th century AD), although there is no clear evidence to show precisely at which date they first began to appear; the dating of some of the periods mentioned is also in need of review (Sankalia *et al*. 1958: 137, 140, 150–151, 154–155, 163; Sankalia *et al*. 1960: 333; Thapar 1967: 15, 89, 93; see also the discussion below related to types 14 and 24). Given the obvious significance of this ware to the archaeology of the Early Medieval period, it is surprising that it is not more widely discussed in the literature (e.g. Mehta 1979: 42–49; Ghosh 1989, I: 260).

Fig. 7.7: White and Red Painted ware sherds (WARP).

At Paithan, Thick Grey ware was a very significant and obvious component of the Period 3 assemblage of which it made up over 13% (Table 7.3). Indeed, its appearance in the sequence was used to mark Period 3. This holds true with the exception of 14 sherds, three from Period 1 and 11 from Period 2, that are considered to be intrusive, although it should be noted that at Maheshwar, it occurred in smaller quantities through the Early Historic levels (Sankalia *et al*. 1958: 150). This suggests that these wares may have been in existence from earlier but have become more abundant towards the end of the Early Historic period. They are potentially extremely important wares for our understanding of the Early Historic/Early Medieval transition.

If the dating of the North Temple here at Paithan is accepted, Thick Grey wares can be shown to have been in circulation by the 4th or 5th century or shortly thereafter.

Black Burnished ware (BBW)

Types 11, 29, 39, 58.

This ware consists of sherds made of Fabric 3 that are entirely black on the interior and exterior surfaces. The surface treatment never varies, being heavily burnished in all cases. This ware is made of exactly the same fabric as Black and Red ware and, aside from the absence of 'inverted firing', shares a very similar firing technique. The forms, however, are quite different from Black and Red ware, consisting of small, closed vessels such as jugs, jars and one or two bowls, although no complete profiles came to light.

Pottery described as 'burnished black', 'black slipped' or 'black-slipped burnished ware' has been found at other sites in the region, for example Maheshwar and Nevasa (Sankalia *et al*. 1958: 153–154; Sankalia *et al*. 1960: 278, 301–306, 323). At Maheshwar, it is first mentioned in Period VI (AD 100–500) and is said to have been most common in Period VII, the so-called 'Muslim-Maratha phase' (Sankalia *et al*. 1958: 151), whilst at Nevasa, it first appears in Period V (50 BC–AD 200), where it is represented by 'a few sherds', and then is said to have become the 'standard ware' of Period VI ('Muslim-Maratha'), although the report contradicts itself further on by stating that red ware was more common in Period VI (Sankalia *et al*. 1960: 278, 323).

At both sites, the forms present in these wares and their occurrence through the sites' sequences seem to associate them with the 'Coarse Black ware' and 'Black ware' mentioned above under Thick Grey wares, whilst at Paithan, their fabric seems to associate them with Black and Red ware (below), as does the fact that they occur predominantly in Periods 1 and 2 together with a few sherds from later layers that are probably residual (Table 7.3).

Black and Red ware

Types 10, 38.

This is a well-known ware, or perhaps 'manufacturing technique' would be a better term, that has been recorded from most Early Historic sites that have been excavated in the region as well as more widely across India (e.g. Sankalia *et al*. 1958: 134–135, 141–143, 144–146, 150, 152–153, 162, 164; Sankalia *et al*. 1960: 259–263, 276, 282–286; Thapar 1967: 68–71; Deo and Gupte 1974: 91–92, 103–104, 110). The ware has a long history, possibly stretching back as early as the Harappan period in some places, but it occurs as late as the Early Historic period in a series of forms similar to those found at Paithan (Ghosh 1989, I: 94–95, 234–238).

At Paithan, it consists entirely of wheel-made, slightly closed bowls that are made of Fabric 3 and are fired black with the exception of the lower part of the exterior, from about 3 cm below the rim, where it is fired to between a yellowish red and a reddish yellow (5YR 5/6 to 7.5YR 7/6) due to having been fired upside down. At Paithan, the surface treatment never varies, being heavily burnished in all cases, although at other sites, for example Nevasa and Maheshwar, a few coarse and unburnished examples are also reported (Sankalia *et al*. 1958: 134; Sankalia *et al*. 1960: 259, 276).

At sites where it is recorded, Black and Red ware seems to decline in abundance from a peak in Early Historic levels, dwindling to much lower quantities by Medieval times, which is exactly the pattern observed at Paithan (see below). For example, at Maheshwar, Black and Red ware made up around c. 14.7%+ of the Period IV assemblage (400–100 BC), 11.4% of the Period V assemblage (100 BC–AD 200), 8.4% of the Period VI assemblage (AD 200–500) and only a few sherds of the Period VII assemblage (Medieval) (Sankalia *et al*. 1958: 137, 143, 150, 162). At Nevasa, it was present in Period IV (150 BC–AD 150), made up a lower quantity in Period V (AD 50–200) and was not mentioned in Period VI (AD 1400+) (Sankalia *et al*. 1960: 259, 276, 322–324). At Prakash, in Period II (600–100 BC), Black and Red made up a total of 34.83%, declining from 55.48% to 9.09% through that period, whilst in Periods III (AD 50–200) and IV, it was not mentioned (Thapar 1967: 27, 84–93). At Bhokardan, in Period IA (early Satavahana), it made up 'much less than other wares', whilst in Period IB (late Satavahana), it made up a 'large number of sherds', and in Period II (post-Satavahana), 'less bulk' (Deo and Gupte 1974: 91–92, 103–104, 110). These figures can be compared with Paithan, where Black and Red ware made up the following proportions of the period-assemblages: 16.96% in Period 1, 10.49% in Period 2, 2.9% in Period 3 and 3.45% in Period 4. It is possible to see a broadly similar decline in the circulation of this ware at all sites in the region, although there are some, for example Bhokardhan, where the pattern does not seem to hold up well, possibly due to imprecise quantification.

Other wares

Table 7.3 shows the occurrence of each ware by period as rim-sherd counts and percentages of total period rim-sherd counts. The percentages are based on the number of rims as the majority of body sherds were not classified according to ware. It should also be noted that many rim-sherds were not allocated a ware type, as has been noted above. These sherds are included in the group called 'Other' in the table. These sherds were, however, classified by type and their occurrence is shown in Table 7.5. Whilst most body sherds were not classified by ware, those belonging to particular diagnostic wares such as NBP, RPW, etc., were also recorded. These are not included in the percentage analysis in Table 7.3 as they would obviously bias the trends elucidated there, but these sherds are listed in Table 7.4 so that their occurrence through the sequence can be seen.

Table 7.3 makes clear the relative significance of different wares through the sequence. Particularly notable are the decline in Black and Red ware from Period 1 onwards and the increase in Thick Grey ware in Period 3. One very obvious absence from Table 7.3 and the discussion above is the group of wares that are normally described as 'red', or 'coarse red' or 'red slipped' wares. Such wares normally make up a large proportion of the Early Historic assemblages from sites in the region; for example in Period IV at Maheshwar, 'coarse red' and 'red slipped' made up 47.4% and 29.3%, respectively, of the assemblage, whilst in Period IV at Nevasa, a 'wide range of shapes' are recorded in coarse and slipped red pottery, whilst 'coarse red ware' is reported as being the most common ware in Period V (Sankalia *et al*. 1958: 137; Sankalia *et al*. 1960: 256, 277). The same is true at Prakash, where red ware is reported as making up most of the 'other wares' that themselves make up almost 65% of the Period II assemblage, whilst the Period III assemblage is described as being 'wholly of monochrome red ware' (Thapar 1967: 27, 75, 84). As can be seen in Table 7.2, at Paithan, rim-sherds that traditionally would have been defined as 'red wares' (e.g. Fabrics 1a, 1b and 1c – which include at least five different combinations of slipping and burnishing) made up roughly 76% of Period 1, 78% of Period 2, 60% of Period 3 and 51% of Period 4 rim assemblages. Although the 'Red ware' category was not used at Paithan because it is too broad and poorly defined to be reliable, these approximate figures are given here to allow rough comparisons to be made with other sites.

However, in most of these cases, 'red ware' is little more than a crude description of clay colour. In reality, there are marked variations in colour, fabric, surface treatment, form and manufacture amongst these materials, and for this reason, 'red ware' was not further used as a category in this study. This presented the problem of how to classify the remaining 80% to 90% of the 'red', 'buff' and 'tan' coloured rim-sherd assemblage that remained after the wares that have been defined above had been removed. As explained above, after a considerable amount of trial and error, it was decided that it was not possible, using the human eye and a ×10 hand lens, to define wares within this material with characteristics that were consistent, coherent and usable. At the same time, it was noted that it was possible to subdivide the forms and shapes of the vessels into consistent and easily recognizable types. It was therefore decided that a form- and type-based approach was the most effective method of classifying the rim-sherd assemblage from the excavations. The resulting typology is presented below.

Typology

Fifty-six separate types were defined, all of which are based on rim forms. Each type is described below and reference is given to illustrations in Figs 7.8 to 7.18. A small graph is included at the end of the chapter showing the 'occurrence profile', or the percentage each type makes up of the period rim assemblages through the sequence. The data upon which these graphs are based are presented in Table 7.5. Tables 7.6 to 7.11 also show the occurrence of types through the sequences of each of the main trenches, context by context.

In order to avoid repetition, where types are made of Fabrics 1 to 5, which have been described above, this is simply indicated. Where the fabric is unique to the type, then a full description is given below, with the type description. It should be noted that all vessels are wheel-made unless otherwise stated.

It is acknowledged that the approach adopted here is at variance with that generally taken in the study of Early Historic pottery in India. For this reason, an attempt has been made to suggest what nomenclature might have been used for each type in the more commonly used classification system, for example 'coarse red ware', 'slipped red ware', etc. This is intended to provide a link if it should be needed; it should be stressed that such terms are only for rough guidance and are not precisely defined.

Table 7.5: Types by period based on rim-sherd count (left) and percentages of total rim-sherd count (right). 'UNIQ' means unique sherd; the most important of these are described in Table 7.15.

Type	1	2	3	3-temple	4	Total
1	2,005	708	440	299	516	3,968
10	853	569	44	21	72	1,559
1A	625	1,503	82	4		2,214
1B	314	1,002	160	3		1,479
2	212	21	5		30	268
4	175	174	15	3	57	424
8	115	84	5		21	225
3	110	159	18		30	317
16	105	171	36	9	73	394
9	63	75	9			147
5	46	52	10		15	123
43	45	20	19	3	11	98
30	27	13			2	42
38	25					25
6	21	16		1	23	61
33	16	39	8	1	11	75
36	12	6				18
40	12	10			3	25
42	9	4				13
58	9	1				10
29	7	11		3	1	22
NBP	5					5
20	4	20	13		72	109
25	4	10	19		13	46
24	3	8	153	1	4	169
39	3					3
41	3	39			36	78
35	2	5	3			10
18	1	4	2		1	8
55	1				24	25
57	1				15	16
32		41	8	2	9	60
7		26	6	1	23	56
31		15	4			19
19		14				14
37		13				13
34		5	3			8
12		2	4		10	16
26		2	27	4		33
14		1	10		19	30
22		1	2	1	2	6
27		1	19	1	3	24
RPW		1			1	2
50			7		5	12
44			5		65	70
47			5		34	39
48			1		125	126
51					62	62
46					31	31
13					30	30
45					19	19
49					16	16
53					15	15

Type	1	2	3	3-temple	4
1	38.74	13.05	29.43	73.46	24.76
10	16.48	10.49	2.94	5.16	3.45
1A	12.07	27.71	5.48	0.98	
1B	6.07	18.47	10.70	0.74	
2	4.10	0.39	0.33		1.44
4	3.38	3.21	1.00	0.74	2.74
8	2.22	1.55	0.33		1.01
3	2.13	2.93	1.20		1.44
16	2.03	3.15	2.41	2.21	3.50
9	1.22	1.38	0.60		
5	0.89	0.96	0.67		0.72
43	0.87	0.37	1.27	0.74	0.53
30	0.52	0.24			0.10
38	0.48				
6	0.41	0.29		0.25	1.10
33	0.31	0.72	0.54	0.25	0.53
36	0.23	0.11			
40	0.23	0.18			0.14
42	0.17	0.07			
58	0.17	0.02			
29	0.14	0.20		0.74	0.05
NBP	0.10				
20	0.08	0.37	0.87		3.45
25	0.08	0.18	1.27		0.62
24	0.06	0.15	10.23	0.25	0.19
39	0.06				
41	0.06	0.72			1.73
35	0.04	0.09	0.20		
18	0.02	0.07	0.13		0.05
55	0.02				1.15
57	0.02				0.72
32		0.76	0.54	0.49	0.43
7		0.48	0.40	0.25	1.10
31		0.28	0.27		
19		0.26			
37		0.24			
34		0.09	0.20		
12		0.04	0.27		0.48
26		0.04	1.81	0.98	
14		0.02	0.67		0.91
22		0.02	0.13	0.25	0.10
27		0.02	1.27	0.25	0.14
RPW		0.02			0.05
50			0.47		0.24
44			0.33		3.12
47			0.33		1.63
48			0.07		6.00
51					2.98
46					1.49
13					1.44
45					0.91
49					0.77
53					0.72

Type	1	2	3	3-temple	4	Total
CHIN					12	12
54					11	11
23					8	8
15					7	7
56					7	7
52					5	5
PERS					1	1
UNIQ	8	21	23		30	82
NON	335	557	330	50	504	1,776
Total	5,176	5,424	1,495	407	2,084	14,586

Type	1	2	3	3-temple	4
CHIN					0.58
54					0.53
23					0.38
15					0.34
56					0.34
52					0.24
PERS					0.05
UNIQ	0.15	0.39	1.54		1.44
NON	6.47	10.27	22.07	12.29	24.18

Throughout the description of types below, reference is occasionally made to whether the absence of a particular type is 'significant' or not. In this context, 'significant' means that three sherds or more of the type would have been expected in the period assemblage concerned, given the size of that assemblage and the proportion that the type makes up of other period-assemblages where it is found.

Type: 1
Traditional ware name: Coarse red ware

- Description: This is a very common, coarse-ware bowl with nearly straight sides and a simple pointed rim that is sometimes slightly thickened and upturned. The diameter is normally 10–12 cm, although up to 18 cm has been observed. The bowl has a flat, string-cut base. Type 1 was subdivided into two subtypes, Types 1a and 1b, based on size (see below).
- Ware: Fabric 1a.
- Illustration: Fig. 7.8.
- Subtypes: Type 1a is a small version with a maximum wall thickness of 5.5 mm and a rim diameter of 7–12 cm. Type 1b is a large version with a minimum wall thickness of 5.5 mm and a rim diameter of 12–20 cm, averaging about 17 cm.
- Internal dating evidence: Fig. 7.23 shows the occurrence of Types 1a and 1b as well as the total for all Type 1. Type 1 is the most common type recorded in the assemblage, making up between 50% and 60% of the rim assemblage in Periods 1 and 2, with a decline to 45% and 25% in Periods 3 and 4, respectively. The very high percentage in Period 3-temple is probably anomalous due to the small size of the assemblage in that period. There is a marked decline in Period 4, many of the sherds from which may be residual, although it seems unlikely that the type ever went completely out of use. The smaller version (Type 1a) is more common in Periods 1 and 2, but this changes in Period 3, where the larger version (Type 1b) becomes more common.
- External parallels: Given the frequency of Type 1 at Paithan, it is surprising that it does not receive greater mention in the published pottery reports from other sites in the region. This may be because it is a ubiquitous, rather simple, shape with a broad chronological range, but it may also be the case that this type is particularly common at Paithan. It is frequently found at Brahmapuri (Sankalia and Dikshit 1952: fig. 18, type 52), whereas at other sites, there is usually no indication of how common this type is, and some of the illustrated types may have been single examples. For example in Period V at Nevasa, there are two types (76 and 97) that are broadly comparable in terms of shape, although the size of 76 is different, as is the fact that it is red slipped (Sankalia *et al*. 1960: figs 129 and 138). At Nasik, which is considerably further distant than Nevasa, better parallels can be found in Period IIA in types 13, 13a and 13b, and also types 62 and 64 in Period IV (Sankalia and Deo 1955: figs 16 and 31). At Bhokardan, parallels can be found in Periods IA and IB (Deo and Gupte 1974: fig. 5 type 1 and 1a, fig. 11 type 63), at Ter in Periods I and II (Chapekar 1969: fig. 7 type 11b, fig. 15 type 33), at Prakash in Periods II and IV (Thapar 1967: fig. 23 type 1 and 1a, fig. 29 type 1) and at Maheshwar in Period IV (Sankalia *et al*. 1958: fig. 60 type 82).

Type: 2
Traditional ware name: Coarse red ware

- Description: This is a small jar with an everted, slightly thickened rim above a short neck. There is some variation in the shape of the rim. The diameter is about 10 cm.
- Ware: Fabric 1a.
- Illustration: Fig. 7.8.
- Internal dating evidence: This type was very common in Period 1 but shows a marked decline after that time. It seems likely that it only occurred in Period 1 and that the few sherds from later periods are residual (Fig. 7.23).
- External parallels: This is a reasonably common type in Period 1 at Paithan, but it is not possible to find reliable parallels in other published assemblages in the region. This may be because this type is not particularly distinctive and is difficult to identify with certainty in published drawings.

Type: 3
Traditional ware name: Burnished and slipped red ware

- Description: This is a large jar with a thick, everted rim (diameter 14–16 cm), normally rounded but also occasionally squared or triangular. There is always a distinctive notch on the inside just below the top of the rim. In this respect, it is similar to Type 4. All examples have a thick, polished, red slip/paint on the interior and exterior surfaces. There is also occasionally some light ribbing on the outside. The size seems to vary considerably. There are also similarities with Types 7, 13 and 25.
- Ware: Fabric 1a.
- Illustration: Fig. 7.8.
- Internal dating evidence: This type makes up between 2% and 3% of the assemblage in Periods 1 and 2, but there is a sharp decline in the quantity of this type after Period 2, suggesting that the type may have gone out of circulation at that time. The sherds from Periods 3 and 4 are probably residual (Fig. 7.23).
- External parallels: This is a distinctive and common type at Paithan, so it is no surprise that parallels can be found at other sites in the region, for example in Period IIa at Nasik, Period IV at Nevasa, Periods 1A and 1B at Bhokardan, Periods I and II at Ter, Period III at Prakash and Period V at Maheshwar (Sankalia and Deo 1955: fig. 9 type 3a and c, fig. 10 type 4c, fig. 11 type 5 and fig. 12. type 6c; Sankalia *et al*. 1958: fig. 74 type 103; Sankalia *et al*. 1960: fig. 118 types 46 and 47; Thapar 1967: fig. 28 type 19a; Chapekar 1969: fig. 4 types 2d and 3a, fig. 15 type 30f; Deo and Gupte 1974: fig. 5 type 7b, fig. 6 type 17b, fig. 7 types 24, 24a and 24b, fig. 12 type 71b). The fact that this type was found only in the later periods at Maheshwar and Prakash seems to go against the evidence for it being a predominantly early type at Paithan.

Type: 4
Traditional ware name: Slipped red ware

- Description: This is a small jar with a thickened, outward-curving rim marked by a distinctive notch on the interior. The diameter is normally about 12–15 cm. The surface is covered with a thin red slip/wash, which is more evident on the exterior. There are marks of wet clay on the surface. This type is often very similar to Type 16.
- Ware: Fabric 1a.
- Illustration: Fig. 7.8.
- Internal dating evidence: This type has a strange occurrence profile: it was abundant in Periods 1 and 2 but appears to have ceased circulating after that time, although a significant number of sherds was also found in Period 4 layers. These are probably residual and reflect the high levels of residuality noted in that period (Fig. 7.23).
- Comments: One fragment of Type 4 comes from context 738, low down in the Trench D2 sequence. This is unusual, being thinner than normal and having a polished red slip, which Type 4 never normally has meaning that it is probably a mis-identification.

Type: 5
Traditional ware name: Slipped red ware

- Description: This is a lid with a pinched edge and high ridge. The diameter of the widest part is about 14 cm. It is coated with a fine, matt red slip/wash on both the interior and exterior.
- Ware: Fabric 1a.
- Illustration: Fig. 7.8.
- Internal dating evidence: The percentage of this type declined after Period 2, but it is not possible to be certain whether sherds from Periods 3 and 4 are

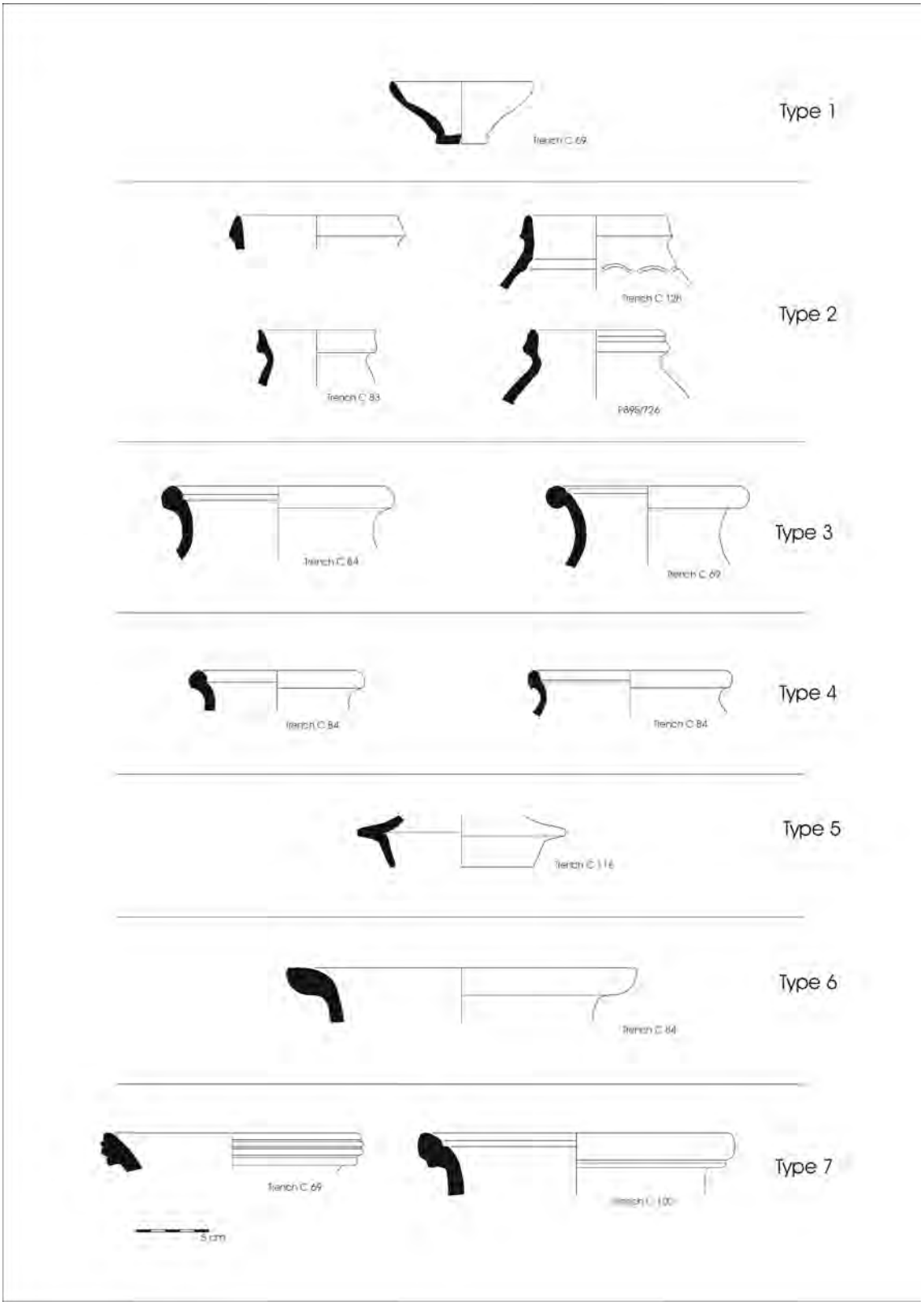


Fig. 7.8: Types 1 to 7.

residual or not. They are quite abundant, probably indicating that the type had a very long life span extending right into Period 4. The type's absence from Period 3-temple is to be explained by the small size of the assemblage in that period.
- External parallels: Parallels can be found at most sites in the region, for example at Brahmapuri in 'late Satavahana' and 'Brahmani' levels, at Bhokardan in Periods IA and 1B, at Nasik in Periods IIA and IV, at Ter in Periods I and II, at Prakash in Periods II and III and at Maheshwar in Period V (Sankalia and Dikshit 1952: fig. 18 type 56; Sankalia *et al*. 1958: fig. 71 type 98; Sankalia and Deo 1955: fig. 20 types 21–24, fig. 33 types 73–80; Thapar 1967: fig. 23 type 8, fig. 27 type 1; Chapekar 1969: fig. 6 type 5, fig. 13 type 26, fig. 17 type 34; Deo and Gupte 1974: fig. 6 type 10, fig. 12 type 73).

Type: 6
Traditional ware name: Burnished and slipped red ware

- Description: This is a large jar or vase with a thick wall and a very heavy, thick everted rim with a diameter of about 24 cm. Internal and external surfaces are both coated with a thick polished red slip/paint, which is often quite well preserved.
- Ware: Fabric 1b.
- Illustration: Fig. 7.8.
- Internal dating evidence: This type has a problematic occurrence profile. It certainly circulated during Periods 1 and 2 and then seems to have disappeared in Period 3. Period 4, however, yielded a higher percentage of this type than either Period 1 or 2. This is difficult to account for; it may be explained by the generally high levels of residuality in Period 4 or it may be related to problems identifying this type in some cases.
- Comments: The distinction between this type and Type 9 is not always clear.
- External parallels: Parallels for this type are not common; roughly similar types have been published from Ter in Period II and at Prakash in Period II (Thapar 1967: fig. 25 type 25; Chapekar 1969: fig. 10 type 20e).

Type: 7
Traditional ware name: Burnished and slipped red ware

- Description: This is a relatively rare but very distinctive jar with an everted, thickened rim, the external vertical face of which is marked with two or three deep horizontal notches. The diameter is 12–20 cm. The vessel is covered with a thick polished red paint/slip on both surfaces.
- Ware: Fabric 1b.
- Illustration: Fig. 7.8.
- Internal dating evidence: This form only occurs from Period 2 onwards and is very abundant in Period 4, which may be linked to the high levels of residuality in that period. This type's clearly significant absence from Period 1 makes it a useful chronological marker at Paithan (Fig. 7.23).
- Comments: The presence of this form was used to make the distinction between levels of Period 1 and Period 2 when the sequence was periodised (see Chapter 6).
- External parallels: This type also occurs at Nevasa in Period IV, at Bhokardan in period 1A, at Nasik in Periods IIA and IV, at Ter in Period I and at Prakash in Period II (Sankalia and Deo 1955: fig. 9 type 3e–h, fig. 21 types 26a and b, fig. 35 type 94; Sankalia *et al*. 1960: fig. 118 type 46c; Deo and Gupte 1974: fig. 6 type 18, fig. 8 type 41a; Thapar 1967: fig. 25 type 30; Chapekar 1969: fig. 6 type 6a–c).

Type: 8
Traditional ware name: Slipped red ware

- Description: This is a wide bowl with an almost vertical, in-turned rim that is carinated and slightly thickened on the carination, sometimes enough to make the profile almost triangular. The rim diameter is around 28 cm. The vessel is often covered with a thin, matt slip similar to Type 5, but this is never polished.
- Ware: Fabric 1a.
- Illustration: Fig. 7.9.
- Internal dating evidence: The occurrence profile of this type shows a clear and marked decline in abundance from Period 1 onwards, with a slight increase in Period 4 that is probably due to the high levels of residuality in that period. Fig. 7.23 shows a histogram of the occurrence of this type through the sequence.

- External parallels: It is not always possible to be certain of identifications of this type made from published drawings. Probable parallels have been found at Nevasa in Period IV, Nasik in Periods IIA and IV, Ter in Period II, Prakash in Period III and Maheshwar in Period V (Sankalia and Deo 1955: figs 17 and 17a types 17d–j, figs 18–19 types 18 and 19; Sankalia *et al*. 1958: fig. 72 type 99, fig. 73 type 100; Sankalia *et al*. 1960: fig. 119 type 49; Thapar 1967: fig. 27 type 4; Chapekar 1969: fig. 12 type 23d).

Type: 9
Traditional ware name: Burnished and slipped red ware

- Description: This is a bowl with tightly curved sides and a thick, broad, everted rim that is slightly thickened and rounded at the end and with a diameter of 16 cm or more in some cases. The surface is sometimes covered with a polished red slip/wash.
- Ware: Fabric 1b.
- Illustration: Fig. 7.9.
- Internal dating evidence: Type 9 almost certainly ceased to circulate after Period 2 or early in Period 3. The few sherds found in Period 3 levels are probably residual (Fig. 7.24).
- Comments: During the course of the pottery study, it became clear that Types 6 and 9 are probably different sizes of the same type, Type 9 being the smaller of the two.
- External parallels: Similar types are reported from Nevasa Period V, Nasik Period IIA, Ter Period II and Maheshwar Period IV (Sankalia and Deo 1955: fig. 15 type 10c; Sankalia *et al*. 1958: fig. 60 type 83; Sankalia *et al*. 1960: fig. 129 type 74, fig. 135 type 86; Chapekar 1969: fig. 16 type 32g).

Type: 10
(Black and Red ware) Traditional ware name: Black and Red ware

- Description: This is the more common of the two Black and Red ware forms. It is a simple, almost vertically sided bowl/cooking pot. It is thin-walled (up to 5 mm) with a heavily burnished gloss over the slip both inside and out. The rim diameter is normally between 17 and 20 cm but can be smaller.
- Ware: Fabric 3.
- Illustration: Fig. 7.9.
- Internal dating evidence: This type declines very markedly after Period 1. It probably went out of use during the course of Period 2 and the sherds from Periods 3 and 4 are probably residual (Fig. 7.24).
- External parallels: This is an extremely common type and has been found at all sites in the region where Black and Red ware has been encountered, for example Nevasa Periods IV and V, Bhokardan Periods IA, IB and II, Nasik Period IIA, Ter Period I, Prakash Period II and Maheshwar Period IV (Sankalia and Deo 1955: figs 26 and 37; Thapar 1967: fig. 20; Sankalia *et al*. 1958: fig. 63 type 89; Sankalia *et al*. 1960: fig. 115 type 28e–i, fig. 124 fig. 59a and b; Chapekar 1969: fig. 6 type 15; Deo and Gupte 1974: fig. 9 types 50–51, fig. 15 types 115–116, fig. 17 type 138).
- Note: Two of the illustrated sherds (1766 and 863) have crude incised symbols on their exteriors just below the rim. This arrow-like symbol is known from other sites in the region; for example at Prakash, it was found in Period I on a sherd of Jorwe ware (Thapar 1967: 67, fig. 19 8), whilst at Nasik, it was found on a sherd of red ware whose period is not reported (Sankalia and Deo 1955: 84, fig. 8a 1).

Type: 11
(Black Burnished ware) Traditional ware name: Burnished black ware

- Description: This is a small jar with a small everted triangular rim, the diameter of which is about 12 cm. The surface is heavily burnished. The type is represented only by three small sherds.
- Ware: Fabric 3.
- Illustration: Fig. 7.9.
- Internal dating evidence: No examples of this type were found in the stratified sequence (the illustrated example is from an unstratified layer).

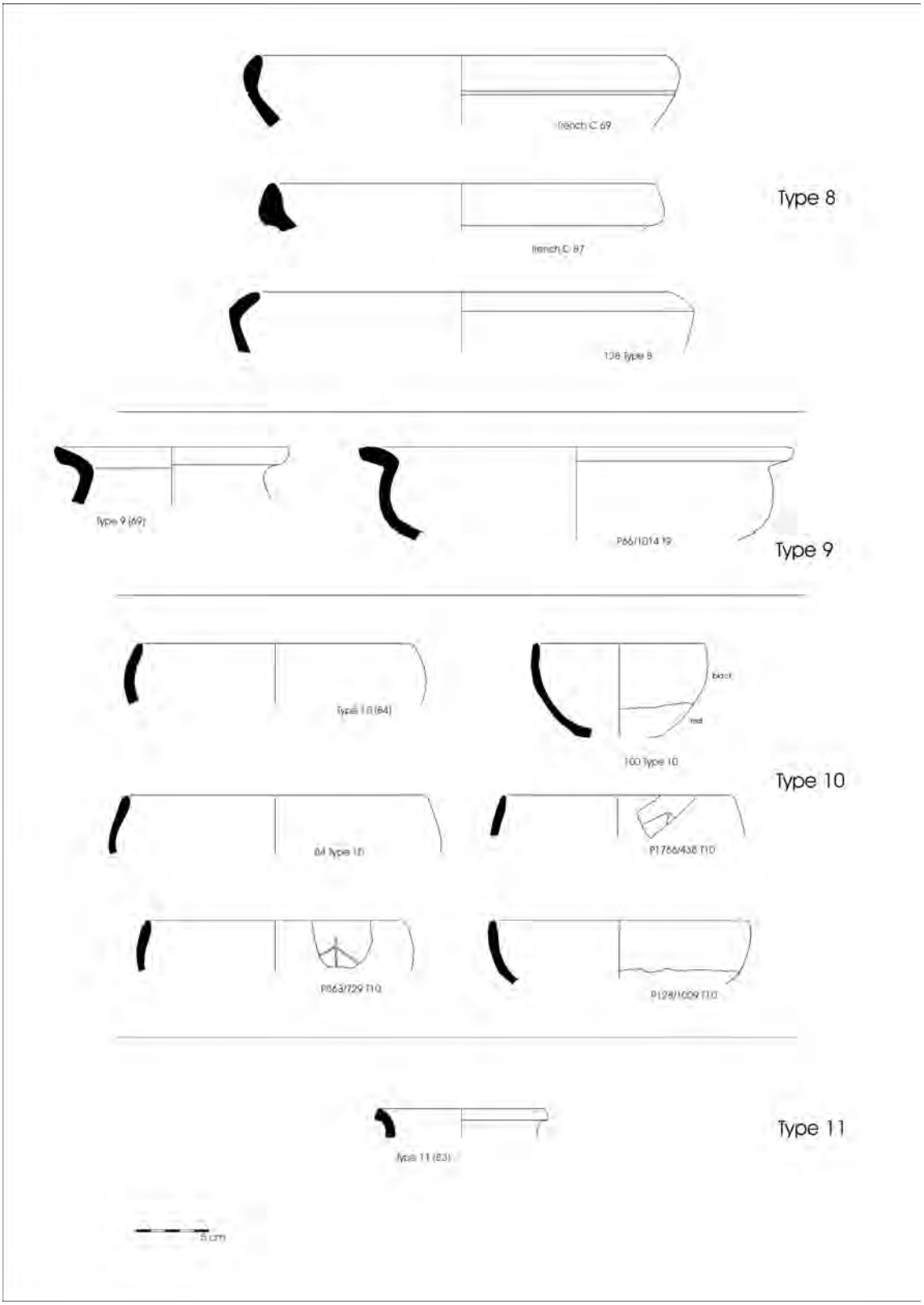


Fig. 7.9: Types 8 to 11.

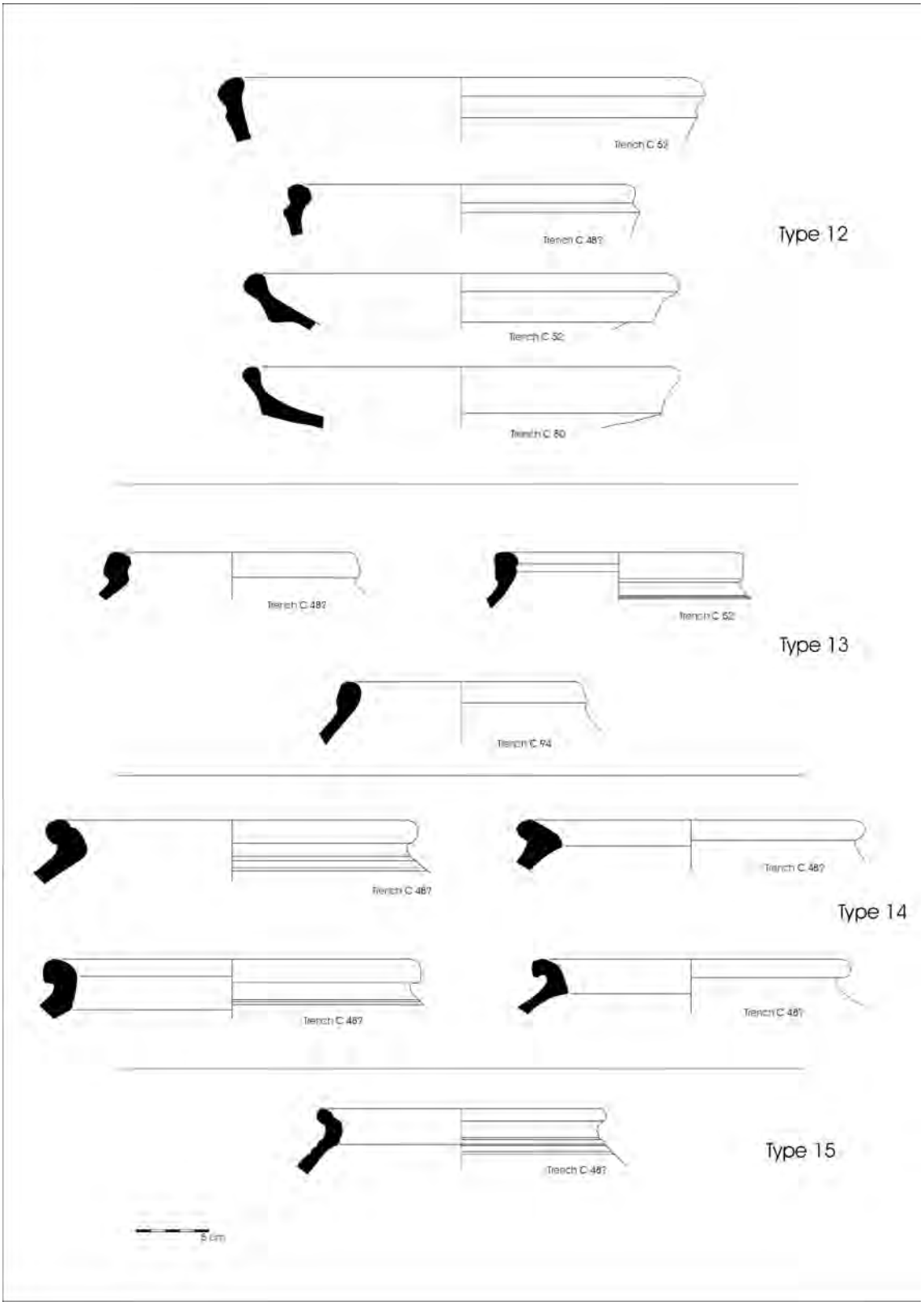


Fig. 7.10: Types 12 to 15.

Type: 12
Traditional ware name: Coarse red ware

- Description: This is a large carinated bowl with a distinctive rounded and thickened rim that flares outwards above the carination. It is a coarse, thick-walled vessel. The diameter is 25–30 cm. It is fired to a dark grey/black red. Traces of a surface wash are only occasionally seen. This is quite a variable type.
- Ware: Fabric 1a.
- Illustration: Fig. 7.10.
- Internal dating evidence: This is not a common type. There are two sherds from Period 2 but it is mostly restricted to Periods 3 and 4, particularly the latter. Because the type is so rare, it is possible that its absence from Period 1 is due to chance. It may have been in circulation at that time (Fig. 7.24).

Type: 13
Traditional ware name: none

- Description: This is a large, broad-mouthed jar with a squared, thickened, vertical rim. There is a notch or indent on the interior and incised lines on some examples below the rim. The diameter is about 17–18 cm. The burnished surface is preserved on a number of examples, one or two are also red slipped/washed.
- Ware: This is a type-specific fabric. It is a coarse grey ware with occasional very small grit inclusions. The dense fabric is medium to soft-fired with a smooth fracture and black body (7.5YR 2.5/1). One example contains vegetable temper, and the fracture shows a more laminar structure. This example is partly fired to a reddish yellow (7.5YR 6/6). This fabric appears to be a slightly better levigated and fired version of Fabric 1a.
- Illustration: Fig. 7.10.
- Internal dating evidence: This type occurs only in Period 4.

Type: 14
(Thick Grey ware) Traditional ware name: Grey ware

- Description: This is a Thick Grey ware jar or cooking pot with a heavy, everted rim and thick walls. The diameter is about 25–30 cm. The exterior is normally burnished and decorated with incised lines.
- Ware: Fabric 2.
- Illustration: Fig. 7.10.
- Internal dating evidence: Apart from one sherd in Period 2, this type occurs only in Periods 3 and 4. Its absence from Period 3-temple is probably due to the small size of that assemblage. Given that ten sherds were found in Period 3, it is likely that its absence from Period 1 and limited presence in Period 2 are an accurate reflection of its dating (Fig. 7.24); see the discussion under 'Thick Grey ware' above.
- External parallels: As with Thick Grey wares, this type tends to be more common in the later levels at excavated sites, for example at Nevasa in Period IV, at Nasik in Period IV and at Ter in Period II (Sankalia *et al*. 1960: fig. 118 types 48 and 48a; Sankalia and Deo 1955: fig. 39 types 118–119; Sankalia *et al*. 1960: fig. 118 types 48 and 48a; Chapekar 1969: fig. 21 types 41–42).

Type: 15
(Thick Grey ware) Traditional ware name: Grey ware

- Description: This is a Thick Grey ware jar with an everted rim and ribbing below the rim on the exterior. The walls of the vessel around the rim tend to be rather thinner than in Type 14. The diameter is about 18 cm. This type does also occur occasionally in red-washed ware.
- Ware: Fabric 2.
- Illustration: Fig. 7.10.
- Internal dating evidence: This type occurs only in Period 4.

Type: 16
Traditional ware name: Coarse red ware

- Description: This is a simple jar, the rim form is similar to Type 4, the rim being smaller, more everted and lacking the distinctive notch on the inside. The rim is quite variable, it is thickened, rounded and slightly triangular, even slightly overhanging. The diameter is about 13 cm. It is not slipped or washed in most cases.
- Ware: Fabric 1a.
- Illustration: Fig. 7.11.
- Internal dating evidence: This type occurs in all periods and there is no obvious chronological pattern (Fig. 7.24).
- Comments: It was noted during the study that this form appears to become finer in the later levels

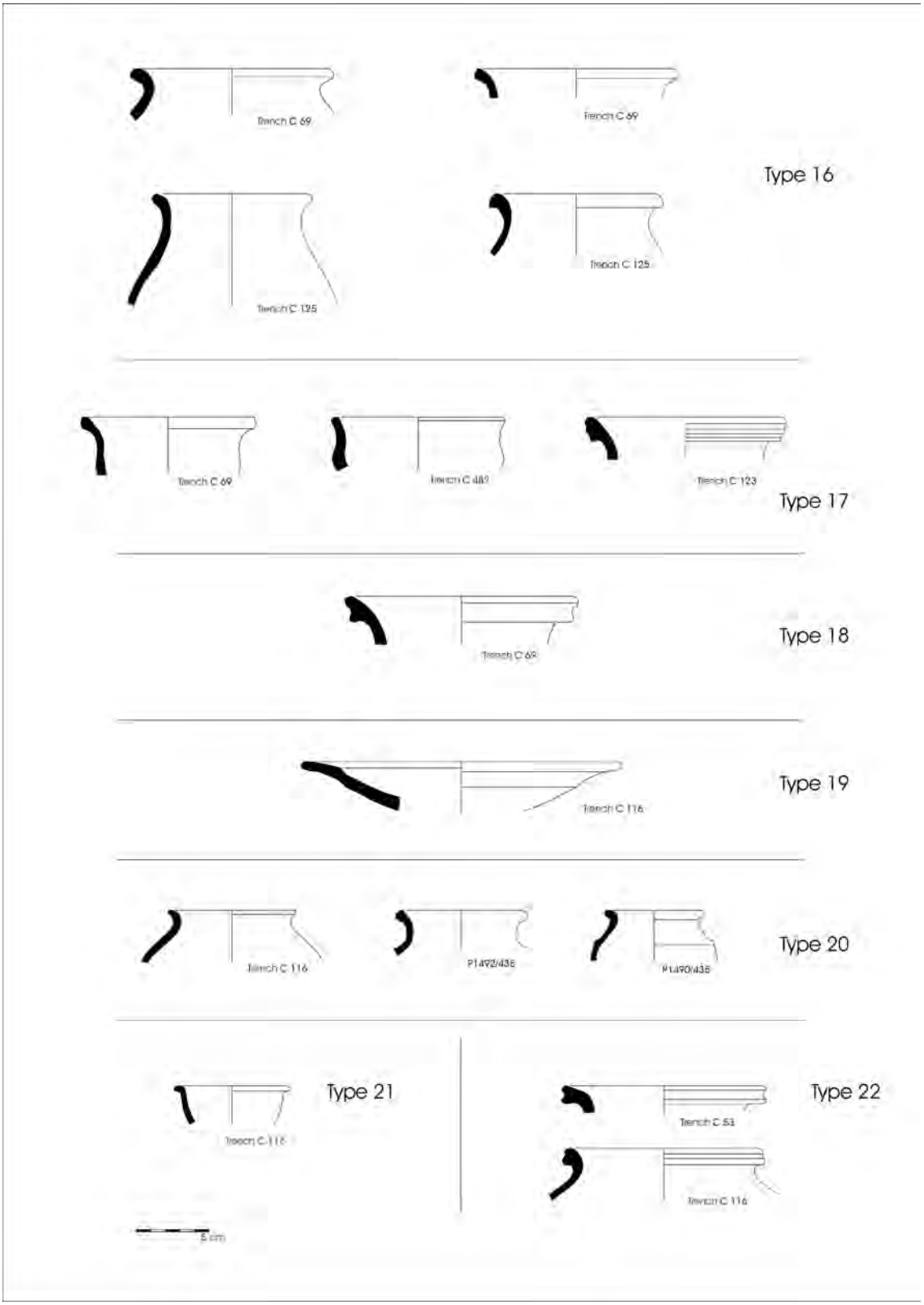


Fig. 7.11: Types 16 to 22.

of Trench B, where the surface is more commonly either burnished or slipped.

Type: 17
Traditional ware name: Coarse red ware

- Description: This is an almost vertically sided beaker or small jar with a slightly everted rim and slightly curved sides. It is possibly a variation on Type 16. The diameter is about 12 to 14 cm.
- Ware: Fabric 1a.
- Illustration: Fig. 7.11.
- Internal dating evidence: The rarity of this type makes it impossible to gain an accurate idea of its occurrence through the sequence.

Type: 18
Traditional ware name: Burnished and slipped red ware

- Description: This is a red or black ware jar with a bifoliate everted rim. There is often an incised notch on the interior. The diameter is about 14 cm. It is covered with a thick polished red slip/wash.
- Ware: Fabric 1a. This type is also occasionally fired black.
- Illustration: Fig. 7.11.
- Internal dating evidence: Only a few examples of this type were found; they become increasingly common from Period 1 to 3, after which time the type ceased to circulate. The few sherds found in Period 4 are almost certainly residual.
- External parallels: A similar type is reported from Nevasa in Period V (Sankalia *et al*. 1960: fig. 130 type 75, fig. 131 type 77).

Type: 19
Traditional ware name: Slipped red ware

- Description: This is a large plate with a slightly raised, flattened rim. The diameter is about 24 cm. There is a very thin matt red wash on the interior which gives a distinctive appearance.
- Ware: Fabric 1c.
- Illustration: Fig. 7.11.
- Internal dating evidence: The presence of this form was used to make the distinction between Period 1 and Period 2 when the sequence was periodised (see Chapter 6). It occurs only in Period 2. The type is wholly absent from Trench B, which is puzzling, but must simply be due to chance.
- External dating evidence: A roughly similar type is published from Brahmapuri in levels reported to date to the 'late Satavahana' period (Sankalia and Dikshit 1952: fig. 15 types 9 and 10).

Type: 20
Traditional ware name: none

- Description: This is a small, thin-walled jar with a finely shaped, everted rim. There is a carination on the body in some examples. The diameter is normally 8–10 cm. It is fine-walled with a red wash on the smoothed exterior.
- Ware: Fabric 4.
- Illustration: Fig. 7.11.
- Internal dating evidence: This type occurs in all periods, but it is very rare in Period 1 and only becomes common in Period 4 (Fig. 7.24).

Type: 21
Traditional ware name: none

- Description: This is a small beaker with a fine everted rim and curved sides. The diameter is 6–8 cm. It has a thin body and a distinctive red slip/wash.
- Ware: Fabric 4.
- Illustration: Fig. 7.11.
- Internal dating evidence: No examples of this type occurred in the quantified sequence (the illustrated example is from an unstratified layer).

Type: 22
Traditional ware name: Coarse red ware

- Description: This is a small jar with an almost horizontally everted, bifoliate rim. The diameter is about 12–13 cm.
- Ware: Fabric 1a. There is a slight snap to the break with a smooth to hackly fracture and no vegetable temper.
- Illustration: Fig. 7.11.
- Internal dating evidence: Very few sherds of this type came to light. There is only one sherd in Period 2 and two in Periods 3 and 4. Because this type is so rare, its absence from Period 1 cannot be

taken as an indication that it was not in circulation at that time.
– External parallels: A similar type is reported from Bhokardan Period IB (Deo and Gupte 1974: fig. 13 types 81a–c).

Type: 23
Traditional ware name: none

– Description: This is a broad-mouthed jar with an everted, rounded rim with a slight notch on the interior. The diameter is about 18 cm. The surface is smoothed with a thin wash.
– Ware: This is a type-specific fabric. It is a dense, well-levigated fabric with a smooth, almost subconchoidal fracture. The body breaks with a slight snap and appears to be only medium fired. The clay has few inclusions apart from occasional laminar particles of chaff or other vegetable temper and a very fine gritty structure that is caused by fine grains that are almost invisible even with a ×10 hand lens. The body is an even reddish yellow (7.5YR 7/8).
– Illustration: Fig. 7.12.
– Internal dating evidence: Eight sherds of this type occur in Period 4.

Type: 24
(Thick Grey ware) Traditional ware name: Grey ware

– Description: This is an extremely variable type. It is a jar with an everted rim that is rounded and slightly thickened at the end. The outward turn of the rim is marked by a sharp carination on the interior. The rim diameter is between 16 and 25 cm, and the wall thickness is between 6 and 7 mm. The jar was also sharply carinated around the middle of the body. The surface is burnished to a high polish which looks like a slip. Turning marks are visible on the surface. Although the basic concept of the jar is the same, there is a high degree of variability in the details of the form and the shape of the rim.
– Ware: Fabric 2.
– Illustration: Fig. 7.12.
– Internal dating evidence: Small quantities of this type occur in all periods, but it is very abundant in Period 3 (Fig. 7.24; see the discussion under 'Thick Grey ware' above).
– External parallels: Parallels to this type are most commonly found in the later levels at excavated sites, for example at Nevasa in Periods V and VI, at Brahmapuri in levels dated 'late Satavahana' or 'Brahmani', at Bhokardan in Periods IA, IB and II, at Nasik in Periods IIA and IV, at Ter in Period II and at Maheshwar in Period VI (Sankalia and Dikshit 1952: fig. 17 type 37a, fig. 19 types 65–66; Sankalia and Deo 1955: fig. 27 type 40, fig. 39 types 120–121; Sankalia *et al*. 1958: fig. 78 type 119, fig. 79 types 120–122; Sankalia *et al*. 1960: fig. 140 type 104, fig. 157 type 127, fig. 158 type 129; Chapekar 1969: fig. 17 type 40; Deo and Gupte 1974: fig. 9 types 46–48, fig. 15 types 112–114, fig. 17 type 133).

Type: 25
Traditional ware name: Burnished and slipped red ware

– Description: This is very similar to Type 3 in almost all respects, but it does not have an interior niche on the rim. The diameter is around 14 cm.
– Ware: Fabric 1a.
– Illustration: Fig. 7.12.
– Internal dating evidence: This type occurs in all periods but is most common in Period 3. Some of the Period 4 sherds might be residual (Fig. 7.24).

Type: 26
(Thick Grey ware) Traditional ware name: Grey ware

– Description: This type was used as a catch-all for very fragmentary rim sherds of thick grey polished ware with a fairly heavy rolled rim. Some of these may in fact be Type 24, but they are too fragmentary to be certain. The diameter is normally about 20 cm.
– Ware: Fabric 2.
– Illustration: Fig. 7.12.
– Internal dating evidence: Apart from two sherds in Period 2, which may be intrusive, this type is found almost entirely in Period 3 and Period 3-temple. As the type is represented by 27 sherds in Period 3, it seems certain that its absence from Period 1 is an indication that it was not in circulation at that time (Fig. 7.25; see also the discussion under 'Thick Grey ware' above).

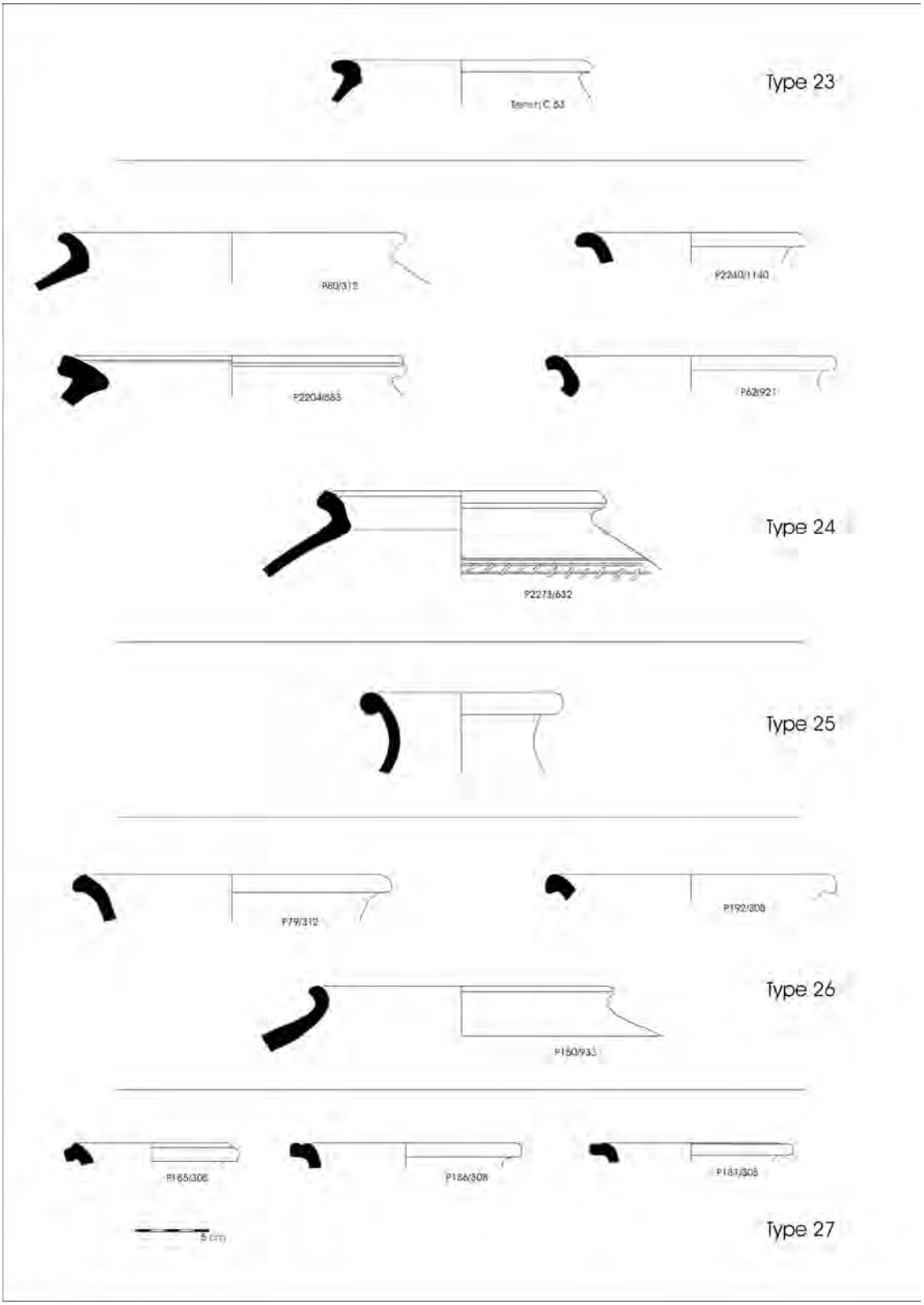


Fig. 7.12: Types 23 to 27.

Type: 27
Traditional ware name: Burnished and slipped red ware

- Description: This type has a slightly complex everted rim with a niche on the upper surface. The width of the everted part of the rim is somewhat variable, but the concept is the same. The diameter is 12–14 cm. The surface of these sherds has a fine red polished slip on the interior and exterior.
- Ware: Fabric 1a.
- Illustration: Fig. 7.12.
- Internal dating evidence: Apart from a single sherd in Period 2, and a few residual sherds in Period 4, this type is found exclusively in Period 3. As the type is represented by 19 sherds in Period 3, it seems certain that its absence from Period 1 is an indication that it was not in circulation at that time (Fig. 7.25).

Type: 28
Traditional ware name: none

- Description: This type number was not used.

Type: 29
(Black Burnished ware) Traditional ware name: Burnished black ware

- Description: This is a simple, almost vertically sided bowl/cooking pot with a widely flaring rim. It is thin walled (up to 5 mm) with a heavy burnish both inside and out. The rim diameter is 10–20 cm. The body is black and the surfaces are heavily burnished.
- Ware: Fabric 3.
- Illustration: Fig. 7.13.
- Internal dating evidence: The percentage of this type appears to increase from Period 1 to Period 2, after which time it must have died out, the sherds in Period 3-temple and Period 4 are probably residual.

Type: 30
Traditional ware name: Slipped red ware

- Description: This is a small, gently carinated bowl with a rounded rim and a distinct mat red wash internally and externally. The diameter is about 15 cm. The surface is covered with an unpolished red slip.
- Ware: Fabric 1a.
- Illustration: Fig. 7.13.
- Internal dating evidence: This type was very abundant in Period 1, but it declined in Period 2 and had completely disappeared from circulation by Period 3. The two sherds in Period 4 are probably residual (Fig. 7.25).

Type: 31
Traditional ware name: Slipped red ware

- Description: This is a somewhat enigmatic type, consisting of a bowl with flaring sides and a slightly incurving, almost vertical rim. It commonly has an unpolished red wash or slip on the surface. The diameter is between 15 and 20 cm.
- Ware: Fabric 1a.
- Illustration: Fig. 7.13.
- Internal dating evidence: This type is found only in Periods 2 and 3. It is abundant enough for its absence from Period 1 to be significant.

Type: 32
Traditional ware name: Slipped red ware

- Description: This is a rolled rim of a large storage vessel. The width of the rolled rim itself is between 3.5 and 5.5 cm and the diameter is a minimum of 35–40 cm. The vessel walls are a minimum of 1.75 cm in thickness. This is a really large storage vessel of the type that would not have been moved around once installed. The surface is lighter than the core of the fabric, and it is smoothed and covered with a mat red slip.
- Ware: Fabric 1a. This type tends to be rather weakly fired and breaks easily with no snap.
- Illustration: Fig. 7.13.
- Internal dating evidence: This type does not occur in Period 1 and its presence was used to make the distinction between Periods 1 and 2. It was most abundant in Period 2, after which time it slowly declined. It is abundant enough for its absence from Period 1 to be significant (Fig. 7.25).
- Comments: The presence of this form was used to make the distinction between levels of Periods 1 and 2 when the sequence was periodised (see Chapter 6).

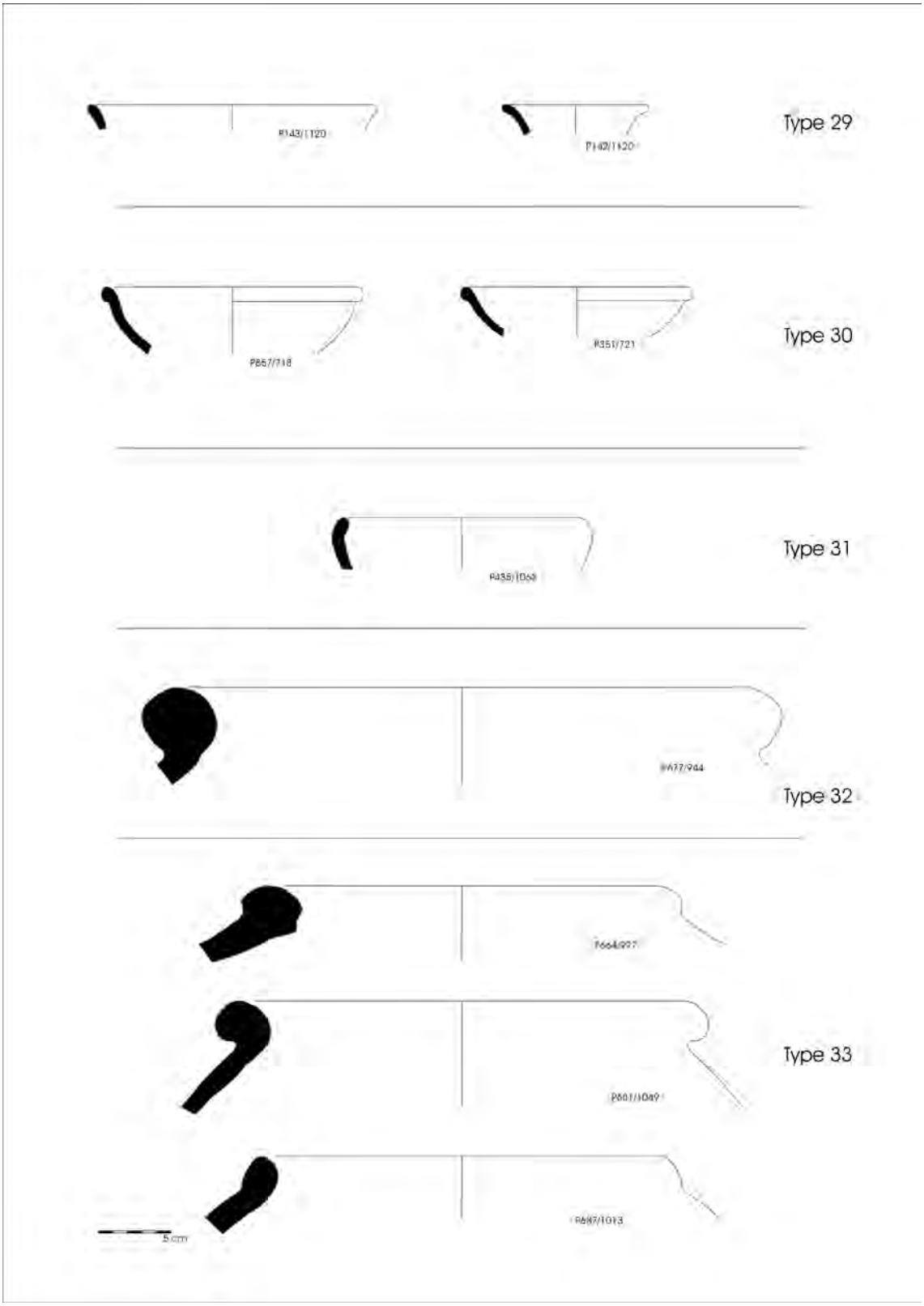


Fig. 7.13: Types 29 to 33.

– External parallels: The introduction of these very distinctive large storage jars appears to have happened relatively late at some sites, such as Nevasa where they first appear in Period IV and at Maheshwar where they occur in Periods V and VI. They do occur, however, in earlier levels at other sites in the region such as Bhokardan Period IA and Ter Period II (Sankalia *et al*. 1958: fig. 76 type 111, fig. 91 type 162; Sankalia *et al*. 1960: fig. 120 type 55; Chapekar 1969: fig. 19 type 35; Deo and Gupte 1974: fig. 9 types 53 and 53a).

Type: 33
Traditional ware name: Slipped red ware

– Description: This is a smaller version of Type 32, a large storage vessel with a large rounded or everted rim, of variable shape. The diameter is 24–30 cm. The type is most often smoothed and covered with a matt red wash. One or two examples are fired grey.
– Ware: Fabric 1a.
– Illustration: Fig. 7.13.
– Internal dating evidence: This type occurs in all periods but is most common in Period 2 (Fig. 7.25).
– External parallels: A similar type was found at Bhokardan in Period IA (Deo and Gupte 1974: fig. 7 types 27 and 27a).

Type: 34
Traditional ware name: Coarse red ware

– Description: This is a bowl with flaring sides and an everted, thickened rim with a deep notch just below the rim on the inside where it has been rolled over. The diameter is 15–20 cm. The surface of the vessel is smoothed and a lighter colour than the body internally and externally.
– Ware: Fabric 1a. This form is slightly higher fired than others in this fabric.
– Illustration: Fig. 7.14.
– Internal dating evidence: Only eight examples of this form were recorded, so it is difficult to be certain of the reliability of its occurrence through the sequence. It occurs only in Periods 2 and 3, most commonly in Period 2. As it is not very common, it is possible that its absence from the Period 1 assemblage is due to chance.

Type: 35
Traditional ware name: Slipped red ware

– Description: This is a large, slightly closed basin, with a thickened, rolled rim with an almost triangular profile. The diameter is between 30 and 35 cm. The surface of the vessel is covered with a thick matt red slip which has fired grey in some cases.
– Ware: Fabric 1a.
– Illustration: Fig. 7.14.
– Internal dating evidence: This type occurs in Periods 1 to 3, in increasing quantities, although numbers are very small. There are no residual sherds from Period 4. The reason for the absence of this type from Period 3-temple is probably due to the small size of that assemblage.

Type: 36
Traditional ware name: Coarse red ware

– Description: This is an angular form of Type 2 that is found in only a few layers in Trench D2. It is unslipped and unburnished. The diameter is about 15 cm.
– Ware: Fabric 1a.
– Illustration: Fig. 7.14.
– Internal dating evidence: This type occurs only in Periods 1 and 2, but its absence from later assemblages may be due to chance, given the small numbers concerned.

Type: 37
Traditional ware name: Burnished and slipped red ware

– Description: This is a medium-sized jar with an everted, slightly thickened rim. It is very similar to Type 3 except that it lacks the distinctive notch on the interior. The diameter is around 15–17 cm. The type is normally coated in a polished red slip.
– Ware: Fabric 1a.
– Illustration: Fig. 7.14.
– Internal dating evidence: Only 13 examples of this type were recorded, all from Period 2. Its presence was used to help define Period 2 from Period 1. It occurs in the lower part of Trench A:TP1 and once in the upper part of D2. Its absence from Trench B is perhaps to be explained by chance.
– Comments: The presence of this form was used to make the distinction between levels of Period 1 and

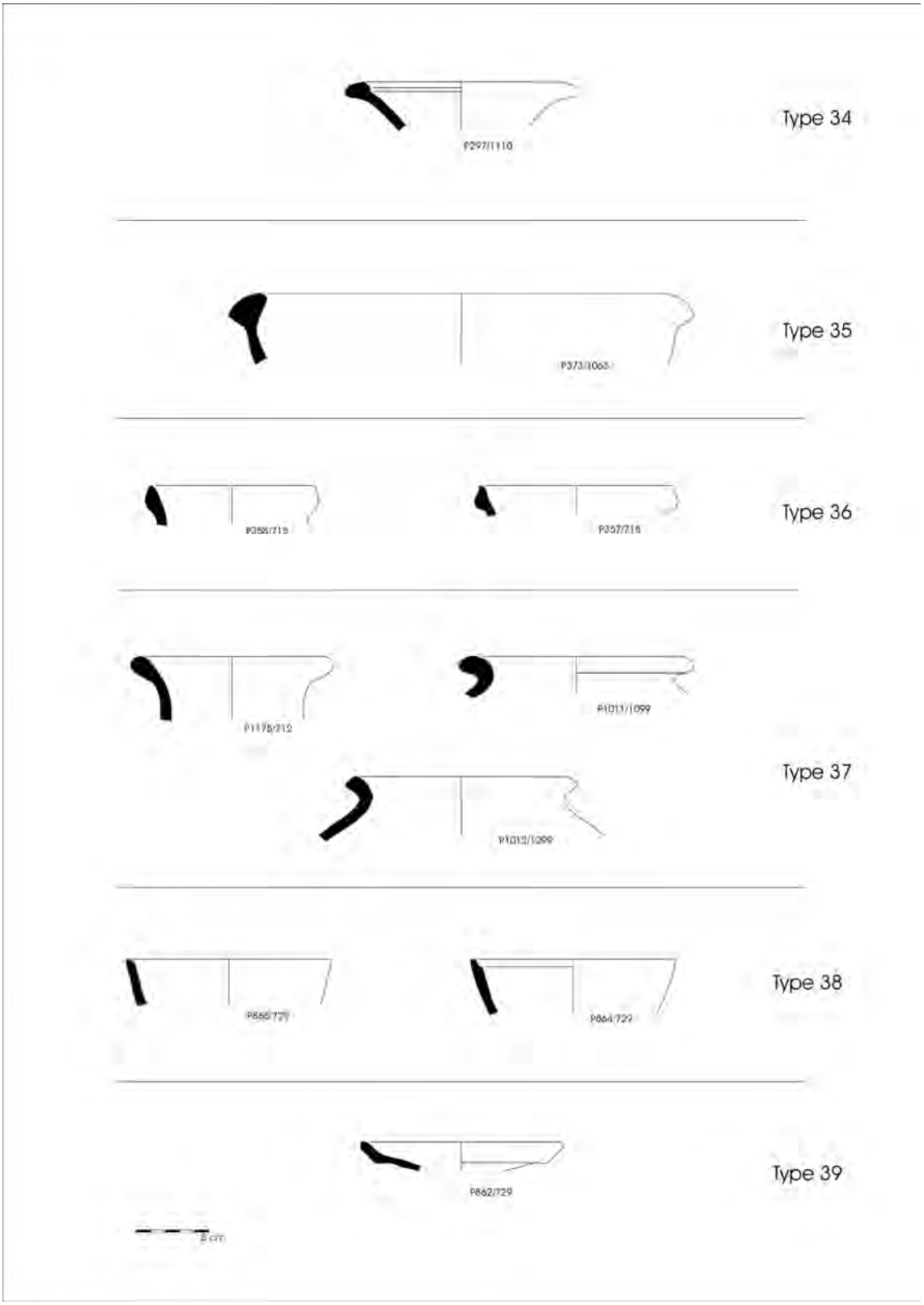


Fig. 7.14: Types 34 to 39.

Period 2 when the sequence was periodised (see Chapter 6).

Type: 38
(Black and Red ware) Traditional ware name: Black and Red ware

- Description: This is a simple, straight-sided bowl with a vertical pointed rim that is marked by having the top 8 mm or so of its inner edge shaved steeply to a triangular point. The diameter is about 12 cm. The surface is slipped and heavily burnished.
- Ware: Fabric 3.
- Illustration: Fig. 7.14.
- Internal dating evidence: This type occurs only in Period 1 (Fig. 7.25).
- Comments: Only 25 sherds of this type were recorded; it was used as a marker of the Period 1 assemblage.
- External parallels: Roughly similar types are reported from Nevasa Period IV and Maheshwar Period V, although no precise parallels to this type could be found amongst the Black and Red ware from early layers at the published sites in the region (Sankalia *et al*. 1958: fig. 69 type 92; Sankalia *et al*. 1960: fig. 116 type 29).

Type: 39
(Black Burnished ware) Traditional ware name: Burnished black ware

- Description: This is a plate or a very shallow bowl with flat sides and a carinated rim of about 15 mm height. The diameter is 13 or 14 cm. The vessels are black-bodied and are heavily burnished on the exterior.
- Ware: Fabric 3.
- Illustration: Fig. 7.14.
- Internal dating evidence: Only three sherds of this type were recorded, and they are all from Period 1.

Type: 40
Traditional ware name: Burnished and slipped red ware

- Description: This is a large 'nailhead' jar with an everted thickened rim with a triangular profile and a deep indent behind it on the interior. The diameter is around 20 cm. The surface is coated with a polished red slip on the interior and exterior.
- Ware: Fabric 1a.
- Illustration: Fig. 7.15.
- Internal dating evidence: This type occurs in Periods 1 and 2. There are no examples from Period 3 or 3-temple, suggesting that it had ceased to be used by that time. The sherds from Period 4 are probably residual.

Type: 41
Traditional ware name: Slipped red ware

- Description: This is a simple bowl with gently curving sides and a straight, pointed rim. The diameter is up to about 26 cm. In some cases, the surface is smoothed and it is coated with a thin mat wash on the interior and over the rim.
- Ware: Fabric 1a and occasionally Fabric 1c.
- Illustration: Fig. 7.15.
- Internal dating evidence: This type has a strange occurrence profile; it is present in Period 1 in very small quantities, it is more common in Period 2, totally absent from Period 3 and 3-temple and appears to have been quite abundant in Period 4 (Fig. 7.25).

Type: 42
Traditional ware name: Burnished and slipped red ware

- Description: This is a small jar with a thin body, a short neck and a slightly flaring rim with a small rounded thickening on the end. The diameter is about 12 cm. The interior and exterior surfaces are covered with a thin mat or polished red or red-brown slip. This type is quite similar to Type 20, but it has a more pronounced neck.
- Ware: Fabric 1a. This type is harder fired than others in this fabric.
- Illustration: Fig. 7.15.
- Internal dating evidence: This type was present in Period 1, it then declined in Period 2 and does not occur in any later levels.

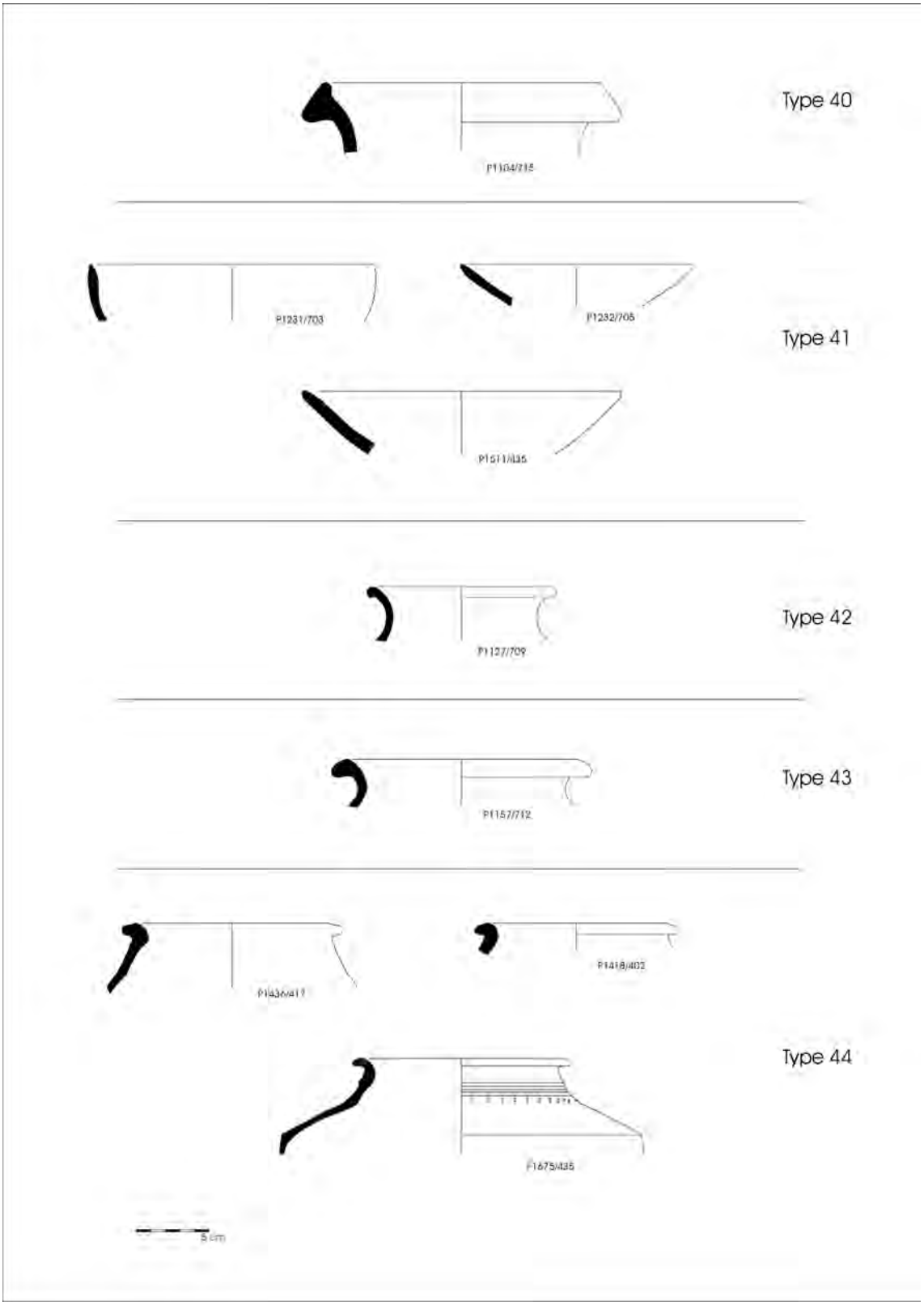


Fig. 7.15: Types 40 to 44.

Type: 43
Traditional ware name: Burnished and slipped red ware

- Description: This is a jar with a short neck and a simple out-turned flaring rim similar but less distinctive than Type 9. The diameter is about 18 cm. The surface is burnished and may have had a thin brown slip.
- Ware: Fabric 1b.
- Illustration: Fig. 7.15.
- Internal dating evidence: This type occurs in all periods in reasonable quantities with no obvious chronological pattern.

Type: 44
(Thick Grey ware) Traditional ware name: Grey ware

- Description: This is a jar with a carinated body, a short neck and an everted rim that is partly rolled back on itself. There is a good deal of variability in the precise form. There are often shallow incised decorative bands around the exterior of the jar below the rim together with rows of incised slits. The diameter is normally about 14 cm. The surface is often smoothed and burnished and is a lighter colour than the body. The body walls are notably thinner than Type 15; in this case, they are about 4 mm thick in the middle of the vessel.
- Ware: Fabric 2.
- Illustration: Fig. 7.15.
- Internal dating evidence: This type occurs from Period 3 in small quantities but was most abundant in Period 4. It is common enough for its absence from Periods 1 and 2 to be significant.

Type: 45
(Thick Grey ware) Traditional ware name: Grey ware

- Description: This is a low, flat grey ware bowl or dish with a flat base that is deliberately impregnated with coarse grit. It has a low, steeply sloping side and a slightly everted rim. The diameter is about 25 cm. The exterior surface is untreated but the interior is burnished.
- Ware: Fabric 2.
- Illustration: Fig. 7.16.
- Internal dating evidence: This type occurs only in Period 4. It is common enough for its absence from Period 3 to be significant.

Type: 46
(Thick Grey ware) Traditional ware name: Grey ware

- Description: This is a very crude grey-ware plate or very shallow bowl with a slightly raised, carinated rim. The diameter is about 28 cm. The base has been deliberately impregnated with coarse grits, but the outside above the carination and the interior are both smoothed, although not burnished.
- Ware: Fabric 2.
- Illustration: Fig. 7.16.
- Internal dating evidence: This type occurs only in Period 4 but it is common enough for its absence from Period 3 and earlier assemblages to be significant.

Type: 47
Traditional ware name: Slipped red ware

- Description: This is a small jar with a short neck and a slightly thickened rim with a shallow notch on the outermost face. The diameter is about 10 cm. The surface is coated with a thin brown slip or wash that is not burnished.
- Ware: Fabric 1a.
- Illustration: Fig. 7.16.
- Internal dating evidence: A small quantity of this type occurs in Period 3, but it was most abundant in Period 4. It is common enough to suggest that its absence from Period 2 and earlier assemblages is significant.
- External parallels: Rough parallels to this form can be found at Nasik in Period IIA and at Prakash in Period II (Sankalia and Deo 1955: fig. 21 type 26; Thapar 1967: fig. 25 type 37), but it is difficult to be certain of identifying this form in published drawings.

Type: 48
Traditional ware name: Coarse red ware

- Description: This is a small, crude, hand-made bowl with very low sides and a flat base. The diameter is between 6 and 12 cm. There is no evidence of deliberate surface treatment.
- Ware: Fabric 1c.
- Illustration: Fig. 7.16.
- Internal dating evidence: This type has a very similar occurrence profile to Type 47; it occurs

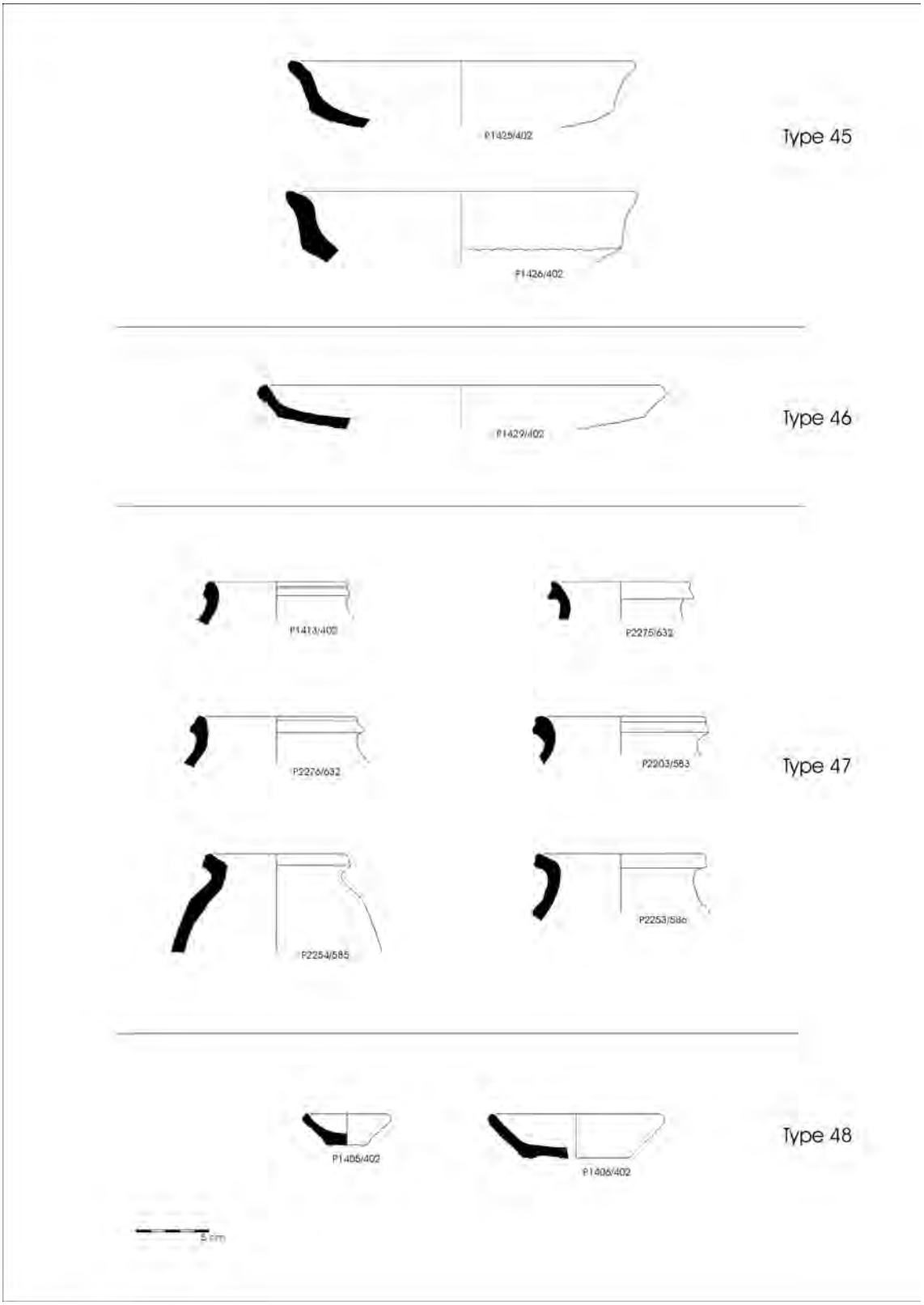


Fig. 7.16: Types 45 to 48.

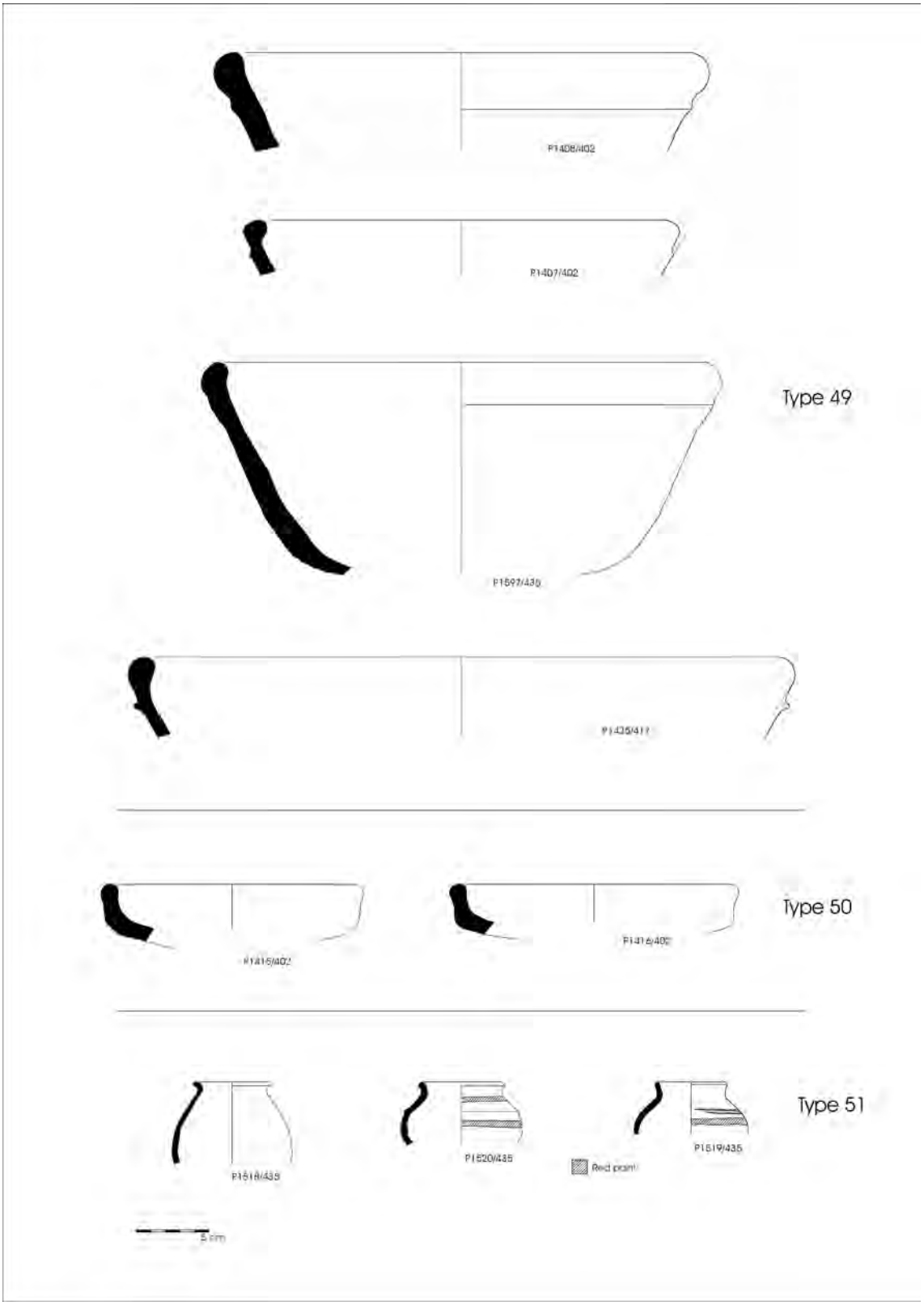


Fig. 7.17: Types 49 to 51.

in Period 3 in small numbers, but only became common in Period 4. It is just about common enough to suggest that its absence from the Period 1 and 2 assemblages is significant.

Type: 49
Traditional ware name: none

- Description: This is a large bowl or basin with a flat base and straight flaring sides with a very slightly incurved rim with a finger-wide grove on the outside. The walls are very thick (9–10 mm) and the diameter is between 30 and 45 cm. There is no evidence of any surface treatment beyond a smoothing.
- Ware: Fabric 1b. This type tends to be made of a denser than average Fabric 1b.
- Illustration: Fig. 7.17.
- Internal dating evidence: This type occurs only in Period 4. Its absence from earlier assemblages does seem to be significant.
- External parallels: Parallels to this type can be found at Maheshwar in Periods V and VI (Sankalia *et al*. 1958: fig. 73 type 100, fig. 84 type 140).

Type: 50
Traditional ware name: Coarse red ware

- Description: This is a crude, thick-walled, carinated bowl with a simple, almost vertical, rounded rim. The walls are about 10 mm in thickness, and the diameter is between 16 and 20 cm.
- Ware: Fabric 1a. This type has a sandier fabric than usual.
- Illustration: Fig. 7.17.
- Internal dating evidence: This type occurs in Period 3 and 4. The reason for its absence from Period 3-temple is probably due to the small size of that assemblage, but its absence from the Period 1 and 2 assemblages does seem to be significant.

Type: 51
(White and Red Painted ware) Traditional ware name: none

- Description: This is a small, very fine-walled, globular jar with an everted rim. The walls are 3 or 4 mm thick and the diameter is between 5 and 6 cm. The exterior is covered in white paint decorated with horizontal red painted bands around the body.
- Ware: Fabric 5, WARP.
- Illustration: Fig. 7.17.
- Internal dating evidence: This type occurs only in Period 4 and its absence from earlier assemblages does seem to be significant (Fig. 7.25).

Type: 52
(White and Red Painted ware) Traditional ware name: none

- Description: This is a small globular jar with no neck and a slightly thickened rim that has been folded back on itself. The walls are very thin (3–4 mm) and the diameter is about 6 cm. The exterior and at least a part of the interior are painted with a thin white paint.
- Ware: Fabric 5, WARP.
- Illustration: Fig. 7.18.
- Internal dating evidence: Only five sherds of this type occur, all in Period 4.

Type: 53
Traditional ware name: none

- Description: This is a small, fine, carinated jar with a slightly everted geometrically shaped rim in a very distinctive fine grey ware that is unique to this type. The walls are very thin (3–4 mm) and the diameter is between 6 and 8 cm. The surface was burnished on the exterior whilst the vessel was still on the wheel.
- Ware: This is a type-specific fabric. It is well levigated with a fine, grainy structure and an almost smooth fracture. It is medium to soft fired and breaks easily. The grainy structure is caused by fine grits that are almost too small to see with a ×10 lens. There are no other inclusions. The fabric fires to an even olive grey to light olive brown (5Y 5/2–2.5Y 5/3).
- Illustration: Fig. 7.18.
- Internal dating evidence: This type occurs only in Period 4 and does not seem to have been in circulation any earlier.

Type: 54
Traditional ware name: none

- Description: This is a short-necked jar with an everted rim that is flattened and slightly grooved on top in order to hold a lid. One sherd has evidence of a spout in the upper part of the body. The rim diameter is 9 cm. It has a mat red slip on the exterior and over the rim; the interior has a light coloured wash.
- Ware: This is a type-specific fabric. This is like a harder-fired version of Fabric 1a. Despite the better firing, it still breaks easily. It has a very rough fracture, with a coarse blocky structure. There are frequent, large (2 mm) air holes caused by burning vegetable temper and numerous rounded white inclusions up to 3 mm. The core is a reddish yellow (5YR 6/6).
- Illustration: Fig. 7.18.
- Internal dating evidence: This type occurs only in Period 4 and almost certainly did not circulate any earlier.

Type: 55
Traditional ware name: none

- Description: This is a small jar with a short neck and an everted rim. The walls can be as thin as 3 mm in some cases. The diameter is between 10 and 14 cm. The exterior of the jar is sometimes lightly burnished, probably on a wheel.
- Ware: Fabric 1c, but fired to an even brown to yellowish brown (10YR 5/3–10YR 5/4).
- Illustration: Fig. 7.18.
- Internal dating evidence: With the exception of one sherd in Period 1 that is probably intrusive, this type occurs only in Period 4 and almost certainly did not circulate earlier.

Type: 56
Traditional ware name: none

- Description: This is a small tobacco container from a *hookah* or water-pipe. It has quite an elaborate shape, the exact number of ribs and the precise form varying somewhat, but always being defined by the ash-stained crucible connected by small holes to the hollow tube below it. The height is about 5.5 cm and the diameter of the widest part is about 3.5 cm. The surface is normally covered with a slip on the interior and exterior that is either mat red or sometimes purple-brown.
- Ware: This is a type-specific fabric. It is a well-levigated fabric with a smooth fracture and a very fine grainy structure. There are no visible inclusions. The body is fired to an even reddish yellow (5YR 7/6).
- Illustration: Fig. 7.18.
- Internal dating evidence: This type occurs only in Period 4. It is common enough for its absence from earlier periods to be significant.

Type: 57
Traditional ware name: none

- Description: This appears to have been the tobacco container from a *hookah* or water pipe. It has a broader crucible than Type 56 above, and no grill of holes is visible on any of the preserved examples. It is a small object (diameter 8 cm) with a wall thickness of 3 mm. In some cases, the surface is burnished. The quality of the turning and the clay is variable.
- Ware: This is a type-specific fabric. It is a very fine, grey ware, well fired with a smooth fracture. It has a very grainy structure and there are no visible inclusions. The body is a dark grey (5YR).
- Illustration: Fig. 7.18.
- Internal dating evidence: Apart from a single sherd in Period 1, which must be intrusive, this type occurs only in Period 4, and its absence from earlier periods is likely to be significant.

Type: 58
(Black Burnished ware) Traditional ware name: Burnished black ware

- Description: This is a small jar with a slightly flaring neck and a thickened rim with an almost angular profile. The diameter is about 11 cm. The body is black and the surface is heavily burnished inside and out.
- Ware: Fabric 3.
- Illustration: Fig. 7.18.
- Internal dating evidence: This type occurs only in Periods 1 and 2. Nine sherds were recorded from Period 1 and a single sherd from Period 2, which is probably residual.

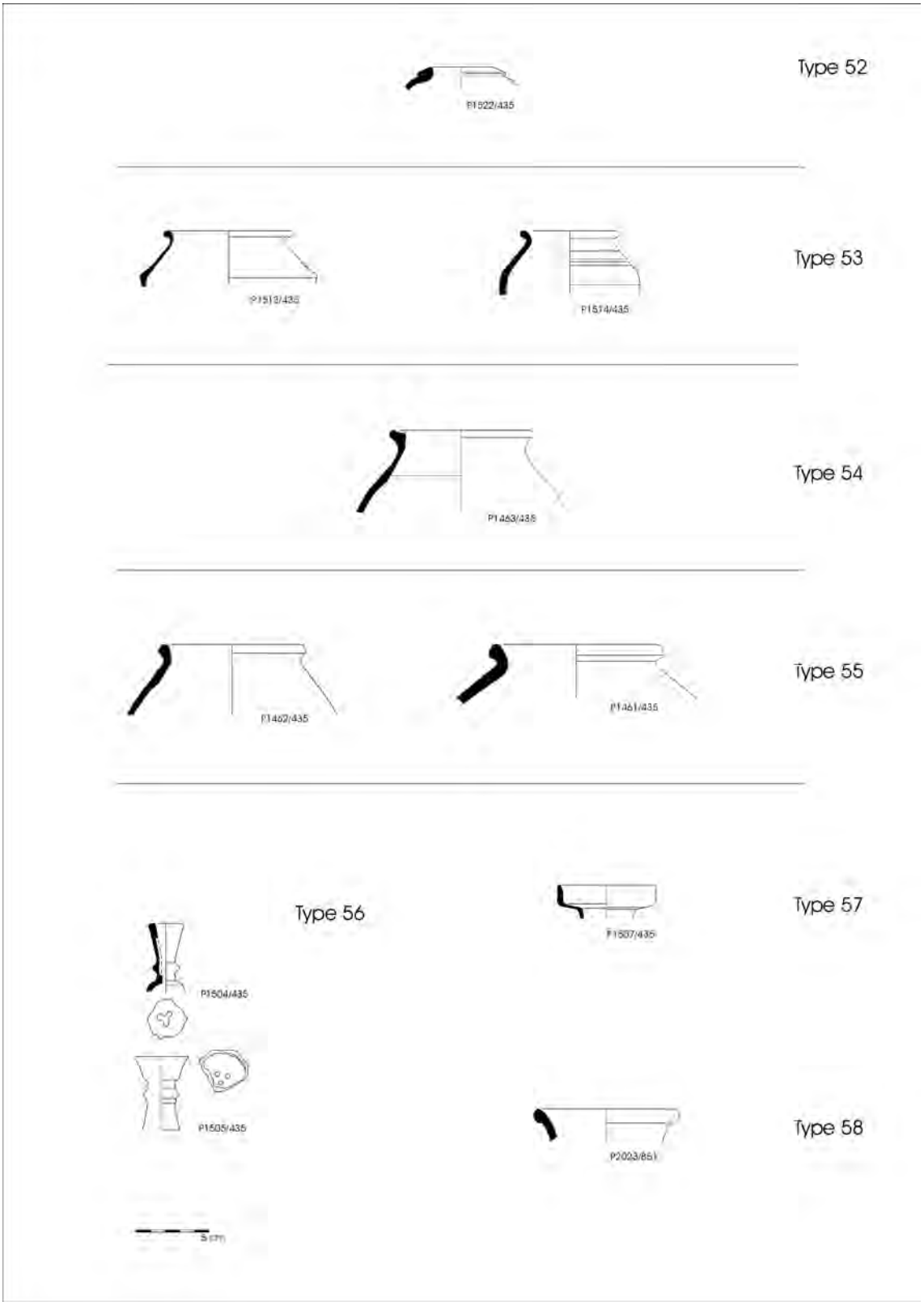


Fig. 7.18: Types 52 to 58.

Distribution on site

The quantified pottery sequence of each of the five main trenches is presented below in a tabular format by context, type and sherd count.

Trench A: Test Pit 1

See Table 7.6 for distribution of types.

Trench B

See Table 7.7 for distribution of types.

Trench C

Trench C was excavated during the 1996 and 1997 seasons. The pottery was only briefly studied and the assemblage was not included in the main analysis that is presented in this chapter. Nonetheless, the results are of some interest and give an impression of how the sequence in this part of the site relates to that in the main trenches.

Table 7.8 shows an obvious change in the nature of the assemblage between layers 83 and 69. In layer 69, a number of new types such as 13, 16, 17 and 18 occur for the first time, followed shortly by GREY forms 14 and 15. In the following deposits, most of the forms which were common in the earliest levels appear to become increasingly less frequent (i.e. Types 6, 7, 8, 9). Layers 60 and above probably correspond roughly to Period 3, but it is more difficult to allocate a period to the layers below this.

Trench D1

See Table 7.9 for distribution of types.

Trench D2

See Table 7.10 for distribution of types.

Trench F

See Table 7.11 for distribution of types.

Analysis of the assemblage and sequence

The typology-based approach to the study of the Paithan assemblage that has been set out above has proved to be successful in that it has been possible to propose a number of well-defined types that have clear and demonstrable chronological profiles that make them useful chronological markers. Quantified analysis of the occurrence of the types through the sequence has helped to refine this through the identification of obviously residual and intrusive types, despite very high levels of residuality and, more importantly, apparently high levels of continuity in pottery tradition and manufacture.

Period 1 is marked by Types 2 and 38 and, to some degree, Type 10, each of which either declined markedly or went out of use completely by Period 2. Almost all other types present in the Period 1 assemblage continued to be used in Period 2 in roughly similar quantities, and some of them also continued into Period 3, although normally in much lower quantities. In Period 2, Types 7, 19, 31, 32, 34 and 37 appeared; these were not in circulation in Period 1, and their absences from that period appear to be significant. Of these, only Types 19 and 37 appear to have ceased circulation by Period 3, whilst the others continued. When it comes to Period 3, only Types 44, 47, 48 and 50 occur that were not present in earlier periods, together with Types 14, 24, 26 and 27 that were previously in circulation in Period 2, but in such low quantities that they were largely insignificant. Some of these types seem to go out of circulation by Period 4, for instance Types 24, 26 and 27, whilst others continued to circulate, some in increased amounts. In Period 4, we see the introduction of a large number of new types, for example Types 13, 15, 23, 45, 46, 49, 51, 52, 53 and 56, whilst types such as Types 44, 47 and 48 continued to circulate, but in notably larger amounts than in Period 3.

Having set out this preliminary framework, it would have been useful to have been able to compare it to published assemblages from other excavated sites in the region as has been done, where possible, in the description of types above. In order to attempt this, seven regional sites were looked at in detail, namely Bhokardan, Brahmapuri, Maheshwar, Nasik, Nevasa, Prakash and Ter, each yielding some parallels to the types defined at Paithan. It did not, however, prove to be the case that the closer sites, such as Nevasa (50 km) and Bhokardan (95 km), yielded more parallels or

Table 7.6: Types from Trench A: Test Pit 1 by rim-sherd count and layer in stratigraphic sequence.

Type	306	310 1195	308	312 908	912 316	913	922 318	921	930	933	945 946 948	944	966 997 985 986 988 1009 1014 1043	1013	1040	1058 1074 1105	1052 1063	1077	1099 1110 1111	1120	1127	1158	1159
1																		1					
1A	3	1	4	4		2	1	17	9	13	4	18	70	96	71	22	74	64	54	60	21	4	3
1B	3		7	9	1	11		32	22	24	3	41	258	84	115	66	172	54	103	30	4		1
2						1		1					4		3	1	4	2	2	2	2		
3												3	9	3	4	1	6	6	10	5			
4					1	1		2		1		1	7	8	8	2	12	8	2	4			
5				1				1					3	1	2	1	1	4	6	1			
6	1												1					1					
7			1					2					4	1			1	2	4				
8												1	4	8	2		4	2	5				
9								2					2	1	3		3	4	4				
10							1	5					20	5	19	1	27	12	19	13	9	1	
12													1					1					
16	1			4	1	3		5	1	2		3	13	5	8	1	7	3	10	7			
18						2											1			1			
19													2	2	3	1	1	2	1	1			
20			1	5	1	2		1		2		1	1		2		1	2	1				
22	1												1										
24		1	8	12		6		9	11	2		2											
25			3	4	2	1		5				1	3	1		1			1	1			
26	4		8	8		3			2	6	1		1										
27		1	6	5	2	2	1		1				1										
29																				2			
31								1	1	1		1	1	2	1	3	4		2	1			
32	1	1							1			1	2	2	3		2	1	1		1		
33						1		1	2		1	1	1	8	2		7	1	3	1			
34												1				2			2				
35			1					1	1						1		1	1	2				
37													1	1			2	1	3				
RPW													1										
NON	3	3	36	26	1	8	5	33	34	28		45	97	41	45	14	44	21	31	7	6		
UNIQ			6							2	2		3	3	1	1	1		1				
Rim total	17	7	81	78	9	43	8	118	85	81	11	120	511	272	293	117	375	193	267	136	43	5	4
NBP body																				1			
RPW body													1						1				
Body total	108		621	807	90	533	69	963	687	847	105	861	3276	1069	1638	527	2140	1149	2112	686	451	38	

a wider range of parallels than the more distant sites such as Maheshwar (300 km), Prakash (250 km), Nasik (177 km) or Ter (148 km). The parallels that have been found are intriguing, and they suggest that major developments in pottery technology and style followed regional trends, whilst at the same time there is evidence, in the types and wares that are restricted only to Paithan, that local pottery manufacture was the norm and each site is also likely to have had a range of types and styles that were unique to it.

More detailed comparisons with the published assemblages from the region are rendered impossible due to problems with the way in which the material has been studied and published, most notably the lack of precision in the definition of wares and fabrics and the lack of systematic quantification. Were it not for these limitations, it would by now be possible to attempt a much-needed synthetic regional review of pottery wares and types that would be an important step towards the creation of a reliable archaeological chronology of the Early Historic and Early Medieval periods in this region of India. Unfortunately, such advances are still a considerable way in the future and are dependent on a fundamental change in the way that pottery is collected, studied and published on archaeological excavations in India.

Period-based analysis of pottery deposition rates

The following analysis uses 15 'period-assemblages' from Trenches A, B, D and F to evaluate the relative density of sherds per cubic metre of excavated earth. The aim is to investigate possible changes in the rate of pottery deposition through the stratigraphic sequence at the site. A 'period-assemblage' is the assemblage from the contexts or layers from a particular period in a particular trench (a period-sequence). To give an example, 'TrB-1' indicates the Period 1 material from Trench B. The 15 period-assemblages were selected from across the site in order to give a representative sample.

Some of the same data are used in the appendix to Chapter 9 to calculate coin deposition rates in the temple foundation deposits.

In order to investigate sherd density, the amount of excavated earth was calculated for each of the period-assemblages. By combining this with the sherd count from the same levels, it is possible for the density of sherds per cubic metre to be calculated and compared (Tables 7.12 and 7.13).

The data and analysis presented above and the ranked analysis in Fig. 7.19 makes clear that, in general, the Period 1 assemblages have amongst the higher densities of sherds at the site and that this density appears to decline gradually through the history of the site, with the lowest densities occurring in Period 3 and 4 deposits.

When averages are taken by period, the figures suggest that the amount of pottery deposited at the site declined by around 20% between Periods 1 and 2, 32% between Periods 2 and 3 and 54% between Periods 3 and 4 (Table 7.14). This represents an overall decline of 75% between Periods 1 and 4.

This very consistent pattern must be indicative of much higher levels of pottery deposition during the earlier part of the site's history. This, in turn, is probably indicative of higher levels of manufacture and use of pottery, but this is more difficult to determine with certainty as other factors related to discard and to localised conditions can be involved.

The significance and implications of these results are further discussed in Chapter 14.

Table 7.7: Types from Trench B by rim-sherd count and layer in stratigraphic sequence.

Type	402 406 414	408	413	415 426	417	418 420 422	427	428	430 432 435	429	438	440	439	437	441	443	444 448	450	451	452	453	456	457
1	65		15	4	17	5	4	2	188	12	56	50	75	23	14	2	54	5	36	90	48		19
2	1		1						21		1	2	1	3						1	2		
3	6			1			2		11		4	3	3		4		3		1	1	2		
4	9		3	1		1			21	1	5	4	12			1	4				12	1	1
5	2								6	1	1	1	4		2		3	1			3	1	
6	6	1							7	1	2	1	5		2	3	4						
7	2					1			3			8	9					1	1				
8	8		1						1		4	1	5	1			6	2	1	1	4		1
9																		3	1	6			
10	4		2			1	1		10	1	9	10	34		2	1	14	1	7	18	16	1	3
12					1		1		8														
13	16		1		1				10		2												
14	1				1		6		2	3	6												
15			2	1					1			3											
16	6		5				4		26	5	10	3	14				4						2
18			1																				
20	9			1		1	3		51	1	5		1							1			
22						1							1										
23	5				3																		
24									4														
25									1	1	1		9	1									
27									3														
29									1								5			1			
30											1			1									
32	1	1					3		2	1			1		13		7						
33					2	1	3		2		1		2				2				3		
35																							
38																							
40									1			1	1		8		1						
41	4		3	1	6	2	1	1	10	5	2		1										
43							1				7	2	1				1						
44	3			2	2		3		52	3													
45	16		1		1								1										
46	10					8			10	1	2												
47	10								22	1	1												
48	17		1			11	1		91	3				1									
49	2			3	1				10														
50	3											1	1										
51	3								54			1		4									
52									4				1										

Type	458	465	467	468	469 470	471	472	473	474	477	481	478	483	484	485	486	487	492	493	495 497	494	731	499	735 736
1	47	58	99	23	442	38	21	25	57	58	70	33	37	11	17	19	8	17	20	26	12		9	42
2	2	4	8		27	2	3	1	3	11	6	9	2	2	3		1		1	2	8			1
3	2				3		1				3		1	1							1			5
4	4	5	3	2	1	2															2			1
5		1	1	2													1			1	2			1
6																								
7																								
8			4		2	2	1		1		2													2
9			2			2						1								1	3		1	2
10	9	6	20	4	5	2	3	2	6	1	4	2	3	2	2	2	1	1	3	2	9		2	29
12																								
13																								
14																								
15																								
16	2		4					4	1		1			1						1				
18																								
20					2							1												
22																								
23																								
24																	1							
25					3																			
27																								
29										2	2			1						1				
30																								
32																								
33		3	1		1			1																
35																					1			
38	2		1						1						1					1	1			8
40		2																	1					
41																								
43					4								1											
44																								
45																								
46																								
47																								
48																								
49																								
50																								
51																								
52																								

Table 7.7 (continued): Types from Trench B by rim-sherd count and layer in stratigraphic sequence.

Type	402 406 414	408	413	415 426	417	418 420 422	427	428	430 432 435	429	438	440	439	437	441	443	444 448	450	451	452	453	456	457
53									15														
54									11														
55			3	4		3	1		12			1											
56					1		2		3				1										
57					2		2		11														
RPW	1																						
CHIN	2				1				9														
PERS					1																		
NON	102		19	14	22	25	19	1	186	21	25	23	44	3	24	2	7	1	14	13	9	1	4
UNIQ	5				5				18				1	1	1								
Rim Total	319	2	58	32	67	60	57	4	898	61	145	115	228	38	70	9	115	14	61	132	99	4	30
NBP Body																							
RPW Body	1								2														
CHIN Body	5				1		1		9														
PERS Body	1								1	1													
SLIP Body							2		1	1			2	1									
WARP Body									4		2												
NON Body	3458	32	567	142	402	224	318	28	3879	446	1	614	1140	163	1248	173	292	128	121	513	229	65	166
Body Total	3465	32	567	142	403	224	321	28	3896	448	3	614	1142	164	1248	173	292	128	121	513	229	65	166

Type	458	465	467	468	469 470	471	472	473	474	477	481	478	483	484	485	486	487	492	493	495 497	494	731	499	735 736
53																								
54																								
55													1											
56																								
57																							1	
RPW																								
CHIN																								
PERS																								
NON	6	4	13	5	8		2		4	1	1	1		1		1	4		2	1	2	1	4	15
UNIQ																								
Rim Total	74	83	156	36	498	48	31	33	73	73	89	47	45	19	23	22	16	18	27	36	41	1	17	106
NBP Body	1																							
RPW Body																								
CHIN Body																								
PERS Body																								
SLIP Body																								
WARP Body																								
NON Body	395	418	774	35	1807	106	78	132	302	239	293	263	227	98	107	123	117	86	190	179	260	0	51	1014
Body Total	396	418	774	35	1807	106	78	132	302	239	293	263	227	98	107	123	117	86	190	179	260	0	51	1014

Table 7.8: Types from Trench C by rim-sherd count and layer in stratigraphic sequence.

Type	48	52	60	69	83	84	87	93
1	4	5	6	16	6	14	7	
3	2	1	7	7	1	9	8	2
4	1		4	6	7	17		
6			3	2	3	11	1	
7			1	2				
8	3		2	7	4	5	5	
9	1		1	3	1	6		
10	2	2	5	15	8	23	1	5
11	1	1			1	2		
12	4	3	2					
13	3	4	1	1				
14	4							
15	4	3	1					
16			4	9		1		
17	2			2				
18	1			1				
Rim total	32	19	37	71	31	88	22	7

Table 7.9: Types from Trench D1 by rim-sherd count and layer in stratigraphic sequence.

Type	751	752	759	760	766	767	773	770	775	777
1	75	6	55		109	255	21	9	2	6
2					2	7	1		1	
3	3		2		4	5		2		
4	2		3		6	7			1	1
5			1		1	4				
8	3	1			1	2		2		
9					1	2				
10	4	1	8		43	36	2	8	3	2
14	2									
16	8		3			4				
20	1									
24	4					2				
32	5	1								
33	2		1		1	3				
38					1	1				
43	5							1		
58								1		1
NBP						1				
NON	13	3	5		5	23		2	1	
Rim total	127	12	78	0	174	352	24	25	8	10
NBP body					3	3		1		
Body total	229	6	102	365	321	1936	88	113	79	48

Table 7.10: Types from Trench D2 by rim-sherd count and layer in stratigraphic sequence.

Type	701	702	703	705	706	707	709	710	711	712	713	715	716	718	719	721	723	722	725	726	728	729
1A	2	24	74	11	10	8	188	88	243	301	4	244	2	211	12	36	4	46	13	13	21	12
1B	2	10	5	4			6	8	18	19		10		150	3	46		35	1	49	17	2
2								1				3		17		19	2	20	3	24	10	
3	1	2	13	2	4		6	7	6	9	1	4		16	1	5				4		
4	1	2	4	3		4	11	5	23	44		53		33		3				3	1	1
5		2	2	3	2			1		4		1		3		4		1		5		1
6			2		1		1			1				16				1		4		
7						1																
8		1	2	1			6	4	3	6		6		5		2		4		2		
9		1	3		3	1	1	2	4	3		3		2		2		4	2	2		
10	1	3	27	19	21	12	22	8	30	23	1	28	1	68	5	39	2	61	19	80	9	30
14										1												
16		6	13	4	1	1	6	5	5	21	1	15		7	1	1		1				
18							1	1						1								
19									1													
24			1						1	1												
25								1	1					1								
29					1																	
30								1						7		10				3		7
32	1			1				4		1												
33	1					1	1		2	4		1		1								
35												1										
36		3								3				8						4		
37									3	2												
38																			1	1	4	2
39																				1		2
40										1		2								2		
41			2	11	2							2		1								
42							2	2				3		4				1				1
43				1	2	1						1		2			2			1		
NBP														2	2							
NON	2	2	4	4	4	3		5	2	6		12		23	1	9	2	8	6	11		4
UNIQ	1		2	1	2		1			1						1						7
Rim Total	8	22	75	50	43	24	58	47	81	131	3	135	1	217	10	95	8	101	31	147	24	55
NBP Body														4	3	1						
Body Total	6	151	498	238	270	115	30	345	101	950	31	839	11	1989	84	510	82	703	149	804	271	0

Table 7.11: Types from Trench F by rim-sherd count and layer in stratigraphic sequence.

Type	778	785	787	788	789	797	798	846	851	852	853
1	273	3	81	106	29	27	2	182	186	16	
2									4		
3	9		7	17	1	1	1	22	46		
4	1		1	9		1		8	28	1	
5	8		4	1			2	3	12		
7	2		3	5		1		2			
8			4	5				14	70	1	
9	7		6	22				8	26	1	
10	15		11	97	8	5		104	243	6	
12	4										
14	8										
16	11		9	17	2			7	52	4	
20								11			
24								3			
27	1										
29			1		2						
30								12			
33				2							
34	3										
40									5		
41						1		23			
43	9			9					33		
44	5										
48	1										
50	7										
58				1					7		
NON	40		11	23	3	7	1	38	111	5	4
Rim total	**404**	**3**	138	314	45	43	6	437	823	34	4
NBP body									1		
Body total	882	31	594	1322	183	203	86	2571	4446	216	50

Conclusion

In addition to the points set out above, a number of further points can be made on the basis of the combined discussion of the types, wares and fabrics in relation to the site's sequence. The first is the high level of residuality that is present in Period 4. This can be seen, for example, in the occurrence of Types 2, 6, 7, 12, 14, 16, 20, 25, 41 and a few others, which make up a similar or higher percentage of the Period 4 assemblage than they do the assemblages of earlier periods when the types were actually in circulation. This suggests that the layers of Period 4 contain a lot of redeposited earth from earlier levels. This is probably due to the deep foundations that were dug when the large brick town houses were built in the later Medieval period, which resulted in earth from 2- or 3-m depth being brought to the surface along with the archaeological material that it contained. This material then entered the deposits of the later Medieval period and it is from such deposits that it was recovered by the excavation. Only full quantification of the pottery assemblage allows this sort of detail to become clear. If it is true for the pottery, then it will also be true for small finds, coins and other antiquities.

Period 3-temple presents something of an enigma. It is made up of layers that are largely foundation deposits and construction layers related to the two temples and might therefore be expected to contain a largely re-deposited assemblage from earlier periods. This is in fact likely to be the case as is suggested by the fact that Types 1 and 10 are over-represented in Period 3-temple compared to Period 3, whilst other types, most notably Type 24 but also Types 3, 25 and 27, appear to be markedly under-represented. These anomalies suggest that, although the Period 3-temple and Period 3 assemblages are broadly contemporary, it is likely that they have quite different depositional histories, with Period 3-temple deposits containing much higher amounts of re-deposited material that is much earlier and relatively few examples of contemporary types. Having said this, it should be remembered that the Period 3-temple assemblage is quite small – between one third and one thirteenth the size of the other assemblages – meaning that it is less likely to contain rarer examples of types and wares and also that the figures from it are more likely to be affected by freak occurrences of one or two sherds that would not affect a larger assemblage.

Period 4 is also notable for a slightly greater variety of classes than are found in earlier periods, especially of higher-quality wares (Table 7.4). In Periods 1 and 2, the presence of small quantities of NBP and RPW is noted, but by Period 4, four high-quality classes are present in the assemblage (CHIN, PERS, SLIP and WARP), at least three of which are imported to Paithan. It is also notable that Period 4 has a higher number of new types than other periods (see above) and a greater number of 'unique' sherds. Both of these points suggest, again, that there was a greater variety of types and wares in circulation at this time. A similar picture is given by the pottery fabrics. In Periods 1 and 2, Fabric 1 and its variants make up over 75% of the pottery. This drops to 60% in Period 3 and 51% in Period 4 (as noted above, the Period 3-temple assemblage is too small to be statistically reliable in such a comparison). These observations suggest a much greater diversity of pottery manufacture and trade in the later Medieval period, when it seems likely that Paithan might have been somewhat better integrated into a broader regional distributive economy than perhaps it had been during the Early Historic period. It is therefore strange to note that the late period, which is sometimes referred to as the 'Muslim-Maratha' period in regional excavation reports, is often said to show a declining quality of pottery production, although no such decline was noted at Paithan.

Conversely, the predominance of a single fabric (Fabric 1a) in Periods 1 and 2, where it makes up over 70% of the total assemblage, might suggest exactly the opposite, that is to say, a production and distribution system with very little diversity, focussed, at least as far as pottery is concerned, on a single production location and possibly a single industry. But this is somewhat speculative. More work needs to be done on these issues before any more can be said with any degree of certainty. They do, however, point the way to some potentially interesting and useful avenues for further research.

In summary, it seems that the use of a formal typology linked to detailed definitions of fabrics and wares and a system of full quantification of the assemblage is likely to yield more useful results than the traditional system of loosely defined wares has done to date. It is difficult to see, otherwise, how progress might be made towards a better understanding of the Early Historic and Early Medieval pottery chronology.

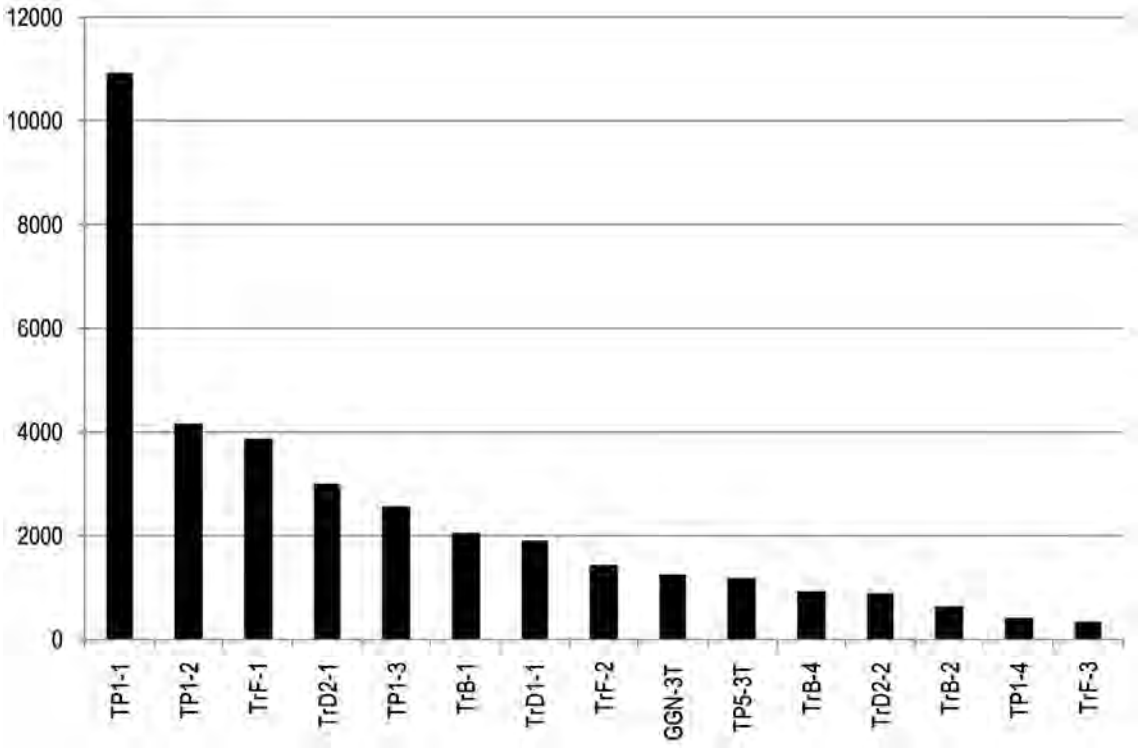


Fig. 7.19: Ranked analysis of the density of sherds per metre cubed from 15 period-assemblages from across the site.

Table 7.12: The number of sherds and the amount of earth excavated from a sample of period-assemblages from across the site (Trench A Test Pit 1 (TP1) Periods 1–4; Trench B (TrB) Periods 1, 2 and 4; Trench D1 (TrD1) Period 1; Trench D2 (TrD2) Periods 1 and 2; Trench F (TrF) Periods 1, 2 and 3; Trench A Garbha Griha of the North Temple (GGN), Period 3-Temple and Trench A Test Pit 5 (TP5) Period 3-Temple).

	Period	Sherds	Meters^3
TrB-1	1	10,602	5.15
TrB-2	2	2,646	4.11
TrB-4	4	15,832	16.64
TP5-3T	3T	10,184	8.60
TrF-1	1	5,787	1.49
TrF-2	2	6,423	4.46
TrF-3	3	1,286	3.53
TrD1-1	1	6,772	3.53
TrD2-1	1	7,658	2.54
TrD2-2	2	4,382	4.92
TP1-1	1	3,500	0.32
TP1-2	2	17,516	4.19
TP1-3	3	6,263	2.42
TP1-4	4	837	2.02
GGN-3T	3T	3,088	2.45

Table 7.13: The density of sherds per cubic metre from 15 period-assemblages from across the site.

Period	Period-assemblage	Sherd density
1	TP1-1	10,938
1	TrF-1	3,884
1	TrD2-1	3,015
1	TrB-1	2,059
1	TrD1-1	1,918
2	TP1-2	4,180
2	TrF-2	1,440
2	TrD2-2	891
2	TrB-2	644
3	TP1–3	2,588
3	TrF–3	364
3T	GGN–3T	1,260
3T	TP5–3T	1,184
4	TrB–4	951
4	TP1–4	414

Table 7.14: Average density of sherds per meter cubed based on the data from Table 7.13 (not including the anomalously high figure for TP1–1 of 10,938 per m³).

Period	Average sherds per m³
1	2,719
2	2,170
3	1,476
3-temple	1,222
4	683

Catalogue of 'unique' sherds

A total of 82 'unique' sherds (UNIQ) was recorded that either could not be classified according to the typology and classes set out above or which have specific traits that are of particular interest. The most significant of these sherds are illustrated in Figs 7.20–7.22 and are described below (Table 7.15).

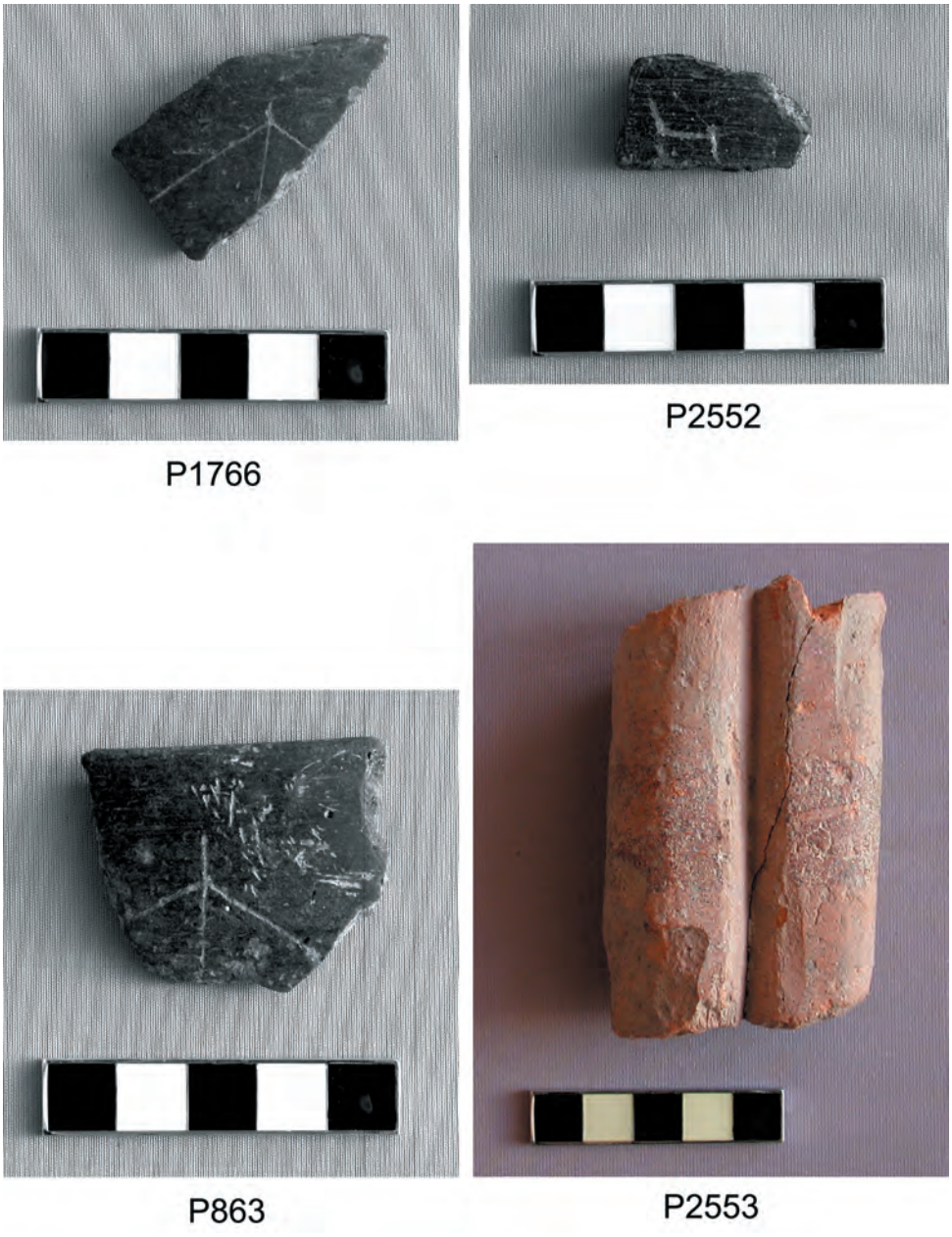


Fig. 7.20: Sherds with incised marks: P863, P1766, P2552 and sherd P2553, Roman amphora.

Table 7.15: Catalogue of unique sherds.

P. No.	Context	Period	Description	Figure
863	729	1	Black burnished ware (Fabric 3). Symbol or letter incised onto sherd after firing.	Fig. 7.9, Fig. 7.20
1173	729	1	Coarse red ware, thick red slip, no trace of burnish.	Fig. 7.21
1254	715	1	Black burnished ware, no slip or burnish on the interior.	Fig. 7.21
168	966	2	Light orange-red ware, soft-fired, no slip or burnish.	Fig. 7.21
216	988	2	Red earthenware, partial slip and burnish on the exterior but none on the interior. Stamped or moulded decoration exterior.	Fig. 7.21
1257	712	2	Very unusual fabric, very light, pink (7.5YR 7/4), lots of organic temper and very coarse. No slip or burnish.	Fig. 7.21
2263	586	3	Coarse red ware, breaks easily, slightly rough fracture, fine sandy texture, grey corer and reddish exterior (pink 7.5YR 8/4) but grey core very thin (c. 4 mm). Exterior and rim painted white with red blotches and lines on rim.	Fig. 7.21
2264	586	3	Coarse reddish sandy ware, rough fracture. No visible inclusions. Body reddish brown (5YR 5/3), surface smoothed, small mica grains visible.	Fig. 7.21
2267	632	3	Grey ware with incised decoration, Fabric 2.	Fig. 7.21
2277	632	3	Grey ware with incised decoration, Fabric 2.	Fig. 7.21
2278	632	3	Fabric 2 but fired to a variable reddish colour.	Fig. 7.21
2279	632	3	Red ware, slipped but no polish.	Fig. 7.21
2280	632	3	Grey ware, Fabric 2.	Fig. 7.21
2281	632	3	Grey ware, Fabric 2.	Fig. 7.21
2282	632	3	Light grey, buff ware with burnish but apparently no slip. Lots of organic temper. Fabric is dark grey with a reddening on the exterior surface 3 mm deep. Sandy texture, occasional large (2 mm) white rounded inclusions.	Fig. 7.22
2285	632	3	Grey ware, Fabric 2.	Fig. 7.22
1388	402	4	Spout, slipped but not polished.	Fig. 7.22
1390	402	4	Fabric 1c. Small thickened rim of a narrow-necked vase or jar. Traces of mat red slip on the exterior and interior.	Fig. 7.22
1556	430	4	Heavy, well-fired grey ware with a dark core and lighter grey edges. Surface is smoothed. Incised decoration.	Fig. 7.22
1608	435	4	Red earthenware, slip and burnish on the exterior only, stamped/moulded decoration.	Fig. 7.22
1610	435	4	Grey ware with traces of pink or red mat paint on the exterior only.	Fig. 7.22
1611	435	4	Thin body up to 3.5 mm, soft-fired, fine sandy texture. Body greyish brown (10YR 5/2). No slip on the interior (closed vessel). The exterior has a fine red burgundy slip. Body moulded with petal decoration.	Fig. 7.22
1660	432	4	Heavy, well-fired grey ware with a dark core and lighter grey edges. Surface is smoothed. Incised decoration.	Fig. 7.22
1662	432	4	Coarse red earthenware, no slip or burnish, fired grey and red.	Fig. 7.22
1766	438	4	Black burnished ware (Fabric 3). Symbol or letter incised onto sherd after firing.	Fig. 7.9, Fig. 7.20
2553	334	4	Roman Dressel 2–4 amphora handle. Dense hard fabric, very strong. Breaks with a sub-conchoidal fracture. Dense badly sorted, sub-angular black inclusions up to c. 0.5 mm. Fabric reddish yellow (5YR 6/6).	Fig. 7.20, Fig. 7.22
2552	532	4?	Black burnished ware (Fabric 3). Symbol or letter incised onto sherd after firing.	Fig. 7.20

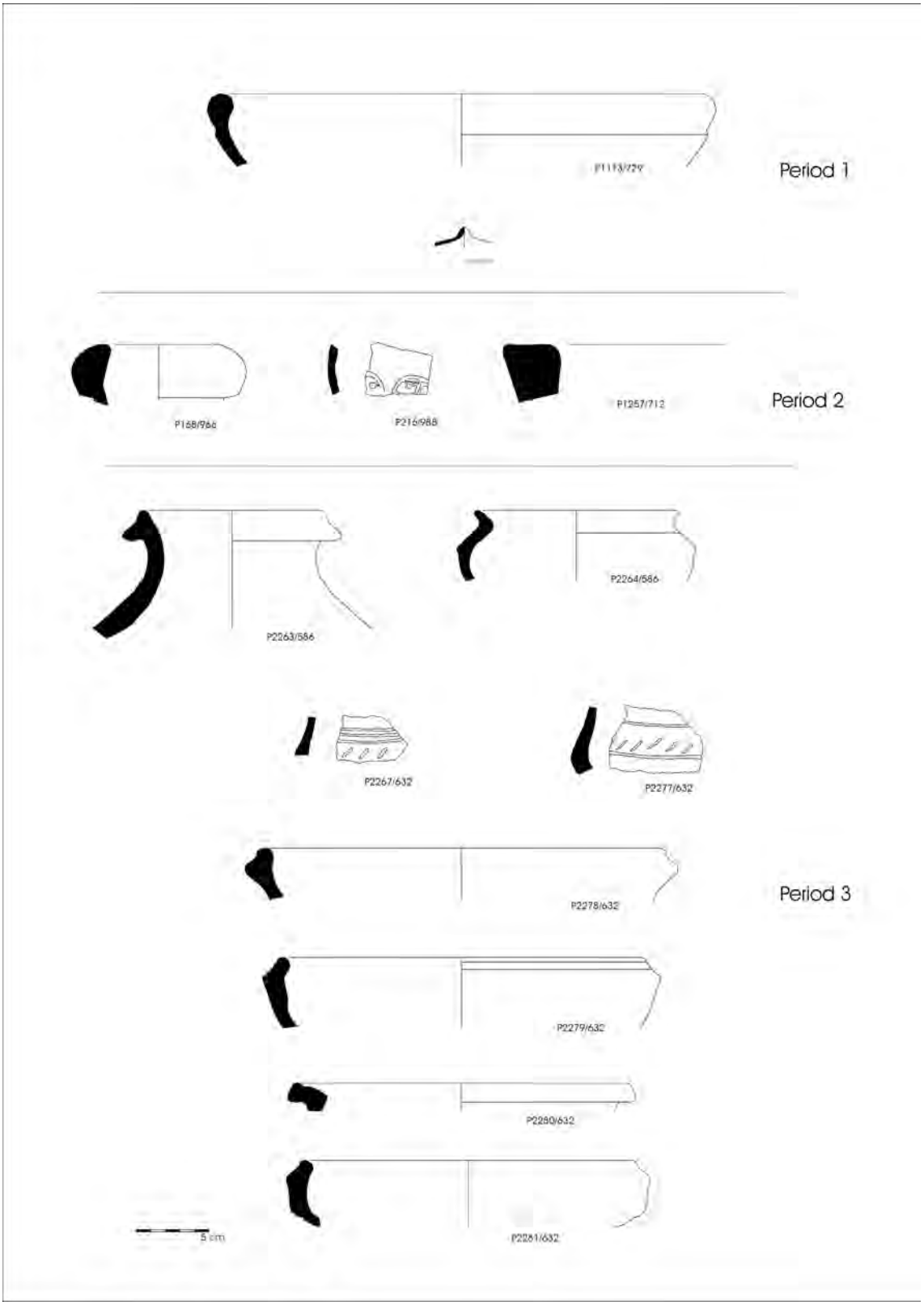


Fig. 7.21: Unique sherds, Periods 1 to 3.

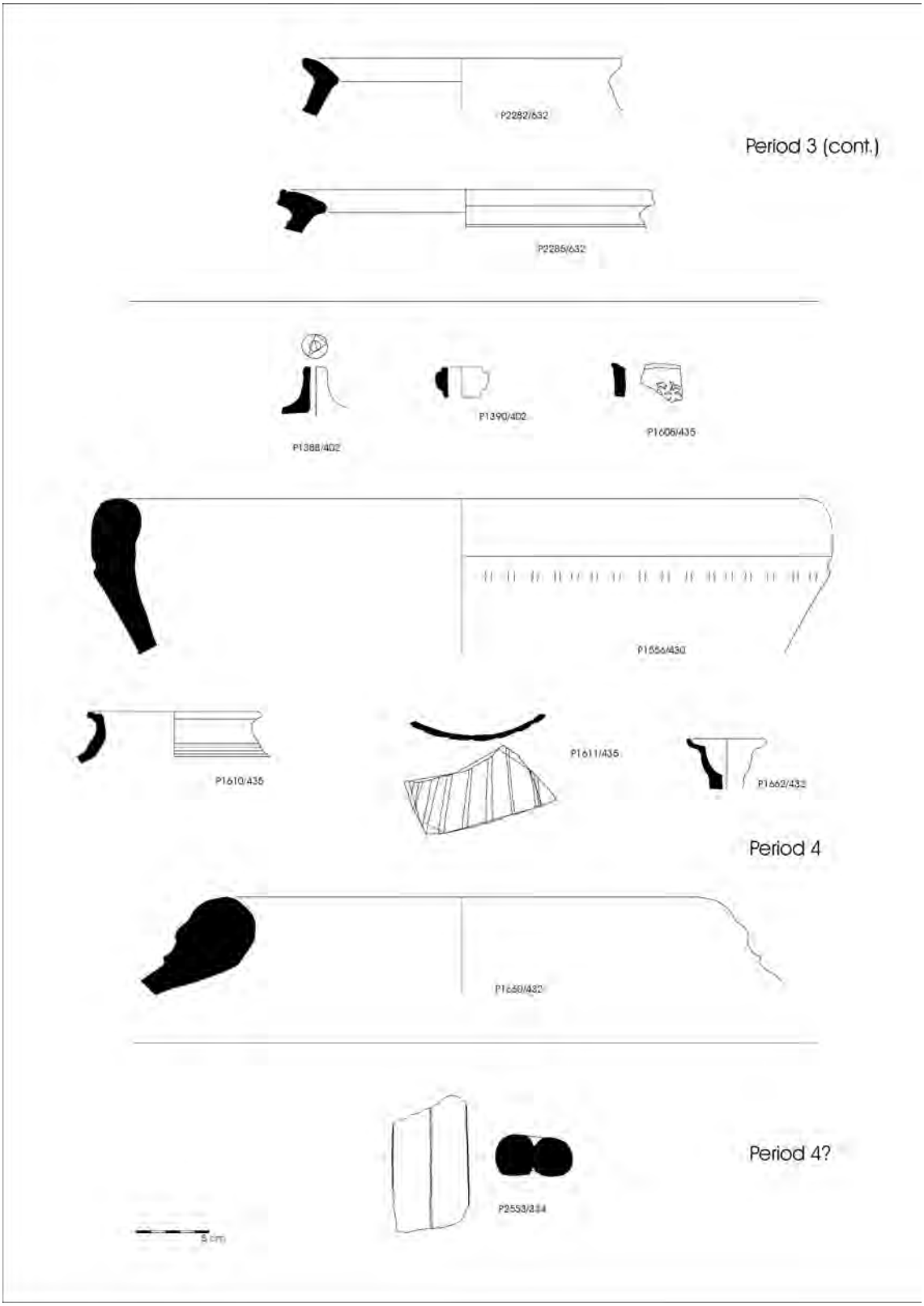


Fig. 7.22: Unique sherds, Periods 3 and 4.

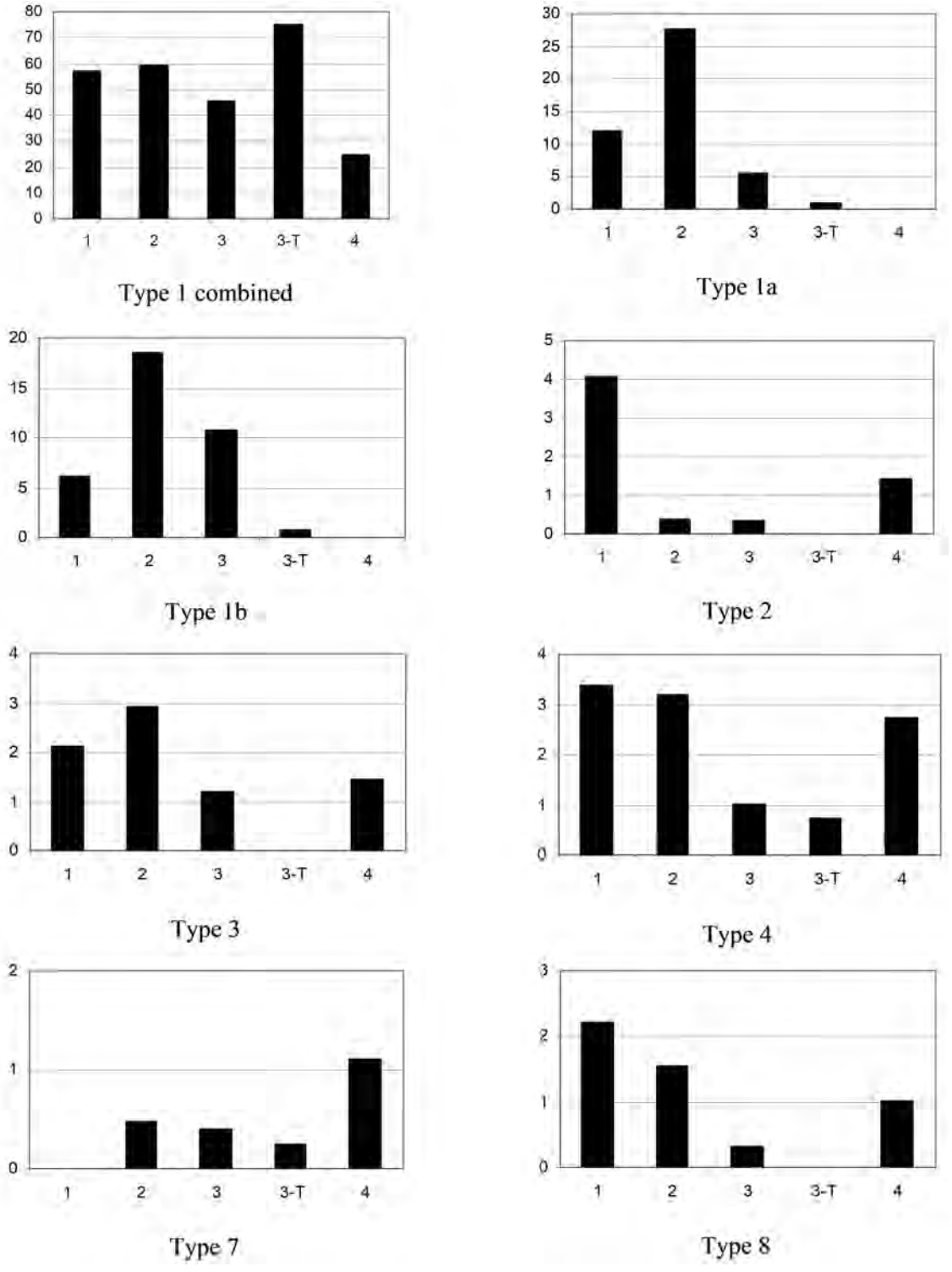


Fig. 7.23: Occurrence profiles of Types 1, 2, 3, 4, 7 and 8. The histograms show occurrence as a percentage of the total period rim-sherd assemblages. Note that vertical scales differ on the histograms.

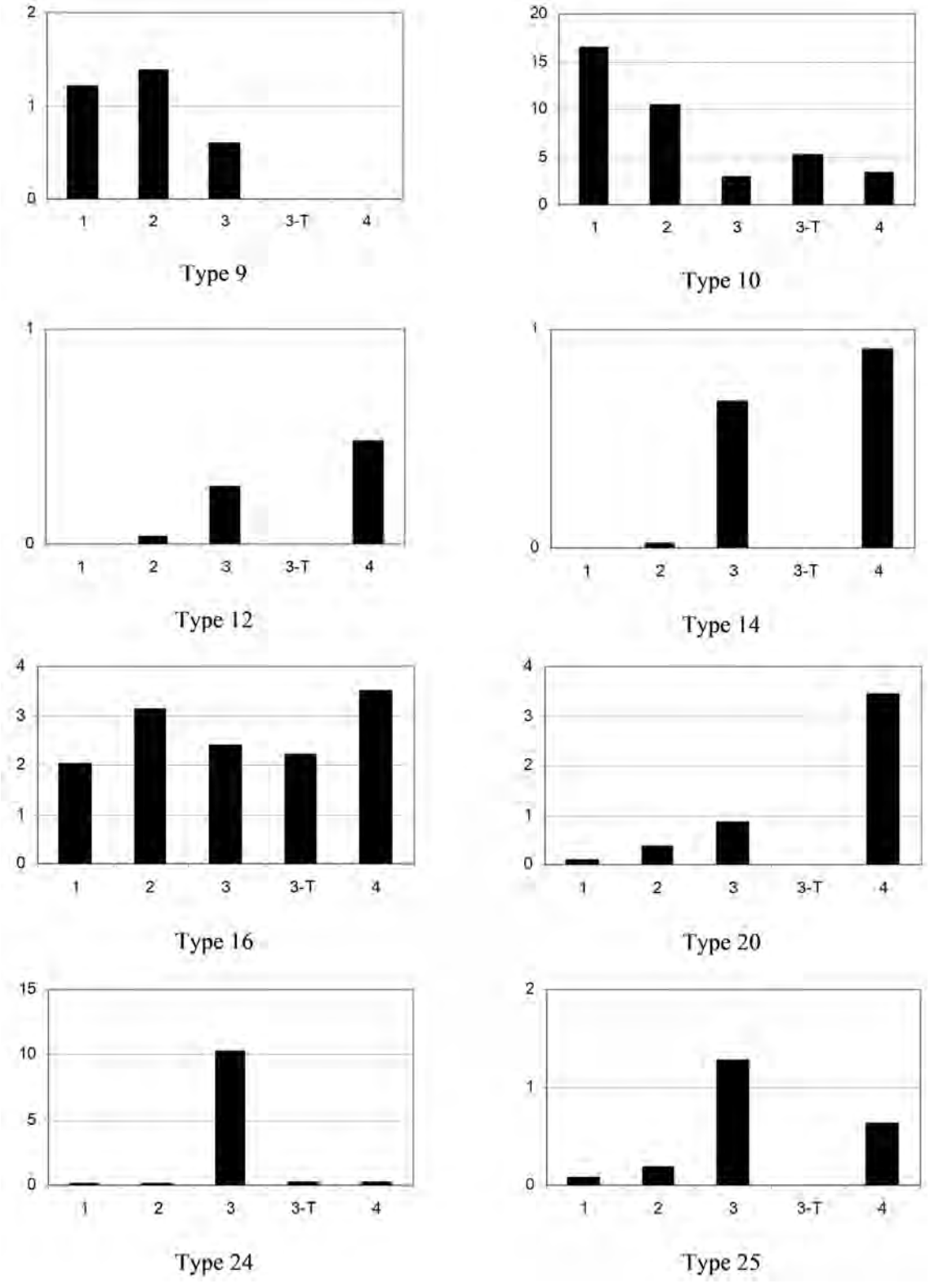


Fig. 7.24: Occurrence profiles of Types 9, 10, 12, 14, 16, 20, 24 and 25. The histograms show occurrence as a percentage of the total period rim-sherd assemblages. Note that vertical scales differ on the histograms.

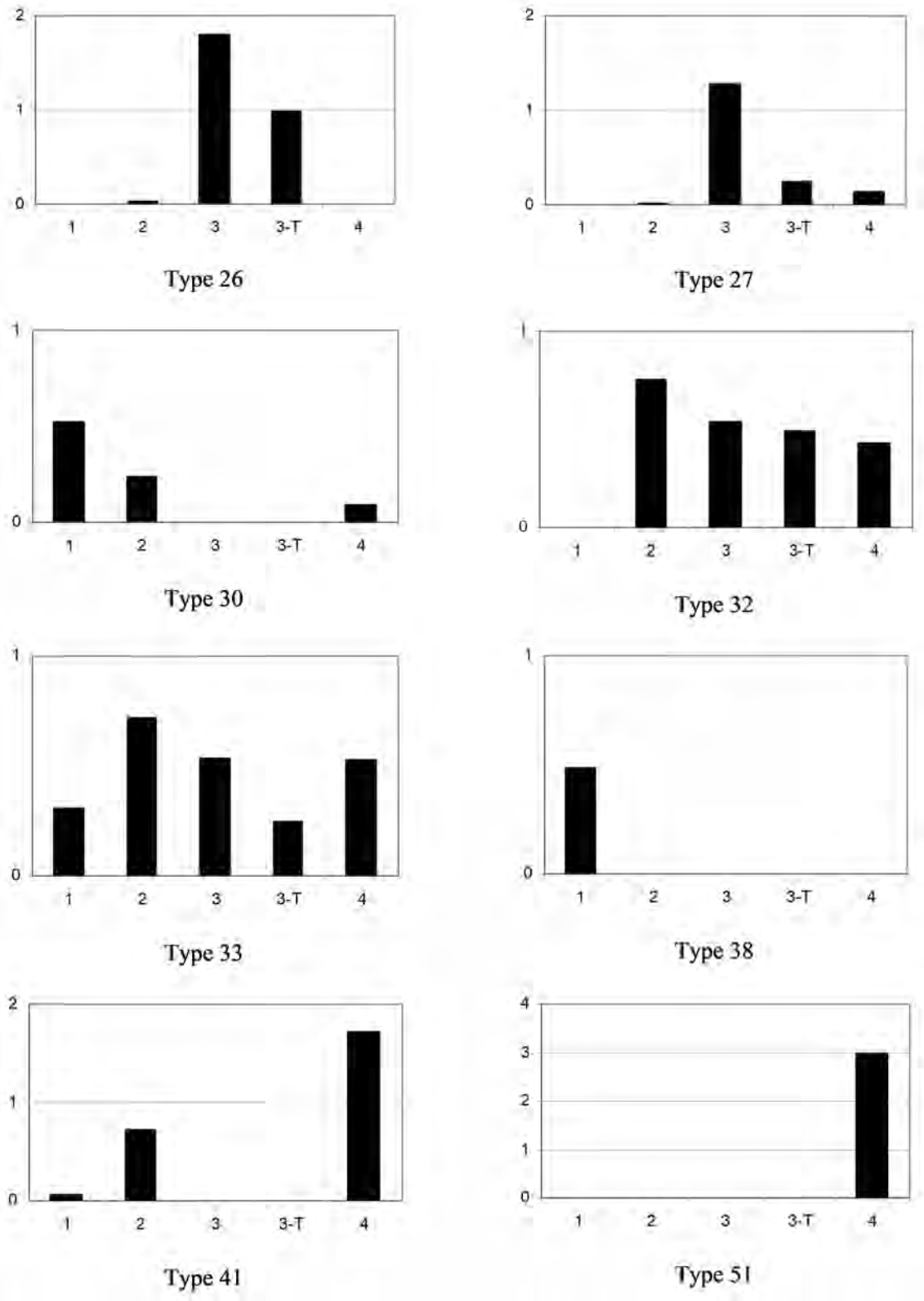


Fig. 7.25: Occurrence profiles of Types 26, 27, 30, 32, 33, 38, 41 and 51. The histograms show occurrence as a percentage of the total period rim-sherd assemblages. Note that vertical scales differ on the histograms.

M. Kasturi Bai

Chapter 8
The Small Finds and Glass

Introduction

A total of 869 small finds were found during the excavations at Paithan (Table 8.1). The finds are described and discussed below, accompanied by a full catalogue. The excavations also provided 56 coins, which are described in Chapter 9.

Finds were collected in the field during excavation, either by hand or in 5-mm mesh sieves through which all excavated earth was passed. The objects were then cleaned and registered before being studied.

Table 8.1: The main categories of small finds.

Category	Total
Coins	56
Microliths	7
Jewellery	375
Metal objects	203
Household objects	67
Play objects	98
Figurines	32
Miscellaneous	4
Unidentified	27
Total	869

Microliths

Altogether, seven microliths were recovered from the site, all of which belong to the Chalcolithic period. Of these, six microliths were obtained from Period 1 and one from Period-3 temple, which is a backed blade. Among the six pieces from Period 1, there were a flake core, a fluted core, two blades and one flake. The materials used for the preparation of these microliths are crypto crystalline materials such as jasper, carnelian and chalcedony.

No: 481 Trench: D1 **Context:** 777 **Period:** 1
Object: Core **Material:** Jasper.
Description: Residual core(?) of jasper.
Date: Chalcolithic.

No: 802 Trench: B **Context:** 741 **Period:** 1
Object: Core **Material:** Jasper.
Description: Amorphous core of green jasper. Fig. 8.1.
Date: Chalcolithic.

No: 704 Trench: B **Context:** 485 **Period:** 1
Object: Core **Material:** Chalcedony.
Description: Fluted core of chalcedony. Fig. 8.1.
Date: Chalcolithic.

No: 730 Trench: B **Context:** 493 **Period:** 1
Object: Flake **Material:** Carnelian.
Description: Amorphous flake of carnelian. Fig. 8.1.
Date: Chalcolithic.

No: 728 Trench: B **Context:** 493 **Period:** 1
Object: Blade **Material:** Chalcedony.
Description: Broken, backed blade of chalcedony(?). Fig. 8.1.
Date: Chalcolithic.

No: 801 Trench: B **Context:** 736 **Period:** 1
Object: Blade **Material:** Chalcedony.
Description: Fragment of thin blade of chalcedony with use-marks. Fig. 8.1.
Date: Chalcolithic.

No: 823 Trench: A:TP9 **Context:** 1168 **Period:** 3-temple
Object: Blade **Material:** Chert.
Description: Backed blade of chert with slightly broken distal end, use-marks on one margin and deliberate blunting on the other margin. Fig. 8.1.
Date: Chalcolithic.

Jewellery

A total of 375 items of jewellery came to light during the excavations (Table 8.2), including beads, bangles, finger-rings, toe-rings, ear-studs and pendants. The miscellaneous jewellery items are mainly categorized under kohlsticks, hair-pin and inlay objects. Of the jewellery objects, beads outnumber the other categories, followed by bangles, finger-rings and pendants etc. The occurrence of beads decreases from Period 1 to Period 3 but in Period 4 it is equal with Period 1. Bangles, however, increase from Period 1 to 4.

https://doi.org/10.1515/9783110653540-008

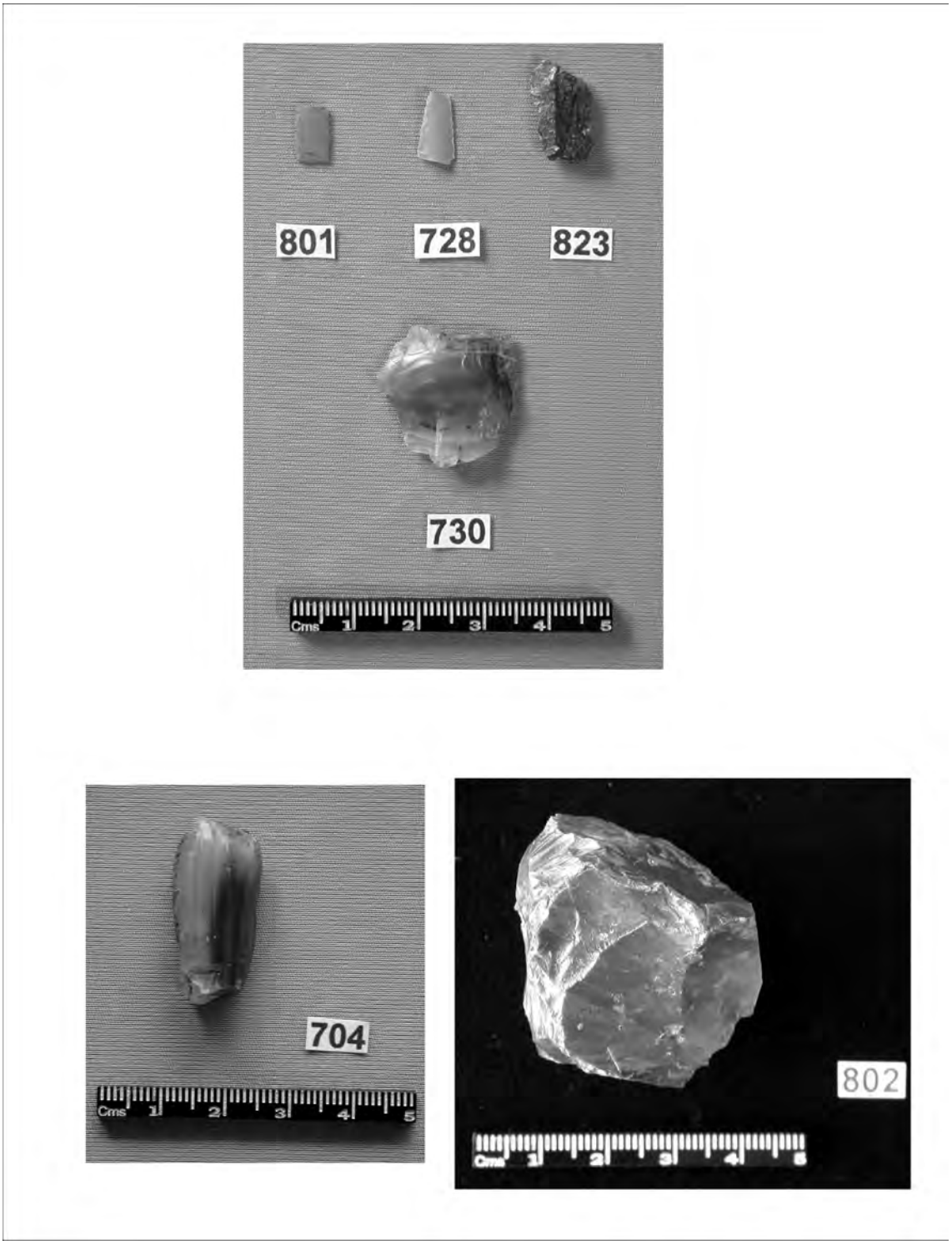


Fig. 8.1: Microliths.

Table 8.2: Jewellery objects by period.

Type \ Period	1	2	3	3-temple	4	4?	No period	Total
Bead	43	22	35	22	44	6	13	**185**
Bead(?)					1			1
Bangle	4	4	33	12	44	6	40	**143**
Finger ring	2	2	3	1	3	1	3	**15**
Ring-stone			1		1			2
Toe ring					2			2
Ear-stud		1	1		2		1	**5**
Pendant	2	2			2	1	3	**10**
Hairpin					1			1
Kohlstick		1	2					3
Inlay object			2		1			3
Foil	1	1				1		3
Band		1						1
Wire			1					1
Total	**52**	**34**	**78**	**35**	**101**	**15**	**60**	**375**

Beads

A total of 185 beads came to light during the excavations (Table 8.3). These are illustrated in Figs 8.2–8.4.

Period 1 shows the usage of different materials like carnelian, coral, crystal, glass, jasper, shell, topaz and terracotta for bead making. Among the bead finds from Period 1, terracotta beads are predominant, and other materials are only found in quantities below five. The occurrence of terracotta beads gradually decreased from Period 1 to Period 4 as it was replaced by glass. The glass beads, by contrast, increase from Period 1 to Period 4.

Table 8.3: Summary of beads by material and period.

Material \ Period	1	2	3	3-temple	4	4?	No period	Total
Carnelian	5	2	2	1	2			12
Chalcedony			1		2			3
Coral	1		1		1			3
Crystal	1			1				2
Garnet				1				1
Glass	2	4	17	11	24	4	5	**67**
Jasper	4		2	3	3			12
Mother of pearl			1					1
Pearl					1			1
Shell	1	1	4	1	2	1		10
Stone (Unidentified)	2				1		2	**5**
Terracotta	26	15	7	4	8	1	6	**67**
Topaz	1							1
Total	**43**	**22**	**35**	**22**	**44**	**6**	**13**	**185**

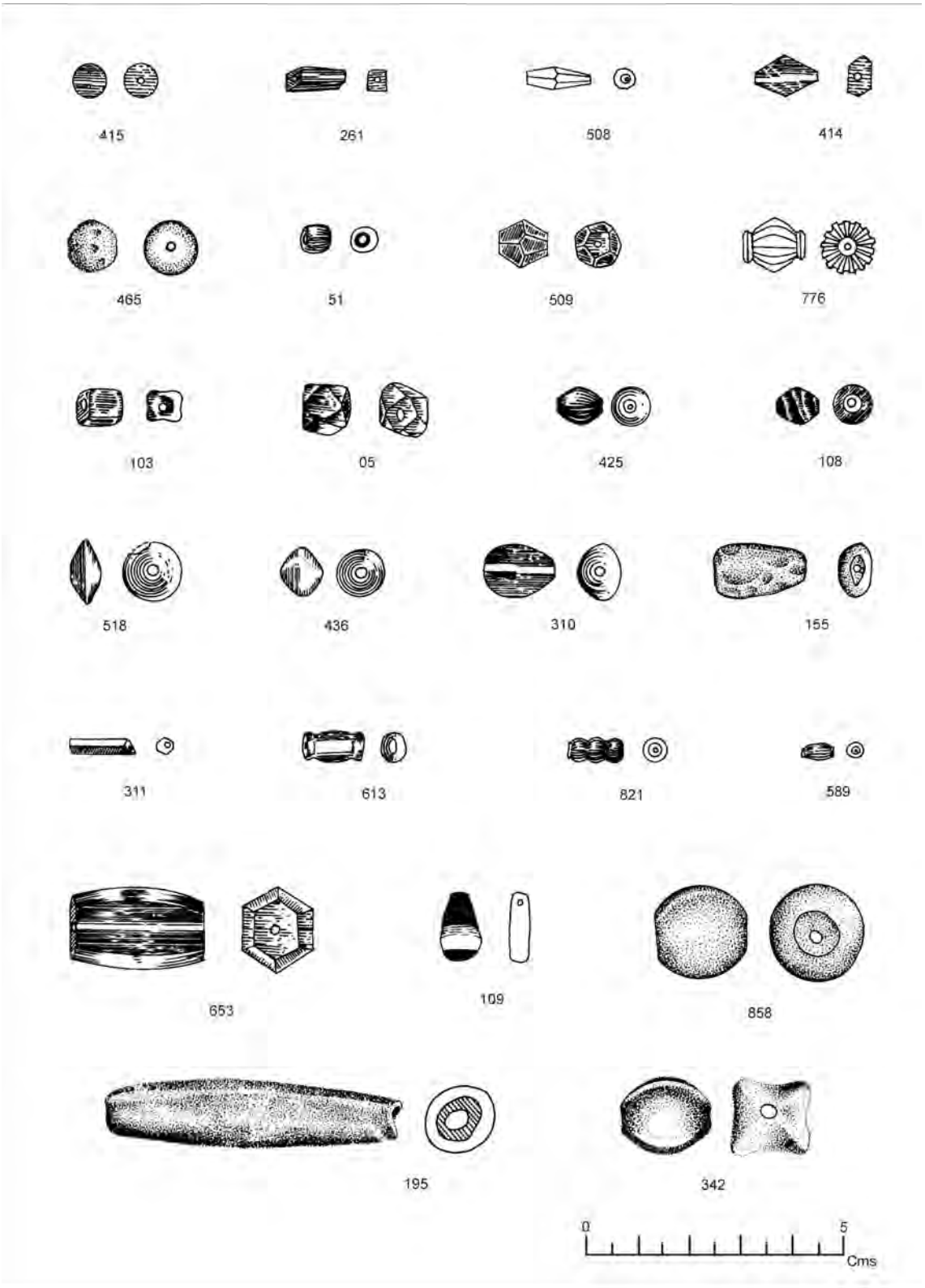


Fig. 8.2: Beads of different materials.

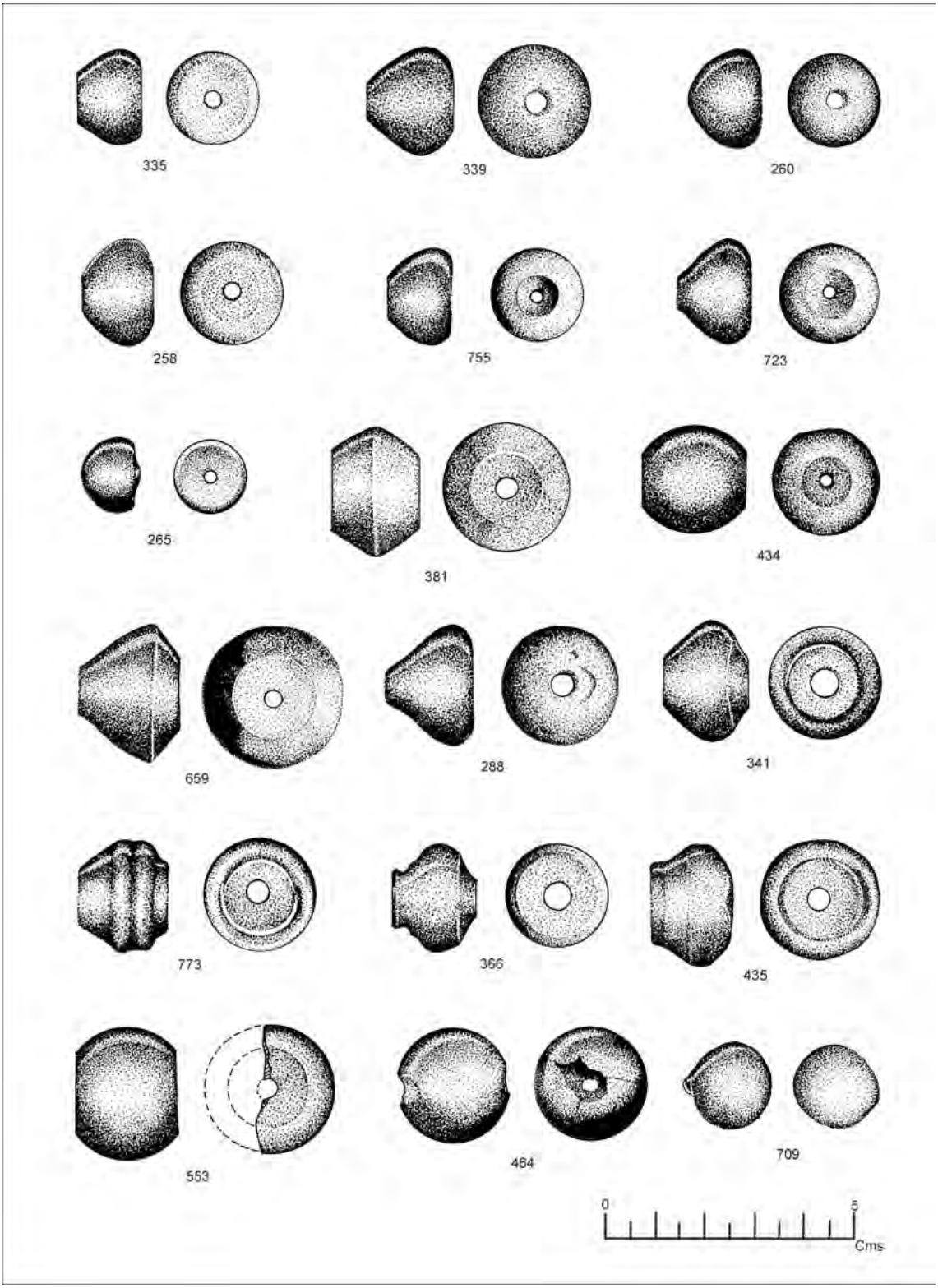


Fig. 8.3: Terracotta beads.

Table 8.4: Summary of non-terracotta beads by shape and period.

Shape \ Period	1	2	3	3-temple	4	4?	No period	Total
Almond			1					1
Barrel	1	2	2			1	1	**7**
Barrel (Faceted)	1							1
Short barrel					1			1
Long barrel	1							1
Bicone	2		1	1	2			6
Short bicone	1				1			2
Biconvex					1			1
Cylinder			1		1			2
Long cylinder	1		1		1			3
Short cylinder	2	2	11	5	11	1	1	**33**
Square cylinder		1	2		1		1	**5**
Disc	1		1	1			1	**4**
Elongated oval					1			1
Lenticular	1			1			1	**3**
Spherical	4		6	5	11	2	2	**30**
Squat globular			2	1	1			4
Tiny	1			3	2	1		7
No ID	1	2		1	2			6
Total	**17**	**7**	**28**	**18**	**36**	**5**	**7**	**118**

Different shapes of beads were made during Period 1, although there are few made from materials other than terracotta (Tables 8.4 and 8.5). Generally, the shapes preferred in Period 1 are barrel, bicone, cylinder and spherical, with slight variation among them. In Period 2, the beads found are fewer in number and show cylindrical and barrel shapes. In Period 3, the occurrence of beads increased from Periods 1 and 2, and as far as shapes are concerned, it is similar to Period 1. In Period 4, a large number of beads were found and the shapes are the same as Period 1.

Carnelian beads

No: 414 Trench: D2 **Context:** 718 **Period:** 1
Object: Bead **Material:** Carnelian.
Description: Lenticular diamond-shaped bead of carnelian, etched lines faintly visible. Figs 8.2 and 8.4.
Ref: A similar bead was recovered from Period IIB of Nasik without etched lines (Sankalia and Deo 1955: 88, fig. 45, 20).

No: 415 Trench: D2 **Context:** 718 **Period:** 1
Object: Bead **Material:** Carnelian.
Description: Spherical bead of carnelian. Fig. 8.2.

No: 507 Trench: B **Context:** 453 **Period:** 1
Object: Bead **Material:** Carnelian.
Description: Small, disc-shaped bead of carnelian. Fig. 8.4.

No: 508 Trench: B **Context:** 453 **Period:** 1
Object: Bead **Material:** Carnelian.
Description: Truncated, bicone bead of carnelian with hexagonal section. Figs 8.2 and 8.4.

No: 625 Trench: B **Context:** 467 **Period:** 1
Object: Bead **Material:** Carnelian.
Description: Spherical bead of carnelian.

No: 555 Trench: B **Context:** 450 **Period:** 2
Object: Bead **Material:** Carnelian.
Description: Small, cylinder bead of carnelian with square section. Fig. 8.4.

No: 556 Trench: B **Context:** 450 **Period:** 2
Object: Bead **Material:** Carnelian.
Description: Small, short cylinder bead of carnelian(?) with a circular section, white etched circle on the body.

No: 261 Trench: D1 **Context:** 751 **Period:** 3
Object: Bead **Material:** Carnelian.
Description: Square cylinder bead of carnelian with rectangular section. Fig. 8.2.

Table 8.5: Summary of terracotta beads by shape and period.

Shape \ Period	1	2	3	3-temple	4	4?	No period	Total
Amlaka-seed	1							1
Arecanut	5	10	3	1	1	1	4	**25**
Bicone	2				1			3
Biconvex	1							1
Convex							1	**1**
Cylinder	1							1
Disc	1							1
Lenticular				1				1
Long Barrel		1			3			4
No ID			1		1			2
Plano-convex	1							1
Pot shaped	2	2						4
Pumpkin shaped		1						1
Short Barrel	1							1
Spherical	8		2	2	1			13
Squat globular							1	**1**
Top shaped	3	1	1		1			6
Total	**26**	**15**	**7**	**4**	**8**	**1**	**6**	**67**

Ref: A similar bead was found in the Satavahana layers of Brahmapuri (Sankalia and Dikshit 1952: fig. 30, 4).

No: 4 Trench: A:TP1 **Context:** 305 **Period:** 3
Object: Bead **Material:** Carnelian.
Description: Spherical bead of carnelian.

No: 486 Trench: A:TP5 **Context:** 700 **Period:** 3-temple
Object: Bead **Material:** Carnelian.
Description: Spherical bead of carnelian.

No: 28 Trench: A:TP9 **Context:** 320 **Period:** 4
Object: Bead **Material:** Carnelian.
Description: Small, spherical bead of carnelian.

No: 37 Trench: A:TP9 **Context:** 320 **Period:** 4
Object: Bead **Material:** Carnelian.
Description: Spherical bead of carnelian.

Chalcedony beads

No: 17 Trench: A:TP1 **Context:** 308 **Period:** 3
Object: Bead **Material:** Chalcedony.
Description: Spherical bead of chalcedony. Fig. 8.4.

No: 58 Trench: A:S of S Temple **Context:** 303 **Period:** 4
Object: Bead **Material:** Chalcedony.
Description: Small, spherical bead of chalcedony.

No: 102 Trench: A:NWNT **Context:** 376 **Period:** 4
Object: Bead **Material:** Chalcedony.
Description: Small, spherical bead of chalcedony. Fig. 8.4.

Coral beads

No: 510 Trench: B **Context:** 453 **Period:** 1
Object: Bead **Material:** Coral.
Description: Short cylinder bead of coral with circular section.

No: 557 Trench: A:TP1 **Context:** 908 **Period:** 3
Object: Bead **Material:** Coral.
Description: Small, squat globular bead of coral with circular section.

No: 70 Trench: A:TP1 **Context:** 300 **Period:** 4
Object: Bead **Material:** Coral.
Description: Deformed, long cylinder bead of coral with circular section.

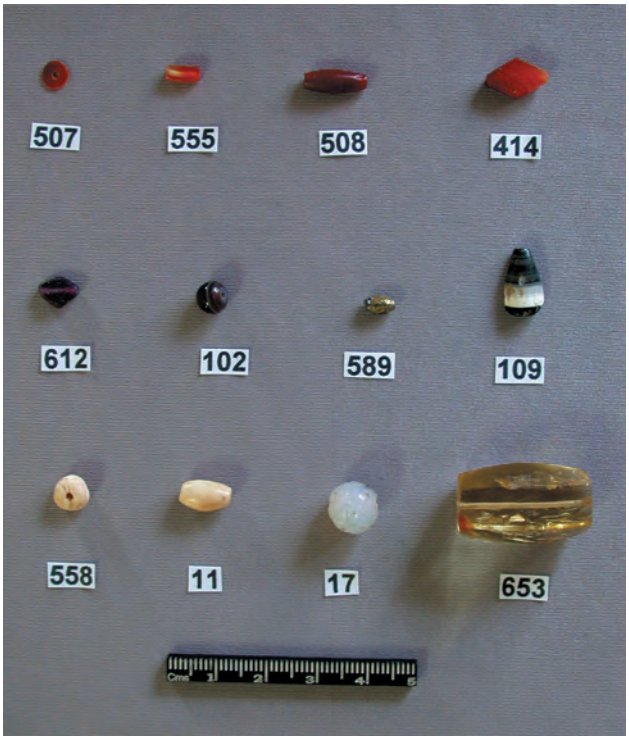


Fig. 8.4: Beads of different materials.

Crystal beads

No: 707 Trench: B **Context:** 487 **Period:** 1
Object: Bead **Material:** Crystal.
Description: Irregular-shaped bead of crystal.

No: 824 Trench: A:TP9 **Context:** 1168 **Period:** 3-temple
Object: Bead **Material:** Crystal.
Description: Fragment of a circular bead of crystal.

Garnet bead

No: 612 Trench: A:TP5 **Context:** 964 **Period:** 3-temple
Object: Bead **Material:** Garnet.
Description: Lenticular diamond-shaped bead of garnet. Fig. 8.4.

Glass beads

No: 432 Trench: D2 **Context:** 721 **Period:** 1
Object: Bead **Material:** Glass.
Description: Tiny, short cylinder bead of cream coloured opaque glass(?).

No: 436 Trench: D1 **Context:** 767 **Period:** 1
Object: Bead **Material:** Glass.
Description: Short bicone bead of cream coloured opaque soft glass, slightly broken. Fig. 8.2.

No: 498 Trench: B **Context:** 448 **Period:** 2
Object: Bead **Material:** Glass.
Description: Fragments of a bead of pale grey translucent glass.

No: 613 Trench: A:TP1 **Context:** 966 **Period:** 2
Object: Bead **Material:** Glass.
Description: Lug collared barrel bead of pale blue glass. Fig. 8.2.

No: 791 Trench: A:TP1 **Context:** 1126 **Period:** 2
Object: Bead **Material:** Glass.
Description: Short cylinder bead of turquoise glass over pale yellow base.

No: 797 Trench: A:TP1 **Context:** 1126 **Period:** 2
Object: Bead **Material:** Glass.
Description: Barrel and eared bead of brownish yellow opaque glass.

No: 5 Trench: A:TP1 **Context:** 305 **Period:** 3
Object: Bead **Material:** Glass.
Description: Standard square cylinder, faceted bead of green translucent glass(?). Fig. 8.2.

No: 255 Trench: A:South Area **Context:** 589 **Period:** 3
Object: Bead **Material:** Glass.
Description: Small, spherical, truncated bead of navy blue opaque glass.

No: 256 Trench: A:South Area **Context:** 589 **Period:** 3
Object: Bead **Material:** Glass.
Description: Small, spherical bead of pale yellow opaque glass.

No: 274 Trench: A:South Area **Context:** 591 **Period:** 3
Object: Bead **Material:** Glass.
Description: Small, short cylinder bead of blue translucent glass with circular section.

No: 310 Trench: A:South Area **Context:** 608 **Period:** 3
Object: Bead **Material:** Glass.
Description: Almond-shaped bead of violet translucent glass. Fig. 8.2.

No: 311 Trench: A:South Area **Context:** 608 **Period:** 3
Object: Bead **Material:** Glass.
Description: Faceted, long cylinder bead of bluish-green opaque glass with hexagonal section. Fig. 8.2.

No: 313 Trench: A:South Area **Context:** 608 **Period:** 3
Object: Bead **Material:** Glass.
Description: Cylinder bead of blue opaque glass with circular section.

No: 405 Trench: A:South Area **Context:** 647 **Period:** 3
Object: Bead **Material:** Glass.
Description: Standard bicone bead of black opaque glass with circular section.

No: 409 Trench: A:South Area, W Area **Context:** 651 **Period:** 3
Object: Bead **Material:** Glass.
Description: Small, short cylinder bead of turquoise glass over yellow base with circular section.

No: 459 Trench: A:South Area **Context:** 675 **Period:** 3
Object: Bead **Material:** Glass.
Description: Tiny, short cylinder bead of pale yellow opaque glass with circular section.

No: 525 Trench: A:TP1 **Context:** 921 **Period:** 3
Object: Bead **Material:** Glass.
Description: Tiny, spherical bead of yellow opaque glass.

No: 585 Trench: F **Context:** 778 **Period:** 3
Object: Bead **Material:** Glass.
Description: Small, short cylinder bead of pale yellow opaque glass.

No: 631 Trench: A:TP6 **Context:** 373 **Period:** 3
Object: Bead **Material:** Glass.
Description: Spherical and truncated bead of cream opaque glass, broken into two pieces.

No: 635 Trench: A:TP3 **Context:** 973 **Period:** 3
Object: Bead **Material:** Glass.
Description: Short cylinder bead of yellow opaque glass with circular section.

No: 636 Trench: A:TP3 **Context:** 973 **Period:** 3
Object: Bead **Material:** Glass.
Description: Small, short cylinder bead of yellow opaque glass with circular section.

No: 733 Trench: A:TP6 **Context:** 1051 **Period:** 3
Object: Bead **Material:** Glass.
Description: Short cylinder bead of pale green glass with circular section.

No: 856 Trench: A:TP6 **Context:** 1035 **Period:** 3
Object: Bead **Material:** Glass.
Description: Short cylinder bead of sky-blue translucent glass with circular section.

No: 449 Trench: A:TP5 **Context:** 666 **Period:** 3-temple
Object: Bead **Material:** Glass.
Description: Tiny bead of black glass.

No: 451 Trench: A:TP5 **Context:** 667 **Period:** 3-temple
Object: Bead **Material:** Glass.
Description: Truncated bicone bead of blue translucent glass.

No: 515 Trench: A:TP5 **Context:** 918 **Period:** 3-temple
Object: Bead **Material:** Glass.
Description: Small and short cylinder bead of blue opaque glass.

No: 542 Trench: A:TP5 **Context:** 919 **Period:** 3-temple
Object: Bead **Material:** Glass.
Description: Tiny, short cylinder bead of pale yellow opaque glass.

No: 554 Trench: A:TP5 **Context:** 902 **Period:** 3-temple
Object: Bead **Material:** Glass.
Description: Tiny bead of blue glass.

No: 610 Trench: A:TP5 **Context:** 964 **Period:** 3-temple
Object: Bead **Material:** Glass.
Description: Small, short cylinder bead of black glass with circular section.

No: 611 Trench: A:TP5 **Context:** 964 **Period:** 3-temple
Object: Bead **Material:** Glass.
Description: Tiny, spherical bead of grass-green translucent glass.

No: 726 Trench: A:TP5 **Context:** 1092 **Period:** 3-temple
Object: Bead **Material:** Glass.
Description: Tiny, spherical bead of pale yellow opaque glass.

No: 741 Trench: A:TP9 **Context:** 1096 **Period:** 3-temple
Object: Bead **Material:** Glass.
Description: Short cylinder bead of turquoise glass over pale yellow base with circular section.

No: 821 Trench: A:GG North **Context:** 1164 **Period:** 3-temple
Object: Bead **Material:** Glass.
Description: Segmented (three) spherical bead of dark blue opaque glass with circular section, wire-wound. Fig. 8.2.

No: 822 Trench: A:TP9 **Context:** 1168 **Period:** 3-temple
Object: Bead **Material:** Glass.
Description: Broken bead of pale green glass.

No: 51 Trench: A:S of S Temple **Context:** 303 **Period:** 4
Object: Bead **Material:** Glass.
Description: Short cylinder bead of turquoise glass over yellow base with circular section. Fig. 8.2.

No: 63 Trench: A:TP5 **Context:** 330 **Period:** 4
Object: Bead **Material:** Glass.
Description: Small, short cylinder bead of pale yellow opaque glass.

No: 64 Trench: A:TP5 **Context:** 330 **Period:** 4
Object: Bead **Material:** Glass.
Description: Small, short cylinder bead of turquoise glass over yellow base with circular section.

No: 72 Trench: A:TP9 **Context:** 320 **Period:** 4
Object: Bead **Material:** Glass.
Description: Small bicone bead of yellow opaque glass with circular section.

No: 101 Trench: A:NWNT **Context:** 376 **Period:** 4
Object: Bead **Material:** Glass.
Description: Small, short cylinder bead of yellow opaque glass with circular section.

No: 103 Trench: A:NWNT **Context:** 376 **Period:** 4
Object: Bead **Material:** Glass.
Description: Square cylinder bead of black glass with slight depression on each side. Fig. 8.2.

No: 122 Trench: A:TP9 **Context:** 519 **Period:** 3
Object: Bead **Material:** Glass.
Description: Small, short cylinder bead of black glass with circular section.

No: 135 Trench: A:TP9 **Context:** 543 **Period:** 4
Object: Bead **Material:** Glass.
Description: Tiny, short cylinder bead of violet opaque glass.

No: 136 Trench: A:TP9 **Context:** 543 **Period:** 4
Object: Bead **Material:** Glass.
Description: Spherical bead of opaque blue glass.

No: 154 Trench: B **Context:** 406 **Period:** 4
Object: Bead **Material:** Glass.

Description: Small, irregular-shaped bead of pale yellow opaque glass.

No: 165 Trench: B **Context:** 414 **Period:** 4
Object: Bead **Material:** Glass.
Description: Small, short cylinder bead of blue glass.

No: 189 Trench: B **Context:** 435 **Period:** 4
Object: Bead **Material:** Glass.
Description: Six short barrel beads of grey translucent glass(?).

No: 226 Trench: B **Context:** 438 **Period:** 4
Object: Bead **Material:** Glass.
Description: Short cylinder bead of blue glass.

No: 245 Trench: A:S Wall of N **Context:** 571 **Period:** 4
Object: Bead **Material:** Glass.
Description: Tiny bead of turquoise translucent glass.

No: 319 Trench: A:TP6, South Area **Context:** 613 **Period:** 4
Object: Bead **Material:** Glass.
Description: Two short cylinder beads of, turquoise, translucent glass with circular section.

No: 331 Trench: A:South Area **Context:** 619 **Period:** 4
Object: Bead **Material:** Glass.
Description: Short bicone barrel bead of black glass with circular section.

No: 345 Trench: A:South Area, TP6 **Context:** 635 **Period:** 4
Object: Bead **Material:** Glass.
Description: Small spherical bead of blue glass.

No: 351 Trench: A:South Area, TP6 **Context:** 635 **Period:** 4
Object: Bead **Material:** Glass.
Description: Tiny bead of black glass with circular section.

No: 356 Trench: A:TP5 **Context:** 633 **Period:** 4
Object: Bead **Material:** Glass.
Description: Tiny, short cylinder bead of pale green opaque glass with circular section.

No: 357 Trench: A:TP5 **Context:** 633 **Period:** 4
Object: Bead **Material:** Glass.
Description: Small, spherical bead of green opaque glass with circular section.

No: 400 Trench: A:South Area, TP6 **Context:** 635 **Period:** 4
Object: Bead **Material:** Glass.
Description: Small, spherical bead of yellow opaque glass.

No: 425 Trench: A:TP6 **Context:** 649 **Period:** 4
Object: Bead **Material:** Glass.
Description: Bicone bead of yellow opaque glass with circular section. Fig. 8.2.

No: 484 Trench: A:South Area **Context:** 645 **Period:** 4
Object: Bead **Material:** Glass.
Description: Tiny, short cylinder bead of green translucent glass.

No: 518 Trench: A:W Area **Context:** 920 **Period:** 4
Object: Bead **Material:** Glass.
Description: Biconvex bead of grass-green opaque glass with circular section. Fig. 8.2.

No: 73 Trench: A:NWNT **Context:** 327 **Period:** 4?
Object: Bead **Material:** Glass.
Description: Tiny, spherical bead of pale green opaque glass.

No: 105 Trench: A:NWNT **Context:** 379 **Period:** 4?
Object: Bead **Material:** Glass.
Description: Tiny bead of translucent turquoise glass.

No: 108 Trench: A:NWNT **Context:** 386 **Period:** 4?
Object: Bead **Material:** Glass.
Description: Barrel bead of black glass. Fig. 8.2.

No: 139 Trench: A:NWNT **Context:** 546 **Period:** 4?
Object: Bead **Material:** Glass.
Description: Small, truncated spherical bead of black glass with circular section.

No: 92 Trench: A:S Temple **Context:** 366 **Period:** No period
Object: Bead **Material:** Glass.
Description: Short cylinder bead of opaque, turquoise glass over yellow base with circular section.

No: 130 Trench: A:N Temple **Context:** 536 **Period:** No period
Object: Bead **Material:** Glass.
Description: Small, barrel bead of pale yellow opaque glass.

No: 562 Trench: E **Context:** 821 **Period:** No period
Object: Bead **Material:** Glass.
Description: Tiny, spherical bead of black glass with circular section.

No: 700 Trench: E **Context:** 831 **Period:** No period
Object: Bead **Material:** Glass.
Description: Flattened, cylinder bead of turquoise glass over yellow base with lenticular section.

No: 840 Trench: A:TP7 **Context:** 1225 **Period:** No period
Object: Bead **Material:** Glass.
Description: Disc-shaped bead of pale yellow glass, broken.

No: 33 Trench: A:NWNT, TP9 **Context:** 328 **Period:** 4
Object: Bead(?) **Material:** Glass.
Description: Rectangular cylinder bead of bluish-green translucent glass(?), under preparation.

Jasper beads

No: 378 Trench: D1 **Context:** 766 **Period:** 1
Object: Bead **Material:** Jasper.
Description: Tiny bead of red jasper.

No: 465 Trench: D2 **Context:** 722 **Period:** 1
Object: Bead **Material:** Jasper.
Description: Spherical bead of jasper. Fig. 8.2.

No: 509 Trench: B **Context:** 453 **Period:** 1
Object: Bead **Material:** Jasper.
Description: Twisted, pentagonal bicone bead of green jasper. Fig. 8.2.
Ref: A similar bead was found at Nasik but in quartz material (see Sankalia and Deo 1955: 90, fig. 45, 16) and also the same type jasper bead was reported from Period IV of Pauni (see Nath 1998: 69, fig. 28, 35).

No: 776 Trench: F **Context:** 851 **Period:** 1
Object: Bead **Material:** Jasper.
Description: Gadrooned, barrel bead of jasper with collars. Fig. 8.2.

No: 312 Trench: A:South Area **Context:** 608 **Period:** 3
Object: Bead **Material:** Jasper.
Description: Small, squat globular bead of red jasper(?).

No: 732 Trench: A:TP6 **Context:** 1051 **Period:** 3
Object: Bead **Material:** Jasper.
Description: Small, short cylinder bead of mustard yellow colour jasper(?) with circular section.

No: 371 Trench: A:TP5 **Context:** 642 **Period:** 3-temple
Object: Bead **Material:** Jasper.
Description: Tiny bead of mustard yellow coloured jasper(?).

No: 634 Trench: A:GG North **Context:** 938 **Period:** 3-temple
Object: Bead **Material:** Jasper.
Description: Tiny, squat globular bead of red jasper.

No: 849 Trench: A:TP5 **Context:** 979 **Period:** 3-temple
Object: Bead **Material:** Jasper.
Description: Short cylinder bead of maroon red jasper with circular section.

No: 155 Trench: B **Context:** 406 **Period:** 4
Object: Bead **Material:** Jasper.
Description: Elongated oval-shaped bead of green jasper. Fig. 8.2.

No: 355 Trench: A:TP5 **Context:** 633 **Period:** 4
Object: Bead **Material:** Jasper.
Description: Tiny, squat globular bead of mustard yellow coloured jasper.

No: 401 Trench: A:South Area, TP6 **Context:** 635 **Period:** 4
Object: Bead **Material:** Jasper.
Description: Small, spherical bead of red jasper.

Mother of pearl beads

No: 589 Trench: A:South Area **Context:** 931 **Period:** 3
Object: Bead **Material:** Mother of pearl.
Description: Barrel-eared bead of mother of pearl with circular section. Figs 8.2 and 8.4.

Pearl beads

No: 190 Trench: B **Context:** 435 **Period:** 4
Object: Bead **Material:** Pearl.
Description: Two spherical beads of pearl with copper string.

Shell beads

No: 502 Trench: B **Context:** 452 **Period:** 1
Object: Bead **Material:** Shell.
Description: Slightly broken, long cylinder bead of shell(?).

No: 614 Trench: A:TP1 **Context:** 966 **Period:** 2
Object: Bead **Material:** Shell.
Description: Short cylinder bead of shell.

No: 6 Trench: A:TP1 **Context:** 305 **Period:** 3
Object: Bead **Material:** Shell.
Description: Small, short cylinder bead of shell with circular section.

No: 11 Trench: A:TP1 **Context:** 308 **Period:** 3
Object: Bead **Material:** Shell.
Description: Barrel bead of shell(?) with circular section. Fig. 8.4.

No: 558 Trench: A:TP1 **Context:** 912 **Period:** 2
Object: Bead **Material:** Shell.
Description: Short cylinder bead of shell. Fig. 8.4.

No: 864 Trench: A:TP5, TP3 **Context:** 1124 **Period:** 3
Object: Bead **Material:** Shell.
Description: Thick, disc-shaped bead of shell, under process.

No: 541 Trench: A:TP5 **Context:** 918 **Period:** 3-temple
Object: Bead **Material:** Shell.
Description: Small, disc-shaped bead of shell.

No: 52 Trench: A:S of S Temple **Context:** 303 **Period:** 4
Object: Bead **Material:** Shell.
Description: Small, spherical bead of shell(?).

No: 100 Trench: A:NWNT **Context:** 376 **Period:** 4
Object: Bead **Material:** Shell.
Description: Short cylinder bead of shell with circular section.

No: 133 Trench: A:NWNT **Context:** 540 **Period:** 4?
Object: Bead **Material:** Shell.
Description: Small, short cylinder bead of shell with circular section.

Unidentified stone beads

No: 759 Trench: F **Context:** 851 **Period:** 1
Object: Bead **Material:** Stone.
Description: Barrel-shaped dull white stone bead, under preparation(?).

No: 800 Trench: B **Context:** 736 **Period:** 1
Object: Bead **Material:** Stone.
Description: Slightly broken spherical bead of grey stone(?).

No: 167 Trench: B **Context:** 418 **Period:** 4
Object: Bead **Material:** Stone.
Description: Big, irregular bead of grey stone, perhaps used for animals.

No: 780 Trench: E **Context:** 843 **Period:** No period
Object: Bead **Material:** Stone.
Description: Square cylinder bead of green translucent stone with squarish section.

No: 826 Trench: E **Context:** 1206 **Period:** No period
Object: Bead **Material:** Stone.
Description: Spherical and truncated bead of pale green stone(?).

Terracotta beads

There are more terracotta beads in Period 1 and Period 2 compared to later periods (Table 8.3). Among these, the most common shape is arecanut. The other shapes found are spherical, long and short barrel, bicone, top-shaped and pot-shaped. Arecanut beads increased from Period 1 to Period 2. Spherical beads are more in Period 1 and decreased from Period 1 to Period 4 and are completely absent from Period 2 (Table 8.5).

No: 288 Trench: D1 **Context:** 754 **Period:** 1
Object: Bead **Material:** Terracotta.
Description: Top-shaped bead of terracotta. Fig. 8.3.

No: 342 Trench: D1 **Context:** 759 **Period:** 1
Object: Bead **Material:** Terracotta.
Description: Amlaka-seed-shaped bead of terracotta with black polish. Fig. 8.2.

No: 366 Trench: D2 **Context:** 715 **Period:** 1
Object: Bead **Material:** Terracotta.
Description: Pot-shaped bead of terracotta, slightly broken at one end, wheel marks visible. Fig. 8.3.

No: 377 Trench: D1 **Context:** 766 **Period:** 1
Object: Bead **Material:** Terracotta.
Description: Arecanut bead of terracotta with flat base.

No: 381 Trench: D2 **Context:** 718 **Period:** 1
Object: Bead **Material:** Terracotta.
Description: Biconical bead of terracotta, flattened on either end. Fig. 8.3.

No: 416 Trench: D2 **Context:** 718 **Period:** 1
Object: Bead **Material:** Terracotta.
Description: Spheroid bead of terracotta with black polish on body.

No: 434 Trench: D1 **Context:** 767 **Period:** 1
Object: Bead **Material:** Terracotta.
Description: Short barrel bead of terracotta, truncated on either end. Fig. 8.3.

No: 435 Trench: D1 **Context:** 767 **Period:** 1
Object: Bead **Material:** Terracotta.
Description: Pot-shaped bead of terracotta with truncated top. Fig. 8.3.

No: 464 Trench: D2 **Context:** 722 **Period:** 1
Object: Bead **Material:** Terracotta.
Description: Spherical bead of terracotta with cleavage. Fig. 8.3.

No: 466 Trench: D2 **Context:** 722 **Period:** 1
Object: Bead **Material:** Terracotta.
Description: Big and half-broken spherical bead of terracotta.

No: 490 Trench: D2 **Context:** 726 **Period:** 1
Object: Bead **Material:** Terracotta.
Description: Broken arecanut bead of terracotta.

No: 499 Trench: D2 **Context:** 729 **Period:** 1
Object: Bead **Material:** Terracotta.
Description: Half-broken spherical bead of terracotta with black polish.

No: 553 Trench: D2 **Context:** 726 **Period:** 1
Object: Bead **Material:** Terracotta.
Description: Vertically broken cylinder bead of terracotta, flattened on either end. Fig. 8.3.

No: 620 Trench: B **Context:** 458 **Period:** 1
Object: Bead **Material:** Terracotta.
Description: Arecanut bead of terracotta with convex base and truncated top.

No: 623 Trench: B **Context:** 467 **Period:** 1
Object: Bead **Material:** Terracotta.
Description: Broken, spherical bead of terracotta.

No: 655 Trench: B **Context:** 469 **Period:** 1
Object: Bead **Material:** Terracotta.
Description: Slightly broken, truncated bicone bead of terracotta.

No: 659 Trench: B **Context:** 474 **Period:** 1
Object: Bead **Material:** Terracotta.
Description: Top-shaped bead of terracotta, slightly truncated on either end. Fig. 8.3.

No: 708 Trench: B **Context:** 487 **Period:** 1
Object: Bead **Material:** Terracotta.
Description: Disc-shaped bead(?) of terracotta(?).

No: 709 Trench: B **Context:** 492 **Period:** 1
Object: Bead **Material:** Terracotta.
Description: Spheroid bead of terracotta. Fig. 8.3.

No: 753 Trench: B **Context:** 493 **Period:** 1
Object: Bead **Material:** Terracotta.
Description: Spherical bead of terracotta, truncated on either end with black polish.

No: 755 Trench: F **Context:** 851 **Period:** 1
Object: Bead **Material:** Terracotta.
Description: Arecanut bead of terracotta, flat at the base and concave at the top. Fig. 8.3.

No: 764 Trench: B **Context:** 499 **Period:** 1
Object: Bead **Material:** Terracotta.
Description: Truncated, biconvex bead of terracotta.

No: 773 Trench: F **Context:** 851 **Period:** 1
Object: Bead **Material:** Terracotta.
Description: Top-shaped bead of terracotta, slightly broken at the base, flattened on top. Fig. 8.3.

No: 775 Trench: F **Context:** 851 **Period:** 1
Object: Bead **Material:** Terracotta.
Description: Slightly broken arecanut bead of terracotta with flat base and flattened top.

No: 807 Trench: A:TP1 **Context:** 1144 **Period:** 1
Object: Bead **Material:** Terracotta.
Description: Plano-convex-shaped bead of terracotta.

No: 811 Trench: A:TP1 **Context:** 1150 **Period:** 1
Object: Bead **Material:** Terracotta.
Description: Spheroid bead of terracotta with black polish.

No: 258 Trench: D2 **Context:** 702 **Period:** 2
Object: Bead **Material:** Terracotta.
Description: Arecanut bead of terracotta with flat base. Fig. 8.3.

No: 335 Trench: D2 **Context:** 706 **Period:** 2
Object: Bead **Material:** Terracotta.
Description: Arecanut bead of terracotta, flattened on either end. Fig. 8.3.

No: 339 Trench: D2 **Context:** 711 **Period:** 2
Object: Bead **Material:** Terracotta.
Description: Arecanut bead of terracotta with convex base. Fig. 8.3.

No: 341 Trench: D2 **Context:** 711 **Period:** 2
Object: Bead **Material:** Terracotta.
Description: Top-shaped bead of terracotta with flattened top. Fig. 8.3.

No: 595 Trench: A:TP1 **Context:** 944 **Period:** 1
Object: Bead **Material:** Terracotta.
Description: Broken, pot-shaped bead of terracotta with black polish and banded decoration.

No: 596 Trench: A:TP1 **Context:** 944 **Period:** 2
Object: Bead **Material:** Terracotta.
Description: Pot-shaped bead of terracotta with black polish.

No: 652 Trench: A:TP1 **Context:** 997 **Period:** 2
Object: Bead **Material:** Terracotta.
Description: Pumpkin-shaped(?) bead of terracotta, slightly broken.

No: 676 Trench: F **Context:** 788 **Period:** 2
Object: Bead **Material:** Terracotta.
Description: Arecanut bead of terracotta with convex base, truncated on top.

No: 684 Trench: F **Context:** 789 **Period:** 2
Object: Bead **Material:** Terracotta.
Description: Arecanut bead of terracotta with convex base and truncated top.

No: 720 Trench: F **Context:** 846 **Period:** 2
Object: Bead **Material:** Terracotta.
Description: Broken, arecanut bead of terracotta with slightly convex base.

No: 723 Trench: F **Context:** 846 **Period:** 2
Object: Bead **Material:** Terracotta.
Description: Arecanut bead of terracotta, slightly concave at the base. Fig. 8.3.

No: 725 Trench: A:TP1 **Context:** 1077 **Period:** 2
Object: Bead **Material:** Terracotta.
Description: Arecanut bead of terracotta with convex base, wheel marks visible.

No: 744 Trench: A:TP1 **Context:** 1099 **Period:** 2
Object: Bead **Material:** Terracotta.
Description: Arecanut bead of terracotta with slightly convex base.

No: 788 Trench: A:TP1 **Context:** 1120 **Period:** 2
Object: Bead **Material:** Terracotta.
Description: Long barrel bead of terracotta, tapering on either end, broken at one end.

No: 793 Trench: A:TP1 **Context:** 1126 **Period:** 2
Object: Bead **Material:** Terracotta.
Description: Arecanut bead of terracotta with concave base, flattened top.

No: 15 Trench: A:TP1 **Context:** 312 **Period:** 3
Object: Bead **Material:** Terracotta.
Description: Small, spheroid bead of terracotta.

No: 61 Trench: A:TP1 **Context:** 312 **Period:** 3
Object: Bead **Material:** Terracotta.
Description: Slightly broken spacer bead of terracotta, concave at the bottom and convex on the top.

No: 260 Trench: D1 **Context:** 751 **Period:** 3
Object: Bead **Material:** Terracotta.
Description: Arecanut bead of terracotta with flat base. Fig. 8.3.

No: 265 Trench: D1 **Context:** 751 **Period:** 3
Object: Bead **Material:** Terracotta.
Description: Small, arecanut bead of terracotta with flat base. Fig. 8.3.

No: 267 Trench: D1 **Context:** 751 **Period:** 3
Object: Bead **Material:** Terracotta.
Description: Spheroid bead of terracotta in black colour.

No: 668 Trench: A:TP3 **Context:** 1012 **Period:** 2
Object: Bead **Material:** Terracotta.
Description: Arecanut bead of terracotta with concave base, flattened top.

No: 805 Trench: A:TP3 **Context:** 1140 **Period:** 3
Object: Bead **Material:** Terracotta.
Description: Top-shaped bead of terracotta, truncated on top.

No: 564 Trench: A:TP9, GG North **Context:** 927 **Period:** 3-temple
Object: Bead **Material:** Terracotta.
Description: Lenticular bead of terracotta, slightly concave at the top.

No: 666 Trench: A:TP9 **Context:** 1010 **Period:** 3-temple
Object: Bead **Material:** Terracotta.
Description: Spherical bead of terracotta, truncated on either end.

No: 795 Trench: A:TP5 **Context:** 1130 **Period:** 3-temple
Object: Bead **Material:** Terracotta.
Description: Small, arecanut bead of terracotta with convex base and truncated top.

No: 858 Trench: A:TP3 **Context:** 1095 **Period:** 3-temple
Object: Bead **Material:** Terracotta.
Description: Spherical bead of terracotta, truncated on either end with black polish. Fig. 8.2.

No: 59 Trench: A:S of S Temple **Context:** 303 **Period:** 4
Object: Bead **Material:** Terracotta.
Description: Small spherical bead of terracotta.

No: 172 Trench: B **Context:** 427 **Period:** 4
Object: Bead **Material:** Terracotta.
Description: Crude and bicone bead of terracotta.

No: 173 Trench: B **Context:** 429 **Period:** 4
Object: Bead **Material:** Terracotta.
Description: Long barrel bead of terracotta, broken on either end.

No: 175 Trench: B **Context:** 429 **Period:** 4
Object: Bead **Material:** Terracotta.
Description: Slightly broken long barrel bead of terracotta with circular section.

No: 195 Trench: B **Context:** 435 **Period:** 4
Object: Bead **Material:** Terracotta.
Description: Six long barrel beads of terracotta with circular section, different sizes, perhaps also used as fish net weights. Fig. 8.2.

No: 280 Trench: A:TP6 **Context:** 596 **Period:** 2
Object: Bead **Material:** Terracotta.
Description: Top-shaped bead of terracotta with truncated top, vertically broken.

No: 689 Trench: A:TP9 **Context:** 684 **Period:** 4
Object: Bead **Material:** Terracotta.
Description: Arecanut bead of terracotta with convex base and truncated top.

No: 76 Trench: A:NWNT **Context:** 332 **Period:** 4?
Object: Bead **Material:** Terracotta.
Description: Arecanut bead of terracotta with flat base and flattened at the top.

No: 89 Trench: A:S Temple **Context:** 366 **Period:** No period
Object: Bead **Material:** Terracotta.
Description: Arecanut bead of terracotta with convex base.

No: 285 Trench: A:South Area **Context:** 513 **Period:** No period
Object: Bead **Material:** Terracotta.
Description: Arecanut bead of terracotta with concave base and flattened top.

No: 387 Trench: E **Context:** 801 **Period:** No period
Object: Bead **Material:** Terracotta.
Description: Arecanut bead of terracotta with flat base and concave top.

No: 607 Trench: E **Context:** 824 **Period:** No period
Object: Bead **Material:** Terracotta.
Description: Squat globular bead of terracotta.

No: 866 Trench: A:TP7 **Context:** 1191 **Period:** No period
Object: Bead **Material:** Terracotta.
Description: Arecanut bead of terracotta with flat base.

No: 528 Trench: E **Context:** 816 **Period:** No period
Object: Bead **Material:** Terracotta.
Description: Irregular bead of terracotta with convex body and collared concave base, slightly damaged on top.

No: 196 Trench: B **Context:** 435 **Period:** 4
Object: Bead **Material:** Terracotta.
Description: Big, irregular bead(?) of terracotta used for animals or net sinker(?).

Topaz(?) beads

No: 653 Trench: B **Context:** 467 **Period:** 1
Object: Bead **Material:** Topaz.
Description: Big, hexagonal, faceted barrel bead of topaz(?). Figs 8.2 and 8.4.
Ref: A similar type of bead made of crystal was found in Period II of Pauni (Nath 1998: fig. 27, 14).

Bangles

A total of 143 bangles came to light during the excavations (see Table 8.6), although they are very fragmentary (Fig. 8.5). Of these, glass bangles are the most common, followed by shell and then ivory. The bangles found in Period 1 and Period 2 are few in number, but the number increases in Period 3 and Period 4.

Copper bangles

Five copper bangles were recorded, one from Period 3, three from Period 4 and one from a layer that has not been allocated to a period. They are completely absent from other periods.

No: 10 Trench: A:TP1 **Context:** 308 **Period:** 3
Object: Bangle **Material:** Copper.
Description: Fragment of a thin and broad bangle of copper, concave at the bottom and convex on top. Fig. 8.6.

Table 8.6: Summary of bangles by material and period.

	1	2	3	3-temple	4	4?	No period	Total
Copper			1		3		1	5
Glass	2	1	13		26		23	65
Ivory			3	2	6	4	7	22
Shell	1	2	16	10	9	2	9	49
Stone	1							1
Terracotta		1						1
Total	**4**	**4**	**33**	**12**	**44**	**6**	**40**	**143**

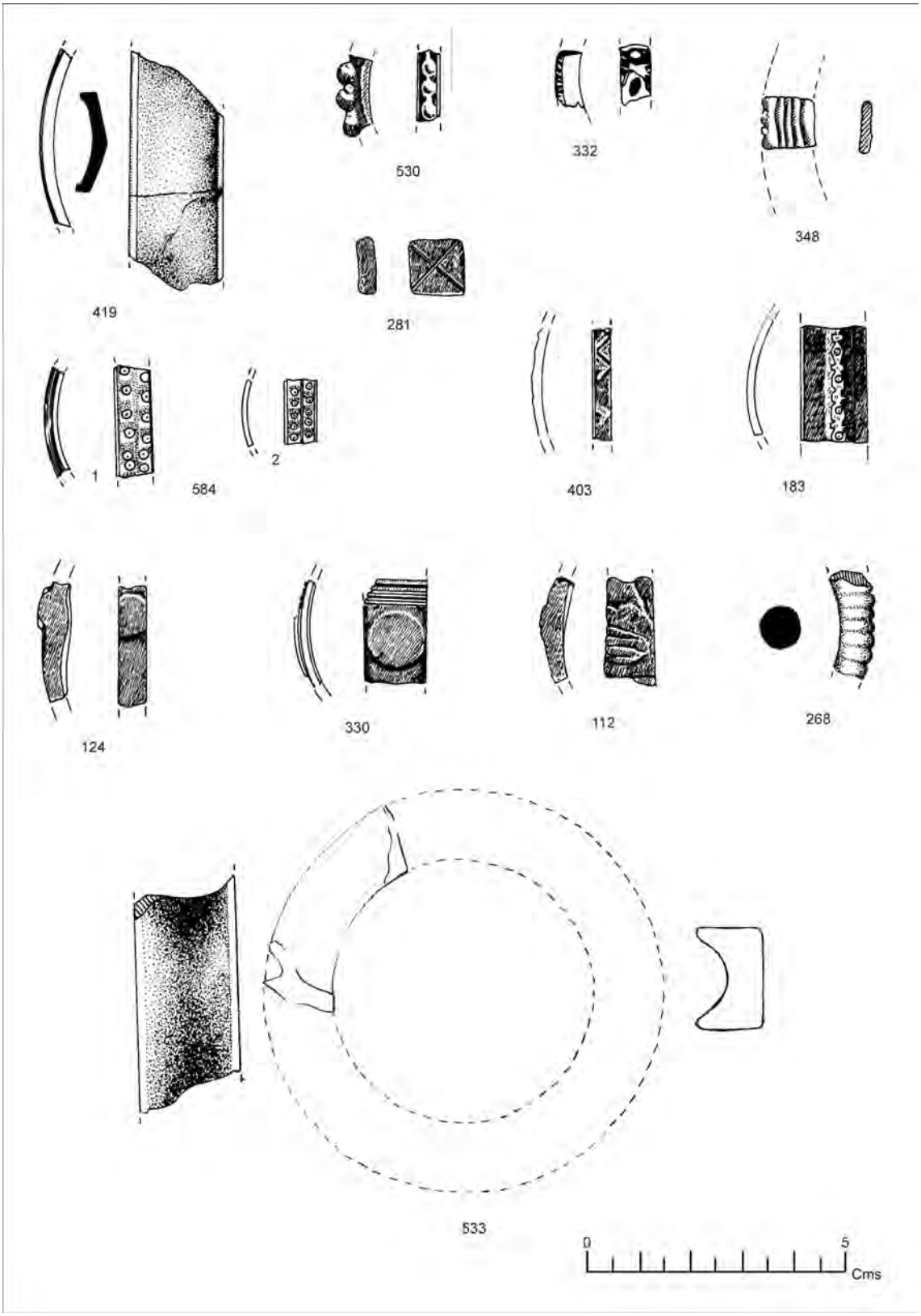


Fig. 8.5: Bangles of different materials.

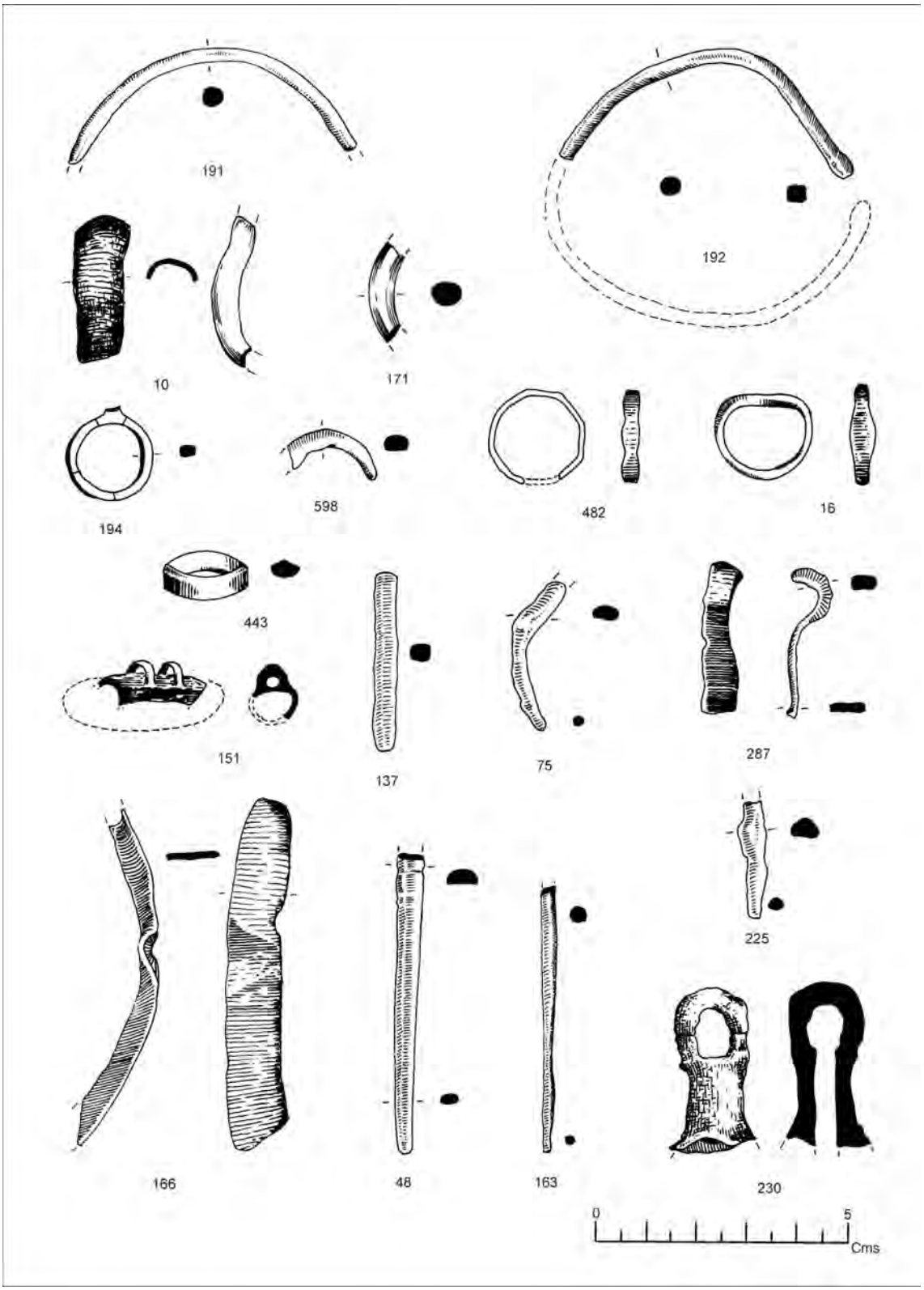


Fig. 8.6: Copper objects.

No: 171 Trench: B **Context:** 427 **Period:** 4
Object: Bangle **Material:** Copper.
Description: Fragment of a thin and slender bangle of copper alloy with circular section. Fig. 8.6.

No: 191 Trench: B **Context:** 435 **Period:** 4
Object: Bangle **Material:** Copper.
Description: Broken, thin bangle of copper alloy with a circular section. Fig. 8.6.

No: 192 Trench: B **Context:** 435 **Period:** 4
Object: Bangle **Material:** Copper.
Description: Curved bangle of copper with one end slightly broad and squarish, the other end narrow, round and broken. Fig. 8.6.

No: 661 Trench: E **Context:** 827 **Period:** No period
Object: Bangle **Material:** Copper.
Description: Two fragments of a thin bangle of copper alloy with grooves on either margins.

Glass bangles

The glass bangles recovered from Period 1 and 2 are fewer in number than in Period 3 and 4. These are mostly monochrome. However, a very few polychrome glass bangles were also found, which exhibit different colours like black, green, blue, yellow and red in different hues. These are mostly plain but a few exhibit some decoration. Both thin and slender and broad and thick varieties of bangles were found. They exhibit rectangular, squarish, biconvex, plano-convex and triangular sections.

No: 419 Trench: D1 **Context:** 767 **Period:** 1
Object: Bangle **Material:** Glass.
Description: Fragment of a broad bangle(?) of violet opaque glass. Fig. 8.5.

No: 420 Trench: D1 **Context:** 767 **Period:** 1
Object: Bangle **Material:** Glass.
Description: Fragment of a bangle of black opaque glass with triangular section.

No: 743 Trench: A:TP1 **Context:** 1099 **Period:** 2
Object: Bangle **Material:** Glass.
Description: Fragment of a broad bangle of black opaque glass with roughly rectangular section.

No: 250 Trench: A:TP6 **Context:** 370 **Period:** 3
Object: Bangle **Material:** Glass.
Description: Fragment of a pale yellowish green bangle of opaque glass over brown base.

No: 276 Trench: A:South Area **Context:** 591 **Period:** 3
Object: Bangle **Material:** Glass.
Description: Fragment of a bangle of pale blue translucent glass with ovalish section, coated with silver paint.

No: 333 Trench: A:South Area **Context:** 624 **Period:** 3
Object: Bangle **Material:** Glass.
Description: Fragment of a bangle of black glass with plano-convex section.

No: 334 Trench: A:South Area **Context:** 624 **Period:** 3
Object: Bangle **Material:** Glass.
Description: Fragment of a thin bangle of dark green translucent glass with rectangular section.

No: 453 Trench: A:South Area **Context:** 668 **Period:** 3
Object: Bangle **Material:** Glass.
Description: Fragment of a thin bangle of black glass with plano-convex section.

No: 454 Trench: A:South Area **Context:** 670 **Period:** 3
Object: Bangle **Material:** Glass.
Description: Fragment of a thick bangle of black opaque glass with plano-convex section.

No: 455 Trench: A:South Area **Context:** 670 **Period:** 3
Object: Bangle **Material:** Glass.
Description: Fragment of a thin bangle of green translucent glass with grey coating.

No: 457 Trench: A:South Area **Context:** 675 **Period:** 3
Object: Bangle **Material:** Glass.
Description: Fragment of a thick bangle of translucent, turquoise glass with rectangular section, decorated by a shallow diamond cut design on top with thick silvery white paint coating.

No: 586 Trench: F **Context:** 778 **Period:** 3
Object: Bangle **Material:** Glass.
Description: Fragment of a bangle of black opaque glass with trapezoidal section.

No: 669 Trench: A:TP3 **Context:** 1012 **Period:** 3
Object: Bangle **Material:** Glass.
Description: Fragment of a bangle of dark blue translucent glass with plano-convex section.

No: 670 Trench: A:TP3 **Context:** 1012 **Period:** 3
Object: Bangle **Material:** Glass.
Description: Fragment of a broad bangle of dark blue opaque glass with two incised grooves design on the top.

No: 735 Trench: A:TP6 **Context:** 1051 **Period:** 3
Object: Bangle **Material:** Glass.
Description: Fragment of a perforated bangle of dark blue opaque glass, twisted rope like and with a squarish section.

No: 239 Trench: A:South Area **Context:** 568 **Period:** 4
Object: Bangle **Material:** Glass.
Description: Fragment of parrot green bangle of opaque glass with a triangular section and decoration of incised lines on either margin on the top.

No: 320 Trench: A:TP6, South Area **Context:** 613 **Period:** 4
Object: Bangle **Material:** Glass.
Description: Fragment of a thin bangle of blue translucent glass with plano-convex section, with a silvery-shine coating over the body.

No: 321 Trench: A:TP6, South Area **Context:** 613 **Period:** 4
Object: Bangle **Material:** Glass.
Description: Fragment of a broad bangle of yellow opaque glass over a pale grey base with a roughly rectangular section.

No: 322 Trench: A:TP6, South Area **Context:** 613 **Period:** 4
Object: Bangle **Material:** Glass.
Description: Fragment of a bangle of black opaque glass with a triangular section.

No: 323 Trench: A:TP6, South Area **Context:** 613 **Period:** 4
Object: Bangle **Material:** Glass.
Description: Fragment of a bangle of red glass with a plano-convex section; it exhibits burnt sienna, green and chrome orange shades, decorated by incised design.

No: 324 Trench: A:W Area **Context:** 618 **Period:** 4
Object: Bangle **Material:** Glass.
Description: Fragment of a bangle of yellow opaque glass over pale grey base with a roughly rectangular section.

No: 325 Trench: A:W Area **Context:** 618 **Period:** 4
Object: Bangle **Material:** Glass.
Description: Fragment of a thin bangle of black glass with a triangular section.

No: 327 Trench: A:South Area **Context:** 619 **Period:** 4
Object: Bangle **Material:** Glass.
Description: Fragment of a thin bangle of green opaque glass over pale blue base with a squarish section.

No: 328 Trench: A:South Area **Context:** 619 **Period:** 4
Object: Bangle **Material:** Glass.
Description: Fragment of a thin bangle of yellow opaque glass over a pale grey base with a rectangular section.

No: 329 Trench: A:South Area **Context:** 619 **Period:** 4
Object: Bangle **Material:** Glass.
Description: Fragment of a thin bangle of green opaque glass.

No: 332 Trench: A:South Area **Context:** 619 **Period:** 4
Object: Bangle **Material:** Polychrome glass.
Description: Fragment of a bangle of polychrome glass with pale grey at the base followed by yellow and red with white dots at the apex. Fig. 8.5.

No: 343 Trench: A:South Area, TP6 **Context:** 635 **Period:** 4
Object: Bangle **Material:** Glass.
Description: Fragment of a thin bangle of bluish-green translucent glass with a roughly triangular section.

No: 344 Trench: A:South Area, TP6 **Context:** 635 **Period:** 4
Object: Bangle **Material:** Glass.
Description: Fragment of a thin bangle of grass-green translucent glass with a plano-convex section.

No: 348 Trench: A:South Area, TP6 **Context:** 635 **Period:** 4
Object: Bangle **Material:** Polychrome glass.
Description: Fragment of a bangle of stratified glass with green at the base followed by yellow, red and blue at the top with cut design and white dots in the depressions. Fig. 8.5.

No: 350 Trench: A:South Area, TP6 **Context:** 635 **Period:** 4
Object: Bangle **Material:** Glass.
Description: Fragment of a bangle of yellow opaque glass with a triangular section, and small dots of yellow glass affixed at the apex.

No: 359 Trench: A:South Area, TP6 **Context:** 635 **Period:** 4
Object: Bangle **Material:** Glass.
Description: Fragment of a broad and thin bangle of black opaque glass with a rectangular section, decorated by a series of grooves.

No: 372 Trench: A:W Area **Context:** 643 **Period:** 4
Object: Bangle **Material:** Glass.
Description: Fragment of a thick and broad bangle(?) of dark honey-coloured opaque glass with a plano-convex section.

No: 376 Trench: A:W Area **Context:** 644 **Period:** 4
Object: Bangle **Material:** Glass.
Description: Fragment of a thin bangle of dark green translucent glass with a plano-convex section.

No: 460 Trench: A:South Area **Context:** 678 **Period:** 4
Object: Bangle **Material:** Glass.
Description: Fragment of a thin bangle of pale golden yellow translucent glass with a plano-convex section of uneven thickness.

No: 461 Trench: A:South Area **Context:** 678 **Period:** 4
Object: Bangle **Material:** Glass.
Description: Fragment of a thin bangle of green opaque glass over a brown base with a plano-convex section.

No: 479 Trench: A:TP9 **Context:** 684 **Period:** 4
Object: Bangle **Material:** Glass.
Description: Fragments of a bangle of yellow opaque glass on a cream base with a trapezoidal section.

No: 480 Trench: A:TP9 **Context:** 684 **Period:** 4
Object: Bangle **Material:** Glass.
Description: Fragment of a thin bangle of black opaque glass with a triangular section.

No: 520 Trench: A:W Area **Context:** 920 **Period:** 4
Object: Bangle **Material:** Glass.
Description: Fragment of a bangle of dark blue translucent glass with a plano-convex section.

No: 521 Trench: A:W Area **Context:** 920 **Period:** 4
Object: Bangle **Material:** Glass.
Description: Fragment of a slightly broad bangle of bluish-green translucent glass with a plano-convex section.

No: 527 Trench: A:TP10 **Context:** 928 **Period:** 4
Object: Bangle **Material:** Glass.
Description: Fragment of a bangle of yellow opaque glass over a grey base with a plano-convex section.

No: 690 Trench: A:TP9 **Context:** 684 **Period:** 4
Object: Bangle **Material:** Glass.
Description: Fragment of a thin bangle of black glass with a triangular section.

No: 392 Trench: E **Context:** 801 **Period:** No period
Object: Bangle **Material:** Glass.
Description: Broken bangle of honey-colour opaque glass with a squarish section and a silvery white paint coating on the body.

No: 393 Trench: E **Context:** 801 **Period:** No period
Object: Bangle **Material:** Glass.
Description: Broken bangle of bluish-green translucent glass with a silvery white paint coat on the body.

No: 397 Trench: E **Context:** 809 **Period:** No period
Object: Bangle **Material:** Glass.
Description: Broken bangle of black glass with a triangular section.

No: 398 Trench: E **Context:** 809 **Period:** No period
Object: Bangle **Material:** Glass.
Description: Broken bangle of blue translucent glass with a plano-convex section.

No: 438 Trench: E **Context:** 811 **Period:** No period
Object: Bangle **Material:** Glass.
Description: Broken, broad and thick bangle of black opaque glass with a triangular section, decorated by white dots at intervals on the top.

No: 439 Trench: E **Context:** 811 **Period:** No period
Object: Bangle **Material:** Glass.
Description: Fragment of a thin bangle of pale brown opaque glass with a rectangular section, decorated by bluish-green dots at intervals on top.

No: 530 Trench: E **Context:** 816 **Period:** No period
Object: Bangle **Material:** Glass.
Description: Broken bangle of blue translucent glass with a roughly triangular section. Fig. 8.5.

No: 534 Trench: E **Context:** 816 **Period:** No period
Object: Bangle **Material:** Glass.
Description: Fragment of a bangle of dark green translucent glass with a plano-convex section.

No: 550 Trench: E **Context:** 812 **Period:** No period
Object: Bangle **Material:** Glass.
Description: Fragment of a bangle of pale brick-red opaque glass over a pale grey base with a triangular section.

No: 551 Trench: E **Context:** 812 **Period:** No period
Object: Bangle **Material:** Glass.
Description: Fragment of a bangle of yellow opaque glass over a pale grey base with a roughly rectangular section.

No: 552 Trench: E **Context:** 812 **Period:** No period
Object: Bangle **Material:** Glass.
Description: Fragment of a broad and thin bangle of black glass with a plano-convex section.

No: 561 Trench: E **Context:** 818 **Period:** No period
Object: Bangle **Material:** Glass.
Description: Broken bangle of black glass with a triangular section.

No: 632 Trench: E **Context:** 826 **Period:** No period
Object: Bangle **Material:** Glass.
Description: Broken bangle of black glass with a triangular section.

No: 633 Trench: E **Context:** 826 **Period:** No period
Object: Bangle **Material:** Glass.
Description: Fragment of a broad bangle of black glass with a plano-convex section.

No: 665 Trench: E **Context:** 829 **Period:** No period
Object: Bangle **Material:** Glass.
Description: Fragment of a bangle of black glass with thin incised grooves on top.

No: 687 Trench: E **Context:** 829 **Period:** No period
Object: Bangle **Material:** Glass.
Description: Fragment of a thick bangle of black glass with a circular section.

No: 712 Trench: E **Context:** 816 **Period:** No period
Object: Bangle **Material:** Glass.
Description: Broken bangle of dark green glass with a roughly squarish section.

No: 713 Trench: E **Context:** 816 **Period:** No period
Object: Bangle **Material:** Glass.
Description: Broken bangle of blue translucent glass with a circular section.

No: 765 Trench: E **Context:** 816 **Period:** No period
Object: Bangle **Material:** Glass.
Description: Fragment of a broad bangle of black glass with a plano-convex section.

No: 766 Trench: E **Context:** 816 **Period:** No period
Object: Bangle **Material:** Glass.
Description: Fragment of a bangle of grass-green opaque glass over a pale grey base with a triangular section.

No: 767 Trench: E **Context:** 816 **Period:** No period
Object: Bangle **Material:** Glass.
Description: Fragment of a bangle of blue glass with incised decoration on top.

No: 838 Trench: A:TP7 **Context:** 1191 **Period:** No period
Object: Bangle **Material:** Glass.
Description: Fragment of a bangle of black glass with a round section.

No: 869 Trench: A:TP8 **Context:** 1216 **Period:** No period
Object: Bangle **Material:** Glass.
Description: Fragment of a bangle of yellow opaque glass over a pale grey base with a roughly rectangular section.

No: 60 Trench: A:TP1 **Context:** 312 **Period:** 3
Object: Bangle **Material:** Glass.
Description: Fragment of a bangle of pale yellow opaque soft glass with a circular section, flaky.

Ivory bangles

A total of 22 ivory bangles were found. These are completely absent in Periods 1 and 2. They were found in thin and slender as well as broad and thin varieties. Many of the bangles show excellent incised and embossed decorative motifs on their top surface.

No: 251 Trench: A:TP6 **Context:** 370 **Period:** 3
Object: Bangle **Material:** Ivory.
Description: Thin and slender bangle of ivory(?) with rectangular section.

No: 403 Trench: A:South Area **Context:** 647 **Period:** 3
Object: Bangle **Material:** Ivory.
Description: Fragment of a narrow and thin bangle of ivory with a rectangular section, decorated on top by triangular pattern, bordered by incised grooves on either margin. Fig. 8.5.

No: 584 Trench: F **Context:** 778 **Period:** 3
Object: Bangle **Material:** Ivory.

Description: Fragments of a bangle of ivory with a rectangular section; one piece is decorated on top by two rows of circles in shallow relief, and the second piece is a narrow and thin bangle decorated on top by two rows of circles in shallow relief with traces of pink paint. Fig. 8.5.
Ref: Parallels can be drawn with a similar specimen from Period V of Nevasa (Sankalia *et al*. 1960: 468, fig. 198, 4).

No: 489 Trench: A:TP5 **Context:** 700 **Period:** 3-temple
Object: Bangle **Material:** Ivory.
Description: Fragment of a bangle of ivory(?) with a roughly rectangular section.

No: 608 Trench: A:TP5 **Context:** 955 **Period:** 3-temple
Object: Bangle **Material:** Ivory.
Description: Fragment of a bangle of ivory(?) with a roughly rectangular section.

No: 62 Trench: A:TP5 **Context:** 330 **Period:** 4
Object: Bangle **Material:** Ivory.
Description: Fragment of an ivory(?) bangle with a roughly biconvex section.

No: 97 Trench: A:NWNT **Context:** 376 **Period:** 4
Object: Bangle **Material:** Ivory.
Description: Fragment of a thick bangle of ivory(?) with a rectangular section.

No: 98 Trench: A:NWNT **Context:** 376 **Period:** 4
Object: Bangle **Material:** Ivory.
Description: Fragment of a bangle of ivory(?) with a roughly rectangular section.

No: 121 Trench: A:TP9 **Context:** 519 **Period:** 4
Object: Bangle **Material:** Ivory.
Description: Fragment of a slender and thin bangle of ivory with a rectangular section.

No: 183 Trench: B **Context:** 430 **Period:** 4
Object: Bangle **Material:** Ivory.
Description: Fragment of a broad bangle of ivory with a rectangular section, decorated on top by a row of fishes in the centre in a low relief, traces of pink paint on the body. Fig. 8.5.

No: 519 Trench: A:W Area **Context:** 920 **Period:** 4
Object: Bangle **Material:** Ivory.
Description: Fragment of a slightly broad bangle of ivory(?) with plano-convex section, decorated on top by circles in low relief in the centre, bordered by incised grooves.

No: 79 Trench: A:NWNT **Context:** 336 **Period:** 4?
Object: Bangle **Material:** Ivory.
Description: Fragment of a broad ivory bangle decorated on top by two rows of circles in shallow relief, a horizontal line separating the rows.

No: 116 Trench: A:NWNT **Context:** 507 **Period:** 4?
Object: Bangle **Material:** Ivory.
Description: Fragment of a bangle of ivory(?) with a rectangular section.

No: 134 Trench: A:NWNT **Context:** 540 **Period:** 4?
Object: Bangle **Material:** Ivory.
Description: Fragment of a slender and thin bangle of ivory with a rectangular section.

No: 138 Trench: A:NWNT **Context:** 546 **Period:** 4?
Object: Bangle **Material:** Ivory.
Description: Fragment of a bangle of ivory(?) with a triangular section.

No: 23 Trench: A:TP2 **Context:** 317 **Period:** No period
Object: Bangle **Material:** Ivory.
Description: Fragment of a bangle of ivory(?) with a biconvex section.

No: 563 Trench: E **Context:** 821 **Period:** No period
Object: Bangle **Material:** Ivory.
Description: Broken, thin and slender bangle of ivory(?) with a rectangular section.

No: 662 Trench: E **Context:** 827 **Period:** No period
Object: Bangle **Material:** Ivory.
Description: Fragment of a thin and slender flat bangle of ivory(?) with a rectangular section.

No: 686 Trench: E **Context:** 829 **Period:** No period
Object: Bangle **Material:** Ivory.
Description: Five broken, thin, slender and flat bangles of ivory(?) with a rectangular section and occasional holes on body.

No: 768 Trench: E **Context:** 816 **Period:** No period
Object: Bangle **Material:** Ivory.
Description: Broad, thin and flat bangle pieces of ivory with a rectangular section and one piece having a hole in the centre.

No: 833 Trench: E **Context:** 1207 **Period:** No period
Object: Bangle **Material:** Ivory.
Description: Broken bangle of ivory(?) which is under preparation.

No: 834 Trench: E **Context:** 1208 **Period:** No period
Object: Bangle **Material:** Ivory.
Description: Broken, thin and slender bangle of ivory(?) with a squarish section.

Shell bangles

A total of 49 shell bangles came to light. Their number gradually increases from Period 1 to Period 3 and decreases in Period 4. Except for a few decorated examples, all are plain bangles. Both thick and thin varieties were found.

No: 626 Trench: B **Context:** 467 **Period:** 1
Object: Bangle **Material:** Shell.
Description: Fragment of a faceted bangle of shell(?) with a pentagonal section.

No: 594 Trench: A:TP1 **Context:** 944 **Period:** 2
Object: Bangle **Material:** Shell.
Description: Fragment of a bangle of shell with a rectangular section and with a patina.

No: 772 Trench: A:TP1 **Context:** 1111 **Period:** 2
Object: Bangle **Material:** Shell.
Description: Fragment of a thin and slender bangle of shell with a rectangular section.

No: 9 Trench: A:TP1 **Context:** 307 **Period:** 3
Object: Bangle **Material:** Shell.
Description: Fragment of a thick bangle of shell with a rectangular section.

No: 18 Trench: A:TP1 **Context:** 312 **Period:** 3
Object: Bangle **Material:** Shell.
Description: Fragment of a slender bangle of shell with a plano-convex section.

No: 257 Trench: A:South Area **Context:** 589 **Period:** 3
Object: Bangle **Material:** Shell.
Description: Fragment of a slender bangle of shell with a rectangular section and plano-convex ends.

No: 270 Trench: A:South Area **Context:** 591 **Period:** 3
Object: Bangle **Material:** Shell.
Description: Fragment of a shell bangle with a rectangular section.

No: 271 Trench: A:South Area **Context:** 591 **Period:** 3
Object: Bangle **Material:** Shell.
Description: Fragment of a broad and thin shell bangle with a lenticular section.

No: 273 Trench: A:South Area **Context:** 591 **Period:** 3
Object: Bangle **Material:** Shell.
Description: Fragment of a shell bangle with a rectangular section.

No: 275 Trench: A:South Area **Context:** 591 **Period:** 3
Object: Bangle **Material:** Shell.
Description: Fragment of a shell bangle with a rectangular section.

No: 307 Trench: A:South Area **Context:** 608 **Period:** 3
Object: Bangle **Material:** Shell.
Description: Fragment of a broad and thin bangle of shell with a rectangular section.

No: 309 Trench: A:South Area **Context:** 608 **Period:** 3
Object: Bangle **Material:** Shell.
Description: Fragment of a slender shell bangle with a rectangular section and plano-convex ends.

No: 330 Trench: A:TP5 **Context:** 622 **Period:** 2
Object: Bangle **Material:** Shell.
Description: Fragment of a broad and thin bangle of shell with a lenticular section, decorated on top by a circle in low relief followed by a series of incised vertical grooves. Fig. 8.5.

No: 500 Trench: A:W Area, TP6 **Context:** 650 **Period:** 3
Object: Bangle **Material:** Shell.
Description: Fragment of a bangle of shell with a rectangular section.

No: 568 Trench: A:South Area **Context:** 931 **Period:** 3
Object: Bangle **Material:** Shell.
Description: Fragment of a broad and thin bangle of shell with a rectangular section.

No: 628 Trench: A:TP6 **Context:** 373 **Period:** 3
Object: Bangle **Material:** Shell.
Description: Fragment of a bangle of shell with a rectangular section.

No: 630 Trench: A:TP6 **Context:** 373 **Period:** 3
Object: Bangle **Material:** Shell.
Description: Fragment of a broad and thick bangle of shell with a rectangular section.

No: 645 Trench: A:TP6 **Context:** 987 **Period:** 3
Object: Bangle **Material:** Shell.
Description: Fragment of a thin and slender bangle of shell with a rectangular section.

No: 736 Trench: A:TP6 **Context:** 1051 **Period:** 3
Object: Bangle **Material:** Shell.
Description: Fragment of a broad and thick bangle of shell with a pentagonal section.

No: 361 Trench: A:TP5 **Context:** 638 **Period:** 3-temple
Object: Bangle **Material:** Shell.
Description: Fragment of a shell bangle with a roughly biconvex section.

No: 368 Trench: A:TP5 **Context:** 642 **Period:** 3-temple
Object: Bangle **Material:** Shell.
Description: Fragment of a thin and broad shell bangle with a roughly rectangular section.

No: 458 Trench: A:TP5 **Context:** 667 **Period:** 3-temple
Object: Bangle **Material:** Shell.
Description: Fragment of a thin bangle of shell.

No: 514 Trench: A:TP5 **Context:** 918 **Period:** 3-temple
Object: Bangle **Material:** Shell.
Description: Fragment of a thin bangle of shell with a rectangular section.

No: 539 Trench: A:TP5 **Context:** 918 **Period:** 3-temple
Object: Bangle **Material:** Shell.
Description: Fragment of a shell bangle with a rectangular section.

No: 588 Trench: A:TP5 **Context:** 918 **Period:** 3-temple
Object: Bangle **Material:** Shell.
Description: Fragment of a thin bangle of shell(?) with a rectangular section.

No: 641 Trench: A:TP5 **Context:** 978 **Period:** 3-temple
Object: Bangle **Material:** Shell.
Description: Fragment of a thick bangle of shell with a rectangular section.

No: 691 Trench: A:TP9 **Context:** 1010 **Period:** 3-temple
Object: Bangle **Material:** Shell.
Description: Fragment of a broad and thin bangle of shell with a roughly rectangular section.

No: 848 Trench: A:TP5 **Context:** 978 **Period:** 3-temple
Object: Bangle **Material:** Shell.
Description: Fragment of a thin and slender bangle of shell with a rectangular section.

No: 862 Trench: A:TP3 **Context:** 1112 **Period:** 3-temple
Object: Bangle **Material:** Shell.
Description: Fragment of a bangle of shell with an irregular section, pecked and not ground.

No: 34 Trench: A:NWNT, TP9 **Context:** 328 **Period:** 4
Object: Bangle **Material:** Shell.
Description: Fragment of a decorated shell bangle.

No: 53 Trench: A:S of S Temple **Context:** 303 **Period:** 4
Object: Bangle **Material:** Shell.
Description: Fragment of a bangle of shell with a rectangular section.

No: 224 Trench: B **Context:** 437 **Period:** 4
Object: Bangle **Material:** Shell.
Description: Fragment of a shell bangle with a rectangular section and plano-convex ends.

No: 227 Trench: B **Context:** 438 **Period:** 4
Object: Bangle **Material:** Shell.
Description: Fragment of a slender bangle of shell(?) with a rectangular section and plano-convex ends.

No: 292 Trench: A:South Area **Context:** 605 **Period:** 4
Object: Bangle **Material:** Shell.
Description: Two fragments of thin slender bangles of shell with a rectangular section, one piece having group of circles painted in violet colour on top.

No: 360 Trench: A:W Area **Context:** 636 **Period:** 4
Object: Bangle **Material:** Shell.
Description: Fragment of a slender and thin shell bangle with a rectangular section and plano-convex ends.

No: 406 Trench: A:TP6 **Context:** 649 **Period:** 2
Object: Bangle **Material:** Shell.
Description: Fragment of a broad and thin bangle of shell with an irregular section, and decoration of a band of incised lines on top.

No: 483 Trench: A:South Area **Context:** 645 **Period:** 4
Object: Bangle **Material:** Shell.
Description: Fragment of a broad bangle of shell with a rectangular section.

No: 491 Trench: A:TP6 **Context:** 905 **Period:** 4
Object: Bangle **Material:** Shell.
Description: Fragment of a bangle of shell with a rectangular section.

No: 112 Trench: A:NWNT **Context:** 504 **Period:** 4?
Object: Bangle **Material:** Shell.
Description: Fragment of a broad bangle of shell(?) decorated on top by excellent incised design. Fig. 8.5.

No: 124 Trench: A:NWNT **Context:** 529 **Period:** 4?
Object: Bangle **Material:** Shell.
Description: Fragment of a thick bangle of shell(?) decorated on top by ovalish relief on the outer surface. Fig. 8.5.
Ref: A similar shell bangle was found from Period V of Nevasa (Sankalia *et al*. 1960: 462, fig. 196, 8).

No: 41 Trench: A:TP2 **Context:** 323 **Period:** No period
Object: Bangle **Material:** Shell.
Description: Fragment of a slender and thick shell bangle with a rectangular section.

No: 549 Trench: E **Context:** 812 **Period:** No period
Object: Bangle **Material:** Shell.
Description: Broken, broad and thick bangle with a roughly rectangular section.

No: 701 Trench: E **Context:** 831 **Period:** No period
Object: Bangle **Material:** Shell.
Description: Fragment of a broad and thick bangle of shell with a squarish section.

No: 749 Trench: E **Context:** 841 **Period:** No period
Object: Bangle **Material:** Shell.
Description: Fragment of a bangle of shell(?).

No: 781 Trench: E **Context:** 844 **Period:** No period
Object: Bangle **Material:** Shell.
Description: Thick and broken bangle of shell with an embossed elongated oval decoration on the top.

No: 782 Trench: E **Context:** 844 **Period:** No period
Object: Bangle **Material:** Shell.
Description: Broken bangle of shell with a rectangular section.

No: 783 Trench: E **Context:** 844 **Period:** No period
Object: Bangle **Material:** Shell.
Description: Fragment of a broad bangle of shell with a roughly rectangular section.

No: 786 Trench: E **Context:** 844 **Period:** No period
Object: Bangle **Material:** Shell.
Description: Broken and thick bangle of shell with a squarish section.

No: 832 Trench: E **Context:** 1207 **Period:** No period
Object: Bangle **Material:** Shell.
Description: Broken bangle of shell with a plano-convex section.

Stone bangle

No: 533 Trench: D2 **Context:** 726 **Period:** 1
Object: Bangle **Material:** Stone.
Description: Broken and pulley-shaped bangle(?) of grass-green stone(?). Fig. 8.5.

Terracotta bangle

No: 268 Trench: D1 **Context:** 752 **Period:** 2
Object: Bangle **Material:** Terracotta.
Description: Fragment of a bangle of terracotta with gadrooned design on top. Fig. 8.5.

Finger-rings

Copper finger-rings

No: 683 Trench: B **Context:** 484 **Period:** 1
Object: Finger-ring **Material:** Copper.
Description: Fragments of a broad and thin finger-ring of copper alloy with greenish patina.

No: 729 Trench: B **Context:** 493 **Period:** 1
Object: Finger-ring **Material:** Copper.
Description: Fragment of a finger-ring(?) of copper, corroded.

No: 482 Trench: B **Context:** 444 **Period:** 2
Object: Finger-ring **Material:** Copper.
Description: Broken finger-ring of copper alloy with wavy edge and faceted design. Fig. 8.6.

No: 598 Trench: A:TP1 **Context:** 944 **Period:** 2
Object: Finger-ring **Material:** Copper.
Description: Fragment of a finger-ring(?) of copper alloy, corroded. Fig. 8.6.

No: 16 Trench: A:TP1 **Context:** 312 **Period:** 3
Object: Finger-ring **Material:** Copper.
Description: Heart-shaped finger-ring of copper with elongated diamond decoration on the top. Fig. 8.6.

No: 194 Trench: B **Context:** 435 **Period:** 4
Object: Finger-ring **Material:** Copper.
Description: Finger-ring of copper alloy with a slight projection at the top. Fig. 8.6.

No: 471 Trench: A:S Wall of N **Context:** 584 **Period:** 4
Object: Finger-ring **Material:** Copper.
Description: Slightly broken finger-ring of copper alloy.

No: 140 Trench: A:NWNT **Context:** 550 **Period:** 4?
Object: Finger-ring **Material:** Copper.
Description: Fragment of a finger-ring(?) of copper alloy, corroded.

No: 26 Trench: None **Context:** 0 **Period:** No period
Object: Finger-ring **Material:** Copper.
Description: Finger-ring of copper alloy with a projecting disc as decoration, encrusted.

No: 391 Trench: E **Context:** 801 **Period:** No period
Object: Finger-ring **Material:** Copper.
Description: Broken finger-ring of copper alloy.

Glass finger-rings

No: 487 Trench: A:TP5 **Context:** 700 **Period:** 3-temple
Object: Finger-ring **Material:** Glass.
Description: Two fragments of a finger-ring of pale grey opaque, soft glass with circular section.

No: 407 Trench: A:TP6 **Context:** 649 **Period:** 4
Object: Finger-ring **Material:** Glass.
Description: Broken finger-ring of yellow opaque glass over a cream base with triangular section.

No: 395 Trench: E **Context:** 805 **Period:** No period
Object: Finger-ring **Material:** Glass.
Description: Broken finger-ring of grass-green opaque glass.

Shell finger-ring

No: 14 Trench: A:TP1 **Context:** 308 **Period:** 3
Object: Finger-ring **Material:** Shell.
Description: Fragment of a thick finger-ring(?) of shell with a rectangular section.

No: 314 Trench: A:South Area **Context:** 608 **Period:** 3
Object: Finger-ring **Material:** Shell.
Description: Broken, thin finger-ring of shell with a plano-convex section.

Finger-ring stones

No: 404 Trench: A:South Area **Context:** 647 **Period:** 3
Object: Ring stone **Material:** Stone.
Description: Finger-ring stone of cream colour with plano-convex section.

No: 3 Trench: A:TP1 **Context:** 300 **Period:** 4
Object: Ring stone **Material:** Stone.
Description: Finger-ring stone(?) of white colour with plano-convex section.

Toe-rings

No: 193 Trench: B **Context:** 435 **Period:** 4
Object: Toe-ring **Material:** Copper.
Description: Toe-ring of copper alloy, which is a twisted thin wire.

No: 443 Trench: A:South Area, TP6 **Context:** 635 **Period:** 4
Object: Toe-ring **Material:** Copper.
Description: Toe-ring of copper alloy. Fig. 8.6.

Ear-studs

No: 38 Trench: A:TP9 **Context:** 320 **Period:** 4
Object: Ear-stud **Material:** Copper.
Description: Ear-stud(?) of copper alloy with a concentric spool shape.

No: 284 Trench: D1 **Context:** 751 **Period:** 3
Object: Ear-stud **Material:** Terracotta.
Description: Thick, disc-shaped ear-stud of terracotta with a circular section, slightly damaged and black in colour. Fig. 8.7.

No: 347 Trench: A:South Area, TP6 **Context:** 635 **Period:** 4
Object: Ear-stud **Material:** Terracotta.
Description: Cylinder-shaped ear-stud of terracotta with a circular section and slightly concave on either ends.

No: 88 Trench: A:S Temple **Context:** 366 **Period:** No period
Object: Ear stud **Material:** Terracotta.
Description: Cylinder-shaped ear-stud of terracotta with one lobe flat and the other lobe slightly concave, perforated.

No: 681 Trench: F **Context:** 788 **Period:** 2
Object: Ear-stud **Material:** Terracotta.
Description: Fragment of a reel-shaped ear-stud of terracotta. Fig. 8.7.

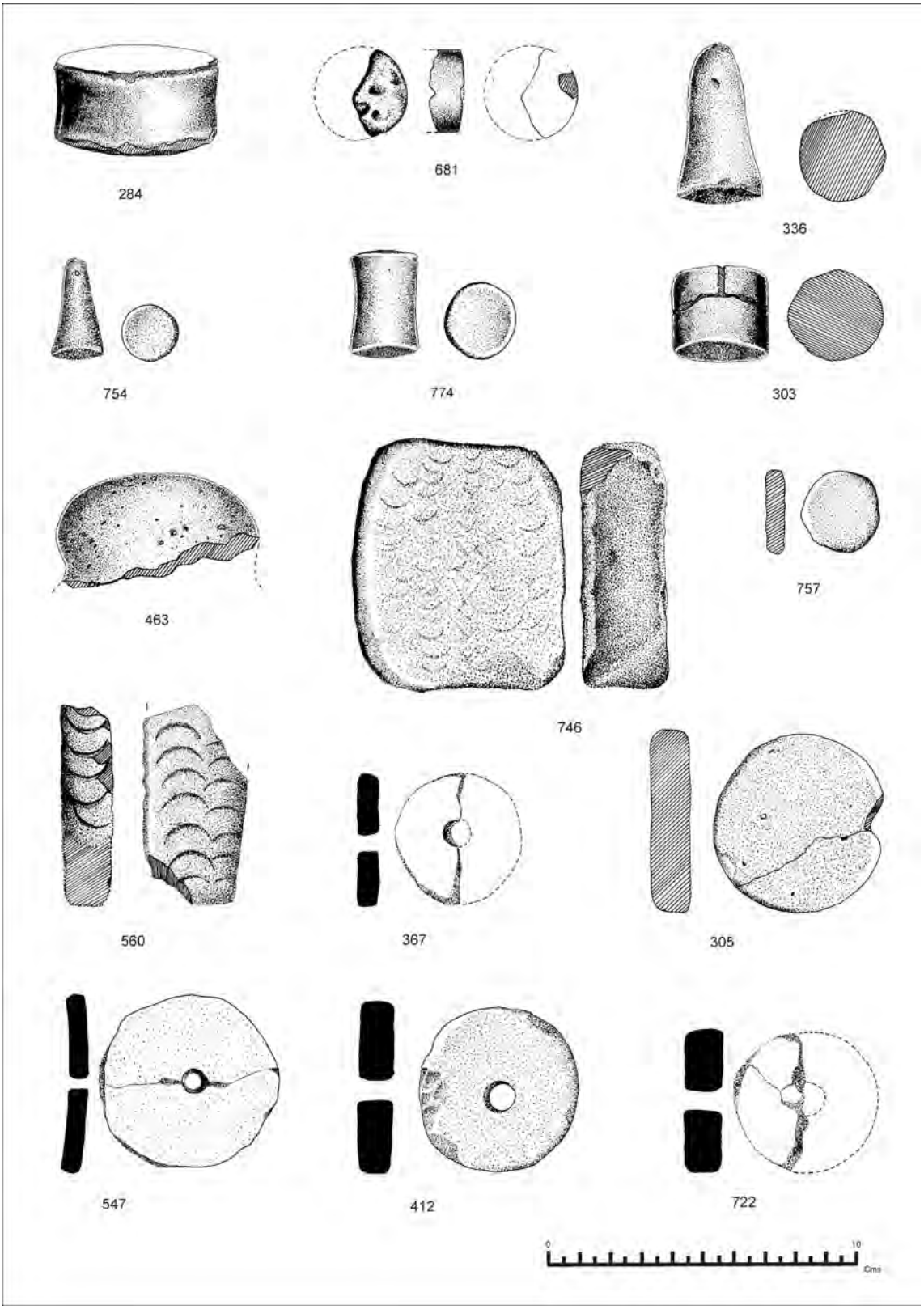


Fig. 8.7: Ear-studs, pendants and other terracotta objects.

Pendants

No: 151 Trench: B **Context:** 402 **Period:** 4
Object: Pendant **Material:** Copper.
Description: Vertically broken tubular pendant having two loops on top. Made of copper alloy. Fig. 8.6.

No: 109 Trench: A:NWNT **Context:** 394 **Period:** 4?
Object: Pendant **Material:** Agate.
Description: Drop pendant of banded agate. Figs 8.2 and 8.4.

No: 754 Trench: F **Context:** 851 **Period:** 1
Object: Pendant **Material:** Terracotta.
Description: Conical-shaped pendant of terracotta, slightly concave at the base, tip broken. Fig. 8.7.

No: 756 Trench: F **Context:** 851 **Period:** 1
Object: Pendant **Material:** Terracotta.
Description: Conical-shaped pendant of terracotta, slightly broken at the distal end.

No: 336 Trench: D2 **Context:** 706 **Period:** 2
Object: Pendant **Material:** Terracotta.
Description: Conical-shaped pendant of terracotta, slightly broken at the base, grits visible. Fig. 8.7.

No: 698 Trench: A:TP1 **Context:** 1052 **Period:** 2
Object: Pendant **Material:** Terracotta.
Description: Cylinder-shaped pendant of terracotta, slightly tapering towards upper end.

No: 131 Trench: A:TP2 **Context:** 538 **Period:** No period
Object: Pendant **Material:** Terracotta.
Description: Conical-shaped pendant(?) of terracotta, broken at the top.

No: 867 Trench: E **Context:** 1210 **Period:** No period
Object: Pendant **Material:** Terracotta.
Description: Conical-shaped pendant of terracotta with a circular section, flat at the base and slightly broken at the top.

No: 326 Trench: A:South Area **Context:** 619 **Period:** 4
Object: Pendant **Material:** Terracotta.
Description: Perforated triangle-shaped pendant of a grey ware sherd, slightly broken.

No: 478 Trench: E **Context:** 809 **Period:** No period
Object: Pendant **Material:** Terracotta.
Description: Broken, thick perforated sherd of buff ware used as a pendant for animals.

Hair-pin

No: 373 Trench: A:W Area **Context:** 643 **Period:** 4
Object: Hair-pin **Material:** Bone.
Description: Broken hair-pin(?) of bone.

Kohlsticks

No: 264 Trench: D1 **Context:** 751 **Period:** 3
Object: Kohlstick **Material:** Ivory.
Description: Kohlstick of ivory(?) with a bud-shaped head at the top and slightly broken at the bottom, circular section. Fig. 8.8.
Ref: A similar but complete specimen was found in Period IV at Nevasa with a little variation in the decoration (Sankalia *et al*. 1960: fig. 194, 8) and also from Period II at Nasik (Sankalia and Deo 1955: fig. 55, 6).

No: 602 Trench: F **Context:** 778 **Period:** 3
Object: Kohlstick **Material:** Ivory.
Description: Kohlstick of ivory, broader flat end at the top with excellent incised decoration and slightly broken, ground and polished. Fig. 8.8.
Ref: Similar specimens were recovered from Period II of Nasik (Sankalia and Deo 1955: fig. 55, 1 and 4, Plate XXIX, 10, 12 and 17), but with some differences in the decoration.

No: 675 Trench: F **Context:** 788 **Period:** 2
Object: Kohlstick **Material:** Ivory.
Description: Kohlstick of ivory(?) with a narrow blunt pointed end and broad decorated broken head, ground and polished. Fig. 8.8.

Inlay objects

No: 104 Trench: A:NWNT **Context:** 376 **Period:** 4
Object: Inlay **Material:** Gold.
Description: Very thin, flat, spheriod-shaped inlay(?) object of gold.

No: 281 Trench: A:TP5 **Context:** 599 **Period:** 3
Object: Inlay **Material:** Shell.
Description: Squarish, flat inlay object of shell(?) with incised cross design on top. Fig. 8.5.

No: 408 Trench: A:South Area, W Area **Context:** 651 **Period:** 3
Object: Inlay **Material:** Glass.
Description: Inlay piece of turquoise glass.

Gold foil and band

No: 806 Trench: A:TP1 **Context:** 1144 **Period:** 1
Object: Foil **Material:** Gold.
Description: Fragment of a very thin foil of gold.

No: 792 Trench: A:TP1 **Context:** 1126 **Period:** 1
Object: Foil **Material:** Gold.
Description: Small and thin foil of gold.

No: 238 Trench: A:NWNT **Context:** 503 **Period:** 4?
Object: Foil **Material:** Gold.
Description: Fragment of a very thin foil of gold.

No: 364 Trench: D2 **Context:** 712 **Period:** 2
Object: Band **Material:** Gold.
Description: Fragment of thin band of gold. Glass wire.

No: 262 Trench: D1 **Context:** 751 **Period:** 3
Object: Wire **Material:** Glass.
Description: Greenish glass wire(?) with a circular section and white encrustation on surface.

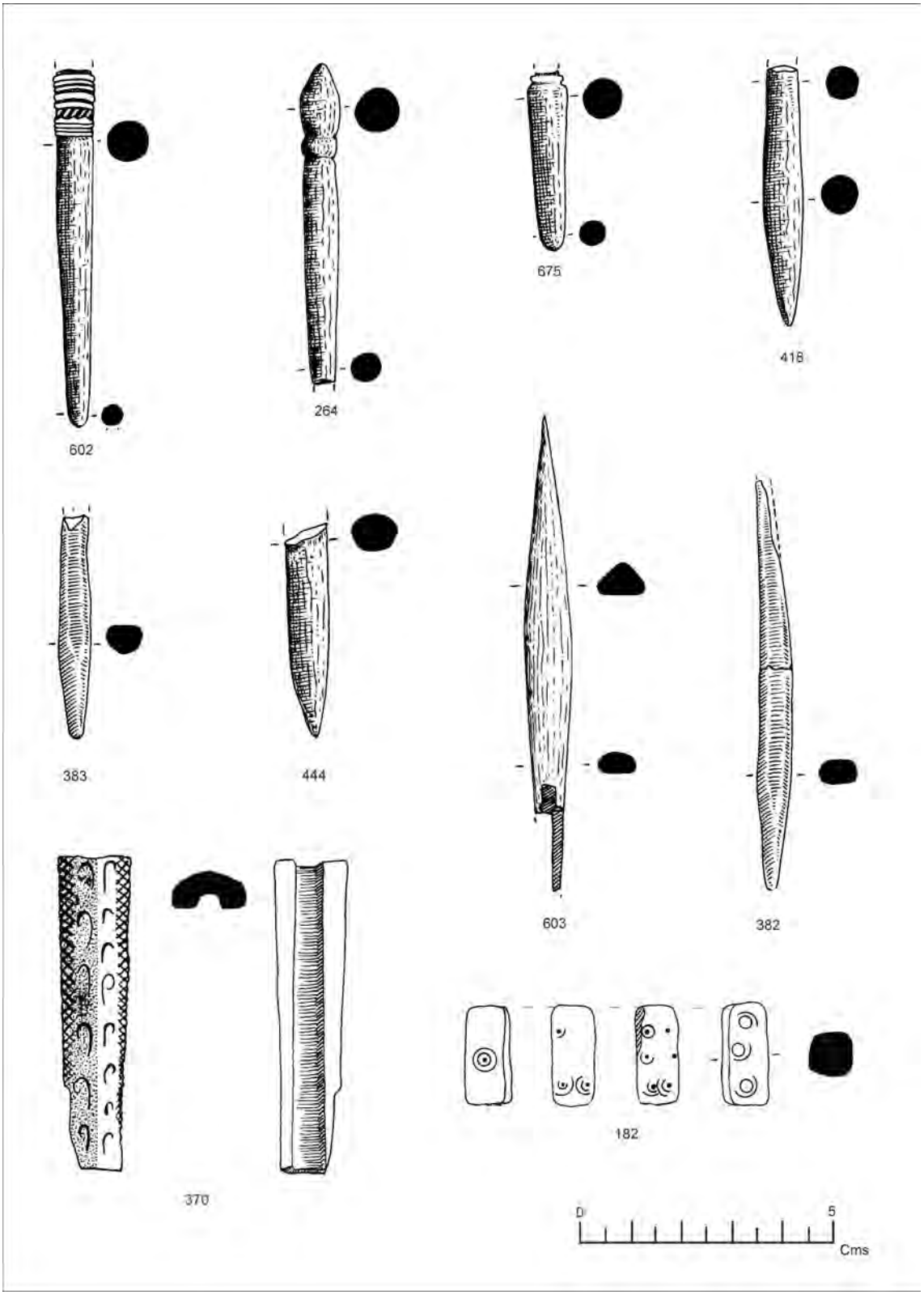


Fig. 8.8: Bone and ivory objects.

Metal objects

A total of 203 metal objects came to light during the excavations (see Table 8.7). Metal objects recovered from the excavations occupy the second place numerically among the small finds. Iron is the chief metal used for the preparation of various objects, followed by copper. Brass, bronze and silver were the least represented metals. The usage of iron and copper objects increased from Period 1 to Period 4.

Brass and bronze objects

No: 247 Trench: A:South Area **Context:** 568 **Period:** 4
Object: Unidentified **Material:** Brass.
Description: Thin, circular inlay object of brass with an embossed floral motif on top and a negative impression on the bottom, slightly broken at the edge.

No: 137 Trench: A:NWNT **Context:** 546 **Period:** 4?
Object: Rod **Material:** Bronze.
Description: Fragment of a slender rod of bronze(?) with a squarish section. Fig. 8.6.

Copper objects

A total of 22 copper metal objects came to light during the excavations (not including the copper objects that have been categorized as jewellery; Table 8.8). For an illustration of some of these, see Fig. 8.6.

Nails

No: 575 Trench: B **Context:** 458 **Period:** 1
Object: Nail **Material:** Copper.
Description: Fragment of a nail of copper alloy, corroded and encrusted.

No: 615 Trench: A:TP1 **Context:** 966 **Period:** 2
Objects: Nail **Material:** Copper.
Description: Fragments of a thin and slender nail(?) of copper alloy.

No: 75 Trench: A:NWNT **Context:** 332 **Period:** 4?
Object: Nail **Material:** Copper.
Description: Small curved nail(?) of copper, corroded. Fig. 8.6.

No: 110 Trench: A:TP9 **Context:** 398 **Period:** No period
Object: Nail **Material:** Copper.
Description: Fragment of a thin and narrow nail-cleaner(?) of copper.

Rivet

No: 287 Trench: D1 **Context:** 754 **Period:** 1
Object: Rivet **Material:** Copper.
Description: Broken ribbon-shaped rivet of copper alloy, one end curved. Fig. 8.6.

Fastener

No: 166 Trench: B **Context:** 414 **Period:** 4
Object: Fastener **Material:** Copper.
Description: Ribbon-shaped, thin fastener of copper alloy, slightly disfigured and corroded. Fig. 8.6.

Needle

No: 225 Trench: B **Context:** 437 **Period:** 4
Object: Needle **Material:** Copper.
Description: Broken needle(?) of copper, corroded. Fig. 8.6.

Table 8.7: Summary of metal objects by type of metal and period.

	1	2	3	3-temple	4	4?	No period	Total
Brass					1			1
Bronze						1		1
Copper	4	1	1	6	7	1	2	**22**
Iron	14	13	27	22	77	8	12	**173**
Iron?	1							1
Lead					3		1	**4**
Silver					1			1
Total	19	14	28	28	89	10	15	203

Rods

No: 48 Trench: A:S of S Temple **Context:** 303 **Period:** 4
Object: Rod **Material:** Copper.
Description: Long cylindrical rod of bronze with plano-convex section, one end broad with incised grooves on either margin and narrowing to a blunt point on the other end, perhaps used as a nail-cleaner. Fig. 8.6.

No: 163 Trench: B **Context:** 414 **Period:** 4
Object: Rod **Material:** Copper.
Description: A long, slender and broken rod of copper with one end tapering to sharpness and the other end broadening. Fig. 8.6.

Bowl

No: 696 Trench: A:TP9 **Context:** 1050 **Period:** 3-temple
Object: Bowl **Material:** Copper.
Description: Fragment of a bowl(?) of copper alloy, encrusted.

Pellate

No: 517 Trench: A:TP5 **Context:** 918 **Period:** 3-temple
Object: Pellate **Material:** Copper.
Description: Fragments of a pellate of copper alloy, badly damaged due to corrosion.

Plates

No: 380 Trench: D2 **Context:** 718 **Period:** 1
Object: Plate **Material:** Copper.
Description: Fragment of a copper-plate(?) with greenish patina.

No: 375 Trench: A:W Area **Context:** 643 **Period:** 4
Object: Plate **Material:** Copper.
Description: Fragment of a thin plate of copper with greenish patina.

Handle of a bell

No: 230 Trench: B **Context:** 439 **Period:** 4
Object: Handle **Material:** Copper.
Description: Tubular handle of a bell of copper alloy, with 'u'-shaped loop attached to one end, broad and slightly concave disc-shaped on the other end, corroded. Fig. 8.6.

Wire

No: 609 Trench: A:TP5 **Context:** 964 **Period:** 3-temple
Object: Wire **Material:** Copper.
Description: Fragment of a very thin wire of copper alloy.

Unidentified

No: 799 Trench: B **Context:** 736 **Period:** 1
Object: Unidentified **Material:** Copper.
Description: Fragment of a thin unidentified object of copper alloy, badly damaged.

No: 734 Trench: A:TP6 **Context:** 1051 **Period:** 3
Object: Unidentified **Material:** Copper.
Description: Fragment of a thin and flat unidentified object of copper alloy, perhaps a nail-cleaner.

No: 590 Trench: A:GG North **Context:** 938 **Period:** 3-temple
Object: Unidentified **Material:** Copper.
Description: Fragment of an unidentified object of copper alloy, corroded.

No: 818 Trench: A:TP9 **Context:** 1156 **Period:** 3-temple
Object: Unidentified **Material:** Copper.
Description: Unidentified object of copper alloy.

No: 828 Trench: A:TP9 **Context:** 1170 **Period:** 3-temple
Object: Unidentified **Material:** Copper.
Description: Fragments of an unidentified object of copper, greenish patina.

No: 231 Trench: B **Context:** 439 **Period:** 4
Object: Unidentified **Material:** Copper.
Description: Unidentified copper object.

No: 437 Trench: E **Context:** 811 **Period:** No period
Object: Unidentified **Material:** Copper.
Description: Cut piece of an unidentified object of copper.

Iron objects

A total of 173 iron objects came to light during the excavations (see Table 8.9). Nails are predominant, followed by knives and rings. The nails, rivets, fasteners and rings might have been used for construction and mending purposes. The chisels and borers were perhaps used in carpentry. The arrowheads, spears and spikes were used for defence purposes. The sickles, spatula, buckle, clamp, latch and wires might have been used for household purposes (see Fig. 8.9).

Arrowheads

No: 794 Trench: A:TP5 **Context:** 1130 **Period:** 3-temple
Object: Arrowhead **Material:** Iron.
Description: Broken arrowhead(?) of iron, corroded.

No: 177 Trench: B **Context:** 430 **Period:** 4
Object: Arrowhead **Material:** Iron.
Description: Tanged arrowhead of iron, broken at the tip, blade is four-faced and spike-like, encrusted.

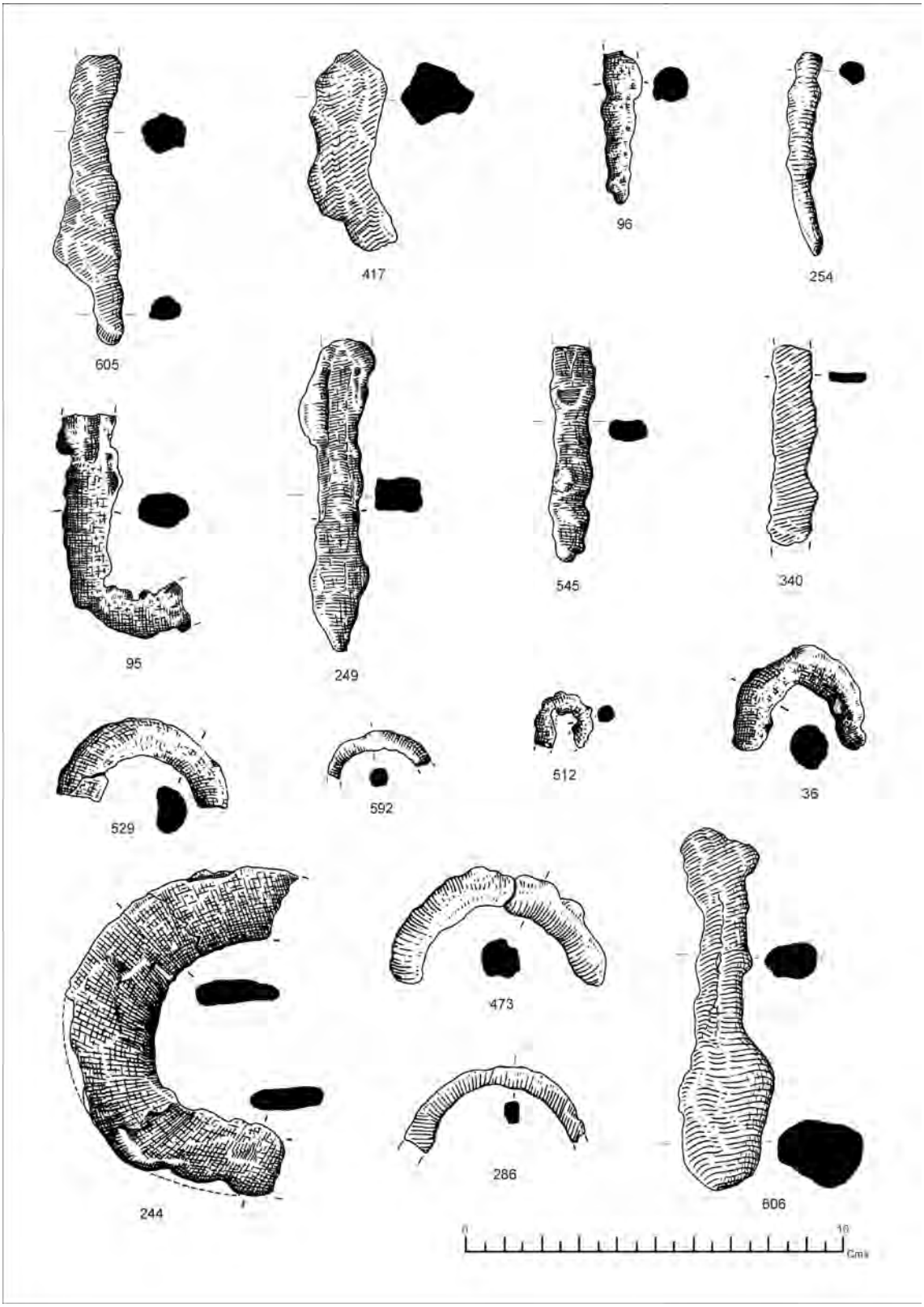


Fig. 8.9: Iron objects.

No: 308 Trench: A:South Area **Context:** 608 **Period:** 3
Object: Arrowhead **Material:** Iron.
Description: Leaf-shaped arrowhead(?) of iron, other end broken.

No: 362 Trench: A:TP5 **Context:** 638 **Period:** 3-temple
Object: Arrowhead **Material:** Iron.
Description: Fragment of a leaf-shaped arrowhead(?) of iron, corroded.

No: 204 Trench: B **Context:** 435 **Period:** 4
Object: Arrowhead **Material:** Iron.
Description: Small, leaf-shaped arrowhead of iron with a tang, pointed end slightly broken, tang curved like a loop.

Spear

No: 532 Trench: D2 **Context:** 726 **Period:** 1
Object: Spear **Material:** Iron.
Description: Two fragments of an iron spear with tang, encrusted.

Tanged point

No: 570 Trench: A:TP1 **Context:** 933 **Period:** 3
Object: Point **Material:** Iron.
Description: Tanged point(?) of iron with a broken tip, handle curved and corroded.

Knives

No: 433 Trench: D2 **Context:** 721 **Period:** 1
Object: Knife **Material:** Iron.
Description: Fragment of a knife of iron, encrusted.

No: 656 Trench: B **Context:** 469 **Period:** 1
Object: Knife **Material:** Iron.
Description: Iron knife(?), broken on either end, encrusted.

No: 658 Trench: B **Context:** 469 **Period:** 1
Object: Knife **Material:** Iron.
Description: Broken iron knife, encrusted.

No: 719 Trench: A:TP1 **Context:** 1074 **Period:** 2
Object: Knife **Material:** Iron.
Description: Broken blade of an iron knife with handle missing, encrusted.

No: 747 Trench: A:TP1 **Context:** 1099 **Period:** 2
Object: Knife **Material:** Iron.
Description: Broken blade of a knife of iron, encrusted.

No: 771 Trench: A:TP1 **Context:** 1110 **Period:** 2
Object: Knife **Material:** Iron.
Description: Broken blade of a knife of iron, corroded.

No: 266 Trench: D1 **Context:** 751 **Period:** 3
Object: Knife **Material:** Iron.
Description: Fragment of an iron knife with encrustation.

No: 296 Trench: A:TP5 **Context:** 610 **Period:** 2
Object: Knife **Material:** Iron.
Description: Fragment of an iron knife(?), broken on either end, encrusted.

No: 565 Trench: A:TP1 **Context:** 930 **Period:** 3
Object: Knife **Material:** Iron.
Description: Fragment of a knife(?) of iron, corroded and flaky.

No: 369 Trench: A:TP5 **Context:** 642 **Period:** 3-temple
Object: Knife **Material:** Iron.
Description: Fragment of an iron knife, broken on either end, corroded.

No: 638 Trench: A:TP3 **Context:** 981 **Period:** 3-temple
Object: Knife **Material:** Iron.
Description: Iron knife(?) broken on either end, corroded.

No: 203 Trench: B **Context:** 435 **Period:** 4
Object: Knife **Material:** Iron.
Description: Iron knife with a tang, broken on either end, encrusted.

No: 210 Trench: B **Context:** 435 **Period:** 4
Object: Knife **Material:** Iron.
Description: Broken barber's knife of iron with handle, corroded.

No: 232 Trench: B **Context:** 440 **Period:** 4
Object: Knife **Material:** Iron.
Description: Fragment of a blade of iron knife, heavily corroded.

No: 248 Trench: A:S Wall of N **Context:** 575 **Period:** 4
Object: Knife **Material:** Iron.
Description: Iron knife with handle, broken on either end, corroded.

Handles

No: 208 Trench: B **Context:** 435 **Period:** 4
Object: Handle **Material:** Iron.
Description: Tubular handle of iron object, corroded.

No: 243 Trench: A:South Area **Context:** 568 **Period:** 4
Object: Handle **Material:** Iron.
Description: Vertically broken tubular handle of an iron knife with a hole in the centre.

No: 293 Trench: A:South Area **Context:** 605 **Period:** 4
Object: Handle **Material:** Iron.
Description: Vertically broken tubular handle(?) of an iron, corroded.

Chisels

No: 399 Trench: A:South Area, TP6 **Context:** 635 **Period:** 4
Object: Chisel **Material:** Iron.
Description: Fragment of an iron chisel(?), corroded and encrusted.

No: 844 Trench: A:TP3 **Context:** 974 **Period:** 3
Object: Chisel **Material:** Iron.
Description: Fragment of a chisel(?) of iron, corroded.

No: 863 Trench: A:TP3 **Context:** 1112 **Period:** 3-temple
Object: Chisel **Material:** Iron.
Description: Fragments of a ribbon-shaped iron chisel(?), corroded and encrusted.

No: 147 Trench: B **Context:** 402 **Period:** 4
Object: Chisel **Material:** Iron.
Description: Thin fragments of a chisel(?) of iron.

No: 205 Trench: B **Context:** 435 **Period:** 4
Object: Chisel **Material:** Iron.
Description: Fragment of a chisel of iron, encrusted.

No: 639 Trench: F **Context:** 784 **Period:** 2
Object: Chisel **Material:** Iron.
Description: Ribbon-shaped chisel(?) of iron, slightly bent in the middle, corroded.

Borers

No: 184 Trench: B **Context:** 432 **Period:** 4
Object: Borer **Material:** Iron.
Description: Broken borer(?) of iron, encrusted.

No: 222 Trench: B **Context:** 435 **Period:** 4
Object: Borer **Material:** Iron.
Description: Broken borer(?) of iron, corroded.

No: 223 Trench: B **Context:** 435 **Period:** 4
Object: Borer **Material:** Iron.
Description: Fragment of a borer(?) of iron, corroded.

Nails

No: 417 Trench: D2 **Context:** 719 **Period:** 1
Object: Nail **Material:** Iron.
Description: Iron nail(?) curved in the middle, corroded and encrusted. Fig. 8.9.

No: 572 Trench: B **Context:** 456 **Period:** 1
Object: Nail **Material:** Iron.
Description: Fragment of a nail of iron, flaked and encrusted.

No: 619 Trench: B **Context:** 458 **Period:** 1
Object: Nail **Material:** Iron.
Description: Broken, thick nail of iron, encrusted.

No: 622 Trench: B **Context:** 465 **Period:** 1
Object: Nail **Material:** Iron.
Description: Fragment of a nail of iron(?), encrusted.

No: 627 Trench: B **Context:** 467 **Period:** 1
Object: Nail **Material:** Iron.
Description: Fragment of a nail of iron, corroded.

No: 657 Trench: B **Context:** 469 **Period:** 1
Object: Nail **Material:** Iron.
Description: Iron nail, broken at pointed end, encrusted.

No: 597 Trench: A:TP1 **Context:** 944 **Period:** 2
Object: Nail **Material:** Iron.
Description: Fragment of a small nail of iron(?) with curved pointed end, corroded.

No: 692 Trench: A:TP1 **Context:** 1040 **Period:** 2
Object: Nail **Material:** Iron.
Description: Fragment of a nail of iron attached to a pot-sherd, circular section, corroded.

No: 715 Trench: A:TP1 **Context:** 1058 **Period:** 2
Object: Nail **Material:** Iron.
Description: Fragment of a nail of iron with circular section, corroded.

No: 716 Trench: A:TP1 **Context:** 1058 **Period:** 2
Object: Nail **Material:** Iron.
Description: Iron nail with pointed end bent, encrusted.

No: 717 Trench: A:TP1 **Context:** 1063 **Period:** 2
Object: Nail **Material:** Iron.
Description: Broken nail of iron, highly corroded.

No: 808 Trench: A:TP3 **Context:** 1148 **Period:** 2
Object: Nail **Material:** Iron.
Description: Iron nail broken towards the head, corroded.

No: 860 Trench: A:TP1 **Context:** 1099 **Period:** 2
Object: Nail **Material:** Iron.
Description: Iron nail with rectangular section and heavily encrusted.

No: 7 Trench: A:TP1 **Context:** 307 **Period:** 3
Object: Nail **Material:** Iron.
Description: Fragment of a nail of iron, encrusted.

No: 82 Trench: A:EEST **Context:** 348 **Period:** 2
Object: Nail **Material:** Iron.
Description: Fragment of a nail of iron with ovalish section, encrusted.

No: 86 Trench: A:EEST **Context:** 350 **Period:** 3
Object: Nail **Material:** Iron.
Description: Fragment of an iron nail broken towards the head.

No: 297 Trench: A:TP5 **Context:** 610 **Period:** 3
Object: Nail **Material:** Iron.
Description: Fragment of a nail of iron with cylindrical section.

No: 363 Trench: A:W Area **Context:** 640 **Period:** 3
Object: Nail **Material:** Iron.
Description: Iron nail with a round head, bent in the middle, encrusted.

No: 569 Trench: A:South Area **Context:** 931 **Period:** 3
Object: Nail **Material:** Iron.
Description: Fragment of a nail of iron with squarish section, corroded.

No: 599 Trench: A:TP3 **Context:** 947 **Period:** 3
Object: Nail **Material:** Iron.
Description: Fragment of a nail of iron, corroded.

No: 604 Trench: F **Context:** 778 **Period:** 3
Object: Nail **Material:** Iron.
Description: Two broken nails of iron, corroded.

No: 605 Trench: F **Context:** 778 **Period:** 3
Object: Nail **Material:** Iron.

Description: Slightly broken long nail of iron, corroded and encrusted. Fig. 8.9.

No: 629 Trench: A:TP6 **Context:** 373 **Period:** 3
Object: Nail **Material:** Iron.
Description: Fragment of a nail of iron, encrusted.

No: 646 Trench: A:TP6 **Context:** 987 **Period:** 3
Object: Nail **Material:** Iron.
Description: Two fragments of nails of iron.

No: 410 Trench: A:GG North **Context:** 658 **Period:** 3-temple
Object: Nail **Material:** Iron.
Description: Fragment of a slender nail of iron, corroded.

No: 440 Trench: A:TP5 **Context:** 919 **Period:** 3-temple
Object: Nail **Material:** Iron.
Description: Iron nail, broken towards the head.

No: 442 Trench: D2 **Context:** 718 **Period:** 1
Object: Nail **Material:** Iron.
Description: Two fragments of nails of iron, encrusted.

No: 450 Trench: A:TP5 **Context:** 667 **Period:** 3-temple
Object: Nail **Material:** Iron.
Description: Fragment of a nail of iron, corroded.

No: 511 Trench: A:TP5 **Context:** 918 **Period:** 3-temple
Object: Nail **Material:** Iron.
Description: Fragment of a nail of iron with the head missing, corroded.

No: 513 Trench: A:TP5 **Context:** 918 **Period:** 3-temple
Object: Nail **Material:** Iron.
Description: Fragment of a nail of iron, encrusted.

No: 587 Trench: A:TP5 **Context:** 918 **Period:** 3-temple
Object: Nail **Material:** Iron.
Description: Slender and small nail of iron with the pointed end curved and encrusted.

No: 591 Trench: A:GG North **Context:** 938 **Period:** 3-temple
Object: Nail **Material:** Iron.
Description: Fragment of a nail of iron, encrusted.

No: 601 Trench: A:GG North **Context:** 949 **Period:** 3-temple
Object: Nail **Material:** Iron.
Description: Two broken nails of iron with encrustation.

No: 642 Trench: A:TP5 **Context:** 978 **Period:** 3-temple
Object: Nail **Material:** Iron.
Description: Fragment of a nail of iron, corroded.

No: 699 Trench: A:TP6 **Context:** 1054 **Period:** 3-temple
Object: Nail **Material:** Iron.
Description: Small nail of iron with encrustation.

No: 831 Trench: A:TP5, TP9, GG North **Context:** 1186 **Period:** 3-temple
Object: Nail **Material:** Iron.
Description: Fragment of a nail of iron, corroded.

No: 27 Trench: A:W Area **Context:** 321 **Period:** 4
Object: Nail **Material:** Iron.
Description: Slightly broken nail of iron.

No: 54 Trench: A:S of S Temple **Context:** 303 **Period:** 4
Object: Nail **Material:** Iron.
Description: Fragment of a nail of iron, bent in the middle, encrusted.

No: 74 Trench: A:TP5 **Context:** 330 **Period:** 4
Object: Nail **Material:** Iron.
Description: Iron nail with square section, encrusted.

No: 78 Trench: A:TP5 **Context:** 334 **Period:** 4
Object: Nail **Material:** Iron.
Description: Fragment of a nail of iron, bent in the middle, heavily encrusted.

No: 94 Trench: A:NWNT **Context:** 376 **Period:** 3
Object: Nail **Material:** Iron.
Description: Iron nail with a spear-shaped head and pointed end, encrusted.

No: 96 Trench: A:NWNT **Context:** 376 **Period:** 4
Object: Nail **Material:** Iron.
Description: Fragment of a nail of iron with a circular section, head broken, corroded. Fig. 8.9.

No: 123 Trench: A:TP9 **Context:** 519 **Period:** 4
Object: Nail **Material:** Iron.
Description: Fragment of a slender nail of iron, corroded.

No: 148 Trench: B **Context:** 402 **Period:** 4
Object: Nail **Material:** Iron.
Description: Broken nail of iron with a bent head, encrusted.

No: 149 Trench: B **Context:** 402 **Period:** 4
Object: Nail **Material:** Iron.
Description: Iron nail with a square head and slightly curved.

No: 150 Trench: B **Context:** 402 **Period:** 4
Object: Nail **Material:** Iron.
Description: Fragment of a nail of iron, encrusted.

No: 164 Trench: B **Context:** 414 **Period:** 4
Object: Nail **Material:** Iron.
Description: A small, broken nail of iron with a square head and bent in the middle, encrusted.

No: 169 Trench: B **Context:** 418 **Period:** 4
Object: Nail **Material:** Iron.
Description: Slightly broken nail of iron with bent working end, corroded and flaky.

No: 178 Trench: B **Context:** 430 **Period:** 4
Object: Nail **Material:** Iron.
Description: Small nail of iron with a square head, corroded.

No: 179 Trench: B **Context:** 430 **Period:** 4
Object: Nail **Material:** Iron.
Description: Fragment of a nail of iron, encrusted.

No: 180 Trench: B **Context:** 430 **Period:** 4
Object: Nail **Material:** Iron.
Description: Slender nail of iron with a bent head, encrusted.

No: 181 Trench: B **Context:** 430 **Period:** 4
Object: Nail **Material:** Iron.
Description: Fragment of a nail of iron, corroded.

No: 198 Trench: B **Context:** 435 **Period:** 4
Object: Nail **Material:** Iron.
Description: Iron nail with a round head, flaky and encrusted.

No: 199 Trench: B **Context:** 435 **Period:** 4
Object: Nail **Material:** Iron.
Description: Long nail of iron with a round head, flaky and encrusted.

No: 200 Trench: B **Context:** 435 **Period:** 4
Object: Nail **Material:** Iron.
Description: Long and slender nail of iron with the head missing.

No: 202 Trench: B **Context:** 435 **Period:** 4
Object: Nail **Material:** Iron.
Description: Iron nail with a squarish head, curved and slightly broken pointed end.

No: 206 Trench: B **Context:** 435 **Period:** 4
Object: Nail **Material:** Iron.
Description: Fragment of a nail of iron, heavily corroded and flaky.

No: 207 Trench: B **Context:** 435 **Period:** 4
Object: Nail **Material:** Iron.
Description: Fragment of a nail of iron, encrusted.

No: 211 Trench: B **Context:** 435 **Period:** 4
Object: Nail **Material:** Iron.
Description: Small nail of iron with encrustation.

No: 213 Trench: B **Context:** 435 **Period:** 4
Object: Nail **Material:** Iron.
Description: Slightly broken, small nail of iron with a rectangular head, encrusted.

No: 214 Trench: B **Context:** 435 **Period:** 4
Object: Nail **Material:** Iron.
Description: Small nail of iron with a square head, encrusted.

No: 215 Trench: B **Context:** 435 **Period:** 4
Object: Nail **Material:** Iron.
Description: Broken nail of iron, flaky and encrusted.

No: 216 Trench: B **Context:** 435 **Period:** 4
Object: Nail **Material:** Iron.
Description: Small and slender nail of iron with a square head, encrusted.

No: 217 Trench: B **Context:** 435 **Period:** 4
Object: Nail **Material:** Iron.
Description: Small nail of iron with a projecting square head, encrusted.

No: 218 Trench: B **Context:** 435 **Period:** 4
Object: Nail **Material:** Iron.
Description: Iron nail with a hook-shaped bent head, encrusted.

No: 219 Trench: B **Context:** 435 **Period:** 4
Object: Nail **Material:** Iron.
Description: Slightly broken and slender nail of iron.

No: 220 Trench: B **Context:** 435 **Period:** 4
Object: Nail **Material:** Iron.
Description: Fragment of a nail of iron, encrusted.

No: 221 Trench: B **Context:** 435 **Period:** 4
Object: Nail **Material:** Iron.
Description: Fragment of a nail of iron, flaky and encrusted.

No: 242 Trench: A:South Area **Context:** 568 **Period:** 4
Object: Nail **Material:** Iron.
Description: Iron nail with a thick circular head, corroded.

No: 246 Trench: A:S Wall of N **Context:** 573 **Period:** 4
Object: Nail **Material:** Iron.
Description: Iron nail with a squarish section, corroded.

No: 349 Trench: A:South Area, TP6 **Context:** 635 **Period:** 4
Object: Nail **Material:** Iron.
Description: Fragment of a slender nail of iron.

No: 358 Trench: A:South Area, TP6 **Context:** 635 **Period:** 4
Object: Nail **Material:** Iron.
Description: Iron nail with a rectangular section, slightly bent head and broken pointed end.

No: 426 Trench: A:TP6 **Context:** 649 **Period:** 4
Object: Nail **Material:** Iron.
Description: Broken nail of iron with a round top, corroded and encrusted.

No: 428 Trench: A:W Area **Context:** 659 **Period:** 4
Object: Nail **Material:** Iron.
Description: Fragment of a nail of iron.

No: 431 Trench: A:TP5, South Area **Context:** 663 **Period:** 4
Object: Nail **Material:** Iron.
Description: Fragment of a thin and small nail of iron, corroded.

No: 445 Trench: A:South Area, TP6 **Context:** 635 **Period:** 4
Object: Nail **Material:** Iron.
Description: Small nail of iron with slightly bent rear head, corroded.

No: 526 Trench: A:TP10 **Context:** 928 **Period:** 4
Object: Nail **Material:** Iron.
Description: Iron nail broken towards the head.

No: 544 Trench: A:TP6 **Context:** 689 **Period:** 4
Object: Nail **Material:** Iron.
Description: Iron nail with a slightly broken head, corroded.

No: 546 Trench: A:TP6 **Context:** 689 **Period:** 4
Object: Nail **Material:** Iron.
Description: Fragment of a small nail of iron, corroded and encrusted.

No: 31 Trench: A:NWNT **Context:** 327 **Period:** 4?
Object: Nail **Material:** Iron.
Description: Iron nail broken at the head.

No: 65 Trench: A:NWNT **Context:** 331 **Period:** 4?
Object: Nail **Material:** Iron.
Description: Iron nail broken at the distal end, encrusted.

No: 115 Trench: A:NWNT **Context:** 505 **Period:** 4?
Object: Nail **Material:** Iron.
Description: Fragment of a nail of iron, bent in the middle, encrusted.

No: 117 Trench: A:NWNT **Context:** 507 **Period:** 4?
Object: Nail **Material:** Iron.
Description: Fragment of a nail of iron, corroded and crackled.

No: 125 Trench: A:NWNT **Context:** 529 **Period:** 4?
Object: Nail **Material:** Iron.
Description: Fragment of a small nail of iron, encrusted.

No: 128 Trench: A:NWNT **Context:** 535 **Period:** 4?
Object: Nail **Material:** Iron.
Description: Two fragments of nails of iron, encrusted.

No: 19 Trench: A:TP2 **Context:** 315 **Period:** No period
Object: Nail **Material:** Iron.
Description: Fragment of a nail of iron, encrusted.

No: 22 Trench: A:TP2 **Context:** 317 **Period:** No period
Object: Nail **Material:** Iron.
Description: Iron nail broken at the distal end, corroded.

No: 40 Trench: A:TP2 **Context:** 323 **Period:** No period
Object: Nail **Material:** Iron.
Description: Broken nail of iron, encrusted.

No: 80 Trench: A:TP6 **Context:** 343 **Period:** No period
Object: Nail **Material:** Iron.
Description: Fragment of a nail of iron, encrusted.

No: 710 Trench: E **Context:** 816 **Period:** No period
Object: Nail **Material:** Iron.
Description: Iron nail with pointed end curved.

No: 770 Trench: E **Context:** 816 **Period:** No period
Object: Nail **Material:** Iron.
Description: Iron nail curved at the broader end, corroded.

No: 835 Trench: E **Context:** 1208 **Period:** No period
Object: Nail **Material:** Iron.
Description: Slightly curved nail of iron, broken at the pointed end.

Rivets

No: 8 Trench: A:TP1 **Context:** 307 **Period:** 3
Object: Rivet **Material:** Iron.
Description: Fragment of a ribbon-shaped rivet of iron, encrusted.

No: 249 Trench: A:South Area **Context:** 578 **Period:** 3
Object: Rivet **Material:** Iron.
Description: Door rivet(?) of iron, flaky and encrusted. Fig. 8.9.

No: 254 Trench: A:South Area **Context:** 589 **Period:** 3
Object: Rivet **Material:** Iron.
Description: Slender rivet of iron, encrusted. Fig. 8.9.

No: 269 Trench: D1 **Context:** 751 **Period:** 3
Object: Rivet **Material:** Iron.
Description: Door rivet(?) of iron.

No: 272 Trench: A:South Area **Context:** 591 **Period:** 3
Object: Rivet **Material:** Iron.
Description: Slightly curved small iron rivet with a bent projecting squarish head and pointed end.

No: 95 Trench: A:NWNT **Context:** 376 **Period:** 4
Object: Rivet **Material:** Iron.
Description: Iron rivet with squarish section, one end curved, corroded and flaky. Fig. 8.9.

No: 176 Trench: B **Context:** 429 **Period:** 4
Object: Rivet **Material:** Iron.
Description: Slender iron rivet(?) with a circular section, encrusted.

Fasteners

No: 340 Trench: D2 **Context:** 711 **Period:** 2
Object: Fastener **Material:** Iron.
Description: Small ribbon-shaped fastener of iron, encrusted. Fig. 8.9.

No: 279 Trench: A:TP6 **Context:** 596 **Period:** 4
Object: Fastener **Material:** Iron.
Description: Fragment of a ribbon-shaped fastener of iron, encrusted.

No: 545 Trench: A:TP6 **Context:** 689 **Period:** 4
Object: Fastener **Material:** Iron.
Description: Ribbon-shaped fastener(?) of iron, one end slightly narrow, other end broad and slightly curved, corroded. Fig. 8.9.

Rings

No: 286 Trench: D1 **Context:** 754 **Period:** 1
Object: Ring **Material:** Iron.
Description: Broken ring of iron with a rectangular section. Fig. 8.9.

No: 473 Trench: D1 **Context:** 767 **Period:** 1
Object: Ring **Material:** Iron.
Description: Broken iron ring, encrusted. Fig. 8.9.

No: 559 Trench: A:TP1 **Context:** 912 **Period:** 3
Object: Ring **Material:** Iron.
Description: Broken, small ring of iron, corroded.

No: 592 Trench: A:TP3 **Context:** 942 **Period:** 3
Object: Ring **Material:** Iron.
Description: Fragment of a thin ring(?) of iron. Fig. 8.9.

No: 512 Trench: A:TP5 **Context:** 918 **Period:** 3-temple
Object: Ring **Material:** Iron.
Description: Broken, small ring of iron, encrusted. Fig. 8.9.

No: 36 Trench: A:TP9 **Context:** 320 **Period:** 4
Object: Ring **Material:** Iron.
Description: A small broken iron ring, corroded. Fig. 8.9.

No: 174 Trench: B **Context:** 429 **Period:** 4
Object: Ring **Material:** Iron.
Description: Broken ring of iron, encrusted.

No: 209 Trench: B **Context:** 435 **Period:** 4
Object: Ring **Material:** Iron.
Description: A small iron ring, corroded and encrusted.

No: 354 Trench: A:South Area, TP6 **Context:** 635 **Period:** 4
Object: Ring **Material:** Iron.
Description: Fragment of a thin iron ring with rectangular section, corroded.

No: 529 Trench: E **Context:** 816 **Period:** No period
Object: Ring **Material:** Iron.
Description: Broken ring of iron, encrusted. Fig. 8.9.

Table 8.8: Summary of copper objects by type of object and period.

Type	1	2	3	3-temple	4	4?	No period	Total
Nail	1	1				1	1	**4**
Rivet	1							1
Fastener					1			1
Needle					1			1
Rod					2			2
Bowl				1				1
Pellate				1				1
Plate	1				1			2
Handle					1			1
Wire				1				1
Unidentified	1		1	3	1		1	**7**
Total	**4**	**1**	**1**	**6**	**7**	**1**	**2**	**22**

Fish hooks

No: 201 Trench: B **Context:** 435 **Period:** 4
Object: Fish hook **Material:** Iron.
Description: Fish hook(?) of iron, encrusted.

No: 212 Trench: B **Context:** 435 **Period:** 4
Object: Fish hook **Material:** Iron.
Description: Fish hook(?) of iron, encrusted.

Sickles

No: 244 Trench: A:TP5 **Context:** 570 **Period:** 4
Object: Sickle **Material:** Iron.
Description: Small iron sickle with slightly broken handle and working end, corroded and flaky. Fig. 8.9.

No: 87 Trench: A:S Temple **Context:** 353 **Period:** No period
Object: Sickle **Material:** Iron.
Description: Fragment of a small iron sickle(?), corroded.

Spatula

No: 20 Trench: A:TP2 **Context:** 315 **Period:** No period
Object: Spatula **Material:** Iron.
Description: Fragment of an iron spatula(?), corroded.

Rods

No: 485 Trench: A:South Area **Context:** 645 **Period:** 4
Object: Rod **Material:** Iron.
Description: Fragment of a thin and slender rod(?) of iron, encrusted.

No: 77 Trench: A:NWNT **Context:** 332 **Period:** 4?
Object: Rod **Material:** Iron.
Description: Broken and slender cylindrical iron rod.

No: 21 Trench: A:TP2 **Context:** 317 **Period:** No period
Object: Rod **Material:** Iron.
Description: Fragment of a slender iron rod.

Spike

No: 374 Trench: A:W Area **Context:** 643 **Period:** 4
Object: Spike **Material:** Iron.
Description: Small spike(?) of iron with squarish section.

Clamp

No: 233 Trench: B **Context:** 440 **Period:** 4
Object: Clamp **Material:** Iron.
Description: Broken iron clamp, fixed in a broad rectangular plate, corroded.

Latch

No: 427 Trench: A:TP6 **Context:** 649 **Period:** 4
Object: Latch **Material:** Iron.
Description: Head portion of a broken latch(?) of iron.

Axle

No: 606 Trench: F **Context:** 778 **Period:** 3
Object: Axle **Material:** Iron.
Description: Iron axle(?), corroded and encrusted. Fig. 8.9.

Wire

No: 697 Trench: A:TP9 **Context:** 1050 **Period:** 3-temple
Object: Wire **Material:** Iron.
Description: Two fragments of iron wire(?).

No: 30 Trench: A:NWNT, TP9 **Context:** 326 **Period:** 4
Object: Wire **Material:** Iron.
Description: Fragment of a thin iron wire.

No: 295 Trench: A:South Area **Context:** 605 **Period:** 4
Object: Wire **Material:** Iron.
Description: Two fragments of iron wire, encrusted.

No: 114 Trench: A:NWNT **Context:** 504 **Period:** 4?
Object: Wire **Material:** Iron.
Description: Fragment of a cylindrical iron wire.

Buckle

No: 229 Trench: B **Context:** 439 **Period:** 4
Object: Buckle **Material:** Iron.
Description: Iron buckle, corroded.

Unidentified

No: 441 Trench: D2 **Context:** 718 **Period:** 1
Object: Unidentified **Material:** Iron.
Description: Big and irregular-shaped unidentified object of iron with a lot of encrustation.

No: 682 Trench: B **Context:** 475 **Period:** 1
Object: Unidentified **Material:** Iron.
Description: Fragment of an unidentified object of iron, corroded.

No: 650 Trench: A:TP1 **Context:** 988 **Period:** 2
Object: Unidentified **Material:** Iron.
Description: Fragment of an unidentified object of iron, encrusted.

No: 252 Trench: A:TP6 **Context:** 370 **Period:** 3
Object: Unidentified **Material:** Iron.
Description: Flat, ribbon-shaped unidentified object of iron, forked at one end, broken on other end.

No: 637 Trench: A:TP3 **Context:** 974 **Period:** 3
Object: Unidentified **Material:** Iron.
Description: Big, unidentified iron object of irregular shape with concavity on one side, encrusted.

No: 488 Trench: A:TP5 **Context:** 700 **Period:** 3-temple
Object: Unidentified **Material:** Iron.
Description: Unidentified perforated disc-like object of iron with slight projection, corroded.

No: 667 Trench: A:TP9 **Context:** 1010 **Period:** 3-temple
Object: Unidentified **Material:** Iron.
Description: Fragments of unidentified objects of iron, encrusted.

No: 789 Trench: A:TP9 **Context:** 1121 **Period:** 3-temple
Object: Unidentified **Material:** Iron.
Description: Small and elongated oval-shaped unidentified object of iron, corroded.

No: 859 Trench: A:TP3 **Context:** 1095 **Period:** 3-temple
Object: Unidentified **Material:** Iron.
Description: Two slender, ribbon-shaped unidentified objects of iron.

No: 446 Trench: A:South Area, TP6 **Context:** 635 **Period:** 4
Object: Unidentified **Material:** Iron.
Description: Thick, unidentified squarish iron object, crackled and encrusted.

No: 91 Trench: A:S Temple **Context:** 366 **Period:** No period
Object: Unidentified **Material:** Iron.
Description: Thin, ribbon-shaped unidentified object of iron.

Lead objects

A total of four lead objects came to light during the excavations.

No: 158 Trench: B **Context:** 410 **Period:** 4
Object: Ball **Material:** Lead.
Description: Small spherical ball of lead.

No: 522 Trench: A:W Area **Context:** 920 **Period:** 4
Object: String **Material:** Lead.
Description: Small curved string of lead(?).

No: 318 Trench: A:TP6, South Area **Context:** 613 **Period:** 4
Object: Band **Material:** Lead.
Description: Small band of lead.

No: 839 Trench: A:TP7 **Context:** 1221 **Period:** No period
Object: Unidentified **Material:** Lead.
Description: Fragment of a small metal piece of lead with some indistinct design.

Silver objects

Only a single silver object came to light during the excavations.

No: 430 Trench: A:TP5, South Area **Context:** 663 **Period:** 4
Object: Decorative object **Material:** Silver.
Description: A shallow, eye-shaped object of silver, perhaps used as decoration to an 'eye' of a stone idol with a religious purpose.

Other materials

A total of 67 household objects came to light during the excavations. Of these, nine objects were made of bone, four of ivory, two of glass and one of porcelain. There were also 26 objects made of stone and 25 of terracotta.

Bone objects

There were nine objects made of bone. Six were simple points, two were double-ended points and one was the broken handle of a knife (Fig. 8.8). Of the simple points, four were recovered from Period 1, one from Period 4 and one from a layer of unattributable period. Among the double-ended points, one was found from Period 1 and one from Period 3.

No: 365 Trench: D2 **Context:** 715 **Period:** 1
Object: Point **Material:** Bone.
Description: Bone point, broken into pieces.

No: 383 Trench: D1 **Context:** 766 **Period:** 1
Object: Point **Material:** Bone.
Description: Bone point, broken towards the head, ground and slightly polished. Fig. 8.8.

No: 384 Trench: D1 **Context:** 766 **Period:** 1
Object: Point **Material:** Bone.
Description: Bone point, broken on either end, pecked and ground.

No: 418 Trench: D1 **Context:** 767 **Period:** 1
Object: Point **Material:** Bone.
Description: Bone point, broken towards head, pecked and ground. Fig. 8.8.

No: 444 Trench: A:South Area, TP6 **Context:** 635 **Period:** 4
Object: Point **Material:** Bone.
Description: Bone point, broken at the head, ground and polished with lime encrustation. Fig. 8.8.

No: 784 Trench: E **Context:** 844 **Period:** No period
Object: Point **Material:** Bone.
Description: Fragment of a bone point with broader end missing.

No: 382 Trench: D1 **Context:** 766 **Period:** 1
Object: Double-ended point **Material:** Bone.
Description: Double-ended point of bone, pecked and ground. Fig. 8.8.

No: 603 Trench: F **Context:** 778 **Period:** 3
Object: Double-ended point **Material:** Bone.
Description: Double-ended point of bone, slightly broken at one end, pecked and ground. Fig. 8.8.
Ref: Similar specimens were obtained from Satavahana layers at Nasik (Sankalia and Deo 1955: fig. 56, a, b and l) and also obtained from Period V at Nevasa (Sankalia *et al*. 1960: fig. 194, 1).

No: 817 Trench: E **Context:** 1206 **Period:** No period
Object: Handle **Material:** Bone.
Description: Vertically broken tubular object of bone, perhaps a handle.

Ivory objects

There are four objects made of ivory, which can be categorised as a perforated disc, a handle of a knife and two lids of a container from Periods 4?, 3-temple and 4 respectively.

No: 370 Trench: A:TP5 **Context:** 642 **Period:** 3-temple
Object: Handle **Material:** Ivory.
Description: Slightly broken and vertically sleeved tubular handle(?) of a knife of ivory with excellent incised decoration on surface, channel slightly broad at one end and slightly broken. Fig. 8.8.

No: 448 Trench: A:South Area, TP6 **Context:** 635 **Period:** 4
Object: Lid **Material:** Ivory.
Description: Small lid of ivory(?) with a concave base and plano-convex top with smeared end, decorated by grooves. Fig. 8.10.

No: 727 Trench: B **Context:** 435 **Period:** 4
Object: Lid **Material:** Ivory.
Description: Lid of ivory with a flat and circular base, and a projecting round knob decorated with incised circles on the top portion. Fig. 8.10.

No: 126 Trench: A:NWNT **Context:** 532 **Period:** 4?
Object: Perforated disc **Material:** Ivory.
Description: Perforated disc of ivory, slightly broken, spindle whorl(?). Fig. 8.10.

Glass objects

There are two household objects made of glass, which are rim fragments of bowls, one from Period 2 and one from a layer of unattributable period.

No: 677 Trench: F **Context:** 788 **Period:** 2
Object: Bowl **Material:** Glass.
Description: Rim fragments of bowls of dark blue translucent glass.

No: 85 Trench: A:TP6 **Context:** 343 **Period:** No period
Object: Bowl **Material:** Glass.
Description: Fragment of a bowl with tubular rim of pale grey glass.

Porcelain objects

No: 394 Trench: E **Context:** 801 **Period:** No period
Object: Base **Material:** Porcelain.
Description: Base of a goblet(?) of porcelain.

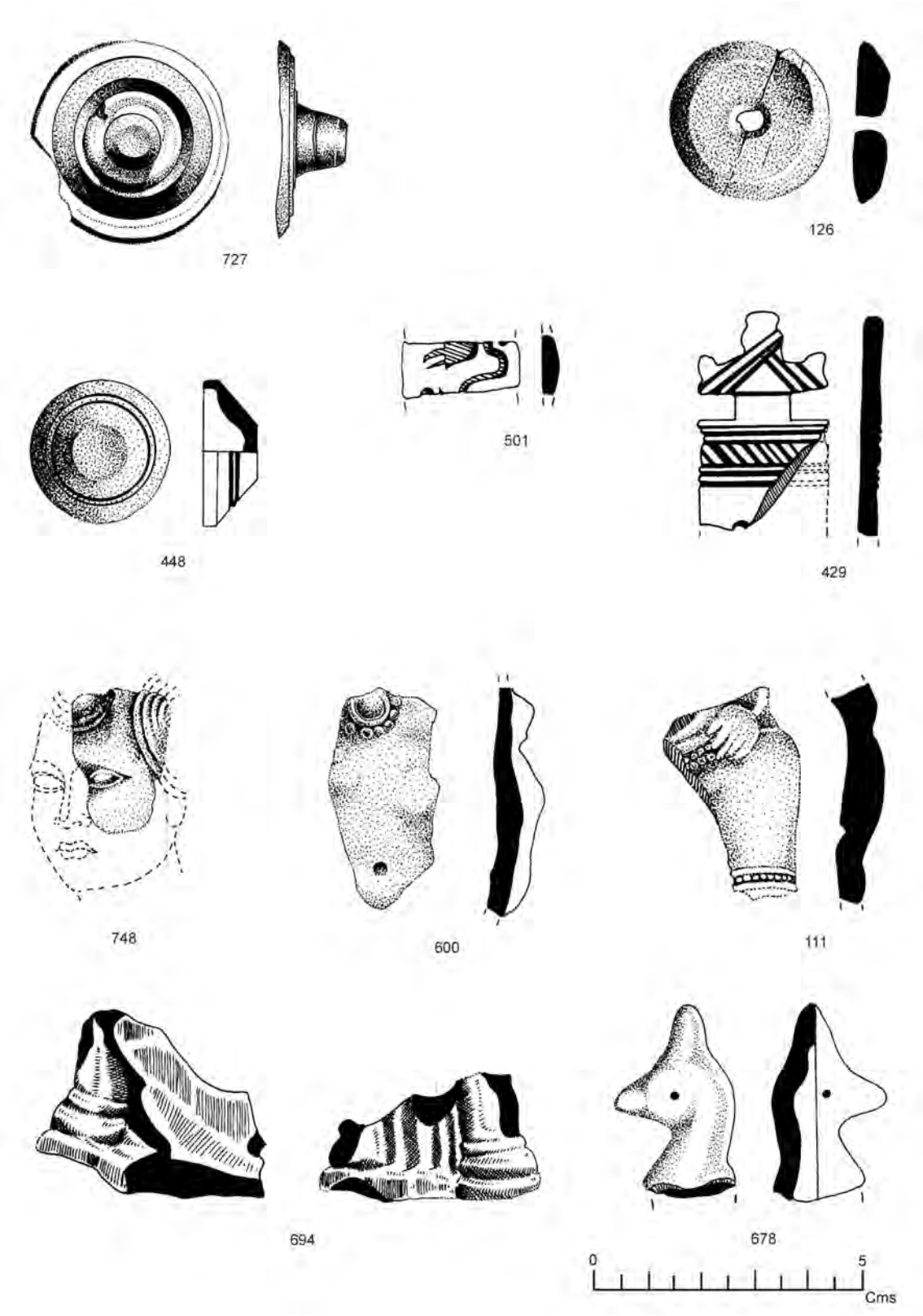


Fig. 8.10: Bone, kaolin and porcelain objects.

Table 8.9: Summary of iron objects by type of object and period.

Type	1	2	3	3-temple	4	4?	No period	Total
Arrow head				3	2			5
Spear	1							1
Point(tanged)			1					1
Knife	3	3	3	2	4			15
Handle					3			3
Chisel		1	1	1	3			6
Borer					3			3
Nail	7	7	11	11	43	6	7	**92**
Rivet			5		2			7
Fastener		1			2			3
Ring	2		2	1	4		1	**10**
Fish hook					2			2
Sickle					1		1	**2**
Spatula							1	**1**
Rod					1	1	1	**3**
Spike					1			1
Clamp					1			1
Latch					1			1
Axle			1					1
Wire				1	2	1		4
Buckle					1			1
Unidentified	2	1	2	4	1		1	**11**
Total	**15**	**13**	**26**	**23**	**77**	**8**	**12**	**174**

Stone objects

There are nine bowls in the above category, one each from Period 1 and Period 3 and seven from Period 4. One small vase of stone was recovered from Period 1. Of the three querns, one each was found in Period 1, Period 2 and Period 4. The other household objects of stone are four grinding stones, three mullers, one pestle, one lamp and a weight.

Balls

No: 474 Trench: A:TP5 **Context:** 642 **Period:** 3-temple
Object: Ball **Material:** Stone.
Description: Big, ovalish ball of stone with a polished surface.

No: 475 Trench: E **Context:** 809 **Period:** No period
Object: Ball **Material:** Stone.
Description: Half-broken, big spherical ball of basalt(?).

No: 476 Trench: E **Context:** 809 **Period:** No period
Object: Ball **Material:** Stone.
Description: Big, ovalish ball of stone with a roughly plano-convex section.

Bowls

No: 411 Trench: D2 **Context:** 718 **Period:** 1
Object: Bowl **Material:** Stone.
Description: Fragment of a bowl of soap stone.

No: 854 Trench: A:TP3 **Context:** 1021 **Period:** 3
Object: Bowl **Material:** Stone.
Description: Fragment of a convex sided big bowl of sand stone. Fig. 8.11.

No: 68 Trench: A:TP1 **Context:** 301 **Period:** 4
Object: Bowl **Material:** Stone.
Description: Fragment of a bowl of soap stone.

No: 185 Trench: B **Context:** 435 **Period:** 4
Object: Bowl **Material:** Stone.
Description: Fragment of a bowl of lime stone.

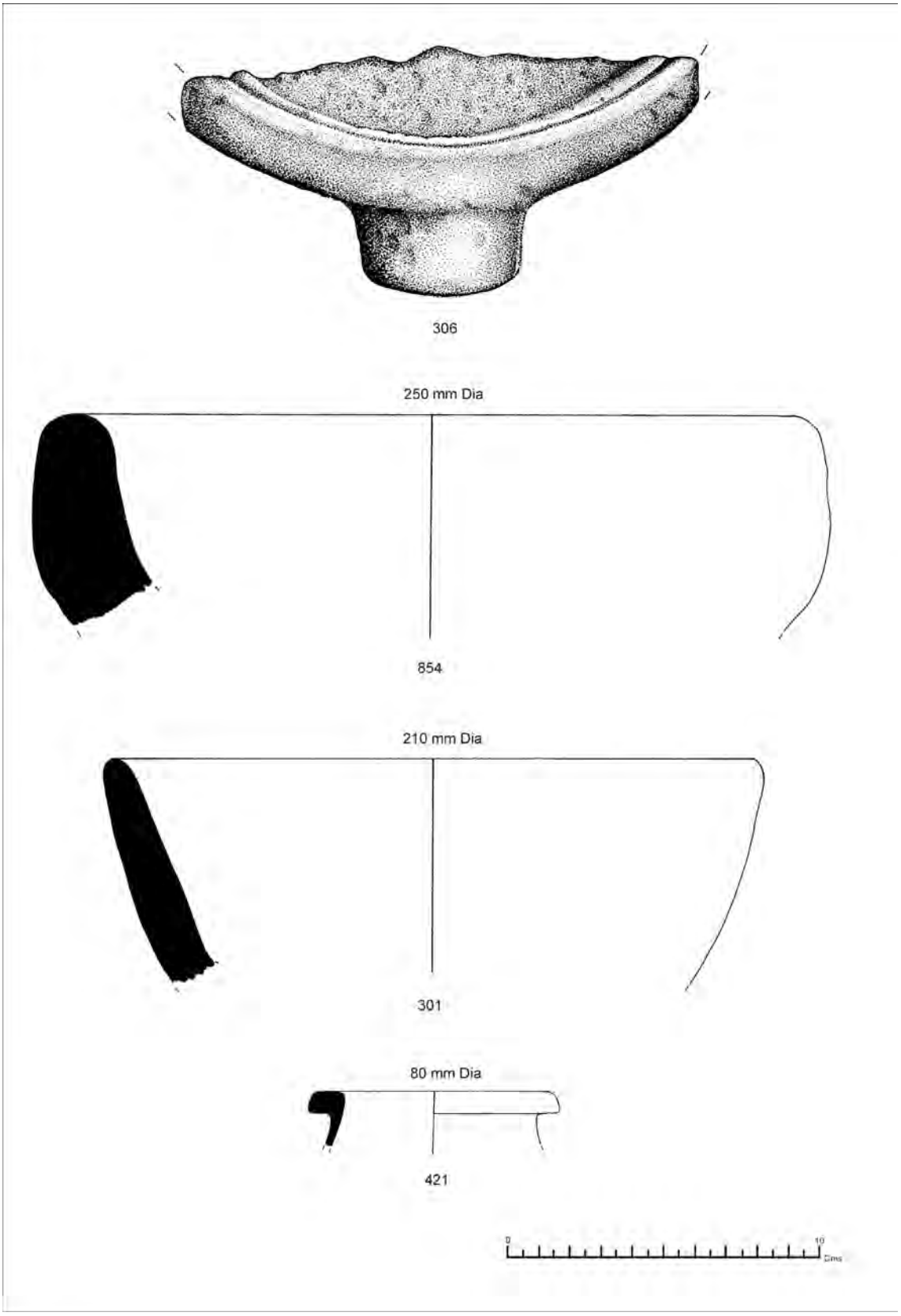


Fig. 8.11: Stone objects.

No: 294 Trench: A:South Area **Context:** 605 **Period:** 4
Object: Bowl **Material:** Stone.
Description: Fragment of a deep bowl of trap(?) stone with featureless rim.

No: 301 Trench: A:TP6, South Area **Context:** 613 **Period:** 4
Object: Bowl **Material:** Stone.
Description: Fragment of a deep bowl of trap stone (this is part of object no. 294). Fig. 8.11.

No: 469 Trench: A:South Area **Context:** 568 **Period:** 4
Object: Bowl **Material:** Stone.
Description: Fragment of a bowl of soap stone.

No: 470 Trench: A:South Area **Context:** 568 **Period:** 4
Object: Bowl **Material:** Stone.
Description: Fragment of a thin bowl of soap stone with horizontal lines on body.

No: 25 Trench: A:TP9 **Context:** 320 **Period:** 4
Object: Bowl **Material:** Stone.
Description: Fragment of a small bowl of soap stone(?) with projecting flat base.

Vase

No: 421 Trench: D1 **Context:** 767 **Period:** 1
Object: Vase **Material:** Stone.
Description: Fragment of a small vase of soap stone. Fig. 8.11.

Querns

No: 385 Trench: D2 **Context:** 718 **Period:** 1
Object: Quern **Material:** Stone.
Description: Leg of a quern of basalt(?) stone with iron rivet.

No: 306 Trench: D2 **Context:** 711 **Period:** 2
Object: Quern **Material:** Stone.
Description: Fragment of circular legged quern of trap(?) stone. Fig. 8.11.

No: 302 Trench: A:TP6, South Area **Context:** 613 **Period:** 4
Object: Rotary quern **Material:** Stone.
Description: Fragment of bottom part of a rotary quern of stone.

Grindstones

No: 32 Trench: A:NWNT, TP9 **Context:** 328 **Period:** 4
Object: Grindstone **Material:** Stone.
Description: Grinding stone of sandstone in pecked condition.

No: 162 Trench: B **Context:** 414 **Period:** 4
Object: Grindstone **Material:** Stone.
Description: Ovalish grinding stone of trap stone, ground.

No: 850 Trench: A:TP5 **Context:** 1000 **Period:** 3-temple
Object: Grindstone **Material:** Stone.
Description: Fragment of a grinding roller(?) of stone.

No: 853 Trench: A:TP1 **Context:** 1013 **Period:** 2
Object: Grindstone **Material:** Stone.
Description: Slightly broken spherical grinding stone of sandstone(?).

Mullers

No: 282 Trench: A:South Area **Context:** 578 **Period:** 3
Object: Muller **Material:** Stone.
Description: Broken cylindrical muller of red sandstone.

No: 153 Trench: B **Context:** 406 **Period:** 4
Object: Muller **Material:** Stone.
Description: Disc-shaped muller of sandstone, slightly broken.

No: 468 Trench: A:South Area **Context:** 568 **Period:** 4
Object: Muller **Material:** Stone.
Description: Broken cylindrical muller of basalt(?).

Pestle

No: 186 Trench: B **Context:** 435 **Period:** 4
Object: Pestle **Material:** Stone.
Description: Rectangular pestle of dolerite(?) with lenticular section.

Lamp

No: 146 Trench: B **Context:** 402 **Period:** 4
Object: Lamp **Material:** Stone.
Description: Thick and big lamp made of trap stone with pecked marks.

Weight

No: 93 Trench: A:NWNT **Context:** 376 **Period:** 2
Object: Weight(?) **Material:** Stone.
Description: Squarish cube-shaped weight(?) of stone.

Terracotta objects

Among the terracotta objects, there are two lamps, three vases, one handle of a vase, one bowl, two lids, three stoppers, four dabbers, three skin rubbers, one cigar pipe, one possible weight, three balls and one crucible. A detailed description is given below.

Lamps

No: 142 Trench: B **Context:** 402 **Period:** 4
Object: Lamp **Material:** Terracotta.
Description: Slightly broken lamp of terracotta with a handle having a flat base and a hollow stand. Fig. 8.12.

No: 145 Trench: B **Context:** 402 **Period:** 4
Object: Lamp **Material:** Terracotta.
Description: Terracotta lamp with a handle having a concave base with hollow stand.

Vases

No: 742 Trench: A:TP9 **Context:** 1096 **Period:** 3-temple
Object: Vase **Material:** Pottery.
Description: Decorated pinkish redware sherd of a vase (religious).

No: 581 Trench: F **Context:** 778 **Period:** 3
Object: Vase **Material:** Pottery.
Description: A small vase of red ware with a projecting disc base and slightly broken at the rim. Fig. 8.12.

No: 583 Trench: F **Context:** 778 **Period:** 3
Object: Vase **Material:** Pottery.
Description: A very small, toy vase of red ware with irregular projecting base. Fig. 8.12.

Handles

No: 235 Trench: B **Context:** 440 **Period:** 4
Object: Handle **Material:** Pottery.
Description: Handle of a red ware pot in the shape of elephant figurine (religious purpose). Fig. 8.13.

No: 582 Trench: F **Context:** 778 **Period:** 3
Object: Bowl **Material:** Pottery.
Description: Small, toy bowl of dull red ware. Fig. 8.12.

No: 777 Trench: F **Context:** 851 **Period:** 1
Object: Lid **Material:** Terracotta.
Description: Very small toy lid(?) of terracotta, slightly broken at the top projecting end. Fig. 8.12.

No: 798 Trench: F **Context:** 851 **Period:** 1
Object: Lid **Material:** Pottery.
Description: Knob of a lid(?) of polished black ware. Fig. 8.12.

Stoppers

No: 774 Trench: F **Context:** 851 **Period:** 1
Object: Stopper **Material:** Terracotta.
Description: Cylinder-shaped stopper of terracotta with a circular section, slightly concave in the middle of the body. Fig. 8.7.

No: 303 Trench: D2 **Context:** 710 **Period:** 2
Object: Stopper **Material:** Terracotta.
Description: Cylindrical-shaped stopper(?) of terracotta, slightly crackled on one end. Fig. 8.7.

No: 714 Trench: E **Context:** 832 **Period:** No period
Object: Stopper **Material:** Terracotta.
Description: Small cylindrical stopper(?) of terracotta with a circular section.

Dabbers

No: 463 Trench: D2 **Context:** 722 **Period:** 1
Object: Dabber **Material:** Terracotta.
Description: Broken dabber(?) of terracotta with a convex base, upper end broken. Fig. 8.7.

No: 841 Trench: A:TP5 **Context:** 918 **Period:** 3-temple
Object: Dabber **Material:** Terracotta.
Description: Thick, plano-convex-shaped dabber(?) of terracotta in a brick-red colour, smooth at the bottom.

No: 283 Trench: A:S Wall of N **Context:** 575 **Period:** 4
Object: Dabber **Material:** Terracotta.
Description: Ovalish dabber(?) of terracotta with a porous surface and a plano-convex section, black in colour.

No: 785 Trench: E **Context:** 844 **Period:** No period
Object: Dabber **Material:** Terracotta.
Description: Big and thick dabber(?) of terracotta with sand grains and vegetable grits.

Skin rubbers

No: 746 Trench: A:TP1 **Context:** 1099 **Period:** 2
Object: Skin rubber **Material:** Terracotta.
Description: Rectangular skin rubber of terracotta with a herring bone pattern on either face and on one side a slight depression in the centre for grip. Fig. 8.7.

No: 787 Trench: A:TP1 **Context:** 1120 **Period:** 2
Object: Skin rubber **Material:** Terracotta.
Description: Fragment of a skin rubber of terracotta with incised decoration on all three sides.

No: 560 Trench: F **Context:** 778 **Period:** 3
Object: Skin rubber **Material:** Terracotta.
Description: Fragment of a skin rubber of terracotta with a series of crescentic decoration on all sides. Fig. 8.7.

Weight

No: 718 Trench: A:TP1 **Context:** 1063 **Period:** 2
Object: Weight(?) **Material:** Terracotta.
Description: Two cylindrical-shaped weights(?) of terracotta with a circular section and a smooth surface, slightly tapering to one end and flat on the other end.

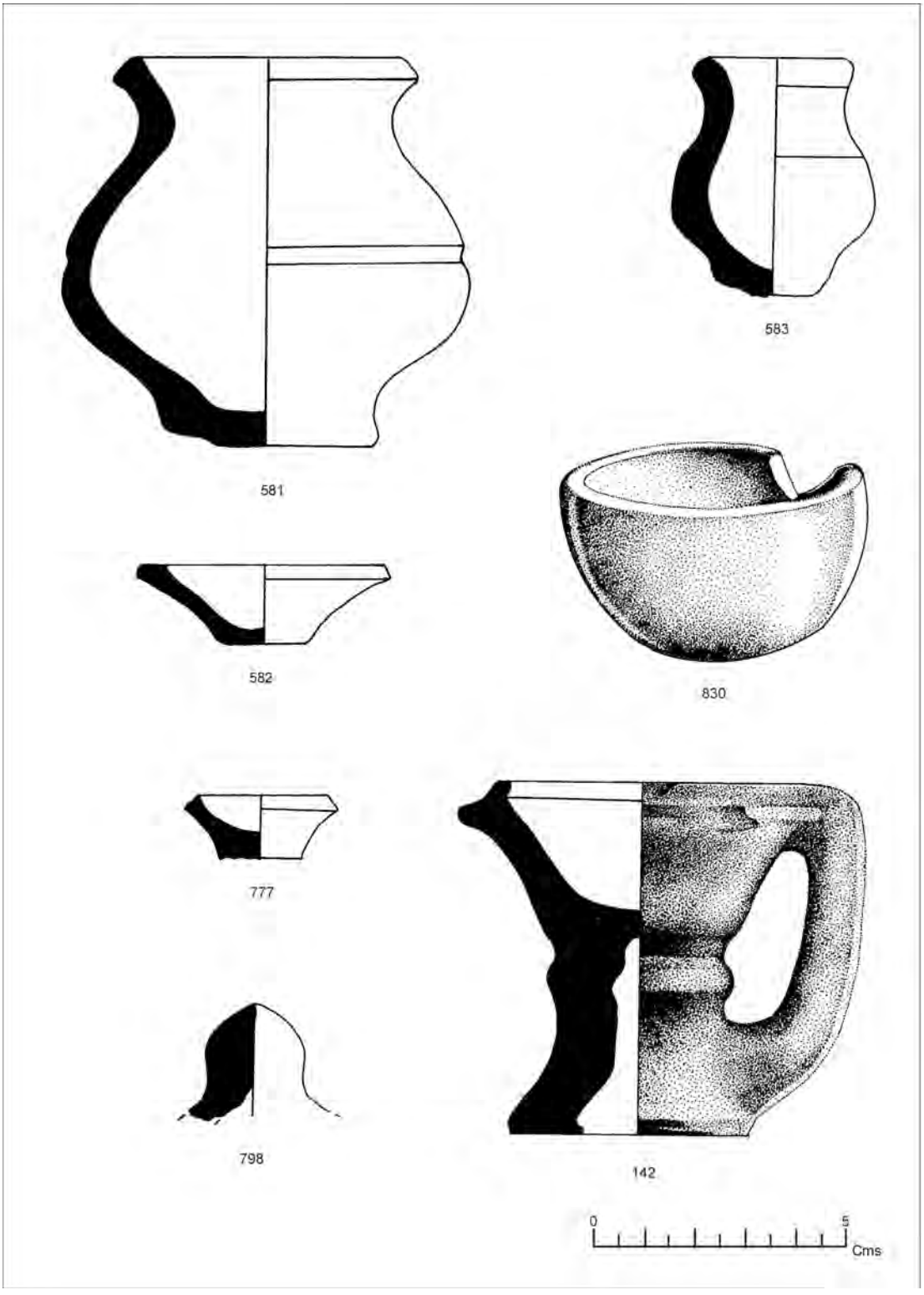


Fig. 8.12: Small jars, crucibles and lamps.

Balls

No: 66 Trench: A:NWNT **Context:** 331 **Period:** 4?
Object: Ball **Material:** Terracotta.
Description: Small terracotta ball, perhaps used as a weight.

No: 71 Trench: A:TP1 **Context:** 306 **Period:** 3-temple
Object: Ball **Material:** Terracotta.
Description: Very small terracotta ball, perhaps used as weight.

No: 67 Trench: A:NWNT **Context:** 331 **Period:** 4?
Object: Ball **Material:** Terracotta.
Description: Very small terracotta ball, perhaps used as weight.

Crucible

No: 830 Trench: B **Context:** 441 **Period:** 2
Object: Crucible **Material:** Terracotta.
Description: Broken round based crucible of terracotta. Fig. 8.12.

Cigar pipe

No: 388 Trench: E **Context:** 801 **Period:** No period
Object: Cigar pipe **Material:** Terracotta.
Description: Two fragments of cigar pipe of terracotta with occasional shining gold paint.

Play objects

A total of 98 play objects came to light during the excavations (Table 8.10). The number of play objects increased from Period 1 to Period 4. They are mainly related to children's play; some of the perforated discs might have been used as toy wheels and also some as spindle whorls. Except for a few, all the discs, hopscotch and toy wheels are made of broken potsherds. The toy wheels, perforated discs and hopscotch are edge-ground.

Balls

No: 624 Trench: B **Context:** 467 **Period:** 1
Object: Ball **Material:** Terracotta.
Description: Small, faceted ball of terracotta.

No: 84 Trench: A:EEST **Context:** 348 **Period:** 3
Object: Ball **Material:** Terracotta.
Description: Small ovalish ball of terracotta.

No: 576 Trench: A:TP6 **Context:** 342 **Period:** 3-temple
Object: Ball **Material:** Terracotta.
Description: Spheroid ball of terracotta, faceted.

No: 50 Trench: A:S of S Temple **Context:** 303 **Period:** 4
Object: Ball **Material:** Stone.
Description: Small stone ball with pecked marks and not ground.

No: 236 Trench: B **Context:** 440 **Period:** 4
Object: Ball **Material:** Terracotta.
Description: Half-broken spherical ball of terracotta with irregular lines on broken part.

No: 107 Trench: A:NWNT **Context:** 386 **Period:** 4?
Object: Ball **Material:** Terracotta.
Description: Terracotta ball of brick-red colour having a slightly porous surface.

No: 663 Trench: E **Context:** 829 **Period:** No period
Object: Ball **Material:** Terracotta.
Description: Small, spherical ball of terracotta.

No: 688 Trench: E **Context:** 831 **Period:** No period
Object: Ball **Material:** Stone.
Description: Small, spherical ball of stone.

Discs

No: 413 Trench: D2 **Context:** 718 **Period:** 1
Object: Disc **Material:** Pot-sherd.
Description: Small, edge-ground disc made of dull red ware sherd.

No: 573 Trench: B **Context:** 458 **Period:** 1
Object: Disc **Material:** Pot-sherd.
Description: Edge-ground, small disc of Black and Red ware.

No: 757 Trench: F **Context:** 851 **Period:** 1
Object: Disc **Material:** Pot-sherd.
Description: Small, edge-ground disc of red ware sherd. Fig. 8.7.

No: 758 Trench: F **Context:** 851 **Period:** 1
Object: Disc **Material:** Pot-sherd.
Description: Small, edge-ground disc of buff ware sherd, slightly broken.

No: 760 Trench: F **Context:** 851 **Period:** 1
Object: Disc **Material:** Pot-sherd.
Description: Small, edge-ground disc of buff ware sherd.

No: 761 Trench: F **Context:** 851 **Period:** 1
Object: Disc **Material:** Pot-sherd.
Description: Slightly damaged, edge-ground disc of red ware sherd.

No: 763 Trench: F **Context:** 851 **Period:** 1
Object: Disc **Material:** Pot-sherd.
Description: Two edge-ground and broken discs of dull red ware sherds of different sizes.

No: 305 Trench: D2 **Context:** 711 **Period:** 2
Object: Disc **Material:** Pot-sherd.
Description: Edge-ground disc of red ware sherd, slightly damaged. Fig. 8.7.

No: 616 Trench: A:TP1 **Context:** 966 **Period:** 2
Object: Disc **Material:** Pot-sherd.
Description: Fragment of an edge-ground thick disc of red ware sherd.

Table 8.10: Summary of play objects by type of object and period.

	1	2	3	3-temple	4	4?	No period	Total
Ball	1		1	1	2	1	2	**8**
Disc	7	10	10	5	5	1	8	**46**
Perforated disc	3	2	1		4			10
Hopscotch	2	4	1	2	4		1	**14**
Marble	1		5	1	1		2	**10**
Toy		1			1			2
Toy Wheel	2	1		1	1	1		6
Dice					1			1
Pan							1	**1**
Total	**16**	**18**	**18**	**10**	**19**	**3**	**14**	**98**

No: 643 Trench: A:TP1 **Context:** 986 **Period:** 2
Object: Disc **Material:** Pot-sherd.
Description: Big and thick edge-ground disc of red ware sherd.

No: 644 Trench: A:TP1 **Context:** 986 **Period:** 2
Object: Disc **Material:** Pot-sherd.
Description: Small, edge-ground, ovalish disc of dull red ware sherd.

No: 679 Trench: F **Context:** 788 **Period:** 2
Object: Disc **Material:** Pot-sherd.
Description: Slightly broken, edge-ground disc of red ware sherd.

No: 705 Trench: F **Context:** 798 **Period:** 2
Object: Disc **Material:** Pot-sherd.
Description: Edge-ground, ovalish disc of red ware sherd.

No: 721 Trench: F **Context:** 846 **Period:** 2
Object: Disc **Material:** Pot-sherd.
Description: Edge-ground, ovalish disc of dull red ware sherd with a squarish section.

No: 739 Trench: A:TP1 **Context:** 1063 **Period:** 2
Object: Disc **Material:** Pot-sherd.
Description: Slightly damaged disc of red ware sherd, partly ground.

No: 851 Trench: A:TP1 **Context:** 1009 **Period:** 2
Object: Disc **Material:** Pot-sherd.
Description: Edge-ground disc of red ware sherd.

No: 263 Trench: D1 **Context:** 751 **Period:** 3
Object: Disc **Material:** Pot-sherd.
Description: Edge-ground disc of red ware sherd.

No: 467 Trench: A:South Area **Context:** 668 **Period:** 3
Object: Disc **Material:** Pot-sherd.
Description: Edge-ground, broken disc of dull red ware sherd.

No: 671 Trench: A:TP3 **Context:** 1012 **Period:** 3
Object: Disc **Material:** Pot-sherd.
Description: Broken, edge-ground disc of burnished red ware sherd.

No: 672 Trench: A:TP3 **Context:** 1012 **Period:** 3
Object: Disc **Material:** Pot-sherd.
Description: Broken, edge-ground disc of black ware sherd.

No: 673 Trench: A:TP3 **Context:** 1012 **Period:** 3
Object: Disc **Material:** Pot-sherd.
Description: Fragment of an edge-ground disc of dull buff ware sherd.

No: 790 Trench: A:TP5, TP3 **Context:** 1124 **Period:** 3
Object: Disc **Material:** Pot-sherd.
Description: Slightly broken and edge-ground disc of red ware sherd.

No: 803 Trench: A:TP3 **Context:** 1140 **Period:** 3
Object: Disc **Material:** Pot-sherd.
Description: Fragment of a big, edge-ground disc of dull red ware sherd.

No: 804 Trench: A:TP3 **Context:** 1140 **Period:** 3
Object: Disc **Material:** Pot-sherd.
Description: Fragment of an edge-ground disc of dull red ware.

No: 842 Trench: A:TP1 **Context:** 921 **Period:** 3
Object: Disc **Material:** Pot-sherd.
Description: Thick and ovalish disc of burnished red ware sherd.

No: 865 Trench: A:TP3 **Context:** 1129 **Period:** 3
Object: Disc **Material:** Pot-sherd.
Description: Big and thick disc of dark brownish red ware sherd, well burnt showing shell grains and vegetable temper.

No: 543 Trench: A:TP9, GG North **Context:** 927 **Period:** 3-temple
Object: Disc **Material:** Pot-sherd.
Description: Two edge-ground, broken discs of red ware sherds.

No: 578 Trench: A:TP6 **Context:** 342 **Period:** 3-temple
Object: Disc **Material:** Pot-sherd.
Description: Fragments of an edge-ground disc of red ware sherd.

No: 846 Trench: A:TP3 **Context:** 981 **Period:** 3-temple
Object: Disc **Material:** Pot-sherd.
Description: Edge-ground, ovalish disc of dull red ware sherd.

No: 847 Trench: A:TP3 **Context:** 981 **Period:** 3-temple
Object: Disc **Material:** Pot-sherd.
Description: Edge-ground and half-broken disc of black ware sherd.

No: 855 Trench: A:TP6 **Context:** 1031 **Period:** 3-temple
Object: Disc **Material:** Stone.
Description: Fragment of an edge-ground disc of trap stone.

No: 39 Trench: A:TP9 **Context:** 320 **Period:** 4
Object: Disc **Material:** Pot-sherd.
Description: Edge-ground disc of black ware sherd.

No: 99 Trench: A:NWNT **Context:** 376 **Period:** 4
Object: Disc **Material:** Pot-sherd.
Description: Small, edge-ground thick disc of burnished buff ware sherd.

No: 278 Trench: A:TP6 **Context:** 596 **Period:** 4
Object: Disc **Material:** Pot-sherd.
Description: Edge-ground disc of burnished black ware.

No: 315 Trench: A:TP6, South Area **Context:** 613 **Period:** 4
Object: Disc **Material:** Pot-sherd.
Description: Edge-ground disc of dull red ware sherd.

No: 113 Trench: A:NWNT **Context:** 504 **Period:** 4?
Object: Disc **Material:** Pot-sherd.
Description: Broken, edge-ground disc of red ware sherd.

No: 119 Trench: A:South Area **Context:** 513 **Period:** No period
Object: Disc **Material:** Potsherd.
Description: Small, edge-ground disc of burnished red ware.

No: 129 Trench: A:N Temple **Context:** 536 **Period:** No period
Object: Disc **Material:** Potsherd.
Description: Edge-ground disc of burnished black ware sherd.

No: 477 Trench: E **Context:** 809 **Period:** No period
Object: Disc **Material:** Pot-sherd.
Description: Edge-ground, triangular-shaped disc of pale grey ware sherd, which is part of a diagonally broken squarish object.

No: 711 Trench: E **Context:** 816 **Period:** No period
Object: Disc **Material:** Pot-sherd.
Description: Two small, edge-ground discs of buff ware sherds in varied sizes.

No: 750 Trench: E **Context:** 843 **Period:** No period
Object: Disc **Material:** Pot-sherd.
Description: Fragment of an edge-ground disc of red ware sherd.

No: 751 Trench: E **Context:** 843 **Period:** No period
Object: Disc **Material:** Pot-sherd.
Description: Fragment of an edge-ground disc of burnished red ware sherd.

No: 815 Trench: E **Context:** 1206 **Period:** No period
Object: Disc **Material:** Pot-sherd.
Description: Thick, squarish disc of red ware sherd with visible grits and slightly damaged.

No: 816 Trench: E **Context:** 1206 **Period:** No period
Object: Disc **Material:** Pot-sherd.
Description: Fragment of a thin disc of red ware sherd.

No: 49 Trench: A:S of S Temple **Context:** 303 **Period:** 4
Object: Disc **Material:** Terracotta.
Description: Thick, edge-ground disc of terracotta.

No: 706 Trench: F **Context:** 798 **Period:** 2
Object: Disc **Material:** Terracotta.
Description: Fragment of a disc of terracotta.

Perforated discs

No: 503 Trench: B **Context:** 452 **Period:** 1
Object: Perforated disc **Material:** Pot-sherd.
Description: Broken perforated disc of dull red ware sherd.

No: 547 Trench: D1 **Context:** 770 **Period:** 1
Object: Perforated disc **Material:** Pot-sherd.
Description: Two fragments of edge-ground perforated discs of burnished red ware sherd. Fig. 8.7.

No: 654 Trench: B **Context:** 468 **Period:** 1
Object: Perforated disc **Material:** Pot-sherd.
Description: Broken, perforated disc of burnished red ware sherd.

No: 722 Trench: F **Context:** 846 **Period:** 2
Object: Perforated disc **Material:** Pot-sherd.
Description: Broken, edge-ground perforated disc of red ware sherd. Fig. 8.7.

No: 852 Trench: A:TP1 **Context:** 1013 **Period:** 2
Object: Perforated disc **Material:** Pot-sherd.
Description: Partly edge-ground and broken perforated disc of red ware sherd, perforation made from either side.

No: 83 Trench: A:EEST **Context:** 348 **Period:** 3
Object: Perforated disc **Material:** Pot-sherd.
Description: Edge-ground disc of burnished black ware sherd with perforation under process.

No: 160 Trench: B **Context:** 413 **Period:** 4
Object: Perforated disc **Material:** Pot-sherd.
Description: Slightly broken perforated disc of red ware sherd, perforation made from either surface.

No: 170 Trench: B **Context:** 420 **Period:** 4
Object: Perforated disc **Material:** Pot-sherd.
Description: Broken perforated disc of grey ware, perforation made from under surface.

No: 422 Trench: A:South Area, TP6 **Context:** 635 **Period:** 4
Object: Perforated disc **Material:** Pot-sherd.
Description: Half-broken, perforated disc of red ware sherd, partly edge-ground.

No: 423 Trench: A:South Area, TP6 **Context:** 635 **Period:** 4
Object: Perforated disc **Material:** Pot-sherd.
Description: Fragment of a perforated disc of red ware sherd, perforation made from either surface.

Hopscotches

No: 472 Trench: D1 **Context:** 766 **Period:** 1
Object: Hopscotch **Material:** Pot-sherd.

Description: Slightly broken disc (hopscotch) of dull red ware sherd.

No: 548 Trench: D1 **Context:** 773 **Period:** 1
Object: Hopscotch **Material:** Pot-sherd.
Description: Small disc (hopscotch) of dull red ware sherd.

No: 618 Trench: A:TP1 **Context:** 966 **Period:** 2
Object: Hopscotch **Material:** Pot-sherd.
Description: Fragment of a disc (hopscotch) of burnished black ware sherd.

No: 680 Trench: F **Context:** 788 **Period:** 2
Object: Hopscotch **Material:** Pot-sherd.
Description: Thick disc (hopscotch) of red ware sherd.

No: 685 Trench: F **Context:** 789 **Period:** 2
Object: Hopscotch **Material:** Pot-sherd.
Description: Broken disc (hopscotch) of dull Black and Red ware sherd.

No: 738 Trench: A:TP1 **Context:** 1063 **Period:** 2
Object: Hopscotch **Material:** Pot-sherd.
Description: Big and thick broken disc (hopscotch) of red ware sherd.

No: 566 Trench: A:TP1 **Context:** 930 **Period:** 2
Object: Hopscotch **Material:** Pot-sherd.
Description: Two small broken discs (hopscotch) of red ware sherds.

No: 577 Trench: A:TP6 **Context:** 342 **Period:** 3-temple
Object: Hopscotch **Material:** Pot-sherd.
Description: Slightly broken disc (hopscotch) of burnished red ware sherd.

No: 579 Trench: A:TP6 **Context:** 342 **Period:** 3-temple
Object: Hopscotch **Material:** Pot-sherd.
Description: Big disc (hopscotch) of red ware sherd.

No: 168 Trench: B **Context:** 418 **Period:** 4
Object: Hopscotch **Material:** Pot-sherd.
Description: Edge-ground disc (hopscotch) of burnished buff ware.

No: 197 Trench: B **Context:** 435 **Period:** 4
Object: Hopscotch **Material:** Pot-sherd.
Description: Partly edge-ground disc (hopscotch) of dull red ware sherd.

No: 228 Trench: B **Context:** 439 **Period:** 4
Object: Hopscotch **Material:** Pot-sherd.
Description: Edge-ground disc (hopscotch) of red ware sherd.

No: 156 Trench: B **Context:** 410 **Period:** 4
Object: Disc **Material:** Terracotta.
Description: Edge-ground terracotta disc (hopscotch?) with porous surface and slightly damaged on one surface.

No: 702 Trench: E **Context:** 831 **Period:** No period
Object: Hopscotch **Material:** Pot-sherd.
Description: Two fragments of discs (hopscotch) of grey ware sherds(?).

Marbles

No: 703 Trench: B **Context:** 485 **Period:** 1
Object: Marble **Material:** Terracotta.
Description: Broken marble of terracotta.

No: 12 Trench: A:TP1 **Context:** 308 **Period:** 3
Object: Marble **Material:** Stone.
Description: Small, round marble of stone(?).

No: 647 Trench: A:TP6 **Context:** 987 **Period:** 3
Object: Marble **Material:** Stone.
Description: Half-broken marble of stone.

No: 731 Trench: A:TP6 **Context:** 1051 **Period:** 3
Object: Marble **Material:** Stone.
Description: Slightly broken spherical marble of stone(?).

No: 13 Trench: A:TP1 **Context:** 308 **Period:** 3
Object: Marble **Material:** Terracotta.
Description: Spheroid-shaped marble of terracotta in brick-red colour.

No: 523 Trench: A:TP1 **Context:** 921 **Period:** 3
Object: Marble **Material:** Terracotta.
Description: Spherical marble of terracotta with incised decoration in the form of '+'.

No: 540 Trench: A:TP5 **Context:** 918 **Period:** 3-temple
Object: Marble **Material:** Stone.
Description: Small spherical marble of stone.

No: 456 Trench: A:TP9 **Context:** 641 **Period:** 4
Object: Marble **Material:** Terracotta.
Description: Spherical marble of terracotta, red in colour.

No: 769 Trench: E **Context:** 816 **Period:** No period
Object: Marble **Material:** Stone.
Description: Small, spheriod marble of stone.

No: 825 Trench: E **Context:** 1206 **Period:** No period
Object: Marble **Material:** Stone.
Description: Small spherical stone marble.

Toys

No: 316 Trench: A:TP6, South Area **Context:** 613 **Period:** 4
Object: Toy **Material:** Terracotta.
Description: Broken toy rotary grinder of terracotta.

No: 678 Trench: F **Context:** 788 **Period:** 2
Object: Toy **Material:** Porcelain.
Description: Head of a peacock figurine of porcelain. Fig. 8.10.
Note: This object is clearly intrusive in Period 2.

Toy wheels

No: 367 Trench: D1 **Context:** 760 **Period:** 1
Object: Toy wheel **Material:** Pot-sherd.
Description: Edge-ground half-broken toy wheel of burnished buff ware sherd with hourglass section. Fig. 8.7.

No: 412 Trench: D2 **Context:** 718 **Period:** 1
Object: Toy wheel **Material:** Pot-sherd.
Description: Edge-ground toy wheel of burnished red ware sherd, perforation made from either surface. Fig. 8.7.

No: 593 Trench: A:TP1 **Context:** 944 **Period:** 2
Object: Toy wheel **Material:** Pot-sherd.
Description: Big and thick edge-ground toy wheel of red ware sherd, perforation made from either surface.

No: 861 Trench: A:TP3 **Context:** 1112 **Period:** 3-temple
Object: Toy wheel **Material:** Terracotta.
Description: Thick and crude toy wheel of terracotta with grits of stone, shell and vegetable temper.

No: 35 Trench: A:NWNT, TP9 **Context:** 328 **Period:** 4
Object: Toy wheel **Material:** Pot-sherd.
Description: Edge-ground, toy wheel of red ware sherd, perforation made from under surface.

No: 106 Trench: A:NWNT **Context:** 381 **Period:** 4?
Object: Toy wheel **Material:** Pot-sherd.
Description: Toy wheel of red ware sherd, perforation made on either side.

Dice

No: 182 Trench: B **Context:** 430 **Period:** 4
Object: Dice **Material:** Ivory.
Description: Long cubical dice of ivory with slightly worn set of ring incisions on each face, one(?), three and six circles respectively. Fig. 8.8.

Pan

No: 664 Trench: E **Context:** 829 **Period:** No period
Object: Pan **Material:** Ivory.
Description: Two fragments of a cylindrical pan of ivory(?) with a circular section, ground and polished.

Figurines

A total of 32 figurines came to light during the excavations. Of these, 26 were of terracotta, one of unbaked clay and five of kaolin.

Kaolin figurines

Among the five figurines of kaolin, three come from Period 2, one from Period 3-temple and one from 'Period 4?'. All are double moulded. Kaolin figurines recovered from the excavations compare well with the kaolin figurines displayed in the Balasaheb Patil Government Museum at Paithan, which were collected from different mounds of Paithan (see Chapter 11). One of the figurines (No. 111) from the excavation resembles very much a similar type of figurine from Ter (see below).

No: 748 Trench: A:TP1 **Context:** 1105 **Period:** 2
Object: Figurine **Material:** Kaolin.
Description: Left side portion of a face of a female figurine of kaolin having high forehead with circular beaded ornament (*chudamani*), broad prominent eyes, plump cheek, gentle smiling expression, hair hanging down and turning backwards covering the left ear. The right-side portion of the face is missing. Double moulded. Figs 8.10 and 8.14.

No: 111 Trench: A:NWNT **Context:** 504 **Period:** 4?
Object: Figurine **Material:** Kaolin.
Description: Broken torso of a human figurine of kaolin in a sitting posture, stunted left leg spread apart with left hand palm resting partly on thigh and partly on ornate waist band, wearing three rows of ornaments in anklet. Double moulded. Figs 8.10 and 8.14.
Ref: A similar figurine was recovered from Period II at Ter (Chapekar 1969: 88, fig. 28, 42). The upper portion of the torso is missing in the Paithan example; otherwise, both are similar.

No: 600 Trench: A:GG North **Context:** 949 **Period:** 3-temple
Object: Figurine **Material:** Kaolin.
Description: Bust of a male(?) figurine of kaolin depicting the body bending slightly towards the left with a prominent navel and a beaded pendent of a chain below the neck. Other things on the body are not identifiable. Double moulded. Figs 8.10 and 8.14.

No: 694 Trench: A:TP1 **Context:** 1040 **Period:** 2
Object: Figurine **Material:** Kaolin.
Description: Fragment of an animal figurine of kaolin showing the feet of the fore legs of an elephant. Double moulded. Fig. 8.10.

No: 809 Trench: A:TP3 **Context:** 1148 **Period:** 2
Object: Figurine **Material:** Kaolin.
Description: Fragment of an unidentified portion of a figurine of kaolin. Double moulded.

Terracottas

Of the 26 terracotta figurines, five are human and the rest are broken animal or bird figurines and their body parts. Some are hand modelled and some are single moulded.

Human figurines

No: 144 Trench: B **Context:** 402 **Period:** 4
Object: Figurine **Material:** Terracotta.
Description: Boy in sitting posture with excellent facial features, hair tied on the top of the head in a circular fashion, legs and one hand slightly broken. Hand modelled in terracotta. Fig. 8.15.

No: 161 Trench: B **Context:** 413 **Period:** 4
Object: Figurine **Material:** Terracotta.

Description: Crude female figurine (anthropomorphic) with a cylindrical body and with prominent breasts, legs stretched sidewise. The head, hands and left leg are broken. Hand modelled from terracotta. Figs 8.15 and 8.16.

No: 289 Trench: A:South Area **Context:** 605 **Period:** 4
Object: Figurine **Material:** Terracotta.
Description: Seated male figurine with head and hands broken, resting on barrel sided back rest. Crudely hand-made in terracotta. Fig. 8.16.

No: 386 Trench: E **Context:** 801 **Period:** No period
Object: Figurine **Material:** Terracotta.
Description: Torso of a male figurine of terracotta.

No: 24 Trench: None **Context:** 0 **Period:** No period
Object: Figurine **Material:** Terracotta.
Description: Head of a male figurine with prominent nose, bulged eyes, and a croff on the forehead. Single moulded in terracotta. Fig. 8.16.

Animals and birds

The animals represented in terracotta are a bull, goat, horse and tiger. The body parts of the animals found at Paithan were represented by horns and legs. One was found in Period 1, two in Period 2, two in Period 3, one from Period 3-temple, ten from Period 4 and five from layers that have not been allocated to a period.

No: 237 Trench: None **Context:** 0 **Period:** No period
Object: Figurine **Material:** Terracotta.
Description: Head of a tiger figurine of terracotta with one ear partly damaged and missing body portion. Fig. 8.15.

No: 90 Trench: A:S Temple **Context:** 366 **Period:** No period
Object: Figurine **Material:** Terracotta.
Description: Small humped bull figurine of terracotta (votive Nandi?). Slightly broken, handmade. Fig. 8.16.

No: 143 Trench: B **Context:** 402 **Period:** 4
Object: Figurine **Material:** Terracotta.
Description: Goat figurine of terracotta with slightly broken legs, mouth and tail. Hand modelled. Fig. 8.13.

No: 240 Trench: A:South Area **Context:** 568 **Period:** 4
Object: Figurine **Material:** Terracotta.
Description: Broken horse figurine of terracotta with occasional white paint. Double moulded. Fig. 8.16.

No: 290 Trench: A:South Area **Context:** 605 **Period:** 4
Object: Figurine **Material:** Terracotta.
Description: Conical-shaped leg of an animal figurine of terracotta with tail representation. Coated in white paint.

No: 617 Trench: A:TP1 **Context:** 966 **Period:** 2
Object: Figurine **Material:** Terracotta.
Description: Leg fragment of an animal figurine of terracotta.

No: 693 Trench: A:TP1 **Context:** 1040 **Period:** 2
Object: Figurine **Material:** Terracotta.
Description: Broken leg of an animal(?) figurine of terracotta with a coating of white paint.

No: 567 Trench: A:TP1 **Context:** 930 **Period:** 3
Object: Figurine **Material:** Terracotta.
Description: Leg(?) portion of an animal figurine of terracotta with a coat of white paint and a patch of pink paint.

No: 317 Trench: A:TP6, South Area **Context:** 613 **Period:** 4
Object: Figurine **Material:** Terracotta.
Description: Slightly broken leg of an animal figurine of terracotta with partly visible white paint.

No: 843 Trench: A:TP10 **Context:** 928 **Period:** 4
Object: Figurine **Material:** Terracotta.
Description: Leg fragment of an animal(?) figurine of terracotta.

No: 396 Trench: E **Context:** 801 **Period:** No period
Object: Figurine **Material:** Terracotta.
Description: Leg portion of an animal figurine of terracotta.

No: 157 Trench: B **Context:** 410 **Period:** 4
Object: Figurine **Material:** Terracotta.
Description: Leg(?) of an animal figurine of terracotta with traces of white paint.

No: 152 Trench: B **Context:** 402 **Period:** 4
Object: Figurine **Material:** Terracotta.
Description: Horn of a bull figurine of terracotta.

No: 253 Trench: A:South Area **Context:** 589 **Period:** 3
Object: Figurine **Material:** Terracotta.
Description: Horn(?) portion of an animal figurine(?) of terracotta with a lime coat.

No: 752 Trench: E **Context:** 843 **Period:** No period
Object: Figurine **Material:** Terracotta.
Description: Conical-shaped horn(?) of an animal figurine of terracotta. Slightly broken.

No: 241 Trench: A:South Area **Context:** 568 **Period:** 4
Object: Figurine **Material:** Terracotta.
Description: Horn of an animal figurine of terracotta, coated with pale pinkish paint and violet painted lines at the end.

No: 778 Trench: F **Context:** 851 **Period:** 1
Object: Figurine **Material:** Terracotta.
Description: Tail portion of an animal(?) figurine of terracotta.

No: 845 Trench: A:TP3 **Context:** 981 **Period:** 3-temple
Object: Figurine **Material:** Terracotta.
Description: Fragment of a bird(?) figurine of terracotta with a lime wash. Fig. 8.16.

No: 159 Trench: B **Context:** 410 **Period:** 4
Object: Figurine **Material:** Terracotta.
Description: Broken, unidentified animal figurine of terracotta with a seat-arrangement on its back.

No: 346 Trench: A:South Area, TP6 **Context:** 635 **Period:** 4
Object: Figurine **Material:** Terracotta.
Description: Trunk(?) of an elephant figurine of terracotta, slightly broken at the narrower end and faintly visible white paint.

No: 531 Trench: E **Context:** 816 **Period:** No period
Object: Figurine **Material:** Clay.

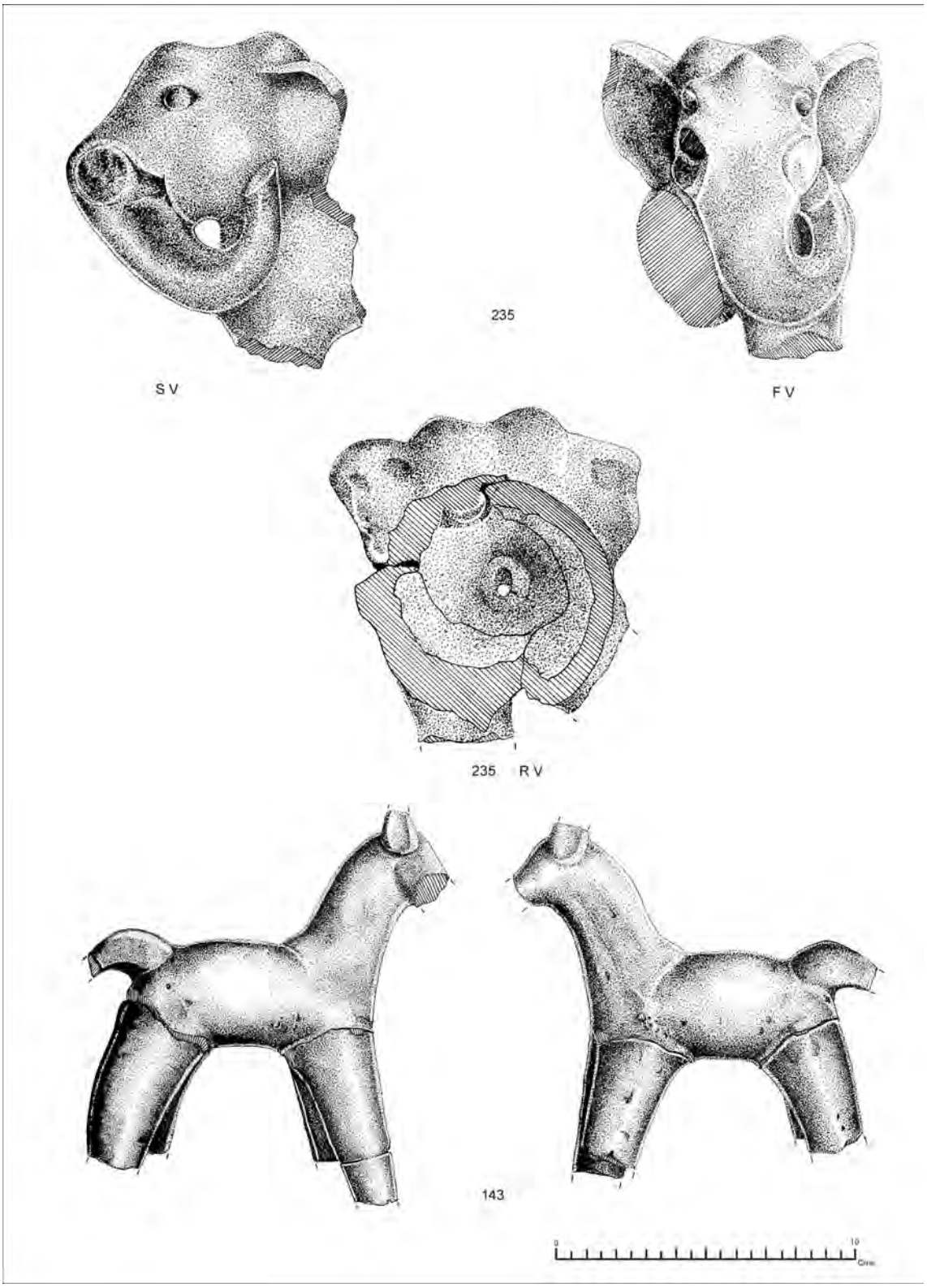


Fig. 8.13: Animal terracotta figurines.

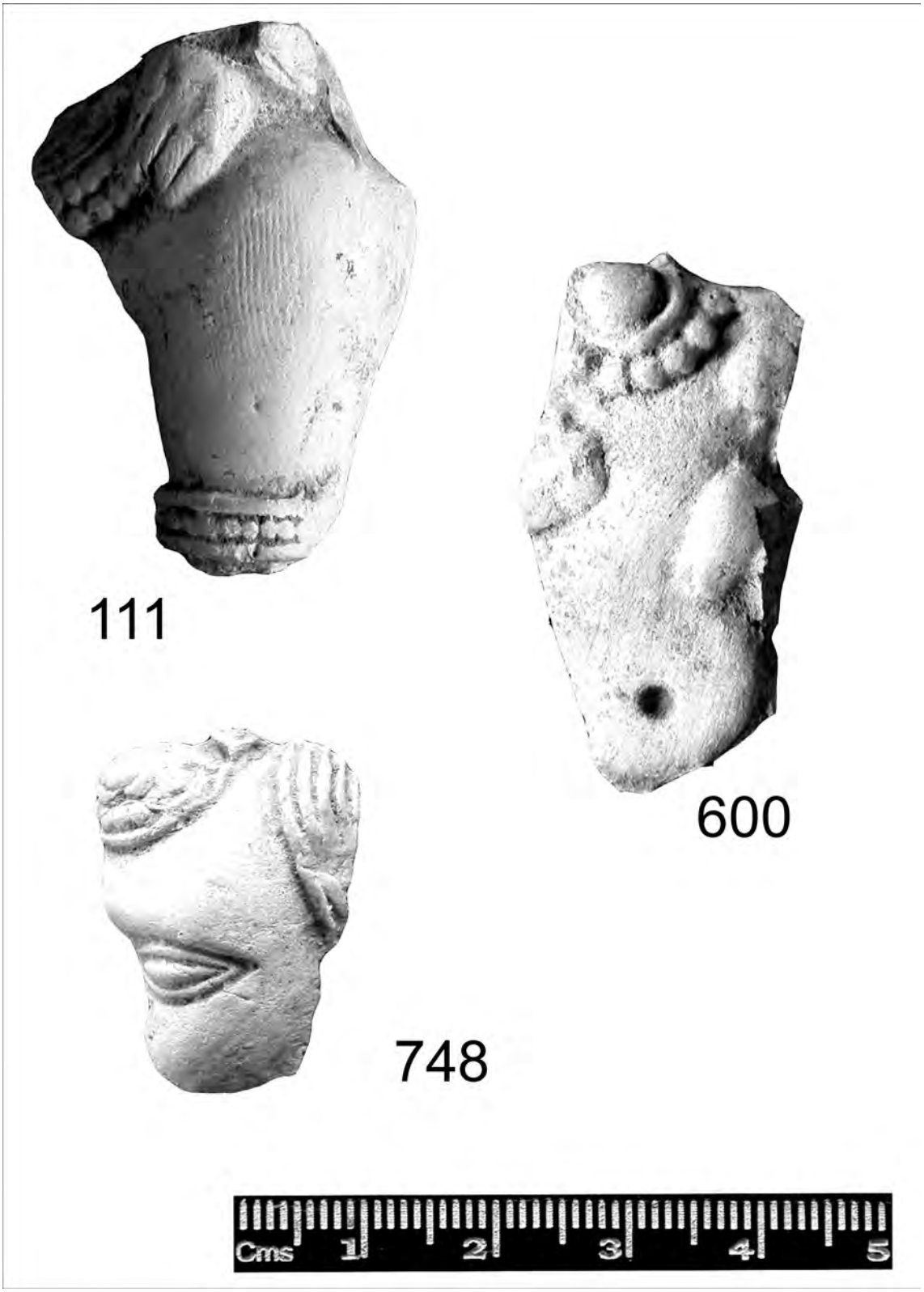


Fig. 8.14: Kaolin figurines.

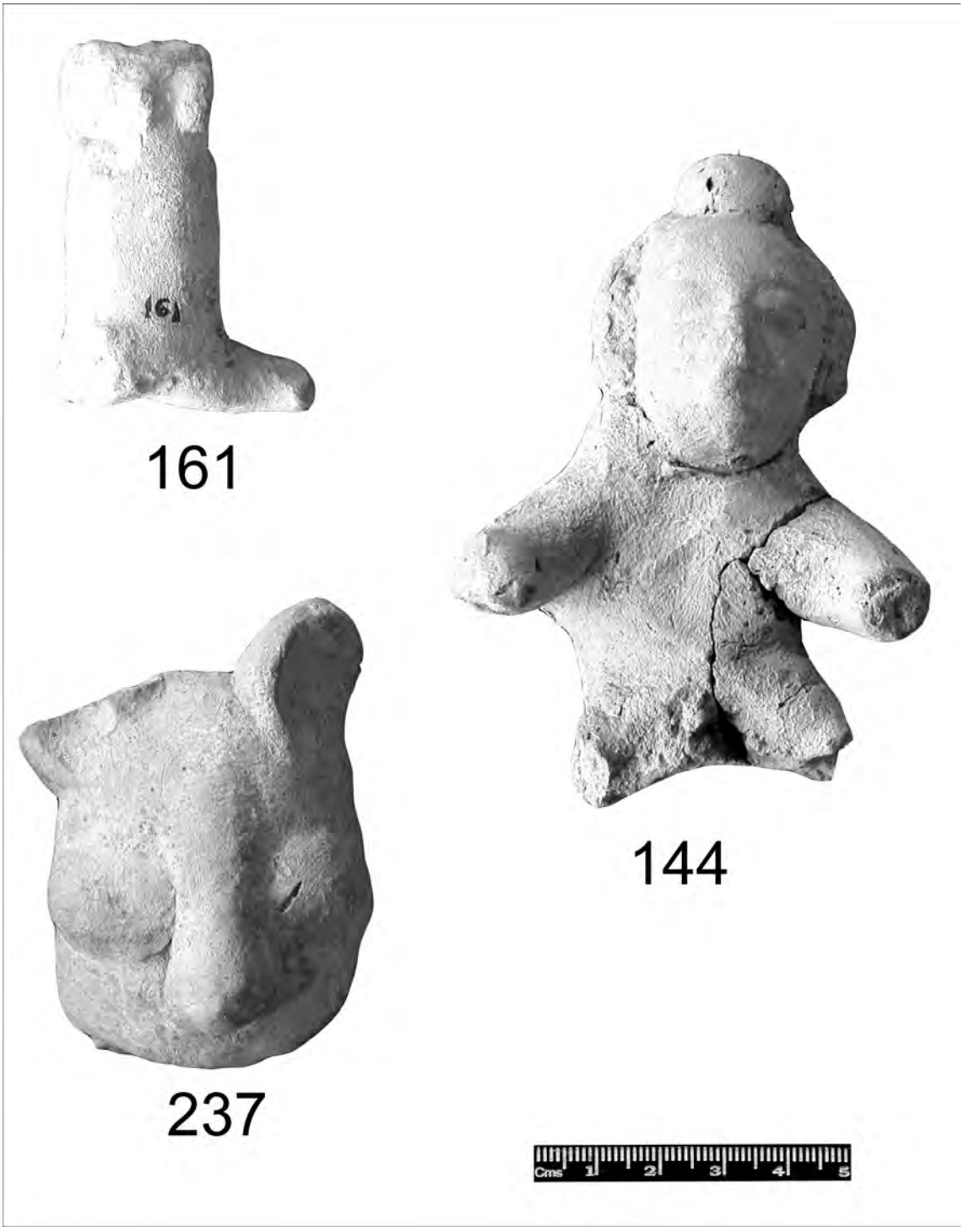


Fig. 8.15: Terracotta figurines.

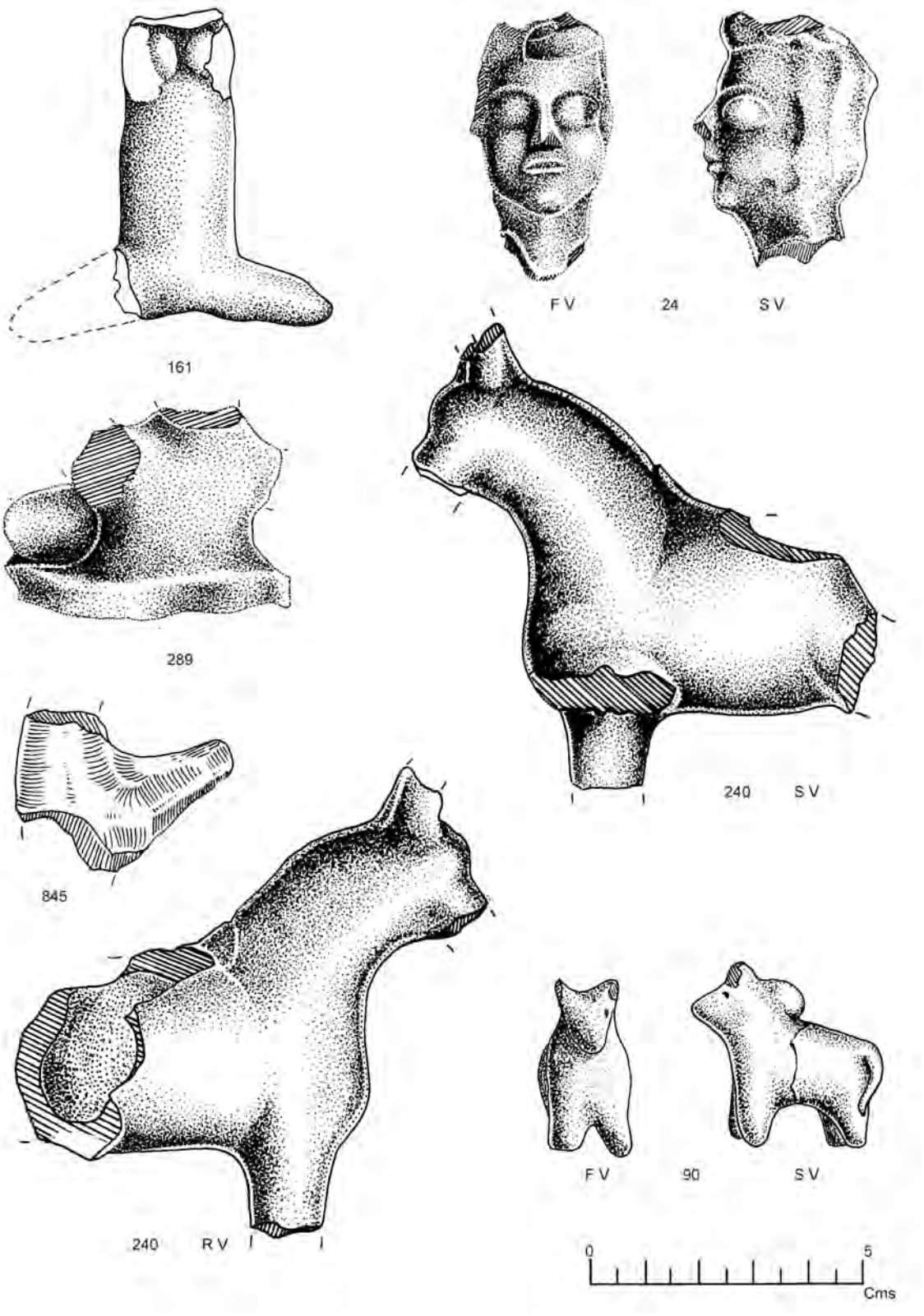


Fig. 8.16: Human and animal terracotta figurines.

Fig. 8.17: Stone sculpture 234.

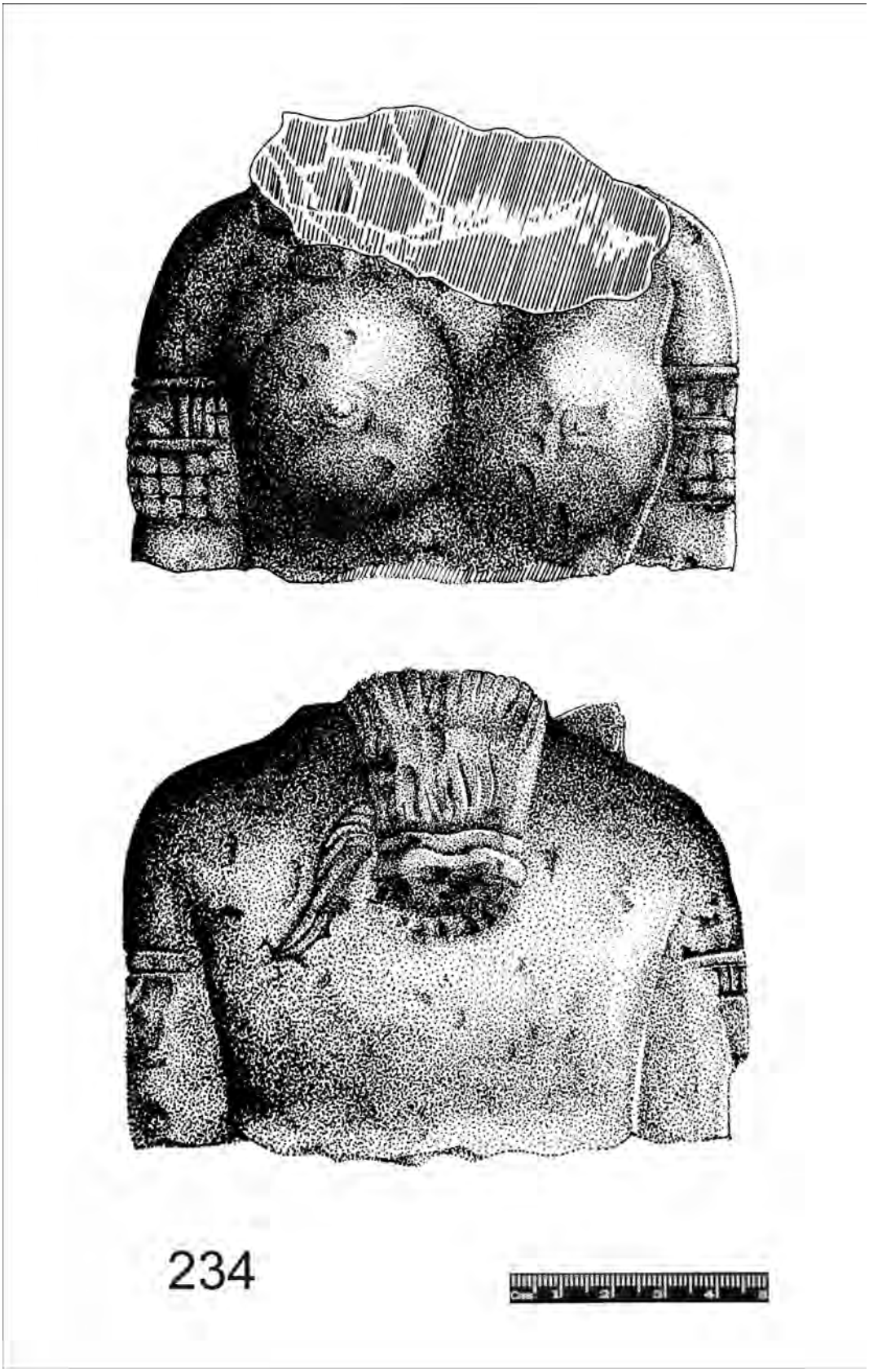


Fig. 8.18: Stone sculpture 234.

Description: Three fragments of a broken serpent figurine with a hood, made of unbaked clay.

Sculpture fragment

No: 234 Trench: B **Context:** 440 **Period:** 4
Object: Sculpture **Material:** Stone.
Description: Bust of a small female sculpture of greenish lime-stone with the head missing, arms suspended sidewise with a series of ornaments executed in low relief. Robust breasts with pointed nipples, traces of an ear ornament hanging down on the right-side of the body above the breast. The back of the sculpture shows hair hanging down freely and knotted in the middle with ends of the hair coming out at the sides. Figs 8.17 and 8.18.

Iron slag

No: 571 Trench: B **Context:** 453 **Period:** 1
Object: Slag **Material:** Iron.
Description: Iron slag.

No: 621 Trench: B **Context:** 458 **Period:** 1
Object: Slag **Material:** Iron.
Description: Iron slag.

No: 640 Trench: F **Context:** 784 **Period:** 2
Object: Slag **Material:** Iron.
Description: Iron slag.

No: 813 Trench: A:TP1 **Context:** 1150 **Period:** No period
Object: Slag **Material:** Iron.
Description: Iron slag with encrustation.

Unidentified objects

No: 81 Trench: A:EEST **Context:** 348 **Period:** 3
Object: Sheet **Material:** Lead.
Description: Small and thin squarish sheet of lead with traces of Ujjain(?) symbol on one side.

No: 429 Trench: A:TP5 **Context:** 661 **Period:** 3-temple
Object: Unidentified **Material:** Ivory.
Description: Unidentified object of ivory, perhaps handle of a comb with excellent cut design of human representation followed by incised design. Fig. 8.10.

No: 501 Trench: B **Context:** 452 **Period:** 1
Object: Unidentified **Material:** Shell.
Description: Fragment of a ribbon-shaped unidentified shell object with incised decoration. Fig. 8.10.

No: 737 Trench: A:TP6 **Context:** 1051 **Period:** 3
Object: Unidentified **Material:** Shell.
Description: Broken ribbon-shaped unidentified shell object.

No: 779 Trench: B **Context:** 735 **Period:** 1
Object: Unidentified **Material:** Tortoise shell.
Description: Unidentified object(?) of tortoise shell.

No: 810 Trench: A:TP3 **Context:** 1148 **Period:** 2
Object: Unidentified **Material:** Glass.
Description: Fragment of an unidentified object of dark honey-coloured soft glass.

No: 695 Trench: A:TP9 **Context:** 1050 **Period:** 3-temple
Object: Unidentified **Material:** Glass.
Description: Fragment of an unidentified object of glass.

No: 402 Trench: A:South Area, TP6 **Context:** 635 **Period:** 4
Object: Unidentified **Material:** Porcelain.
Description: Fragment of an unidentified object of porcelain.

No: 304 Trench: D2 **Context:** 710 **Period:** 2
Object: Tablet **Material:** Stone.
Description: Unidentified tablet of agate(?).

No: 674 Trench: A:TP3 **Context:** 1023 **Period:** 3
Object: Unidentified **Material:** Stone.
Description: Fragment of an unidentified squarish object of stone with a leg.

No: 827 Trench: A:TP9 **Context:** 1151 **Period:** 3-temple
Object: Unidentified **Material:** Stone.
Description: Unidentified circular object of stone(?) with indistinct symbols on either surface.

No: 127 Trench: A:NWNT **Context:** 532 **Period:** 4?
Object: Unidentified **Material:** Stone.
Description: Fragment of an unidentified polished circular object of granite(?).

No: 42 Trench: A:TP2 **Context:** 323 **Period:** No period
Object: Unidentified **Material:** Stone.
Description: Broken unidentified polished dolerite stone.
Date: This object appears to have a Mauryan polish.

No: 132 Trench: A:TP2 **Context:** 538 **Period:** No period
Object: Unidentified **Material:** Stone.
Description: Plano-convex-shaped object of sandstone with a shallow depression at the bottom.

No: 69 Trench: A:TP1 **Context:** 300 **Period:** 4
Object: Tablet **Material:** Terracotta.
Description: Edge-ground rectangular tablet of terracotta.

No: 762 Trench: F **Context:** 851 **Period:** 1
Object: Unidentified **Material:** Terracotta.
Description: Broken unidentified object of terracotta.

No: 452 Trench: A:TP5 **Context:** 667 **Period:** 3-temple
Object: Unidentified **Material:** Terracotta.
Description: Small, unidentified disc-shaped object of smoky quartz(?) with a polished top.

No: 814 Trench: A:TP9 **Context:** 1151 **Period:** 3-temple
Object: Unidentified **Material:** Terracotta.
Description: Fragment of unidentified object of terracotta with incised decoration of dots and lines.

No: 857 Trench: A:TP3, TP5 **Context:** 1062 **Period:** 3-temple
Object: Unidentified **Material:** Terracotta.

Description: Fragment of an unidentified portion of a terracotta object with decoration. Double moulded.

No: 277 Trench: A:South Area **Context:** 592 **Period:** 4
Object: Unidentified **Material:** Terracotta.
Description: Broken unidentified object of terracotta.

No: 291 Trench: A:South Area **Context:** 605 **Period:** 4
Object: Unidentified **Material:** Terracotta.
Description: Slightly broken unidentified object of terracotta.

No: 300 Trench: A:W Area **Context:** 616 **Period:** 4
Object: Unidentified **Material:** Terracotta.
Description: Fragment of an unidentified terracotta object decorated with appliqué petal motif.

No: 352 Trench: A:South Area, TP6 **Context:** 635 **Period:** 4
Object: Unidentified **Material:** Terracotta.
Description: Broken unidentified object of terracotta with a lime coating.

No: 353 Trench: A:South Area, TP6 **Context:** 635 **Period:** 4
Object: Unidentified **Material:** Terracotta.
Description: Unidentified and slightly curved cylindrical terracotta object, broken on either end.

No: 447 Trench: A:South Area, TP6 **Context:** 635 **Period:** 4
Object: Unidentified **Material:** Terracotta.
Description: Edge-ground, unidentified triangular object of dull red ware sherd, slightly broken at one end.

No: 389 Trench: E **Context:** 801 **Period:** No period
Object: Unidentified **Material:** Terracotta.
Description: Broken unidentified object of terracotta with traces of white coating.

No: 868 Trench: A:TP6 **Context:** 1214 **Period:** No period
Object: Unidentified **Material:** Terracotta.
Description: Fragment of an unidentified object of terracotta.

Glass vessels

Apart from the glass bangles and beads that are described above with the small finds, only six fragments of glass vessels were recorded from the excavations (Table 8.11). All but one of these comes from Period 4. Some of them appear to be very recent, although P2184, P2181 and P1618 look as if they could be considerably older. P2184 comes from a stratified context allocated to Period 2.

Fig. 8.19: Glass fragments.

Table 8.11: Glass fragments.

No.	Context	Period	Description	Figure
P1616	435	4	Body fragment. Thick translucent glass with a light green-blue tint. Not weathered. 4 mm thick.	
P1617	435	4	Body fragment. Opaque clear glass with slight yellow tint. Some weathering. Less than 1 mm thick. Almost flat. Traces of painted or enamelled decoration on the exterior surface.	
P1618	435	4	Rim fragment. Semi-opaque purple-blue glass. Some weathering. 3 mm thick.	Fig. 8.19
P2181	414	4	Small body fragment. Opaque white colour, weathered. 1.5 mm thick.	
P2184	846	2	Rim fragment. Black opaque glass, weathered. 3 mm thick.	Fig. 8.19
P2554	429	4	Tiny body fragment. Translucent light-yellow glass. Not weathered. 1 mm thick.	

M. Kasturi Bai and Shailendra Bhandare (with an appendix by D. Kennet)

Chapter 9
The Coins

Introduction

The excavations at Paithan yielded a total of 56 coins, including two that were found on the surface. Many of these are in a very poor condition, making identification difficult and tentative or, in 17 cases, impossible. Those coins that can be identified are broadly classified in the catalogue below as pre-Satavahana (c. 370–150/100 BC), Satavahana (c. 140 BC–AD 220), post-Satavahana (2nd–7th centuries AD), Islamic (c. AD 1300–19th century) and British (AD 1818 and later), some of which are subdivided into types. Table 9.1 shows the occurrence of each of these categories and types by period.

Pre-Satavahana coins

The pre-Satavahana coins are subdivided into 'hollow cross' and 'tree' types. All are made of copper alloy.

'Hollow cross'-type coins

This type consists of a hollow cross on the obverse. These are square in shape. They are also corroded, cracked, worn out and sometimes flaked. All of these coins can be attributed to the post-Mauryan and pre-Satavahana period.

Coin 1. Find No. **574** (Context: 458), Tr. B.
Period 1. Fig. 9.1.
Copper alloy, squarish, broken, corroded and worn out.
Size: 1.75 × (-) × 0.50 cm, weight: 3.49 g.
Obv: Traces of a hollow cross are present.
Rev: Indistinct due to corrosion.

Coin 2. Find No. **504** (Context: 453), Tr. B.
Period 1. Fig. 9.1.
Copper alloy, squarish, corroded, greenish patina and cracked.
Size: 1.94 × 1.85 × 0.57 cm, weight: 5.85 g.
Obv: Hollow cross is faintly visible.
Rev: Corroded, no details visible, perhaps blank.

Table 9.1: The occurrence of coins by period.

	Period 1	Period 2	Period 3	Period 3-temple	Period 4	No period	Total
Pre-Satavahana (total)	**8**	**2**	**1**	**3**			**14**
'Hollow cross'	8	2		1			11
'Tree'			1	2			3
Satavahana (total)		**1**	**3**	**6**	**5**	**3**	**18**
'Elephant'		1	2	2	4	3	12
'Bull'			1	4			5
'Lion'					1		1
Post-Satavahana				**2**	**1**		**3**
Unidentified		2	1	6	5	3	17
Late Med/Islamic					2	1	3
British					1		1
Total	**8**	**5**	**5**	**17**	**14**	**7**	**56**

https://doi.org/10.1515/9783110653540-009

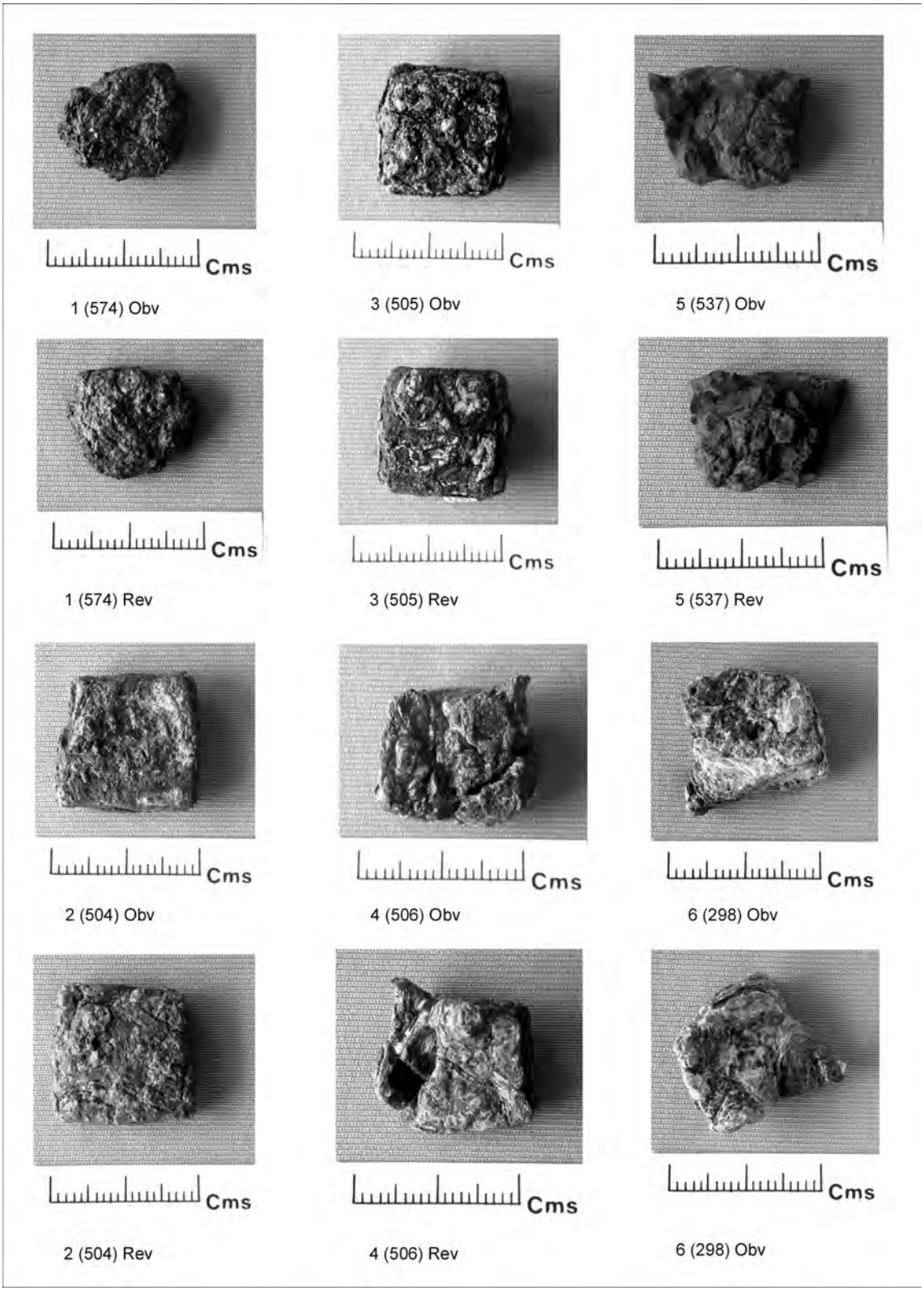


Fig. 9.1: Coins 1 (574), 3 (505), 5 (537), 2 (504), 4 (506) and 6 (298).

Coin 3. Find No. **505** (Context: 453), Tr. B.
Period 1. Fig. 9.1.
Copper alloy, squarish, corroded, slight greenish patina, cracked.
Size: 1.78 × 1.76 × 1.00 cm, weight: 8.23 g.
Obv: Hollow cross faintly visible.
Rev: Core visible with uneven surface.

Coin 4. Find No. **506** (Context: 453), Tr. B.
Period 1. Fig. 9.1.
Copper alloy, squarish, slightly broken, highly corroded, flaked, cracked.
Size: 2.06 × 1.69 × 0.75 cm, weight: 4.42 g.
Obv: Hollow cross is visible.
Rev: Corroded, no details visible.

Coin 5. Find No. **537** (Context: 453), Tr. B.
Period 1. Fig. 9.1.
Copper alloy, squarish, highly corroded, flaked.
Size: 1.88 × (-) × 0.55 cm, weight: 2.87 g.
Obv: No details visible.
Rev: No details visible, core exposed.
Note: This coin can be categorized as a 'hollow cross' type based on the fabric.

Coin 6. Find No. **298** (Context: 754), Tr. D1.
Period 1. Fig. 9.1.
Copper alloy, squarish with projection, corroded, flaked.
Size: 1.82 × 1.65 × 0.77 cm, weight: 4.38 g.
Obv: Hollow cross faintly visible.
Rev: Not discernable.

Coin 7. Find No. **299** (Context: 754), Tr. D1.
Period 1.
Copper alloy, rectangular(?), broken irregularly, corroded to core, worn out.
Size: 1.55 × (-) × 0.20 cm, weight: 1.08 g.
Obv: Worn out.
Rev: No details visible.

Coin 8. Find No. **812** (Context: 1150), Tr. A.
Period 1.
Copper alloy, fragment, corroded and encrusted.
Size: (-) × (-) × 0.45 cm, weight: not taken.
Obv: No details visible.
Rev: No details visible due to corrosion.

Coin 9. Find No. **337** (Context: 711), Tr. D2.
Period 2. Fig. 9.2.
Copper alloy, squarish, broken into two pieces, corroded, cracked.
Size: 1.90 × 1.78 × 0.78 cm, weight: 6.28 g.
Obv: Hollow cross is faintly visible.
Rev: Unidentifiable due to flaking of the surface.

Coin 10. Find No. **338** (Context: 711), Tr. D2.
Period 2.
Copper alloy, broken into two pieces, corroded, cracked.
Size: 1.80 × (-) × 0.50 cm, weight: 2.04 g.
Obv: No details visible.
Rev: No details visible.

Coin 11. Find No. **536** (Context: 923), Tr. A.
Period 3-temple.
Copper alloy, squarish, broken, corroded and cracked.
Size: 1.52 × (-) × 0.43 cm, weight: 2.10 g.
Obv: No details visible due to corrosion.
Rev: No details visible due to corrosion.
Note: Fabric is the same as that of 'hollow cross' type coins.

'Tree'-type coins

There are three coins of this type with a tree associated with other symbols. The type occurs in the pre-Satavahana and Satavahana periods, but all three coins of this type found at Paithan are pre-Satavahana (Nos. 12, 13 and 14). Of these, No. 12 was found in Period 3, the other two, Nos. 13 and 14, were recovered from the deposits of Period 3-temple. Coin 14 is similar to coin 12 but differs in ancillary symbols.

Coin 12. Find No. **535** (Context: 921), Tr. A.
Period 3. Fig. 9.2.
Bronze, squarish, worn out.
Size: 0.77 × (-) × 0.15 cm, weight: 0.46 g.
Obv: Branched tree with taurine symbol on its right-side top corner, some indistinct symbols at the bottom that are illegible due to the worn out condition.
Rev: Some worn, indistinct symbols are visible.

Coin 13. Find No. **648** (Context: 956), Tr. A.
Period 3-temple. Fig. 9.2.
Copper, rectangular, badly worn out.
Size: 0.84 × (-) × 0.14 cm, weight: 0.35 g.
Obv: Indistinct symbols inside a square frame.
Rev: Worn out, part of a square frame is visible.

Coin 14. Find No. **538** (Context: 919), Tr. A.
Period 3-temple. Fig. 9.2.
Bronze, rectangular, obliquely broken.
Size: 0.91 × (-) × 0.16 cm, weight: 0.46 g.
Obv: Branched tree with partly visible railing, taurine symbol on right-side top corner of the tree, indistinct symbol on the left side of the tree at the bottom, the left side upper portion is cut off.
Rev: A tree with oval leaves to right.
Note: This coin is similar to No. 12 in fabric and in the main symbol.

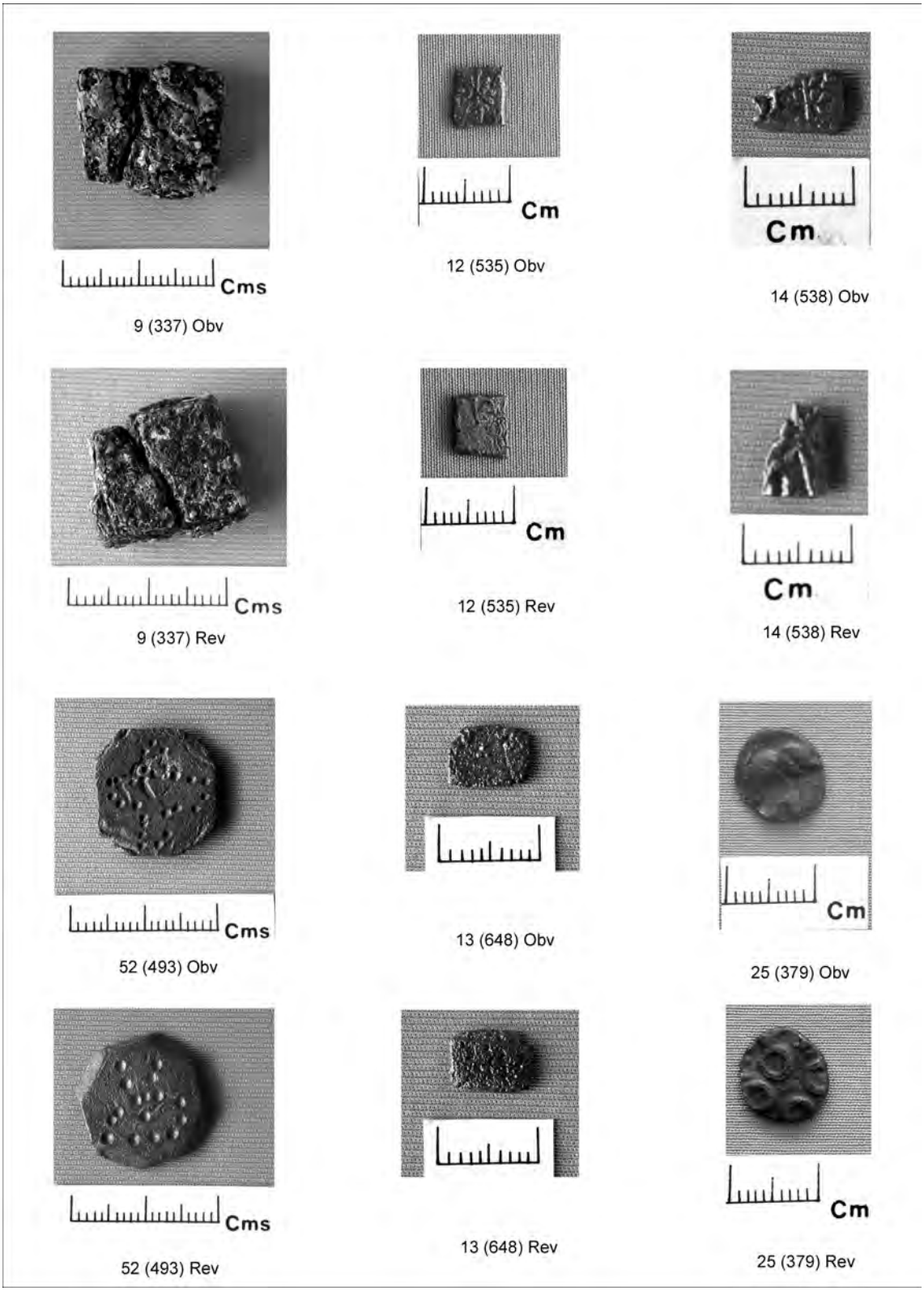


Fig. 9.2: Coins 9 (337), 12 (535), 14 (538), 52 (493), 13 (648) and 25 (379).

Satavahana coins

'Elephant'-type coins in copper

Coin 15. Find No. **724** (Context: 1072), Tr. A.
Period 3-temple. Fig. 9.3.
Copper, rectangular, worn out.
Size: 0.87 × 0.73 × 0.20 cm, weight: 0.71 g.
Obv: Traces of an elephant facing to right, traces of some indistinct letters above the animal.
Rev: Traces of Ujjain symbol.

Coin 16. Find No. **495** (Context: 700), Tr. A.
Period 3-temple.
Copper alloy, squarish, fragment, corroded, worn out.
Size: (-) × (-) × 0.37 cm, weight: 0.43 g.
Obv: Traces of some indistinct symbol.
Rev: Traces of part of an Ujjain symbol.

Coin 17. Find No. **745** (Context: 1099), Tr. A.
Period 2. Fig. 9.3.
Copper alloy, broken, squarish with greenish patina.
Size: 1.70 × (-) × 0.45 cm, weight: 5.29 g.
Obv: Indistinct symbols and not discernable due to worn out condition and patina.
Rev: Corroded and worn out, however traces of two orbs of an Ujjain symbol are visible.

Coin 18. Find No. **02** (Context: surface), Tr. A.
Surface. Fig. 9.3.
Copper alloy, round, corroded, cracked, worn out.
Size: 1.49×1.50×0.36 cm, weight: 2.02 g.
Obv: Faint traces of an elephant.
Rev: Faint traces of an Ujjain symbol.

Coin 19. Find No. **188** (Context: 435), Tr. A.
Period 4. Fig. 9.3.
Copper alloy, ovalish, slightly worn out.
Size: 1.54 × 1.34 × 0.23 cm, weight: 1.98 g.
Obv: Elephant walking to right, trunk and back partly off the flan, *Shrivatsa* symbol in front above the forelegs and below the mouth, legend along the flan is partly cut off, the extant legend starting at 2 o'clock reads '(PU) TASA SIRISADA (KA)...'
Rev: Tree with five oval leaves was found towards the left side of the reverse of the coin.
Note: This coin belongs to a type markedly oriented to the Nevasa-Paithan region in terms of its distribution (see the discussion at the end of this chapter). The inscription on it can be read as '(PU) TASA SIRISADA (KA)...', leaving out the complete metronymic. Although the full legend is not clear, the coin can be safely attributed to Kosikiputa Siri Satakani, by comparison with published specimens (Chumble 1991: 41–50) and also on the basis of a distinct ancillary symbol, a *Shrivatsa* placed below the mouth of the elephant.

Coin 20. Find No. **57** (Context: 320), Tr. A.
Period 4. Fig. 9.4.
Copper alloy, round, corroded and worn out, cracked.
Size: 1.90 × 0.51 cm, weight: 4.76 g.
Obv: Traces of an elephant facing to right, trunk hanging, swastika (or *Shrivatsa*) above the head of the animal, indistinct letters.
Rev: A series of dots in groups, a crescent like symbol is visible but unidentifiable.

Coin 21. Find No. **55** (Context: 303), Tr. A.
Period 4. Fig. 9.4.
Copper alloy, squarish, slightly broken with greenish patina, corroded.
Size: 1.25 × 1.15 × 0.35 cm, weight: 2.02 g.
Obv: Elephant facing to right, trunk hanging is visible.
Rev: Worn out and traces of indistinct symbols.

Coin 22. Find No. **46** (Context: 303), Tr. A (TP–3).
Period 4. Fig. 9.4.
Copper alloy, round with greenish patina, worn out, slightly cracked.
Size: 1.45 × 1.40 × 0.30 cm, weight: 1.47 g.
Obv: Faintly visible elephant facing to right with trunk hanging, enclosed in a dotted circle that is partly visible, legend along the flan is illegible.
Rev: Worn out, nothing can be made out.

Coin 23. Find No. **118** (Context: 513), Tr. A.
Unattributable period.
Copper alloy, round, slightly broken, cracked to the core, worn out.
Size: 1.10 × (-) × 0.21 cm, weight: 0.48 g.
Obv: Indistinct symbols, unidentifiable.
Rev: Indistinct symbols, unidentifiable.

Coin 24. Find No. **390** (Context: 801), Tr. E.
Unattributable period. Fig. 9.4.
Copper alloy, round, slight greenish patina, corroded, worn out.
Size: 1.52 × 1.35 × 0.30 cm, weight: 1.88 g.
Obv: Traces of elephant standing to right, trunk hanging.
Rev: Traces of some indistinct symbols.

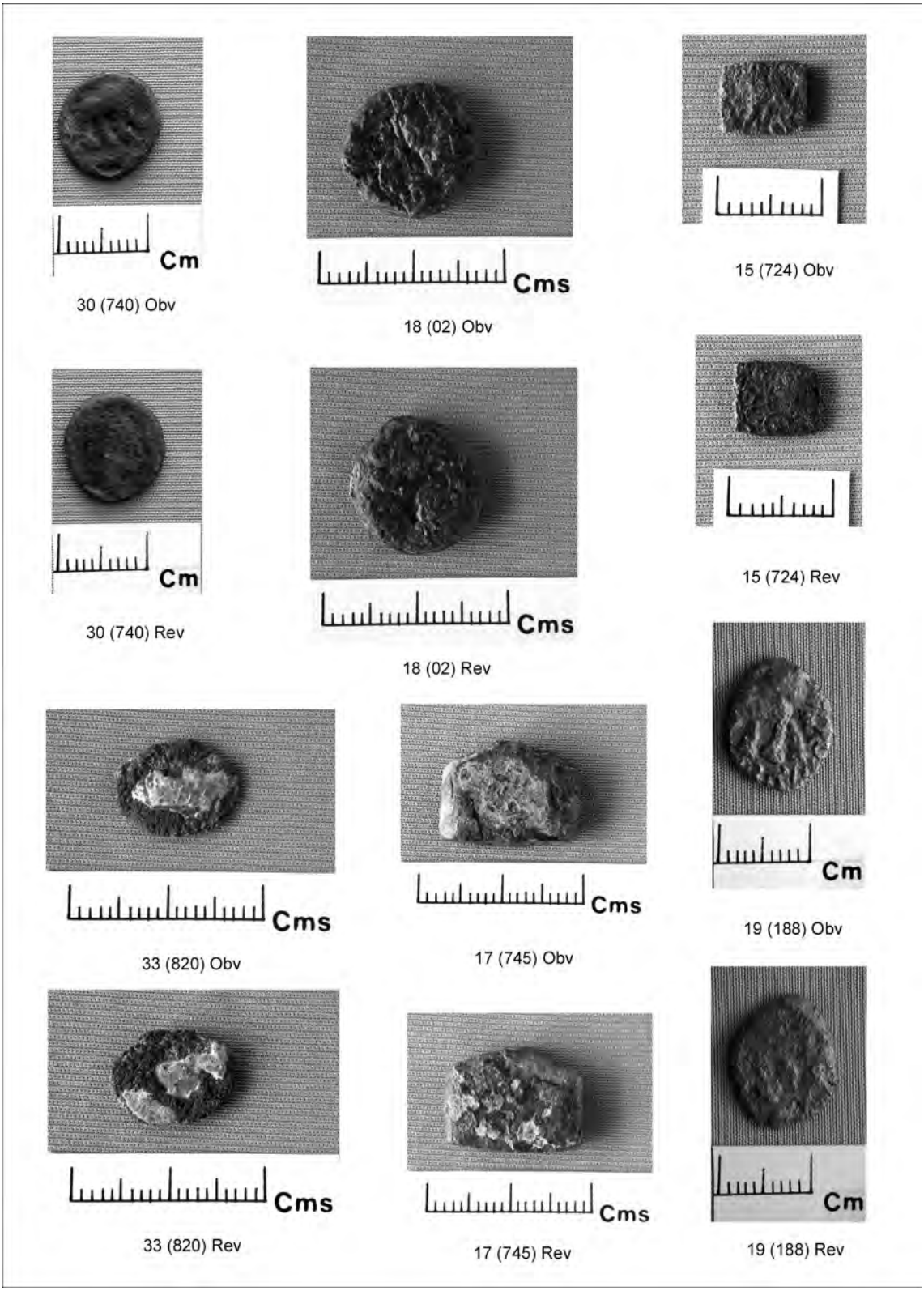


Fig. 9.3: Coins 30 (740), 18 (02), 15 (724), 33 (820), 17 (745) and 19 (188).

'Elephant'-type coins in lead

Coin 25. Find No. **379** (Context: 642), Tr. A.
Period 3. Fig. 9.2.
Lead, roundish, small.
Size: 1.15 × 1.07 × 0.17 cm, weight: 1.21 g.
Obv: Elephant facing to the right, trunk partly cut off, legend along the flan partly cut off and worn out. However, the letter 'sa' is visible below the fore legs.
Rev: Four unconnected circles, one of the circles is surmounted by a crescent and part of a swastika is visible in between the two circles.

Coin 26. Find No. **494** (Context: 650), Tr. A.
Period 3.
Lead, round, broken, worn out.
Size: 1.15 × (-) × 0.20 cm, weight: 0.62 g.
Obv: Traces of an elephant facing to right, legend worn out.
Rev: Ujjain symbol faintly visible.

'Bull'-type coins

Coin 27. Find No. **651** (Context: 993), Tr. A.
Period 3.
Copper alloy, broken, corroded up to core, cracked.
Size: 1.18 (diam.), 0.31 cm, weight: 0.62 g.
Obv: Traces of bull(?).
Rev: Worn out.

Coin 28. Find No. **829** (Context: 1172), Tr. A.
Period 3-temple. Fig. 9.4.
Copper alloy with lead coating, squarish, tiny, worn out.
Size: 0.60 × 0.55 × 0.17 cm, weight: 0.28 g.
Obv: Traces of humped bull facing right.
Rev: Traces of three-arched hill.
Note: Before conservation this coin was identified as lead rather than copper.

Coin 29. Find No. **492** (Context: 667), Tr. A.
Period 3-temple, Fig. 9.4.
Lead, round, corroded.
Size: 1.45 × 1.37 × 0.27 cm, weight: 2.50 g.
Obv: Humped bull facing to right.
Rev: Corroded and indistinct symbol.

Coin 30. Find No. **740** (Context: 1083), Tr. A.
Period 3-temple. Fig. 9.3.
Lead, round, thick coin.
Size: 1.30 × 1.20 × 0.22 cm, weight: 2.27 g.
Obv: Bull walking to right, partly visible.
Rev: Faint traces of Ujjain symbol.

Coin 31. Find No. **462** (Context: 666), Tr. A.
Period 3-temple. Fig. 9.5.
Copper, rectangular.
Size: 1.07 × 0.84 × 0.22 cm, weight: 1.08 g.
Obv: A humped bull with prominent horns walking to left. A symbol comprising of four interconnected circles seen partially above its hump.
Rev: Traces of some indistinct symbols.

'Lion'-type coins

Coin 32. Find No. **120** (Context: 519), Tr. A.
Period 4. Fig. 9.5.
Lead, squarish, thin, worn out.
Size: 1.50 × 1.30 × 0.14 cm, weight: 1.70 g.
Obv: Lion facing to right, fore leg lifted up as if jumping, tail raised up, *triratna* motif above the neck.
Rev: Worn out.

Post-Satavahana coins

Three coins can be dated to the post-Satavahana period, two are from Period 3-temple and one from Period 4.

Coin 33. Find No. **820** (Context: 1161), Tr. A.
Period 3-temple. Fig. 9.3.
Copper alloy, ovalish, corroded almost up to core, worn out.
Size: 1.30 × 1.00 × 0.23 cm, weight: 0.67 g.
Obv: Legend along the flan is indistinct and illegible.
Rev: Worn out and not discernable.
Note: Possibly a Western Kshatrapa coin.

Coin 34. Find No. **496** (Context: 700), Tr. A.
Period 3-temple. Fig. 9.5.
Copper alloy, round, cracked, one flake peeled off on the obverse, worn out.
Size: 1.60 × 1.55 × 0.20 cm, weight: 1.72 g.
Obv: Some indistinct symbols are found but are unidentifiable due to the flaking of metal and the worn out condition.
Rev: Trident with traces of crude Brahmi characters, enclosed within traces of a dotted border.
Note: For dating and possible attribution see discussion below.

Coin 35. Find No. **29** (Context: 320), Tr. A.
Period 4. Fig. 9.5.
Silver, round, heavily worn out.
Size: 1.64 × 1.60 × 0.20 cm, weight: 3.00 g.
Obv: Bust of a king (?), legend illegible.
Rev: Worn out.
Note: For dating and attribution see discussion below.

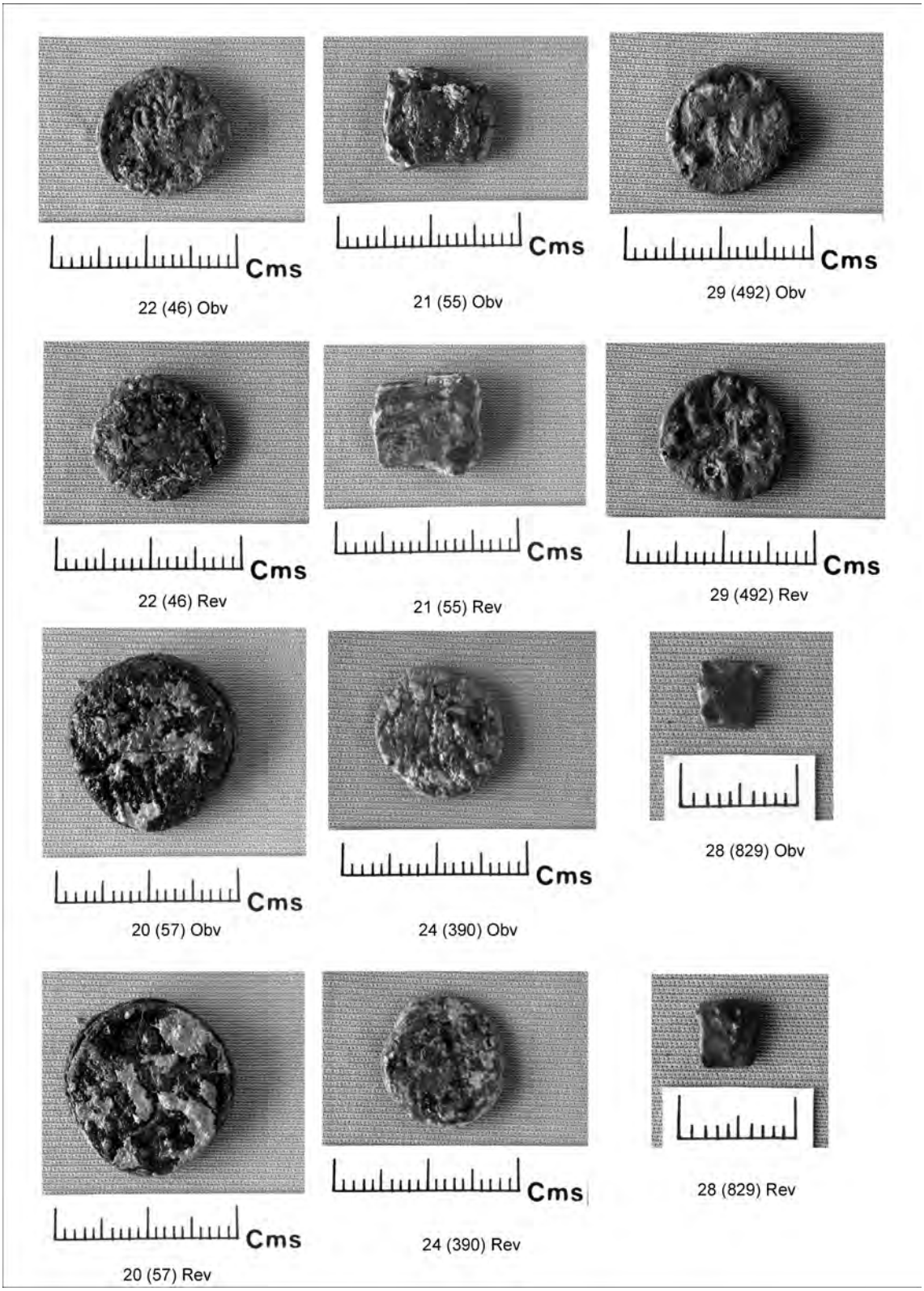


Fig. 9.4: Coins 22 (46), 21 (55), 29 (492), 20 (57), 24 (390) and 28 (829).

Unidentifiable coins

Among the unidentifiable coins, some are complete and others are fragments. These coins cannot be attributed to particular type due to the poor condition, although, to judge by the fabric, many of these coins may be Satavahana.

Coin 36. Find No. **259** (Context: 703), Tr. D2.
Period 2.
Thin fragment of a coin, greenish patina and metal eaten away to core.
Obv & Rev: No details visible.

Coin 37. Find No. **524** (Context: 921), Tr. A.
Period 3.
Copper alloy, fragment, corroded.
Obv & Rev: No details visible.

Coin 38. Find No. **819** (Context: 1157), Tr. A.
Period 3-temple.
Copper alloy, ovalish, broken, corroded, worn out, cracked.
Obv & Rev: No details visible.
Note: This was identified as lead before conservation. There was a lead coating, which survives as patches on the copper.

Coin 39. Find No. **796** (Context: 1130), Tr. A.
Period 3-temple.
Copper alloy, thin fragment of a coin.
Obv: Traces of a symbol but indistinct.
Rev: No details visible.

Coin 40. Find No. **649** (Context: 964), Tr. A.
Period 3-temple.
Copper, squarish, broken and worn out on either side.
Size: 0.83 × 0.81 × 0.17 cm, weight: 0.40 g.
Obv & Rev: Trace of indistinct symbols.
Note: Based on the fabric this coin may be 'tree' type.

Coin 41. Find No. **516** (Context: 918), Tr. A.
Period 3-temple.
Copper alloy, fragment, highly corroded, worn out.
Obv & Rev: No details visible.

Coin 42. Find No. **497** (Context: 700), Tr. A.
Period 3-temple.
Copper alloy, rectangular, corroded up to the core.
Size: 1.24 × 0.95 × 0.35 cm, weight: 1.54 g.
Obv & Rev: No details visible due to corrosion.

Coin 43. Find No. **580** (Context: 342), Tr. A.
Period 3-temple.
Copper alloy, fragment, highly corroded.
Obv & Rev: No details visible.

Coin 44. Find No. **424** (Context: 649), Tr. A.
Period 4.
Copper alloy, squarish, half-broken, worn.
Obv & Rev: No details visible.

Coin 45. Find No. **01** (Context: 303), Tr. A.
Period 4.
Copper alloy, squarish, slightly broken, corroded to the core and worn out.
Size: 1.15 × 1.00 × 0.13 cm, weight: 0.70 g.
Obv & Rev: No details visible due to corrosion.

Coin 46. Find No. **43** (Context: 303), Tr. A (TP-3).
Period 4.
Copper alloy, round, corroded and worn out, cracked.
Size: 1.63 × 1.56 × 0.36 cm, weight: 2.61 g.
Obv: Some indistinct animal and letters are visible.
Rev: Indistinct symbols.

Coin 47. Find No. **47** (Context: 303), Tr. A (TP-3).
Period 4.
Copper alloy, ovalish with projection, greenish patina, worn out, slightly cracked.
Size: 1.55 × 1.25 × 0.47 cm, weight: 1.65 g.
Obv & Rev: Some indistinct symbols are visible.

Coin 48. Find No. **44** (Context: 303), Tr. A (TP-3).
Period 4.
Copper alloy, round, broken, corroded, cracked.
Size: 1.37 × 1.20 × 0.30 cm, weight: 1.59 g.
Obv & Rev: No details visible due to corrosion.

Coin 49. Find No. **836** (Context: 1191), Tr. A.
Unattributable period.
Copper alloy with lead coating, squarish, corroded and worn out.
Size: 0.90 × 0.90 × 0.20 cm, weight: 0.55 g.
Obv & Rev: Indistinct symbols.
Note: Before conservation this coin was identified as lead.

Coin 50. Find No. **837** (Context: 1191), Tr. A.
Unattributable period.
Copper alloy, fragment, corroded.
Obv & Rev: No details visible.

Coin 51. Find No. **660** (Context: 827), Tr. E.
Unattributable period.
Copper alloy, rectangular, corroded to the core, badly worn out.
Size: 1.55 × 1.33 × 0.20 cm, weight: 1.71 g.
Obv & Rev: No details visible.

Coin 52. Find No. **493** (Context: 451), Tr. B.
Period 2. Fig. 9.2.
Copper alloy, octagonal.

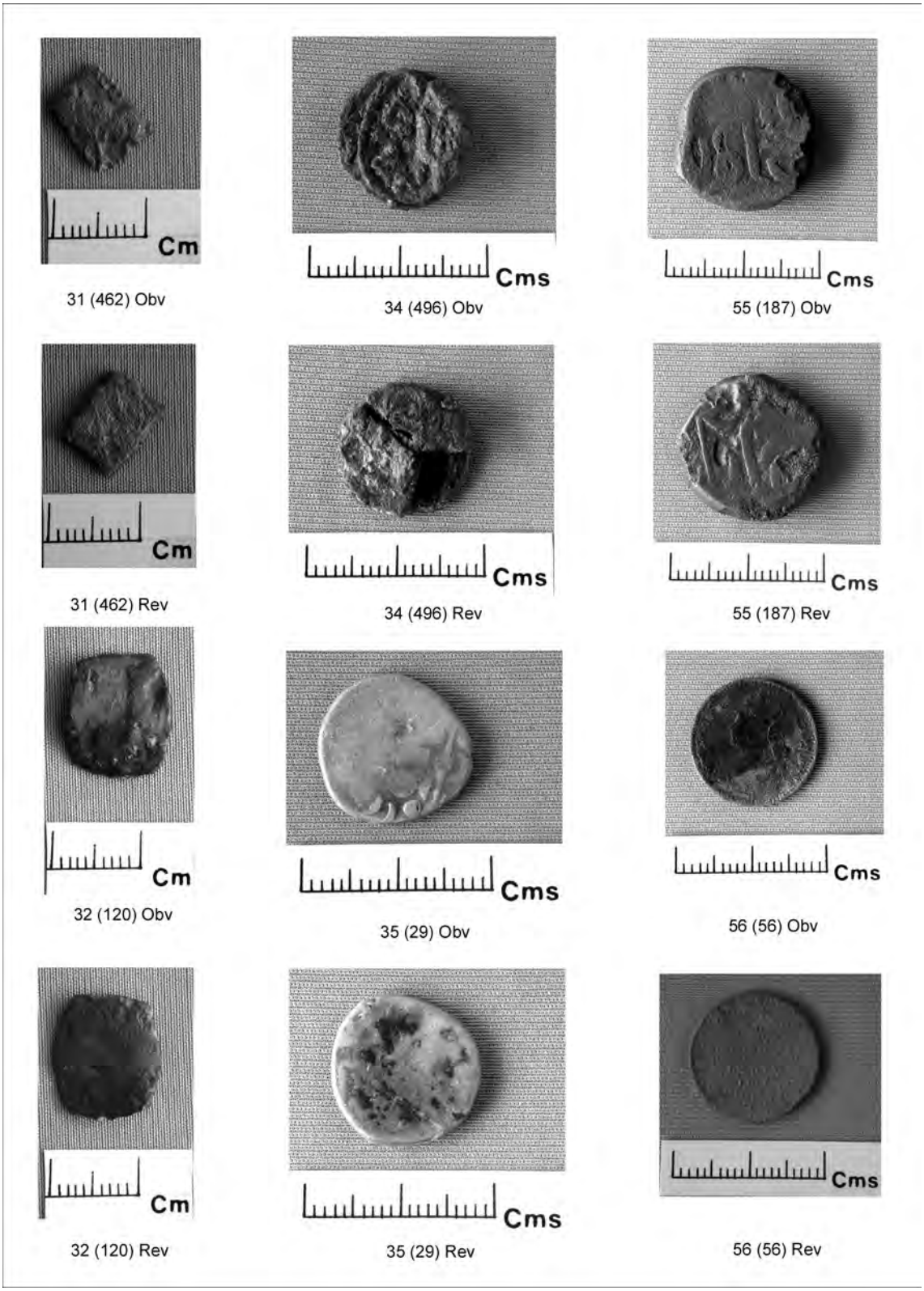


Fig. 9.5: Coins 31 (462), 34 (496), 55 (187), 32 (120), 35 (29) and 56 (56).

Size: 1.77 × 1.69 × 0.23 cm, weight: 4.23 g.
Obv: Hollow cross symbol is executed in incised dots.
Rev: Taurine symbol is executed in incised dots.
Note: This is almost certainly not a coin, but a roughly octagonal metallic object made of copper bearing the hollow cross on one side and a taurine symbol on the other. Both these symbols have been incised using a pointed tool. On the taurine-side, two strikes have resulted in scratches, thus giving an indication for the slipping of the tool while the punches were being struck. The exact purpose of this object is difficult to ascertain, but it is more likely to be intended for a non-monetary use, given the curious method of its manufacture. But the motifs on it are clearly derived from coins.

Islamic coins

Of the three Islamic coins, two were recovered from Period 4 deposits and one from the surface.

Coin 53. Find No. **45** (Context: 303), Tr. A (TP–3).
Period 4.
Copper alloy, round, thick, heavily worn out.
Size: 1.72 × 1.58 × 0.30 cm, weight: 4.81 g.
Obv: Traces of Arabic inscription.
Rev: Arabic inscription partly visible.
Note: For attribution see discussion below.

Coin 54. Find No. **141** (Context: surface), Tr. B.
Surface.
Copper alloy, ovalish, thick, heavy, depression at the centre on one of the surfaces, greenish patina, worn out.
Size: 2.06 × 1.95 × 0.45 cm, weight: 10.74 g.
Obv: No details visible.
Rev: Arabic inscription partly visible.
Note: Attributed to Mughals: Aurangzeb (see discussion below).

Coin 55. Find No. **187** (Context: 435), Tr. B.
Period 4. Fig. 9.5.
Copper alloy, squarish, edges slightly cut, worn out.
Size: 1.84 × 1.88 × 0.40 cm, weight: 9.87 g.
Obv: Arabic letters faintly visible.
Rev: Arabic letters faintly visible.
Note: Attributed to the Qutb Shahi Sultanate of Golkonda (see discussion below).

British coins

Coin 56. Find No. **56** (Context: 303), Tr. A (TP–3).
Period 4. Fig. 9.5.
Copper alloy, round, thin, worn out.
Size: 1.75 × 1.73 × 0.10 cm, weight: 1.93 g.
Obv: Bust of Queen Victoria facing to left with legend in front.
Rev: 1/12 ana, India, 1897 within a circle encircled by a floral pattern.

Discussion

The occurrence of the coin categories and types by period are shown in Table 9.1. The pattern of occurrence suggests that Period 1 should be dated to the pre-Satavahana period and Period 2 to the Satavahana period, but the dating of Period 3 and Period 3-temple is more complicated. According to the pottery, these two periods are contemporary, but only Period 3-temple levels contain post-Satavahana coins. This may simply be due to statistical chance because post-Satavahana coins are very much rarer and it may be that the greater total number of coins from Period 3-temple deposits has made it more likely that rare coins would be found. It is not therefore clear, on the basis of the coins alone, whether Period 3 should be dated to the Satavahana or post-Satavahana period. Finally, Period 4 can be dated to the Late Medieval and British periods. Table 9.2 shows the occurrence of the main categories of coins as percentages of the total number of coins found in each period. The chronology of the four periods has already been discussed in Chapter 6.

The tables also show high levels of residuality in all periods bar Period 1. In the Period 3-temple deposits, at least 53% of the coins are residual (i.e. all of the pre-Satavahana and Satavahana coins), but this number could be as high as 88% if all of the six unidentified coins were Satavahana or earlier. Were it not for the two post-Satavahana coins that have been found in these deposits, this period might easily have been erroneously dated to the Satavahana period on the basis of the other coins that it has yielded. The deposits of Period 4 also contain very high levels of residual coins. Such high levels of residuality make it clear that the simple presence of large numbers of coins in an excavated layer or period must always be treated with caution when establishing a date. This is especially true in the post-Satavahana period during which time post-Satavahana coins

appear to have been relatively rare, whilst Satavahana coins continued to be deposited, either as part of secondary deposits or because they continued in use.

Pre-Satavahana coins

Silver punch-marked coins of the Magadha-Maurya 'Karshapana' series are noticeably absent, although they do appear to have been found elsewhere at Paithan or in the vicinity (Chapter 11, coins 1 to 7). They are classified as GH VIb-570 (two coins), GH IVd-416 (2 coins), GH VIb-566, GH IVd-456 and GH IVd-450 (GH numbers refer to Gupta and Hardaker 1985). According to the dating scheme proposed by Gupta and Hardaker (1985: 10, table 1), all these coins are dateable to the 'Nanda' and 'Maurya-Sunga' periods, or c. 370–150 BC. Three punch-marked coins are illustrated in Yusuf's excavation reports (Yusuf 1938: pl IXa top; 1939: pl. XXc) but as the picture is of poor quality, nothing more can be said about them, except that they are all rectangular in shape.

The 'hollow cross' coins therefore seem to be the earliest of the coins from the excavations, being the only coins that occur in Period 1 deposits and are also the most common type in Period 2 deposits (Table 9.1).

Yusuf reported 'numerous copper coins' from his excavations at Paithan and his report contains two illustrations; the first, a lump of ten or so coins and the second, a single specimen, which clearly has the hollow cross on it (Yusuf 1938: pl. IXa right, IXb; 1939: pls XXd, e, f). Yusuf, however, identified the hollow cross seen on the solitary coin as a swastika and attributed the coins to the Andhras. He also drew attention to coins with a similar motif found at Taxila by Alexander Cunningham (Yusuf 1939: 42, pl. XXf). He does not make it sufficiently clear whether the coins that are lumped together are of the same type as the solitary specimen, but, to judge by the shape and fabric, it seems very likely that they are. If this is the case, then the reverse of the 'hollow cross' coins would carry a tree-in-railing motif, seen clearly on one of the coins from the lump illustrated by Yusuf. This tree-in-railing motif, which Yusuf identified as a Bodhi tree (Yusuf 1939: 42, pl. XXd), is flanked by a taurine symbol on its left.

Taking a broader perspective, 'hollow cross'-type coins have been found in the excavations at Adam (Nath 1993: 20–21). They have also been reported along a Vidarbha-Telingana regional axis, lying to the east of the Marathwada region, wherein Paithan is located (Maheshwari 1977: 4–7, coins 7–10; Todywalla/Hurmuz Kaus 2004: lots 11a–c). These are generally dated to between 200 and 150 BC (Maheshwari 1977). But there are significant differences between the Paithan and the Vidarbha-Telingana coins. Firstly, the Paithan specimens are square or irregular, whereas most of the others are round. Secondly, most other specimens of this type are cast copper coins, whereas even though the condition of the Paithan specimens is too poor to allow any firm conclusions as to how they were manufactured, from their appearance it seems very probable that they are die-struck. The prevalence of die-struck square coins of this type at Paithan may suggest the existence of a contemporary regional sub-series of uninscribed post-Mauryan copper coinage in Marathwada.

Apart from the 'hollow cross'-type coins, the other coins of a possibly pre-Satavahana date to be found at Paithan belong to the 'tree' type. In fabric and weight, they conform to a genre of post-Mauryan coins, widely recognized as 'Ujjain' coins and encountered at Maheshwar and Prakash (Sankalia *et al*. 1958: 73–74; Thapar 1967: 130, pl. XXVII-C 1, 3). They are gener-

Table 9.2: Occurrence of coins by period as an approximate percentage of the total number of coins found in each period.

	Period 1	Period 2	Period 3	Period 3-temple	Period 4
Pre-Satavahana	100%	40%	20%	18%	
Satavahana		20%	60%	35%	36%
Post-Satavahana				12%	7%
Unidentified		40%	20%	35%	36%
Late Med/Islamic					14%
British					7%
Total coins	**8**	**5**	**5**	**17**	**14**

ally dated to between 200 and 100 BC (Bopearachchi and Pieper 1998: 21–22). Similar coins, but of different types, have also been found in the excavations at Bhokardan (Deo and Gupte 1974: 63–65). It cannot be said with certainty whether the Paithan coins belong to a distinct regional series of uninscribed die-struck copper coins of the post-Mauryan period.

Satavahana coins

Amongst the coins classified as belonging to the 'elephant' type, the most common at Paithan is one that occurs specifically in the Newasa-Paithan-Bhokardan region and which occurs from Period 2 onwards in the Paithan sequence (see Table 9.1). The type may be described as follows:

- Obverse: The obverse has an elephant walking to the right with an upraised trunk. It also has a legend inscribed in exergue, usually beginning at 7 o'clock, with the word *Rajno* followed in order by the metronymic, the ruler's first name and the dynastic appellation, usually ending below the feet of the elephant. A symbol composed of four circles touching each other tangentially, with one modified with a crescent, rests above the elephant's back. Variations include the presence of a *Shrivatsa* symbol below the elephant's mouth.
- Reverse: The reverse has a tree with (usually) five broad leaves, flanked by symbols such as *Shrivatsa* and the *Nandipada*. Prominent variations include the way the leaves emanate out from the stem and the arrangement of ancillary symbols.

Coins 18, 20, 19 and 33 belong to this type. Additionally, coins 22 and 24 may be included, but, as they are in a bad condition, this attribution is tentative. Coin 19 is the only coin of this type that bears any legible inscription. As described in the catalogue, it is most probably an issue of the Satavahana king Kosikiputa Siri Satakani. Coins of this particular regio-specific type have only been encountered in significant numbers in the Nevasa and Bhokardan excavations (Deo and Gupte 1974: 40–49; Sarma 1980: 200–202, 204). There are also two coins of this type amongst the specimens preserved in the Balasaheb Patil Collection (Chapter 11, coins 10 and 11).

Coins 25 and 26 can also be categorized as 'elephant'-type coins, but judging by type characteristics, they belong to a later chronological horizon. Coin 25 appears to be a smaller denomination of lead coins exemplified by the Wategaon hoard, which included coins of Vasithiputa Siri Pulumavi and his successors (Mirashi 1972). Coin 26 is a small denomination of the universal 'elephant × Ujjain symbol' type in potin, which was struck by Satavahana kings post-Gautamiputa Siri Satakani (Sarma 1980: 97–104).

The 'bull' type Satavahana coins found at Paithan belong to two distinct varieties. The first, which is represented by coin 31, has the bull walking to the left with a symbol, similar to that seen above the back of the elephant in the regio-specific type just described, placed above its hump. Similar coins, with the bull walking to the right, have been published bearing legends attributing them to the Satavahana ruler Kochhiputa Siri Satakani (Maheshwari 1979). Coins with legends referring to the generic 'Satavahana' name are also known (Jha and Chumble 2003/4: type 6). It is likely that coin 31 is an uninscribed smaller denomination of the inscribed coins already published and, as such, is to be dated to the pre-Gotamiputa period. The second, represented by coins 29 and 30, may date somewhat later despite retaining a regio-specific orientation to Nevasa-Paithan. These coins are of lead and are anepigraphic. Exactly similar coins have been found at Bhokardan (Deo and Gupte 1974: 26–27, pl. XVI–11,12). Two similar coins have also been reported as having a 'Western India' provenance in the British Museum Catalogue of Satavahana coins (Rapson 1908: 54, no. 219 and 56, no. 232). Both are from the collection of Pt. Bhagwanlal Indraji (cf. Sarma 1980: 170–171).

Two more Satavahana coins, of an anepigraphic variety, were found amongst those excavated. One of them, coin 32, is a lead coin of the 'leaping lion × tree' type. Similar coins were found in the Nevasa excavations (Sarma 1980: 187). Coin 15 belongs to the 'tree × Ujjain symbol' type. Some coins of this type are known from the Bhokardan excavations (Deo and Gupte 1974: 50–52). Some others appear to have been counterstruck by the Kshaharata Kshatrapa ruler Nahapana with his dynastic emblem (Jha and Rajgor 1994: 105–106, nos. 159–161), and the undertype can therefore be safely dated to the mid-1st century AD.

From a chronological perspective, all of the identifiable Satavahana coins at Paithan can be dated to the immediate pre- and post-Gotamiputa Satakani period, that is to say from the late 1st century BC to the late 1st century AD based on the dates proposed for this ruler (Cribb 1992: 132–136). Specifically, the earliest coin is probably coin 31 and the latest is coin 26, both of which have been discussed above. It is noteworthy that no coins that can be attributed conclusively to Gotamiputa

Siri Satakani were found although the Balasaheb Patil Collection is known to include one silver coin of Nahapana (c. AD 33–78) counterstruck by Gotamiputa, of a variety that is found in the Jogalthembi Hoard (Scott 1908; Chapter 11, coin 14). The Patil collection also includes two silver portrait coins of Satavahana rulers Vasithiputa Siri Pulumavi and Gotamiputa Siri Yana Satakani (Chapter 11, coins 12 and 13). A fragment of a silver coin of Vasithiputa Siva Siri Pulumavi has also been reportedly found at Paithan (Dhopate 2004: 51, coin 1).

Post-Satavahana coins

The post-Satavahana to Early Medieval period at Paithan is represented by very few coins. Coins of the Western Kshatrapas are not represented amongst those excavated, except for a fragment, coin 33, which can only tentatively be attributed to one of these rulers and should therefore be datable to the 2nd to 4th century AD. A few Western Kshatrapa specimens exist in the Patil collection (Chapter 11). Three coins, struck in the name of Kumara Gupta (c. AD 415–455), but belonging to the posthumous debased series, are also known from the Patil collection (Chapter 11, coins 15, 16, 17). Amongst the excavated finds presented here, coin 34 is particularly noteworthy. This coin is in a bad state of preservation, but distinct traces of a trident symbol surrounded by crude Brahmi letters and a circular border of interrupted dots are apparent. These aspects help us tentatively to identify it as a degraded copy of the silver coins of the Sarvva-Bhattaraka and Maitraka dynasties of peninsular Gujarat. The dating of these coins with reference to the Gupta conquest of Gujarat and from the analytical perspective of 'type vis-à-vis metallic degradation' has recently been discussed in some detail (Maheshwari and Rath 1996: 190–194; Maheshwari and Rath 1998: 310–311; Bhandare 2006: 98–100). If we accept the chronological schema outlined in these contributions, the extent of deterioration in type characteristics might suggest that the Paithan specimen dates to about the 7th century AD. Degraded Maitraka coins of a similar type have also been illustrated by Mitchiner (1978: 609, nos. 4897–98).

Another Early Medieval coin, this time found in Period 4 layers, is coin 35, which belongs to the 'Sri Vigra' variety of the 'Indo-Sasanian' genre of debased silver 'Dramma' coins. These coins bear the abbreviated form of the name 'Vigrahapala' and are referred to in many north Indian inscriptions as *Vigrahapaliya Drammas*. It is uncertain who struck them, but Deyell believes they were struck prior to the mid-9th century AD and gives a scheme of the distribution of their finds in the Gangetic Plains (Deyell 1990: 262–268). The Patil collection includes one more 'Indo-Sasanian' coin, belonging to the 'Gadhaiya Paisa' series. This coin, as is evident from its wide flan and visibly high silver content, dates to an early period (c. 9th–10th century AD) in the scheme of the evolution of the series (Deyell 1990: 115–123; Chapter 11, coin 18).

Late Medieval and Islamic coins

Late Medieval and Islamic coins are represented in the excavated finds by only three specimens: one attributed to the Bahmani Sultans of Gulbarga (coin 53), one to the Mughal Empire (coin 54) and the third to the Qutb Shahi Sultanate of Golkonda (coin 55). The Bahmani coin was struck during the rule of Ahmed Shah II, who is also known as 'Wali' (AD 1435–1457), a noted patron of Sufism during whose reign Khuldabad and Daulatabad, both located in the vicinity of Paithan, flourished as centres of Sufi worship. The coin (Goron and Goenka 2001: type BH88) has Arabic inscriptions on both sides alluding to the Sultan's political and religious prowess. The Mughal coin can be attributed to the Emperor Aurangzeb (AD 1658–1707) and is a copper *Fulus* struck at the mint of Surat. This is evident from remnants of the reverse inscription (the Persian letter 'Te' clearly seen below parts of the word *Sanah*, referring to the emperor's regnal year). The Qutb Shahi coin bears the inscription *Khatama b'il-Khair wa al-Sa'adat* and is anonymous. It also gives the mint name on the reverse as *Darb Dar al-Saltanat Haidarabad*. Coins of this type (Goron and Goenka 2001: type Q73) were struck during the reigns of the last two Sultans, namely Abdullah and Abu'l Hasan Qutb Shah (AD 1626–1672 and AD 1672–1684, respectively).

The latest coin amongst the excavated finds is a 1/12th Anna of British India of 1897, bearing the effigy of Queen Victoria.

The low numbers of Late Medieval and Islamic coins that were found in the excavations are probably due to the fact that very few layers of this period were excavated during the course of the four seasons of fieldwork.

Derek Kennet

Appendix 9.1
Coin Deposition in the Temple Foundation Deposits and Coin Residuality

As has been shown above, 39 coins were recovered from Trench A, 18 of which came from temple foundation deposits, 14 from the South Temple and 4 from the North Temple (Table 9.3). The fact that so many of the coins found in Trench A come from the foundation deposits raises the possibility that these coins may have been deliberately added to the foundations during construction of the temples.

However, it is not simple to demonstrate this because a far greater amount of earth was excavated from the temple foundation deposits than from any other type of deposit in Trench A, and this may explain the high number of coins from the foundations. Obviously, the number of coins needs to be considered in relation to the quantity of earth excavated if an accurate impression is to be gained of the relative pattern of coin deposition.

In order to investigate this, the amount of excavated earth was calculated for a sample of 15 period-sequences from trenches and test pits across the site, including two from foundation deposits. This data allows the density of coins per cubic metre to be compared. The number of sherds was also recorded so that comparisons of the ratio of coins to pottery sherds could also be made from the same period-sequences. A 'period-sequence' is the sequence of layers from a particular period in a particular trench.

Table 9.3: The coins from Trench A summarized by period.

Period	Total coins	% of Trench A coins
Unphased	3	7.7%
1	1	2.6%
2	1	2.6%
3	4	10.3%
3-temple	18	46.2%
4	12	30.8%
Total	39	

This data and the calculation of coins per cubic metre, sherds per cubic metre and the ratio of coins to sherds are presented in Tables 9.4 and 9.5.

On the basis of this analysis, it is possible to make the following observations: (1) the two Period 3-temple assemblages are at the higher end of the range of coins per cubic metre; (2) the two Period 3-temple assemblages are at the middle to lower end of the range of sherds per cubic metre; (3) the two Period 3-temple assemblages are at the lower end of the range of ratios of coins to sherds (Fig. 9.6) and (4) the two Period 3-temple assemblages are close or adjacent to each other in each of the three rankings in Table 9.5.

Table 9.4: The number of coins, sherds and the amount of earth excavated from a sample of period-sequences from across the site (Trench A Test Pit 1 (TP1): Periods 1–4; Trench B (TrB): Periods 1, 2 and 4; Trench D1 (TrD1): Period 1; Trench D2 (TrD2): Periods 1 and 2; Trench F (TrF): Periods 1, 2 and 3; Trench A Garbha Griha of the North Temple (GGN): Period 3-temple; and Trench A Test Pit 5 (TP5): Period 3-temple).

	Period	Coins	Sherds	Cubic metres
TrB-1	1	5	10,602	5.15
TrB-2	2	1	2,646	4.11
TrB-4	4	2	15,832	16.64
TP5-3T	3T	8	10,184	8.60
TrF-1	1	0	5,787	1.49
TrF-2	2	0	6,423	4.46
TrF-3	3	0	1,286	3.53
TrD1-1	1	2	6,772	3.53
TrD2-1	1	0	7,658	2.54
TrD2-2	2	3	4,382	4.92
TP1-1	1	1	3,500	0.32
TP1-2	2	1	17,516	4.19
TP1-3	3	2	6,263	2.42
TP1-4	4	0	837	2.02
GGN-3T	3T	2	3,088	2.45

These observations suggest that the Period 3-temple deposits have closely related depositional histories. Whilst they both contain below-average amounts of anthropogenic material more generally (as indicated by the low amount of sherds per cubic metre), they both contain a higher-than-average ratio of coins per cubic metre. This is clearly reflected in the fact that they have amongst the highest ratios of coins to sherds at the site and, perhaps most importantly, a much higher ratio of coins to cubic metre than Period 3 deposits generally (Fig. 9.6).

Some of the coins in the temple foundation deposits almost certainly found their way into these layers accidentally, along with redeposited earth containing older, anthropogenic material from elsewhere at the site. However, the analysis presented here strongly suggests that a significant proportion of the coins in the temple foundation deposits were deliberately added to those deposits at the time the temples were being constructed, possibly as part of a formal or informal ritual.

Table 9.5: Coins per cubic metre, sherds per cubic metre and the ratio of coins to sherds from a sample of period-sequences from across the site (based on the data in Table 9.4). The period-sequences from the temple deposits are indicated in bold.

	Coins per m^3		Sherds per m^3		Sherds per coin
TP1–1	3.13	TP1–1	10,938	**TP5–3T**	**1,273**
TrB–1	0.97	TP1–2	4,180	TrD2–2	1,461
TP5–3T	**0.93**	TrF–1	3,884	**GGN–3T**	**1,544**
TP1–3	0.83	TrD2–1	3,015	TrB–1	2,120
GGN–3T	**0.82**	TP1–3	2,588	TrB–2	2,646
TrD2–2	0.61	TrB–1	2,059	TP1–3	3,132
TrD1–1	0.57	TrD1–1	1,918	TrD1–1	3,386
TrB–2	0.24	TrF–2	1,440	TP1–1	3,500
TP1–2	0.24	**GGN–3T**	**1,260**	TrB–4	7,916
TrB–4	0.12	**TP5–3T**	**1,184**	TP1–2	17,516
TrF–1	0.00	TrB–4	951	TrF–1	-
TrF–2	0.00	TrD2–2	891	TrF–2	-
TrF–3	0.00	TrB–2	644	TrF–3	-
TrD2–1	0.00	TP1–4	414	TrD2–1	-
TP1–4	0.00	TrF–3	364	TP1–4	-

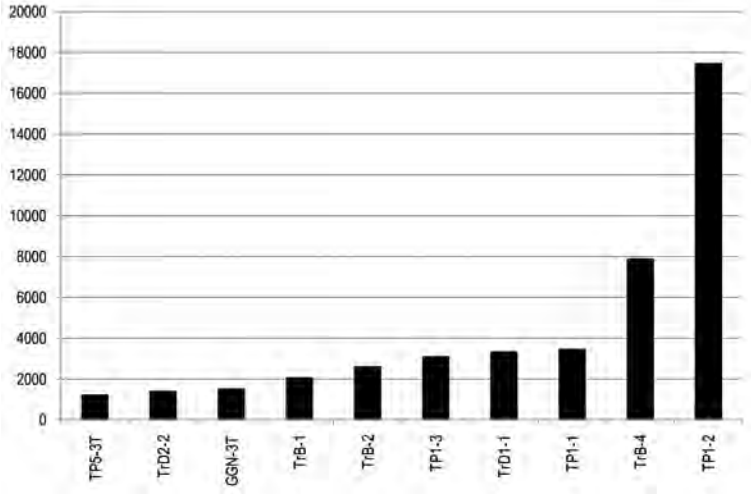


Fig. 9.6: Rank analysis of the ratio of coins to sherds from a sample of period-sequences from across the site. The two Period 3-temple period-sequences (TP5-3T and GGN-3T) are at the lower end of the range.

This provides useful insights into two things: firstly the practice of deliberately depositing coins in temple foundation deposits during temple construction and secondly the type of coins that were in circulation at the time the temples were constructed. Amongst the 18 coins from the temple foundations, three are pre-Satavahana, seven are Satavahana and six are unidentifiable due to their poor a state of preservation. In addition, there are two post-Satavahana coins, both from the South Temple deposits. One may be a fragment of a Western Kshatrapa coin datable to 2nd to the 4th century AD (No. 33), and the second a degraded copy of the silver coins of the Sarvva-Bhattaraka and Maitraka dynasties, which can be dated to the 7th century (No. 34). The latter coin provides an important *terminus post quem* for the construction of the South Temple. If most of the unidentified coins mentioned above are of Satavahana date – as is supposed on the basis of their size, shape and fabric – this indicates that a significant proportion of the coins that were put into the foundation deposits when the temples were constructed were Satavahana coins that were already several hundred years old. This adds weight to a suggestion that has already been made by other scholars based on different evidence that Satavahana coins continued to circulate widely into much later periods (e.g. Shastri 1992: 142 n. 23, 144).

Apart from being of considerable interest for the political and economic history of the Late Historic/Early Medieval period, this conclusion has profound implications for the dating of archaeological layers that may have been attributed to the Satavahana period by excavators on the basis of the coins contained within them, but which may in fact have been deposited much later.

M. Kasturi Bai

Chapter 10
Summary of the Finds from the 1996 and 1997 Excavations

The excavations carried out during the 1996 and 1997 seasons in Trench C yielded a number of small finds that were stored in the office of the Aurangabad Circle of the ASI. Because these excavations were carried out according to a different methodology and because detailed trench reports and a site matrix are not available, a study of these finds is not included in this publication. However, based on a list of small finds made during the 1997 season, the finds can be categorised into coins, beads, ear-studs, pendants of various materials, hair pins, points of bone and ivory, household objects of stone, terracotta, iron etc., toy objects such as marbles, discs, hopscotch, toy wheels, toys, bangles and rings etc.

A total of 91 coins were recorded during the 1996–1997 seasons, including 18 coins from the surface; two of them are lead, the rest being copper alloy. Most of the copper coins are badly corroded and encrusted, and sometimes, they are cracked and flaked. The copper coins exhibit different shapes and are found in different sizes, whilst some are thick and squarish or rectangular in shape. A few round or ovalish coins are also found. Although corroded and cracked, some of the squarish coins (Field Nos. 480, 500, 774 and 849) are decorated with a hollow cross symbol on the obverse and a blank reverse. The fabric, the shape, the condition and the symbols on the obverse compare well with the coins obtained from Period 1 of the 1998 and 1999 seasons, which belong to the post-Mauryan but pre-Satavahana period. A small, squarish copper coin (Field No. 429) has an Ujjain symbol, a sun and an arched hill on one side and is blank on the other side.

Some of the coins bear symbols like elephants, horses and possibly lions. One of the ovalish copper alloy coins from the surface (Field No. 425) has an elephant facing right, trunk uplifted with the extant legend '...MAVISA' on the obverse and a tree with big leaves in a railing on the reverse. This certainly belongs to one of the Pulumavi's of the Satavahana period. A similar reverse symbol is found on one large lead coin (Field No. 282), which has an indistinct and illegible symbol on the obverse. Due to the bad condition of the obverse, it cannot be attributed to a particular king, although it clearly belongs to the Satavahana period. There are also round copper alloy coins (Field Nos. 225, 361 and 375), which have an elephant on the obverse and a Ujjain symbol on the reverse. Another round coin (Field No. 455) from the surface contains a horse on the obverse and a crude representation of a bow and arrow. Mention may also be made of a terracotta seal obtained from the excavation, which has the reverse motif of a thunderbolt and arrow and which can be attributed to the Kshatrapas. Two copper coins that were obtained from the surface belong to the Islamic period. In summary, the coin collection of the 1996–1997 seasons contains coins belonging to the post-Mauryan, Satavahana and Kshatrapa periods in addition to two coins of the Muslim period.

Other small finds were also found during the excavations, beads being the most frequent. They occur in various shapes and sizes and are made of materials such as carnelian, agate, chalcedony, jasper, crystal, glass, paste, shell and terracotta. The carnelian beads exhibit spherical, barrel-faceted, bicone barrel, pentagon cylinder and disc shapes. One of the spherical beads has etched decoration. Crystal beads are also spherical, barrel, faceted, barrel-eared and disc shaped. Both banded and plain agate beads were found in small quantities with long cylinder, barrel and disc shapes. Barrel-faceted beads of garnet and almond-shaped chalcedony were also found, as well as rectangular and spherical beads of jasper. Among the shell beads, spherical, cylindrical, barrel-eared and disc shapes were recorded. A few paste beads of the barrel-eared variety were also found. Spherical beads of chert and rectangular and oblong-shaped beads of lapis lazuli were also present. Glass and terracotta beads are also very common. The shapes noted in glass are spherical, short cylinder truncated, barrel-eared, bicone and a bird shape. Arecanut is a predominant shape amongst the terracotta beads. The other shapes in terracotta are globular, squat globular, hemispherical, conical

https://doi.org/10.1515/9783110653540-010

with flat shaped, bicone, long cylindrical, rectangular eared and grooved, flat based with conical profile, barrel and bell shaped. Pulley-shaped ear-studs and flat-based pendants with a conical profile were found in small numbers.

Small cylinders used as stoppers, skin rubbers with a herringbone pattern and cylindrical ceramic weights were also recorded. A number of pottery discs, hopscotch discs, toy wheels, spindle whorls and toys are the play objects found at the site. Among the bone objects, mention may be made of pins, double-ended points, discs, carved bangles and a stand with a knob-like design.

Broken elephant and bird-like terracotta objects, a plaque fragment of a god and a kaolin fragment were also found. A few bangles of terracotta and glass, along with a few finger-rings, were noticed.

Among the iron objects, nails predominate, a total of 96 being found, and occur in different sizes. These are mostly broken, corroded and encrusted. Other iron objects include tanged, thick arrowheads, needles, chisels and blades of knives.

M. Kasturi Bai

Chapter 11
Objects Displayed in the Balasaheb Patil Government Museum

The Balasaheb Patil Government Museum at Paithan contains the private antiquity collection of the late Shri Balasaheb Patil, after whom it is named. He was a local dignitary and coin and art collector who acquired objects randomly from different mounds of Paithan and the surrounding area over a period of many years and donated them to the State Department of Archaeology, Maharashtra. The collection holds a variety of objects of different periods, which are of interest to the general public as well as to historians and archaeologists. The collection has never been catalogued, comprehensively studied or published, although objects have been mentioned in print. Some brief notes on some of the objects from the collection were also published by R. S. Morwanchikar in his book on the history and archaeology of Paithan (Morwanchikar 1985: 137–154, plates II–XVIII), which are further discussed below.

The present report on the collection is based solely on a viewing of the museum display cases where only a part of the collection was on display, whilst the rest was kept in store and was not seen. For this reason, the weights of coins and other details could not be measured due to lack of access. Some of the coins and two of the terracotta moulds have already been studied and published by other scholars (see below).

The objects of archaeological interest are coins; moulds, medals and bullae of terracotta; figurines of kaolin and terracotta; stone sculptures; different types of pottery; household objects of various materials such as pottery, kaolin, stone and metals; and some miscellaneous objects. There is also Proto Historic and Early Historic pottery. The complete spouted vase of Jorwe ware (Fig. 11.6, 1) is an interesting find belonging to the Chalcolithic period and recalls Jorwe pottery found at Nevasa (Sankalia *et al*. 1960: 213, fig. 85b), although the painted decorations are different in this case. Some of the Red Polished spouted vases and a broken kaolin pot with *astamangala* symbols are also worth mentioning.

Of course, it should be noted that the precise find spots of these objects is unknown. Although most objects are believed to come from Paithan and its immediate surroundings, it is impossible to be certain of their provenance.

Coins

Coins displayed in the museum can be categorized as punch-marked (8), uninscribed (1), inscribed (2) and portrait coins of the Satavahana kings (2) and Kshatrapa kings (8).

Punch-marked coins

Seven of the punch-marked coins are made of silver and one of copper. These are squarish, rectangular, round, ovalish and irregular in shape. The symbol numbers used in the descriptions of the punch-marked coins below are the numbers given by Gupta (1960: 39–61, pl. I–II), based on symbols or combinations of symbols found on silver punch-marked coins of the Amaravati Hoard.

1. Silver, squarish with clipped edges, worn out. Fig. 11.1.
Size: 1.435 × 1.246 × 0.241 cm.
Obv: Five symbols; solar symbol (Symbol 1), *sadachakra* (Symbol 7; i.e. three arrows and three ovals alternately placed around a circle with a conspicuous dot in the centre), elephant facing right (Symbol 71) and two other indistinct symbols.
Rev: Worn out, two indistinct marks are found.

2. Silver, rectangular with clipped edges. Fig. 11.1.
Size: 1.986 × 1.181 × 0.183 cm.
Obv: Five symbols; solar symbol (Symbol 1), *sadachakra* (Symbol 7), elephant facing right (Symbol 71) and two other indistinct symbols.

https://doi.org/10.1515/9783110653540-011

Rev: Four symbols; solar symbol (Symbol 1), *sadachakra* and two other worn out symbols.

3. Silver, roughly rectangular with clipped edges. Fig. 11.1.
Size: 2.182 × 1.139 × 0.201 cm.
Obv: Five symbol type: solar symbol (Symbol 1), *sadachakra* (Symbol 23, i.e. three arrows and three taurines alternately placed around a circle with a conspicuous dot in the centre), crescent on a three-arched hill (Symbol 48), bull(?) facing right (Symbol 62), caduceus (Symbol 84).
Rev: Caduceus with some worn out and indistinct marks.

4. Silver, round, worn out. Fig. 11.1.
Size: 2.021 × 1.765 × 0.126 cm.
Obv: Five symbol type: solar symbol (Symbol 1), hare facing right standing on five hills (Symbol 43) or two hills (Symbol 99), bull facing right (Symbol 62), elephant facing right (Symbol 71), heavily worn out and indistinct symbol perhaps a fish symbol.
Rev: Fish in tank (?) with some indistinct marks.

5. Silver, rectangular with clipped edges. Fig. 11.1.
Size: 1.662 × 1.300 × 0.161 cm.
Obv: Five symbol type; solar symbol (Symbol 1), a wavy line (Symbol 80), three other indistinct symbols are visible.
Rev: Traces of two symbols in square and circular incuses, a few worn out marks.

6. Silver, square with clipped edges, slightly worn out. Fig. 11.1.
Size: 1.841 × 1.784 × 0.133 cm.
Obv: Four symbol type; solar symbol (Symbol 1), *sadachakra* (Symbol 6. i.e. three arrows and three taurines in an oval, alternately placed around a circle with a conspicuous dot in the centre), six-arched hill (Symbol 46), some other symbol, perhaps a triangular headed standard with four taurines (Symbol 61).
Rev: Worn out, crescent on a three-arched hill (Symbol 136) and two other indistinct symbols.

7. Silver, irregularly clipped square, worn out. Fig. 11.1.
Size: 1.501 × 1.279 × 0.346 cm.
Obv: Five symbol type; Solar symbol (Symbol 1), *sadachakra* (Symbol 7), crescent on a three-arched hill (symbol.48) (?) and two other indistinct symbols, caduceus(?).
Rev: Crescent on arched hill (Symbol 48), some indistinct marks.

8. Copper alloy, squarish, slightly worn out. Fig. 11.2.
Size: 1.441 × 1.260 × 0.188 cm.
Obv: Four symbols type; solar symbol (Symbol 1), *sadachakra* (Symbol 7), animal (?), and one unidentified symbol.
Rev: Fish in a tank (?), other indistinct symbols.

Uninscribed coins

A single copper uninscribed coin was found in the collection.

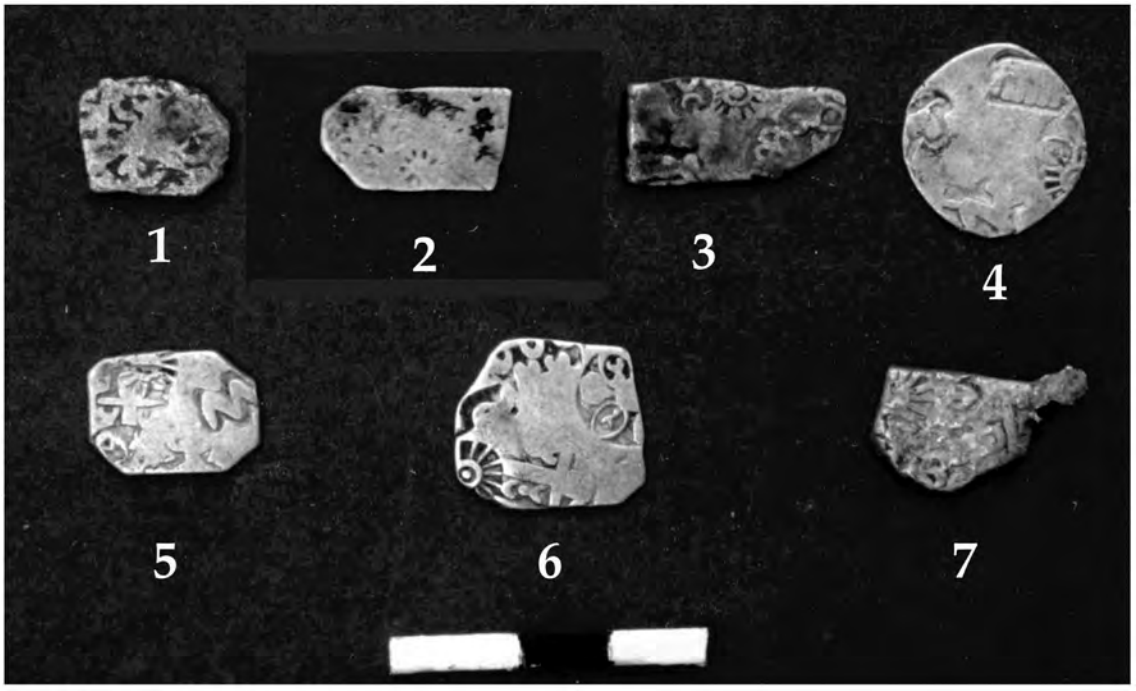
9. Copper alloy, squarish, good condition. Fig. 11.2.
Size: 1.540 × 1.395 × 0.341 cm.
Obv: Elephant facing to left as if walking towards a triangle-headed standard, trunk hanging with a tusk, a swastika and inversed taurine above the animal, ladder below.
Rev: Hollow cross at the bottom left, a crescent on a three-arched hill above it and a tree in railing to its right.
Note: This coin can be compared with Mauryan coins of similar type recovered from middle Gangetic valley as stated by Mitchiner (1972: nos. 18–26). The symbols and the size ranges are the same in both areas.

Inscribed coins

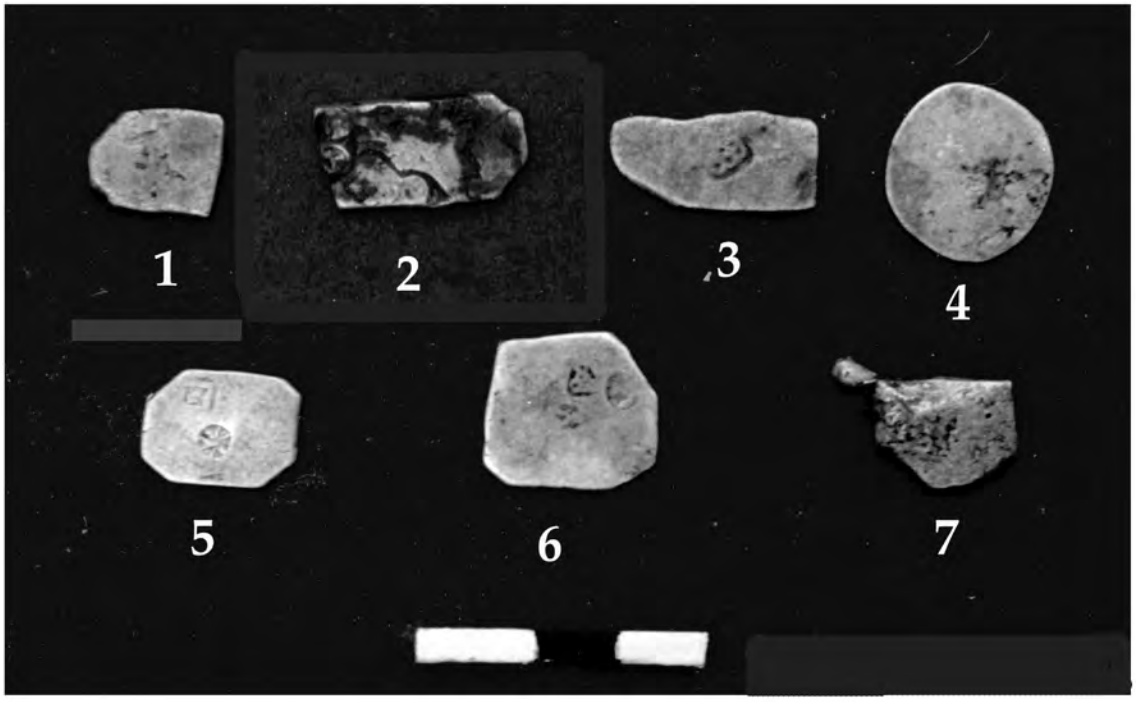
There are two inscribed circular coins of elephant/tree type, one each in copper and lead.

10. Copper alloy, round, slightly worn out. Fig. 11.2.
Size: 1.880 × 0.330 cm.
Obv: Elephant walking to the right, trunk uplifted, four circles placed together above the animal, two Brahmi letters in front of mouth reads as 'SI RI------' and above on the back of the animal 'RA JNO ------' faintly visible.
Rev: Branched tree in railing with oval leaves, *srivatsa* symbol to its left and an indistinct symbol (arched hill?) to its right.

11. Lead, round, worn out. Fig. 11.2.
Size: 2.289 × 0.320 cm.
Obv: Elephant walking right, trunk uplifted with four unconnected circles with a crescent on one of the circles above the animal, the legend along the flan is faintly visible and reads 'SA RA JNO SI RI SA TA---------'.
Rev: A tree with five oval leaves is faintly visible.
Note: This can be compared with a circular copper coin at Nevasa having the legend 'RA NO SI RI SA (TA KA) NI SA' and five oval leaves in a railing of six compartments on the reverse (Sankalia *et al*. 1960: 180–181, fig. 78, 2, pl. II, 4). The same type of coin was also issued in lead at Nevasa.



(Obv)



(Rev)

Fig. 11.1: Coins from the Balasaheb Patil Collection (1–7).

Fig. 11.2: Coins from the Balasaheb Patil Collection (8–11).

The above two coins of elephant/tree type may be attributed to King Satakarni but were issued in different metals. Both the Paithan and Nevasa coins of this type may belong to the same King Satakarni but cannot be definitely assigned to Satakarni II or Gautami Putra Satakarni etc.

Portrait coins of the Satavahana kings

There are two silver portrait coins in the collection.

12. Silver, round, good condition. Fig. 11.3.
Size: 1.563 × 1.535 × 0.175 cm.
Obv: Portrait of a king in the centre, inscription along the flan reads 'S I R I Y A N A S A T A K A N I S A R A J N O' then *chudamani* begins, again the legend reads 'G O T A M I P U T A S A'.
Rev: Ujjain symbol to the left and six-arched hill to the right; both are surmounted by crescent, a rayed sun symbol in between the two on top and a wavy line below the whole device within a dotted circle, which is partly off the flan. A vertical line passing through the Ujjain symbol is found on the flan. The legend starts from about 5 o'clock and reads '(KU) H A R I YA NA HA TA KA NI KU ARA….'.
Note: This coin has already been published by Ranade (1964: 98, pl. I, 8) but his reading on the reverse is slightly different. The initial letters preceding 'YA N A' he reads as 'SI RI', but they are '(KU) HI RI' and also 'SA' instead of 'HA'.

13. Silver, round, good condition. Fig. 11.3.
Size: 1.592 × 1.504 × 0.160 cm.
Obv: Portrait of a king in the centre, legend along the flan reading 'SI RI PU DU MA VI SA (RA JNO)', then *chudamani* begins and afterwards the legend reads '(VA) S I T H I PU TA SA'. The upper portion of the letters 'RAJNO' and 'VA' are cut off.
Rev: The devices on the reverse are the same as that of the Yajnasiri Satakarni coin mentioned above, but here, an arched hill is effaced except for the crescent above within a partly visible dotted circle. The legend along the flan reads '…….T(I) RU PU DU SHA VI KU A RA HA NA…….'.

Fig. 11.3: Coins from the Balasaheb Patil Collection (12–13).

Note: Here the letter that seems to be 'SHA' is 'MA'. The top portion of 'MA' is given in straight lines instead of cursive so it looks like 'SHA'. It may also reflect the influence on the scribe of scribbling the legends on the western Kshatrapa coins.

The legend on the reverse of the above two coins reads 'HA' for 'SA', the sixth case ending suffix 'KU' in each word and 'TI RU' as elsewhere on portrait coins of Satavahanas as has been pointed out by Sarma (2000: 79–80).

Kshatrapa coins

There are eight portrait coins of Kshatrapa kings (six silver and two copper) in the collection. But since they are worn out and illegible, and due to lack of access and good photographs, they are not included in this study.

Further coins

The following five coins were later identified and described from photographs by S. Bhandare.

14. Silver coin of Nahapana, Western Ksatrapa (Kshaharata) ruler of Gujarat-Saurashtra (c. 33–78 AD), counterstruck by Gotamiputa Siri Satakani, Satavahana king (c. AD 70–85). Satavahana devices of an 'Ujjain' symbol and a 'three-arched hill surmounted by crescent' are seen on reverse and obverse, respectively. Fig. 11.4.

15, 16, 17. Debased 'peacock'-type drachm struck posthumously in the name of Kumara Gupta, the Gupta emperor (c. AD 415–455).
Obverse: Profile bust of the king facing to the right; reverse: stylised peacock in the centre, surrounded by Brahmi legend '/Parama Bhagavata Rajadhiraja Sri Kumara Gupta Mahendradityah/', which is seen in parts on these coins. Fig. 11.4.

18. Silver Drachm (Dramma) of the 'Indo-Sasanian' series, early 'Gadhaiya' variety, c. 10–12th century AD. Fig. 11.4.

Moulds

There are three interesting terracotta moulds of circular shape. One of them contains three separate incuses interconnected by a channel and measures 48.84 mm in diameter and 9.67 mm in thickness. It consisted of devices in negative on the obverse of the King Gautamiputra Yajnasri Satakarni depicting the three stages of life of the king (Fig. 11.5, 1). The other side of

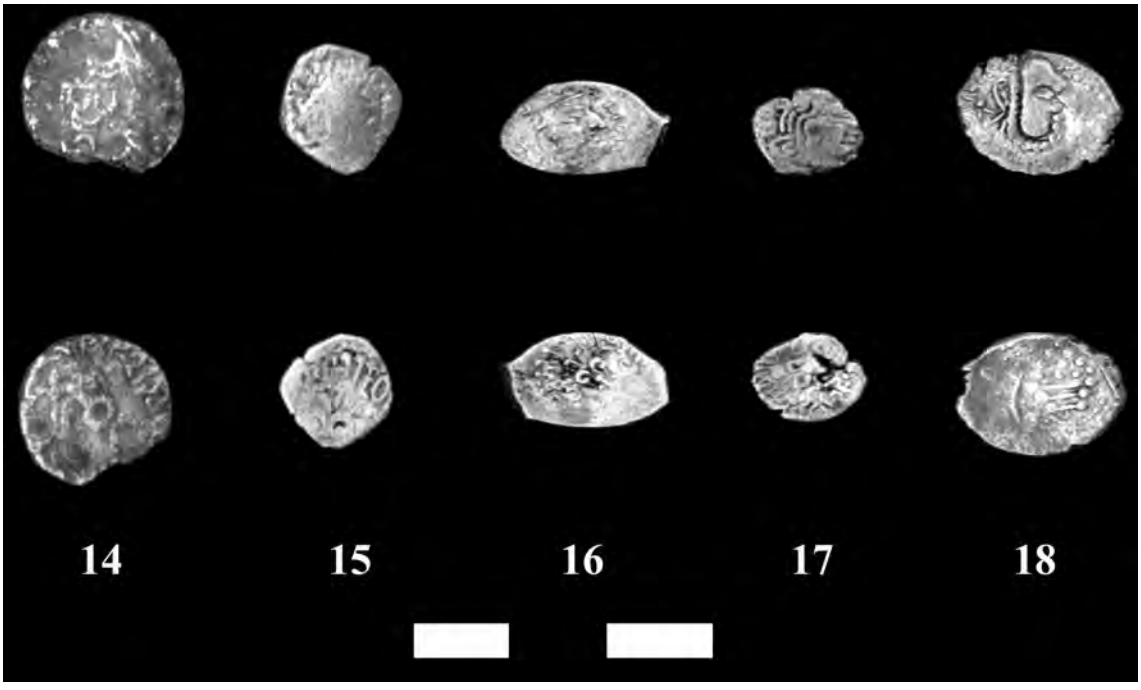


Fig. 11.4: Coins from the Balasaheb Patil Collection (14–18).

the mould is flat and blank. It was earlier reported by Gokhale (1995: 138–139) as a mould belonging to the three stages of king Gautamiputra Yajnasri Satakarni.

The second terracotta mould referred to here is circular in shape with a channel on both the surfaces having symbols (Fig. 11.5, 2). The third terracotta mould has a deep incuse without a channel having the reverse motif of a Satavahana king (Fig. 11.5, 3). It was not possible to study either of these moulds in more detail due to lack of access. One of the clay moulds of the collection that was not on display has been studied and identified as a proof piece of a silver coin of Vasisthiputra Satakarni (Shastri 1991).

Art Objects

The collection contains a variety of kaolin representations of humans and animals. The kaolin objects displayed in the museum are master works of the craftsmen from the Satavahana/Kshtrapa times and of later Early Historic times. They are all of double-moulded type. The human figurines depicted in Fig. 11.6, 8 are the heads of the male and female figurines. A number of other miniature figurines were also found, including a couple, a Chinese man with a beard and the heads of monks (saints), all showing different hairstyles and adorned with a variety of ornaments. A complete kaolin figurine in a sitting posture (Fig. 11.6, 7) delineates excellent artistic features that can be compared with a fragment of a kaolin figurine from the Paithan excavation (Chapter 8, No. 111). The animals include heads of goats and horses and the torso of a bull with wheel decoration on its mane (seat).

Terracotta objects of human (Fig. 11.6, 9) and animal figures are also displayed in the museum. The dark red colour terracotta faces of a male figurine in a laughing posture are interesting. The other terracotta

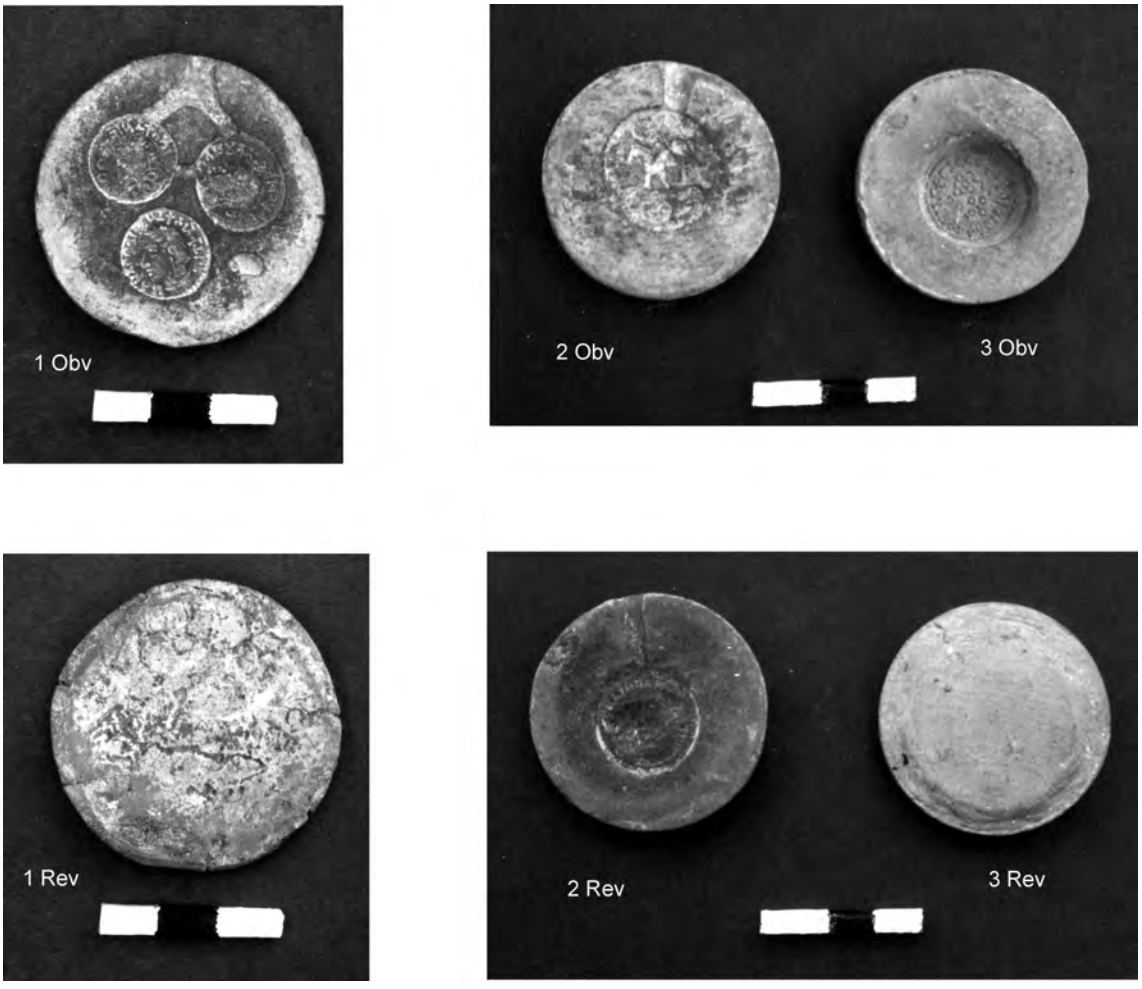
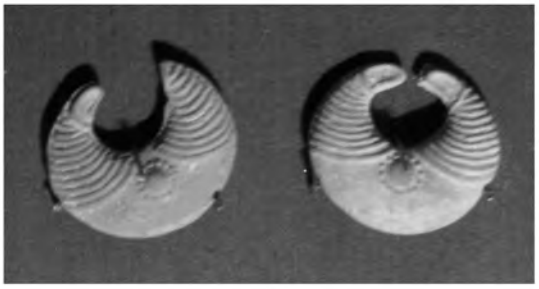


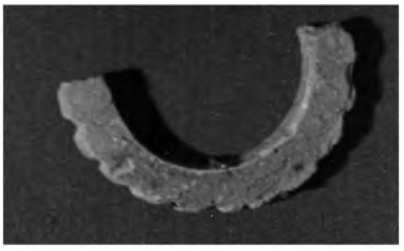
Fig. 11.5: Coin moulds from the Balasaheb Patil Collection (1–3).

1



2

3



4

5

6

7

8

9

Fig. 11.6: Pottery and terracotta objects from the Balasaheb Patil Collection (1–9).

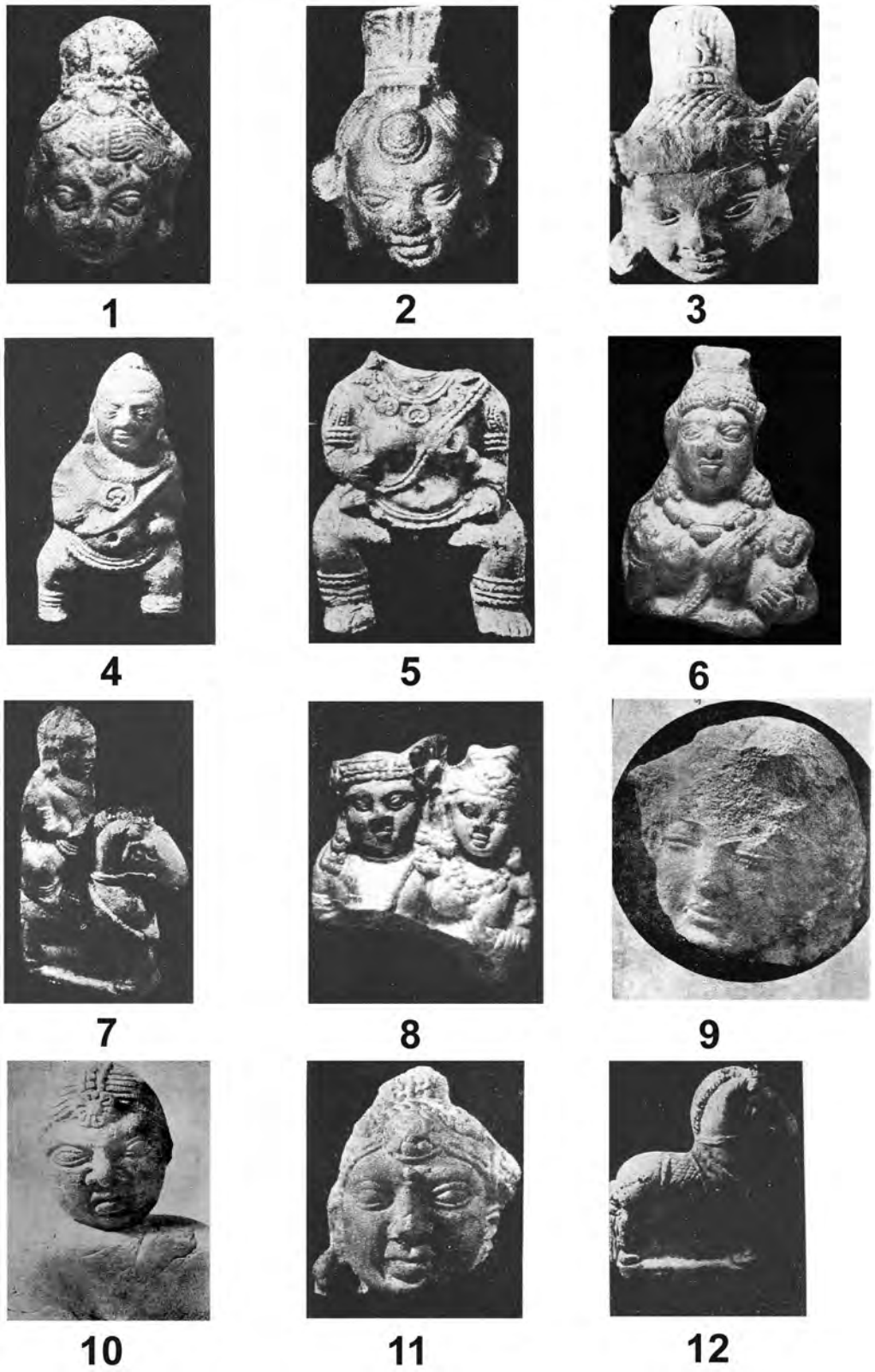


Fig. 11.7: Figurines from Paithan (from Morwanchikar 1985: pls X–XIII).

objects include the bust of a human being, a full figure of a man, a monk's head, two terracotta plaques of human beings and animals such as monkeys, cocks, elephants, a royal horse, Nandi and a cart. The head of a lady depicted in a side pose is a very interesting piece, having parallels with Roman art. The terracotta bulls with portraits of kings are also very interesting objects. There are a few terracotta medals of circular shape depicting a sitting stag and a Nandi within a floral motif, which are interesting finds (Fig. 11.6, 5–6).

One of the ivory objects of an umbrella shape is a unique piece of art with decoration executed on the body. Perforation was made in the middle of the body after making the decoration. There are other interesting ivory objects like a stupa-like motif and one with nut-powder-box shape.

Ornaments

The ornaments displayed in the museum include beads, ear-studs, pendants, bangles and rings of different materials in a variety of shapes, along with other ornaments. The beads are made up of semi-precious stones like agate, carnelian, chalcedony, garnet, jasper, rock crystal, steatite (paste), shell, glass and terracotta. Among the carnelian beads, the etched example of cylindrical shape with a circular section is a remarkable find, which can be dated to between approximately 100 BC and AD 100. Other carnelian beads are spherical, barrel shaped, cylindrical and rectangular. There is also a top-shaped pendant in this material. The crystal beads are spherical, rectangular-cylindrical, barrel-faceted and disc shaped (tablet).

Beads of shell and ivory are found here in different shapes and sizes. Beads that are squarish, flat, barrel shaped, truncated eared, cylindrical-circular, spherical, star shaped, oval shaped with a flat bottom and pointed top are the most important shapes. The terracotta beads are predominantly of arecanut shape. The others are gadrooned, eared and tablet shaped.

The ear ornaments of terracotta are crescent-shaped (Fig. 11.6, 2), which are broad in the middle and taper at the ends. Ear ornaments of similar shape were recovered from Bhokardan (Deo and Gupte 1974: pl. LIV, 11).

There are full and broken bangles of shell and ivory displayed in the museum and manufacturing waste from conch shells. Among these, there are broad and thin varieties and plain and decorated bangles. A broad bangle having a deep groove with projections on either side is interesting. Ivory bangles are decorated with circles, diamonds and some other decorations. There are a number of terracotta bangles of various sizes and decorations (Fig. 11.6, 3–4). A few broad bangles contain diamond-shaped cuttings and other designs. A few finger-rings were also found. There are kohl sticks and hairpins of ivory and also bone points. Among the ivory objects, different sizes of dices with different depictions are interesting finds.

Objects published by Mowanchikar

Morwanchikar published a number of objects that are also apparently from the Balasaheb Patil Collection (1985: chapter 7). These include querns, skin rubbers, bullae (at least one of which appears to be based on a Roman coin; Morwanchikar 1985: pl VII a), medallions, sealings, coin moulds, and a number of kaolin, terracotta and stone figurines that are not amongst those shown in Fig. 11.6 (Morwanchikar 1985: 143–153, pls X–XIII). Twelve of these objects are illustrated in Fig. 11.7, one of which (2) is very similar to a kaolin head from Ter in the British Museum, dated there to the 4th century AD on stylistic grounds (British Museum registration number 1958,1017.1) suggesting that the Satavahana date proposed by Morwanchikar for this object may be too early (1985: 144). As with all objects in the Balasaheb Patil Collection, it is not absolutely certain that they actually originated in Paithan as it is possible they were purchased from dealers who brought them from other localities.

Part IV

Environmental Evidence

Derek Kennet

Introductory Remarks on the Environmental Evidence

Part IV of this volume presents two specialist reports on the environmental evidence from the excavations (archaeobotanical and faunal).

As with the collection and study of the artefacts, a key aim of the present project was to use a systematic and quantified approach to both the collection and study of environmental evidence. This included, on the advice of Dr Mark Nesbitt of Kew Gardens, London, the construction of a 'Siraf-type' flotation machine that was set up on the banks of the Godavari and allowed the processing of very large quantities of flotation samples from key trenches and soundings. The advantage of this approach is manifest in the assemblage of more than 8,300 carbonized seeds that form the basis of the archaeobotanical study in Chapter 12. This is the largest archaeobotanical assemblage from any Early Historic or Medieval site that has so far been published from anywhere in India. At the same time, a rigorous programme of sieving of excavated earth was implemented. This resulted in the collection of a good faunal assemblage that provides insights into some very useful historical trends in animal husbandry at the site. Having said this, the general density of animal bone by cubic metre of excavated earth was noted by the excavators, many of whom have excavated in the Near East and Europe, to be relatively low by global standards. This may be a regional phenomenon related to diet or culture (although not bone survival as the bone that was collected was all in good condition), but because data on density of occurrence are rarely published from sites anywhere in the world, it is impossible to make reliable comparisons.

The results of these collection and study strategies are two chapters that make an outstanding and groundbreaking contribution to our understanding of the development of Paithan and its agricultural economy and also make the most substantial contribution to our understanding of Early Historic and Early Medieval agriculture that has yet been published from anywhere in India. These studies take the first steps in plugging a problematic and gaping hole in our knowledge of the economy of these periods that has been lamented by almost every scholar who has written on the subject.

The results of the two studies presented in Part IV are further discussed and contextualised in the conclusions (Chapter 14).

It should be noted that no systematic environmental sampling was carried out in 1996 or 1997, but a small pilot project of bucket flotation recovered some plant remains in 1997.

https://doi.org/10.1515/9783110653540-012

Dorian Q. Fuller

Chapter 12
Archaeobotany

Introduction

Archaeobotany is the study of plant remains from archaeological contexts, with aims to contribute to archaeological interpretations of past economies, foodways and in some cases environmental change. Archaeobotanical remains also provide evidence for the evolution of domesticated plants that have changed in the past as a result of human activities, in particular cultivation. As is most often the case, the present report will focus on seed and fruit remains (carpological analysis), which provides evidence mainly about food plants and agricultural systems. Other archaeobotanical datasets, such as wood charcoal and some charred parenchymatous remains (probably from tubers), are also present at Paithan and would repay future study. Archaeobotanical studies have a long history in India and have become increasingly systematic in terms of methods of recovery and sophistication of analytical and interpretative methodologies over the past few decades (Weber 2001; Fuller 2002). Nevertheless, the archaeobotanical record of India (and Pakistan) remains inconsistent. There are major variations between periods and regions that have been studied, with generally more evidence being available from the Neolithic and Chalcolithic periods, and often from regions that were foci of civilizations, such as the Indus and Ganges valleys, although the Southern Deccan is also well sampled (see Kajale 1991; Saraswat 1992; Fuller 2002, 2006a). Historical periods are generally more poorly represented, while Medieval and more recent times are almost entirely unsampled. Paithan, as a well-sampled site of Early Historic through Early Medieval times, is therefore of some significance. There are differences in the degree to which remains are counted and analysed quantitatively. In many published reports, only the presence of species is reported from individual samples or even site phases. A large body of research worldwide indicates that statistically significant quantitative patterns exist in archaeobotanical assemblages, structured by a combination of archaeological formation processes and past human activities, such as crop processing, agricultural practices and in some cases dietary preferences (e.g. Jones 1991; Colledge 1998, 2001; Pearsall 2000; Stevens 2003; Wilkinson and Stevens 2003). One of the aims of this report is to show how quantification can contribute to our understanding of the Early Historic plant economy on the peninsula.

Samples and their distribution

Most samples were collected systematically in the 1998 and 1999 seasons and processed with a flotation machine that was set-up at the site. A few samples had been processed in 1997 by simple bucket flotation using the wash-over method (for details on various flotation methods, see Pearsall 2000). For many samples, initial sorting was carried out in the field, supervised by Peter Rowley-Conwy, and the separated seeds and non-wood material were then exported to the UK for further analysis. In addition, some unsorted flots were sorted in full in the UK. As such, the latter could be separated in a microscopy laboratory with rather more care. Seed density and diversity may have been affected by sampling method in these samples. As a result, sorted samples vary greatly in richness, and it is not possible to consider how sample richness might relate to past activity patterns; although it might repay further analysis to consider the impact of sampling and sorting procedures on data, it is beyond the scope of this interim report to do. Despite these concerns, the overall sample size from Paithan is considerable and allows us to consider patterns through time at the site and provides a firm basis for comparison to the rather more limited published Early Historic datasets from this region.

The raw data are presented in Table 12.1. The maximum seed count in one sample is 1,124 items, the minimum is 2 and the average is around 100 items per sample. Forty samples contain more than 30 items and 20 samples contain more than 70. In terms of samples that are reliably phased on the basis of stratigraphic and artefactual evidence, the three main phases are fairly evenly represented by sample numbers, although the

total seed counts are quite variable. We can therefore be more confident about the patterns in Period 1 and Period 3. A number of samples, especially from bucket flotation in 1997, come from contexts which could not be phased. They are included in the total site patterns and in a few cases contain well-preserved, identifiable remains. For most discussion, however, samples will be considered only where they are assigned to phases:

Period 1 (Pre-Satavahana, perhaps the 3rd century BC through to about the 1st century BC): 17 samples and 2,529 seeds studied.

Period 2 (Satavahana period and later, probably 1st century BC/AD–4th/5th century AD or perhaps earlier): 21 studied samples, but only 762 seeds identified.

Period 3 (construction of the earliest preserved Hindu temples on the site, probably 4th/5th century AD to 8th century AD or later): 17 samples and 1,128 seeds.

Period 4 (post-Medieval, 14th/15th to 17th century and later): only one archaeobotanical sample of this period has been studied. Those remaining in the Paithan archive would repay future analysis.

General patterns in the evidence

Broad patterns in the data can be illustrated by 'relative frequencies' and 'ubiquities', which are calculated for Periods 1–3 (based only on samples which were phased) and on site totals (including unphased samples). *Relative frequency* refers to the percentage of identified seeds (including indeterminate seeds but not indeterminate fragments) which are summed across all the samples for a phase. *Ubiquity* refers to the percentage of samples in which a species is present. Thus, ubiquity is less prone to biases due to high versus low seed input into the record and preservation biases. It can be regarded as an estimate of recurrence of discard of species and for economic species recurrence of use. Relative frequency may be more useful for assessing how much of a species was used relative to another, but this may be heavily biased by numerous factors, especially differential preservation, which probably leads to higher rates of destruction for oily seeds as opposed to dry starchy seeds (like cereal grains and dried pulses), and differential rates of accidental loss during processing (e.g. more hulled cereals and pod-threshing pulses versus free-threshing types). For weed seeds which are likely to be incidental inclusions in crop-processing waste, seed productivity may also be important, and thus, prolific seed producers such as *Chenopodium* may be over-represented in relation to smaller seed producers such as Convovulaceae or Malvaceae. Despite such biases, we expect assemblages prior to charring to have been structured by human activities, including the quantities of species used and processing practices, as the latter structure crop-chaff-weed assemblages systematically (see e.g. Hillman 1984; Fuller 2002: 262–264; Stevens 2003; Harvey and Fuller 2005; Fuller and Weber 2005). Relative frequencies might therefore include more of a signal of activities, especially when considered on a sample-by-sample basis, whereas ubiquity will be less informative except to indicate that taxa have been used.

In general terms, there is a higher occurrence of grain crops (cereals and pulses) during Paithan Period 1 than in later periods, with relative increases in the occurrence of rice, wheat and barley and winter pulses in Period 3. This is indicated by relative frequency (Fig.

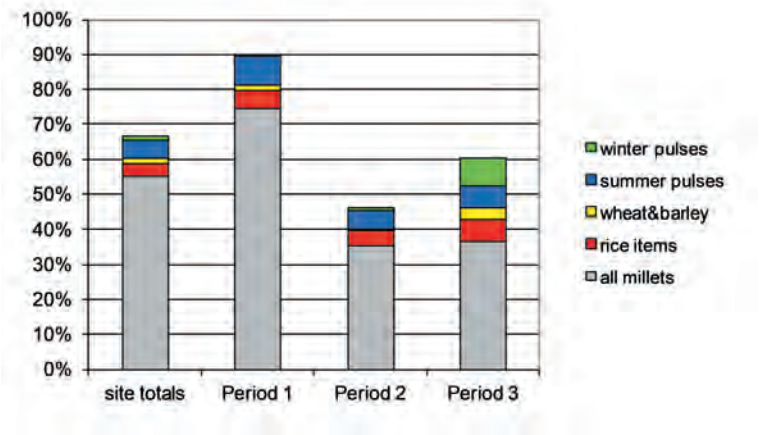


Fig. 12.1: Relative frequency of major crop groups.

12.1), where it can be seen that through all phases, millets dominate the archaeobotanical assemblage. This can be considered further through the ubiquity of some of the same crop groups together with some subdivisions of the millets (Fig. 12.2). In this, it can be seen that kodo millet (*Paspalum scrobiculatum*) is the most ubiquitous crop overall, followed by rice and the composite group of summer pulses. Kodo millet is also the dominant crop in terms of overall relative frequency, accounting for about 45% of all identified seeds. It can be noted, however, that the ubiquity of kodo millet declines through the three periods, whereas the small 'S/E/B' millets, which are mainly *Brachiaria ramosa* and *Setaria italica,* increase, as do African millets. Summer pulses show a similar trend and a Period 3 increase in winter pulses is also clear. This suggests an overall trend away from kodo millet cultivation towards a diverse range of millets, including the introduced African millets and *Setaria italica*. It is also worth noting the presence and persistence of the Southern Neolithic Ashmound millet, *Brachiaria ramosa,* as this is very much a relict and is, today, nearly extinct as a crop (Kimata *et al*. 2000) but was clearly a major staple in the earliest agriculture on the peninsula (Fuller *et al*. 2001, 2004). The decline of *Brachiaria ramosa* can therefore be hypothesized to post-date these Paithan samples. The trend towards more small millets in this long-embryo group is highlighted by a consideration of relative frequency (Fig. 12.3). Once again, increasing frequency is also seen in African millets and winter pulses, while the trend for summer pulses is less clear. With rice, wheat and barley, no single directional trend can be seen, but there is a decline in Period 2 and an increase that is more than a recovery in Period 3. On the whole, we might summarize the trends as indicating a move away from kodo millet dominance in Period 1 towards other millets and a further decline in kodo millet in Period 3 as other non-millet crops increased.

There is also a general tendency towards increasing cultivation of winter crops in the later phases of the site, seen especially in winter pulses. This is of interest because the predominant rainfall pattern in central Maharastra is the summer monsoon, and cultivation of winter crops poses some challenges and normally implies some form of artificial irrigation, as noted by Kajale (1988). While winter crops had been major staples in the region in the Chalcolithic (Kajale 1991; Fuller 2003c), there are indications that agriculture went into some decline after the Jorwe period. The particular emphasis on an increase in winter pulses may imply increasing double-cropping of the same lands. Pulses are naturally nitrogen-fixing plants and thus do not remove nitrates from the soil (Smartt 1990). Nitrates are one of the limiting nutrients for plant growth, and growing of legumes can help to replenish 'tired' soils. Thus, soils which were heavily and annually cropped for staple cereals in the summer might be planted with pulses in the winter to help replenish for use again the next year. This has two likely implications, which are not mutually exclusive: first, that cropping became increasingly continuous and fallow times were reduced between reuse of the same plot of land; and second, that cropping was expanded onto more marginal soils. In general the black regur soils of much of Maharastra are quite rich and thus move towards a regular rotation of cereals and pulses might imply use of locally poorer soils. Taken together, this evidence suggests moves to increased agricultural output, both through expansion (onto new lands and a wider range of soils) and intensification (by decreasing fallow periods and increasing repeated cropping on the same lands).

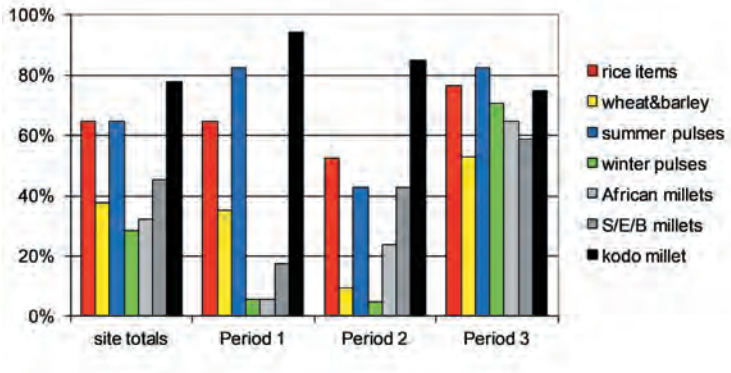


Fig. 12.2: Ubiquity of major crop groups and selected subdivisions of millets.

Table 12.1a: Archaeobotanical data from Paithan. P: present; T: total.

Period							1		1		2		2		3		3	
	Site total	Freq.	P	Ubiquity	Pulse items	%	T		P		T		P		T		P	
Pulses																		
Vigna cf. aconitifolia (whole)	5	0.06%	3	3.90%	7	0.12	0	0%	0	0%	2	0%	1	5%	3	0%	2	13%
Vigna cf. aconitifolia (cotyledon)	1	0.01%	1	1.30%			1	0%	1	6%	0	0%	0	0%	0	0%	0	0%
Vigna cf. aconitifolia (fragment)	1	0.01%	1	1.30%			0	0%	0	0%	1	0%	1	5%	0	0%	0	0%
Vigna cf. mungo (whole)	4	0.05%	3	3.90%	12	0.20	0	0%	0	0%	0	0%	0	0%	3	0%	2	13%
Vigna cf. mungo (cotyledon)	8	0.10%	6	7.79%			0	0%	0	0%	2	0%	1	5%	4	0%	4	25%
Vigna cf. mungo (frags)	0	0.00%	0	0.00%			0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Vigna cf. radiata (whole)	10	0.12%	7	9.09%	29	0.50	0	0%	0	0%	2	0%	2	10%	8	1%	5	31%
Vigna cf. radiata (cotyledon)	19	0.23%	13	16.88%			4	0%	3	18%	5	1%	3	15%	8	1%	6	38%
Vigna cf. radiata (frags)	0	0.00%	0	0.00%			0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Vigna sp. (whole)	180	2.16%	24	31.17%	299	5.15	138	5%	10	59%	7	1%	3	15%	13	1%	6	38%
Vigna sp. (cotyledon)	84	1.01%	16	20.78%			40	2%	7	41%	1	0%	1	5%	3	0%	2	13%
Vigna sp. (frag)	35	0.42%	12	15.58%			10	0%	5	29%	0	0%	0	0%	11	1%	3	19%
Vigna unguiculata (cotyledon)	1	0.01%	1	1.30%			0	0%	0	0%	0	0%	0	0%	1	0%	1	6%
Macrotyloma (whole)	3	0.04%	3	3.90%	23	0.39	1	0%	1	6%	1	0%	1	5%	1	0%	1	6%
Macrotyloma (cotyledon)	13	0.16%	3	3.90%			11	0%	2	12%	0	0%	0	0%	2	0%	1	6%
Macrotyloma (frag)	7	0.08%	3	3.90%			5	0%	1	6%	1	0%	1	5%	1	0%	1	6%
Lablab (whole)	6	0.07%	1	1.30%	23	0.39	0	0%	0	0%	0	0%	0	0%	6	1%	1	6%
Lablab (cotyledon)	8	0.10%	4	5.19%			5	0%	2	12%	2	0%	1	5%	0	0%	0	0%
Lablab (frag)	9	0.11%	5	6.49%			1	0%	1	6%	2	0%	1	5%	2	0%	1	6%
Cajanus (whole)	8	0.10%	6	7.79%	18	0.31	0	0%	0	0%	4	1%	2	10%	3	0%	3	19%
Cajanus (cotyledons)	1	0.01%	1	1.30%			0	0%	0	0%	0	0%	0	0%	1	0%	1	6%
Cajanus (frags)	9	0.11%	2	2.60%			0	0%	0	0%	9	1%	2	10%	0	0%	0	0%
Cicer (whole)	12	0.14%	6	7.79%	36	0.62	0	0%	0	0%	3	0%	1	5%	9	1%	5	31%
Cicer (cotyledons)	21	0.25%	9	11.69%			0	0%	0	0%	3	0%	1	5%	17	2%	7	44%
Cicer (frags)	3	0.04%	2	2.60%			0	0%	0	0%	1	0%	1	5%	2	0%	1	6%
cf. *Cicer* (reticulate surface)	3	0.04%	1	1.30%			0	0%	0	0%	3	0%	1	5%		0%	0	0%
Lathyrus sativus (whole)	4	0.05%	3	3.90%	7	0.12	0	0%	0	0%	0	0%	0	0%	3	0%	2	13%
Lathyrus sativus (cotyledon)	3	0.04%	1	1.30%			0	0%	0	0%	0	0%	0	0%	3	0%	1	6%
Lens (whole)	48	0.58%	14	18.18%	71	1.22	0	0%	0	0%	0	0%	0	0%	38	3%	9	56%
Lens (cotyledon)	12	0.14%	5	6.49%			0	0%	0	0%	0	0%	0	0%	7	1%	4	25%
Lens (frags)	11	0.13%	4	5.19%			1	0%	1	6%	0	0%	0	0%	10	1%	3	19%
Pisum sativum (whole)	2	0.02%	2	2.60%			0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Indet. large legume	63	0.76%	8	10.39%			16	1%	1	6%	15	2%	1	5%	20	2%	1	6%
Millets																		
Brachiria/Setaria caryopsis	74	0.89%	5	6.49%			0	0%	0	0%	27	4%	1	5%	0	0%	0	0%
Brachiaria ramosa/Setaria italica	269	3.23%	16	20.78%			5	0%	3	18%	24	3%	4	20%	111	10%	3	19%
Brachiaria ramosa type (w/o husk)	67	0.80%	11	14.29%			0	0%	0	0%	13	2%	2	10%	39	3%	6	38%
B. ramosa (w/ husk)	4	0.05%	4	5.19%			0	0%	0	0%	1	0%	1	5%	1	0%	1	6%
B. ramosa spikelets (silicified)	0	0.00%	0	0.00%			0	0%	0	0%	0	0%	0	0%	0	0%	0	0%

Echinochloa sp. caryopsis	10	0.12%	6	7.79%	0	0%	0	0%	1	0%	1	5%	6	1%	3	19%
Eleusine coracana	2	0.02%	1	1.30%	2	0%	1	6%	0	0%	0	0%	0	0%	0	0%
cf. *Eleusine coracana*	4	0.05%	3	3.90%	2	0%	1	6%	0	0%	0	0%	0	0%	0	0%
Panicum sp. (small)	5	0.06%	2	2.60%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Panicum sp. (small immature)	2	0.02%	2	2.60%	0	0%	0	0%	0	0%	0	0%	1	0%	1	6%
Paincum miliaceum	4	0.05%	2	2.60%	0	0%	0	0%	0	0%	0	0%	4	0%	2	13%
Panicum cf. sumatrense	27	0.32%	10	12.99%	2	0%	2	12%	4	1%	2	10%	14	1%	3	19%
Panicum cf. sumatrense (spikelet)	1	0.01%	1	1.30%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Panicum sp. (immature)	5	0.06%	1	1.30%	0	0%	0	0%	0	0%	0	0%	5	0%	1	6%
Paspalum scrobiculatum	3,724	44.72%	60	77.92%	1,842	73%	16	94%	192	25%	17	85%	69	6%	12	75%
Paspalum scrobiculatum (w/ husk)	4	0.05%	3	3.90%	3	0%	2	12%	0	0%	0	0%	0	0%	0	0%
cf. *Paspalum* husk frags (charred)	121	1.45%	2	2.60%	31	1%	1	6%	0	0%	0	0%	0	0%	0	0%
Paspalum spikelet bases	8	0.10%	1	1.30%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
cf. *Paspalum rachis* segment	1	0.01%	1	1.30%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Pennisetum glaucum	75	0.90%	9	11.69%	2	0%	1	6%	8	1%	1	5%	58	5%	3	19%
Setaria italica type	41	0.49%	5	6.49%	0	0%	0	0%	2	0%	2	10%	39	3%	3	19%
S. italica type w/ husk	4	0.05%	2	2.60%	0	0%	0	0%	2	0%	1	5%	2	0%	1	6%
S. italica spikelet	1	0.01%	1	1.30%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Setaria verticillata type	35	0.42%	9	11.69%	0	0%	0	0%	6	1%	2	10%	26	2%	6	38%
S. verticillata type w/ husk	4	0.05%	4	5.19%	0	0%	0	0%	2	0%	2	10%	1	0%	1	6%
Setaria cf. *pumila*	19	0.23%	3	3.90%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Setaria cf. *sphaceleata*	2	0.02%	2	2.60%	0	0%	0	0%	0	0%	0	0%	1	0%	1	6%
Setaria/*Brachiaria* immature	5	0.06%	4	5.19%	0	0%	0	0%	1	0%	1	5%	2	0%	2	13%
Sorghum bicolor	44	0.53%	16	20.78%	0	0%	0	0%	13	2%	4	20%	22	2%	8	50%
S. bicolor cf. race bicolor	3	0.04%	3	3.90%	0	0%	0	0%	1	0%	1	5%	1	0%	1	6%
S. bicolor cf. race durra	4	0.05%	3	3.90%	0	0%	0	0%	0	0%	0	0%	4	0%	3	19%
Indet. small millet	40	0.48%	5	6.49%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Indet. millet	6	0.07%	1	1.30%	0	0%	0	0%	0	0%	0	0%	6	1%	1	6%
Big cereals																
Oryza cf. *sativa* (grains)	163	1.96%	39	50.65%	55	2%	8	47%	27	4%	9	45%	60	5%	12	75%
Oryza grain frags	137	1.65%	23	29.87%	75	3%	5	29%	5	1%	4	20%	13	1%	4	25%
Oryza husk fragments (charred)	3	0.04%	3	3.90%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Oryza husk fragments (silicified)	0	0.00%	0	0.00%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Oryza spikelet bases	12	0.14%	1	1.30%	12	0%	1	6%	0	0%	0	0%	0	0%	0	0%
Oryza sp. (small wild)	6	0.07%	2	2.60%	3	0%	1	6%	0	0%	0	0%	3	0%	1	6%
Hordeum vulgare (Grains/frags)	56	0.67%	14	18.18%	33	1%	6	35%	1	0%	1	5%	1	0%	1	6%
Hordeum vulgare rachis	1	0.01%	1	1.30%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Triticum sp. (grain)	13	0.16%	6	7.79%	0	0%	0	0%	0	0%	0	0%	6	1%	3	19%
Triticum cf. *dicoccum* (grain)	15	0.18%	7	9.09%	0	0%	0	0%	2	0%	1	5%	11	1%	4	25%
Triticum FT (grain)	19	0.23%	5	6.49%	0	0%	0	0%	0	0%	0	0%	18	2%	4	25%
Indet *Hordeun/Triticum* (grain)	27	0.32%	5	6.49%	1	0%	1	6%	0	0%	0	0%	0	0%	0	0%
Culm node (large grass/cereal)	6	0.07%	4	5.19%	0	0%	0	0%	2	0%	1	5%	4	0%	3	19%

Table 12.1b: Archaeobotanical data from Paithan. P: present; T: total.

Period					1		1		2		2		3		3	
	Site total	Freq.	P	Ubiquity	T		P		T		P		T		P	
Other crops																
Sesamum indicum	225	2.70%	15	19.48%	6	0%	1	6%	165	22%	5	25%	7	1%	4	25%
cf. *Sesamum radiatum* type	1	0.01%	1	1.30%	0	0%	0	0%	0	0%	0	0%	1	0%	1	6%
Linum usitatissimum	1	0.01%	1	1.30%	0	0%	0	0%	0	0%	0	0%	1	0%	1	6%
cf. *Linum* frags.	3	0.04%	1	1.30%	0	0%	0	0%	0	0%	0	0%	3	0%	1	6%
Carthamus tinctorius	2	0.02%	1	1.30%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
cf. *Carthamus tinctorius* (frags)	6	0.07%	2	2.60%	3	0%	1	6%	0	0%	0	0%	0	0%	0	0%
Cannabis sativa cf. subsp. *sativa*	1	0.01%	1	1.30%	0	0%	0	0%	0	0%	0	0%	1	0%	1	6%
Brassica cf. *juncea*	8	0.10%	1	1.30%	0	0%	0	0%	8	1%	1	5%	0	0%	0	0%
Gossypium sp.	25	0.30%	12	15.58%	2	0%	2	12%	3	0%	3	15%	16	1%	6	38%
Gossypium testa frags	13	0.16%	5	6.49%	2	0%	1	6%	5	1%	2	10%	5	0%	1	6%
Abelmoschus sp.	8	0.10%	5	6.49%	0	0%	0	0%	1	0%	1	5%	6	1%	3	19%
Cucumis cf. *melo agrestis*	1	0.01%	1	1.30%	0	0%	0	0%	0	0%	0	0%	1	0%	1	6%
Cucumis melo/sativus	2	0.02%	2	2.60%	0	0%	0	0%	1	0%	1	5%	1	0%	1	6%
Cucurbitaceae: small *Melothria heterophylla*	7	0.08%	4	5.19%	0	0%	0	0%	0	0%	0	0%	6	1%	3	19%
Cucurbitaceae	2	0.02%	2	2.60%	1	0%	1	6%	0	0%	0	0%	1	0%	1	6%
cf. *Cuminum*	3	0.04%	1	1.30%	0	0%	0	0%	0	0%	0	0%	3	0%	1	6%
Tree fruits																
Fruit/nut indet. frags	12	0.14%	7	9.09%	1	0%	1	6%	6	1%	2	10%	3	0%	3	19%
Ziziphus sp. (wh+frags)	35	0.42%	10	12.99%	4	0%	2	12%	3	0%	2	10%	22	2%	4	25%
Ficus sp.	118	1.42%	14	18.18%	5	0%	1	6%	2	0%	2	10%	56	5%	5	31%
Emblica sp.	2	0.02%	2	2.60%	0	0%	0	0%	1	0%	1	5%	1	0%	1	6%
cf. *Vitaceae* small	1	0.01%	1	1.30%	0	0%	0	0%	1	0%	1	5%	0	0%	0	0%
cf. *Acacia* sp.	2	0.02%	2	2.60%	0	0%	0	0%	1	0%	1	5%	1	0%	1	6%
cf. *Prosopis* sp.	4	0.05%	2	2.60%	2	0%	1	6%	2	0%	1	5%	0	0%	0	0%
Indet fruit seed/nutlet	1	0.01%	0	0.00%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Weedy grasses (excluding millet genera)																
Alopecurus sp.	1	0.01%	1	1.30%	0	0%	0	0%	0	0%	0	0%	1	0%	1	6%
Coix caryopsis	12	0.14%	1	1.30%	0	0%	0	0%	12	2%	1	5%	0	0%	0	0%
cf. *Coix caryopsis*(?)	1	0.01%	1	1.30%	0	0%	0	0%	1	0%	1	5%	0	0%	0	0%
Dactyloctenium cf. *aegyptium*	1	0.01%	1	1.30%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Digitaria sp.	31	0.37%	8	10.39%	0	0%	0	0%	5	1%	2	10%	23	2%	5	31%
Eleusine indica	3	0.04%	2	2.60%	2	0%	1	6%	0	0%	0	0%	1	0%	1	6%
Ischaemum cf. *rugosum*	21	0.25%	7	9.09%	0	0%	0	0%	3	0%	2	10%	18	2%	5	31%
cf. *Lolium temulentum* (large Hordeae)	2	0.02%	1	1.30%	0	0%	0	0%	0	0%	0	0%	2	0%	1	6%
cf. *Pennisetum* sp. small wild	2	0.02%	1	1.30%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
cf. *Stipa*(?)	1	0.01%	1	1.30%	0	0%	0	0%	1	0%	1	5%	0	0%	0	0%
Urochloa/Braciahia eruciforme	20	0.24%	4	5.19%	0	0%	0	0%	0	0%	0	0%	14	1%	1	6%
Indet small grass	46	0.55%	6	7.79%	0	0%	0	0%	2	0%	2	10%	19	2%	1	6%
Aizooaceae	1	0.01%	1	1.30%	0	0%	0	0%	1	0%	1	5%	0	0%	0	0%
Aizooaceae: *Trianthema*	35	0.42%	5	6.49%	1	0%	1	6%	5	1%	2	10%	3	0%	2	13%
Aizooaceae: *Zaleya decandra*	84	1.01%	23	29.87%	0	0%	0	0%	25	3%	6	30%	28	2%	6	38%

Amaranthaceae	2	0.02%	2	2.60%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Apiaceae	1	0.01%	1	1.30%	0	0%	0	0%	0	0%	0	0%	1	0%	1	6%
Asteraceae	19	0.23%	3	3.90%	17	1%	1	6%	0	0%	0	0%	1	0%	1	6%
Boraginaceae type	3	0.04%	1	1.30%	3	0%	1	6%	0	0%	0	0%	0	0%	0	0%
Brassicaceae	26	0.31%	7	9.09%	1	0%	1	6%	0	0%	0	0%	13	1%	3	19%
Capparaceae type	1	0.01%	1	1.30%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Caryophyllaceae	10	0.12%	1	1.30%	0	0%	0	0%	0	0%	0	0%	2	0%	1	6%
Chenopodiaceae: *Chenopodium* sp.	5	0.06%	3	3.90%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Commelinaceae: *Commelina* sp.	9	0.11%	7	9.09%	1	0%	1	6%	5	1%	3	15%	3	0%	3	19%
Cyperaceae: cf. *Carex*	2	0.02%	2	2.60%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Cyperaceae: *Cyperus*	1	0.01%	1	1.30%	0	0%	0	0%	1	0%	1	5%	0	0%	0	0%
Cyperaceae: *Fimbristylis*	10	0.12%	1	1.30%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Cyperaceae	7	0.08%	4	5.19%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Euphorbiaceae type	6	0.07%	4	5.19%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Leguminosae small	109	1.31%	19	24.68%	12	0%	1	6%	1	0%	1	5%	24	2%	5	31%
Lamiaceae	2	0.02%	2	2.60%	0	0%	0	0%	0	0%	0	0%	1	0%	1	6%
Malvaceae (large) CROP?/ below	44	0.53%	15	19.48%	0	0%	0	0%	8	1%	5	25%	35	3%	9	56%
Malvaceae (large) cf. *Hibiscus*	23	0.28%	3	3.90%	0	0%	0	0%	11	1%	1	5%	12	1%	2	13%
Malavaceae (small) cf. *Malva*	21	0.25%	10	12.99%	3	0%	1	6%	5	1%	2	10%	10	1%	4	25%
Papavaraceae type	2	0.02%	1	1.30%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Poaceae indet.	4	0.05%	2	2.60%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Polygonacaeae: cf. *Polygonum* sp.	1	0.01%	1	1.30%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Portulaceae type	4	0.05%	1	1.30%	0	0%	0	0%	0	0%	0	0%	4	0%	1	6%
Rubiaceae mericarp, *Spermacoce* cf. *hispida*	4	0.05%	2	2.60%	0	0%	0	0%	0	0%	0	0%	3	0%	2	13%
Rubiaceae cf. *Rubia* sp.	2	0.02%	2	2.60%	0	0%	0	0%	0	0%	0	0%	1	0%	1	6%
Solanaceae: *Solanum* sp.	4	0.05%	3	3.90%	2	0%	1	6%	0	0%	0	0%	1	0%	1	6%
Schrophulariaceae: cf. *Verbascum*	4	0.05%	3	3.90%	0	0%	0	0%	0	0%	0	0%	4	0%	3	19%
Indet large seeds	14	0.17%	6	7.79%	0	0%	0	0%	2	0%	1	5%	2	0%	2	13%
Indet small seeds/sclerotia	73	0.88%	8	10.39%	0	0%	0	0%	3	0%	1	5%	32	3%	3	19%
Indet	39	0.47%	3	3.90%	37		1	6%	1		1	5%	1		1	6%
Indet testa frags	39	0.47%	5	6.49%	0		0	0%	0		0	0%	0		0	0%
Indet. fragments	1,330	15.97%	15	19.48%	122		2	12%	10		1	5%	5		1	6%
Large frags (cf. parenchyma)	94	1.13%	4	5.19%	0		0	0%	63		1	5%	22		2	13%
Dung fragments	1	0.01%	1	1.30%	1		1	6%	0		0	0%	0		0	0%
Total items	**8,327**		**77**		**2,529**				**762**				**1,128**			
No. samples	**78**				**17**				**21**				**17**			

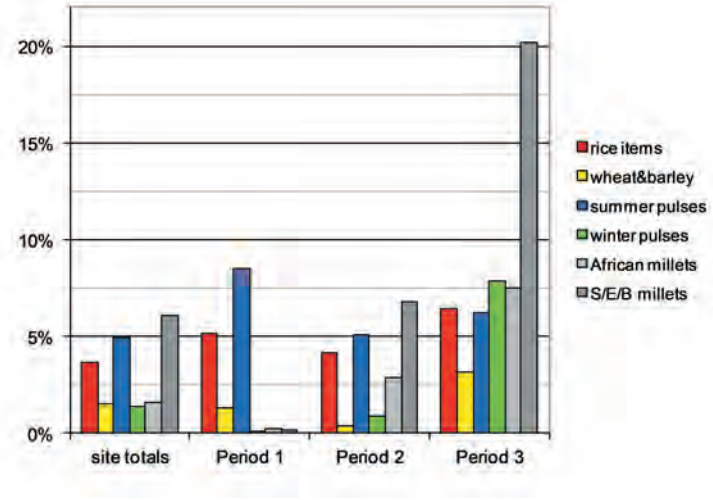


Fig. 12.3: Relative frequency of major crop groups.

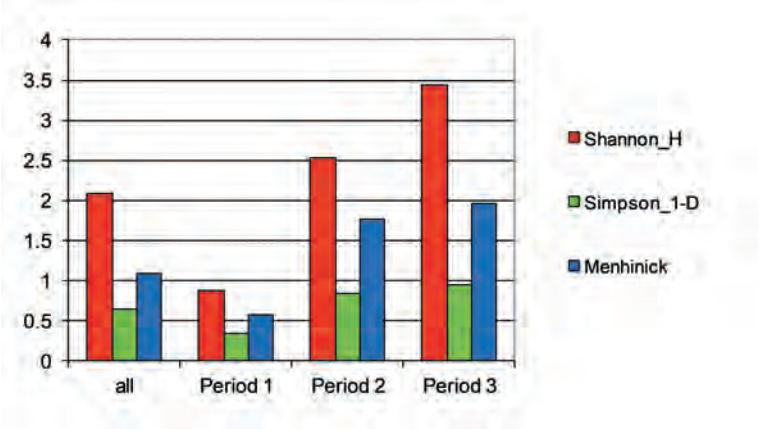


Fig. 12.4: Comparative diversity indices.

Overall, in terms of staple crop production, this might be interpreted as some tendency towards agricultural diversification. Measured merely in terms of the number of cereal/pulse species, there is directional change: from 13 taxa in Period 1 to 18 taxa in Period 2 and 22 in Period 3 (this count includes *Setaria verticillata*, assumes the presence of both *Brachiaria ramosa* and *Setaria italica* throughout and groups together sorghum subdivisions but separates free-threshing and *diococcum*-type wheat grains). This increase in diversity is not reflected in the weed flora, of which each period has 38 identifiable species present (although the total for all periods is 43, indicating that there were some minor changes in the presence of weed species). In biological terms, diversity is often considered to include not just the number of species but also how evenly distributed they are. In other words, an assemblage with ten species but in which only one or two of these account for most individuals is less diverse than an assemblage with ten species that are all found in similarly low frequencies. To measure this, three simple indices have been drawn from the ecologists' toolkit (Krebs 1985: 519ff). These include the Simpson index and the Shannon index, which are in common use amongst paleontologists and archaeozoologists. The Shannon index represents entropy on a scale from 0 (when a single species represents all individuals) to higher numbers as more species are encountered and are more evenly distributed. The Simpson index represents evenness with an index between 0 and 1, by calculating a ratio of dominance (for each species the number of individuals of the species is divided by the total of all individuals squared, and then summed across all species). The Menhinick richness index takes

into account the number of species and sample size as an attempt to correct for influence of sample size (i.e. that larger samples normally contain more taxa). These indices were calculated using the program PAST (Hammer *et al*. 2001). By these measures, the increase in diversity is clear (Fig. 12.4).

In the subsequent sections of this report, discussion is focussed around particular quantitative aspects of occurrence, issues of identification and significance of the species in terms of the economy at Paithan. The evidence from Paithan is situated in relation to the archaeobotanical record for South Asia as a whole. Table 12.1 presents the raw data.

Limitations of the interim report

There is still further work to be done on the archaeobotanical assemblage at Paithan. This includes preparing a comprehensive set of representative illustrations for all taxa, systematic measurements on many taxa, rechecking and refining some identifications especially of small millets and putting further efforts into identifying some unknown seed types. Of particular importance is refining the identification of weed seeds to genus and/or species level. At present, available reference collection materials are inadequate, and unlike many world regions, good seed atlases are not available for southern India. In the present report, a comprehensive discussion of the weed taxa recovered is not provided.

Cereals

Cereals are the mainstays of most world agricultural economies today as they were in the past. These are cultivated grasses in which production is focussed on the seed, which is a dry, hard grain that is readily storable and high in carbohydrates. Cereal grains, once mature, are not directly edible but require preparation through pulverisation (grinding), which makes flours for breads or gruels, or through boiling or steaming whole, as is familiar for rice, or boiling and fermenting to make beers. Paithan has a rich record for cereals and includes a wide range of species, including most of those known to have been cultivated in India in ancient times. Cropping in general and cereals in particular are often divided into two main seasonal groups in South Asia (see e.g. Kajale 1988; Weber 1991): the winter cereals (wheat and barley), or *rabi* cereals, and summer (monsoon) millets (a wide range of species, including sorghum), or *kharif* crops, as well as rice, which is probably most often a *kharif* crop, although winter varieties exist and may have already been available in the past. For the most part, these seasonalities are constrained by physiology and genetics of the crops themselves, as flowering (and subsequent seed production) is normally triggered by changes in day-length (Willcox 1992). Thus, winter crops are long-day plants that flower as a result of days getting longer after the shortest day (21 December), leading to harvests in February or March, while summer crops are short-day plants that flower as days shorten towards the end of summer. In modern agriculture, exceptions are found, and these are usually 'photoperiod neutral' plants, i.e. plants in which sensitivity to day-length has been deactivated through plant breeding. Thus, there are winter sorghums and pearl millets and summer wheats and barleys (in Europe and in the Himalayas). How long ago these alternative season varieties evolved is unknown, although in many cases, these alternative states may exist in different wild populations, for example, in sorghum and rice. Wild rices in southern regions, such as Indonesia or Sri Lanka, are often photoperiod neutral and not tied to the summer, whereas those further north in south China or the Ganges and Orissa are (Jennings 1966). The same is true of Southern African sorghums, both domesticated and wild. Thus, it is possible that winter varieties were already available to the inhabitants of Paithan, and at present, we just do not know. However, since the establishment of millet and sorghum agriculture in Southern Africa is rather later – probably closer to the time that Paithan was founded (Marshall and Hildebrandt 2002) – it seems likely that the sorghum varieties available at Paithan would have been predominantly, if not entirely, tied to summer cultivation. This was probably also the case with early *indica* rices, prior to the diffusion of tropical *japonica* varieties from the Malaysia region. In the case of summer wheats and barleys in the Himalayas, in all likelihood, the evolution of these varieties was necessary for agricultural settlement and may be hypothesized to have occurred by the start of the Kashmir Neolithic (Fuller 2006a: 36), but such forms are unlikely to have ever spread to southern India.

Table 12.2: The presence/absence of cereal crops on peninsular Indian sites of Iron Age or Early Historic date. Sources: Cooke *et al.* (2005), Kajale (1974, 1977b, 1982, 1984, 1989, 1994), Fuller *et al.* (2004), Fuller (unpublished data) (Piklihal), Vishnu-Mittre (1968), Vishnu-Mittre and Gupta (1968a,b) and Vishnu-Mittre *et al.* (1971, 1984). (IA = Iron Age; IV = Hallur period IV; EH = Early Historic).

	Period	Site	Wheat(s)	Barley	Rice	*Sorghum bicolor*	*Pennisetum glaucum*	*Eleusine coracana*	*Brachiaria ramosa*	*Setaria italica*	*Setaria verticillata*	*Panicum sumatrense*	*Paspalum scrobiculatum*	*Echinochloa colona*	No. cereal crops
800 BC	IA	Adam Cave	-	-	+	-	-	-?	+?	+	+?	-	-	-	5
	IA	Bhagimohari	-	+	+	-	-	-	-	-	-	-	-	-	2
	IA	Bhokardan	+	-	+	+	-	-?	+?	-	?	-	-	-	4
	IA	Naikund	+	-	-	-	-	-	-	-	-	-	-	-	1
	IA	Veerapuram	-	-	+	-	-	-	-	-	-	-	+	-	2
	IV/IA	Hallur	-	-	+?	-	-	+	+	-	+	-	-	-	4
300 BC–?	EH	Piklihal	-	-	-	+	-	-	+	-	-	+	+	-	4
	EH	Veerapuram	-	-	+	-	-	-	-	-	-	-	+	-	2
	EH	Adam Cave	+	+	+	-	-	-	-	-	-	-	-	-	3
	EH	Bhatkuli	-	-	-	+	-	-	-	-	-	-	-	-	1
	EH	Bhokardan	+	-	-	+	-	-?	?	?	?	-	-	-	2
	EH	Dangwada	+	-	+	-	-	-	-	-	-	-	-	-	2
	EH	Kaundinyapura	-	-	+	-	-	-	-	-	-	-	-	-	1
	EH	Nevasa	+	+	+	+	+	+	?	-	?	-	+	-	7
	EH	Paunar	-	-	+	+	-	-	-	-	-	-	-	-	2
	EH	Ter	+	+	+	-	-	-	-	-	-	-	+	-	4
	EH	Kodumanal	-	-	+	-	-	-	+	-	-	+	-	-	3
	EH	Mangudi	-	-	+	-	-	-	+	-	-	-	-	+	3
	EH	Perur	-	-	+	-	-	+	+	-	+	+	+	+	7
300–0 BC		Paithan I	-	+	+	-	+	+	+	+?	-	-	+	-	7
AD 0–400		Paithan II	+	+	+	+	+	-	+	+	+	+	+	+	11
AD 400–700		Paithan III	+	+	+	+	+	-	+	+	+	+	+	+	11
		Total sites	9	7	18	8	4	4	10	4	5	5	9	4	

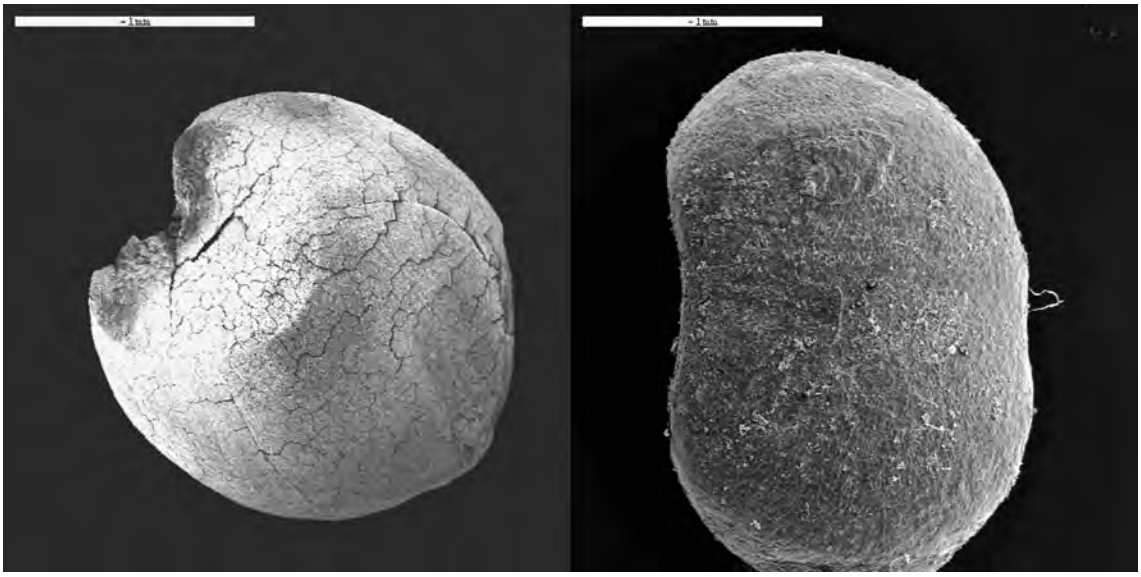


Fig. 12.5: Scanning electron micrograph of charred *Paspalum scrobiculatum* (kodo millet) from Paithan; dorsal view (left) and ventral view (right).

In comparison to other peninsular sites of Iron Age or Early Historic date, Paithan has the most diverse range of cereal species (Table 12.2). This may, however, merely reflect the impact of a large-scale flotation program rather than any real difference in agricultural diversity.

Kodo millet, *Paspalum scrobiculatum* (Fig. 12.5), is by far the dominant plant in the Paithan archaeobotanical assemblage; it occurs in 80% of the samples and accounts for 44% of all the seeds identified. As discussed above, its unrivalled dominance in Period 1 declines through subsequent phases and sees replacement by other millets, including African millets and especially *Brachiaria ramosa* and/or *Setaria italica*. This trend is of interest since kodo millet is not a major crop in the region today, although it is known (Kimata 1989; Kobayashi and Kimata 1989), and does not appear to have been a crop in the region during Chalcolithic times (Kajale 1991; Fuller 2002). It is present as only a few seeds in the later Southern Neolithic in Karnataka, which may not represent use as a crop (Fuller *et al*. 2004). All of this implies that during the late Iron Age and through the Satavahana period, kodo millet was a major crop in this region. Indeed, kodo millet is known from several other sites of the Iron Age or Early Historic period on the peninsula, and this period may represent the apogee of cultivation of this species (Table 12.3). Based on the current archaeobotanical evidence, we might point towards the Ganges Chalcolithic (e.g. Narhan Culture) as a possible locus of domestication of this crop. Presumably, this species was first known as a weed of cultivated rice and is still today a pernicious weed of rice (Moody 1989; Galinato *et al*. 1999). It may then have been recognized as a useful fall back or supplement food and began to be cultivated on poorer non-rice soils. This would make kodo millet a true secondary domesticate in the Vavilovian sense, as postulated for several Indian millets by Kimata *et al*. (2000). Subsequently, it may have spread to the Deccan at the same period as rice, but in the drier savannah zone, it was found to be particularly well suited.

This species is drought-tolerant, does well on poor soils and has a short growing season of 3 to 4 months, thereby being a low-labour demanding crop (Watt 1889–1893; De Wet *et al*. 1983). It also provides a relatively nutritious grain (FAO 1995; Weber and Fuller 2008). One of its drawbacks however, is that it is prone to fungal infection especially if it gets wet during grain maturation, and such infected grains are toxic for people and in animal fodder (FAO 1995). Frequency of this would have varied with climatic conditions, and realization of this could have contributed to decreased popularity over the course of the Early Historic period, which may have been a time of increasing monsoons between 300 BC and AD 100 (see e.g. increased Oxygen-18 Isotope levels in the Arabian sediment profile of Staubwasser *et al*. 2003).

Rice, *Oryza sativa* (Fig. 12.6) is the world's most productive crop today and a widespread staple food in Asia and South Asia. Its origins have been reviewed elsewhere (Fuller 2006a: 39–41; 2006b; 2007: 911–915),

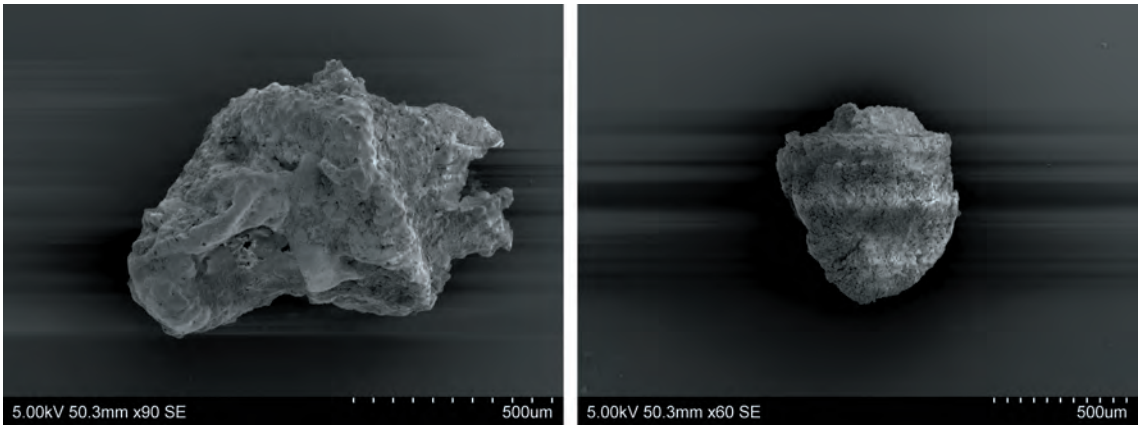


Fig. 12.6: Rice spikelet base from context 721; lateral view (left) and ventral view (right). Notice the indented scar indicative of domesticated/non-shattering morphotype.

Table 12.3: The occurrence of kodo millet in South Asian archaeology.

Site	Period	*Paspalum* ubiquity/comments	Dominant cereal(s)	Others	Reference
Kuntasi, Saurashtra	Mature Harappan	Probable *Paspalum*	*Panicum sumatrense*, *Setaria* spp.(?)	Wheat, barley, many *Coix* for beads	Kajale 1996a (preliminary report only)
Kurugodu	Neolithic IIIA (1750–1550 BC)	One grain, one sample (of four)	*Brachiaria ramosa, Setaria verticillata*	Wheat, barley	Fuller *et al*. 2001, 2004; revised dating: Fuller *et al*. 2007
Rojdi, Saurashtra	Period C, Late Harappan (2000–1700 BC)	1% (of 254 samples)	*Panicum sumatrense, Setaria* spp.(?)	Sorghum, *Echinochloa* (weedy?)	Weber 1991
Rupar, Punjab	Late Harappan/Baran (2000–1600 BC?)	?	Wheat		Vishnu-Mittre and Savithri 1979
Senuwar	Period IB, Late Neolithic (2000–1300 BC)	2% (of 42), absent from earlier period	Rice, barley	Wheat, sorghum, *Setaria pumila*	Saraswat 2004
Daimabad, Maharashtra	Jorwe (1500–1100 BC)	Absent from earlier levels, as are rice and sorghum	Wheat, barley, *Brachiaria ramosa*(?)/ *Setaria italica*	Sorghum, rice	Kajale 1977a; Vishnu-Mittre *et al*. 1986
Imlidh-Khurd, Uttar Pradesh	Period II, Narhan Culture (1300–800 BC)	?	Rice, wheat, barley	*Setaria pumila*	Saraswat 1993
Malhar, Uttar Pradesh	Period II, Early Iron Age (1600(?)–800 BC)	5.5% (of 18)	Rice, wheat, barley	Sorghum, *Eleusine*	Tewari *et al*. 2000
Narhan, Uttar Pradesh	Chalcolithic-Iron Age (c. 1300–200 BC)	23% (of 26 samples), absent from later period	Rice, wheat, barley	Pearl millet	Saraswat *et al*. 1994
Hallur, Karnataja	Neolithic IIIB (1550–1350 BC)	12.5% (1 of 8 samples; 2% frequency)	*Brachiaria ramosa, Setaria verticillata*	Wheat, pearl millet, *Panicum sumatrense*, wild *Oryza* sp.	Fuller *et al*. 2001, 2004; revised dating: Fuller *et al*. 2007
Magha, Uttar Pradesh	Black and Red ware	?	Rice	*Echinochloa* sp.	Vishnu-Mittre *et al*. 1984
Hulaskhera, Uttar Pradesh	Iron Age (800–300 BC)	17% (of 6 samples), mis-reported as 'Eleusine'	Barley, rice	Rare wheat	Chanchala 1992
Perur, Tamil Nadu	Early Historic/Late Megalithic (300 BC–300 AD)	20% (of 10 samples, frequency 9% and 26%)	Rice, *Eleusine coracana*	*Panicum sumatrense, Echinochoa* cf. *colona*	Cooke *et al*. 2005
Veerapuram, Andhra Pradesh	500 BC–400 AD	14% (of 21 samples, but high frequency)	Rice, kodo millet(?)	Barley	Kajale 1984
Hallur, Karnataka	800–200 BC	One of two samples studied of this period, low Frequency (9.6%); also preserved by mineralization with metal tools	*Brachiaria ramosa, Setaria verticillata*	*Panicum sumatrense, Eleusine coracana*, rice	Fuller 1999; Fuller *et al*. 2004; Vishnu-Mittre 1971; for dating: Fuller *et al*. 2007
Charda, Uttar Pradesh	Period IIA, 600–200 BC	9% (of 11 samples)	Rice, barley	Wheat, a small millet	Chanchala 2002

Saunphari, Uttar Pradesh	1000 BC–AD 300	?	Rice, barley, wheat		Chanchala 2004
Hulaskhera, Uttar Pradesh	Early Historic (300 BC–AD 300)	83% (of 23 samples), mis-reported as 'Eleusine')	Kodo millet, barley, rice	Rare wheat, pearl millet	Chanchala 1992
Manji, Uttar Pradesh	Early Historic (300 BC–AD 300)	50% (of 4 samples), mis-reported as 'Eleusine')	Barley, wheat, rice	Rare *Setaria* cf. *italica*	Chanchala 2000–2001
Sanghol	Early Historic (300 BC–AD 300)	?, mis-reported as 'Eleusine'	Rice, barley, wheat	Sorghum, *Setaria* sp.	Pokharia and Saraswat 1999
Balathal, Rajasthan	Early Historic (300 BC–AD 300)	?	Barley, wheat, rice, kodo millet(?)	Panicum, Setaria, Coix	Kajale 1996a
Nevasa, Maharashtra	Early Historic (150 BC–AD 200)	?	Barley, wheat, rice	Pearl millet, sorghum, *Eleusine(?)*	Anonymous, in Sankalia *et al.* 1960: 529–30; Kajale 1977b
Ter (Thair), Maharashtra	Early Historic (200 BC–AD 400)	Large quantities	Rice, kodo millet(?)	Wheat, barley	Vishnu-Mittre *et al.* 1971
Piklihal, Karnataka	Early Historic	One grain in one sample (of two)	*Brachiaria ramosa, Panicum sumatrense*	Sorghum	Fuller, unpublished data; dating: Fuller *et al.* 2007
Paithan, Maharashtra	400 BC–AD 700	78% (in 77 samples, declining over duration of site from 94% to 75%)	Kodo millet, *Brachiaria ramosa/ Setaria italica,* rice	Wheat, barley, sorghum, pearl millet, *Panicum sumatrense, Eleusine coracana*	This report

but there is now a strong case for one of several domestication events for Asian rice in northern South Asia, probably the Gangetic region, while separate processes of domestication are inferred for Yangtze river basin of China (Crawford 2006; Fuller 2007). Available evidence suggests that rice became a crop in parts of peninsular India during the Iron Age (Kajale 1989, 1991; Fuller 2006a: 53), with the earliest few finds from the latest level at Inamgaon in Maharashtra, dated to 1200–900 BC (Kajale 1988). The Iron Age adoption of rice was accompanied by some changes in ceramic repertoire that suggest the influence of northern Indian food traditions (Fuller 2005: 769). It is therefore no surprise that rice was a consistent find at Paithan. It has a high ubiquity of c. 65% of samples, which is essentially constant through all phases. In terms of absolute numbers and relative frequencies, however, rice is quite low, with its total relative frequency of c. 3%. While this is about twice the total frequency of wheat and barley, it is less than the frequency of summer pulses or winter pulses (when taxa are grouped) and much less than the total frequency of millets, which is over 60%. Given that recovery and sorting biases might be expected to favour large seeds (like rice, wheat and pulses), these numbers are suggestive. Rice was widely available, but somehow special, and does not appear to have been the staple crop, but perhaps a high-status or special-use cereal alongside the staple millets and pulses. This is how we would expect the traditional diet of the Deccan to have been until quite recent times, until the spread of artificial irrigation. Rice is a thirsty crop, and without major capital investments (landesque intensification, *sensu* Brookfield 1984; Blaikie and Brookfield 1987: 9; also Kirch 1994: 19), it is unlikely to have been produced on as large a scale as monsoon-adapted dry crops like millets and summer pulses.

Rice is highly diverse, with a wide range of landraces known in India as well as several varieties of wild weedy rice that may occur as weeds of cultivation. Varieties in India include both the conventional subspecies *indica*, with likely origins in northern India, and *japonica* of East Asian origin. Grain morphometric evidence suggests that *japonica* rices were introduced to the northwestern subcontinent, as at Pirak, in the first half of the 2nd millennium BC, together with other evidence for diffusion from China (Fuller 2006a: 36; Fuller and Qin 2009). It is therefore of interest to know which subspecies are most likely represented by the Paithan

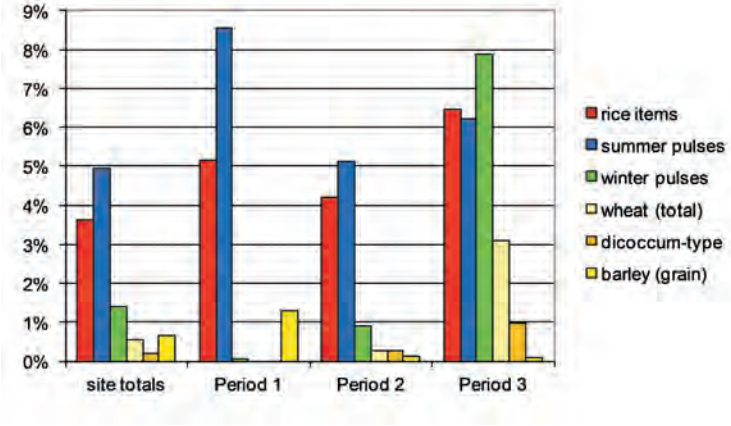


Fig. 12.7: Comparison of the frequency of wheat and barley with other taxa.

finds, and detailed metrical analysis may allow this in the future. In addition, the presence of apparent wild rices with noticeably smaller and thinner grains must also be noted, some of which may have had long use as occasional foodstuffs in South India, or perhaps occurred as weeds of pulse or millet cultivation, as indicated by small quantities of probable *Oryza granulata* grains from Late Neolithic Hallur in Karnataka (2nd millennium BC) (Fuller 2003c: 378, n.2). In addition, other thin and flattened grains are likely to represent immature grains, implying that crops did not ripen evenly and that early harvests included some ill-formed grains. A full morphometric analysis of the Paithan rices in the context of the wider context of grain shape variation in archaeobotanical materials in South Asia is warranted.

Wheat and barley

The major winter cereals of South Asia have their origins in South-West Asia and have been transmitted to India via the Indus region, where they were the staple crops of the Harappan civilization (Fuller and Madella 2001; Fuller 2006a: 20–35). In Maharashtra, they were widespread and important cereals of the Deccan Chalcolithic (Kajale 1991; Fuller 2003c: 372–374), with the more drought-tolerant barley in particular dominating the archaeobotanical record at Inamgaon (Kajale 1988). Further south, in the Southern Neolithic, these cereals were occasional and of low frequency, suggesting that they may have had some special status (Fuller *et al*. 2004; Fuller 2005), and they might have been cultivated in small, garden-like plots, where they could be more carefully tended and watered (Fig. 12.7). At Paithan, these species are fairly widespread, with a combined ubiquity of over 40% but with very low frequency. However, the patterns in wheat and barley differ. In Period 1, only barley is recorded, and this shows a significant subsequent decline into Periods 2 and 3. Wheat first occurs in Period 2 and shows a major rise into Period 3. The latter increase is mirrored in the winter pulses, which suggests a general increase in winter-cropping; this perhaps implies an increase in the control over water supply to provide irrigation through the winter. This may be related to an overall pattern of agricultural intensification, diversification and expansion aimed at increasing overall productivity (as noted in the general discussion, above).

The evidence from Paithan implies a significant difference from the regional pattern in the Chalcolithic period. In addition, in more recent times, it is free-threshing bread wheats that are most prominent, with barley significantly less so. Glumed wheats, namely emmer (*Triticum dicoccum*), were reported from the region in the 19th century (Watt 1889–1893; Fuller 2006a: 22–24), and it is therefore of interest to know the relative proportions of different winter cereal types through time. Distinguishing the glume wheat emmer from free-threshing wheat can only definitively be done on the basis of chaff remains, although grains tend to be clearly distinct, and on this basis, some plumper grains have been assigned to the free-threshing category and others to the emmer-type category (Figs 12.8–12.10). This suggests that there is a fairly even split between emmer and free-threshing wheat at Paithan, at least in Period 3, where there are sufficient numbers.

Fig. 12.8: Grains of barley (*Hordeum vulgare*), hulled variety, from context 721; ventral view (above) and dorsal view (below).

It should be noted that no attempt here is made to identify *Triticum sphaerococcum*, 'Indian shot wheat'. Although *T. sphaerococcum* has been widely reported in South Asian archaeobotany, its identification as a distinct genotype group of hexaploid breadwheats on the basis of grain remains is dubious (Fuller 2002: 273–277; 2006a: 23). No clear criteria exist for recognizing this species from grain remains. The reported criteria of some authors contradict each other and if found in Neolithic Europe would fit with known free-threshing tetraploids (cf. Maier 1996). Given the impact of carbonization, which tends to make grains more spherical through differential shrinkage of length, and the potential wide range of variability of grain shapes

Fig. 12.9: Grains of free-threshing wheat (*Triticum aestivun/durum*) from context 1036; dorsal view.

within both bread wheat and durum wheat, it is premature and misleading to refer archaeological material to '*Triticum sphaerococcum*' until more systematic metrical studies of populations have been carried out on both modern and archaeological Indian wheats. A definitive identification would also be aided by the recovery of charred rachis remains, which have proved elusive in the Paithan samples.

African millets (sorghum, pearl millet and finger millet) (Figs 12.11–12.13)

These three cereals (Hindi *jowar, bajra* and *ragi*), which were brought into cultivation in three different parts of Africa (Fuller 2003b; cf. Marshall and Hildebrand 2002), are of widespread importance in South Asia today, and especially on the Indian peninsula (FAO 1995; Possehl 1986). These species are on the whole fairly minor at Paithan, although both sorghum and pearl millet show major increases in frequency in Period 3. This may suggest that the beginning of the process by which these species rose to prominence in

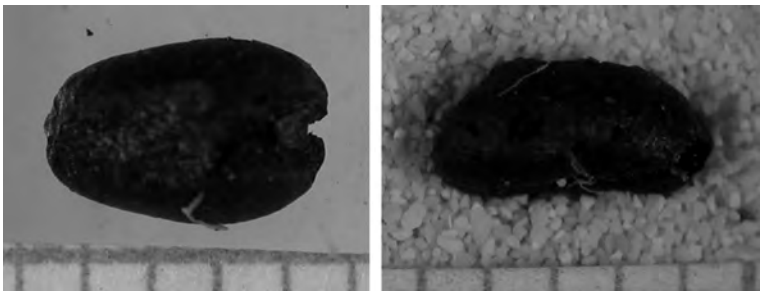


Fig. 12.10: Grain of emmer wheat type (*Triticum diococcum*) from context 919; dorsal view (left) and lateral view (right).

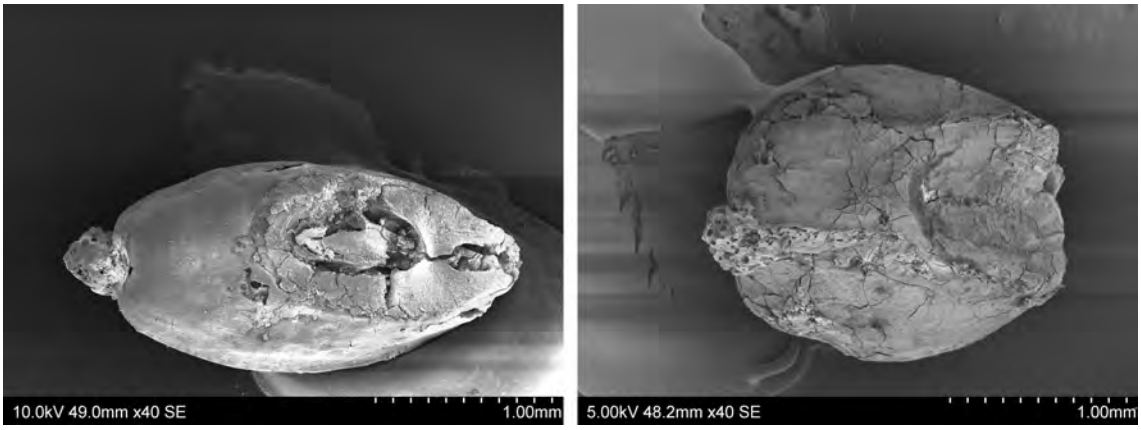


Fig. 12.11: Pearl millet grain (*Pennisetum glaucum*), narrow grain type, from context 930; dorsal view (left) and dorsal view (right).

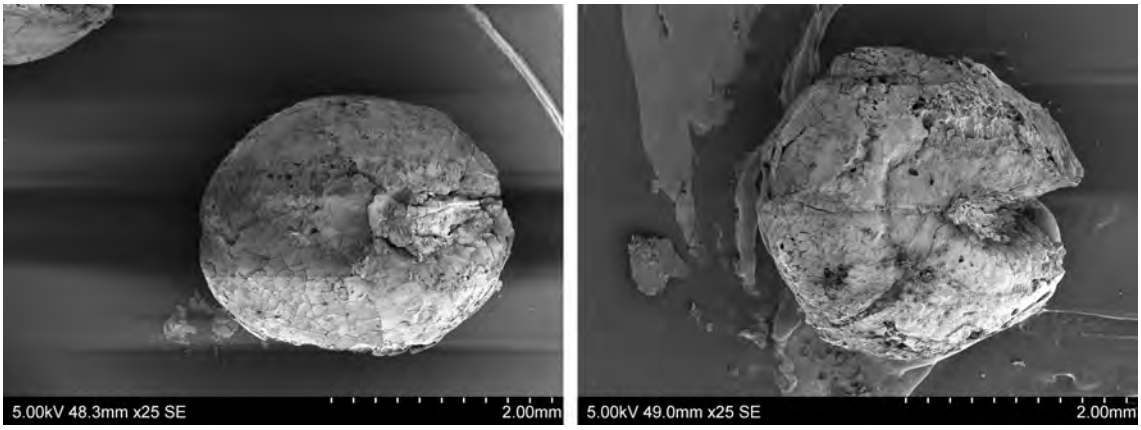


Fig. 12.12: Sorghum (*Sorghum bicolor*) of race bicolor type from context 930; dorsal view (right). Sorghum of race durra type from context 1092; dorsal view (right).

South India began only in the 3rd or 4th century. Some years ago, Possehl (1986) postulated that the introduction of these species from Africa may have been fundamental to the development of double-cropping in the greater Indus region and especially Gujarat, and paved the way for the development of agriculture in peninsular India. Subsequently, systematic archaeobotanical work in Gujarat suggested that the African millets were added to cultivation based on indigenous millets, especially *Panicum sumatrense* (Weber 1991, 1998), and research in South India established the primacy of a suite of native crops with *Brachiaria ramosa* and *Setaria verticillata* millets (Fuller *et al.* 2004). What is intriguing about the evidence from Paithan is that it implies that even though these species were introduced already in the Chalcolithic period (see Fuller 2003b), they may have remained fairly minor crops for the first two millennia or so that they were in India. The reasons for this are not immediately apparent. In general terms, they have a similar ecology and seasonality to the indigenous millets and have an advantage in being free-threshing (true of pearl millet and finger millet, and advanced *durra* type sorghums; see Reddy 2003; Fuller and Weber 2005), and this implies fewer crop-processing stages and labour needed to take them from the field to the plate. Nevertheless, cultural preference may have operated against them in favour of the traditional small millets, or else the persistent husks of the small millets may have been favoured for the advantages that the husks provide in storage as extra protection against fungus and to some extent against insects. In this regard, it is of interest to note that earlier finds of sorghum in Periods 1 and 2 – when referable to variety – appear to be hulled *bicolor* type sorghums, whilst the free-threshing larger-grained *durra* is present only in Period 3. It should also be noted that recent research suggests that a local trajectory of evolution from *bicolor* to *durra* sorghum took place in the Middle Nile Valley (Nubia) in the early centuries AD, and thus, it may be that this free-threshing form

became available by diffusion from Africa only in the 3rd century or so (see Clapham and Rowley-Conwy 2007; Shinnie and Anderson 2004: 366).

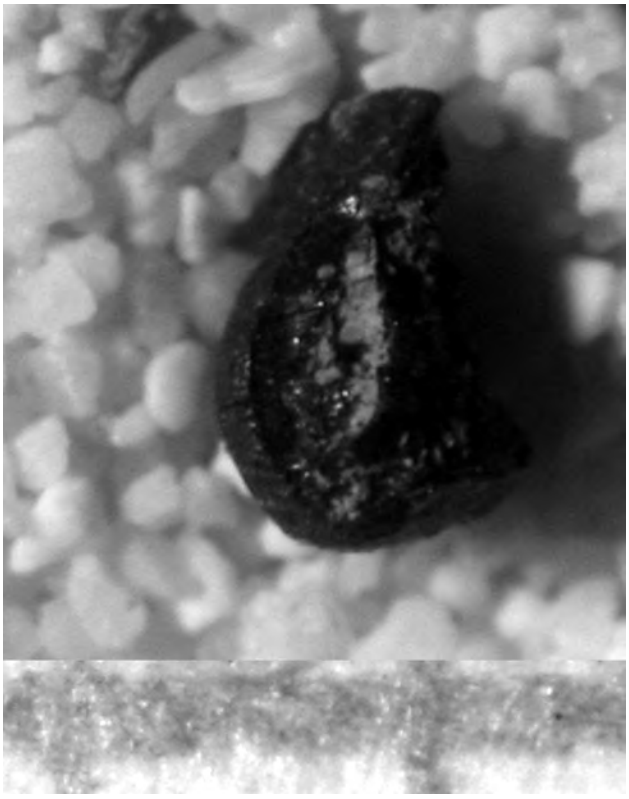


Fig. 12.13: Finger millet (*Eleusine coracana*), fragmented, from context 721; basal view of embryo. Approximately half of the grain is preserved.

There have been recent concerns over identification criteria for distinguishing these cereals (see Fuller 2003b for a review). While some reports of sorghum on the basis of ceramic and mudbrick impressions appear to have been in error, most reports on charred macroremains appear valid, and specimens from Paithan are well preserved and readily recognizable. This is also true of pearl millet. Finger millet appears to have been the most widely mis-reported. Clear grains, with characteristic globular-angular shapes and minute surface warts, were recovered only from one sample in Period 1 at Paithan (Fig. 12.13). Previously, the author has found one distinct specimen from Iron Age Hallur (Fuller *et al*. 2004) and ten from Early Historic Perur in Tamil Nadu (Cooke *et al*. 2005). These extremely small numbers raise the question as to whether there is some inherent preservation bias acting against this species. Compared to other cereals, it has a distinctively thicker pericarp, which is somewhat sticky and oily in appearance. It is conceivable that this lends itself more readily to destruction by fire. At present, there is so little good archaeobotanical evidence for this species, from either East Africa or India, that its early cultivation remains truly obscure.

The Chinese millets (broomcorn millet and common foxtail millet) (Figs 12.14 and 12.15)

These two species, *Panicum miliaceum* and *Setaria italica,* are both widespread in India today, and the latter, in particular, is a major crop in South India. At Paithan, there are only a few occurrences of broomcorn millet in Periods 2 and 3, while *Setaria italica* is confirmed for both of these periods and probably in significant proportions, having a ubiquity of 10–20%. A complicating factor is that charred grains of *Setaria italica* are very difficult to separate from grains of the indigenous *Brachiaria ramosa*, even their rugose husk patterns are similar, although the rugae are slightly coarser in *B. ramosa*, which has grains that tend to be somewhat flatter and with a relatively larger hilum. These distinctions, however, are made more problematic by the distortions introduced by charring.

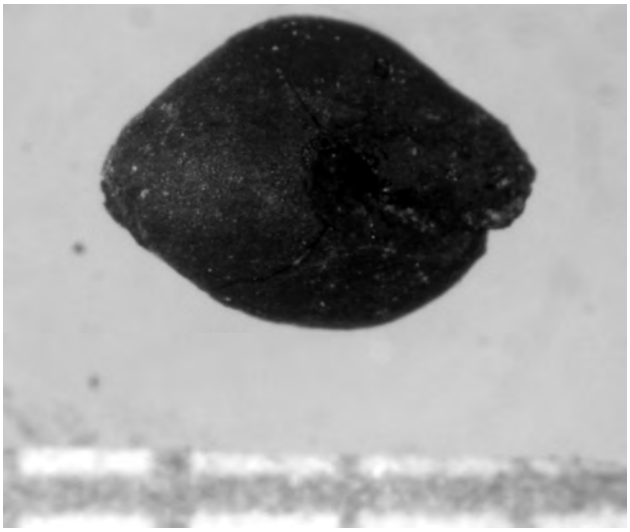


Fig. 12.14: Grain of common broomcorn millet (*Panicum miliaceum*) from context 1128; dorsal view.

Further re-examination of this material is warranted; only for a few samples has the author attempted these divisions, and thus for many samples, only a *B. ramosa/S. italica* category is counted. As will be seen, this accounts for about 10% of all seed finds in Period 3, indicating major significance. Future work needs to focus on determining the relative contribution of these

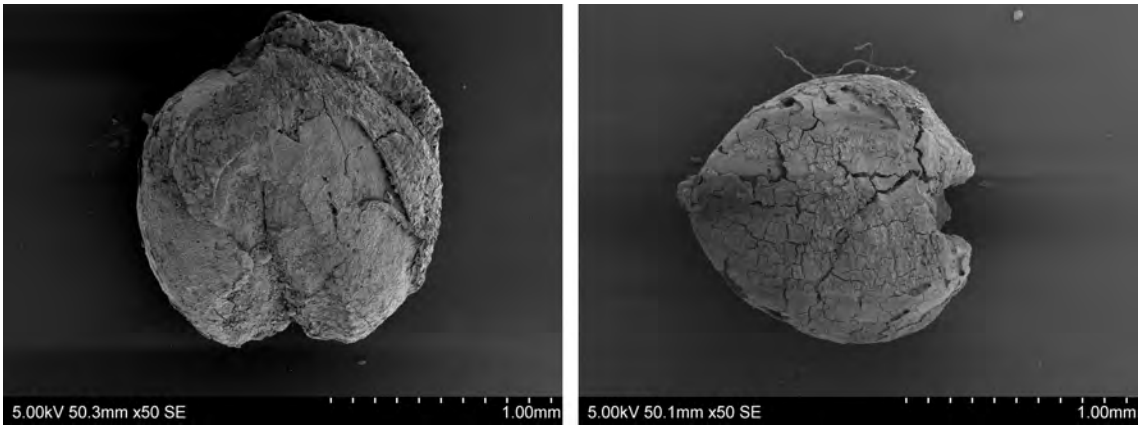


Fig. 12.15: Grain of common foxtail millet (*Setaria italica*) from context 1135; dorsal view (left) and ventral view (right), both with adhering lemma. Notice on ventral view the indentation of charred away hilum which is relatively short compared to overall grain length (in contrast to *Brachiaria ramosa*).

two species, as at some stage, there must have been a transition from prehistoric dominance of *Brachiaria ramosa*, the native crop of the Southern Neolithic and probably the Deccan Chalcolithic (Fuller 2003b, 2006a; Fuller *et al*. 2004; Cooke *et al*. 2005), to recent historical dominance by *Setaria italica*, with *Brachiaria* persisting in cultivation only in isolated peripheral pockets, where it is maintained apparently for ritual uses (Kimata *et al*. 2000). This transition amongst the small millets represents a major, still undocumented, change in the history of Indian agriculture.

Foxtail and Broomcorn millets are associated with the earliest agriculture in North China in the Yellow River basin (Crawford 2006), and both species appear to have been domesticated there. Nevertheless, recent genetic studies on modern foxtail millet varieties suggest more than one domestication centre, and a distinctive wild race found today in Afghanistan and northern Pakistan may have given rise independently to some domesticated landraces (Fukunaga *et al*. 2002, 2006). This being the case, it need not surprise us that *Setaria italica* reports, for example at Rojdi A (Weber 1991), predate those of *Panicum miliaceum* or other potential Chinese imports, which appear mainly after 1900 BC (Fuller 2006a: 36). Nevertheless, the identification challenge of separating *S. italica* and *B. ramosa* needs to be tackled more widely.

The Indian small millets (little millet, browntop millet, sawa millet and other *Setaria* spp.) (Fig. 12.16)

There is a wide range of small millets cultivated in South Asia today, and many of these were domesticated somewhere on the subcontinent (see Fuller 2006a: 18). At least five of these were present at Paithan, including kodo millet (see above) and the other genera discussed here (*Panicum*, *Brachiaria*, *Echinochloa* and *Setaria*). One difficulty with all of these species is that they are wild components of the flora in India and occur as weeds of other crops (including other millets and rice), but they are also known in cultivated or domesticated forms. For the archaeobotanist, we do not yet have clear and unambiguous means for determining whether finds of these represent domesticated crops or weeds. For early periods, such as the Southern Neolithic, this has been inferred on the basis of high relative frequency and ubiquity of occurrence (see Fuller 2003c; Fuller *et al*. 2004), but at an agriculturally diverse site such as Paithan, this is somewhat more problematic. Nevertheless, these species are likely to have been cultivars, and most of them (with the exception of *Brachiaria ramosa*) can be found in cultivation in Maharashtra today (Kimata 1989; Kobayashi and Kimata 1989; Kimata and Sakamoto 1992). *B. ramosa* was the staple cereal of the Southern Neolithic (Fuller *et al*. 2004), and it may also have been cultivated in the Neolithic Ganges, Gujarat and Maharashtra, although difficulties with precise identification and determining whether it might be present in the wild form, as a weed, raise interpretative problems. Its presence at Paithan, as well as Early Historic Tamil Nadu (Cooke *et al*. 2005), indicates that it was more widespread in the past than today (cf. Kimata *et al*. 2000; Kingwell-Banham and Fuller 2014). As noted in the discussion of *S. italica* (above), determining the timing and regions in which this crop declined remains an important issue. In the Southern Neolithic, the recurrent presence of *Setaria*

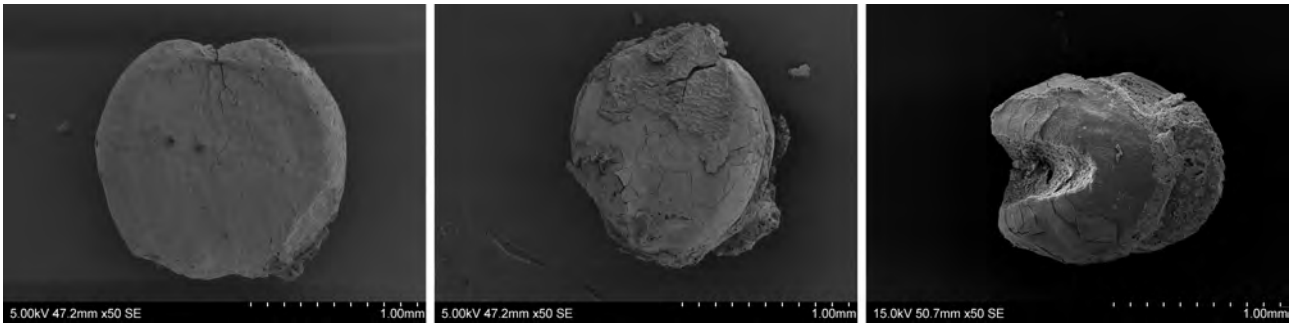


Fig. 12.16: Grain of browntop millet (*Brachiaria ramosa*) from context 1127; ventral view (left) showing adhering palea (centre) and dorsal view (right). Notice (left) faint traces of hilum, which is relatively long compared to overall grain length (1/4–1/3 length).

verticillata has been interpreted as having been a co-staple with *Brachiaria* (Fuller *et al*. 2004). It is not clear whether this species was ever domesticated, but it may have been a tolerated and consumed weed. Its co-occurrence at Paithan in some quantity in Period 3, together with *B. ramosa* and *S. italica*, suggests that this continued to be the case into Medieval times. *Panicum sumatrense* was the staple cereal of Protohistoric Saurashtra (Weber 1991: 84–85) and was also cultivated at Harappa (Weber 1999). The process and timing by which it spread to the peninsula remain unclear, but it persists as a widespread minor cereal today. The early history of sawa millet (*Echinochoa colona*) remains obscure. It may be, like kodo millet, a secondary domestication of an early rice or millet weed. Early finds of probable weedy type include those from the Southern Neolithic (Fuller *et al*. 2004) and Rojdi Phase C (Weber 1991).

Pulses

As already noted above, pulses are important in crop rotations because they are nitrogen-fixing plants (Smartt 1990; Zohary and Hopf 2000: 92). They can generally be grown on most soils except those which are waterlogged. In general, those pulses native to the tropics (India or Africa) have a monsoon-adapted seasonality, while those that spread in prehistory from the Near East (including lentil, pea, chickpea and grasspea) are winter crops. They are important also in human nutrition as sources of protein and thus complement the carbohydrate-rich cereals. Indeed, in much of India today, pulses are probably the main protein source for vegetarians, and in the form of *dhal*, they are a regular part of Indian meals. Pulses can also be made into flour, a key ingredient in many distinctive southern Indian food products, such as *dosa*, *idli* and *vadai*. It is noticeable that archaeologically, pulses are a prominent part of the archaeobotanical evidence in peninsular India already in prehistory, in many cases occurring in equal or greater quantity than cereals (Fuller *et al*. 2004; Fuller and Harvey 2006). This is a notable contrast from the quantitative frequency of pulses in other world regions, such as the Near East, Europe or the Indus Valley. It can be hypothesized that this resulted from the fact that the distinctive impor-

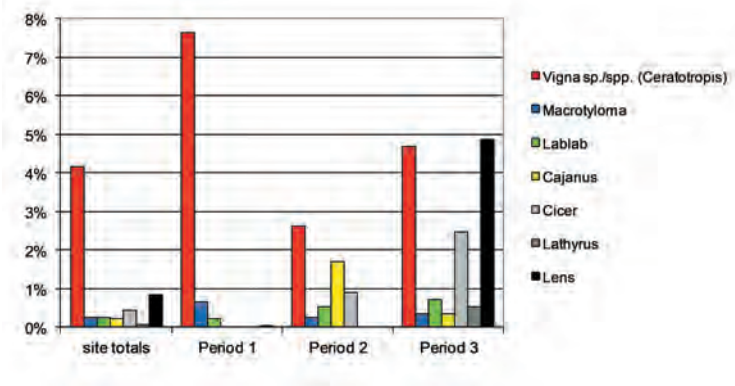


Fig. 12.17: Relative frequency of pulses.

Table 12.4: The presence/absence of pulse crops on peninsular Indian sites of Iron Age or Early Historic date. Sources as for Table 12.2. (IA = Iron Age; IV = Hallur period IV; EH = Early Historic).

	Period	Site	Lentil	Pea	Chickpea	Grasspea	Mung bean	Urd bean	Moth bean	Horsegram	Pigeonpea	Hyacinth bean	Cowpea	No. pulse crops
800 BC	IA	Adam Cave	-	-	-	+	-	+	-	+	-	+	-	4
	IA	Bhagimohari	+	+	-	+	+?	+	-	+	+	+	-	8
	IA	Bhokardan	+	+	+	+	-	+	-	-	+	+	-	7
	IA	Naikund	+	+	-	-	-	+	-	-	-	-	-	3
	IA	Veerapuram	-	-	+	-	-	+	-	+	-	+	-	4
	IV/IA	Hallur	-	-	-	-	+	+	-	+	-	+	-	4
300 BC–?	EH	Piklihal	-	-	+	+	+	-	-	+	-	+	-	5
	EH	Veerapuram	-	-	+	-	-	-	-	+	-	+	-	3
	EH	Adam Cave	+	+	-	+	+	+	-	-	-	+	-	5
	EH	Bhatkuli	-	-	+	-	-	-	-	-	-	-	-	1
	EH	Bhokardan	+	+	+	+	+	+	-	-	+	+	-	8
	EH	Dangwada	+	-	-	+	-	-	-	-	-	-	-	2
	EH	Kaundinyapura	-	+	-	+	-	-	-	-	-	-	-	2
	EH	Nevasa	+	+	+	+	+	+	-	+	+	+	-	8
	EH	Paunar	-	-	-	-	-	-	-	-	-	-	-	0
	EH	Ter	+	+	-	+	+	+	-	+	-	-	-	6
	EH	Kodumanal	-	-	-	-	+	+	-	+	-	+	+	5
	EH	Mangudi	-	-	-	-	-	-	-	-	-	-	-	0
	EH	Perur	-	-	-	-	+	+	-	+	-	+	+	5
300–0 BC		Paithan I	+	?	-	-	+	-	+	+	-	+	-	5
AD 0–400		Paithan II	-	?	+	-	+	+	+	+	+	+	-	7
AD 400–700		Paithan III	+	?	+	+	+	+	+	+	+	+	+	10
		Total sites	10	8	9	11	12	14	3	13	6	15	3	

tance of pulses, and especially pulse flours, associated with southern Indian foods had already developed on the Indian peninsula and that this distinctive pulse preparation style, which often involves dry-roasting, led to more frequent carbonization (Fuller and Harvey 2006). The relative frequency of pulses at Paithan is illustrated in Fig. 12.17. A comparative table on the presence of pulses on the Indian peninsula during Iron Age and Early Historic times is shown in Table 12.4. As with cereals, Paithan provides evidence for a wider range of pulses than other sites, a likely reflection of more extensive sampling.

Mung and urd beans (Figs 12.18 and 12.19)

An important group of related pulses are those of the genus *Vigna*, subgenus *Ceratotropis*, which is focussed in Asia (Tomooka *et al*. 2003). This includes two closely related species of particular importance in India, the mung bean (or green gram), *V. radiata*, and urd bean (or black gram), *V. mungo*. The scientific names of these species have, unfortunately, caused a degree of confusion (see Verdcourt 1971; Fuller 2002: 334, n.6; Fuller and Harvey 2006). These two species had separate origins from distinct wild progenitors, and current evidence suggests that they had non-overlapping origins, with a suggested epicentre of early urd cultivation in Gujarat/north-west Maharashtra and two early centres of mung cultivation in the Eastern Harappan zone and the South Indian Neolithic (Fuller and Harvey 2006; Fuller 2007). Distinguishing these species may prove difficult, especially if charred seeds are whole (with the cotyledons still together), but the seed coat and hilum have been destroyed by charring. If preserved, the hilum clearly distinguishes these taxa, with a much larger, protruding hilum in *V. mungo* and a smaller hilum in *V. radiata* that is flush with the seed surface, but very few such examples are available from Paithan, as was also true in the Southern Neolithic (Fuller *et al*. 2004). The criteria used in this study are those of Fuller *et al*. (2004) and Fuller and Harvey (2006), with a focus on plumule length (visible on split cotyledons)

to overall seed length. These species have been widely recovered from archaeological sites throughout India.

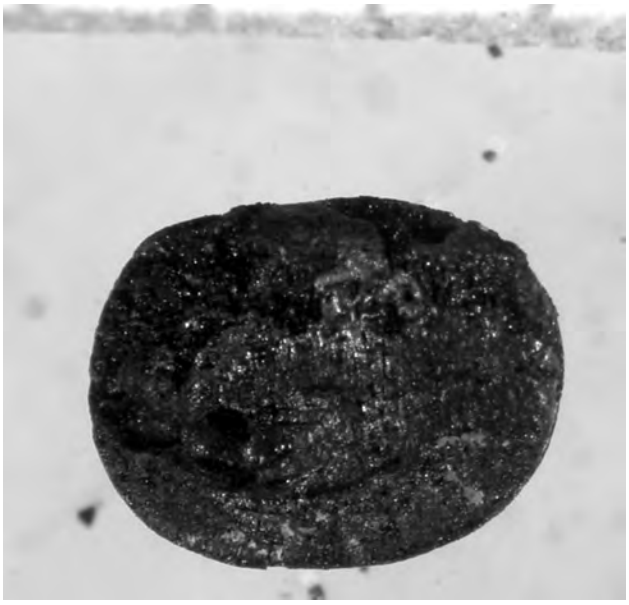


Fig. 12.18: Interior view of the cotyledon of mung bean (*Vigna radiata*) from context 1150. Notice the relatively long plumule.

Fig. 12.19: Interior view of the cotyledon of urd bean (*Vigna mungo*) from context 1150. Notice the shorter, half-seed-length plumule.

At Paithan, the Indian *Vigna* species dominate the pulse assemblage (Fig. 12.17). This is not unexpected as mung bean is one of the most frequent and ubiquitous pulses in Neolithic South India and Chalcolithic Maharashtra (Kajale 1988, 1991; Fuller *et al.* 2004), while urd is also prominent on the northern peninsula. Despite the Early Historic date of Paithan, *Vigna* specimens from the site can contribute to our understanding of the domestication process in pulse species. As with cereals, the domestication syndrome in pulses is expected to include grain size increase as well as a shift to non-dehiscent pods and loss of seed dormancy. While the latter two traits must have evolved early, it has been suggested that seed size increase did not and that this is a recurrent feature of pulses (Fuller and Harvey 2006; Fuller 2007). It may have required more intensive cultivation regimes, such as ard-ploughing, resulting in deeper burial of planted seeds to select for seed size increase. This assumes an unconscious mechanism, but it is also possible that farmers eventually took the conscious decision to select those crops that produced bigger seeds. Evidence for this lag time in size increase comes from the fact that early pulses, such as *Vigna* measured from Southern Neolithic sites, are small and within the size range of modern wild populations (which have been corrected for shrinkage due to charring), but that at later sites, particularly of Iron Age or Early Historic date, larger seeds, which would fit within the range of modern domesticated crops, are present. Some measurements from Paithan *Vigna* (on an initial representative assemblage rather than all examples) illustrates this in comparison to Southern Neolithic measurements (Fig. 12.20).

Moth bean, *Vigna aconitifolia* (Fig. 12.21), is another closely related pulse crop domesticated in South Asia. It can be distinguished from *V. radiata* and *V. mungo* by its minute hilum, which lies in a slight depression; it also has a distinctively short plumule length visible on split cotyledons. Unfortunately, it has not been adequately mapped in terms of its wild and weedy distribution, although it is *not* considered native to southern India (Cooke 1903–1908; Gamble 1935; Saldanha 1984) and thus may be a northern or central Indian domesticate (cf. Tomooka *et al.* 2003). In addition, early archaeological finds span from Harayana, including Harappan Burthana Tigrana and Late Harappan Mitathal, through the middle Ganges, at several sites in the 1300–600 BC horizon (Narhan, Imlidih-Khurd Period II, Raja-Nala-Ka-Tila Period II, Senuwar Period II, Kharadih Period II and Saunphari; see Chanchala 2004; Saraswat 2005). Together, these archaeological finds suggest a north Indian origin. Finds on the peninsula are lacking (see Table 12.4), and it may be that

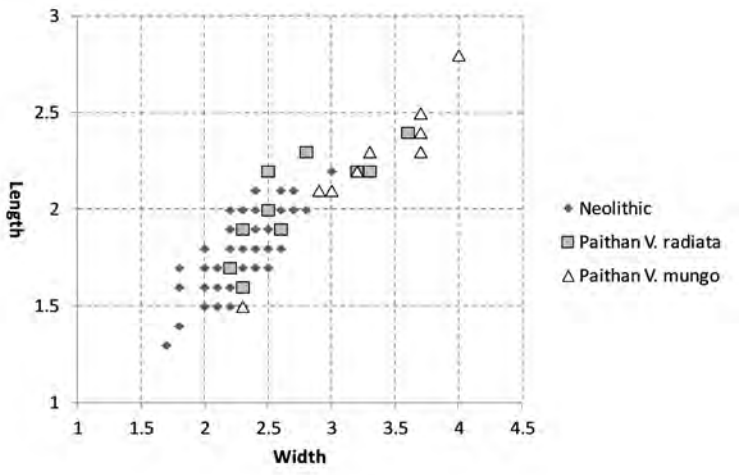


Fig. 12.20: Comparison of measurements of Paithan Vigna with samples from Neolithic contexts in southern India.

the appearance of this species at Paithan indicates its initial spread to the south.

Fig. 12.21: Moth beans (*Vigna aconitifolia*) from context 1136.

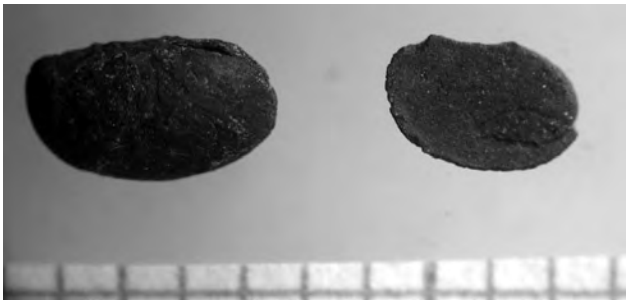


Fig. 12.22: Horsegram (*Macrotyloma uniflorum*) from context 467; complete seed (left) and interior of split cotyledon (right).

Cowpea (*Vigna unguiculata*), Hindi *lobiya*, is represented by a single unambiguous specimen from Period 3. This species is native to Africa and was most likely brought into cultivation in the West African savannah woodland transition, perhaps within modern Ghana (Vaillancourt and Weeden 1992; Ng 1995; Fuller 2003b: 241; D'Andrea *et al*. 2007). This author's previous review of crops of African origin in South Asia accepted two Chalcolithic reports of *Vigna unguiculata* at Hulas and Daimabad (Fuller 2003b), although in neither case is the evidence unambiguous. More recently, additional finds have been reported from the Late Chalcolithic/Iron Age Ganges at Kharadih and Raja-Nala-Ka-Tila in Uttar Pradesh (Saraswat 2005), while those of Early Historic Sanghol are unambiguous (Pokharia and Saraswat 1999).

Horsegram (*Macrotyloma uniflorum* (Lam.) Verdcourt) (Fig. 12.22), known in Hindi as *kulthi*, is one of the most widespread pulses (grain legumes) of modern and ancient India. It is grown as a small shrub throughout the semi-arid or savannah regions of South Asia. It is highly drought-resistant and yields a crop in 3–4 months. It is thought to be native to a region with such a climate, although very little botanical research on wild populations has been carried out. A limited herbarium survey by the author indicates wild populations in Rajasthan, such as around Mount Abu, a few north peninsular finds and several in the Southern Deccan, all in the drier semi-arid savannah zone (Fuller and Harvey 2006). Archaeologically, horsegram is one of the most widely reported pulses in prehistoric/protohistoric India (cf. Fuller and Harvey 2006), and it is the most widespread pulse find in peninsular India in Iron Age or Early Historic times (Table 12.4). Its seeds are distinctly rectangular-trapezoidal with a sharp edge. It is a pod-threshing pulse, and as such, seeds may be more prone to loss during processing. Its flat seed shape may also provide for preservation bias under charring, as seems to be the case with lentils. Archaeobotanical finds indicate that it was cultivated from Southern India

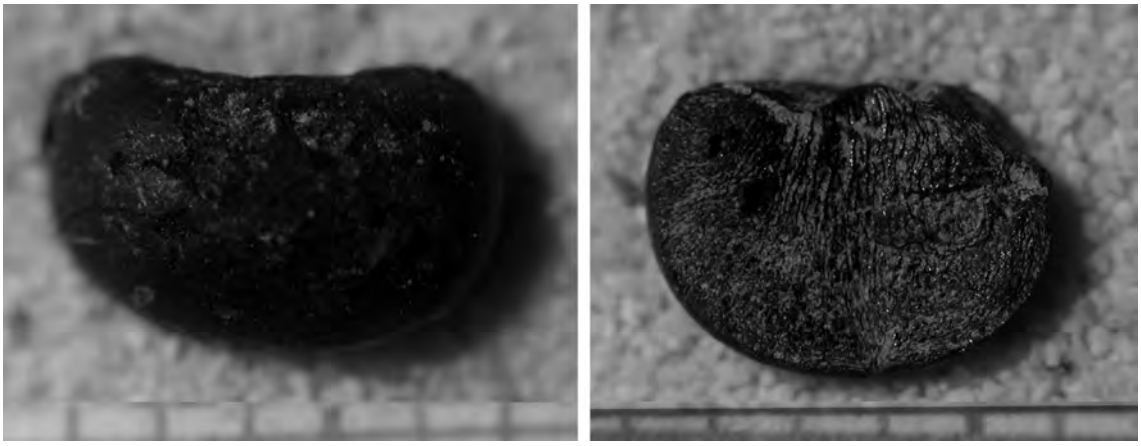


Fig. 12.23: Pigeonpea (*Cajanus cajan*) from context 1036; lateral view (left) and interior view of split cotyledon (right).

to Haryana and the middle Gangetic basin by 2200 BC. While this species has been suggested to be part of the indigenous Southern Neolithic package (Fuller 2002: 296; Fuller *et al*. 2004), current archaeological evidence might suggest independent domestication(s) in northern/western India (Fuller & Murphy 2018).

Hyacinth bean

Finds of *Lablab purpureus* (Hindi *sem*) in India are earlier than any available from Africa, although it is generally regarded as originating in Africa (Fuller 2003b; Fuller and Harvey 2006). Early finds in Africa include early-centuries-AD finds in Nubia (Clapham and Rowley-Conwy 2007) and in Southern Africa (Smith and Jacobson 1995). By contrast, *Lablab* appears to have arrived in India relatively early, probably in the first half of the 2nd millennium. Out of 90 sites with evidence for pulses, *Lablab* has been reported from 19, of which 15 are on the peninsula (Fuller and Harvey 2006). It appears that this crop became widespread in peninsular India by c. 1500 BC, with an early direct AMS date of c. 1600 BC (Fuller and Harvey 2006; Fuller *et al*. 2007). A few earlier finds may come from the Eastern Harappan zone, with reports from Late Harappan Sanghol and Mahorana, but dating evidence is inadequate to place these securely much earlier than 1700–1500 BC. In Africa, this species is grown mainly as a pulse, for its dried seeds, whilst in India, it has both pulse and green vegetable varieties, the latter being grown for its green pods, which are harvested before seed maturation as a vegetable (Smartt 1990). The latter variety presumably evolved in India and predominates more towards the north and east and also occurs further east into South-East Asia and China. The form at Paithan was presumably a pulse type.

Pigeonpea *Cajanus cajan* (Hindi *toor dhal* and *arhar*) (Fig. 12.23)

This is a major pulse throughout India and often a staple dhal variety. Nevertheless, it has only been reported from relatively few sites in India to date, including Tuljapur Garhi, Peddamudiyam and Sanganakallu, all from the Deccan in roughly the mid-2nd millennium BC, with similar age finds from Gopalpur in Orissa (Fuller *et al*. 2004; Fuller and Harvey 2006; Harvey *et al*. 2006). It is a rare find at Paithan, as on other sites where it occurs, and it may be that there are persistent preservation biases working against this species.

Winter pulses (chickpea, grasspea, pea, lentil) (Figs 12.24 and 12.25)

Cicer arietinum (Hindi *chana*), *Lathyrus sativus* (Hindi *khesari*), *Pisum sativum* (Hindi *matar*), *Lens culinaris* (Hindi *masur*) – these four pulse species have their origins in the Near East in the same general regions as wheat and barley (Smartt 1990; Zohary and Hopf 2000). While they spread east to South Asia in prehistory, the earliest evidence for these species comes from the Early and particularly the Mature Harappan period (Fuller and Madella 2001). All species were present in Maharashtra in the Chalcolithic period, but they appear to have been less favoured and largely absent further south (Kajale 1991; Fuller 2005). They remain

frequent finds on the northern peninsula through the Iron Age and Early Historic periods. As already discussed, one aspect of their importance lies in nitrogen-fixation, which allows them to be cropped in the winter on soils that have already been used for cereals or other crops in the summer; their use in this way can help to maintain soil fertility.

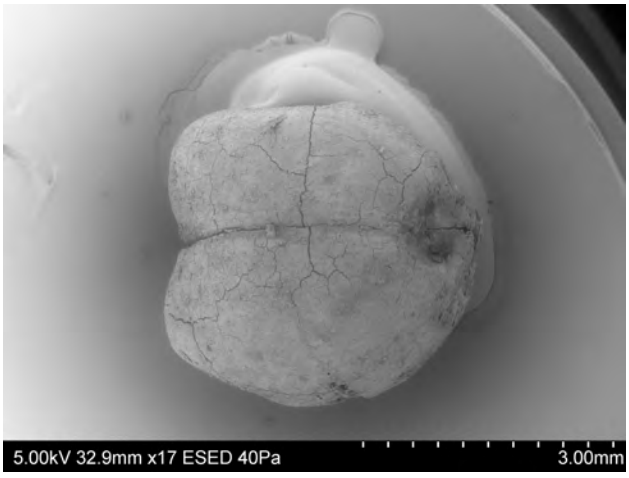


Fig. 12.24: An example of chickpea (*Cicer arietinum*); ventral view.

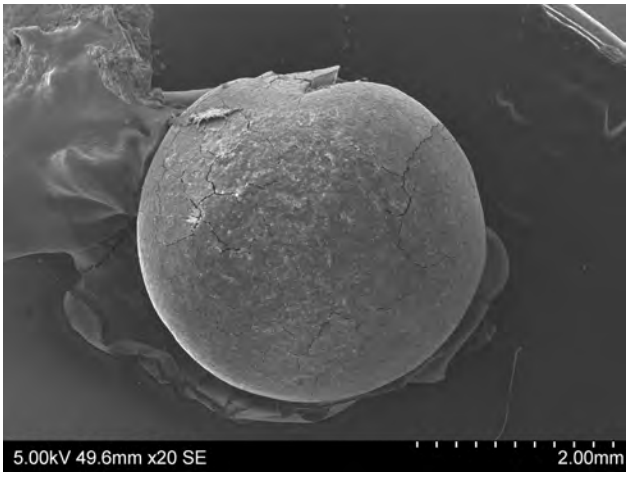


Fig. 12.25: An example of lentil (*Lens culinaris*); lateral view.

Some other field crops

There is a range of other crops at Paithan, and the section below will include five oilseed/fibre crops of particular note. In addition to these, there is evidence for probable brown mustard (*Brassica juncea)* cultivation (Fig. 12.26) and possible cucurbit cultivation, including possible melons or cucumbers (which can be difficult to distinguish on charred seeds). There are also a few tree fruits, including the ubiquitous *Ziziphus*, emblic myrobalan (*Phyllanthus emblica*) and fig seeds (not necessarily of a cultivated species) (Fig. 12.27). Possible okra seeds (*Abelmoschus* sp.) deserve note and further investigation in order to determine whether domesticated versus wild progenitor species might be involved. Also worthy of further investigation are *Solanum* seeds, listed in this report under weeds (as there are numerous weed taxa in this genus), in relation to the possible presence of eggplants (*Solanum melongena*), for which clear archaeobotanical identification criteria are not yet available. It should also be noted that there is evidence of probable 'mouse cucumber', *Melothria heterophylla* (Fig. 12.28), a wild species throughout India and much of South-East Asia that is eaten (from wild or weedy plants) but not cultivated. The *Melothria*-type seeds had been previously referred to as 'cf. *Cucumis prophetarum*' in reports on the Southern Neolithic (Fuller *et al*. 2004: Fig. 6H), which testifies to the fact that the gamut of cucurbitaceae species in South Asia, both wild and domesticated, still requires further comparative study.

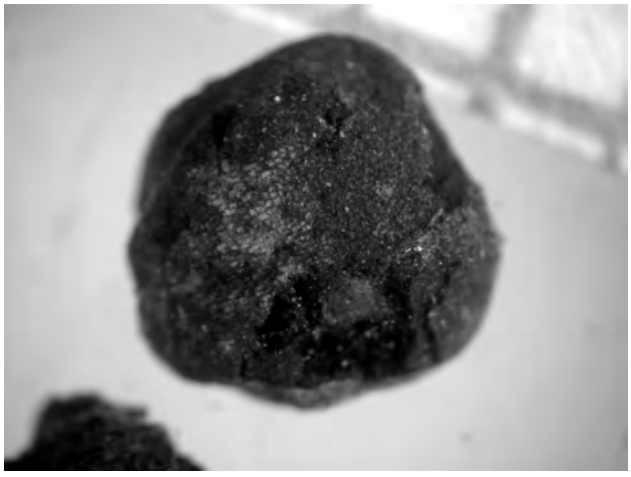


Fig. 12.26: Seed of mustard (*Brassica cf. juncea*) from context 985, with part of seed coat cell pattern visible.

Sesame (*Sesamum indicum* L. syn. *S. orientale* L.) (Fig. 12.29) is an oilseed crop of global importance. This crop is widely cultivated in South Asia through Burma, and somewhat more patchily eastwards. It is now firmly established that sesame has a South Asian origin (Bedigian and Harlan 1986; Bedigian 1998, 2003; Fuller 2003a), although details about when, and more precisely where, and the ecological circumstances of domestication require research. Origins in the greater Indus region seem likely. At present, the earliest archaeological evidence comes from the mature

urban phase of the Harappan civilization (2500–2000 BC), at which time sesame would appear to have been an important oilseed crop (Fuller and Madella 2001; Fuller 2003a). Finds are nevertheless few, probably owing to the low preservation potential of oily seeds, and include finds from Miri Qalat (Tengberg 1999) and Harappa (Vats 1940: 467; Weber 1999, 2003) and Late Harappan Sanghol. In the case of Miri Qalat, sesame is absent from earlier levels, back to 4000 BC, indicating that it is likely to have been introduced to this site during the Harappan period. South Asian finds from the 2nd millennium BC and later are fairly numerous, especially from the Middle Ganges region, including Imlidh-Khurd Period II, Narhan, Kharaidih Period II, Senuwar Period II and Raj-Nala-Ka-Tila Period II (Saraswat 2004, 2005). The cultivation of this species can be considered widespread in the subcontinent by c. 1000 BC.

Fig. 12.28: Seed of mouse cucumber (*Melothria cf. heterophylla*, family Cucurbitaceae) from context 1116.

Fig. 12.27: Seeds of fig type (*Ficus* sp.) from context 619.

As an oilseed, there are strong biases against preservation by charring; thus, it is not surprising that find-counts are low. At Paithan, some 67 seeds (<1% by frequency) have been recovered from 12 samples (16% ubiquity), suggesting fairly widespread use. Unfortunately, a large number of these come from unphased samples. In phased samples, *Sesamum* increased in ubiquity and frequency through Periods 2 (Satavahana) and 3 (Early Medieval) (Fig. 12.30).

Sesame grows best in well-drained soils with long-warm growing seasons and is highly drought-resistant. It generally has similar climatic requirements to cotton and is well suited to savannah environments. It is a short-day plant growing to maturity more quickly through the summer (Griffee 2001; Burden 2005).

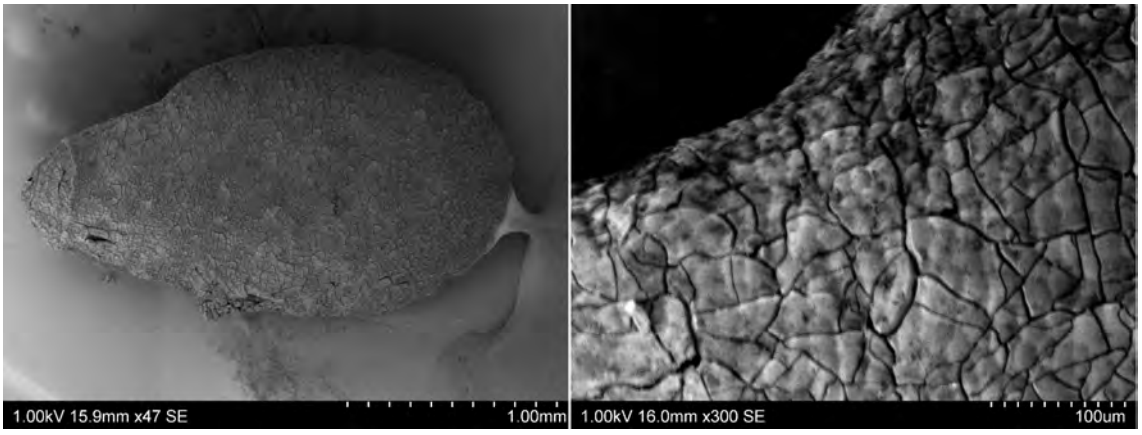


Fig. 12.29: Sesame seed (*Sesamum indicum*) from context 930, whole seed (left) and detail of seed coat (right).

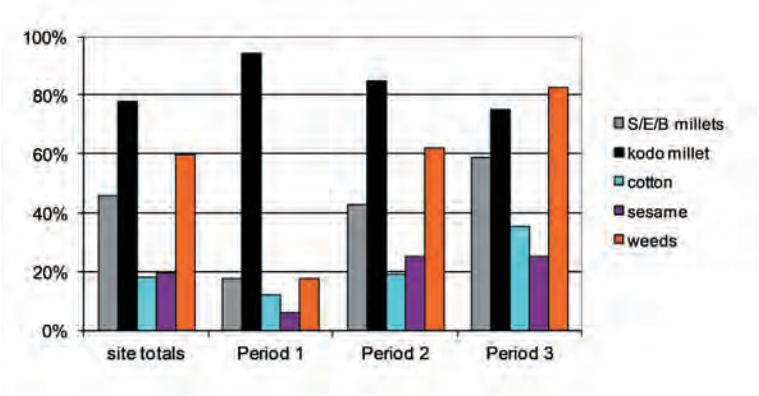


Fig. 12.30: Ubiquity of selected crop types and weeds.

Cotton (*Gossypium* sp.) is represented by charred whole seeds, seed fragments and sometimes a minute funicular 'cap' structure (Fig. 12.31). Although identification at species level seems impossible on the basis of preserved anatomical features, it is fairly safe to presume that these early cottons represent the indigenous species tree cotton (*G. arboreum*).

Cotton is grown primarily for its unique seed hairs that are readily spun and turned into threads and textiles. However, cotton seeds can also be pressed for oil once the fibre is removed, and with refining, this is edible. The pressed seed cakes also make a traditional fodder (Rehm and Epsig 1991: 343). There are four cotton species that are cultivated for their seed fibres today, including two of New World origin (*G. hirsutum* and *G. barbadense*), which have become of global importance in the past 300 years. Indigenous to the Old World are tree cotton (*G. arboreum*) and short-staple cotton (*G. herbaceum*) (Wendel 1995). Tree cotton, *G. arboreum* L., is now considered most likely to be of South Asian origin (Zohary and Hopf 2000; Fuller 2002), and its early use is probably represented by finds at Mehrgarh in Pakistan in the 6th millennium BC (Costantini 1983; Moulherat *et al*. 2002). Archaeological evidence for cotton in South Asia is fairly extensive (see Table 12.5; Fig. 12.32). Cotton is presumed to have been an important 'cash crop' of the Indus region during the Harappan civilization, and several sites have yielded finds of cotton seeds or possible textile remains, including Harappa and Mohenjo-daro (see Weber 1999; Fuller and Madella 2001). During this era, cotton was unknown in Mesopotamia or Egypt, where textile production was focussed on flax (Zohary and Hopf 2000). Beyond the Harappan zone, cotton appears to have spread only in the post-urban period, including Late Harappan era finds on the eastern and south-eastern zones of the Harappan civilization, and from the mid to late 2nd millennium BC, finds are reported from a number of sites in the middle Ganges region. The earliest hard evidence from South India is that from the later levels at Hallur, Karnataka, which produced a direct AMS date of c. 950 BC (Fuller *et al*. 2007).

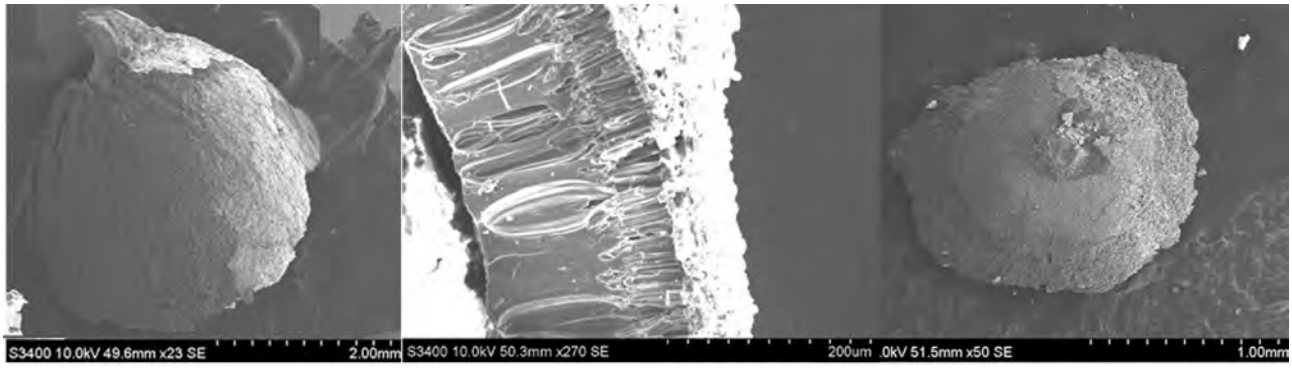


Fig. 12.31: Cotton (*Gossypium* sp.) remains from context 930, including fragmented seed (left), cross-section of seed coat (centre) and funicular cap from inferior seed (right).

Table 12.5: Archaeobotanical and textile remains of cotton from South Asia.

Site	Evidence	Period	Reference(s)
Mehrgarh, Baluchistan	Seeds (uncharred); mineralized thread in copper bead	Ceramic Neolithic, 6000–4500 BC	Costantini 1983; Costantini and Biasini 1985: 24; Moulherat *et al*. 2002
Mohenjo-daro	Cloth	Mature Harappan, 2600–2000 BC	Gulati and Turner 1929
Balakot, Sindh	Malavaceae pollen type, comparable to *Gossypium*	Mature Harappan, 2500–2000 BC	McKean 1983; also mentioned in Dales 1986
Harappa	Seed(s)/imprints	Mature Harappan(?), 2600–1900 BC	Weber 1999: 818; Vats 1940: 466.
Kunal	Seed(s)	Mature Harappan, ?2500–2000 BC, perhaps equivalent to Harappa 3C(?), 2200–1900 BC	Saraswat and Pokharia 2003
Banawali	Seed(s)	Mature Harappan (?=Harappa 3C), 2200–1900 BC	Saraswat *et al*. 2000; Saraswat 2002
Sanghol	Seed(s)	Late Harappan, 1900–1400 BC	Saraswat 1997
Hulas	Seed(s)	Late Harappan, 1800–1300 BC	Saraswat 1993
Kanmer, Kacchh	Seed(s)	Late Harappan, 2000–1700 BC	Pokharia in Kharakwal *et al*. 2007
Imlidh-Khurd, Gorakhpur, Uttar Pradesh	Seed(s)	Period II, 1300–800 BC	Saraswat 2005
Waina, Ballia, Uttar Pradesh	Seed(s)	Period I, 1600–800 BC	Saraswat 2005
Sringaverapura, Dist Allahabad, Uttar Pradesh	Fibres	Late Ochre-Coloured Pottery, 1200–700 BC	Saraswat 1986
Hallur, Upper Tungabhadra, Karnataka	Seeds and fragments	Early Iron Age, AMS direct date: 950–900 BC	Fuller *et al*. 2004; for dating: Fuller *et al*. 2007
Sanghol, Ludhiana Dist., Indian Punjab	Seed(s)	Early Historic, Kushana, 200 BC–AD 300	Pokharia and Saraswat 1999
Hund, Peshwar Dist., Pakistan	Seeds and fragments	Kushana through Mughal (all periods), 200 BC–AD 1600	Fuller, unpublished data; Cooke 2002
Kausambi	Seed(s)	NBP horizon, 550–250 BC	Chanchala 1995
Nevasa (1954–1956 season)	Seed(s)	Early Historic, 250 BC–AD 250	Anonymous, in Sankalia *et al*. 1960: 529–530
Kodumanal, Coimbatore Dist., Tamil Nadu	Seeds and fragments	Early Historic/Late Megalithic, 300 BC–AD 300	Cooke *et al*. 2005
Perur, Coimbatore Dist., Tamil Nadu	Seed and fragments	Early Historic/Late Megalithic, 300 BC–AD 300	Cooke *et al*. 2005
Mangudi, Madurai Dist., Tamil Nadu	Seed and fragments	Early Historic/Late Megalithic, 300 BC–AD 300	Cooke *et al*. 2005
Ufalda, Garhwal, Uttaranchal	Seeds and fragments	Early Historic(?), AD 0–600	Fuller, unpublished data
Singh-Bhagwantpur, Rupnagar Dist., Indian Punjab	Seed(s)	Medieval, AD 800–1100	Vishnu-Mittre *et al*. 1984
Mangali Luduwala, Haryana	Seed(s)	Sub-recent, AD 1500–1900	Willcox 1992

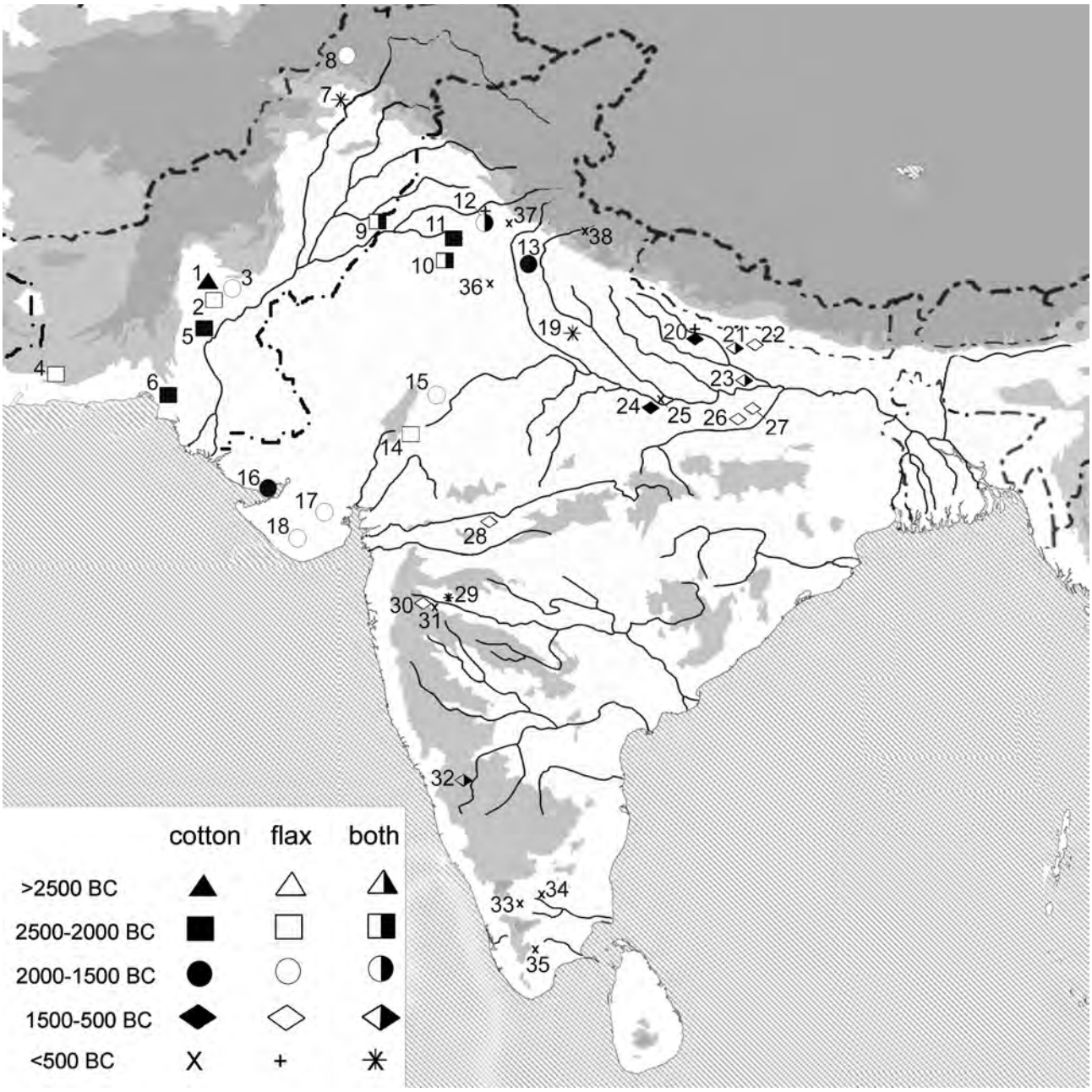


Fig. 12.32: The distribution of archaeological finds of cotton and flax seed in South Asia, indicated by broad time horizons. Sites numbered with data references: 1. Mehrgarh (Moulherat *et al.* 2002); 2. Nausharo (Costantini 1990); 3. Pirak (Costantini 1979); 4. Miri Qalat (Tengberg 1999); 5. Mohenjo-daro (Gulati and Turner 1929); 6. Balakot (McKean 1983); 7. Hund (Fuller, unpublished data); 8. Loebanhr 3 (Constantini 1987); 9. Harappa (Weber 1999, 2003); 10. Kunal (Saraswat and Pokharia 2003); 11. Banawali (Saraswat 2002); 12. Sanghol (indicating Late Harappan and Early Historic evidence) (Saraswat 1997; Pokharia and Saraswat 1999); 13. Hulas (Saraswat 1993); 14. Balathal (Kajale 1996b); 15. Ojiyana (Pokharia 2008); 16. Kanmer (Pokharia 2007); 17. Babor Kot (Reddy 1994, 2003); 18. Rojdi (Weber 1991); 19. Hulaskhera (see Chanchala 1992, plate 5, 24, interpreted by the present author as cotton seed fragment); 20. Charda (Saraswat 1993; Chanchala 2002); 21. Imlidh-Khurd (Saraswat 2005); 22. Narhan (Saraswat *et al.* 1994); 23. Waina (Saraswat 2005); 24. Sringaverapura (Saraswat 1986); 25. Kausambi (Chanchala 1995); 26. Senuwar (Saraswat 2004); 27. Raja-Nala-Ka-Tila (Saraswat 2005); 28. Navdatoli (Vishnu-Mittre 1961); 29. Paithan (this report); 30. Daimabad (Kajale 1977a); 31. Nevasa (Sankalia *et al.* 1960: 529–530); 32. Hallur (Fuller *et al.* 2004); 33. Perur (Cooke *et al.* 2005); 34. Kodumanal (Cooke *et al.* 2005); 35. Mangudi (Cooke *et al.* 2005); 36. Mangali/Luduwala (Willcox 1992); 37. Singh-Bhagwantpur (Vishnu-Mittre *et al.* 1984); 38. Ufalda (Fuller, unpublished data).

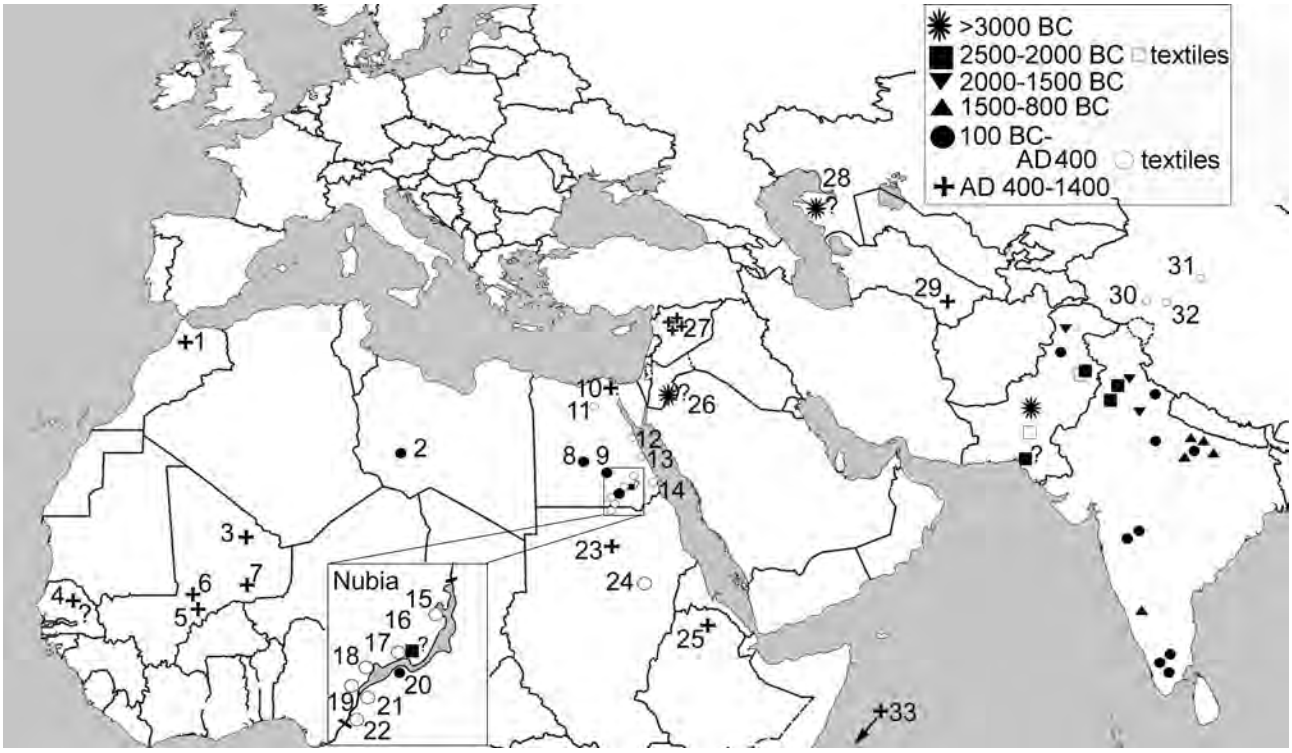


Fig. 12.33: The spread of cotton beyond South Asia: finds of seeds and textiles. Sites in India and Pakistan are unlabelled but represent those in Fig. 12.32 and Table 12.5. Other sites, with citations, are labelled as follows, with approximate dates indicated and nature of evidence if not seed remains. Question marks indicate uncertain evidence in terms of identifications, dating or indications of textile use. 1. Volubilis, AD 780–1000 (Fuller, unpublished data; cf. Pelling 2005); 2. Jarma, c. AD 200 (Pelling 2005); 3. Essouk (Murray and Nixon 2006); 4. Ogo, pollen, AD 1100–1200 (Chavane 1986); 5. Tellem burial caves, Bandiagara escarpment, textiles, AD 1100–1500 (Marr 1978; Boland *et al.* 1991); 6. Dia, AD 1000–1600 (Murray 2004, 2007); 7. Gao, AD 1200–1500 (Fuller 2000); 8. Dakleh Oasis, AD 200–400 (Thanheiser 2002); 9. Khargeh Oasis, AD 300–400 (Clapham and Rowley-Conwy 2009); 10. Tinnis, pre-AD 1200 (Clapham and Rowley-Conwy 2009); 11. Karanis, thread, AD 300–500 (Wilson 1933); 12. Abu Sha'ar, textile, AD 300–700 (Bender-Jorgensen and Vogelsang-Eastwood 1991); 13. Quesir al-Qadim, textile (Eastwood 1982); 14. Berenike, textiles, AD 0–500 (Wild and Wild 1998, 2001, 2005); 15. Wadi Qitna, AD 300–400 (Strouhal 1984); 16. Afyeh, c. 3000 BC, seeds in dung (Chowdhury and Buth 1971: 2005); 17. Karanog, textiles, AD 100–300 (Griffith and Crowfoot 1934); 18. Arminna West, textiles, AD 200–500 (Fuller, unpublished data); 19. Ballanna, AD 0–500 (Mayer-Thurman and Williams 1979); 20. Qasr Ibrim, seeds, capsules, fibres and textiles, 25 BC–AD 1800 (Clapham and Rowley-Conwy 2009); 21. Qustul, AD 0–500 (Mayer-Thurman and Williams 1979); 22. Second cataract cemeteries, AD 100–500 (Bergman 1975); 23. Nauri, seeds, AD 1000–1400 (Fuller and Edwards 2001); 24. Meroe West cemetery, textiles (Griffith and Crowfoot 1934); 25. Axum, AD 400–800 (Boardman 1999); 26. Dhuweila, fibres in plaster, 4400–3000 BC (Betts *et al.* 1994); 27. Sheheil, AD 700–800, Guftan, AD 1000–1100, Medād, AD 1100–1200, Hrim, AD 1200–1300, charred seeds (Samuel 2001); 28. Maykop kurgan, textiles, 'cotton-like', 3700–3200 BC (Shishlina *et al.* 2003); 29. Merv, seeds, AD 300–500 (Nesbitt 1993, 1994); 30. Sampul (Mallory and Mair 2000: 155); 31. Ordek (Mallory and Mair 2000: 152); 32. Niya (Mallory and Mair 2000: 165); 33. Arrow pointing in direction of Pemba island sites, Tumbe, AD 600–1000, and Chwaka, AD 1100–1600 (Walshaw 2005). For additional recent finds, see Viot 2019.

The quantity of cotton found at Paithan shows a marked increase over the lifespan of the site (Fig. 12.30), suggesting an increasing investment to cash-cropping and a probably local textile production.

Tree cotton is normally harvested in the summer. It is a crop that likes high temperatures but also requires sufficient water. It is also important that in its final stages, as the cotton bolls form, that it is kept dry and free of rain, or else fibres will become discoloured and may become mouldy. In much of India, cultivation can rely on the monsoon, but in the Indus region, it is likely that systems of irrigation were developed. It is therefore conceivable that the spread of this crop to other regions also involved irrigation.

The production of textiles is an important part of craft-production economies in two ways: firstly to do with craft and secondly with agriculture. In terms of craft, textiles are labour-intensive and time-consuming to produce. They require labour for spinning and weaving after the initial fibre processing, which itself involves several stages: dehusking, seed removal (ginning), cleaning and smoothing, bowing or carding to separate the fine fibres, which are then rolled and ready to be spun. Only then can weaving of the threads or yarn be done. Accounts of traditional cotton processing from different regions are similar, including those from ancient India (Schlingloff 1974). In recent centuries, much of this process has been aided by mechanical developments, but traditional ginning was a labour-intensive method involving a rolling pin (often metal) and a wooden board which was used to force out seeds. Bowing is done with a bow-like instrument in which a vibrating cord helps to loosen the separation of the fibres. The implication of all this is that cotton production requires both the expenditure of labour in cultivation, beyond subsistence requirements, and in the household, in processing, but with the result of a commodity by which wealth can be accumulated and fairly easily transported, or sequestered by elites. The production of textile crops implies additional surplus production beyond what is required to feed families and communities. It is therefore necessarily production for trade, as fields of textile crops produce fibre far beyond what individual households are likely to use or need. In addition, it seems unlikely that all farming households that produced cotton crops would have also had the time and skill necessary to process raw cotton through to finished textiles, and this implies the trade of cotton to craftspeople. While it is conceivable that cotton might be grown on a small, garden scale for household needs, such production would be unlikely to produce recurrent finds in archaeobotanical samples from an urban excavation. Thus, we can conclude that there is likely to have been production for consumption above the household level. Craft crops such as cotton therefore constitute important evidence of early 'cash-cropping' (*sensu* Sherratt 1999).

Fig. 12.34: Safflower (*Carthamus tinctorius*) from context 841.

That cotton was an important trade commodity of peninsular India in Early Historic times is implied by evidence from Roman importation of cotton cloth, including specifically from Paithan. Importation is indicated archaeologically by cotton textile finds at the Roman-era port of Berenike on the Red Sea coast of Egypt, which are inferred to have come from India on the basis of Z-spun threads; these finds dominate the archaeological textile record at the port (Wild and Wild 1998, 2001, 2005, 2008). Cotton is also indicated as an import from India in Papyrus Vinod from Egypt (Casson 1990; Sidebotham 1991). Importation is also discussed in ancient Roman texts, including the *Periplus Maris Erythraei*, a 1st century AD Roman mariner's travel guide, written in Greek, probably in Egypt, which is associated with several sites in the Deccan. The site of Ter (reached overland from Paithan) is specifically named, as are Minnagara and Ujjain to the north of Paithan (Wild and Wild 2008; see Casson 1989). While Paithan was not specifically named as a source of cotton cloth, the archaeobotanical evidence suggests that it was part of a broader Indian geography of cotton production. The distribution of archaeological finds, whether in north-eastern Africa or Central Asia, is predominantly from the Roman period (the Chinese Han period) (Fig. 12.33), testifying to the widespread trade in cotton during the Indian Early Historic period.

Flax/linseed (*Linum usitatissimum*) is present in one sample. This species originated in the Near East and is widely cultivated for its edible oily seeds, as well as for its fibres. Divergent varieties have been developed for each of these specialized functions (Zohary and Hopf 2000). The seed oil is important for human consumption but is not easy to store once extracted from the seeds. Extracted from the seeds, the oil goes rancid but has other uses such as a lighting fuel or lubricant. Identifying *Linum* archaeologically is fairly straightforward, although congeneric wild species, which are widespread in Eurasia, may be difficult to distinguish definitively. In South India, for example, there is an indigenous *L. mysurense* (Saldanha 1996), but seeds of this species are expected to be much smaller.

Within India, the spread of *Linum* correlates with that of cotton, moving east and south of the Harappan zone in post-Harappan/Chalcolithic times, especially towards the latter part of that period (Fig. 12.32). This correlation suggests that *Linum* moved as a fibre crop, although oilseed varieties are likely to have also been present. The meagre evidence of this species at Paithan should not be taken as evidence that it was not present in the region, given the strong biases against seeds of this species surviving charring, although it is probably safe to conclude that this was in much less frequent use as an edible oilseed than sesame.

As discussed in relation to cotton, the spread of flax as a fibre crop implies a level of 'cash-crop' production and agricultural production beyond the basic surplus level. It is also a labour-intensive species to process. Processing plants for fibres involves rippling and retting (soaking with partial fermentation of stems), followed by pounding and combing to separate the internal (bast) fibres (for a synopsis, see McCorriston 1997: 522–524), after which spinning and weaving are possible. Unlike cotton, which had an international export market, linen may have been for more local use.

Safflower (*Carthamus tinctorius*) (Fig. 12.34) is used for its edible, oily seeds as well as its colourful flowers and pollen, which can be used in dying as well as in cooking. Safflower is a thistle-like winter annual, producing yellow, orange or red flowers (capitulum). Due to its large taproot, it tolerates dry conditions and is thus suitable for cultivation during the dry winters of South Asia. It produces a cypsela with a fibrous shell, within which is an edible oily kernel, like that in sunflower seeds. Like the main winter cereals and pulses, safflower has its origins in the Near East, but early finds suggest domestication rather late, perhaps as late as the end of the 5th or 4th millennium BC (Zohary and Hopf 2000). By the end of the 4th millennium BC, it had spread in India, as it has been found in quantity in a jar from an early level at Balathal in Rajasthan (Misra and Mohanty 2001). During the 2nd millennium BC, it had become widespread in South Asia, with finds reported from Daimabad and Nevasa during the Malwa period (Kajale 1991), and several late 2nd millennium or early 1st millennium BC sites in the middle Ganges, including Imlidh-Khurd (Period II), Narhan, Waina (Period II), Senuwar (Period II) and Raja-Nala-Ka-Tila (Period II) (Saraswat *et al.* 1994; Saraswat 2004, 2005). Its archaeological distribution therefore parallels that of flax and cotton.

At Paithan, safflower is represented by a few fragments in Period 1 and two well-preserved fruits from an unphased sample.

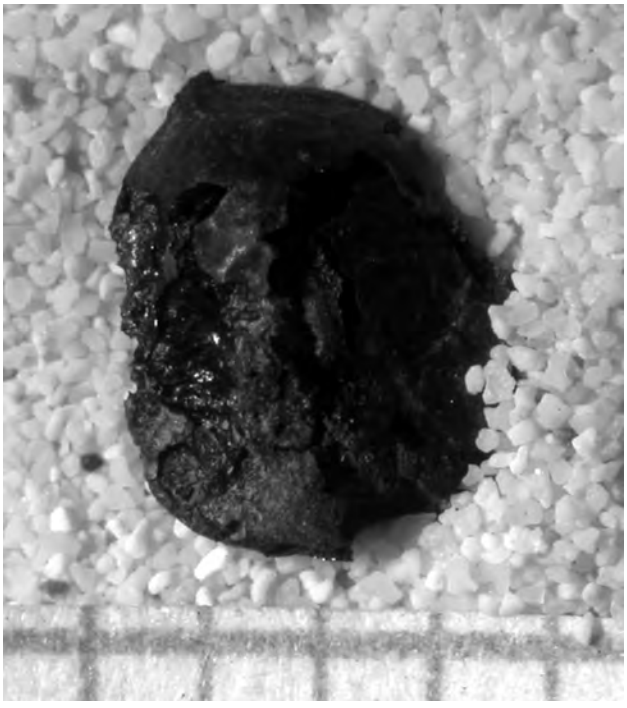


Fig. 12.35: Lone specimen, poorly preserved, of possible hemp (cf. *Cannabis sativa*) from context 1128.

Hemp, *Cannabis* (Fig. 12.35), is a highly polymorphic group of plants, which have been widely spread through cultivation and naturalization. Traditional taxonomy groups all of these as a single variable species as all forms are interfertile (Small and Cronquist 1976; Zhou and Bathelomew 2003). Plants are monoeious, producing either male or female flowers. Hemp is the distinctive thick-stemmed and large-seeded form that have been selected as fibre-producing and also have large,

edible oily seeds. By contrast, a much more herbaceous form, with much smaller seeds, is typically cultivated as a drug plant with higher concentrations of the psychotomimetic compound, especially in female flowers, conventionally called *Cannabis sativa* ssp. *indica*, or *C. indica* Lamarck. Hillig (2005) recognizes three species: a west Eurasian *C. sativa sensu stricto,* which included fibre of oilseed landraces from Central Asia, West Asia, Europe and northeast Asia; *C. indica,* including all of the various drug cultivars, feral populations in South Asia, which are common in the Himalayas, and Chinese fibre cultivars; and the wild species *Cannabis ruderalis*. Although criteria for separating these species have not yet been developed for charred seeds, we expect the *C. indica* type to have been present, with its main uses for the drug, some use for its edible oily seeds and perhaps as a minor fibre source, much as is true in recent times (Watt 1889–1893; Pandey and Chanda 1996). It is a winter crop.

The few finds in South Asia are from the 2nd millennium BC, when it was probably introduced from Central Asia (cf. Fuller 2006a: 38). Phytoliths of *Cannabis* have been reported from Harappa (Fuller and Madella 2001: 338; Madella 2003), from the Late Harappan period (after 2000 BC). Charcoal evidence and charred seeds were found at Chalcolithic levels at Senuwar, 1300–600 BC (Saraswat 2004). The single specimen from Paithan, which is probable *Cannabis*, is therefore worthy of note. As oily seeds, there are major preservation biases against this species.

The potential of archaeobotanical weeds

Most of these species probably entered the archaeological record as part of crop-processing waste, as weedy contaminants are a normal part of any harvest (Hillman 1984; Reddy 1997, 2003; Stevens 2003; Harvey and Fuller 2005). Some species might also have entered the site with fuel, such as remains of fodder or grazed plant in dung fuel, although this is regarded generally as a less likely scenario in this case (see Fuller *et al.* 2014; Fuller 2003c). Therefore, weeds provide a record of the ecology of arable fields, which in turn may provide insights into the nature of agriculture in the past. Unfortunately, this is confounded by two issues: lack of species-level resolution in identification and uncertainty about which crops particular weeds are to be associated with. Some weeds most likely came onto the site with rice, such as sedges (Cyperaceae) and *Ischaemum* (cf. Galinato *et al.* 1999) (Fig. 12.36), while

Fig. 12.36: Weedy grass, wrinklegrass (*Ischaemum rugosum*) from context 1116, dorsal view.

Fig. 12.37: Weedy grass, Indian goosegrass (*Eleusine indica*) from context 721, dorsal view.

Fig. 12.38: Weedy grass, fingergrass (*Digitaria* sp.) from context 1116, dorsal view.

others are more plausibly millet crop weeds, including the carpetweeds (discussed below) and Rubiaceae, as well as grasses such as *Eleusine indica* (Fig. 12.37), *Digitaria* (Fig. 12.38) and *Urochloa*. Other weed species may cut across several crops.

Another potential use of weed data is for inferring aspects of crop-processing, as weed seeds of particular size and weight characteristics are systematically removed from crop-processing at different stages. Once again, confounding factors include the large diversity of crops at Paithan, which may not have all been treated the same way. Nevertheless, one trend is clearly evident which is towards increasing quantities of weeds, from less than 2% relative frequency (18% ubiquity) in Period 1, to 12% (and 62%) in Period 2, to 23% (and 82%) in Period 3. The total number of weed species, however, does not change (43 taxa). These data strongly suggest that more routine crop-processing stages are being carried out on site in Periods 2 and 3 compared to Period 1. It is also notable that in the two later periods there is a greater range of small-seeded weeds, such as *Digitaria, Eragrostis, Urochloa* and the Aizooaceae species. We expect many weed seeds, especially small seeds, to be removed early in the crop-processing sequence, i.e. through winnowing. The absence of this from the site during Period 1 could imply a more centralized organization of agricultural labour during this period, with larger workgroups available for processing in the fields immediately after harvest and fewer stages of processing carried out on site in domestic contexts on a day-to-day basis (see discussion of reasoning in Stevens 2003; Harvey and Fuller 2005; Fuller *et al*. 2014). It may also be the case that this change relates to the move away from an emphasis on kodo millet towards a more diversified cropping system. It may be that agricultural diversification and intensification were linked with an increasing emphasis on smaller, household units of productions.

Three recurrent and recognizable weeds in the family Aizooaceae are singled out for discussion together with a Rubaiceae type as these have been widely found in South Asian archaeobotany and it should now be possible to identify them accurately to species and to consider their significance. In the discussion some ethnographic uses are also mentioned, although it should be stressed that such uses are unlikely to have resulted in recurrent exposure to fire and archaeological recovery. Nevertheless, the presence of the species raises the possibility of multivarious uses in the past.

Carpetweeds

Three species of carpet weeds (family Aizooaceae) recur in the Paithan assemblage: *Zaleya decandra, Trianthema portulacastrum* and *Trianthema triquetra* (Fig. 12.39). *Zaleya* cf. *decandra* (L.) Burm. f. (syn. *Trianthema decandra)* is a widely encountered seed type. It is a curled discoidal seed with an ornamented surface, which is typical of several major Caryophyllid families. As with many Aizooaceae, the seed coat ornamentation tends to be represented by wavy ridges that are concentric with the curl of the seed. In this case, they are represented by short, round rugouse ridges. Archaeobotanical examples identified to this species were illustrated by Vishnu-Mittre (1990) at Surkotada (also Chanchala 1994: pl. 1.20) and were also reported throughout the sequence at Rojdi, but in large quantities only from the Late Harappan Phase C (Weber 1991: 96). These seeds are commonly encountered in Southern Neolithic material (Fuller 1999). Comparable reference material is illustrated from a congeneric species by Kirkbride *et al*. (2006). This appears to be the same species identified as '*Portulaca* cf *oleracea*' at Inamgaon (Kajale 1988: 818, fig. 27), and possibly also at other sites. The large hilum of *Portulaca* is, however, missing, as are the distinctive beads of the surface decoration, suggesting earlier misattribution of *Zaleya* specimens. This is a common weed in the open, dry areas of the inner Deccan that flowers after the monsoons, with reported seed sets in October–November or during the winter (Tadulingam and Venatanarayana 1985; Singh *et al*. 2001). Its distribution and archaeobotanical finds imply an association with millets. Common names include *Belekomme* or *Gaijasoppe* (Kannada), *Tella-Galijeru* (Telugu), *Vellai Sharanai* (Tamil) and *Gadabani* (Hindi) (Saldanha 1984; Tadulingam and Venatanarayana 1985; Ambasta *et al*. 1986). Some medicinal uses are reported for its roots, while the leaves have served as a famine food (Ambasta *et al*. 1986).

Trianthema portulacastrum L. (syn. *T. monogyna* L.) has plump curled seeds, with narrow beaks near the hilum and wider, somewhat square, ends. From the square end radiate faint wavy ridges, which are periodically discontinuous (cf. Noda *et al*. 1985). This species is also known from Chalcolithic and Iron Age sites in the Ganges basin, e.g. Narhan (Saraswat *et al*. 1994), Hulaskhera (Chanchala 1992) and later Early Historic sites, e.g. Manji (Chanchala 2000–2001). This species has not been noted in the Southern Neolithic assemblage and may be later addition to the peninsular weed flora. It is reported from Rojdi but only from the Late Harappan Phase C (Weber 1991: 95). Today this is a widespread and 'aggressive' weed of cultivation in India and elsewhere (Tadulingam and Venatanaray-

ana 1985; Singh *et al*. 2001). The seeds are readily spread through animal dung. Nevertheless, it has some medicinal uses, can be fodder and is useful as a green manure (Ambasta *et al*. 1986). Its common names include *Pundharoighentuli* or *Ghol* (Marathi), *Lal-sabuni* (Hindi), *Santhi* (Gujarati), *Ambatimadu* or *Galjeru* (Telugu), *Muchchugoni* or *Pasale-soppu* (Kannada) and *Shaaranaj* (Tamil).

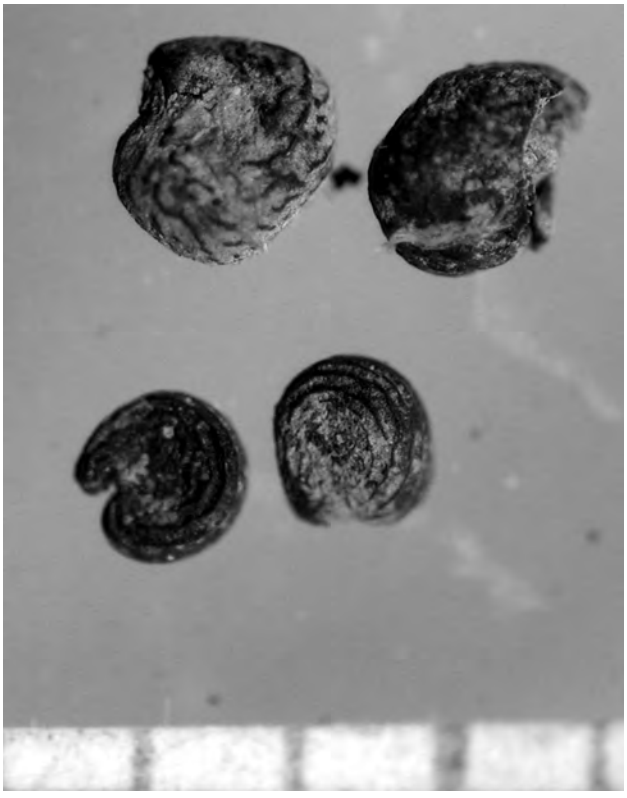


Fig. 12.39: Two species of carpetweeds (Aizooaceae) from context 933: *Trianthema portulacastrum* (above) and *Trianthema triquetra* (below), lateral views.

Trianthema triquetra Willd. Ex Rottl

These seeds are smaller and more flattened than either of the previous two species and have distinctive concentric ridges that run as uninterrupted rings around the seeds (cf. Kirkbride *et al*. 2006). These occurred occasionally in Southern Neolithic samples, as the author has examined, and are also reported from Late Harappan Rojdi Phase C (Weber 1991: 96) and the Early Historic period at Shirkapur (cf. Chanchala 1994: pl. 2.16). The species is also reported from the Early Historic Punjab at Sanghol (Pokharia and Saraswat 1999), but not in early Chalcolithic levels (Saraswat 1996–1997). It is reported as occasional in scrubland and moist soils, but favouring saline sandy soils (Saldanha 1984; Tadulingam and Venatanarayana 1985; Ambasta *et al*. 1986; Singh *et al*. 2001). It is not regarded as a significant weed under regular cultivation (i.e. regular tillage), being more common on field edges (Tadulingam and Venatanarayana 1985), and it may be poisonous to livestock (Ambasta *et al*. 1986). It normally seeds from September to November. Local names include *Naye-soppu* (Kannada), *Kukkapalakoora* (Telugu), *Siru-Sharanai* (Tamil) and *Pathar-phor* (Rajasthani).

Borreria/Spermacoce (Rubiaceae) (Fig. 12.40) consists of small mericarps in which seeds are assymetrical, ovoid and one smooth convex back opposite a linear indentation in which a tubular attachment is present. These might be compared with miniature elongate coffee beans. This type is well represented in Southern Neolithic samples (Fuller 1999: C39) and occurs throughout the sequence at Harappan Rojdi (Weber 1991: 66). The widespread weed *Spermacoce articularis* L. f. (syn. *Borreria hispida* (L.) K. Schum.) is the most likely species, although this has not yet been confirmed against reference material, and two other species from the genus are reported from Maharashtra (Singh *et al*. 2001). These 'buttonweeds' are all low (<30 cm) to prostrate annual herbs that fruit at the end of the monsoon and are reported from light soils (Tadulingam and Venatanarayana 1985; Singh *et al*. 2001). This type is a likely millet weed; it is also traditionally used as fodder and the seeds and the leaves have medicinal uses (Ambasta *et al*. 1986). Common names include *Ghanti-chi-bhaji* (Maharati), *Guthari* (Hindi), *Madana-budama* (Telugu), *Natha-churi* (Tamil) and *Madanabudu-maegiddah* (Kannada).

Caryophyllaceae/Molluginaceae types are small curled discoidal seeds with distinct warted surfaces and small beaks above the hilum. They are rounder than the typical temperate *Silene* or *Stellaria* but a precise match is not yet available from reference material or seed atlases. This same type is known from the Southern Neolithic (Fuller 1999: C37). Another Caryophyllaceae or perhaps Molluginaceae type has distinct radiating ridges (Fig. 12.41) and should be identifiable when reference material is available. The situation is similar with the seeds of a mallow (cf. *Malva* sp.) (Fig. 12.42), and further comparative work is needed on seeds of this group from India, although several taxa are known as weeds. These latter weeds highlight the pressing need to develop a more comprehensive reference collection of wild herbaceous plants from peninsular India.

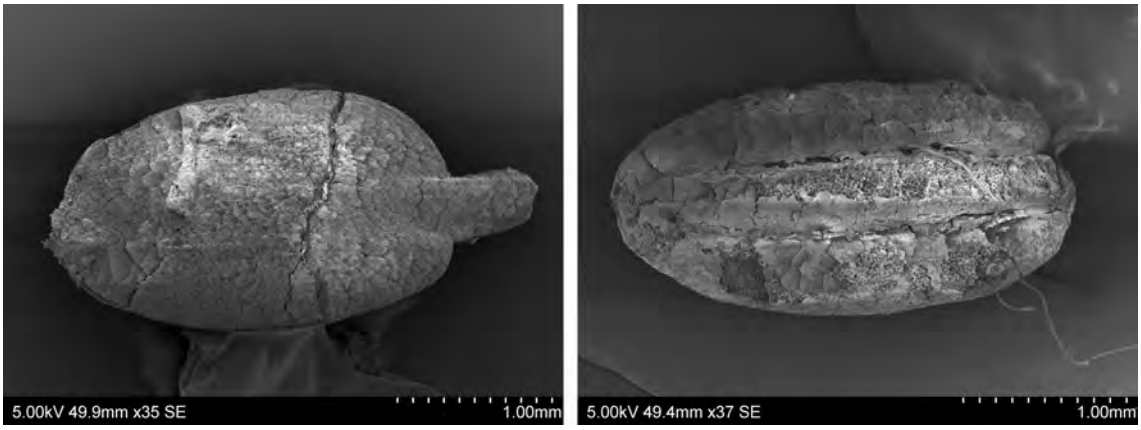


Fig. 12.40: Buttonweed mericarp (*Borreira/Spermacoce*) from context 1116: dorsal (left) and ventral view (right).

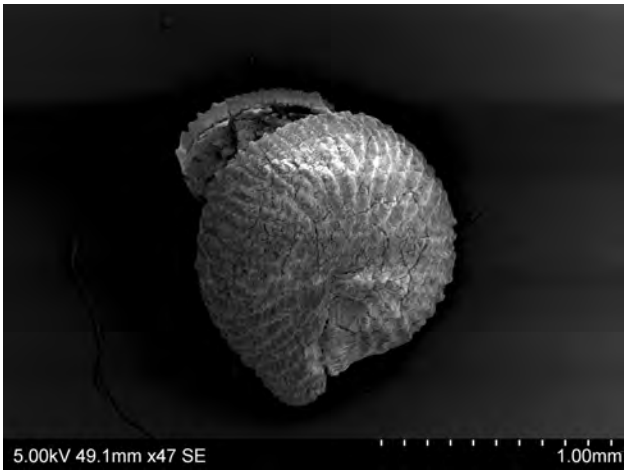


Fig. 12.41: Indeterminate weed type of *Caryophyllaceae/Molluginaceae* type from context 721, lateral view.

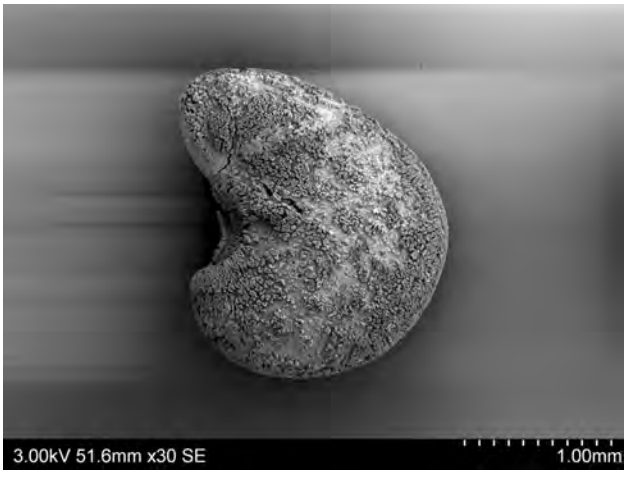


Fig. 12.42: Weedy mallow type seed (*Malvaceae, cf. Malva*), lateral view.

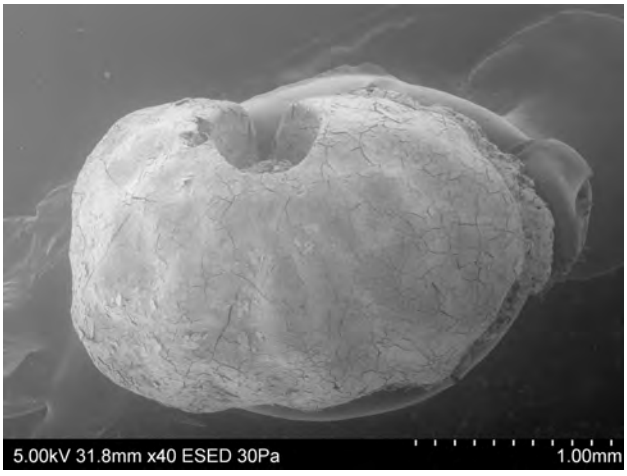


Fig. 12.43: Weedy dayflower seed (*Commelina cf. benghalensis*) from context 486, dorsal view.

An additional weed type of note is the dayflower (*Commelina* cf. *benghalensis*) (Fig. 12.43). This species is common today as a weed of both irrigated and rainfed rice (Galinato *et al.* 1999). This species is reported as an occasional weed in the Neolithic and Chalcolithic Ganges, presumably of rainfed rice, but became increasingly common in Iron Age and Early Historic times probably with the increase in irrigated rice (see Fuller and Qin 2009: table 2). A very similar type, however, has also been found in Southern Neolithic samples, suggesting that this may also be a weed of millets (Fuller 1999: fig. C4,B).

Concluding remarks

The Paithan excavations have provided a rich archive of plant use from the Early Historic to Medieval periods. This represents the botanically richest archaeological

assemblage to date from the peninsular region. This is a result of routine sampling and flotation as part of the excavations but is also a product of the diversified plant economy practiced by the ancient inhabitants of the Godavari. Paithan has contributed important evidence on the history of several major crops. As should be evident from the discussion above, there are many issues which require further investigation and further evidence, and therefore, more programs of archaeobotanical sampling and laboratory investigation are needed on more sites. The staple cereals appear to have been millets, well adapted to the semi-arid savannah zone of peninsular India, and in particular native millets, of which kodo millet was pre-eminent in the Satavahana period. By the Early Medieval period, the African crops, sorghum and pearl millet had risen in importance together with foxtail millet (*Setaria italica*), but the South Indian native *Brachiaria ramosa* remained in cultivation. Rice was consistently present, but in relatively low amounts, suggesting that it may have been a high-status cereal. Another important crop throughout the sequence at Paithan was cotton. The presence of charred cotton seeds implies that processing of cotton bolls for fibre took place on site and that cotton was cultivated in the surrounding region. Thus, we have archaeobotanical evidence that Paithan was one of many Early Historic centres of cotton textile production for trade. The general importance of cotton cloth export from the Deccan is implied in Roman historical sources, as well as archaeological finds at Berenike on the Red Sea coast of Egypt (Wild and Wild 2008).

The patterns of change testified to through the site's occupation sequence suggest various strategies for increasing agricultural production, which in turn may imply a growing population. There is an unambiguous increase in the biodiversity of plant species, including a wider range of crops. There is also more emphasis on winter pulses through time. This implies both diversification of cropping strategies and probably cultivation of a wider range of soil types, including more marginal areas. In addition, it suggests increased double-cropping and reduction of the fallow periods between crops, i.e. true intensification (see Morrison 1994). It may be that agricultural diversification and intensification were linked with an increasing emphasis on smaller, household units of producers, as is suggested by the evidence for increased on-site processing of crops.

Peter Rowley-Conwy, with a contribution by P. K. Thomas

Chapter 13
The Faunal Remains

Introduction

The study of faunal remains from archaeological sites has a long history. Methodological advances over the years have meant that zooarchaeological studies can yield a great deal of information. It has increasingly been understood that such information has been more useful to *archaeologists* than to *zoologists*. This is for two reasons. Firstly, the zoological history of more recent times is now quite well known, so zooarchaeological studies do not add much to the sum of current knowledge. Secondly, animal remains from archaeological sites are usually present because of human action. They were acquired, killed, processed, consumed and their remains discarded entirely within the cultural context of the humans who inhabited the site. This cultural context is the very thing archaeologists seek to reconstruct, and the animal remains form a valuable and powerful means to assist in this task. The following report is written entirely from this perspective.

This report discusses the faunal remains from Paithan. A grand total of 4,777 fragments of bone, tooth, scute and shell were examined, although as is usual, only a small proportion of these could be identified to species. A total of 490 items were identified as coming from the four most common domestic species: sheep (*Ovis aries*), goat (*Capra hircus*), pig (*Sus scrofa*) and cow (*Bos indicus*). Smaller numbers of items were referred to other taxa. They will be discussed grouped into the four major periods represented at Paithan (Periods 1 to 4, see Chapter 6).

An added complexity is that some layers and contexts in Period 3 are directly associated with the construction of the temples, while others are not. The Period 3 remains are therefore divided into Period 3-temple contexts and Period 3 contexts. If no subdivision of Period 3 is specified, then the overall period total comprising both 3-temple and 3 is being referred to.

Some previous bone reports are available from sites in the region which fall into this time range, and these are useful for comparative purposes. They include Nasik (George 1955), Nevasa (Eapen 1960) and Bhorkardan (Rao 1974), all the reports providing considerable detail about the bones present. Because of the nature of the site of Paithan, the present report will set itself two additional goals. First, the fact that four major periods are represented means that it is possible to examine *change through time*. Second, to achieve the first goal, *precise quantification* must be undertaken of the remains in each phase. As will be seen below, the outcome provides information of the greatest interest.

One factor which has a major effect on any sample of archaeological animal bones is the method by which they were recovered. Contrary to popular opinion, archaeologists and excavation labourers do not detect and recover all items in the deposits they are excavating: many objects are overlooked. Not surprisingly, it is the smallest objects that are most often overlooked. This has a predictable effect on zooarchaeological samples: bones of smaller animals are overlooked more frequently, and smaller animal species are therefore under-represented in the identified totals. This is true whether the excavators are fully trained archaeologists (Payne 1972, 1975) or labourers specializing in archaeological work (Rowley-Conwy 1994). The proportions of smaller bones overlooked vary greatly, depending not just on the degree of skill and diligence of the excavators, but also on factors such as soil type and moisture, amount of daylight and weather conditions and time of day. It is therefore generally recognized that it is necessary to sieve archaeological deposits in order to ensure unbiased representation of zooarchaeological remains (and indeed of all kinds of archaeological items). The Paithan excavation was conducted to fully modern standards. All deposits were sieved through 5-mm mesh, so the faunal samples may be considered unbiased by recovery.

Another factor that can have a major biasing effect on assemblages of animal bones is gnawing by dogs. If dogs have access to the bones after their discard by people, they may damage or destroy many fragments. Unfortunately, such destruction is not random: some elements within the animal skeleton are harder than others, and dogs tend to destroy the softer ele-

https://doi.org/10.1515/9783110653540-013

ments more frequently. The bones of younger animals are also softer than those of adults, so juveniles also suffer greater losses (e.g. Brain 1981; Binford 1981; Legge 1992). Gnawing by dogs may be recognized in two ways. First, tooth marks may be present. Second, if a bone has passed through a dog's digestive system, the powerful digestive acids often leave characteristic etching on the surface of the bone (if they do not destroy it completely) (Payne and Munson 1985). At Paithan, very few bones exhibited such damage (Fig. 13.1). In Period 1, one fragment was gnawed and one digested; in Period 2, one was gnawed; in Period 3, three were digested; and in Period 4, a single fragment showed traces of both gnawing and digestion. These very small totals suggest that dogs did not have much access to the animal bones at Paithan, so the effects of this biasing factor are likely to be insignificant.

Two of the common biasing factors may thus largely be discounted. We may therefore approach the Paithan assemblage with a degree of confidence.

Fig. 13.1: Phalanges of blackbuck (*Antilope cervicapra*) showing the characteristic etching caused by the digestive acids of dogs (top) and holes caused by gnawing (both specimens). The specimens were identified to species by Dr P. K. Thomas.

Species represented

The animal bones from Paithan were transported to Goa along with the rest of the excavated material for post-excavation study and were identified there by the author in 2000. It is desirable wherever possible to identify animal bones with the help of a comparative collection. However, no such collection was available in Goa, so the specimens were identified using the author's drawings and identification notes. Most of the identified specimens were from species with which the author has long been familiar, namely sheep, goat, cow and pig, and basic classification of the fragments as sheep/goat, cow and pig was usually unproblematic. The 490 specimens identified as coming from these taxa are listed in Table 13.1; the totals are unmodified in any way, thus conforming to the 'Number of Identified Spec-

Table 13.1: Number of Identified Specimens (NISP) of the main domestic taxa at Paithan, divided by layer and expressed as percentages of the layer total.

Period	1		2		3						4	
					temple		ordinary		total			
	N	%	N	%	N	%	N	%	N	%	N	%
Sheep/goat	52	35	73	51	38	56	20	56	58	56	64	67
Cow	40	27	37	26	25	37	10	28	35	34	28	29
Pig	55	37	33	23	5	7	6	17	11	11	4	4
Total	**147**		**143**		**68**		**36**		**104**		**96**	

imens' (NISP) method of quantification (other methods of quantification will be discussed below).

The separation of sheep from goat is a considerable problem, and the NISPs of the two species are amalgamated in Table 13.1. Only a minority of skeletal elements can be reliably and consistently separated, although methodological improvements continue to be made (see Boessneck 1969 for a general review). Among the most useful elements are distal metacarpal and metatarsal (Boessneck 1969; Payne 1969; Rowley-Conwy 1998), the deciduous dentition (Payne 1985) and the distal tibia (Kratochvil 1969), and since the Paithan material was examined, a method has been published using the permanent dentition (Halstead *et al*. 2002). The small number of bones that could be definitely identified as sheep or goat using these methods is listed in Table 13.2. The sample is too small to permit precise conclusions to be drawn, but it may tentatively be suggested that (a) both species were present throughout; (b) sheep consistently outnumbered goats by between 2.75 and 8 to 1; and (c) there is no indication that the proportions changed through time. The small size of the identified sample must however be born in mind.

Apart from the major food taxa, various other items were identified (Table 13.3). Canids were the most common mammal. Dog (*Canis familiaris*) and jackal (*C. aureus*) are notoriously hard to distinguish, especially without comparative skeletons, and no attempt to do so was made in this instance. Under the circumstances, however, it is likely that most or all of the bones come from domestic dogs: they would most probably have been present and would have acted to keep jackals away from the human settlement. Single fragments of teeth from members of the horse family (Equidae) and deer family (Cervidae) were also identified, but species could not be determined. Small numbers of bones were identified as coming from birds and fish, but again, species could not be determined. Finally, 130 shells of various kinds were counted. They were referred to three main groups (see Table 13.3).

Table 13.2: Number of sheep/goat specimens definitely identified as either sheep or goat.

Period	1	2	3			4
			temple	ordinary	total	
Sheep	10	11	2	6	8	10
Goat	2	4	0	1	1	2

Table 13.3: Other specimens identified by the author, not included in Table 13.1.

Period	1	2	3			4
			temple	ordinary	total	
Dog or jackal	2	3	5	1	6	6
Equid	0	0	0	1	0	0
Deer	0	1	0	0	0	0
Bird	5	12	3	0	3	1
Fish	5	1	4	2	6	21
Frog or toad	0	0	0	1	1	0
Gastropod	15	14	3	9	12	4
Bivalve	40	13	0	1	1	3
Cowrie	0	0	0	4	4	24

Once the identifications described above had been made, there remained a number of specimens which were clearly potentially identifiable, but which came from species with which the author was not familiar. It was most fortunate that the author was able to visit Deccan College in Pune and consult Dr P. K. Thomas about these specimens. Dr Thomas kindly identified the various specimens, which are listed in Table 13.4. A fragment of crocodile mandible containing two teeth (Fig. 13.2) was identified as belonging to *Crocodilus palustris*. Twenty-one turtle scute fragments were found, all but two in Period 4; some of these could definitely be identified as *Trionyx gangeticus*, and the rest were tentatively referred to the same species. Three of the scute fragments from Period 4 were cut with a sharp knife (Fig. 13.3), suggesting that craft or manufacturing activities may be one reason for the presence of the turtle scute fragments. A few specimens of other species were present (Table 13.4), including the blackbuck phalanges illustrated in Fig. 13.1. The two monkey bones could not be identified to species. A pelvis fragment from Period 3 came from a juvenile animal, while an ulna from Period 2 came from a species visibly larger than the langur (*Presbytis entellus*).

A few of the more complete fragments listed as 'cattle' in Table 13.1 were also taken to Deccan College, with a view to attempting to establish whether they were all zebu (*Bos indicus*) or whether any water buffalo (*Bubalus bubalis*) might be present. The biological tribe Bovini constitutes the largest members of the family Bovidae, comprising principally the genera *Bos* (cattle including zebu), *Bison* (European and American), *Syncerus* (the African buffalo) and *Bubalus* (the water buffalo). Distinction between all these species

is difficult. Published criteria exist for distinguishing between *Bos* and *Bison* (Olsen 1960) and between *Bos* and *Syncerus* (Peters 1986). No criteria for distinguishing between *Bos* and *Bubalus* are, however, known to the author. The two genera are quite distinct in evolutionary terms and have long been distinct species (Ritz *et al*. 2000; Hernández Fernández and Vrba 2005), so it is to be expected that reliable criteria might well exist. A complicating factor is that many breeds of water buffalo exist (Kikkawa *et al*. 1997; Kumar *et al*. 2006), and how much osteological variation there might be within *Bubalus* is not known to the author. As regards Paithan, eight specimens were compared to the *Bos* and *Bubalus* comparative skeletons at Deccan College. Six of these appeared to align with *Bos*. These were fragments of a distal metacarpal and a distal metacarpal from Period 1, a distal tibia and a distal metatarsal from Period 2 and an astragalus and proximal radius from Period 3. The other two appeared to align with *Bubalus*. These were a distal humerus from Period 1 and an astragalus from Period 3. These very tentative identifications can do no more than suggest the possible presence of *Bubalus*, not unexpected in view of its presence at both Bhokardan (Rao 1974) and Nasik (George 1955) – although it was apparently not present at Nevasa (Eapen 1960). A comparative osteological study of *Bos* and *Bubalus*, and a survey of archaeological material containing these species, would be of great benefit to South Asian zooarchaeology.

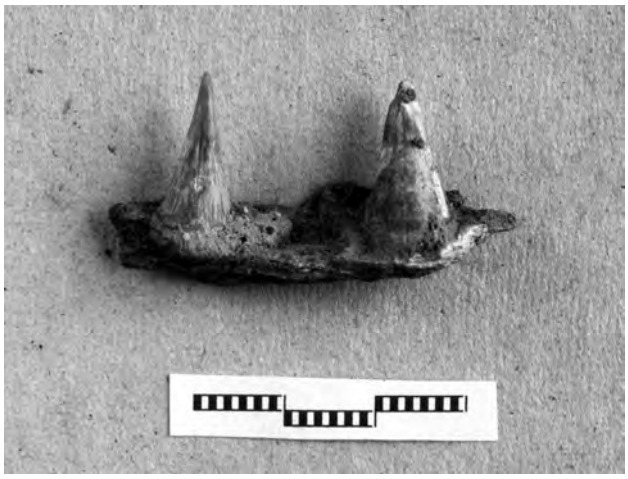


Fig. 13.2: Fragment of mandible of *Crocodilus palustris*, identified by Dr P. K. Thomas.

Once all the various items discussed above had been identified, there remained the majority of bone fragments which could not be identified. In many cases, it was possible to determine that the animals from which the fragments had come were relatively small (sheep/goat and pig size), while others came from larger animals (cow size). Given that the overwhelming majority of *identified* bones come from sheep/goat, pig and cow, it is highly probable that the overwhelming majority of *unidentified* fragments also do so, even though this cannot be demonstrated. Table 13.5 presents the totals for the two size categories, divided into

Table 13.4: Dr P. K. Thomas' identifications of bones and scute fragments from Paithan.

Period	1	2	3			4
			temple	ordinary	total	
crocodile *Crocodilus palustris*	0	0	1	0	1	0
turtle *Trionyx gangeticus*	2	0	0	0	0	19
hare *Lepus nigricollis*	0	2	0	1	1	3
bandicoot *Bandicota indica*	0	0	0	1	1	0
blackbuck *Antilope cervicapra*	0	1	1	2	3	1
monkey Cercopithecoidea	0	1	0	1	1	0
swamp cat *Felis chaus*	0	0	0	1	1	0

the anatomical region of the skeleton, for each of the phases. Finally, there were numerous fragments that could not be classified at all, and these are also listed at the bottom of Table 13.5.

Fig. 13.3: Fragments of scute of turtle (*Trionyx gangeticus*) cut with a knife.

Change through time

The examination of changing species frequency through time is a main goal of this contribution. To be able to examine this, precise quantification of the bone assemblage is required (see above). One step towards precise quantification has been taken, with the summing of fragments presented in Table 13.1. There has, however, been considerable discussion about whether the NISP total presented there is the best method of quantification to use in such studies. For the following discussion, see Fig. 13.5 for the location of the various bones mentioned; 'distal' refers to the end of the bone away from the vertebral column, 'proximal' to the end nearer the vertebral column.

Various factors may lead to the basic NISP total being an imperfect method of quantification. One is the simple fact that different species have different numbers of bones in their bodies. Pigs, for example, have four metacarpals in each forefoot and four metatarsals in each hindfoot, while cattle, sheep and goats have only one in each case. This problem is increased when considering animals such as fish, which have a completely different bodily conformation; and clearly, no meaningful comparison can be made between (say) the number of sheep bones and the number of cowrie shells found on a site. Another factor may be differential fragmentation. A distal humerus of a cow might be broken into (say) five fragments, all of which might be identifiable, while a sheep distal humerus might be

Table 13.5: The unidentified bone fragments from Paithan, divided into size class and anatomical region where possible.

Period	1	2	3			4
			temple	ordinary	total	
Sheep/goat or pig sized animal						
limb splinter	129	182	72	128	200	144
vertebral fragment	43	39	16	15	31	10
skull fragment	21	12	7	20	27	11
rib fragment	122	170	82	82	164	86
total	315	403	177	245	422	251
Cow-sized animal						
limb splinter	61	52	31	41	72	47
vertebral fragment	19	15	1	5	6	0
skull fragment	21	6	0	19	19	2
rib fragment	65	69	11	17	28	23
total	166	142	43	82	125	72
Unclassified fragments	421	421	493	443	936	372

found in a complete state. If a simple NISP count was applied in such an instance, cattle would incorrectly appear to be five times more common than sheep (for general discussions, see Casteel 1977; Watson 1979; Gautier 1984; Grayson 1984; Davis 1987).

One method of quantification that seeks to get round these problems is the calculation of the Minimum Number of Individuals (MNI) total. This seeks to establish the minimum number of individual animals that it took to generate the bone assemblage. At its simplest, a total of (say) five left and three right distal humeri of cattle must derive from a minimum of five cattle – because the right-side elements might come from the same animals that produced the left side elements. There are, however, problems with the MNI method. The MNI for each species is usually a rather small number, a particular problem in small assemblages like that from Paithan, and the frequency of species represented by a single bone is exaggerated. It is also based on an unrealistic assumption. Using the hypothetical example of five left and three right distal humeri in the context of an archaeological site occupied for two centuries, it is clear that the MNI is in any literal sense meaningless: many more than five cattle would have been killed and consumed in two centuries. We cannot know how many; but even if only one animal was killed each year, making 200 cattle in all, it is evidently highly unlikely that *any* left and right elements in the archaeological assemblage actually come from the same animal.

No method of quantification is perfect. Perhaps the safest option is one that lies between NISP and MNI. This is one that sums the so-called Minimum Animal Units (MAU) for each taxon. The MAU is intended to bring all elements into line with the basic artiodactyl (e.g. cow, sheep/goat) skeleton, in the following two steps (Binford 1984). (1) Differential fragmentation is, to some extent, overcome by recording which part of (say) the distal humerus is present. Thus, the Paithan records show whether any distal humerus fragment is complete (i.e. the entire articulation is present) or whether just the medial or just the lateral portion of the articulation is present. This allows determination of the Minimum Number of Elements (MNE) to be calculated: it is the sum of complete articulations, plus *either* the medial *or* the lateral portions, whichever is the most common. In an ideal world, the analyst would attempt to refit medial and lateral fragments or determine whether they could come from the same bone. In practice, the time constraint usually means that this is impossible, especially when the analyst does not know the site phasing at the time the recording is carried out. Shaft fragments that do not have articular ends are discounted. For mandibles and maxilla, the same principle is used: complete mandibles are counted, and loose teeth or partial mandibles then grouped into a theoretical minimum number that is added to the complete ones. (2) The resulting MNE totals are brought into line with the artiodactyl skeleton. Each such skeleton has two distal humeri. Each such skeleton has two distal humeri but only one atlas vertebra (see Fig. 13.5), so the MNE for atlas is doubled. Each artiodactyl skeleton has two distal metacarpals, so the MNE of these bones is left unchanged; each pig skeleton, however, has four distal metacarpals, so the two easily recognizable lateral metacarpals are discounted, and the MNE for the central pair is halved. Phalanges (toes) cannot be divided between fore and hind foot. There are eight first phalanges in each artiodactyl skeleton (two in each foot), so the total is divided by 4; and the same procedure is used for second and third phalanges.

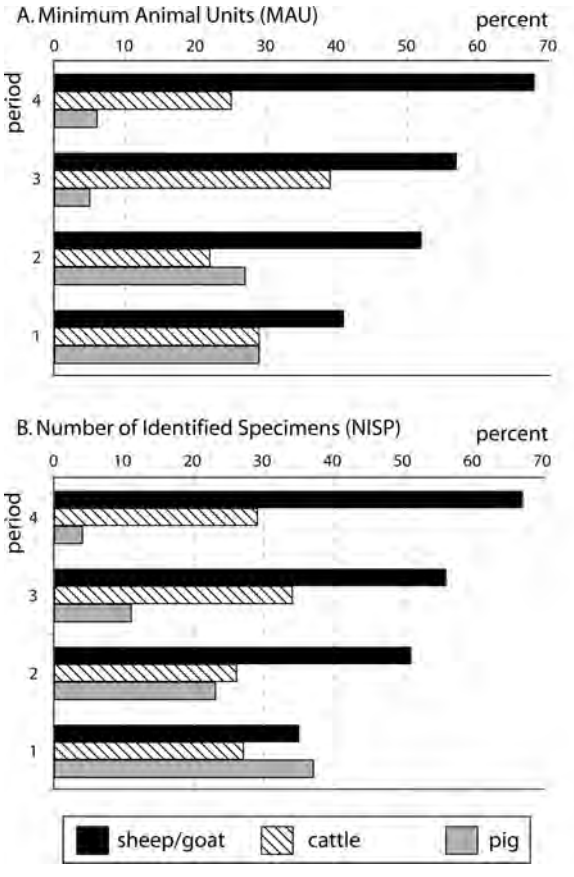


Fig. 13.4: Minimum Animal Units (MAU) of the main domestic taxa at Paithan, divided by layer and expressed as percentages of the layer total (see text for the method of deriving the MAU).

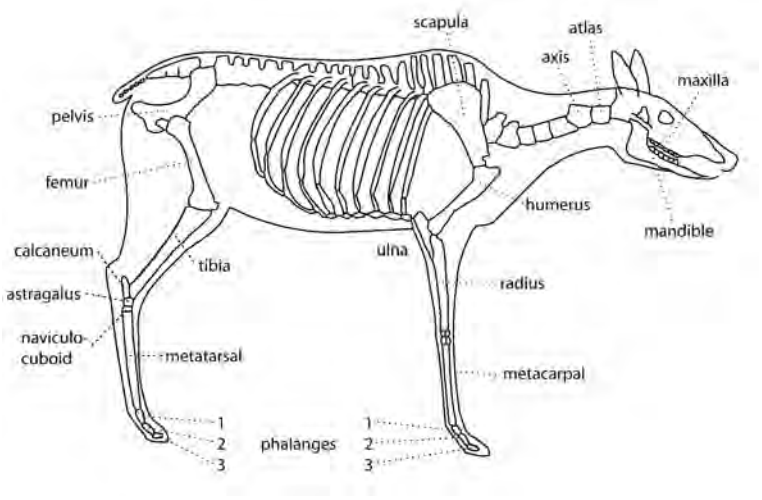


Fig. 13.5: Diagram of the skeleton of an artiodactyl, showing the various bones.

The resulting MAUs for each element are listed in Appendix 13.1. The sum of MAUs for each species in each period should, in theory, give the most secure basis for the relative quantification of species frequency, and thus for considering change through time. These MAU totals are listed and calculated as percentages in Table 13.6.

Using the MAU totals, we are in a position to examine change through time at Paithan. Fig. 13.4 plots the percentages of the three main taxa, based on MAU (top), with the NISP percentages from Table 13.1 also presented for comparative purposes (bottom). It is immediately apparent that there is substantial change through time. In both charts, sheep/goat increase substantially through the four periods represented at the site; the pattern is broadly similar using both methods of quantification, except that in Period 1, the NISP percentage is lower, which accentuates the visible increase. Cattle do not vary directionally through time, although they appear to peak in Period 3; this peak is more prominent in the MAU chart. Finally, and perhaps most interestingly, pig decreases through time in both charts. The outline is rather different depending on method of quantification, however: in the NISP chart, the decrease is fairly even, while in the MAU chart, it appears as a more abrupt step between Periods 2 and 3.

There is no independent way to determine which method of quantification gives the result which is closest to reality, although for the reasons discussed above, this author prefers the MAU method. Quite apart from anything else, the Paithan sample is relatively small, and stochastic variations may therefore appear more marked. But the most important conclusion is that change through time is clearly visible, and it is consistent across the four periods: sheep and goat increase in frequency, while pigs decrease, throughout the time of occupation of Paithan. This will be further discussed in the conclusions.

Table 13.6: Minimum Animal Units (MAU) of the main domestic taxa at Paithan, divided by layer and expressed as percentages of the layer total (see text for the method of deriving the MAU).

Period	**1**		**2**		**3**						**4**	
					temple		**ordinary**		**total**			
	N	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
Sheep/goat	42	**41**	53.25	**52**	22.5	58	12.25	57	34.75	**57**	42.75	**68**
Cow	29.75	**29**	22.25	**22**	13.5	35	10.25	44	23.75	**39**	16	**25**
Pig	30	**29**	27.25	**27**	2.5	6	1	4	3.5	**5**	4	**6**
Total	**101.75**		**102.75**		**38.5**		**23.5**		**62**		**62.75**	

The changing frequencies of sheep/goat and pig are clearly the most important change occurring through time at Paithan, but a couple of more minor points may also be made in this section. Neither birds nor fish are ever very common, but bird bones reach a minor peak in Period 2, while fish do so in Period 4. Among the shells, bivalves decrease through time; if their presence reflects their use as a food source, their dietary importance was apparently reducing. Gastropods may also show a decrease, but the trend is less clear. Cowries, in contrast, appear to *increase* through time. Since cowries are marine species, all such shells must have been imported from coastal regions, and it may be that the increase in Period 4 signals an increase in trade or other connections at this time. None of the other taxa listed in the tables appear to show any trend through time.

The nature of the samples, and the temple deposits

One interesting aspect of any animal bone assemblage is the question of whether the assemblage is dominated by butchery waste, food waste or a mixture of the two. The starting point for any analysis is the MAU total, described above and listed by period for each species in Appendix 13.1. Each table in Appendix 13.1 starts with the head and neck (mandible through to axis – see Fig. 13.5), then runs down the forelimb (scapula to metacarpal), then down the hindlimb (pelvis to metatarsal) and ends with the phalanges. The outline of the soft tissues in Fig. 13.5 shows the decreasing amount of meat towards the feet of the animal. The lower limbs are therefore generally classified as butchery waste, discarded at an early stage in the butchery process. The upper limbs and trunk carry most of the edible meat.

The samples from Paithan are mostly too small for significant conclusions to be drawn, but a few suggestions may be offered. Considering sheep/goat first, the feet are rather rare, while meat-bearing bones such as the pelvis are relatively common, particularly in Periods 1 and 2. This is unusual, since the pelvis is not a very hard bone and often does not survive in large numbers. This might suggest that the Paithan sheep/goat bones derive predominantly from food waste rather than butchery waste, although the pattern is less clear in Periods 3 and 4, and the small size of the sample must be born in mind. Distal metacarpals and metatarsals are remarkably rare (and since they are among the most diagnostic elements for separating sheep from goat, their rarity contributes to the small number of definitely identifiable bones of these species: see Table 13.2). In the forelimb, proximal metacarpal is more common than distal metacarpal; it may be that this bone was chopped through during butchery so that the distal end and the phalanges could be discarded. Fig. 13.6 shows a metacarpal exhibiting marks resulting from two chops that have not cut through the bone. In the hindlimb, metatarsals are rare, while astragalus and calcaneum are more common; possibly the leg was cut through between the astragalus and the naviculocuboid, and the foot subsequently discarded. The samples of cattle and pig bones are even smaller, so conclusions are even more tentative. Among the cattle bones, feet are generally rare, as are heads except for the five maxillas (upper jaws) in Period 3-temple. Among the pigs, feet are also rare, but heads are substantially more common in Periods 1 and 2.

Fig. 13.6: Metacarpal shaft fragment of sheep or goat, showing two heavy chop marks.

The Paithan samples thus appear to represent rather ordinary waste material, with the exception that the feet and in some cases the heads may have been detached and dumped elsewhere. From this perspective, we can approach the nature of the temple deposits. The tables of bones in Appendix 13.1 do not suggest that the contents of the Period 3-temple and Period 3 deposits differ materially from each other, or from the other periods, with the possible exception of the presence of the cattle maxillas in Period 3-temple already noted. The small size of the samples must again be stressed, however, and the presence of the cattle maxillas is plausibly due simply to chance. The unidenti-

fied bones recovered from Period 3-temple and listed in Table 13.5 similarly resemble those from the other deposits. Little or nothing in the animal bones in fact marks Period 3-temple out in any way. The only possible exception to this is the fragment of crocodile mandible containing two teeth, identified by Dr P. K. Thomas as *Crocodilus palustris* (Table 13.4). This fragment was recovered from Period 3-temple deposits. Whether its presence there has any significance that does not emerge from the straightforward study of the bones carried out here must be a subject for future discussion.

Age at death and metrical analysis

Age at death is an informative tool in zooarchaeology. Best results are obtained from large statistically reliable assemblages. The Paithan assemblage is too small to produce such results, but the available mandibular data are tabulated in Appendix 13.2. Ageing is based on the replacement and wear of the mandibular teeth, the most useful being the rear milk premolar (dp4), or the rear adult molar (P4) if it has replaced dp4, and the three permanent molars (M1, M2 and M3). During identification, the state of eruption and wear of the teeth in the mandibles were recorded, and for the more complete fragments, this permits an approximate age at death to be established (see Appendix 13.2 for details).

In large assemblages, age at death may enable us to understand something of the herding practices employed in the past. For example, in sheep, goats and cattle, maximum meat weight is usually reached somewhere around 2–4 years of age, and this is a good time to slaughter animals for meat. Animals of this age will not put on much more meat, and their removal allows more lambs, kids or calves to be reared. However, if dairy products are what is desired, it is necessary to kill some animals at a much younger age, usually in the first month or two of life. A female will only lactate after producing offspring, and if these offspring are kept alive, they will consume at least some of the milk (see e.g. Payne 1973; Legge 1981, 1992; Halstead 1987, 1998).

The small number of sheep/goat mandibles from Paithan do not include any animals in the first 2 months of life. Such jaws are smaller and softer than those of adults and are thus more prone to loss due to dog gnawing in ancient times or poor recovery during excavation. As mentioned above, however, dog gnawing is rare at Paithan, and recovery was excellent, so these factors may be discounted. The small sample therefore appears to suggest that dairy products were not a major goal at Paithan, although this does not exclude the possibility of some less specialized use.

In pigs, the focus is usually different: pigs produce half a dozen or more offspring (as opposed to the one or two in the other major species), and meat is the only significant product. The high breeding turnover of pigs means that most animals are typically killed in their first 2 years of life, and the jaws listed in Appendix 13.2 suggest that Paithan was not an exception to this.

Metrical analysis is also an important zooarchaeological tool. Sometimes, measurements may complement analysis of age at death. For example, in cattle and goats (but not in sheep), elements such as distal metacarpal allow males and females to be distinguished, males forming a separate scatter larger than the females. Distal metacarpals fuse only when the animals approach adult size, however. Under a herding policy focussed on dairy products, it is likely to be the males that are killed when very young, because of the herdsmen's desire to keep the females alive and in due course join the milking herd. In the archaeological record, this policy will lead to a predominance of females among the measurable adults. If, on the other hand, the males are kept alive for longer and are killed for meat, the sex ratio visible in the distal metacarpals will be more equal (see e.g. Legge 1981; Halstead 1998; Rowley-Conwy 2000).

As mentioned above, butchery practices at Paithan unfortunately mean that distal metacarpals and metatarsals are virtually absent, and none could be measured. The Paithan measurements do not therefore play a primary part in the analysis presented here, but are listed in Appendix 13.3 in the hope that they may be of use to other researchers in the future.

Conclusions

The relatively small zooarchaeological assemblage from Paithan has proved to be of the greatest interest, and due to the excellent method of recovery has generated a considerable amount of information.

The major conclusion is that there was a consistent *increase* in the importance of sheep and goat, and a concomitant *decrease* in the importance of pigs, through the period of occupation of the site. This is a conclusion of considerable interest, and it would be of

the greatest importance to know whether this is mirrored at other sites in India and indeed in South Asia in general. The rise of Islam probably meant that pig keeping declined in much of central and western Asia. The reasons for a parallel decline, although not disappearance, in the pig in the non-Muslim context of Paithan raises wider issues concerning the changing importance of this species: was the Islamic prohibition superimposed on a more general decline taking place for other reasons?

This is a question for future research. In the meantime, it is hoped that the present report has achieved the aims set out in the introduction and also that it shows something of the kinds of information that can be extracted from animal bones, and which makes them so worthwhile an object of study.

Acknowledgements

I would like to thank Dr Derek Kennet for asking me to study this most interesting assemblage and Dr P. K. Thomas for all his help and for the identifications listed in Table 13.4. Dr Ruby Ceron-Carrasco discussed cowrie shells with me.

Appendix 13.1 Minimum Animal Units (MAU) Tables

Note: P indicates the Proximal, D the Distal, articulation of each longbone

A. Sheep/goat: Minimum Animal Units

Period	1	2	3			4
			temple	ordinary	total	
Mandible	1	2	2	4	6	4
Maxilla	1	2	2	2	4	3
Atlas	2	2	0	0	0	0
Axis	2	4	0	2	2	4
Scapula	6	2	0	0	0	0
Humerus P	1	0	0	0	0	0
Humerus D	1	4	1	2	3	2
Radius P	0	1	0	3	3	0
Ulna	3	5	1	1	2	1
Radius D	0	3	0	1	1	2
Metacarpal P	2	3	1	1	2	4
Metacarpal D	0	1	0	0	0	1
Pelvis	4	6	1	2	3	2
Femur P	1	1	0	0	0	2
Femur D	2	2	0	2	2	2
Tibia P	3	2	1	1	2	1
Tibia D	3	6	0	0	0	2
Astragalus	5	3	2	0	2	1
Calcaneum	2	2	1	1	2	6
Naviculo-cuboid	1	0	0	0	0	0
Metatarsal P	0	1	0	0	0	2
Metatarsal D	1	0	0	0	0	2
Phalanx 1	0.75	1	0	0.5	0.5	1.75
Phalanx 2	0	0.25	0	0	0	0
Phalanx 3	0.25	0	0.25	0	0.25	0

B. Pig: Minimum Animal Units

Period	1	2	3			4
			temple	ordinary	total	
Mandible	3	3	0	0	0	0
Maxilla	7	5	0	0	0	0
Atlas	0	0	0	0	0	0
Axis	0	0	0	0	0	0
Scapula	5	2	1	0	1	1
Humerus P	0	1	0	0	0	0
Humerus D	2	2	0	0	0	0
Radius P	1	0	0	0	0	0
Ulna	0	2	0	0	0	0
Radius D	0	0	0	0	0	0
Metacarpal P	2	1	0	0	0	0
Metacarpal D	0	1	0	0	0	0
Pelvis	1	0	0	1	1	1
Femur P	0	0	0	0	0	0
Femur D	2	1	0	0	0	0
Tibia P	0	0	0	1	1	0
Tibia D	2	4	0	0	0	0
Astragalus	1	1	0	0	0	0
Calcaneum	1	1	0	0	0	0
Naviculo-cuboid	0	0	0	0	0	0
Metatarsal P	1	1	0	0	0	1
Metatarsal D	0	2	0	0	0	1
Phalanx 1	1.25	0	0	0.25	0.25	0
Phalanx 2	0.5	0	0	0	0	0
Phalanx 3	0.25	0.25	0	0.25	0.25	0

C. Cattle: Minimum Animal Units (MAU)

Period	1	2	3			4
			temple	ordinary	total	
Mandible	1	1	0	0	0	2
Maxilla	1	1	5	0	5	3
Atlas	0	0	0	2	2	0
Axis	0	0	0	0	0	0
Scapula	2	0	0	1	1	1
Humerus P	3	1	0	0	0	0
Humerus D	2	0	0	2	2	1
Radius P	1	3	0	1	1	1
Ulna	0	0	0	0	0	0
Radius D	0	1	1	0	1	1
Metacarpal P	2	0	0	1	1	1
Metacarpal D	2	0	1	1	2	2
Pelvis	3	0	1	1	2	0
Femur P	5	0	0	0	0	0
Femur D	2	2	0	0	0	1
Tibia P	0	0	1	0	1	0
Tibia D	1	2	0	0	0	0
Astragalus	0	1	1	2	3	0
Calcaneum	2	1	0	1	1	1
Naviculo-cuboid	0	3	0	1	1	1
Metatarsal P	0	5	0	0	0	0
Metatarsal D	1	1	0	0	0	0
Phalanx 1	1	0	0.25	0.5	0.75	0.25
Phalanx 2	0.25	0.25	0	0	0	0.75
Phalanx 3	0.5	0	0	0	0	0

Appendix 13.2
Ageable jaw fragments of the three main species at Paithan

Ages are approximate only for sheep/goat, and they are taken from Payne (1973); for pigs, they are taken from Higham (1967).

For all taxa, (P) means tooth present but wear stage not ascertainable; E = top of tooth erupted to level of the jawbone; H = tooth half erupted; U = erupted to full height but unworn; J = tooth just in wear; nye = not yet erupted.

For sheep/goat, the numbered wear stages are those distinguished by Payne (1973), the first stage with no wear being numbered 1. For pig, the lettered wear stages are those distinguished by Grant (1982).

Period	dp4	P4	M1	M2	M3	Age
A. Sheep/goat						
2		(P)	(P)	6	H	18–24 months
2		U	8	5	U	18–24 months
3(o)		5	(P)	8	6	3–4 years
3(o)		6	(P)	6	(P)	?18–24 months
3(o)*	8					?
3(t)			10	8	3	2–3 years
4*	7		H	nye		2–6 months
4		9	14	14	10	6–8 years
4	(P)		E			?2–6 months
* = identified as sheep						
B. Cattle						
3			(P)	U		
4					J	
C. Pigs						
1			J	H	nye	10–11 months
1		U	(P)	a		15–16 months
1		a	g	b		16–18 months
2	d		a	U		11–12 months
2	e		d	E		9–10 months
2				a	H	19–21 months

Appendix 13.3
Measurements of animal bones from Paithan

All measurements are in millimetres. Only fully fused adult bones are included. All the cattle bones measured are tentatively identified as *Bos*, not *Bubalus* (see text). Bracketed measurements are uncertain.

All measurements are as defined and illustrated by von den Driesch (1976), except as follows: distal humerus HT and HTC, and distal metatarsal Dd, from Legge and Rowley-Conwy (1988); pig tooth measurements from Payne and Bull (1988).

A. Sheep/goat

Sheep/goat distal humerus

Period	Sheep or goat	Trochlea breadth (BT)	Thickness of trochlea (HT)	Trochlea at constriction (HTC)
2	Goat?	29.0	19.0	13.7
3(o)	Sheep	-	20.8	15.3
3(t)	?	-	-	15.9

Sheep/goat radius

Period	Sheep or goat	Proximal breadth (Bp)	Distal breadth (Bd)
2	Goat		28.3
2	Sheep		28.8
3(o)	Sheep?	33.9	
3(o)	Sheep		30.1
3(o)	Sheep	38.2	

Sheep/goat tibia

Period	Sheep or goat	Distal breadth (Bd)
1	Sheep	25.3
1	Goat	28.8
2	Goat	27.5
2	Sheep	28.1
2	Sheep	27.9
4	Sheep	23.8

Sheep/goat astragalus

Period	Sheep or goat	Greatest length (GLl)	Distal breadth (Bd)	depth (Dl)
1	Sheep	30.5	17.9	16.9
1	Sheep	30.4	-	16.9
1	Sheep	34.3	19.7	18.3
1	Sheep?	31.4	20.2	16.4
2	Sheep	33.0	19.9	18.0
2	Goat?	-	22.8	-
2	?	-	19.0	-
3(t)	Sheep	33.8	21.0	18.7
3(t)	Sheep	31.5	19.4	18.0

B. Cattle

Cattle radius

Period	Proximal breadth (Bp)
3	86.8

Cattle tibia

Period	Distal breadth (Bd)
2	75.2

Cattle astragalus

Period	Greatest length (GLl)	Distal breadth (Bd)	Depth (Dl)
3(o)	(69.0)	(45.1)	36.9

Cattle metatarsal

Period	Distal breadth (Bd)	Distal thickness (Dd)
2	(61.2)	34.8

C. Pig

Pig scapula

Period	Length of glenoid (GLP)	Breadth of glenoid (BG)	Smallest length of collum (SLC)
1	(27.2)	(20.0)	17.5
1	33.4	21.6	-
1	-	-	20.2
1	(28.5)	20.2	18.2

Pig astragalus

Period	Greatest length (GLl)
2	44.9

In the following table, each jaw fragment is given one line; thus, if measurements for more than one tooth appear in the same line, they were found in the same jaw fragment.

Pig mandibular teeth

Period	dp4		M1			M2			M3	
	L	WP	L	WA	WP	L	WA	WP	L	WA
1			15.5	9.9	10.5					
1						20.7	13.5	14.1		
1			15.2	9.4	9.8	19.1	12.4	13.4		
2	17.5	7.8	16.1	–	10.0					
2	17.4	7.9	14.3	8.4	9.7					

Pig maxillary teeth

Period	dp4		M1			M2			M3	
	L	WP	L	WA	WP	L	WA	WP	L	WA
1	14.8	11.3	16.7	12.7	13.7					
1									33.2	19.6
1	16.3	13.5	21.4	16.6	–					
1									29.8	19.5
1						21.7	17.8	17.6		
2			15.7	–	13.8	23.0	17.2	17.8	29.1	17.6
2			17.7	12.3	12.1	–	15.7	–		

Part V

Conclusions

Derek Kennet

Chapter 14
Paithan in Its Regional, Historical and Cultural Context

The excavations at Paithan have provided some important insights into the cultural and economic transitions that took place during the Early Historic and Early Medieval periods in central India. In this chapter, we will return to some of the key points that have emerged from the excavations, particularly those with resonance beyond Paithan and its immediate locality to the wider arena of Early Historic and Early Medieval India more generally, for example the chronology of the occupation at the site, the spatial development of the site, the construction and development of the temples and the changing nature of the economy of the Early Historic and Early Medieval periods.

In Chapter 1, the rationale behind the present project was set out, along with five research questions. In relation to the first question about the construction and development of the temples, in Chapter 4 a detailed outline of the development of the temples has been presented along with a chronological framework established on the basis of parallels with dated temples elsewhere. This question is also further discussed below in the present chapter. In relation to questions 2 and 3, it has been possible to retrieve a stratigraphically excavated and systematically collected set of artefacts and environmental samples associated with the temples. This has resulted in 78 studied archaeobotanical samples that have yielded 8,327 seeds – the largest archaeobotanical assemblage from any Early Historic site in India by some distance. This has allowed Fuller to present a detailed and compelling analysis in Chapter 12 of the development of agricultural practice throughout the occupation of Paithan. In addition, the 4,777 fragments of faunal material have allowed Rowley-Conwy to present an equally useful picture of the changing nature of animal husbandry at the site in Chapter 13. Together, these two studies present us with the most detailed account to date of Early Historic and Early Medieval agricultural practice, supporting a detailed discussion of developing crop-livestock interaction strategies further on in the present chapter. The analysis of the pottery, coins and small finds presented in Part III, especially those that were retrieved from layers stratigraphically associated with the temples, provides information on the production and distribution of artefacts which contradicts some widely held assumptions about the artisanal economy during the Early Historic and Early Medieval periods (see below). The question of the link between the establishment of the temples and the developing economy is discussed in some detail further on in the present chapter in relation to recent historical work on the subject. On the final question of the nature and extent of occupation at the site during the Early Historic and Early Medieval periods, the following section sets out what has been learned.

Part 1: The development of the site and the temples

The development of the site

The fact that most of the ancient archaeological site of Paithan lies buried beneath the modern town makes a comprehensive overview of its development very difficult. Although investigating this development was not a key aim of the excavations, trenches were excavated in as many different parts of the site as possible in an attempt to gain some insight. Such efforts were, however, severely hampered by practical constraints such as finding suitable space and gaining the permission of landowners. Trench F, located on the northern side of the centre of the town, gives an insight into the stratigraphic sequence in that location, but it was very restricted in size, as was the trench excavated not far away by Dikshit many years before. From these trenches there is a distance of over 500 m to Trenches A and D in the ASI-protected area to the south, and it is in this 500 m – currently an archaeological blank – where the core of the Early Historic settlement is likely to have been located. Much then still remains to

https://doi.org/10.1515/9783110653540-014

be learned about the spatial development of Paithan, beyond the very basic outline that it has been possible to surmise below.

Earliest levels

The earliest evidence of occupation that came to light during the present excavations was the eroded sherds of possible 'Jorwe ware' that were excavated in the lowest levels of Trench D (Chapter 7). Due to their eroded state, these sherds cannot be attributed a precise date and are taken as being indicative of a human presence at Paithan at some time between c. 1400 to 700 BC. It should be noted, however, that these sherds were in stratigraphic association with later material such as Black and Red ware, indicating that they are residual and may have been redeposited from other areas of the site. It is likely that the seven microliths that were recorded by the present excavations also date from this period, but these are also all residual and redeposited (Chapter 8). Aside from these facts, nothing is known at present about the extent and nature of occupation at Paithan during the Proto Historic period.

Interestingly, there is no reliable evidence of occupation at Paithan during a period of 400 years or more between 1400 and 700 BC and the Mauryan period. Occupation in the Mauryan period, or at least the 'Nanda' and 'Maurya-Sunga' periods (370 to 150 BC), is suggested by the eight punch-marked coins on display in the Balasaheb Patil Museum, as well as others that were found and published by Yusuf (Chapter 11, nos. 1–8; Yusuf 1938: pl. IXa top; 1939: pl. XXc). Some of the NBP sherds found by the present excavations as well as by Dikshit (1973: 28) might also conceivably date to this period (Chapter 7).

Period 1 (200–100 BC)

When we come to Period 1, it is possible to say a little more about occupation at the site as layers dating to this period were excavated by the present project. The hollow cross-type coins found in these layers suggest a pre-Satavahana date roughly between 200 and 100 BC. Evidence of occupation at this time was found in all of the excavated trenches to varying degrees and it is also to this period that most of the NBP sherds recovered by the excavations are likely to be dated, although they may of course be much earlier (see Chapter 7). Contemporary occupation appears to have consisted predominantly of wooden huts with beaten-earth floors associated with occasional hearths and rubbish pits.

In the area excavated by Yusuf, a fired-brick drain and three cylindrical brick structures were located in the lower levels of his sixth *stratum* (Yusuf 1938: 4, pl. VI; 1939: 41, pl. XVIIIa, b). The very presence of fired brick in these levels suggests that they should be allocated to Period 2 because fired brick was completely absent from Period 1 deposits in TP1 in Trench A. Yusuf, however, mentioned that the drain was associated with copper coins, including – it seems – hollow cross coins (Chapter 9), which fall within our Period 1. But Yusuf's stratigraphy was not precisely defined, and in any case, the coins provide only a *terminus post quem* for the drain, which could also be later in date. It is therefore sensible to allocate Yusuf's brick drain to our Period 2, whilst noting the presence of the hollow cross coins as evidence of Period 1 activity in the vicinity. Meanwhile, Dikshit's Period I has similar characteristics to our Period 1 and is probably roughly contemporary (Dikshit 1973: 28).

The presence of Period 1 layers in all of the present trenches as well as those excavated by Yusuf and Dikshit suggests that this was perhaps the first period during which occupation became widespread across the Paithan mound. This might suggest the arrival of new settlers from elsewhere to a location that was previously unoccupied, or it might be indicative of the expansion of a smaller, already existing settlement, the location of which has not yet been found.

The post-Mauryan/pre-Satavahana period is still poorly understood in this part of the western Deccan. Ray has proposed that political authority in the Deccan became very localised at this time (Ray 1989: 106). She has also pointed out that a common denominator of many of the known settlements of this period is that they are located on overland trade routes (Ray 1989: 105). Period 1 at Paithan – limited as the evidence is – would therefore appear to be a fairly typical settlement of this period, albeit one that seems to have been slowly increasing in size.

Period 2 (100 BC–AD 100 and possibly later)

Fired brick can be said with some confidence to have appeared by Period 2. Broken fired bricks were used in

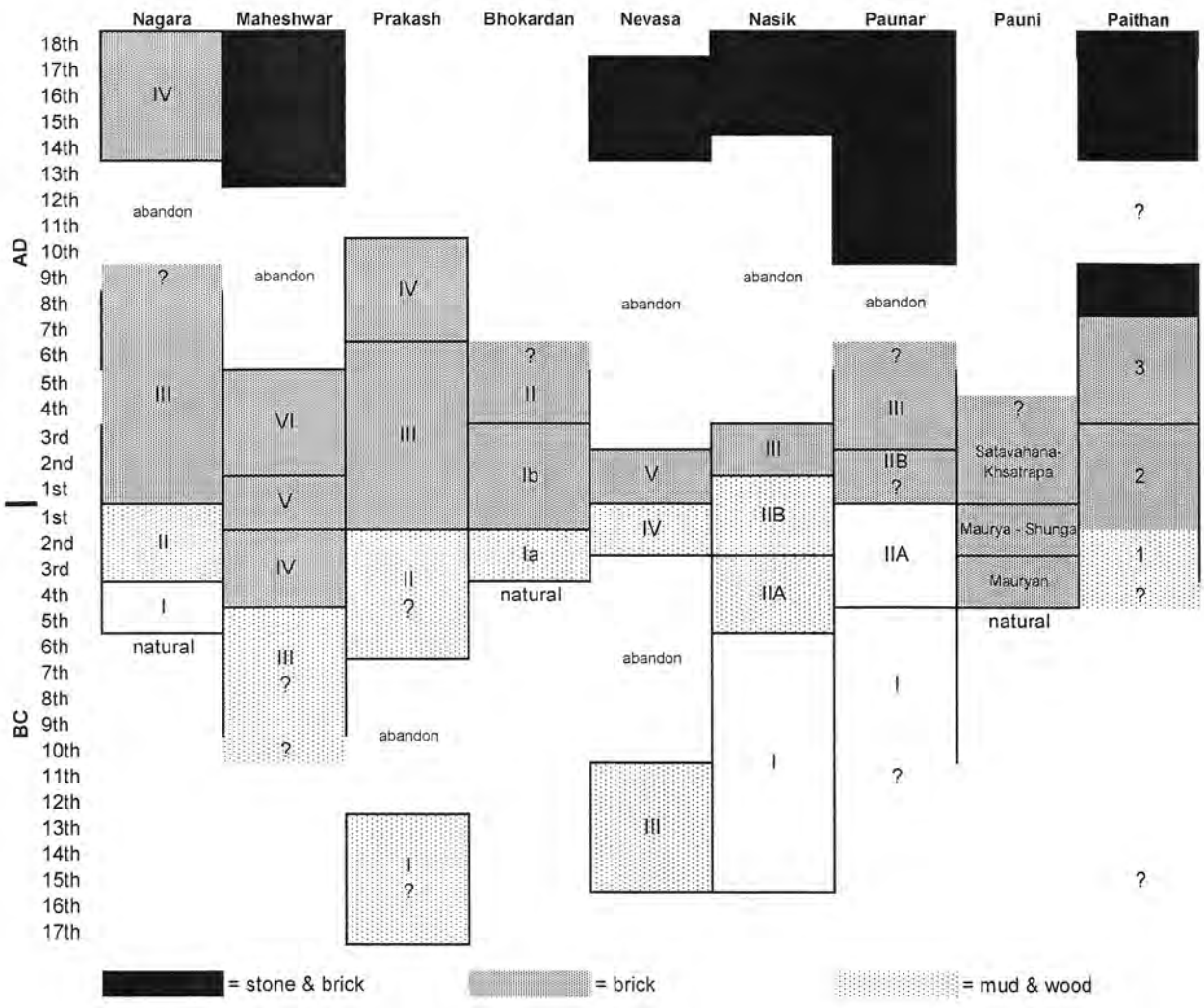


Fig. 14.1: A schematic outline of the building materials used in the Paithan sequence and at eight other Early Historic sites in the region.

Trench F to construct a floor, and they also make up a significant part of the dense rubble layers that occur in the Period 2 layers in TP1 in Trench A. Although no buildings or walls were uncovered from this period, it can be surmised, on the basis of excavations undertaken at contemporary sites elsewhere in the region (see Fig. 14.1), that with the introduction of fired brick, domestic architecture changed its form from circular-shaped wooden huts to rectangular houses with brick walls and terracotta tiled roofs.

In addition, it will have been noted that in Trench B objects apparently associated with some form of manufacturing activity came to light in this period. Not enough evidence was uncovered to demonstrate more than the presence of activities associated with a furnace.

As mentioned above, in the area excavated by Yusuf, a fired-brick drain and three cylindrical brick structures were located in the lower levels (Yusuf 1938: 4, pl VI; 1939: 41, pl. XVIIIa, b). To judge by the published photograph, the drain was roughly constructed whilst the 'cylindrical brick structures' appear to be ring-wells that were dug down through these layers at a later date. Nonetheless, on the basis that the fired brick first appears in Period 2, the drain is indicative of activity in this part of the site at that time.

Dikshit recorded the presence of a 1.22-m-thick layer of mud overlying his Period I deposits (1973: 29). This resulted, he assumed, from a heavy flood that covered the whole site at some time. This is an unlikely explanation and it seems more likely to be the result of natural soil accumulation during a time when the

area was abandoned and overgrown by vegetation. Indeed, it is noteworthy that Yusuf recorded a thick earth deposit below his Fifth *Stratum*, which is stratigraphically much later than Dikshit's, confirming that such accumulations result from localised abandonment rather than widespread flooding (Yusuf 1938: 4).

Above the mud layer, Dikshit reported finding a ruined structure built of 'extraordinarily large-sized bricks' that he interpreted as the plinth of a ruined temple and which he tentatively dated to the Rashtrakuta period, although he provided no evidence to support either interpretation or dating (Dikshit 1973: 29). Dikshit did not give the measurements of the bricks, so it is impossible to compare them with those from Trench A. Nonetheless, it is notable that the brick drain uncovered by Yusuf is also described as having been made of bricks of 'exceptionally large size' (9 × 20 × 50 cm in this case) and that they are the only really large bricks from the sequence (Yusuf 1938: 4; 1939: 41). It therefore seems likely that Dikshit is mistaken in his dating – and also probably his interpretation – of this brick structure and that it should be placed in Period 2. If this is correct, Period 2 remains were located in all excavated trenches and it is therefore likely to have been a period of relatively widespread activity across the site.

The Satavahana period has been characterised as a period of growth and economic prosperity in the western Deccan (e.g. Ray 1986; 1989: 106–107). As a site of some historical significance, it is no surprise to see evidence of widespread activity, large brick structures and abundant use of coinage at this time.

Period 3
(4th/5th to 8th/9th centuries AD)

With the exception of a single coin (Chapter 9: coin 33) which is datable to between the 2nd and 4th century AD, there is no datable evidence for activity at Paithan between the 1st and the 7th centuries AD. This is likely to be due to an absence of coin deposition at this time, but it might reflect a reduction of settlement or an abandonment. Until a more precise understanding of the pottery chronology is available, it is impossible to be certain.

With the possible exception of a single deposit from Trench D1 (751), Period 3 remains are entirely restricted to Trench A, where they are associated with the construction, enlargement and use of the two brick temples. This might suggest that the extent of activity at the site contracted after Period 2, although the available 'sample' area is very small.

Of course, the temples themselves indicate that activity certainly continued between the 4th/5th century AD and about the 8th century in one location, although nothing is known about the nature of occupation elsewhere on the site at this time. With the exception of a possible issue of the 4th/5th century and one of the 7th century from the foundation deposits of the temples (Chapter 9, coins 33 and 34), no coins of this period have come to light – a point which is further discussed below in the section on coins and monetization. It is not possible to be certain when the temples were finally abandoned. It seems most likely that this took place around the 8th century or perhaps slightly later as there are indications that the temples remained in use for a reasonable period of time, although they did not undergo further embellishments.

The nature of occupation in large, urban centres during the post-Satavahana period has been the focus of much debate. It has been argued by some scholars that this was a period of widespread urban decline but these arguments, although they need to be carefully considered, are not without problems (e.g. Sharma 1987; Kennet 2013). It is difficult to form a clear picture of the nature of occupation at Paithan from the limited area that has been exposed, but the construction of two early Hindu temples in what is likely to have been an area that was marginal to the earlier site is an interesting development as it is suggestive of a shift in the focus of settlement. This is a point that is significant to our understanding of the formal elaboration of temples at this time and their relationship to existing settlement and power structures.

Period 4

After Period 3, there is no clear evidence for occupation at the site until the 14th/15th centuries, to which period some of the glazed pottery from the present excavations can be dated as can a number of coins reported by Yusuf (1938: 3; 1939: 41).

It should be noted that Period 4 is a rather loosely defined phase and has essentially been taken to represent all post-Medieval periods at the site. No systematic attempt was made to investigate the archaeology of these periods by the present project. Period 4 levels were present in the Trench A area, but they had been almost entirely removed by Yusuf's earlier excavations. Period 4 levels were excavated in Trench B, where they con-

Table 14.1: Tentative correlation of the excavated sequences from Yusuf (1938; 1939), Dikshit (1973) and the present excavations.

Yusuf 1938; 1939		**Dikshit 1973**		**Present excavations**	
1st *stratum*	Stone-and-mortar and brick-and-mud buildings, British period?	?		Period 4	Houses, 17th century +
2nd *stratum*	?18th–19th centuries	Period IV	House, 18th–19th centuries		
3rd *stratum*	? Mughal period	?			
4th *stratum*	Jumbled, tilted walls, ?14th–15th centuries			?	
5th *stratum*	Thick deposit with coins, no structures				
6th *stratum* (upper)	Brick temples			Period 3	Brick temples
6th *stratum* (lower)	Brick drain, coins	Period III	Brick 'temple'	Period 2	Fired bricks
		Period II	Thick sterile mud		
				Period 1	Post-holes, coins, NBP
		Period I	Coins, NBP		

sisted of the corner of a stone building overlying a building with six pillar bases. Below this, a sequence of uneven floors, ash and rubbish pits came to light. In Trenches D1 and D2, Period 4 levels had been removed by brick quarrying. Neither were they present in Trench F, although it is not clear why not. Dikshit notes the presence of later buildings dating to his Period IV in the trench he excavated. These remains included the cellar of a house that had cut into underlying levels (Dikshit 1973: 29). Yusuf describes an upper level of buildings constructed of stone, lime and brick dated by coins to the British, Asaf Jahi and Mughal periods (1938 3, pl. III; 1939: 41, pl. XVI).

The general impression is that the site was quite densely built up towards the end of the Mughal period, reaching a peak perhaps in the Asaf Jahi or early British period, and it may have been during this time that the urban plan of the older part of modern Paithan came into existence (Fig. 1.5). The whole town was also walled at some time, possibly during the Mughal period (Govt. of Maharashtra 1977: 1035, 1604). At a later date, it is likely that the area of the site that is now covered by the ASI protected area was abandoned, the buildings within it fell into disrepair and their bricks and stones were removed for use as building materials elsewhere.

It would be wrong to attempt to characterise the nature and extent of occupation in Period 4 any more precisely based on the evidence that has been collected here. Nonetheless, the extensive remains of Mughal and post-Mughal period architecture that are still scattered about the site suggest that a more detailed investigation of this period would yield interesting and informative results related to the development of minor urban centres at this time.

Summary

The present excavations did not have as their main aim an investigation of the spatial development of the site. Indeed, such an aim would require a much larger-scale project with greater resources than were available to the present one. Nonetheless, it has been possible to

set out a tentative overview based on the information from the various trenches that have so far been excavated (see Table 14.1).

In order to provide a regional context for these developments, Fig. 14.1 shows a schematic outline of the building materials used at Paithan compared to eight other excavated Early Historic and Medieval sites in the region. It should be noted that the absolute chronology of almost all of the phases and periods shown is tentative and open to question, and this may explain some of the apparent anomalies, for example the apparently late introduction of brick at Nasik, Nagara and Nevasa. The phases of abandonment in the Early Medieval period are also open to question and reinterpretation being based, as they are, on limited excavation, biased sampling and problematic chronologies (e.g. Kennet 2004b; 2013). Nonetheless, Fig. 14.1 serves to demonstrate that the pattern of development recorded at Paithan is part of a regional trend rather than a local or site-specific development, even if the precise chronology has not yet been finalised.

The same can also be said of the general trends of expansion and contraction that have been tentatively identified at Paithan. A phase of growth up until the end of Period 2, followed by a phase of contraction of the settlement, would conform to the general trends that have been identified at other sites in the region (e.g. Sharma 1987: 60–83). Nonetheless, the evidence from Paithan is not strong, and it would be wrong to make too much of it here.

An obvious question that is raised by the analysis shown in Fig. 14.1 is what do these regional trends represent? For example, why was there a transition from mud-and-wood to brick-and-tile architecture in around the 1st century BC? Is it indicative of cultural, technological or economic changes? Does the manufacture of tile and brick reflect a more organized, commercialised economy or does it simply reflect the spread of a new technology? Similar questions are raised by the transition from brick to stone in the Early Medieval period. Does this reflect an increase in the cost of fuel for firing bricks, a change in cultural attitudes, or a change in the systems that produced and distributed these materials? We are not at present in a position to answer these questions, but this analysis demonstrates that important insights into economic and social developments may be revealed by further consideration of these issues.

The lack of evidence for monumental architecture, paved streets and dense urban architecture at Paithan reminds us how little is known about what Satavahana towns actually looked like, how they were constructed, whether they included large, monumental architecture and how they were laid out. Excavated sites have revealed evidence for earthen ramparts, sometimes reinforced with fired brick, and generally small and isolated units of small-scale architecture such as houses and structures of a similar scale. From an archaeological perspective, therefore, the Early Historic town still remains something of a mystery and the question of the nature of Early Historic urbanism perhaps represents one of the most important areas of Early Historic archaeological research.

The development of the temples

One of the most significant aspects of the Paithan excavations is the detailed architectural and stratigraphic investigation of the two Vakataka to Rashtrakuta period brick temples, the details of which have been set out in Chapter 4. Aside from providing an insight into the nature of brick temples of this date in Maharashtra, about which very little is presently known, these are almost the first temples of this period that have been stratigraphically excavated, recorded and analysed to the same level of detail anywhere in India (e.g. Jayaswal 2001). So, although the Paithan temples were not major monuments benefiting from royal patronage – as were the temples at Bhitari – they are well-documented examples of small to medium-sized Early Hindu temples that were built during the formative period of temple architecture in South Asia (e.g. Meister *et al*. 1988: 22). For this reason, they provide an important insight into the architectural traditions of the time.

Both temples underwent a phased architectural development before they reached their final forms, by which time they both consisted of what might be referred to as the 'standard temple plan', by which is meant a square or rectangular *garbhagriha* (cella) for the deity and an attached *mandapa* (hall) for sheltering the devotee (Meister *et al*. 1988: 22). In the case of the North Temple, the fact that it has been possible to trace the development from a relatively simple platform shrine in Phase I to a standard temple plan in Phase III might provide something of a blueprint for the way in which the standard temple plan is likely to have evolved from the 4th century more generally. This insight is certainly one of the most important contributions to arise from this study. By contrast, the South Temple, which was probably built in the 7th century –

but certainly after the North Temple had already been in existence for 200 years or more – did not undergo the same development but was planned and constructed according to the standard temple plan, which suggests that the standard temple plan had become the accepted norm in the intervening years.

In view of the significance of these questions, a few comments are offered below on the key stages in the Paithan temples' development.

The foundations

The foundations of both temples are remarkable. It came as a surprise to the excavators to encounter foundations of this scale and elaborate complexity supporting structures of such a relatively small size. The foundations are clearly in excess of what is required for the size of the building, suggesting that the rationale behind them is sacred rather than structural.

Parallels for such foundations have already been discussed in Chapter 4, where the suggestion was made that this aspect of temple construction might be a formalisation of regional, non-sacred construction techniques, thus providing a possible insight into the origins of temple-construction rituals and methods. It should also be noted that the close correspondence between the Paithan foundations and the Brahminical literature describing temple foundations suggests that the sacred formulae related to temple construction were widely disseminated and closely adhered to, even at this relatively early date.

North Temple Phase I: Mulaprasada

Phase I of the North Temple appears to have been a small, square shrine located on a brick platform. It might be seen as a more elaborate form of the square brick shrines that are known from sites such as Yelleshvarum, Nagarjunakonda and Veerapuram, and which appear to have been in existence from at least the 3rd/4th centuries AD (Khan 1963: 14–15; Sarkar and Misra 1972: 24–31; Sastri *et al*. 1984: 38–44). These simple shrines themselves might be seen, in the broader scheme of things, as representing a development towards a more permanent, brick-built manifestation of earlier wooden shrines of a type that is known, at present, exclusively from representations in relief sculpture and on coins (e.g. Coomaraswamy 1927: 83; 1930: fig. 23; 1992 [1956]: 105–109; see also Ray 2009). It is possible that the Phase I structure replaced a wooden shrine at the same location, but any such evidence would have been destroyed during the construction of the Phase I structure itself.

In considering what the Phase I structure actually looked like when it was in use, it is possible that it was the basal platform of an open-sided shrine that was covered by a roof supported on pillars: a one-storied, simplified and obviously later version of the concept depicted on stone reliefs from monuments such as Amaravati (Fig. 14.2) and Jaggayyapeta, which Shah has compared to the 6th-century temple at Gop in Gujarat (Coomaraswamy 1930: figs 30, 33; Shah 1975: fig. 9).

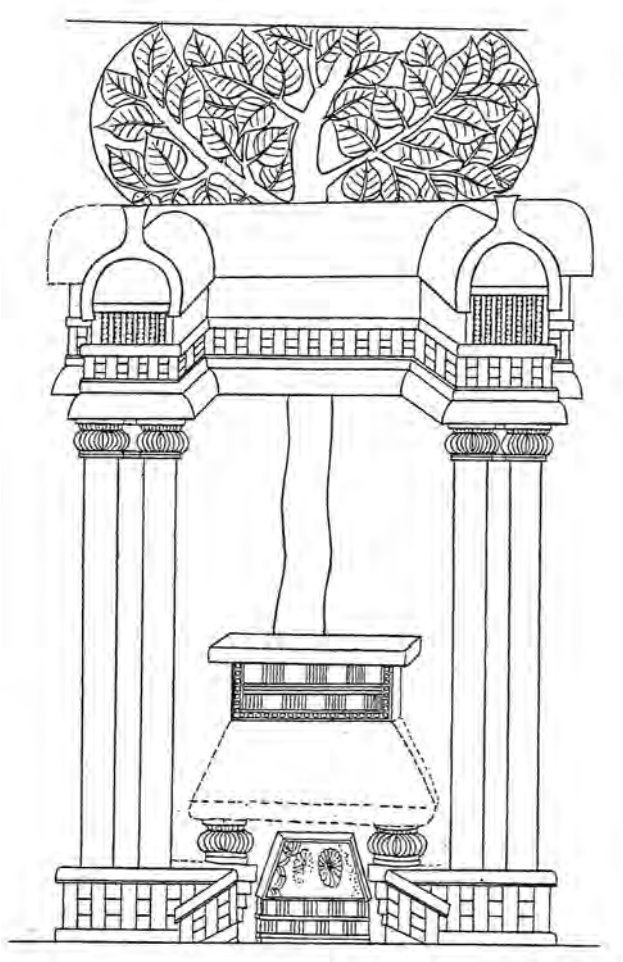


Fig. 14.2: Drawing of a shrine in a relief from Amaravati (from Coomaraswamy 1930: fig. 33).

However it looked, Phase I is the earliest evidence of any cultic activity that has so far come to light in this location. No exact parallels can be found for it, but it is possible that other such brick shrines do still exist from this period and they are encased within the later structures of brick temples, thus making them invis-

ible, except where there has been damage to the later phases of construction.

North Temple Phase II: Shikhara

As has been noted in Chapter 4, the thickened walls of Phase II of the North Temple were probably intended to support a brick *shikhara* (tower), the introduction of which – it has been suggested – can be dated to about the middle of the 5th century on the basis of parallels with temples such as Bhitargaon, Deogarh and the brick temple at Bodhgaya (Meister *et al*. 1988: 23). The *triratha* form (square with slight projections on each side) of the structure and the fact that it was probably surmounted by a *shikhara* similar to – but smaller than – Bhitargaon, suggest that the shrine underwent increased monumentalisation at this time. As with the foundations mentioned above, this development was carried out in close conformity with the prevalent pan-Indian norms of temple architecture.

It can be imagined that the resulting *shikhara*, even if only of relatively modest proportions, would have formed a prominent landmark in the surrounding landscape, probably reflecting an increased local importance of the shrine.

One key question about the Phase II shine is how access would have been gained to the deity, given the absence of an obvious entrance into the *garbhagriha*. One possibility is that there may have been window-like openings above ground level in one or more of the walls. Alternatively, it is possible that there was access from the west side, the evidence for which has been obscured by later destruction of the wall on that side.

North Temple Phase III: *Mandapa*

As Kramrisch has pointed out in relation to the Hindu temple more generally, the addition of a *mandapa* was something of an afterthought, and so it seems was the case in the North Temple at Paithan (Kramrisch 1946: 254). Here, the *mandapa* can be shown to have been a later addition. It is built of bricks which are the same size and quality as the earlier two phases, but they clearly abut or are inter-keyed with the Phase II wall. In addition, the *mandapa* foundation cut is different from, and shallower than, the Phase II foundation cut.

The development of the *mandapa* as an architectural concept is key to the formation of the Hindu temple as it is now known. As has been argued in Chapter 4, the first *mandapas* that closely resemble Phase III of the North Temple at Paithan in terms of proportions and layout first occur at the end of the 6th or the early 7th century in North India, or a little later in the Karnata-Dravida tradition, whilst by the 8th century, they had become a feature of most temples and part of the standard temple plan (Meister *et al*. 1988: 230–236, 256–260, 265–267; Hardy 1995: 67, 71, fig. 46).

At Paithan, the addition of a *mandapa* appears to represent a further stage in the monumentalisation of the shrine and its final transformation into what can be recognized as a fully formed temple. Once again, the architectural development of the structure followed closely developments that were occurring elsewhere in India, including the addition of *adhisthana* mouldings (basal plinth mouldings) to the *mandapa* wall. This is a further statement of the obvious point that, even in a relatively modest-sized temple such as this, there was close correspondence with the pan-Indian norms and rules of Hindu temple construction.

South Temple Phase I: construction

The construction of the South Temple took place some time shortly after the addition of a *mandapa* to the North Temple. This can be demonstrated by the size of the bricks, which had been consistently 7 × 25 × 40 cm through the first three phases of the North Temple but which changed to 6.5 × 26 × 42/43 cm before the construction of the South Temple and Phase IV of the North Temple and did not change again. Although using brick sizes as an absolute dating method at a regional scale is highly problematic and error prone, it is likely to be reliable when used for the relative dating of individual structure phases, as is the case here.

At the same time, the similarity in the style of the *adhisthana* mouldings in the *mandapas* of the two temples suggests that there was not a long time gap between the two construction phases. One possible interpretation of this sequence is that between the construction of Phase II of the North Temple and Phase I of the South Temple, a *mandapa* had become a recognized and expected part of a temple and was included from the planning stage rather than being added later. If this is correct, then the development of the North and South Temples presents a microcosm of the evolution of the standard temple plan through this period.

Once again, it is impossible to know whether an earlier shrine of some sort stood where the South

Temple now stands; any evidence for such a shrine would have been completely destroyed by the construction of the temple. In either case, it seems that the construction of a second temple right next to the North Temple represents a further increase in the monumentalisation of this sacred locality and highlights, once again, its growing importance.

North Temple Phases IV–V and South Temple Phases II–V: later developments

Following the construction of the South Temple, further architectural developments consist only of repairs, rebuildings, internal subdivisions and the construction of a crude perimeter wall some time later.

The North Temple saw the construction of an internal subdivision (N-IV), probably a low, raised platform in the middle of the *mandapa*, that was probably related to a subordinate deity that was placed there. It appears to be very similar in concept to Phase V of the South Temple and it is tempting to suggest that both alterations were made at the same time.

The layout of the South Temple was adapted, extended and the superstructure almost completely rebuilt in Phase IV. Nonetheless, it is key to note that, apart from a slight increase in size towards the east, there was no further significant enlargement or monumentalisation of either of the structures. This suggests that the site had reached its zenith, at least in terms of size, investment and architectural development. Indeed, the building techniques used in some of the later extensions and adaptations suggest a decline in the quality of construction and perhaps some degree of neglect or impoverishment. The latest changes in the North Temple (the Phase V platform at the western end of the *mandapa* interior against the wall of the *garbhagriha*) are extremely crude and might even be taken to indicate informal re-use of the temple for cultic purposes once the temple itself had been formally abandoned and had fallen into disrepair.

The stone perimeter wall, which appears to have been constructed some time later, seems to represent a crude attempt to enclose the temples and to define the plot on which they stand. This might reflect a change in land use immediately surrounding the temples that created the requirement to isolate them in this way. So little of the stratigraphic layers related to these later phases were left undisturbed by Yusuf, that it is impossible to say much about these developments.

Discussion

Unfortunately, with the exception of the fragmentary stone sculpture of a female found in Trench B some 70 m to the south of Trench A (Chapter 8 No. 234, Figs 8.17 and 8.18), no images or inscriptions were found directly in association with the temples that might give some insight into the nature of the cult that was practiced here. The Balasaheb Patil Government Museum at Paithan contains, however, a number of terracotta, kaolin and stone figurines that apparently come from Paithan, although it is not known exactly whereabouts they were found. Some of these are illustrated in Chapter 11 (Figs 11.6 and 11.7), and further examples are published by Morwanchikar (1985: chapter 7). Some of these are datable to about the 4th century AD based on stylistic comparisons, and these are presumably the types of images that might originally have been associated with the Paithan temples.

Whatever the nature of the cult that was practiced, it is clear that, despite the elaborate formulae that were involved in the planning and construction of these two temples (as exemplified by the careful brickwork, the elaborate foundations and the precise conformity with the rules as set out in Brahminical texts), the temples were dynamic structures, both of which were constantly adapted and re-formed throughout their lives.

In terms of the development of Hindu temple architecture, it is the North Temple that is the most interesting and significant. It developed from a simple platform shrine in the 4th/5th century and was then elaborated through the construction of a *shikhara* around the middle of the 5th century and was finally turned into a larger and more complex standard temple plan incorporating a *mandapa* with *adhisthana* mouldings in the late 6th or early 7th century. In this way, it passed through the stages of temple development that have been mapped out for the Hindu temple more generally on the basis of standing buildings of different dates (e.g. Meister *et al*. 1988: 22–24; Pichard 1994: chapter 2, fig. 4; Hardy 1995: chapter 4). The North Temple at Paithan is, however, the only temple at which these developments have been clearly shown to have taken place in a single structure.

Why the North Temple should have developed in this way is an important question. It seems quite possible that the small Phase I shrine housed a local cult image whose significance in the area attracted the patronage of a local personage, thereby allowing the cult and the structure that housed it to grow in stature throughout the 5th and 6th centuries. In suggesting

this, it is assumed that the architectural developments that have been mapped out in the North Temple were paralleled by an increased formality, permanence and institutionalisation of the cult that it housed. These trends were continued into the construction of the South Temple, which appears to take up the architectural story that had been started in the North Temple at a later stage in its development. The South Temple was conceived and constructed as a fully formed standard temple plan with *mandapa* from the start. Its presence, size and form are also likely to reflect the increasing permanence, institutionalisation and monumentality of the cult that was practiced here. Indeed, it might therefore be argued that, in some ways, the development of the two temples can be seen as an architectural palimpsest of the transformation of a 'village cult' into a 'temple cult', with its attendant formalisation and Hinduization, following the pattern outlined by Eschmann and others on the basis of fieldwork in Orissa (Eschmann *et al*. 1978: 86–89; see also Ray 2009).

Arguing that such developments took place at Paithan is therefore to argue that the Paithan cult and temples were not a unique case but rather that the developments mapped out here were linked to a broader process that was taking place at this time as cults, deities and the temples in which they were housed became an increasingly important aspect of the political and cultural institutions of Early Medieval states across India (e.g. Bakker 1992; Kulke 1978; 1995b; Willis 2009: 113–122). This theme is further explored in relation to the associated evidence for Paithan's economic development that is discussed below.

Part 2: The changing economy of the Early Historic and Early Medieval periods

An excavation such as this can provide insights into various aspects of the ancient economy. This section presents an integrated overview of the agricultural economy (as elucidated by the archaeobotanical and paleofaunal assemblages), patterns of production and consumption (as elucidated principally by pottery deposition) and patterns of coin deposition. An attempt is made to place this discussion within the broader historical context of the Early Historic and Early Medieval periods in central India.

Economic change and agricultural intensification

One of the most significant findings of the present excavations is the evidence of the way in which agricultural practice and strategy changed through the site's history. This evidence has been outlined by Fuller in Chapter 12 and can be linked to developments described by Rowley-Conwy in Chapter 13.

Fuller's analysis of the archaeobotanical assemblage provides evidence for increasing diversification, intensification, investment in and commercialisation of cultivation strategies. It also suggests a change in the organization of agricultural labour away from centralized or communally organized processing towards household-based processing. The argument for the diversification of cropping strategies is based on the increase in the diversity of crops between Periods 1 and 2 and also between Periods 2 and 3, most notably, the trend away from kodo millet, which dominated the Period 1 assemblage, towards a wider range of millets through both Periods 2 and 3, including African millets and the so-called 'S/E/B' millets. These changes are likely to be explained by the exploitation of a wider range of soil types, which are likely to have included lower-grade, marginal areas around the site with poorer soils that would not have been the first choice of cultivators but that were exploited in later periods due to increased pressure on land and food production. The argument for intensification is based on the evidence for an increase in winter crops, especially winter pulses, such as chickpea, grasspea, pea and lentil, that would have allowed double-cropping of the same land that was used for other crops in the summer but would also have allowed a reduction in the length of the fallow periods between crops due to their nitrogen-fixing characteristics. As for investment, as Fuller points out, the increased exploitation of winter crops in an area such as Maharashtra, which experiences relatively low levels of winter rainfall, would almost certainly have required the construction of some form of irrigation such as tanks, canals and/or wells, which would have required technical knowledge as well as the investment of money and labour. Fuller's argument for the growing commercialisation of the agricultural economy is based on the continuing trend of increase in the amount of cotton at the site from Period 1 to 3 and the assumption – because textiles are labour-intensive and therefore imply surplus production beyond subsistence – that cotton is indicative of 'cash-cropping', or production

for commerce rather than for local consumption. This certainly seems to have been the case in the Mughal period (Habib 1999: 43) and it should also be noted that the Periplus specifically mentions cotton from Tagara (Ter) being transported by cart overland to Barygaza on the coast (Casson 1989: 82–83), although the commerce might also have been directed towards more localised markets. Of course, it is possible that some cotton production was also for household consumption, but, as Fuller points out, the continued occurrence of charred cotton seeds in archaeobotanical samples from urban contexts is probably indicative of larger-scale production. In addition, Fuller notes that African millets, which had been cultivated in low quantities in the region since the Chalcolithic, but which show a trend of marked increase through Periods 2 and 3, would have been cheaper to process and might therefore indicate an increase in commercial considerations amongst cultivators or the landowners that controlled agricultural production. The argument for a shift towards household-based production is based on the presence of weed seeds. Fuller points out that the increased numbers of weed seeds in the archaeobotanical assemblage probably results from an increased degree of crop-processing being carried out on site in the latter two periods. This he interprets as being indicative of a change from a more centralized or community-level organization of agricultural labour in Period 1 towards an increasing emphasis on smaller, household-level organization through Periods 2 and 3, with the most significant shift apparently occurring between Periods 1 and 2.

As for the palaeofaunal evidence, in his analysis, Rowley-Conwy has set out a number of points, the most significant of which is a continuing decline in the amount of pig and the commensurate increase in the consumption of sheep/goat between Periods 1 and 4. This very clear, long-term trend raises two obvious questions: how might this shift be interpreted in terms of broader agricultural and economic strategy? And can it in any way be linked to the trends identified by Fuller in the archaeobotanical assemblage?

Firstly, it needs to be stated that there are no grounds for using the decline in pig bones as an 'ethnic index fossil' with which to identify the presence of Muslims at Paithan as the shift away from pig began between Periods 1 and 2, which is obviously far too early for Islamic practice to have been a contributory factor. Neither is it possible to identify any other obvious cultural or social factors that might have acted at this period and over such a duration of time to cause comparable shifts in meat consumption – the likelihood is therefore that the rationale behind this change is economic.

Indeed, if we consider how pigs and sheep/goats tend to be kept and fed, there are some obvious potential links between a decline in pig husbandry and the changes in cultivation strategy identified by Fuller. The increasingly extensive agricultural exploitation of the area around Paithan suggested by Fuller's evidence would very likely have resulted in a reduction in the amount of scattered micro-environments that are suitable for foraging by pigs, for example areas of woodland and patches of disused, overgrown and poor-grade land. This would have made the feeding of pigs more difficult and potentially more expensive and may have led to free-foraging pigs posing an increasing threat to crop fields close to settlements. Such tensions can perhaps be seen in the Laws of Manu (on the dating of which see below), a text that defines an area around villages and towns within which it is the responsibility of the cultivator to maintain good fencing, without any gaps 'that a dog or a pig could put his muzzle or snout through' (Laws of Manu 1991: 8.237–244). At the same time, there would have been an accompanying increase in crop residues such as straw and haulm from the expanding cultivated areas, and it is exactly these types of residue that are ideal for feeding goats and sheep, although they are not at all suitable for pigs. Indeed, crop residues are still important today in many parts of India for feeding goats and sheep as a traditional part of crop-livestock interaction strategies (e.g. Geerlings 2001: 36–38; Singh *et al.* 2007: 41–36).

This makes clear one potential link between the trends defined in the archaeobotanical and palaeofaunal assemblages by illustrating how much more easily sheep and goat husbandry could have been integrated into the more extensified cropping strategies of Periods 2 and 3 than pig husbandry might have been. But this is not the whole story. It may also be that intensified demand for meat made sheep and goats a better option than pigs. In order to explain this, it is necessary to look at evidence from the Levant, a region where a considerable amount of analysis of palaeofaunal remains from archaeological sites has been carried out, which has led to the development of a number of theories about the significance of pig husbandry and the possible reasons behind its decline in certain periods, some of which are directly applicable to the Paithan evidence. In the Levant, it has been argued that pigs played an important a role in certain quite specific types of agricultural strategy and that changes

in the levels of pig consumption can be indicative of changes in broader economic structures. Generally, and for reasons that will be further outlined below, evidence for high levels of pig consumption is thought to be indicative of localised, relatively low-intensity, subsistence-based, small-holder economies that are poorly integrated into broader market structures, whilst lower levels of pig have been taken to indicate higher-intensity, more commercialised economies that are better integrated into broader market structures (e.g. Redding 1991; Zeder 1996: 298–299, 306–309; Hesse and Wapnish 1997: 238–253).

To understand why this is, and why it might also be applicable to Paithan, we need to consider an imaginary Paithan small-holder, who kept a few pigs that were fed on household refuse and let out to forage during the day. This would have been a cheap and effective way of producing small amounts of meat for the family. Pigs breed and grow quickly, their meat is high in calories and fat and they could have been kept and fed at little or no cost if they were kept in small numbers (Zeder 1996: 300–303; Singh *et al*. 2007: 37). A problem would have arisen, however, if it had become necessary or desirable to increase meat production significantly, for example due to the wish or need to sell commercially. Keeping a number of pigs larger than could have been fed from household refuse and free foraging would have immediately meant that it would have been necessary to provide water, shelter, containment and especially feed, all of which would have required expenditure and investment. This would have been especially true if patches of woodland and other suitable pig-foraging areas around the settlement were being cleared, fenced and brought under cultivation, as it seems from Fuller's evidence they were. Goats and sheep would have had the advantage of being able to fallow graze, feeding on crop residues whilst a large herd of pigs would have consumed foods that would have needed to be specially produced or purchased. Goats and sheep also have the advantage of being more comfortably mobile than pigs. Mobility was potentially a key issue as it would have allowed goat and sheep pastoralists to move herds and flocks several kilometres (or even tens or hundreds of kilometres), either on a daily basis 'scout-browsing' or seasonally throughout the year as part of a longer-distance transhumant migration strategy. In both cases, herders would have been able to take advantage of more widely scattered grazing resources with sheep and goats, thereby permitting higher levels of livestock production than would have been possible on the basis of locally available resources alone.

The potential value of goat and sheep mobility is further increased if the availability of fallow-grazing around the site was being reduced by double-cropping, as Fuller's evidence again suggests was the case at Paithan. The Raika, a group of sheep pastoralists in contemporary Rajasthan, provide a modern illustration of mobile pastoralist strategies and their interaction with double-cropping cultivators (Agrawal 1999; Geerlings 2001). In studies of the Raika, it has been noted that a shift to irrigated double-cropping has led to a reduction in the availability of fallow-grazing and a commensurate rise in the distances moved by pastoralists each day, and the numbers of pastoralists practicing longer-distance transhumant migration (Agrawal 1999: 14; Geerlings 2001: 37–38; Robbins 1994: 10). Of course, strategies such as those used by the Raika involving regular, long-distance movement would be completely impractical with pigs.

In the light of these points, the decline in pig and the increase in sheep and goat consumption identified by Rowley-Conwy make perfect sense in relation to the changes in cropping practices that have been outlined by Fuller: both are likely to have resulted from pressure to expand and increase production and both may possibly reflect a shift towards a more commercially oriented, cash-cropping economy.

It also needs to be pointed out that the changes in agricultural strategy that have been outlined above are likely to have been accompanied by changes in social relationships. For example, according to the argument made above, the increase in mobile goat and sheep production would have led to the emergence of specialist, mobile or semi-mobile sheep/goat pastoralist groups similar to the modern-day Raika mentioned above. It is unclear whether such groups would have been those pushed to the margins by the expansion of cultivation or those being brought in to the margins of cultivation from the outside, as outlined by Ludden (1999: 72). In either case, the emergence of specialist groups in one area of the economy is likely to have been accompanied by a degree of specialization more widely across society in order to allow for the production of surplus that could be traded for sheep/goat meat. In short, the archaeobotanical and paleofaunal evidence may reflect a long and slow shift from a subsistence-oriented economy to one that was increasingly specialized and possibly commercialised.

In this context, it is interesting to consider the point made by Fuller in relation to the evidence for a shift

towards greater numbers of crops being processed in individual households rather than communally or centrally. Might this development (the evidence for which, it must be noted, is still very limited) reflect the sort of transformation that Chakravarti has in mind when she describes 'the emergence of the family as the basic producing unit' in agriculture'? (Chakravarti 1996: 93). Of course, Chakravarti's comments were made specifically in relation to the *gana-sanghas* of north-eastern India and she saw the developments she describes as being linked to a number of other very profound social and political changes, including the emergence of private control over land for the first time. Less is known about the social and political configuration of the Paithan region than is known about the area of the *gana-sanghas* in the earliest periods represented in this sequence, but it is quite possible that some of the same developments took place in both areas, even if at slightly different periods.

The status of pigs

Before moving on, it is worth making a few comments on the social and cultural status of pigs in India. By world standards, India's pig population has traditionally always been low, although it has been growing significantly since the 1960s mainly due to modern, large-scale production systems (Tisdell and Gali 1999: 7, table 1). Today, pigs are a relatively insignificant part of the Indian livestock industry, making up less than 3% of the total cattle, buffalo, goat, sheep and pig population in 2003 (Fig. 14.3), a figure that is, in fact, remarkably close to Rowley-Conwy's figures for Period 4 at Paithan. How long this has been the case is unknown, but low levels of pig husbandry were also noted by Fa-Hsien, the Chinese Buddhist traveller who visited India in the 5th century AD and who was led to comment that people in India did not keep pigs or fowls at all at that time (Fa-Hsien 1923: 21). In most parts of modern-day India, largely due to their low-maintenance costs, pigs are kept in small numbers by underprivileged and landless groups for whom they provide income and food (Singh *et al.* 2007: 37, 49). They are primarily left to free-forage, exploiting all available food sources in exactly the same way as the imaginary Paithan small-holder discussed above might have operated, except that, now, these food sources also include sewage drains and rubbish dumps. Perhaps because of these habits, pork has long been regarded as a low-status, low-value food and upper-caste Hindus have tended to shun it.

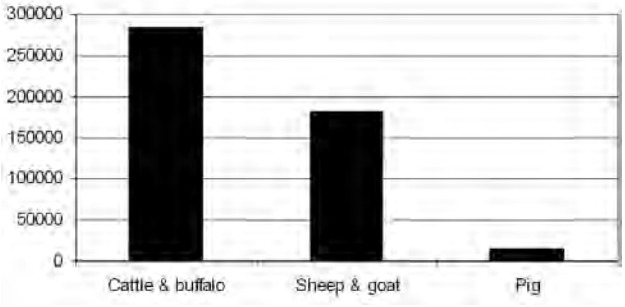


Fig. 14.3: Numbers of Indian livestock (1,000s) from the 17th Livestock Census of 2003 (source: FAO 2001–2003).

Interestingly, pigs are also associated with low commercial value and low social status in some ancient texts, for example the Arthashastra and the Laws of Manu. Because of its nature, the Arthashastra has little to say on the polluting nature of pigs, but it does set the fine for stealing or killing a pig at 54 *panas*, which is the lowest level for any livestock (the same as a dog, cat or cock) and is 1/11th of the 600 *pana* fine for the theft of a cow (Arthashastra 1987: 4.10.2–11). In almost all instances where pigs are mentioned in the Laws of Manu, they are regarded as low-value or unclean and polluting animals, and this is reflected in the fact that one of the most common terms for them is *vidvaraha*, literally 'shit-boar' or 'dung-heap pig' (Laws of Manu 1991: 3.190, 3.239, 3.241, 5.14, 5.19, 11.155, 11.157, 11.200, 12.55). Along with dogs, they are protected by a fine of only one *mashaka*, which, based on a *mashaka* being worth 1/16th of a *pana* (van Schrötter 1930: 548; Laws of Manu 1991: 8.132–7; Arthashastra 1987: 109, 327 (2.12.24), 767 (2.19.2–7)), is 1/3,200th of the 200 *pana* fine for small cow and 1/8,000th of the 500 *pana* fine for a large cow (Laws of Manu 1991: 8.290–8).

Bearing in mind the often complex symbolism linking animals and social status in Indian literature (e.g. Doniger 2009), the Arthashastra and Laws of Manu suggest that pigs were already the lowest-valued livestock by the 2nd to 4th centuries AD (to which broad period these texts are to be dated following, most recently, Willis 2009: 62, 204–206 and Bronkhorst 2011: 2, 65–74). Of course, as the Paithan sequence has clearly demonstrated, by this time, pig consumption had already decreased markedly from a much higher point during the pre-Satavahana period. The question that must therefore be asked is how were pigs perceived socially in the pre-Satavahana and Satavahana

periods when they appear to have been a much more important component of the agricultural economy? It should certainly not be assumed that the low social status and economic value that have been noted above can be applied to this earlier period. Indeed, it is quite possible to imagine that, as the economic importance of pigs declined in favour of sheep and goat during the Satavahana period and later, they became increasingly associated with poor, low-status social groups and it was this association that was ultimately the cause of the low status and low value that was attributed to them by the time the two texts mentioned above were composed.

Paithan's agricultural economy in its broader context

From the discussion above, it can be seen that the developments documented by the Paithan archaeobotanical and paleofaunal sequences provide evidence of a dynamic rural economy that evolved in all its aspects, from cropping and crop-livestock interaction strategies to the processing of harvests. This dynamism gives the lie to the notion of a stagnant, unchanging rural economy that has sometimes been projected onto India's ancient countryside. Instead, we are given a picture of an economy that seems to have continually been under pressure to increase production. The changes that were made in order to achieve this were not based on the introduction of new crops – for which there is no evidence at all – but on complex re-configurations of cropping strategies, crop-livestock interaction strategies, group specializations and infrastructure development.

The insights that have been provided into Early Historic and Early Medieval agricultural strategies are possible because the archaeobotanical and paleofaunal assemblages were rigorously and systematically collected through a carefully implemented sampling programme – which included flotation for the archaeobotanical material – and were quantitatively analysed in relation to each other and to the site's stratigraphic sequence. Such an approach has hardly ever been applied to Early Historic and Medieval levels in India. The few published reports from excavations of these periods are based on small samples and consist mostly of basic presence-or-absence reporting of species. These allow the identification of newly introduced species, but they do not allow any insight into changing agricultural strategy (e.g. Kajale 1994: table 2.2; Fuller 2002: 249–269). At the present time, there is therefore no other archaeological sequence that has been studied in this way, making it impossible to know whether Paithan is typical of broader regional developments or whether it is, for some reason, a unique case.

This is also the reason why the history of agriculture in Early Historic and Medieval India is, to date, based almost entirely on historical, epigraphic and art-historical sources (e.g. Gopal 1980; Randhawa 1980; Ludden 1999; Gopal and Srivastava 2008). Whilst these sources provide many important insights into some agricultural practices, they are – by their nature – incapable of providing a sustained and detailed narrative of the development of agricultural strategies across long periods of time. The reasons for this are obvious and can be summarized under the following headings:

- they generally lack the level of detail required to gain a full insight into the agricultural strategy of any one time or place, or indeed to allow comparisons between different times and places;
- they are, by their nature, unsystematic and in some ways biased in the type of information that they record; for example they tend to concentrate on the activities of literate groups rather than smaller rural farming communities;
- they are arbitrarily scattered across the historical time-scale so that some periods are quite well covered, whilst others are hardly covered at all;
- there are uncertainties about the historiography, date and reliability of many of the key texts.

Nonetheless, it is worth considering how the developments outlined at Paithan relate to the broader historical understanding of the development of Indian agriculture during the Early Historic and Early Medieval periods that have been gleaned from historical sources. Whilst there are a number of studies of specific periods and places in the scholarly literature, there are relatively few attempts at a comprehensive history of Indian agriculture that spans the Early Historic and Medieval periods. In this respect, M. S. Randhawa's *A History of Agriculture in India* (1980) and D. Ludden's *An Agrarian History of South Asia* (1999) are well-known and widely cited studies which draw together the most significant research up to the time when they were each written (e.g. Ludden 1999: 231–248). Using these two works, let us start by summarizing the consensus on the historical development of Indian agriculture through the period with which we are concerned. The development is generally portrayed as being based around a number of distinct historical phases. Initially, the so-called 'Vedic'

and 'later Vedic' periods are seen as encompassing a general shift away from pastoralism towards settled agriculture and a peasant economy, specifically in the Ganges valley and northern India (Randhawa 1980: chapters 19–20; Ludden 1999: 61–3; see also Thapur 1984). The Magadhan and Mauryan periods are seen as a time during which agriculture was expanded and intensified under state authority and collection of surplus around core urban areas, whilst the transition from pastoralism to settled farming went on gradually elsewhere – 'islands of farming in a sea of pastoralism' as Ludden puts it (1999: 65; Randhawa 1980: chapters 21–26; see also Thapur 1984). Little is said on the Satavahana period by either work (Randhawa 1980: chapter 27; Ludden 1999: 64; but see Ray 1986: chapter 4). The Gupta/Vakataka period is portrayed as a period of 'conquest by farming' involving the foundation and endowment of temples, the settlement of Brahmins and the clearing or enhancement of previously uncultivated or under-cultivated areas along with the cultural and political integration of the groups inhabiting them. It is generally argued that landholding became key to social status and political power during this time and some have argued that agricultural yields increased markedly (Ludden 1999: 64–65; Randhawa 1980: chapter 29; see also Digby 1982; Sharma 1987: chapter 10; Shrimali 1987). The Early Medieval period is seen as a period when emerging localised kingdoms expanded cultivation as the foundation of their power, especially through the development of irrigation infrastructure, some of which is recorded by inscriptions (Randhawa 1980: chapters 31–34; Ludden 1999: 69–76; e.g. Chattopadhyaya 1973[1994]; Kulke 1995b: 240).

There are some obvious problems with this still very basic narrative, for example the date of some of the key sources used, e.g. the Arthashastra for the Mauryan period (Willis 2009: 62), the general lack of detail relating to crops and strategies and the fact that the nature of the sources differs considerably for each period, as does the information they contain, which obviously makes *longue-durée*, comparative perspectives problematic. It is also notable that some periods hardly appear in these broad narratives – for example the Satavahana period – although such voids probably reflect the relative lack of available historical sources rather than the fact that no significant developments in agriculture occurred. Another problem, and one that is emphasized from a wider review of the literature, is that 'agrarian expansion' is a phenomenon that is claimed for almost all periods in Indian history: pre-Mauryan (e.g. Chakravarti 1996: 16–20), Mauryan (e.g. Thapur 1984: 123–125), Satavahana (e.g. Ray 1986: chapter 4), Gupta/Vakataka (e.g. Sharma 1987: chapter 10) and Medieval (e.g. Kulke 1995b: 252, 262). Is this a reliable picture? It might accurately reflect a long, steady underlying process of population growth and land clearance that spread across the subcontinent, beginning with the first farming communities and continuing, with possible scattered interruptions, until relatively recent times – a process that is, of course, only unevenly recorded in historical texts and inscriptions. However, it might not be accurate; it might simply reflect the fact that new land clearances, settlements and land endowments are much more likely to be recorded in texts and epigraphic sources than are episodes of steady-state agriculture, declining production and the abandonment of agricultural land. Reality might therefore have been much more complex. This is an important question, but it is one that can only be resolved through the accumulation of more detailed archaeobotanical and archaeological evidence against which to compare the historical record.

Developments between the pre-Satavahana and Satavahana periods (Period 1 to Period 2)

Focussing in on the Paithan region, Ray's very useful review of agriculture in the Satavahana Deccan describes an 'expanding rural economy' that served as the agricultural base for Satavahana rule in the Deccan (Ray 1986: 92–104). She acknowledges that details of crops are lacking from the historical sources and must be made up by the still very thin evidence from excavation at sites such as Nevasa, Bhokardan and Ter, where the presence of crops such as wheat, barley, rice, millets, sorghum and *Ziziphus* is recorded. Ray is, however, able to point to texts, inscriptions and numismatic evidence which testify to the existence of irrigation systems, such as water tanks, water wheels and wells. These facilities, she suggests, were privately controlled even if their construction might have necessitated the patronage of wealthy or royal individuals. Attempting to filter out those of her conclusions that are based solely on the Arthashastra (which is largely post-Satavahana; see above), she also points to the reclaiming of waste land and to the numerous inscriptions that indicate the private ownership and transfer of land that, on the basis of Jataka stories, she suggests might have been farmed either by the landowner himself or by waged labour or slaves. Inscriptions also

record the donation of land and land revenues to monasteries or to Brahmins. Initially, in the 1st century BC, this appears to have been a royal prerogative, but by the 1st century AD, increasing numbers of inscriptions record the donation of land by lay devotees, although the majority of these are in the region of Junnar.

Some points from Ray's analysis are clearly worth emphasizing in relation to the Paithan evidence. The first relates to the advent of private land ownership, the second to the development of irrigation and a third to the improvement of agricultural methods through land grants to the *sangha* (Ray 1986: 93, 95, 101). In all of these cases, it is possible to see a context for the changes in agricultural practice that have been identified at Paithan between Periods 1 and 2. Firstly, the advent of private land ownership and the rise of the *gahapati* as a group of land-owning cultivators (of various scales of wealth), which is suggested by inscriptions at sites such as Junnar, Kanheri and Nasik, might be linked to the transition towards the increase in household-based processing of crops and also to the spread of cultivation into marginal areas as individual small land owners sought to maximise the exploitation of their land (see also Chakravarti 1996: 93). Certainly, the increase in weeds that Fuller has identified appears to be more marked between Periods 1 and 2 than between Periods 2 and 3, suggesting that the transition to household-based processing was most prevalent at this time. Secondly, Ray points to evidence for the development of irrigation that comes from coins and inscriptions. Although she suggests that this is likely to have taken place under the control of the king or rich landowners due to the difficulty and expense of creating irrigation systems, this nonetheless provides a context for Fuller's suggestion, based on the increased use of winter crops in Period 2, for the presence of irrigation infrastructure given the relative lack of rainfall in this part of India. Thirdly and finally, royal land grants to the *sangha*, which are recorded by inscriptions, are suggested by Ray to have been part of a deliberate policy intended to improve agricultural yields and would presumably have led to the adoption of new agricultural techniques brought by the *sangha* from other parts of India. An example might be new cropping strategies that were designed to maximise yield and/or profit, which might be reflected in the increase in the diversity of crops and the increased use of the more commercially viable African millets. Such innovations were possibly outside the grasp of many of the smaller-scale subsistence cultivators whose horizons are likely to have been quite narrow and whose scope for innovation more limited.

An important exception to the general lack of archaeological evidence for agricultural practice at this time is Shaw's recent work around Sanchi and Vidisha, some 500 km to the north of Paithan but in a roughly similar geographical setting to the central Godavari valley basin. Using a landscape-archaeology approach integrating field survey with environmental sampling, Shaw has argued for a marked intensification of agricultural production in this area in the late centuries BC, at the time when Buddhist monasteries began to expand beyond their original nucleus in the Ganges valley. She argues that the intensification of agricultural production was part of a package of cultural and economic developments that accompanied the westward spread of Buddhism, urbanization and the development of centralized state polities at this time. Key to Shaw's model are the numerous earthwork irrigation dams that, she argues, were constructed to permit wet-rice cultivation. Aside from being part of an eastern Indian cultural package imported alongside Buddhism, wet-cultivated rice would have had the advantage of yields up to 11 times greater than might have been obtained from un-irrigated wheat. Shaw suggests that it was the resulting increased surplus that effectively underwrote the growth of population, towns and Buddhist monasteries in the area (Shaw 2007: 233–262).

This is a compelling and well-argued model which, whilst engaging with previously established models, provides a totally new perspective on the study of the Early Historic rural economy of this part of India. As Shaw admits, however, there are some aspects that are still open to debate, and one of these is certainly the significance that is attached to rice. Although the arguments for rice make perfect sense, Shaw was unable to provide any direct evidence for its cultivation, relying instead on economic logic, possible cultural associations and the fact that the waterlogged environment that was identified through environmental sampling accords closely with what would be expected in an area of wet-rice cultivation.

Rice has certainly been identified in Early Historic levels from at least ten excavated sites in India (see Table 12.2) but at most of these it is unfortunately not possible to gain any clear sense of how abundant it was compared to other staple crops. For example, Kajale notes that rice was particularly abundant in Satavahana levels at Adam, but detailed data are not presented, making it impossible to assess the reliability

of this evidence, which may be affected by taphonomy, sample size and the presence of wild rice (Kajale 1994: 45–46).

In this respect, the Paithan evidence is potentially very significant. Although Paithan and the upper Godavari are some distance to the south of Sanchi and Vidisha, inscriptions make clear that they were closely connected and were part of the spread of Buddhism and Buddhist monasticism by the time the Sanchi dams were being constructed (Ray 1986: 53, 68). Indeed, being an important Satavahana centre, Paithan is likely to have been fully engaged in the major economic, cultural and political developments of the time. The low relative frequency of rice in the Paithan archaeobotanical assemblage indicates, however, that it was not common enough to have had the economic impact that Shaw proposes – at least in this area. Indeed, Fuller has concluded that rice at Paithan must have been a high-status or special-use crop alongside the staple millets and pulses, rather than a staple crop itself. This is true for all periods at Paithan, the earliest of which are contemporary with Shaw's proposed dates for the construction of the Sanchi dams (Shaw 2007: 240–241). Although the western Deccan traditionally has one of the lowest levels of rice cultivation in India (Spate and Learmonth 1967: 694), this evidence might nonetheless suggest that it is necessary to reconsider the importance of rice in the model proposed by Shaw.

As Fuller has pointed out, the evidence for an increasing reliance on winter pulses in Periods 2 and 3 at Paithan suggests an increasing dependence on double-cropping and artificial irrigation through those periods. Of course, as was famously reported by Megasthenes, as early as the late 4th/early 3rd century BC, double-cropping has long been a feature of South Asian agriculture (Strabo 1930: 15.I.20; McCrindle 1926: 52–53; e.g. Kajale 1984: xi). However, the key question is not whether or not double-cropping was practiced but rather how significant it was to the agricultural strategies of any particular time. Indeed, Shaw does consider the possibility that the Sanchi dams were intended to support double-cropping but rejects it on the basis of the somewhat circular argument that it would not fit in to the wet-rice cultivation cycle that she proposes (Shaw 2007: 250). Taking into consideration the chronological ambiguities in both the Paithan and Sanchi/Vidisha phasing and the potential time lag and environmental differences between the two areas, the Paithan evidence suggests that the increased use of irrigation that Shaw has identified might just as easily have been linked to the expansion of double-cropping as it was to rice cultivation.

Developments between the Satavahana and Vakataka/Rashtrakuta periods (Period 2 to Period 3)

From about the mid-4th century AD copper-plate inscriptions recording land endowments to Brahmins and temples began to be issued in significant numbers across India from Tamil Nadu to Malwa (Willis 2009: 81). Such endowments continued throughout the Early Medieval period, during which time it is generally thought that they were linked to very significant agrarian expansion and intensification across many parts of India. They led to virgin, forested land being cleared and brought under cultivation for the first time in areas such as Orissa, Bengal and South India as well as parts of the Deccan and central India, whilst in other areas, such as Madhya Pradesh, Gujarat and Maharashtra, including, presumably, the upper Godavari region surrounding Paithan, which had already been urbanized and widely cultivated for several centuries, the endowments encompassed land that was already under cultivation and included villages and farmhouses (Kosambi 1956 [1975]: 301–302, 321; Sharma 1980: 29, 31–34, 222–3; 1987: chapter 10, appendix 1; 2001: 13, 31–32, 108–112, 291; Shrimali 1987). In some of the latter cases, such donations consisted of an entire village but in others, much smaller units were involved, for example a field, a well or a disused orchard. It is in these areas that Sharma believes land grants, rather than being linked to a geographic expansion of agriculture, led instead to increased production through better techniques, improved methods of animal husbandry, an increase in the varieties of crops grown and the construction of irrigation systems (Sharma 1987: 172–174; 2001: 108–112).

Many of Sharma's points seem to resonate closely with changes in the Paithan sequence noted between Periods 2 and 3. As far as irrigation is concerned, one notable point is that the increase in winter pulses that Fuller has identified appears to be much more marked between Periods 2 and 3 than it is between Periods 1 and 2 (e.g. Figs 12.2 and 12.3), and it seems likely that this reflects an increase in irrigation systems at this time. Chattopadhyaya (1973 [1994]) has examined the development of irrigation systems in Early Medieval Rajasthan and has considered the changes in cropping strategies as well as the implications for the social and political organization of the communities where these

systems were introduced. Chattopadhyaya's study is based on a different region of India and a slightly later period. Most significantly, it is based almost entirely on evidence from inscriptions, which can perhaps be expected to emphasize the predominant royal involvement that he notes (1973 [1994]: 52). There are no such inscriptions known from the Paithan region which suggests that in some areas, the introduction of irrigation systems may also have taken place within different social and political spheres.

The copper plates and the land endowments that they record have been interpreted in various ways by historians. D. D. Kosambi and R. S. Sharma, taking a Marxist perspective, have seen the change in land ownership that they record as part of the feudalization of Indian society and economy during the Early Medieval period (Kosambi 1956 [1975]; Sharma 1980; 1987: chapter 10; 2001; *contra* Sircar 1974: chapter 2; see also Kulke 1995a: 6–18). Other scholars, such as H. Kulke (1978; 1995b), H. Bakker (1992) and M. Willis (2009), for example, see them as part of a complex socio-political process that, through the settlement of Brahmins, the Sanskritisation of 'tribal' groups and the foundation of temples, helped to establish, legitimise and expand the authority of Early Medieval kings and kingdoms (Kulke 1995b).

Many of the ideas on which this latter interpretation is based come from fieldwork originally conducted by Eschmann and her colleagues at Jagannath in Orissa, which focussed particularly on the transformation and Hinduization of a forest, 'tribal' community (Eschmann *et al*. 1978). Perhaps for this reason, the model relates particularly to the transformations that took place in outlying, forested areas, rather than in the agrarian regions that were already cultivated and settled at that time (e.g. Kulke 1995b; Willis 2009: 159). Indeed, as Bakker has pointed out, it seems that it was precisely in these outlying areas that most of the estates donated by the Vakatakas were located (Bakker 1992: 91). Bakker also notes that the strategy and process would have been quite different in the core agrarian areas, the areas he refers to as the 'political, religious and economic fundament' of the Vakataka elite (Bakker 1992: 88–90). In such areas, there were few forests to clear or 'tribal' groups to settle, instead – from an economic perspective at least – it would have been a question of improving agricultural yields through the introduction of new methods and strategies, the enhancement of land that had already been under cultivation for some centuries and the improvement of infrastructure.

This is precisely the type of area Paithan and the surrounding upper Godavari must have been at this time, as is made clear by the mention of Paithan in historical and epigraphic sources and by the density of surrounding Satavahana-period settlement (Ray 1986: 25, 68–69, 72). In fact the core area of Vakataka land grants is over 200 km to the north-east of Paithan, and there is, at present, no evidence of endowments having been made any closer during this period (Shrimali 1987: 48, map 2), although, of course, they are known from later periods, as is recorded by the two Rashtrakuta-period copper-plate charters mentioned by Bhandare in Chapter 2: one in the late 8th century and one in the early 10th.

Building closely on the so-called 'processural' model of Early Medieval state formation in which Brahmins are seen, amongst other things, as conveyors of improved agricultural methods (Kulke 1995b: 240), Willis has recently explored the issues surrounding the establishment of Sanskritic worship and the endowment of temples in the Gupta/Vakataka period (2009; see also now Bronkhorst 2011). In this work, he makes a number of points and provides a number of examples that might help towards a better understanding of the Paithan evidence. His analysis makes the same distinction between, on the one hand, the establishment of new estates in forested areas that had the potential for agricultural development but which had been left undeveloped and, on the other hand, areas, such as that around Vidisha, where intense agricultural development had been in place since long before the Guptas and in which there was no need to create new estates (Willis 2009: 159–161). In relation to areas in the latter category, Willis explores a Gupta example from the early 6th century where administrative and priestly control was imposed on a pre-existing village in order to support the construction and maintenance of a new temple (Willis 2009: 120). In this case, it is actually a consortium of merchants headed by a priest that came to control the village and its land. Willis suggests that it is likely to have been the merchants who managed the endowed land and revenues, thereby instituting changes that would have affected all levels of village life. Such an arrangement is very likely to have led to an increase in agricultural production because people such as these, in bringing knowledge and experience from other regions, would have been in a position to introduce new agricultural techniques and strategies (Willis 2009: 157–162). They may also have brought a focus on more market-oriented production.

Willis' example therefore provides a historical scenario that potentially allows us to link the changes in the Paithan archaeobotanical and palaeofaunal sequences with the foundation and construction of the two temples at the site. Even though the Paithan temples are relatively small and there is no evidence of royal endowment associated with them, they serve to link the Paithan sequence with the period of royal endowments and the settlement of Brahmins that occurred across India at this time. Even if Paithan was not directly involved, the innovations and ideas that were transported as part of the movement of Brahminical groups would soon have become common knowledge and would have been taken up by a wide variety land owners and cultivators. This scenario therefore provides a tentative historical context for the changes in agricultural strategy that are visible in the Paithan archaeobotanical sequence.

At the same time, the Paithan evidence considerably enhances the Kulke/Willis scenario by providing precise insights into the nature of the agricultural changes that were occurring at this time. Here, we have an indication of how it would have been possible to have increased agricultural production in what Kulke refers to as the ecologically favourable riverine landscapes that had long been under cultivation – this reflects the earliest stages of Kulke's model, and the stages about which least is known (Kulke 1995b: 234–242). Elsewhere, and possibly as a later stage, in the peripheral areas outside the riverine heartlands, agricultural production was increased by the very different method of clearing forest and bringing land under cultivation for the first time (e.g. Hinüber 2007: 192, note 38; Kulke 1995b).

Longer-term changes

It has been possible to show how Ray's analysis of evidence from Satavahana inscriptions and Willis' analysis of endowments in the Gupta/Vakataka period might provide historical context for the developments in agricultural practice that have emerged from the Paithan sequence. Even if an increase in agricultural production was not the main intention of land endowments (e.g. Bronkhorst 2011: 91), they might nonetheless suggest a mechanism for the spread of new agricultural ideas across India. This is a useful model, and it has the added attraction of locating the Paithan archaeobotanical and palaeo-faunal sequences within the broader context of Indian history.

It is far from certain that this model is correct, however. The problem is that many of the agricultural changes identified at Paithan appear to be long-term and to have continued at a similar rate between Periods 1 to 2 and Periods 2 to 3, for example the increases in cotton, African millets and S/E/B millets. This suggests the possibility that some changes were driven by longer-term processes (for example population growth) and were largely unrelated to an influx of new ideas through land endowments. It suggests that they might in fact be a sort of Malthusian, *longue durée* backdrop to historical developments rather than a consequence of them. This is an important point because it brings up the question of the relationship between the lives of small-scale *gahapati* and village cultivators and the broader historical and political structures of the time. Unfortunately, it is impossible, at present, to disentangle this issue because land endowments are known to have taken place through all three periods of the Paithan sequence (Bronkhorst 2011: 85–90; Ray 1986: 100–104) so the effects of their commencement cannot necessarily be identified at any particular point in the sequence.

This discussion also raises the problem of how changing practice is identified in an archaeological sequence such as that at Paithan. Although the sequence is actually made up of a gradual accumulation of thin layers, each of which contains a small amount of archaeobotanical and palaeofaunal material, these have to be artificially amalgamated into 'Periods' in order to create assemblages that are large enough to allow differences to be perceptible. This amalgamation means that we are able to look at the sequence only through the artificial prism of periodisation that has been imposed on it. One of the drawbacks is that it is impossible to distinguish between slow, steady change that took place gradually over a long period of time and abrupt, sudden change that took place as the result of a specific historical occurrence. It is also impossible to be certain exactly when any particular change began to occur. For example, the increase in cotton and weeds that Fuller has observed between Period 1 and Period 2 may have been the result of a gradual change in agricultural practices that began in Period 1 (or perhaps even earlier), or it may have been the result of a more abrupt change that was implemented as the result of a specific event at some time during Period 2. The fact that the increase in cotton and weeds both continue between Periods 2 and 3 might suggest that a gradual change in agricultural practices

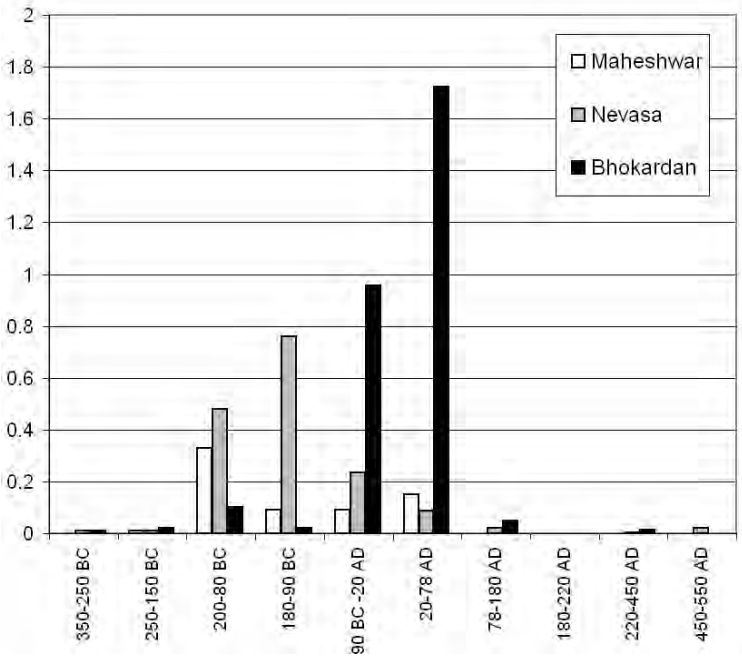


Fig. 14.4: A histogram of coins from Bhokardan, Maheshwar and Nevasa redated by S. Bandhare showing the numbers of coins deposited per year (from Bhandare and Kennet forthcoming).

amongst smaller-scale landholders and cultivators is the more likely explanation.

Coins and monetization

Having identified and discussed shifts in agricultural production at Paithan, we will now turn to look at other aspects of the site's economy through the same period. One key issue is certainly the numismatic evidence. Much has been written on possible changes in the pattern of monetization of the Indian economy between the Gupta/Vakataka and the Medieval periods and there is still no clear consensus on the question of demonetization (e.g. Chattopadhyaya 1977; Sharma 1980: 52–53; 2001: chapter 4; Deyell 1990: 3–8; Ali 2012: 9). Much of the debate has been based on museum collections or coin hoards, whilst little emphasis has generally been placed on coin assemblages retrieved from archaeological excavations (e.g. Deyell 1990: 5). There is no doubt that museum collections and coin hoards have their part to play in understanding patterns of monetization, but these need to be weighed against excavated evidence. Because of the unsystematic way in which museum collections are built up and the sporadic way in which coin hoards generally come to light, excavated assemblages are the only source of coins that can be expected to reflect actual patterns of ancient coin deposition accurately and it is precisely for this reason that they need to be more carefully considered. Of course, when coins retrieved from archaeological excavations are used for quantified analysis, it is necessary to take into consideration the collection strategy that was used during the particular excavation – whether it was by hand or whether a sieve was used and, if so, what the mesh size was. This latter point is crucial, as it has been shown that some base-metal Vakataka issues are quite small, less than 10 mm in diameter (Shastri 1992), and would regularly escape notice unless excavated earth was consistently sieved through a finer mesh. It needs to be stated that whilst deposition rates calculated from excavated coin assemblages might provide some indication of the actual circulation rates of low-denomination, base-metal coinage, they are much less reliable when it comes to higher-value coins of gold and silver, that tend to be much less easily lost (e.g. Harle 1996: 16–17). Nonetheless, the low-denomination, base-metal aspect of the monetary system is crucially important, as is demonstrated by the extremely large numbers of such coins that circulated during certain periods.

Taking these points into consideration, the present author and S. Bandhare recently reviewed the coins excavated at three sites within the vicinity of Paithan:

Bhokardan, Maheshwar and Nevasa, where the reporting of the coin assemblage is good enough to allow verification of identification. Unfortunately, no information on artefact retrieval strategy was available for these assemblages. Nonetheless, the published coins were re-dated by S. Bhandare and tabulated, taking into consideration the lengths of the period of time during which they circulated. The results are being prepared for publication (Bhandare and Kennet forthcoming) and are shown in Fig. 14.4. They demonstrate a notable increase in deposition in the second century BC and a very marked decline in coin deposition – and almost certainly therefore also of circulation and minting – by the end of the 1st century AD at all three sites.

The pattern of coin deposition as revealed at Paithan is broadly similar, although the size of the overall Early Historic/Medieval coin assemblage (35 coins) is too small to be statistically convincing. Nonetheless, the vast majority of the Paithan coins (32 or 91%) are pre-Satavahana or Satavahana, with only three coins being post-Satavahana (9%). As stated in the Introduction, at Paithan, all excavated earth was sieved through a 5-mm mesh and numerous coins came to light in this way.

The point has already been made in the Appendix to Chapter 9 that the coins in the temple foundation deposits (Period 3-temple) appear to have been deliberately thrown or placed into the temple foundation deposits whilst the temples were being constructed. This is suggested by the higher ratio of coins to both excavated earth and to pottery sherds in these layers compared to other layers at the site. The point has also been made that, whilst the foundation deposits of the South Temple can be dated to about the 7th century or later on the basis of coin 34, the rest of the coins deposited in these layers were already very old, six (35%) of them being Satavahana, three (18%) being pre-Satavahana and one (6%) being 4th century AD. It is well known that coins – especially Satavahana coins – remained in circulation for long periods in ancient and Medieval India (e.g. Sircar 1974: 18; Shastri 1992: 291–292). The above figures from the Paithan temple foundations are, however, the first to give a precise indication of the proportion of ancient coins that might still have been in circulation in the 4th to 7th centuries. The figures are actually quite startling: some of the coins being used at this time were already as much as 600 or 700 years old – a fact that seems almost incredible. Of course, some of these coins will have been archaeologically 'residual'; that is to say that they were deposited much earlier elsewhere and have simply been accidentally redeposited as the earth in which they were buried was moved into the temple foundation deposits. At the same time, the evidence discussed in the Appendix to Chapter 9 strongly suggests that a good number of these coins were deliberately deposited in the temple foundations and were therefore still in use.

In relation to the debate on the decline of coin circulation, or the demonetisation of the Indian economy in the 4th century AD or later, the Paithan evidence does contain some relevant information. Firstly, it is clear that the number of deposited coins declined very markedly after the 1st century AD in exactly the same way as it appears to do at Bhokardan, Maheshwar and Nevasa based on the analysis shown in Fig. 14.4. Secondly, large numbers of ancient coins continued to circulate after this time. Thirdly, if we compare the cowrie shells retrieved during excavation (Chapter 13) to the coins (see Table 14.2), a clear pattern emerges. Cowrie shells do not occur at the site before Period 3, but in the excavated layers of that period, there are almost equal numbers of cowrie shells and coins. By Period 4, cowrie shells outnumber coins by almost 2:1 (24 to 14 or 1.7 to 1). It is also notable that no cowrie shells were recovered from the Period 3-temple deposits, despite the large number of coins that were retrieved from those layers. This point might add credence to the idea of the coins being deliberately added to the foundation deposits because of their perceived spiritual or

Table 14.2: Coins and cowrie shells from the Paithan sequence (summarized from Table 9.1).

Coin date	Period 1	Period 2	Period 3	Period 3-temple	Period 4	No period	Total
Pre-Satavahana	8	2	1	3			14
Satavahana		1	3	6	5	3	18
Post-Satavahana				2	1		3
Total coins	8	5	5	17	14	7	**56**
Cowrie shells			4		24		28

superstitious value, a value that cowrie shells presumably did not share.

The use of cowrie shells as low-denomination currency is well attested by texts and hoards from the Gupta period and into later Medieval times (e.g. Bowrey 1905: 199–200; Fa-Hsien 1923: 21; Sircar 1968: chapter 17; 1974: 18; Deyell 1990: 33–34, 62, 221, 237; Shastri 1992: 291, note 23). However, the Paithan sequence is the first quantified insight into the degree to which cowries might have circulated and how their deposition rates compare to those of base-metal coins through the Early Historic and Early Medieval periods in this part of India.

Whether or not cowrie shells and more ancient base-metal coins were recognized as actual currency in the 4th century AD and later (and the Paithan evidence suggests very strongly that they were), it seems absolutely clear that after the 1st century AD in the Paithan area, base-metal coins very largely ceased to circulate – not entirely but certainly in the same quantities that had been minted in the preceding two or three centuries. This indicates that they also ceased to be minted in the same quantity. There are two implications of this: firstly, the political statement of minting coins bearing a king's name seems to have ceased to be important. As Deyell puts it related to a later period, 'coins cease to be used as a message-bearing medium' after about AD 500 (Deyell 1990: 5). Conversely, during the Satavahana period, Bhandare has shown that coinage was 'regio-specific'; that is to say it circulated only within specific and closely defined areas within the Satavahana realm and rarely moved beyond these borders, suggesting that the political message that it carried was understood and was seen as being significant (Bhandare 1998: 49–63). Secondly, succeeding dynasties would have had very little control over monetary policy within their realms. They would not have been able to control the purity of their coinage or in any way influence the amount of base-metal coinage in circulation. Of course, this is also true of other times and places; for example in Han China, minting was carried out privately outside the control of the state (Peng 1994: 102), but it is nonetheless indicative of a lack of political control over the lower-denomination parts of the monetary economy.

It is worth stating here that the picture of coin circulation presented above does not necessarily fit well with analyses that are based largely on museum collections or hoards. Whilst the reasons behind such disparities certainly need to be investigated, it must be remembered that the Paithan, Bhokardan, Maheshwar and Nevasa evidence is based on actual deposition rates on contemporary sites and therefore provides a different and perhaps more robust and reliable perspective on ancient patterns of monetization and coin circulation than other sources of data.

Production and consumption

Before concluding this section on the economy of the site, it is worth making one further point. Manufacture and distribution were important aspects of the Early Historic economy as is demonstrated by the large numbers of manufactured and traded items that are found on Early Historic sites. It has been suggested by some scholars that these aspects of the economy declined in the later Early Historic and Early Medieval period at a time when, it is argued, there was a disruption to urban, mercantile and artisan life (e.g. Sharma 1987: 153–155, 183; 2001: 285–289; Nath 2001: 22). This is a point of considerable significance and is certainly worthy of investigation. The difficulty, however, from the archaeologist's point of view, is finding ways to investigate and measure it. It is not simply a case of demonstrating that manufactured items were or were not present in any particular period. Rather it is necessary to be able to make reliable quantified comparisons between periods in order to demonstrate decrease or increase. Nonetheless, few archaeological excavations record the sort of information that is required to allow such comparisons to be made.

At Paithan, efforts were made to address this question through the analysis of the density of pottery sherds by cubic metre of excavated soil (see Chapter 7). Although pottery is only one of a wide range of manufactured items that were used in the ancient and Medieval periods, it is by far the most abundant, the most visible and the least problematic archaeologically because it has no re-use value and it is cheap and ubiquitous and survives well in buried deposits. For these reasons, the amount of pottery that was deposited in any given period might reasonably be taken as being representative of the amount of pottery that was actually in use, bearing in mind, of course, factors such as variable rates of breakage and repair, neither of which would appear to have been very significant in the present case.

The figures given by the analysis mentioned above suggest that the amount of pottery in use at Paithan declined by around 20% between Periods 1 and 2, 32% between Periods 2 and 3 and 54% between Periods 3 and

4. This is a very marked rate of decline which appears to have accelerated through time.

Similar data are not available for other manufactured materials simply because the numbers involved are too low to allow for statistically reliable comparisons to be made. In the absence of better information, pottery will be taken here to serve as a 'proxy' for all manufactured items, although it must be remembered that other types of materials might, in fact, have had quite different histories. It is possible, for example, that the amount of metal utensils increased and that these were partly responsible for a reduction in pottery use. Indeed, it is notable that, at 27, the number of iron objects from Period 3 is much higher than for Periods 1 and 2, where only 14 and 13 were found respectively, despite the fact that the rim-sherd assemblages from Periods 1 and 2 were around 3.5 times bigger than Period 3 (Tables 8.7 and 8.9). Although it is based on a small sample, this information might suggest that iron containers replaced pottery to some degree, although it is also notable that the majority of iron objects were nails and rivets rather than fragments of cauldrons or pots. It is also necessary to remember that the trends identified at Paithan are based on limited samples and might simply be due to the specific nature of the deposits that have been excavated. It is possible that trenches located elsewhere on the same site might have given different results.

Nonetheless, the evidence of a marked and continued decline in pottery deposition from the pre-Satavahana period onwards is potentially highly significant. The most likely explanation is that there was simply less pottery in circulation, meaning that less of it was manufactured and used.

There is no general consensus on the patterns of increasing and declining production of manufactured goods in the Early Historic period, or on the reasons for them, but a number of scholars have suggested that overseas trade contact from around the 1st century AD – particularly with the Mediterranean/Roman world – provided an important external stimulus for many of the economic developments that took place at that time, including manufacture (e.g. Ray 1986: 200; Sharma 1987: 135–138; Gupta *et al*. 2001: 14–15). It has also been argued that the decline of these same contacts around the 4th century AD had commensurately negative effects, leading to a reversal in manufacture and other areas of the economy (e.g. Sharma 1987: 135–138).

There is, however, to date no clear archaeological evidence to demonstrate increasing or declining manufacture. The argument that has been made is based on the general impressions of excavators rather than on systematic, quantified analysis. In one case, a published attempt has been made to analyse the quantities of manufactured items from Periods IV and V at Nevasa (Gupta *et al*. 2001). At Nevasa, Period IV predates the occurrence of Roman amphorae at the site, whilst Period V contains them. The analysis is based on a simple count of objects made from stone, glass, shell and ivory from the two periods and purports to show an increase in Period V in all types of objects, supposedly due to the stimulation provided by Roman trade (Gupta *et al*. 2001: 15). The analysis, however, is fundamentally flawed because the quantity of earth excavated from each period has not been taken into consideration. According to a rough calculation by the present author based on the published sections of trenches A, F/H, E, and G in Sankalia *et al*. (1960: figs 10, 11, 27, 29), almost 20 times as much earth was excavated from Period V levels as it was from Period IV. Although such a calculation can only be very approximate, it is accurate enough to show that the raw figures cannot be used as they have been by Gupta *et al*. to argue for an increase in manufacturing at Nevasa. Indeed, when corrected by the factor given above, the figures actually indicate that the number of manufactured items declined in Period V after the beginning of Roman contact.

Interestingly enough, this revised conclusion agrees with the picture presented by the Paithan evidence, which suggests that the high-point in manufacturing occurred in the latter centuries BC rather than in the first century AD and that it declined quite markedly thereafter. Given that Paithan is an inland site (one of the few) that is mentioned in the Periplus, this evidence puts another large dent in the already heavily battered theory of Roman economic influence on Early Historic Indian manufacturing. At the same time, the Paithan evidence does support the argument for a decline in production in the later Early Historic/Early Medieval period – but, it must be stressed, only as part of a much longer trend. As the declining influence of Roman trade can now almost certainly be discounted as a possible causal factor in this, it is not clear what might have been the cause. All that can be ventured here is that the decline appears to have been part of a longer process and the explanation therefore needs to be sought at the same historical scale of *longue durée* processes. Before this can be done, however, further data need to be collected from other archaeological sites in order to corroborate the Paithan evidence.

Part 3: Conclusion

During the excavations at Paithan, a concerted effort was made to collect and analyse quantified evidence in a way that would allow engagement with key historical debates about the Early Historic and Early Medieval economies. The discussion above has shown that this is possible if the necessary evidence is collected and if it is appropriately analysed.

Table 14.3 summarizes the key developments at Paithan that have been reviewed in the current chapter. Taken together, these present a complex and sometimes contradictory picture with different strands of evidence, in some cases suggesting developments in apparently

Table 14.3: A summary of the development of key aspects of the Paithan sequence.

Period	Occupation	Cultivation	Animal Husbandry	Temples	Coins	Pottery
Pre-1	Little known. Probably a small settlement somewhere on the mound.	Nothing known.	Nothing known.		A few punch-marked coins deposited.	No clear information available.
1	Expands to cover most of mound. Wooden architecture.	Well established and mixed. Predominantly millets, especially Kodo millet.	Even mixture of cows, pigs and sheep/goat.		Significant number of coins deposited.	Highest rates of pottery deposition in the sequence.
2	Continues to cover most of mound. Brick and tile architecture.	Expansion and increased diversity of crops, evidence for intensification of production. Increased home processing. Increase in 'cash-cropping'?	Decline in pigs, increase in sheep/goat possibly related to increased meat production.		Slight decline in deposition.	20% decline in pottery deposition.
3	Contracts, possibly to area around temples.	Expansion and increased diversity of crops, evidence for intensification of production. Increased home processing. Increase in 'cash-cropping'?	Decline in pigs, increase in sheep/goat possibly related to increased meat production.	Construction, use and enlargement.	Larger numbers of coins deposited, especially in temple foundations, but many are old issues. Cowrie shells appear.	Further 32% decline in pottery deposition.
4	Re-expands to cover most of mound and surrounding area.	Little known at the present time.	Decline in pigs, increase in sheep/goat possibly related to increased meat production.	Abandoned.	Large numbers of coins and cowrie shells.	Further 54% decline in pottery deposition.

different directions. For example, the decline in pottery deposition – which might be taken as indicating a more generalised decline in manufacture and consumption – seems at first glance to be at odds with the archaeobotanical and palaeofanual evidence, which suggests a marked movement towards increased production in all aspects of the agricultural sphere. But there is of course no reason to expect that the ancient economy of Paithan would have been simplistic or monolithic. Indeed, the evidence presented here suggests a number of interlocking spheres, each of which demonstrates its own distinct trends of development.

The fact that similar approaches to studying excavated evidence have not been applied to other sites means that we do not yet know how typical (or otherwise) Paithan was of Early Historic and Early Medieval towns in central India more generally. Clearly, comparator evidence is needed from other sites so that it is possible to know whether the developments that occurred at Paithan were isolated and localised, or whether they are representative of regional or even pan-Indian trends. The Paithan evidence does, however, make one thing absolutely clear: the ancient Indian rural economy was anything but 'unchanging'. On the contrary, there is clear evidence for a complex, dynamic and constantly changing set of economic spheres, each with its own trajectory. In some cases, it has been possible to suggest ways in which these spheres might be linked to each other and to the broader political and cultural developments of the time, but for the most part, more evidence is still needed before more can be said on these questions. The Paithan evidence has taken us forwards by a number of important steps, it has demonstrated the potential of a more systematic, quantified approach to archaeological evidence and it has also provided the first real archaeological insight into the dynamic nature of the agricultural economy of the Early Historic and Early Medieval periods.

A final point that must be made is that there is currently a major failing in Indian archaeology. The archaeological methods that were applied during the excavations at Paithan and during the study of the material have shown their value in addressing questions about the nature of the economy and how it changed through time. Had other Indian sites been analysed in the same way in recent years, there would by now be a corpus of data against which Paithan could be compared and such comparisons would provide further insights into regional patterns and trends. The methods used at Paithan are now standard amongst archaeologists in almost all countries of the world, but they are still not applied systematically in India. The reasons for this failure are unclear, but it brings a consequential lack of progress in dealing with some of the key questions that surround the Early Historic and Medieval periods of one of the greatest and most significant countries in world history. It is only to be hoped that this failing is soon remedied.

Derek Kennet, Jason Hawkes and Michael Willis

Chapter 15
Paithan Excavation: Historical, Archaeological, Geographical and Epigraphical Contexts

The importance of the Paithan excavation goes beyond the site itself and touches issues central to the history of India and the profound changes in politics, society and economic relations during the early centuries AD. That the transition from the Early Historic period to the Medieval was a crucial moment for India has long been noted (e.g. Kosambi 1956; Sharma 1965; Thapar 1968). Impacts were felt not only in established urban centres such as Paithan, but in marginal zones that appear to have been transformed by land grants and the foundation of Brahmanical temples (e.g. Kulke 1995b; Willis 2009: 159, following Bakker 1992). Yet while historians have done much to develop and modernise the study of India's transition to the Medieval, archaeologists have made only modest contributions to the subject (a problem pointed out in, for eexample, Singh 2011, Hawkes 2014b). Unfortunately, the ways archaeology has been practiced in South Asia have not always been conducive to resolving the questions that historians have raised. Archaeology is essential, however, because many changes are outside the concern of Indic literatures and epigraphic texts and thus not recorded in them. The evidence from Paithan is accordingly crucial. It furnishes not only information about changes at the site itself, but provides a starting point for new programmes of research that can tackle salient issues at the regional and pan-regional level.

History and Archaeology

Looking back, there are a number of reasons for a lack of exchange between history and archaeology in the study of South Asia's ancient and Medieval pasts. Primary among them has been inherent differences between the disciplines and how they are practiced in the Indian context. Historians tend to focus on political, social, religious and economic change, while archaeologists of the Early Historic period—up to now at least—have focused on tackling sites, establishing chronologies, developing artefact typologies, identifying coins and documenting phases through stratigraphy. For the Medieval period, the principal datasets tend to be different, primarily temple architecture, inscriptions and sculpture. There is little communication between history and archaeology and the disciplines rank their priorities in different ways. Institutional venues also differ, with archaeology led primarily by the Archaeological Survey of India and state departments of archaeology, while history rests in university departments. This is further complicated by the fact that where archaeology is studied and practiced in universities, it often tends to be within departments of history where it is deemed a sub-discipline.

We begin with the historical side. Over the last fifty years, historians have generated a variety of narratives embedded in an historiography that is particular to India. The literature has been reviewed by Daud Ali (2012, 2014). These articles are essential reading and necessary points of departure for anyone seeking to understand how Indian history—and the understanding of the Medieval in particular—has developed. As Ali (2014) noted, the study of the Medieval "has been vexed by issues of chronological uncertainty, obscurantism, communal distortion and heavy model building." The levels of obscurantism are usefully introduced by one example: Vishwa Mohan Jha's (1996) review of B. D. Chattopadhyaya's (1990) *Aspects of Rural Settlements and Rural Society in Early Medieval India*. This review, chosen from an extensive discourse, gives insight into the parochial nature of much of the historical scholarship on the Medieval. Jha does not cite the book he is reviewing because the readers of the *Indian Historical Review* are expected to know, which of course they do. But aside from this indicative silence, the patience with which Jha has read Chattopadhyaya's complex arguments, understood them and seen links across the script that normal readers would miss and Chattopadhyaya does not bother to point out and, moreover, the rigorous attention to which Jha has subjected Chattopadhyaya's interpretations and inserted his own carefully worded and poignant observations, are as commendable as they are remarkable. Outsiders will be baffled. The performance is readily explained, however, by the fact that B. D. Chattopadhyaya was the professor of history at Jawahar-

https://doi.org/10.1515/9783110653540-015

lal Nehru University until his retirement in 2004 and, following R. S. Sharma's retirement from Delhi University in 1985, the father of the 'Delhi school' and the leading voice for historical studies in India. From his position of eminence and power, Chattopadhyaya (1998) meticulously explored what he termed the 'twin burdens' of history: historiography and the written sources. He was not burdened by fieldwork. Throughout his life, Chattopadhyaya described himself to his students as a desk-based scholar with no pretensions to field study (Masahiko Mita, personal communication, Nagoya, June 2019).

This is understandable, up to a point. Chattopadhyaya, like Sharma and other luminaries of historical scholarship, were historians and not archaeologists. Indeed, many were at pains to point this out—explicitly stating the value of archaeological fieldwork and articulating what archaeological findings might be useful in their research (see, for example, Sharma 1983, 1987). However, for reasons that we will turn to later, this archaeological work was not forthcoming and in its absence no attempt was made by historians to venture into the landscape to see what materials might be found to support their investigations. The consequent limitations of this are apparent in the slow pace of development in Chattopadhyaya's ideas, although whether a dose of fieldwork would have clarified his thinking (and that of others) is moot. The literature is dense and complicated, made more so by the vigorous counter-arguments written by Chattopadhyaya's academic opponents at each step. From our own side, we would observe only that for every theory or proposition Chattopadhyaya has put forward, a qualification or variant theory seems to appear somewhere in his extensive writing. To be fair, Chattopadhyaya did not hold a single view, but rather refined his interpretative position over a long career. With his book *The Making of Early Medieval India* (Chattopadhyaya 1994) his arguments were articulated in mature form. There he accords Early Medieval society, from the time of the Gupta dynasty, with several key socio-economic and political features: an increased clearing and settlement of uncultivated lands (often through the deployment of Brahmins and land grants), the growth of networks of rural settlements, the growth of new political lineages, the transformation of hinterland and forest societies into 'state-societies', the peasantisation of cultivators and hunter-gatherers as a part of this process and the concomitant incorporation of non-caste peoples into the caste hierarchy. Ali (2014) may be consulted for a guide to the development of these ideas.

Chattopadhyaya's thinking emerged from a primary focus on the nature and constitution of the state as understood by historians of the colonial and immediate post-colonial period. During this time, historical scholarship in India borrowed much from the economic, social and anthropological theories that were emerging in Europe and America. Ideas of feudalism and associated socio-economic changes (after Bloch 1933, 1939; Pirenne 1936; Duby 1952) and social and cultural evolution (Childe 1951) all found their way to the writings of historians in India. Yet over time, as that scholarship became weighed down by arguments and counter-arguments, it also became more circumscribed. The degree to which the historiography of the Delhi school (and Calcutta at the formative stage) was inward looking and self-referential is shown by the ways in which new methodologies were ignored or rejected summarily. Scholars like Ronald Inden, Burton Stein and Nicholas Dirks, influenced by powerful new trends in anthropology and sociology (which had continued to evolve on the international stage), developed innovative forms of historical analysis and wrote pieces that are now regarded as classics. Inden (1985), inspired by A. M. Hocart (1950), proposed that the state was an 'imperial formation', constituted as an evolving hierarchy of human and divine lordships (see also Inden 2006). Stein (1980) famously drew on the study of acephalous societies in Africa to propose a 'segmentary' model of the Cola state, while Dirks (1988) created what he termed 'ethnohistory' by mapping the changing roles of 'big kings' and 'little kings' in Tamil Nadu. Daud Ali (2014: 390) paused to reflect on these contributions, saying: "Interestingly, this literature and its categories, whether as segmentary polity, ethnohistory or imperial formation, generally did not articulate clearly with the trends and camps of Medieval historiography well established in India and were largely ignored or refuted, though their contributions have arguably been just as formative for later developments in the field."

Ali's detached analysis does him much credit. The inability of the Delhi school to take on ideas from the outside deserves, however, a harsh rebuke. The problem is highlighted by James Heitzman's (1997) *Gifts of Power: Lordship in an Early Indian State*, a work that involved a reappraisal of temple institutions in their economic, historical and political landscapes. This is a book of such innovation and creative scholarship that its lessons are being assimilated but slowly. Heitzman surpassed much in the historiography of loosely Marxian affiliation, but his cross-cultural comparisons were greeted with a facetious dismissal by R. Champakalakshmi (1998). The impact of Heitzman, Inden, Stein and Dirks on the Delhi school has been minimal, in part because their works were from outside the school, but also because most of the publica-

tions deal with the Cola state in Tamil Nadu—a foreign land and cultural anomaly as far as many inhabitants of Delhi are concerned. The circumscribed geographical vision shows also in the impact of Upinder Singh's (1994) *Kings, Brāhmaṇas and Temples in Orissa*, an excellent work informed by a careful analysis of inscriptions and an understanding of the theoretical positions then prevailing, especially evident in her cogent critique of Sharma's theories about Medieval feudalism. If David Lowenthal (1985) is right in believing that *The Past Is a Foreign Country* then, for the Delhi school at least, Orissa and Tamil Nadu are removed both spatially and temporally—so doubly foreign.

The impact of anthropology and sociology on historical writing has already been noted. More influential has been the *Annales* school with its emphasis on long-term social history and, in more recent manifestations, its focus on the *histoire des mentalités*. Subaltern studies—an examination of the colonial populations who were (and are) socially, politically and geographically outside the hierarchies of power—has a genuine base in Indian society and an intellectual reality beyond the abstract debates about the nature of the state. Ironically, however, the approach was championed by academics in Europe and America. The leading figures—Homi K. Bhabha, Gayatri Chakravorty Spivak and Ranajit Guha to name the main players—work (or worked) at Harvard, Columbia, Sussex and the Australian National University. Nor is their style of analysis indigenous, showing as it does an ultimate debt to Antonio Gramsci to whom we owe not only term 'subaltern' but a general theory of 'cultural hegemony' based (yet again) on Marxist principles (see, for example, Gramsci 1995, 1996).

Readers of this chapter may think us somewhat dated in rehearsing the intellectual fashions set by grandees of social and literary theory in the 1990s for a book completed in 2020, especially since authors like Chatterjee (2012) have reflected on how subaltern studies has given way to a more nuanced cultural history. There is, however, remarkable deference to authority on the Indian academic scene and a reticence to engage in robust critiques. We will not here explore the networks of patronage and influence that support the status quo and that are, to varying degrees, characteristic of elite academia everywhere. Rather, we will content ourselves with a few words on approaches to the study of subaltern history as exemplified by the works of Gayatri Chakravorty Spivak. Her (1988) essay "Can The Subaltern Speak?" is regarded by some as a seminal text in subaltern studies. The ramifications in the literature is extensive, but a start can be found in Maggio (2007). As is well known, Spivak was concerned with *sati*, the self-immolation of wives on the funeral pyres of their husbands. This is a perennially debated topic, especially in the on-going contest between liberal and conservative thinkers. Spivak explored the race and power dynamics involved in the banning of *sati* under British rule, noting that what we know of the matter comes only from the accounts written by British and Hindu reformers. We never hear from *sati*-performing women, a problem that prompted Spivak to reflect on whether the subaltern can speak. Looking at the documentation of *sati* in colonial archives, Spivak attempted to show that western scholars have assumed that their sources are objective and assumed also that the 'oriental other' is anonymous and mute. However interesting this seems, we will turn the pages of Spivak in vain looking for a quotation from a *sati* pillar inscription, and this despite the fact that these inscriptions survive in great numbers. To put the matter in plain language: subalterns are certainly able to speak, but if we want to hear their voices we will have to listen, and listen in their language. More precisely, we will have to read what was written on the spot, and look at how the *sati* was represented in life and death. This subject is not without relevance to the present book and its concern with the transition to the Early Medieval. Although inscribed memorial stones of this kind belong mainly to Medieval times, the oldest *sati* in India is at Eran, on the ancient route to and from the Deccan—and so also Paithan (Fig. 15.1). It is dated AD 510–11 (Fleet 1888: 91–93; Bhandarkar *et al*. 1981: 353–54). The text of the inscription has been known for more than a century, but the pillar was only located and photographed recently by Peter Bisschop as part of the *Beyond Boundaries* project. The pillar and its documentation are available online (Siddham OB00045).

Fig. 15.1: Eran (Dist. Vidisha, Madhya Pradesh). Inscribed memorial stone of Goparāja, dated AD 510–11.

The relative lack of intersection between history, theory and field archaeology as practiced in India—thrown into high relief by the Eran pillar—characterises subaltern studies and the degree to which those engaged in this mode of historical research have not engaged with the archaeology of social memory, even when *sati* itself is the subject. In a landmark study, S. Settar and Günther-Dietz Sontheimer (1982) focussed on the Deccan and worked in a way that showed it is not for historians and ethnographers to decide if the practice documented by *sati* memorials is good or bad, but rather to record that it happened and to understand what these memorials meant and mean to the people in whose places they are found. Certainly in our own travels in Central India we found that the stones are often preserved and respected, the focus of prayers and offerings (Fig. 15.2). They are taken as signals that women long past were heroic and that they, even now, stand as moral exemplars. These memorial stones fill the countryside and survive in their thousands, making the landscape a place populated by events and people. Historians often lament the lack of sources in the periods they study and rightly note that written texts do not tells us much about everyday people. But such observations ignore this vast archive in stone. It is one of the largest archives in the world and it is, in fact, an archive without parallel anywhere. If we reflect on the scale of the corpus, we soon realize that an entire dimension of Indian history and social life is absent from the ways historians normally depict the past: it is as if individual people—and the actions they deemed worthy of record—have been banished from the scene. Once we take notice of these memorials and the memories they embody, we find that far from lacking local and subaltern histories, India is filled with them. The reservoir is so deep, wide and varied—and so densely filled with undigested data—that it presents an impossibly huge and daunting task. No single person could cope with it, least of all a desk-bound scholar constrained by liberal ideologies that render the very subject repugnant.

This excursus brings us back to the central problem raised in this chapter, namely a lack of connection between history and data collection in the field. What is particularly evident is that history is based on re-cycled data and derivative methods. As a result, the analyses produced are little more than re-configurations of existing information and the historical propositions put forward mere hypotheses. Kennet (2013), and again in the introduction here, has shown that R. S. Sharma's influential theory of urban decline, proposed first in 1972 and a dominant theme in historical discussion since, has no substantive basis but has enjoyed influence because

Fig. 15.2: Salkanpur (Dist. Sehore, Madhya Pradesh). Hero-stone memorial with a pinnacle in the shape of a temple spire, with a relief sculpture of warriors in battle below, circa 12th century.

it was based on an archaeology that was deemed "unassailable" (Sharma 1972, 1987). Thanks to this assumption, the urban decline that took place at the end of Early Historic times was, in the words of Chattopadhyaya, "not a matter for speculation" (Kennet 2013: 334, citing Chattopadhyaya 1974, 1986). However, a close reading of the archaeological reports shows that the theory of urban decline is to some degree an historiographical illusion, generated by the excavation strategies of the archaeologists and a selective reading of their publications on the part of R. S. Sharma (Kennet 2013: 334; Hawkes 2014b). The critique is essentially Foucauldian in that the historical picture created by R. S. Sharma simply rehearses the perceived exclusions of the archaeological, numismatic and epigraphic archives. So what is the upshot? It is simply this: *contra* Chattopadhyaya, urban decline is very much a matter for speculation. And while Chattopadhaya is correct to say that archaeology can resolve the questions he has raised, the way archaeology is practiced currently precludes any such a resolution. With this we

come to the discipline of archaeology, the second theme of this chapter.

Archaeological Methodology in India

Jürgen Neuß (2012) has provided a severe critique of Indian archaeology and how the nature of its organisation at the state and national level impedes significant progress and innovation. The wider context of this and the way that the development of archaeology is also constrained by its position as an historic discipline in universities as noted by Chakrabarti (1988, 2003). Dass and Willis (2002) raised similar questions based on their preliminary work at Udayagiri. At that time they suggested—naïvely as it turns out—that "future research might involve micro-documentation of the visible traces on the site and a close study of these features in partnership with historians of traditional Indian astronomy. As theories and possible lines of investigation developed, this could lead, in the longer term, to some careful excavation work. The degree of interdisciplinary co-ordination and attention to minutiae required would necessitate a type of archaeology that is not practiced in India today. As there are no signs of such an archaeology developing in the present circumstances, we can only hope that this essay does not trigger off some ill-informed escapade of random digging similar to that seen at Satdhara and Sanchi over the last few years" (Dass and Willis 2002: 41). This same article further cited R. G. Collingwood (1889–1943) who, writing in the 1930s, was one of the early critics of archaeological practice. He wrote: "Once digging has been decided on excavation becomes a sport for human terriers, tempered by the possibility that scientific results—who knows?—may be forthcoming. Today, matters have reached a point when it can be said clearly and publicly that no archaeologist ought even to be allowed to excavate at all unless, when he is deciding to work on a certain site, they can answer the question 'what archaeological or historical problems lead you to that site, why do you think you can solve them there, and how exactly do you mean to go about it?'; unless, every time he or she orders a new trench to be opened or even a single shovelful of earth to be moved, he is prepared to explain, in terms of historical questions and their possible answers, exactly why he is doing it; unless his record shows that, instead of nibbling away at this site like a small boy with a cake until nothing is left, he is capable of saying 'now I have answered the question I came here to answer, and we are going home'" (Dass and Willis 2002, citing Collingwood 1999: 65). Coming forward in time and back again to India, we note that the issues have not gone away. For example, Hawkes (2020) and Hawkes *et al.* (2020) have tried to point to the evidence available, and come to some evidence-led conclusions, without avoiding the fact that much is defective in the way the archaeology has been done. The problem today is as much methodological as it is conceptual. While it is important for archaeology to be question-driven, the nature of those questions is also important. For the last seventy years or so, the vast majority of archaeological activity and research in India has been on pre- and proto-historic periods—as archaeology has developed to fill the gaps where textual history cannot reach (Chakrabarti 1988). Yet as Hawkes (2014a, 2014b) makes clear, for historical periods such as the first millennium AD, both the questions archaeologists have asked and the interpretations they have made have been defined by traditional historical research.

While we may hope that the publication of excavation reports (as a bare minimum) may trigger improvements, past experience suggests that they will have little immediate impact. It is worth reflecting on why this is so. The matter turns, in our view, on the question of deference noted before and, more importantly, on the way organisations (governmental, academic and non-profit) perpetuate and defend themselves. As civil servants know, it is essential to be discreet and impartial, and not to sacrifice one's career to a cause—be it political, intellectual or academic—especially if that cause has the potential to undermine one's department and those within it. Criticism is mute. Perhaps "Can The Civil Servant Speak?" would have been a more relevant question for Spivak to have posed. Certainly it is better not to speak—and not to publish—and collect a pay cheque and pension in the normal way. The alternative is to publish and be damned. The fraught nature of publishing in the official setting and a reasonable fear of unintended consequences naturally encourages deferral. Moreover, all organisations develop systems of practice and will perpetuate those systems unless there are cogent reasons to change. In Indian archaeology there have been numerous campaigns of reform and re-organisation, the first undertaken by Alexander Cunningham who established the Archaeological Survey of India and became its first Director General in 1871. At the beginning of the twentieth century vigorous reforms were led by George Curzon who was Viceroy from 1899 to 1905. He took an active interest in cultural heritage and appointed John Marshall as the Director General of the Archaeological Survey in 1902. From this point on, Indian nationals were allowed to par-

ticipate in (and direct) excavations in their own country. There followed a series of well-known excavations and restorations at major sites such as Charsadda (1902–3), Harappa (1920, 1925–34), Mohenjo-daro (1922–27), Sanchi (1912–19) and Taxila (1913–33). The reports of these excavations continue to book-end much of our archaeological knowledge (see Marshall 1924, 1931, 1951; Marshall *et al.* 1939). Guha-Thakurta (2013) has reflected on the restoration of Sanchi and its publication, *The Monuments of Sanchi*, that the books themselves are a sort of monument in three elephant folio volumes.

By the time *The Monuments of Sanchi* appeared, the need to modernise, and move away both academically and professionally from an Edwardian footing, was felt clearly. This led to the appointment of Mortimer Wheeler in 1944. In his day, Wheeler was at the forefront of archaeology and museum practice. Influenced by Pitt-Rivers, he saw that excavation required a more scientific approach central to which was the careful recording of stratigraphy. He was highly critical of the large scale horizontal digs that revealed a single period of a site's history (as had characterized excavations carried out under Marshall). In response, he developed a system of excavation that has come to be known as the "Wheeler method", wherein an excavation grid (of any size) is divided into squares or 'box trenches', which are then excavated so as to leave a baulk of earth between them to facilitate recording of stratigraphy (Wheeler 1954). This method was applied in India as an expedient means of quickly establishing the chronology of the many hundreds of sites that had been discovered (Wheeler 1955; see further Ray 2008). In doing this, Wheeler not only transformed our understanding of the archaeological history of India, but also trained what later became the next generation of archaeologists in India.

As is well known, world archaeology has moved ahead in scientific, technical and theoretical ways that would have been inconceivable seventy years ago. We now know that the Wheeler-method is not the best (or indeed the only) method of excavation, and 'area excavation' has now come to be the norm, certainly in the west (e.g. Barker 1982). But it has also become clear how fundamentally important it is to take a holistic view of an archaeological site, before beginning to dig a trench to establish the chronological sequence. The full extent of the site must be understood and the 'horizontal stratigraphy' clearly grasped. If this is not done, the excavation is likely to provide an unbalanced view of the site's development (Kennet 2013). Institutionally speaking, however, the Archaeological Survey of India and the education system that feeds it has perpetuated and retained a variant of Wheeler's deep-sounding system and the excavation system has remained largely unchanged. There is also a strong resistance to deviation from this method, due to the notion that preserving a single system ensures a common standard of practice. The level of ownership is indicated by R. S. Bisht, Deputy Director of the Archaeological Survey at the time of the Paithan excavation, who was in regular touch with departmental staff on the site to "make sure they [i.e. Kennet *et al.*] follow our methods [i.e. those of Wheeler]".

What is often seen is an absence of a clear research framework for many of the excavations that take place, and a failure to examine the extent of the site from the surface using simple techniques that are available and regarded as standard practice in many countries. These include controlled surface artefact collection, geophysical examination, aerial photographic examination, detailed mapping and the excavation of a network of test-pits. Once excavation has begun, the focus on Wheeler-style 'box trenches' makes it difficult for the archaeologist to detect the more subtle large-scale evidence that is easily obscured by the excavation baulks that are a part of the Wheeler box system. A tendency to phase whilst excavating rather than at the post-excavation stage and to record objects by phase only, (making later reinterpretation of the phasing and chronology impossible) is still a problem at many sites. But probably the most serious issues are the lack of systematic study of the artefacts using robust methodologies and detailed descriptions, a failure to sample systematically for environmental evidence, and the almost complete lack of synthetic, regional, comparative analysis of the data from excavations.

Archaeological sites that are obscured by modern settlement are generally excluded from excavation. Indeed, the concept of 'urban archaeology' which became such an important element of European and Scandinavian archaeology from the 1950s onwards, is practically unknown in India. There are two major problems with this. The first is that in only looking at sites that are presently unoccupied we are unable to investigate the movement of human settlement to locations that are still occupied today. The second, and real heart of the matter, is that while uninhabited sites allow archaeologists to work in the ways they prefer, given the space and lack of overburden, an exclusive focus on such sites results an archaeological profile only of settlements that were abandoned at some time—and not those that have continued to be inhabited, or even flourished. This is enforced by the archaeological reserve areas that have been set aside by the Government of India to protect the archaeological record from modern development. This is laudable,

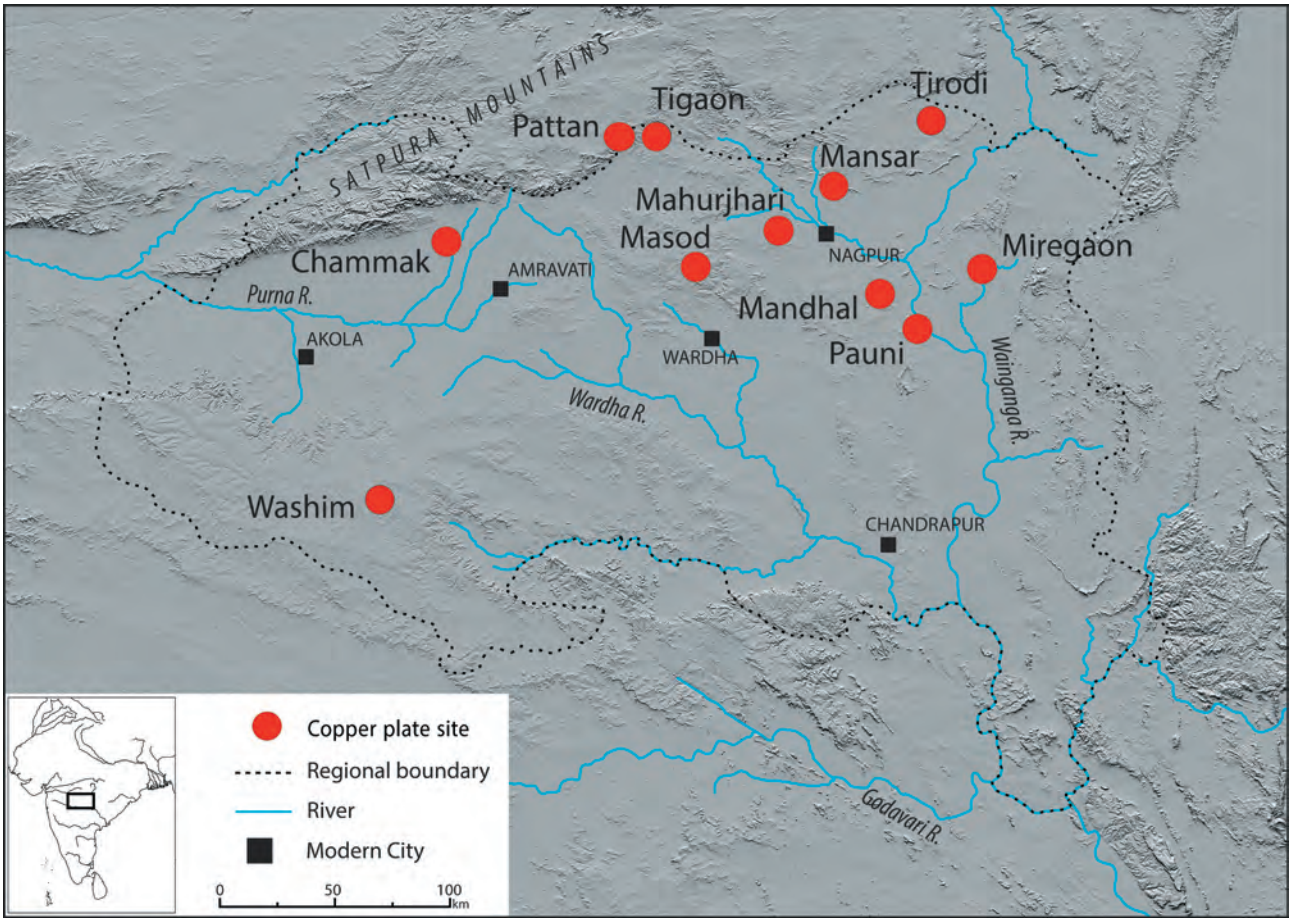


Fig. 15.3: Maharashtra, region of ancient Vidarbha, showing the distribution of key copper-plate charters of the Vakataka period.

of course, but the reserve areas are often located on the peripheries of sites, in areas that had no modern habitation when they were set aside—thus compounding the problem set out above. The combination of Wheeler's methods with the system of reserves and a reluctance to excavate ancient settlements that are still occupied introduces important biases into our data collection. We end up, in essence, with an archaeology of sites that have failed over time, not those that endured and prospered. No wonder, then, that India's greatness is so frequently portrayed as being in the distant past—the wonder that *was* India—in A. L. Basham's immortal words (1954). If we are to believe this notion that India is a place that has 'had its day' it is because archaeologists and historians have made it so.

New Directions

The possible solutions to this problem suggested by Kennet (Chapter 14 this volume) are modest and in no way prescriptive. The remedies posed certainly have the potential to address the issues raised by historians and thus establish common cause between archaeologists and historians on matters relating to the transition from the Early Historic period to the Medieval. The recommendations are as follows: (1) a shift to the excavation of Medieval rather than only ancient sites, even if this involves excavation in modern urban centres; (2) a change of focus in the procedure of excavation and exploration with a more careful and holistic surface evaluation of any site before excavation commences; (3) the routine, quantified study of archaeobotanical, zooarchaeological, ceramic and find sequences; and (4) the documentation of rural settlement patterns.

The present volume sets an example on the first three points and is, as a result, a milestone marked by innovation in practice, the collection of new empirical data and the articulation of interpretative theories to explain that data. At the same time, the authors of this chapter have recognised that there is an urgent need to look at wider settlement patterns around key sites. This strategy allows

the exploration of changes that were taking place on a regional scale, traces of which can be observed at specific locations like Paithan.

To situate Paithan in its regional setting, Hawkes, Lefranq, Abbas and Willis studied land-granting activities as documented by copper-plate inscriptions. This line of analysis was based on the long-established historical proposition that the appearance of land records marked innovations in land use, agrarian practice, property relations and social formation in many parts of India. The find spots of the copper-plate charters were traced, from Uttar Pradesh to Karnataka, to test what might be concluded from their spatial distribution (Hawkes and Abbas 2016). The focus was on the earliest charters—from the fourth, fifth and sixth centuries—and the stone inscriptions of the same period. The number of surviving charters is substantial. These data have been compiled and published online (see Siddham as well as the aggregated data available at www.siddham.network). Having plotted the distribution of the copper plates, research then concentrated on an area of eastern Maharashtra—a region known in ancient times as Vidarbha. Not only does this area neighbor Paithan (thus facilitating the investigation of its regional context), it also yielded a number of copper plates issued by one one dynasty—the Vakatakas—making it possible to test the effects that these grants had. The results of the findings are shown here in Fig. 15.3.

Investigations in Vidarbha made a conscious attempt to implement the recommendations noted above, but adapted them to suit local circumstances. There were three main aspects to this: (1) in terms of focussing on Medieval sites rather than ancient ones, field surveys showed that it was difficult to distinguish reliably between Medieval and ancient sites and that most sites had multi-period occupation; consistent abandonment of earlier settlements or movement to new ones seem to have occurred only later in the early second millennium AD; (2) in terms of changing procedure, work focused on the systematic reconnaissance and recording of archaeological sites in areas selected on the basis of the presence of known epigraphic and monumental remains, coupled with the collection of surface material so as to characterize those sites and establish patterns in the regional distribution of archaeological material; (3) in order to supplement and improve on this regional picture, a programme of limited test-pitting was implemented at Adam and Mandhal, sites known from excavation and for their inscriptions (Nath 2016; Sali 1998). This was carried out to generate data necessary to improve pottery typologies, as well as to collect environmental samples as a step towards understanding the supposed agrarian innovations that took place during the early centuries AD, and the apparent settlement shift from Adam to Mandhal during the mid-first millennium. The results of these surveys and key-hole excavations are being published separately. Here we will restrict ourselves to some comments on settlement patterns and the distribution of copper-plate charters, the third and final theme of this chapter.

Vidarbha

Mapping the find spots of the Vidarbha copper-plates has shown that of the twenty-nine charters from the region, 15 (52%) were found during digging or ploughing in locations that may relate to their original contexts, at least until evidence emerges to the contrary (for discussion, see Hawkes and Abbas 2016). Others were found in the possession of people and museums, having been dug up long ago—notably for the present purpose the copper plates in Pune (Siddham OB00143), and in Patna (Siddham OB00159). It is for this reason that some of the Vakataka charters do not appear in the map (Fig. 15.3). There are also some plates that are outliers, i.e., they were found geographically outside the main corpus and possibly not in locations that are historically reliable. The several charters found in the Satpura hills to the north (beyond the area covered by our map) are good examples, with the so-called Siwani copper-plate charter a prime case (Siddham OB00150). This was found in or shortly before 1836 in the possession of a *zamindar* in the then Seoni District. Before 1888, the plates were still in the possession of a *zamindar* of Pindarai village (Siwani Tahsil, Madhya Pradesh). This location is 95 km north of Balaghat, itself the source of a copper plate of uncertain provenance. The original find spot of the Siwani plates is not known but, like the other inscriptions recovered in the Satpuras, they seem to have been carried into the hills and, as a consequence, preserved there. This distribution of evidence is not unique to Vidarbha or the Vakatakas. Cultural artefacts deemed valuable or talismanic are often preserved outside core areas, especially if those areas have experienced a sequence of upheavals and adjacent regions have provided a safe haven.

Looking, then, at the distribution of those copper plates that were found in or near their original contexts, a picture beings to emerge. Once we discount the 'noise' in the data produced by the highland evidence, we see that all the Vakataka grants are from low-lying geographical zones, i.e. at elevations below 500 m. The Masod charter

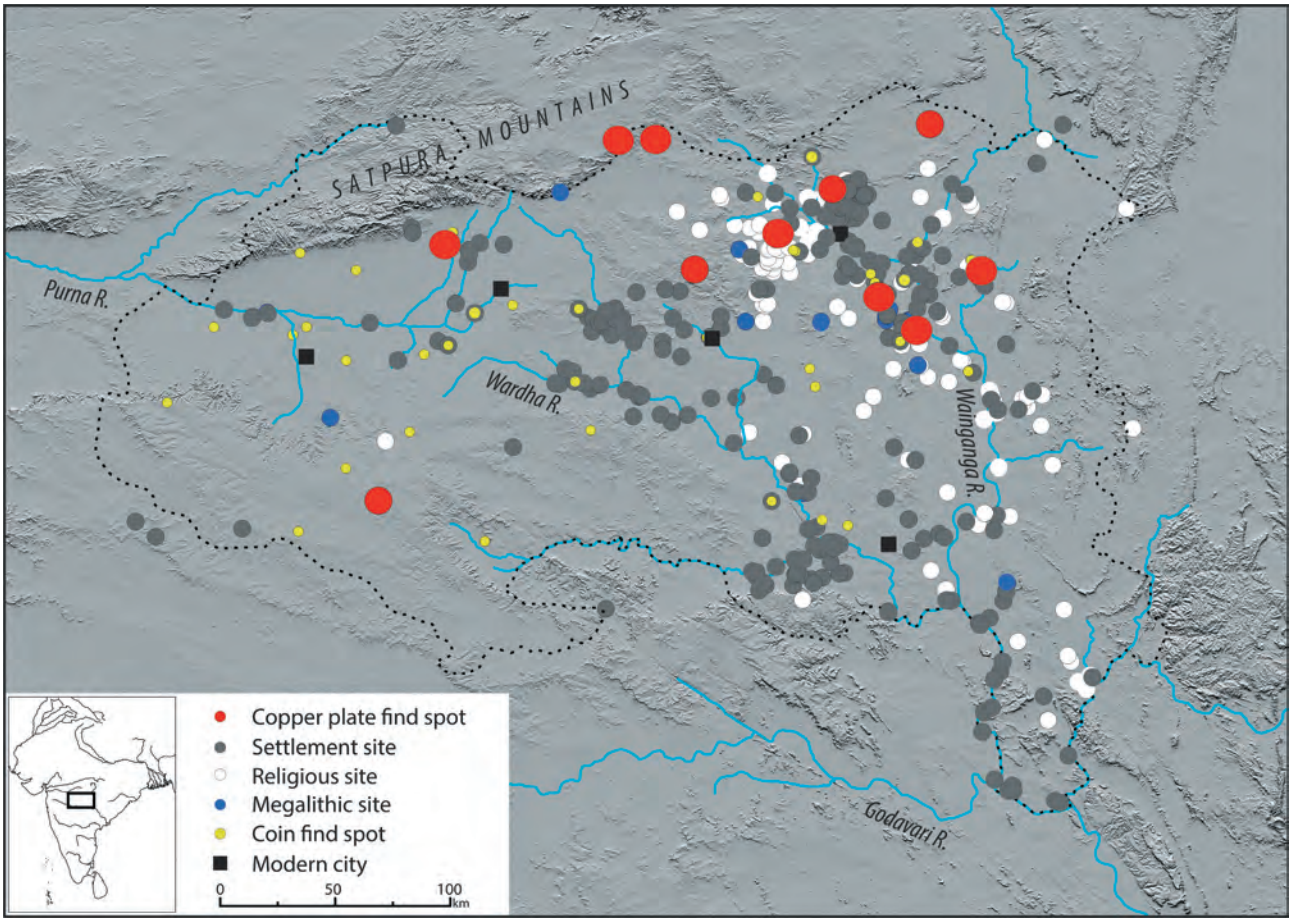


Fig. 15.4: Maharashtra, region of ancient Vidarbha, showing the distribution of relevant archaeological sites and coin finds.

seems to be an exception (Fig. 15.3, Siddham OB00171), but this anomaly is explained by the fact that this grant is not an original Vakataka inscription but a forgery of Medieval times. With this example set aside, we can see that the Vakataka charters—and the administrative, economic and social practices they reflect—pertain to lowland areas, almost all of which were broad, alluvial riverine plains.

When we then relate the charters with the distribution of settlements, further patterns of importance emerge. As noted above, the results of new surveys and excavations are currently in the process of being finalised for publication. Still, it is still possible to identify certain broad-scale patterns in the distribution of known archaeological remains when they are mapped in space and time (see Fig. 15.4). The data in this map were gathered through a comprehensive survey of the existing archaeological literature (published and unpublished). This resulted in the compilation of a census of all archaeological sites and remains that have been documented in the region over the last one-hundred and thirty years (Hawkes and Casile, forthcoming). As would be expected, the consistency, dependability and detail of these data varied. For instance, the dating of many remains and sites is uncertain, with only three sites across the area having been subject to radiocarbon dating; in addition, there is no regional pottery typology and thus little consensus as to the date of the remains found at any one site (Lefrancq *et al.* 2019; Lefrancq and Hawkes, forthcoming). Additionally, as we know from the accounts, many surveys and campaigns of exploration were not systematic. Sites were found through local informants or simply turned up along the paths walked by archaeologists, while large areas of the region have not been surveyed at all. As we might expect, areas that are difficult to reach have been surveyed far less intensively than those close to Nagpur and other towns.

Notwithstanding its obvious idiosyncrasies, the dataset as a whole is not lacking historical weight and substantive implications. The first of these, and most

important of all, is that the existing settlement data shows that the entire region was well-settled from at least the 'Megalithic' or early Iron Age (from *circa* 800 BC in this region). Further, when we look at the distribution of these sites, we can see that settlements tended to cluster around water bodies—small tanks developed and managed by local residents—and along rivers and streams. In addition, most settlements—like the land grant inscriptions—are located at elevations below 500 m. The main historical implication of the census data for the present chapter is this: if we compare land grants and settlements, we can see that the grants have a settlement context indicative of the agrarian and geographical environment in which the grants operated. It is perhaps better to rephrase this observation in terms of human agency: if settlements are proxies for the people and communities living on the land and managing its environmental and agricultural resources, and land grant inscriptions are proxies for the presence of elites receiving land from the king, then the find spots of the grants juxtaposed to settlements shows the social and economic matrix in which beneficiaries of the grants lived and derived their livelihoods. The network of settlements—and their economic surpluses—also gave rise to monumental remains, such as temples and monasteries, and the inscriptions that sometimes survive to document the construction and endowment of these institutions.

Agriculture and property relations

The pairing of epigraphic find spots and settlement distribution has significant implications for the historical theories put forward about the Early Medieval period. Far from documenting the increased clearing and settlement of uncultivated lands through the deployment of Brahmins and land grants, and the growth of networks of rural settlements—as Chattopadhaya would have us believe—matters are exactly the opposite. The charters document gifts of land to Brahmins in well developed zones where settlements had been established for at least 1000 years. In one case, at Mahurjhari, the plates were found at a site where there was a well-developed industry in carnelian-bead production (Mohanty 1999, 2005; Mohanty *et al.* 2019) (Figs 15.5 and 15.6; for the plates see Siddham OB00178). Some of these stones were engraved and their inscriptions show they were produced for Buddhist clients and had a wide distribution (Fig. 15.7). These findings indicate that wealth at Mahurjhari came from a vibrant trade in semi-precious stones as well as agricultural activity.

Fig. 15.5: Mahurjhari (Dist. Nagpur, Maharashtra). Raw material for carnelian from ancient quarry.

Fig. 15.6: Mahurjhari (Dist. Nagpur, Maharashtra). Carnelian bead fragments in fields at village.

Fig. 15.7: Mahurjhari (Dist. Nagpur, Maharashtra) (?). Engraved carnelian with a Buddhist inscription in Vakataka-style script reading *apramāda* with corresponding impression. Probably made at Mahurjhari. British Museum, 1892, 1103. 126, see SIDDHAM IN01102.

Fig. 15.8: Chammak (Maharashtra). Copper-plate charter of Pravarasena II with seal of the king and a paper note by J. F. Fleet. British Library Ind Ch 16, see SIDDHAM OB00149.

Lest we be accused of selecting examples that suit our interpretation, we can take the Chammak plates as a final example (Fig. 15.8, Siddham OB00149). These plates were found in the ground in the nineteenth century and the inscription on them registers the donation of the village of Carmanka by Pravarasena II at the request of ruler named Kondaraja (Mirashi 1963). The village of Chammak perpetuates the ancient name. The donation was made to a large number Brahmins of various Vedic schools and the charter lists 49 of these donees by name. An exploration of the area under the project led to the discovery of a large settlement immediately south of Chammak village. This dates from at least the Iron Age to the late Medieval period (Hawkes *et al.* 2017, 2020). There can be little doubt that this location was the seat of the king named Kondaraja in the inscription. Now the settlement of a large number of Brahmins in this location at the behest of a local grandee—and its sanction by king Pravarasena—would necessitate there being adequate resources to support the people in question. The developed nature of the wider area is shown by the *stupa* and associated settlements at Bhon, slightly to the south on the Purna river (Deotare *et al.* 2007; Naik and Deotare 2016). The Chammak charter does not represent, therefore, some sort of pioneering effort in a remote forest area. It is the settlement of a community of learned individuals, their families and attendants in what was already a prosperous zone. The fact that this site was discovered through simple reconnaissance, and that more than a century stands between the publication of the Sanskrit text on the plates in 1888 and the publication of the archaeological context in 2016, underlines the need for the integration of fieldwork and historical studies.

Summary

Returning to the excavations reported in this volume, we have, it is hoped, demonstrated that some of the observations made at the regional level correspond with interpretations that emerge from the site of Paithan. This provides a methodological basis for placing sites in a broader context as well as providing insight into the contemporary development of two different but key parts of the region: the Godavari and Vidarbha. As Kennet makes clear in Chapter 14, the Paithan excavations document the range and depth of agrarian reform that took place in a long-settled core area during the Early Medieval. Kennet suggests these changes may have been stimulated by the settlement of Brahmins from outside the region, and by the building of temples whose endowment lands probably came under new management regimes. These changes reflect the developments evidenced by the two land charters discussed above—Mahurjhari and Chammak—and demonstrate the value of linking landscape surveys with in-depth excavations at selected locations. Moreover, this chapter has shown that a coupling of landscape studies and excavations can indeed shed light on the the transition from the Early Historic to the Medieval, providing a level of insight into processes of change and their regional variations that are not available from the epigraphic sources alone.

Reference list

Agrawal, A. 1999. *Greener pastures: Politics, markets and community among a migrant pastoral people*. Durham and London.

Agrawal, V. S. 1942. The geographical contents of the Mahamayuri text. *Journal of the United Provinces Historical Society* 15/2: 19–35.

Ali, D. 2002. *Vidīśā and its environs in Early Medieval India*. Paper circulated to the Vidisha Research Group. Zenodo http://doi.org/10.5281/zenodo.3623645

Ali, D. 2012. The historiography of the Medieval in South Asia. *Journal of the Royal Asiatic Society* 22(1): 7–12.

Ali, D. 2014. The idea of the Medieval in the writing of South Asian history: contexts, methods and politics. *Social history* 39(3): 382–407.

Allchin, F. R. (ed.) 1995. *The Archaeology of Early Historic South Asia: the emergence of cities and states*. Cambridge.

Ambasta, S. P., Ramachandran, K., Kashyapa, K. and Chand, R. (eds). 1986. *The Useful plants of India*. New Delhi.

Ansari, Z. D. and Dhavalikar, M. K. 1975. *Excavations at Kayatha*. Pune.

AnguttaraNikāya = Morris, R. (ed.) 1885–1900. *The Anguttara-nikâya*. Pali Text Society/Henry Frowde. 6 vols. London.

Arthashastra. *Kautilya, the Arthashastra*. L. N. Rangarajan (ed., trans. notes). London: Penguin Classics, 1987 [1992].

Āvaśyakaniryukti, part II (reprint). 1981. Mumbai: Śrī Bherulāl Kanaiyālāl Kothārī Dhārmik Trast, sam 2038.

Bakker, H. 1992. Throne and temple: political power and religious prestige in Vidarbha. In H. Bakker (ed.). *The Sacred centre as the focus of political interest.* Proceedings of a symposium held on the occasion of the 375th anniversary of the University of Groningen, 5–8 March, 1989. Gronigen: 83–100.

Bakker, H. 1997. *The VākāYakas: an essay in Hindu iconology*. Groningen.

Barker, P. 1982. *Techniques of archaeological excavation*. London, 2nd edn.

Basham, A. L. 1954. *The wonder that was India*. London.

Bedigian, D. 1998. Early history of sesame cultivation in the Near East and beyond. In A. B. Damania, J. Valkoun, G. Willcox and C. O. Qualset (eds), *The Origins of agriculture and crop domestication*. Proceedings of the Harlan Symposium. Aleppo: 93–101.

Bedigian, D. 2003. Evolution of sesame revisited: Domestication, diversity and prospects. *Genetic resources and crop evolution* 50: 779–787.

Bedigian, D. and Harlan, J. R. 1986. Evidence for cultivation of sesame in the ancient world. *Economic botany* 40: 137–154.

Bender-Jørgensen, L. and Vogelsang-Eastwood, M. 1991. The Abu Sha'ar textiles 1991. *Archaeological textiles newsletter* 13: 3–4.

Bergman, I. 1975. *Late Nubian textiles: Scandinavian joint expedition to Nubia, vol. 8*. Copenhagen, Oslo, Stockholm.

Betts, A., van der Borg, K., de Jong, A., McClintock, C. and van Stryndonck, M. 1994. Early cotton in North Arabia. *Journal of archaeological science* 21: 489–499.

Bhandare, S. U. 1998. *Historical analysis of the Satavahana era: A study of coins*. Unpublished PhD, University of Mumbai, Ananthacharya Indological Research Institute.

Bhandare, S. U. 2006. Political transition in early 5th century Gujarat: A numismatic reappraisal based on the silver issues of the Western Ksatrapas, the Guptas and their contemporaries. *Numismatic digest* 29–30: 70–108.

Bhandare, S. and Kennet, D. Forthcoming. A reconsideration of Satavahana and later coins from archaeological contexts.

Bhandarkar, D. R. 1925. *Asoka*. Calcutta.

Bhandarkar, D. R., Chhabra, B. C. and Gai, G. S. 1981. *Inscriptions of the early Gupta kings*. New Delhi.

Bhandarkar, R. G. 1895. *Early History of the Dekkan*. Bombay.

Binford, L. R. 1981. *Bones: Ancient men and modern myths*. New York.

Binford, L. R. 1984. *Faunal remains from Klasies river mouth*. New York.

Blaikie, P. and Brookfield, H. C. 1987. Defining and debating the problem. In P. Blaikie and C. Brookfield (eds). *Land degradation and society.* London: 1–26.

Bloch, M. 1933. Le problème de l'or au Moyen Age. *Annales d'histoire économique et sociale* 5: 1–34.

Bloch, M. 1939. *La société féodale 1: la formation des liens de dépendance*. Paris.

Boardman, S. 1999. The agricultural foundation of the Aksumite Empire, Ethiopia: An interim report. In M. van der Veem (ed.). *The Exploitation of plant resources in ancient Africa.* London: 137–148.

Boessneck, J. 1969. Osteological differences between sheep (*Ovis aries Linné*) and goats (*Capra hircus Linné*). In D. Brothwell and E. S. Higgs (eds). *Science in archaeology*. London: 331–358.

Boland, R., Bedaux, R. and Boser-Sarivaxevanis, R. 1991. *Tellem textiles: Archaeological finds from burial caves in Mali's Bandiagara*. Amsterdam.

Bollée, W. B. 1994. *Materials for an edition and study of the Pimda- and Oha-Nijjuttis of the Śvetāmbara Jaina tradition. Volume II: Text and glossary.* Stuttgart.

Bopearachchi, O. and Pieper, W. 1998. *Ancient Indian coins.* Indicopleustoi: Archaeologies of the Indian Ocean 2. Turnhout.

Bowrey, T. 1905. *A Geographical account of countries round the Bay of Bengal 1669–1679.* R. C. Temple (ed.). London.

BrahmaPurāṇa = P. Schreiner and R. Söhnen. *Sanskrit indices and text of the Brahmapurāna*. Purana research publications, Tübingen vol. 1. Wiesbaden, 1987.

Brain, C. K. 1981. *The Hunters or the hunted?* Chicago.

Brhatkalpabhāsya = Brhatkalpasutra, with the bhāsya of Sanghadāasaganin. Muni Caturave-jaya and Muni Punyavijaya (eds). Bhāvnagar: Jain Atmānand Sabhā 2002, 2nd edn.

Bronkhorst, J. 2011. *Buddhism in the shadow of Brahminism*. Handbook of oriental studies section 2, South Asia, vol. 24. Leiden.

Brookfield, H. C. 1984. Intensification revisited. *Pacific viewpoint* 25(1): 15–44.

Burden, D. 2005. *'Sesame profile' in agricultural marketing resource centre: A national information resource for value-added agriculture*. Website, 11 November 2007: http://www.agmrc.org/agmrc/commodity/grainsoilseeds/sesame/sesameprofile.htm

https://doi.org/10.1515/9783110653540-016

Casson, L. 1989. *Periplus Maris Erythraei: Text with translation, introduction and commentary.* Princeton.
Casson, L. 1990. New light on maritime loans: P. Vindob. G. 40822. *Zeitschrift für papyrologie und Eepigraphik* 84: 195–206.
Casteel, R. W. 1977. Characterization of faunal assemblages and the minimum number of individuals determined from paired elements: Continuing problems in archaeology. *Journal of archaeological science* 4: 125–134.
Chakrabarti, D. K. 1988. *A history of Indian archaeology from the beginning to 1947*. New Delhi.
Chakrabarti, D. K. 1997. *The Archaeology of ancient Indian cities*. Delhi.
Chakrabarti, D. K. 2003. *Archaeology in the Third World: a history of Indian archaeology since 1947*. New Delhi.
Chakravarti, W. 1996. *The Social dimensions of early Buddhism*. New Delhi.
Champakalakshmi, R. 1998. Review of James Heitzman, *Gifts of power: lordship in an early Indian state*, Delhi, Oxford University Press, 1997. *Studies in history* 14: 147–152.
Chanchala, S. 1992. The fruit and seed remains from ancient Hulaskhera, district Lucknow, U.P. (c. 700 BC–500 AD). *Pragdhara: Journal of the Uttar Pradesh State Archaeological Organisation* 2: 65–80.
Chanchala, S. 1994. Harappan plant economy of Kutch, Gujarat. *Geophytology* 23(2): 227–233.
Chanchala, S. 1995. Some seed and fruit remains from Kausambi, district Allahabad, U. P. (ca 600 BC–450 BC). *Geophytology* 24: 169– 172.
Chanchala, S. 2000–2001. Seed and fruit remains from Manjhi. *Pragdhara: Journal of the Uttar Pradesh State Archaeological Organisation* 11: 143–153.
Chanchala, S. 2002. Botanical remains. In D. P. Tewari (ed.). *Excavations at Charda*. Lucknow: 166–194.
Chanchala, S. 2004. Botanical remains. In D. P. Tewari (ed.). *Excavations at Saunphari and explorations in Ganga plain*. Lucknow: 189–210.
Chapekar, B. N. 1969. *Report on the excavation at Ter 1958*. Pune.
Chatterjee, P. 2012. After Subaltern Studies. *Economic and political weekly* 47(35): 44–49.
Chattopadhyaya, B. 1973 [1994]. Irrigation in Early Medieval Rajasthan. In B. Chattopadhyaya. 1994. *The Making of Early Medieval India*. Oxford: 38–56.
Chattopadhyaya, B. 1974. Trade and urban centres in Early Medieval North India. *Indian historical review* 1(2): 203–219.
Chattopadhyaya, B. 1990. *Aspects of rural settlements and rural society in Early Medieval India*. Calcutta.
Chattopadhyaya, B. 1994. *The making of Early Medieval India*. Oxford.
Chattopadhyaya, B. 1998. *Representing the Other? Sanskrit sources and the Muslims*. Delhi.
Chattopadhyaya, B. D. 1977. *Coins and currency systems in south India c. AD 225–1300*. New Delhi.
Chattopadhyaya, B. D. 1986. Urban centres in Early Medieval India: An overview. In S. Bhattacharya and R. Thapar (eds). *Situating Indian history for Servepalli Gopal*. Delhi: 8–33.
Chavane, B. 1986. Etude pédologique et palynologique du site protohistorique de Ogo (moyenne vallée du Sénégal). *Archéologie africaine et sciences de la nature appliquées à l'archéologie*. Symposium international 1. Paris: 355–368.
Childe, G. 1951. *Social evolution*. London.
Chowdhury, K. A. and Buth, G. M. 1971. Cotton seeds from the neolithic in Egyptian Nubia and the origin of old world cotton. *Biological journal of the Linnean Society* 111: 303–312.
Chowdhury, K. A. and Buth, G. M. 2005. Plant remains from excavation of terraces of the Nile at Afyeh, Nubia and Egypt. *Purattatva* 35: 154– 159.
Chumble, P. D. 1991. Rare Satavahana coins. *Numismatic digest* 15: 41–50.
Clapham, A. and Rowley-Conwy, P. 2007. New discoveries at Qasr Ibrim, Lower Nubia. In R. Cappers (ed.). *Fields of change: Proceedings of the 4th international workshop for African archaeobotany*. Groningen: 157–164.
Clapham, A. J. and Rowley-Conwy, P. 2009. The archaeobotany of cotton (*Gossypium* sp. L.) in Egypt and Nubia with special reference to Qasr Ibrim, Egyptian Nubia. In A. S. Fairbairn and E. Weiss (eds). *From foragers to farmers: Papers in honour of Gordon C. Hillman*. Oxford: 244–253.
Colledge, S. 1998. Identifying pre-domestication cultivation using multivariate analysis. In A. B. Damania, J. Valkoun, G. Willcox and C. O. Qualset (eds). *The Origins of agriculture and crop domestication*. ICARDA, Aleppo: 121–131.
Colledge, S. 2001. *Plant exploitation on Epipalaeolithic and early Neolithic sites in the Levant*. British Archaeological Reports International Series 986. Oxford.
Collingwood, R. G. 1999. *The principles of history and other writings in philosophy of history*. W. H. Dray and W. J. van der Dussen (ed., notes). Oxford.
Cooke, M. 2002. *Investigating changing agricultural production and patterns of subsistence at ancient Hund, in the Vale of Peshawar, Pakistan*. Unpublished BSc Dissertation, Institute of Archaeology, University College London.
Cooke, M., Fuller, D. Q. and Rajan, K. 2005. Early historic agriculture in southern Tamil Nadu: Archaeobotanical research at Mangudi, Kodumanal and Perur. In U. Franke-Vogt and J. Weisshaar (eds). *South Asian archaeology 2003: Proceedings of the European Association for South Asian Archaeology conference, Bonn, Germany, 7th–11th July 2003*. Aachen: 329–334.
Cooke, T. 1903–08. *The Flora of the presidency of Bombay*. London.
Coomaraswamy, A. K. 1927. *History of Indian and Indonesian art*. New York.
Coomaraswamy, A. K. 1930. Early Indian architecture. *Eastern Art* 2: 209–235.
Coomaraswamy, A. K. 1992. *Early Indian architecture: IV. Huts and related temple types*. Essex House Press (Originally published 1956. Reprinted in A. K. Coomaraswamy. 1992. *Essays in early Indian architecture*. New Delhi: 103–124).
Costantini, L. 1979. Plant remains at Pirak. In J. F. Jarrige and M. Santoni (eds). *Fouilles de Pirak*. Paris: 326–333.
Costantini, L. 1983. The beginning of agriculture in the Kachi plain: The evidence of Mehrgarh. In B. Allchin (ed.). *South Asian archaeology 1981: Papers from the sixth international conference of the Association of South Asian Archaeologists in Western Europe held in Cambridge University 5–10 July 1981*. Cambridge: 29–33.
Costantini, L. 1987. Appendix B: Vegetal remains. In G. Stacul (ed.). *Prehistoric and protohistoric Swat, Pakistan*. Rome: 155–165.
Costantini, L. 1990. Harrapan agriculture in Pakistan: The evidence of Nausharo. In M. Taddei (ed.). *South Asian archaeology 1987*. Rome: 321–332.

Costantini, L. and Biasini, L. C. 1985. Agriculture in Baluchistan between the 7th and 3rd millenium BC. *Newsletter of Baluchistan studies* 2: 16–37.

Crawford, G. 2006. East Asian plant domestication. In M. T. Stark (ed.). *Archaeology of Asia*. Oxford: 77–95.

Cribb, J. 1992. Numismatic evidence for the date of the 'Periplus'. In D. W. MacDowall, S. Sharma and S. Garg (eds). *Indian numismatics, history and culture: Essays in honour of Dr Parmeshwaril Lal Gupta*. Delhi: 131–145.

Crowfoot, G. M. and Griffiths, F. L. 1934. On the early use of cotton in the Nile Valley. *Journal of Egyptian archaeology* 20: 5–12.

D'Andrea, A. C., Kahlheber, S., Logan, A. L. and Watson, D. J. 2007. Early domesticated cowpea (*Vigna unguiculata*) from central Ghana. *Antiquity* 81(313): 686–698.

Dales, G. F. 1986. Some fresh approaches to old problems in Harappan archaeology. In J. Jacobson (ed.). *Studies in the archaeology of India and Pakistan*. Delhi: 117–136.

Dass, M. and Willis, M. 2002. The lion capital from Udayagiri and the antiquity of sun worship in Central India. *South Asian studies* 18(1): 25–45.

Davis, S. J. M. 1987. *The Archaeology of animals*. London.

De Wet, J. M. J., Prasada Rao, K. E., Mengesha, M. H. and Brink, D. E. 1983. Diversity in kodo millet, *Paspalum scrobiculatum*. *Economic botany* 37(2): 159–163.

Deo, S. B. 1975. Paithan: Ek aitihaseeka samalochan [Marathi]. *Marathwada Samshodhana Mandala Warshika*. Usmanabad: 1–9.

Deo, S. B. and Dhavalikar, M. K. 1968. *Paunar excavations (1967)*. Nagpur.

Deo, S. B. and Gupte, R. S. 1974. *Excavations at Bhorkardan (Bhogavardhana) 1973*. Nagpur/Aurangabad.

Deo, S. B. and Joshi, J. P. 1972. *Pauni excavations (1969–70)*. Nagpur.

Deotare, B., Shete, G., Sawant, R., Kathale, V. and Naik, S. 2007. Discovery of structural stupa at Bhon, District Buldana, Maharashtra. *Puratattva* 37: 176–185.

Dey, N. L. 1899. *Geographical dictionary of ancient and medieval India*. Calcutta.

Deyell, J. S. 1990. *Living without silver: A monetary history of early medieval north India*. Delhi.

Dhopate, S. G. 2004. Two Satavahana silver coins with a distinct portrait feature. *Studies in South Indian Coins* 14: 51–54.

Digby, S. 1982. Northern India under the Sultanate. In T. Raychaudhuri and I. Habib (eds). *The Cambridge economic history of India Vol. 1. c. 1200–c. 1750 AD*. Cambridge: 45–47.

Dikshit, M. G. 1968. *Excavations at Kaundinayapura*. Bombay.

Dikshit, M. G. 1973. Excavation at Kausan and Paithan, district Aurangabad. *Indian archaeology 1965–66: a review*: 28–29.

Dirks, N. 1988. *The hollow crown: ethnohistory of an Indian kingdom*. Cambridge.

Doniger, W. 2009. Dogs as dalits in Indian literature. In U. Dill and C. Walde (eds). *Antike mythen: Medien, transformationen und konstruktionen*. Berlin/New York: 391–405.

Driesch, A. E. von den. 1976. *A Guide to the measurement of animal bones from archaeological sites*. Peabody Museum bulletin 1. Cambridge, Massachusetts.

Duby, G. 1952. *La société aux XIe et XIIe siècles dans la région mâconnaise*. Paris.

Eapen, J. 1960. A report on the animal remains of the Nevasa excavations. In H. D. Sankalia, S. B. Deo, Z. D. Ansari and S. Ehrhardt. *From history to prehistory at Nevasa (1954–56)*. Pune: 531–536.

Eastwood, G. 1982. Textiles. In D. S. Whitcomb and J. H. Johnson. 1982. *Quseir Al-Qadim 1980: Preliminary report*. American Research Center in Egypt: 285–326.

Erdosy, G. 1995. City states of north India and Pakistan at the time of the Buddha. In F. R. Allchin (ed.). *The Archaeology of early historic South Asia: The emergence of cities and states*. Cambridge: 99–122.

Eschmann, A., Kulke, H. and Tripathi, G. C. 1978. *The Cult of Jagannath and the regional tradition of Orissa*. South Asian studies 8. South Asia Institute, New Delhi branch, Heidelberg University. New Delhi.

Fa-Hsien. 1923. *The Travels of Fa-hsien (399– 414 A.D.), or records of the Buddhistic kingdoms*. Re-translated by H. A. Giles. Cambridge.

FAO 1995. *Sorghum and millets in human nutrition*. (FAO food and nutrition series, No. 27). Food and agriculture organization of the United Nations. Rome [available online: http://www.fao.org/DOCREP/T0818e/T0818E00.htm#Contents].

FAO 2001–2003. *Food and agriculture organization of the United Nations, world census of agriculture* (http://www.fao.org/fileadmin/templates/ess/documents/world_census_of_agriculture/countries_for_website/INDIA_2001-2003-F.pdf).

Fergusson, J. 1868. *Tree and serpent worship in India*. London.

Fleet, J. F. (ed.) 1888. *Inscriptions of the early Gupta kings and their successors*. Corpus inscriptionum Indicarum, vol. 3. Calcutta.

Flood, G. 2003. Introduction: Establishing the boundaries. In G. Flood (ed.). *The Blackwell companion to Hinduism*. Oxford: 1–19.

Fukunaga, K., Ichitani, K. and Kawase, M. 2006. Phylogenetic analysis of the rDNA intergenic spacer subrepeats and its implications for the domestication history of foxtail millet, *Setaria italica*. *Theoretical and applied genetics* 113(2): 261–269.

Fukunaga, K., Wang, Z., Kato, K. and Kawase, M. 2002. Geographical variation of nuclear genome RFLPs and genetic differentiation in foxtail millet, *Setaria italica* (L.) P. Beauv. *Genetic resources and crop evolution* 49: 95–101.

Fuller, D. Q. 1999. *The Emergence of agricultural societies in south India: Botanical and archaeological perspectives*. Unpublished PhD Dissertation, Cambridge University.

Fuller, D. Q. 2000. The botanical remains. In T. Insoll (ed.). *Urbanism, archaeology and trade: Further observations on the Gao region (Mali). The 1996 field season results*. British Archaeological Reports International Series 829. Oxford: 28–35.

Fuller, D. Q. 2002. Fifty years of archaeobotanical studies in India: Laying a solid foundation. In S. Settar and R. Korisettar (eds). *Indian archaeology in retrospect, volume III. Archaeology and interactive disciplines. Publications of the Indian council for historical research*. New Delhi: 247–364.

Fuller, D. Q. 2003a. Further evidence on the prehistory of sesame. *Asian Agri-History* 7(2): 127–137.

Fuller, D. Q. 2003b. African crops in prehistoric South Asia: A critical review. In K. Neumann, A. Butler and S. Kahlheber (eds). *Food, fuel and fields. Progress in Africa archaeobotany, Africa Praehistorica 15*. Colonge: 239–271.

Fuller, D. Q. 2003c. Indus and non-Indus agricultural traditions: Local developments and crop adoptions on the Indian

Peninsula. In S. Weber and W. Belcher (eds). *Indus ethnobiology: New perspectives from the field*. Lanham, Maryland: 343–396.

Fuller, D. Q. 2005. Ceramics, seeds and culinary change in prehistoric India. *Antiquity* 79(306): 761–777.

Fuller, D. Q. 2006a. Agricultural origins and frontiers in South Asia: A working synthesis. *Journal of world prehistory* 20: 1–86.

Fuller, D. Q. 2006b. The Ganges on the world Neolithic map: The significance of recent research on agriculture origins in northern India. *Pragdhara: Journal of the Uttar Pradesh State Archaeological Organisation* 16: 187–206.

Fuller, D. Q. 2007. Contrasting patterns in crop domestication and domestication rates: Recent archaeobotanical insights from the Old World. *Annals of botany* 100(5): 903–924.

Fuller, D. Q., Boivin, N. and Korisettar, R. 2007. Dating the Neolithic of South India: New radiometric evidence for key economic, social and ritual transformations. *Antiquity* 81: 755–778.

Fuller, D. Q. and Edwards, D. N. 2001. Medieval plant economy in middle Nubia: Preliminary archaeobotanical evidence from Nauri. *Sudan and Nubia* 5: 97–103.

Fuller, D. Q. and Harvey, E. L. 2006. The archaeobotany of Indian pulses: Identification, processing and evidence for cultivation. *Environmental archaeology* 11(2): 219–246.

Fuller, D. Q., Korisettar, R., Vankatasubbaiah, P. C. and Jones, M. K. 2004. Early plant domestications in southern India: Some preliminary archaeobotanical results. *Vegetation history archaeobotany* 13: 115–129.

Fuller, D. Q., Korisettar, R. and Venkatasubbaiah, P. C. 2001. Southern Neolithic cultivation systems: A reconstruction based on archaeobotanical evidence. *South Asian studies* 17: 171–187.

Fuller, D. Q. and Madella, M. 2001. Issues in Harappan archaeobotany: Retrospect and prospect. In S. Settar and R. Korisettar (eds). *Indian archaeology in retrospect, volume II. Protohistory publications of the Indian Council for Historical Research*. New Delhi: 317–390.

Fuller, D. Q. and Murphy, C. 2018. The Origins and early dispersal of horsegram (*Macrotyloma uniflorum*), a major crop of ancient India. *Genetic resources and crop evolution* 65(1): 285–305.

Fuller, D. Q. and Qin, L. 2009. Water management and labour in the origins and dispersal of Asian rice. *World archaeology* 41: 88–111.

Fuller, D. Q., Stevens, C. J. and McClatchie, M. 2014. Routine activities, tertiary refuse and labor organization: Social inference from everyday archaeobotany. In M. Madella, C. Lancelloti and M. Savard (eds). *Ancient plants and people. Contemporary trends in archaeobotany*. Tucson: 174–217.

Fuller, D. Q. and Weber, S. A. 2005. Formation processes and paleoethnobotanical interpretation in South Asia. *Journal of interdisciplinary studies in history and archaeology* 2(1): 91–114.

GacchācārVrtti = Gacchācāraprakīrnaka, with Vijayavimalaganin's vrtti. Vijayajinendrasūri (ed.). Sāntipurī: Harsapuspāmrta Jain Granthamālā, 1987.

Galinato, M., Moody, K. and Piggin, C. 1999. *Upland rice weeds of South and Southeast Asia*. International Rice Research Institute. Manila.

Gamble, J. S. 1935. *Flora of the Presidency of Madras, vol. I*. London.

Gautier, A. 1984. How do I count you, let me count the ways? Problems of archaeozoological quantification. In C. Grigson and J. Clutton-Brock (eds). *Animals and archaeology: 4. Husbandry in Europe*. British Archaeological Reports International Series 227. Oxford: 237–251.

Geerlings, E. 2001. S*heep husbandry and ethnoveterinary knowledge of Raika sheep pastoralists in Rajasthan, India*. Unpublished MSc dissertation, Department of Environmental Sciences, Wageningen University, Deventer, Netherlands.

George, J. C. 1955. Identification of bones. In H. D. Sankalia and S. B. Deo. *Report on excavations at Nasik and Jorwe 1950–51*. Pune: 142–143.

Ghosh, A. 1989. *An Encyclopaedia of Indian archaeology*. 2 vols. Delhi.

Godbole, S. 2002–2003. Some terracotta sealings from Paithan. *Journal of the Numismatic Society of India* 64–65: 18–19, pls II–III.

Gokhale, S. 1995. New discoveries in the Satavahana coinage. *Journal of archaeology – Satavahana Special*. Hyderabad.

Gopal, L. 1980. *Aspects of history of agriculture in ancient India*. Varanasi.

Gopal, L. and Srivastava, V. C. (eds). 2008. *History of agriculture in India (up to c.1200 AD)*. History of science, philosophy and culture in Indian civilization, vol. 5, part 1. General editor D. P. Chattopadhyaya. Delhi.

Goron, S. and Goenka J. P. 2001. *Coins of the Indian sultanates*. New Delhi.

Govt. of Maharashtra. 1977. *Maharashtra state gazeteers: Aurangabad district* (revised edition). Bombay.

Gramsci, A. 1995. *Further selections from the prison notebooks*. D. Boothman (ed., trans.). London.

Gramsci, A. 1996. *Prison notebooks*, vol. 2. J. A. Buttigieg (ed., trans.). New York.

Grant, A. 1982. The use of tooth wear as a guide to the age of domestic ungulates. In B. Wilson, C. Grigson and S. Payne (eds). *Ageing and sexing animal bones from archaeological sites*. British Archaeological Reports British Series 109. Oxford: 91–108.

Gray, B. 1948–49. Blue and white vessels in Persian miniatures of the 14th–15th centuries reexamined. *Transactions of the Oriental Ceramic Society*, 26: 22–30.

Grayson, D. K. 1984. *Quantitative zooarchaeology*. New York.

Griffee, P. 2001. *Sesamum indicum L.* In *Ecoport: food and agriculture organization of the United Nations. Food for all*. Website 11 November 2007: http://ecoport.org/ep?Plant=1937&entityDisplayCategory=full

Griffith, F. LL. and Crowfoot, G. M. 1934. On the early use of cotton in the Nile Valley. *Journal of Egyptian archaeology* 20: 5–12.

Guha-Thakurta, T. 2013. The production and reproduction of a monument: the many lives of the Sanchi stupa. *South Asian studies* 29(1): 77–109.

Gulati, A. N. and Turner, A. J. 1929. A note on the early history of cotton. *Journal of the Textile Institute* 20: 1–9.

Gunawardana, R. A. L. H. 1979. *Robe and plough: Monasticism and economic interest in early medieval Sri Lanka*. Tucson.

Gupta, P. L. 1960. *Punch-marked coins in the Andhra Pradesh Government Museum*. Hyderabad.

Gupta, P. L. and Hardaker, T. R. 1985. *Ancient Indian silver punch-marked coins of the Magadha Maurya Karshapana series*. Nasik.

Gupta, S. 1999. Ceramic seriation and chronology of early Satavahana coins. In A. M. Shastri (ed.). *The Age of the Satavahanas*. New Delhi: 349–359.

Gupta, S., Williams, D. and Peacock, D. 2001. Dressel 2–4 amphorae and Roman trade with India: the evidence from Nevasa. *South Asian studies* 17: 7–18.

Guy, J. 1986. *Oriental trade ceramics in South East Asia, 9th to 16th Century.* Oxford.

Guy, J. 1990. *Oriental trade ceramics in South-East Asia, ninth to sixteenth centuries, with a catalogue of Chinese, Vietnamese and Thai wares in Australian collections.* Oxford.

Habib, I. 1999. *The Agrarian system of Mughal India*. New Delhi, 2nd edn.

Halstead, P. 1987. Man and other animals in later Greek prehistory. *Annual of the British School of Archaeology at Athens* 82: 71–83.

Halstead, P. 1998. Mortality models and milking: problems of uniformitarianism, optimality and equifinality reconsidered. *Anthropozoologica* 27: 3–20.

Halstead, P., Collins, P. and Isaakidou, V. 2002. Sorting the sheep from the goats: morphological distinctions between the mandible and mandibular teeth of adult *Ovis* and *Capra*. *Journal of archaeological science* 29: 545–553.

Hammer, O., Harper, D. A. T. and Ryan, P. D. 2001. PAST: Paleontological statistics software package for education and data analysis. *Palaeontologia electronica* 4(1). palaeo-electronica.org/2001_1/past/issue1_01.htm.

Hardy, A. 1995. *Indian temple architecture: Form and transformation*. New Delhi.

Harle, K. 1996. *Coinage in the Roman economy, 300 B.C. to A.D. 700*. Baltimore.

Harvey, E. and Fuller, D. Q. 2005. Investigating crop processing through phytolith analysis: The case of rice and millets. *Journal of archaeological science* 32: 739–752.

Harvey, E. L., Fuller, D. Q., Mohanty R. K. and Mohanta, B. 2006. Early agriculture in Orissa: Some archaeobotanical results and field observations on the Neolithic. *Man and environment* 31(2): 21–32.

Hawkes, J. 2014a. Chronological sequences and the 'problem' of Early Medieval settlement in India. *Puratattva* 44: 208–228.

Hawkes, J. 2014b. Finding the Early Medieval in South Asian archaeology. *Asian perspectives* 53(1): 53–96.

Hawkes, J. 2020. The elephant in the room: archaeology and the Early Medieval period in India. In E. Myrdal (ed.). *South Asian archaeology and art 2014*. New Delhi: 169–183.

Hawkes, J. and Abbas, R. 2016. Copperplates in context: preliminary investigation of the study and archaeological settings of land grant inscriptions. *Pratnatattva*, 22: 41–71.

Hawkes, J. and Casile, A. 2019 (under review). Back to basics: exploring the importance of returning to the evidence, a case study from South Asia. *Asian archaeology*.

Hawkes, J., Abbas, R. and Willis, M. 2016. Report of the archaeological survey of Chamak and its surroundings, District Amaravati, Maharashtra. *Ancient Asia* 7: 1–7.

Hawkes, J., Abbas, R., Shete, G. and Willis, M. 2017. A newly discovered Iron Age settlement at Chachondi, District Amravati, Maharashtra. *Puratattva* 46: 114–125.

Hawkes, J., Abbas, R., Shete, G. and Willis, M. 2020. Iron Age stratigraphy: the sequence at Chachondi, Vidarbha. In L. Greaves and A. Hardy (eds). *Religions, society, trade and kingship: archaeology and art in South Asia and along the Silk Road, 3500 BCE–5th century CE*, vol. 1. New Delhi: 43–61.

Heitzman, J. 1997. *Gifts of power: lordship in an early Indian state*. Delhi.

Hernández Fernández, M. and Vrba, E. A. 2005. A complete estimate of the phylogenetic relationships in Ruminantia: A dated species-level supertree of the extant ruminants. *Biological review* 80: 269–302.

Hesse, B. and Wapnish, P. 1997. Can pig remains be used for ethnic diagnosis in the ancient Near East? In N. A. Silberman and D. Small (eds). *The Archaeology of Israel. Constructing the past, interpreting the present*. Journal for the study of the Old Testament, supplement series 237: 238–270.

Higham, C. F. W. 1967. Stock rearing as a cultural factor in prehistoric Europe. *Proceedings of the Prehistoric Society* 33: 84–106.

Hillig, K. W. 2005. Genetic evidence for speciation in Cannabis (Cannabaceae). *Genetic resources and crop evolution* 52(2): 161–180.

Hillman, G. C. 1984. Interpretation of archaeological plant remains: The application of ethnographic models from Turkey. In W. Van Zeist and W. A. Casparie (eds). *Plants and ancient man. Studies in paleoethnobotany*. Rotterdam: 1–41.

Hinüber, O. von. 2007. Review of F. Virkus Politische Strukturen im Guptareich (300–500 n.Chr) by F. Virkus. *Indo-Iranian journal* 50: 183–192.

Hocart, A. M. 1950. *Caste: a comparative study*. London.

Howell, J. 1995. *Excavations at Sannathi 1986–1989*. Memoirs of the Archaeological Survey of India, No. 93. New Delhi.

Inden, R. 1985. Lordship and caste in Hindu discourse. In A. Cantlie and F. Marglin (eds). *Indian religion*. London: 159–179.

Inden, R. 2006. *Text and practice: essays on South Asian history*. D. Ali (notes). SOAS Studies on South Asia. Oxford.

Jain, J. C. 1984. *Life in ancient India as depicted in the Jain canon and commentaries: 6th century BC to 17th century AD*. Delhi, 2nd edn.

Jayaswal, V. 2001. *Royal temples of Gupta period (excavations at Bhitari)*. New Delhi.

Jennings, P. R. 1966. The evolution of plant type in *Oryza sativa*. *Economic botany* 20: 396–402.

Jha, V. M. 1996. Settlement, society and polity in Early Medieval rural India. *Indian historical review* 20: 34–65.

Jha, A. and Chumble, P. D. 2003–2004. Coin bearing the name Satavahana/Sadavahana: Some new types. *Numismatic digest* 27–28: 47–66.

Jha, A. and Rajgor, D. 1994. *Studies in the coinage of the Western Ksatrapas*. Nasik.

Jinaprabhasūri = *Vividhatīrthakalpa*. Jinavijaya (ed.). Śāntiniketan: Singhī Jaina Jñānapītha, 1931.

Jones, G. E. M. 1991. Numerical analysis in archaeobotany. In W. Van Zeist, K. Wasylikowsa and K.–E. Behre (eds). *Progress in old world palaeoethnobotany*. Rotterdam: 63–80.

Kajale, M. D. 1974. Plant economy at Bhokardan. In S. B. Deo and R. S. Gupte (eds). *Excavations at Bhokardan (Bhoqavardhana) 1973*. Nagpur-Auranagabad: 217–224.

Kajale, M. D. 1977a. On the botanical findings from excavations at Daimabad, a Chalcolithic site in Western Maharashtra, India. *Current science* 46: 818–819.

Kajale, M. D. 1977b. Ancient plant economy at Nevasa during Satavahana and Indo-Roman period. *Bulletin of the Deccan College Research Institute* 35: 62–65.

Kajale, M. D. 1982. First record of ancient grains at Naikund. In S. B. Deo and A. P. Jamkhedkar (eds). *Excavations at Naikund 1978–1980*. Bombay: 60–63.

Kajale, M. D. 1984. New light on agricultural plant economy during 1st millennium BC: Palaeobotanical study of plant remains from excavations at Veerapuram, district Kurnool, Andhra Pradesh. In T. V. G. Sastri, M. Katsuri Bai and J. V. P. Rao (eds). *Veerapuram: A type site for cultural study in the Krishna Valley*. Hyderabad. Appendix B: 1–15.

Kajale, M. D. 1988. Plant economy. In M. K. Dhavalikar, H. D. Sankalia and Z. D. Ansari (eds). *Excavations at Inamgaon*. Pune: 727–821.

Kajale, M. D. 1989. Archaeobotanical investigation on Megalithic Bhagimohari and its significance. *Man and environment* 13: 87–96.

Kajale, M. D. 1991. Current status of Indian palaeoethnobotany: Introduced and indigenous food plants with a discussion of the historical and evolutionary development of Indian agriculture and agricultural systems in general. In J. M. Renfrew (ed.). *New light on early farming: Recent developments in palaeoethnobotany*. Edinburgh: 155–189.

Kajale, M. D. 1994. Archaeobotanical investigations on a multicultural site at Adam, Maharashtra, with special reference to the development of tropical agriculture in parts of India. In J. Hather (ed.). *Tropical archaeobotany: Applications and new developments*. London: 34–50.

Kajale, M. D. 1996a. Plant remains. In M. K. Dhavalikar, M. R. Raval and Y. M. Chitalwala (eds). *Kuntasi: a Harappan emporium on the west coast*. Pune: 285–289.

Kajale, M. D. 1996b. Palaeobotanical investigations at Balathal: Preliminary results. *Man and environment* 21: 98–102.

Kalpasūtra = Kalpa Sutra, Jain Sutras Part I. J. Hermann (ed.). Sacred Books of the East, Vol. 22. Oxford, 1884.

Kennet, D. 2004a. *Sasanian and Islamic pottery from Ras al-Khaimah: Classification, chronology and analysis of trade in the western Indian Ocean*. Society for Arabian Studies Monographs No. 1. BAR International Series 1248.

Kennet, D. 2004b. The transition from Early Historic to Early Medieval in the Vakataka realm. In H. Bakker (ed.). *The Vakataka heritage: Indian culture at the crossroads*. Groningen: 11–17.

Kennet, D. 2012. *Transformations in Early Historic and Early Medieval India: Excavations at Paithan, Maharashtra 1996–1999* [data-set]. York: Archaeology Data Service [distributor] (doi:10.5284/1017460).

Kennet, D. 2013. Reconsidering the decline of urbanism in late Early Historic and Early Medieval South Asia. In J. Schiettecatte and C. Robin (eds). *Les préludes de l'Islam: ruptures et continuités dans les civilisations du Proche-Orient de l'Afrique orientale, de l'Arabie et de l'Inde à la veille de l'Islam*. Orient & Méditerranée No. 11. Paris: 331–353.

Kennet, D. and Rao, J. V. P. 2003. Two Early Historic brick temples at Paithan in Maharashtra. *South Asian studies* 19: 113–123.

Ketkar, S. V. 1963. *Pracheena Maharashtra*, volume II [Marathi]. Pune.

Khan, A. W. 1963. *A Monograph on Yeleswaram excavations*. Andhra Pradesh Government Archaeological Series No. 14. Hyderabad.

Kharakwal, J. S., Rawat, Y. S. and Osada, T. 2007. Kanmer: a Harappan site in Kachchh, Gujarat, India. In T. Osada (ed.). *Linguistics, archaeology and the human past*. Occasional Paper 2. Kyoto: 21–46.

Kielhorn, F. 1894–95. *Epigraphia Indica* 3. New Delhi.

Kikkawa, Y., Yonekawa, H., Suzuki, H. and Amano, T. 1997. Analysis of genetic diversity of domestic water buffaloes and anoas based on variations in the mitochondrial gene for cytochrome b. *Animal genetics* 28: 195–201.

Kimata, M. 1989. Grain crop cookery on the Deccan plateau. In S. Sakamoto (ed.). *A Preliminary report of the studies on millet cultivation and its agro-pastoral culture complex in the Indian subcontinent, II*. Research team for the studies on millet cultivation in the Indian subcontinent, Kyoto University. Kyoto: 33–50.

Kimata, M., Ashok, E. G. and Seetharam, A. 2000. Domestication, cultivation and utilization of two small millets, *Brachiaria ramosa* and *Setaria glauca* (Poaceae), in South India. *Economic botany* 54(2): 217–227.

Kimata, M. and Sakamoto, S. 1992. Utilization of several species of millet in Eurasia. *Bulletin of Field Studies Institute, Tokyo Gakugei University* 3: 1–12.

Kingwell-Banham, E. and Fuller, D.Q. 2014. Brown top millet: origins and development. In C. Smith (ed.). *Encyclopedia of global archaeology*. New York: 1021–1024.

Kirch, P. J. 1994. *The Wet and dry: Irrigation and agricultural intensification in Polynesia*. Chicago.

Kirkbride, J. H. Jr., Gunn, C. R. and Dallwitz, M. J. 2006. *Family guide for fruits and aeeds*, version 1. 0. Website 5 May 2007: http://nt.arsgrin.gov/sbmlweb/OnlineResources/frsdfam/Index.cfm.

Kobayashi, H. and Kimata, M. 1989. Millets in Maharashtra and Orissa in India. In S. Sakamoto (ed.). *A Preliminary report of the studies on millet cultivation and its agro-pastoral culture complex in the Indian subcontinent, II*. Research team for the studies on millet cultivation in the Indian subcontinent, Kyoto University. Kyoto: 1–9.

Kosambi, D. D. 1956. *Introduction to the study of Indian history*. Bombay.

Kosambi, D. D. 1975. *An Introduction to the study of Indian history*. Originally published 1956. Bombay, 2nd edn.

Krahl, R. 1986. *Chinese ceramics in the Topkapı Saray Museum. A Complete catalogue*. 3 vols. London.

Krahl, R. 1997. Vietnamese blue-and-white and related wares. In J. Stevenson and J. Guy (eds). *Vietnamese ceramics: A Separate tradition*. Chicago: 146–157.

Kramrisch, S. 1946. *The Hindu temple*. 2 vols. Calcutta.

Kratochvil, Z. 1969. Species criteria on the distal section of the tibia in *Ovis ammon* f. *aries* and *Capra aegagrus* f. *hircus* L. *Acta Veterinaria (Brno)* 38: 483–490.

Krebs, C. 1985. *Ecology: The Experimental analysis of distribution and abundance*. New York, 3rd edn.

Kulke, H. 1978. Royal temple policy and the structure of Medieval Hindu kingdoms. In A. Eschmann, H. Kulke and G. C. Tripathi (eds). *The Cult of Jagannath and the regional tradition of Orissa*. South Asian Studies No. VIII. New Delhi: 125–137.

Kulke, H. 1995a. The study of the state in pre-modern India. In H. Kulke (ed.). *The State in India 1000–1700*. Delhi: 1–47.
Kulke, H. 1995b. The Early and the imperial kingdom: A Processural model of integrative state formation in Early Medieval India. In H. Kulke (ed.). *The State in India 1000–1700*. Delhi: 233–262.
Kumar, S., Gupta, J., Kumar, N., Dikshit, K., Navani, N., Jain, P. and Nagarajan, M. 2006. Genetic variation and relationships among eight Indian riverine buffalo breeds. *Molecular ecology* 15: 593–600.
Lane, A. 1947. *Early Islamic pottery*. London.
Laws of Manu. *The Laws of Manu*. W. Doniger and B. K. Smith (trans., notes). London: Penguin, 1991.
Lefrancq, C., Hawkes, J., Jaseera, C. M. and Mohanty, R. K. 2019. A typology of practice: the archaeological ceramics from Mahurjhari. *Internet archaeology* 52 https://doi.org/10.11141/ia.52.9.
Lefrancq, C. and Hawkes, J. 2019 (in preparation). Accepting variation and embracing uncertainty: creating a regional pottery typology in South Asian archaeology. *Open archaeology*.
Legge, A. J. 1981. Aspects of cattle husbandry. In R. Mercer (ed.). *Farming practice in British prehistory*. Edinburgh: 169–181.
Legge, A. J. 1992. *Excavations at Grimes Graves, Norfolk, 1972–1976, 4: Animals, environment and the Bronze Age economy*. London.
Legge, A. J. and Rowley-Conwy, P. A. 1988. *Star Carr revisited. A Re-analysis of the large mammals*. London.
Longhurst, A. H. 1917–18. The Kapotesvara temple at Chejerla in Guntur district. *Annual report of the Archaeological Department, Southern Circle*. Madras: 33–35.
Lowenthal, D. 1985. *The past is a foreign country*. Cambridge.
Ludden., D. 1999. *An Agrarian history of South Asia*. The New Cambridge history of India 4. 4. Cambridge.
Lueders, H. 1909–10. A list of Brahmi inscriptions. Appendix to *Epigraphia Indica*, vol. X. Calcutta.
Lunsingh Scheurleer, D. F. 1974. *Chinese export porcelain, 'Chine de commande'*. London.
Madella, M. 2003. Investigating agriculture and environment in South Asia: Present and future considerations of opal phytoliths. In S. A. Weber and W. R. Belcher (eds). *Indus ethnobiology. New perspectives from the field*. Lanham: 199–250.
Maggio, J. 2007. Can the subaltern be heard? Political theory, translation, representation, and Gayatri Chakravorty Spivak. *Alternatives: global, local, political* 32(4): 419–443.
Mahabharata = Sriman Mahabharatam. T. R. Krishnacharya and T. R. Vyasacharya (eds). Bombay, 1906–1909.
Maheshwari, K. K. 1977. Some interesting coins from Andhra Pradesh. *Numismatic digest* 1/I: 1–13.
Maheshwari, K. K. 1979. Coins of Kochhiputa Satakarni. *Numismatic digest* 3/II: 29–30.
Maheshwari, K. K. and Rath, B. 1996. Fire altar type of Skandagupta: Towards a typological and chronological definition. In K. K. Maheshwari and B. Rath (eds). *Numismatic panorama: Essays in memory of S. M. Shukla*. Delhi: 179–194.
Maheshwari, K. K. and Rath, B. 1998. Garuda type silver coins of Kumaragupta reconsidered. In A. K. Jha and S. Garg (eds). *Ex moneta: Essays in honour of Dr. David W. MacDowall*. Delhi: 293–320.
Maier, U. 1996. Morphological studies of wheat free-threshing ears from a Neolithic site in Southwest Germany, and the history of naked wheats. *Vegetation history and archaeobotany* 5: 39–55.
Majumdar, R. C. 1960. *Classical accounts of India*. Calcutta.
Mallory, J. P. and Mair, V. 2000. *Tarim mummies*. London.
Marr, C. 1978. West African textiles. *African arts* 11: 81.
Marshall, F. and Hildebrand, E. 2002. Cattle before crops: The beginnings of food production in Africa. *Journal of world prehistory* 16: 99–143.
Marshall, J. 1924. First light on a long forgotten civilization. *Illustrated London news* September 20: 528–532, 548.
Marshall, J. 1931. *Mohenjo-daro and the Indus civilization*. 3 vols. London.
Marshall, J., Foucher, A. and Majumdar, N. G. 1939. *The monuments of Sañchi*. 3 vols. Calcutta.
Marshall, J. 1951. *Taxila: an illustrated account of archaeological excavations carried out at Taxila under the orders of the Government of India between the years 1913 and 1934*. Cambridge.
Mate, M. S. 1957. Trivikrama temple at Ter. *Bulletin of Deccan College Institute* XVIII: 1–4.
Mayer-Thurman, C. C. and Williams, B. B. 1979. *Ancient textiles from Nubia*. Chicago.
McCorriston, J. 1997. The fiber revolution: Textile extensification, alienation, and social stratification in ancient Mesopotamia. *Current anthropology* 38: 517–549.
McCrindle, J. 1885. *Ancient India as described by Ptolemy*. Calcutta/London.
McCrindle, J. W. 1926. *Ancient India as described by Megasthenes and Arrian*. Reprint. New Delhi.
McKean, M. B. 1983. The palynology of Balakot, a pre-Harappan and Harappan age site in Las Bela, Pakistan. Unpublished PhD, Southern Methodist University.
Medley, M. 1976. *The Chinese potter: A Practical history of Chinese ceramics*. Oxford.
Mehta, R. N. and Shah, D. R. 1968. *Excavation at Nagara*. Baroda.
Mehta, R. N. 1979. *Mediaeval archaeology*. Delhi.
Meister, M. W., Dhaky, M. A. and Deva, K. 1988. *Encyclopaedia of Indian temple architecture*. Vol. II, part 1, text. Delhi.
Mirashi, V. V. 1963. *Corpus inscriptionum Indicarum*, vol. 5. New Delhi.
Mirashi V. V. 1966. *Epigraphia Indica*, vol. 36. New Delhi.
Mirashi, V. V. 1972. Wategaon hoard of Satavahana coins. *Journal of the Numismatic Society of India* 34/II: 205–212, pl. X.
Mirashi, V. V. 1979. *Satavahana ani Pashchimi Ksatrapa yancha Itihas aani Koreeva Lekha* [Marathi]. Bombay.
Misra, V. N. and Mohanty, R. K. 2001. A rare Chalcolithic pottery cache from Balathal, Rajasthan. *Man and environment* 26(2): 67–74.
Mitchiner, M. 1972. Some Kausambi, Rajgir and Mauryan copper coins. *Journal of the Numismatic Society of India* 34: 157–175.
Mitchiner, M. 1973. Local coinage of Taxila and Gandhara. *Journal of the Numismatic Society of India* 35: 48–72.
Mitchiner, M. 1978. *Oriental coins and their values: The ancient and classical world*. London.
Mohanty, R. K. 1999. Significance of a bead manufacturing centre at Mahurjhari, District Nagpur, Maharashtra, India. *Man and environment* 26(2): 79–89.

Mohanty, R. K. 2005. Some important observations: excavations at Mahurjhari (2001–2004). *Man and environment* 30(1): 106–107.

Mohanty, R. K., Hawkes, J., Lefrancq, C. and Abbas, R. 2019. Report on the dating of the Historical Period site at Mahurjhari, Vidarbha. *Heritage: journal of multidisciplinary studies in archaeology* 7: 15–28.

Moody, K. 1989. *Weeds reported in rice in South and Southeast Asia*. International Rice Research Institute, Manila.

Morris, R. (ed.) 1885–1900. *The Anguttara-nikâya*. Pali Text Society/Henry Frowde. 6 vols. London.

Morrison, K. 1994. The intensification of production: Archaeological approaches. *Journal of archaeological method and theory* 1(2): 111–159.

Morwanchikar, R. S. 1985. *The City of the saints: Paithan through the ages*. New Delhi.

Moulherat, C., Tengberg, M., Haquet, J.–F. and Mille, B. 2002. First evidence of cotton at Neolithic Mehrgarh, Pakistan: Analysis of mineralized fibres from a copper bead. *Journal of archaeological science* 29: 1393–1401.

Murray, M. and Nixon, S. 2006. Tadmakka/Essouk: Medieval plant remains from the Malian Sahara. Paper presented at the Fifth International Workshop on African Archaeobotany, University College London, London, July 2006 [http://www.homepages.ucl.ac.uk/~tcrndfu/IWAA/AbMurray.htm].

Murray, S. S. 2004. Searching for the origins of African rice domestication. *Antiquity* 78(300): Project Gallery: http://antiquity.ac.uk/progall/murray/

Murray, S. S. 2007. Medieval cotton and wheat finds in the middle Niger Delta (Mali). In R. Cappers (ed.), *Fields of change. Progress in African archaeobotany.* Groningen: 43–52.

Museum of London Archaeology Service. 1994. *Archaeology site manual*. London, 3rd edn.

Naik, S. S. and Deotare, B. C. 2016. Plant economy at Early Historic site of Bhon, District Buldana, Maharashtra. *Bulletin of the Deccan College Research Institute* 76: 51–68.

Nath, A. 1993. Taxila coins from Adam: A site in Vidarbha. *Journal of the Numismatic Society of India* 55: 19–22.

Nath, A. 1998. *Further excavations at Pauni 1994.* New Delhi.

Nath, A. 2016. *Excavations at Adam (1988–1992): a city of Asika Janapada*. Memoirs of the Archaeological Survey of India 109. New Delhi.

Nath, V. 2001. From 'Brahmanism' to 'Hinduism': Negotiating the myth of the Great Tradition. *Social scientist*. 29, 3/4: 19–50.

Nesbitt, M. N. 1993. Archaeobotanical remains. In G. Herrmann *et al*. The International Merv Project, preliminary report on the first season (1992). *Iran* 31: 39–62.

Nesbitt, M. N. 1994. Archaeobotanical research in the Merv oasis. In G. Herrmann *et al*. The International Merv Project. Preliminary report on the second season (1993). *Iran* 32: 53–75.

Neuss, J. 2012. Review of *Archaeological Excavations in Central India* by R. K. Sharma and O. P. Misra. *Journal of the Royal Asiatic Society* 22/1: 189–191.

Ng, N. Q. 1995. Cowpea. *Vigna unguiculata* (Leguminosae-Papilionideae). In J. Smartt and N. W. Simmonds (eds). *Evolution of crop plants*. Longman: 326–332 (2nd ed).

Niśīthacūrni=Niśītha-Sūtram with bhāsya and Jinadāsa's cūrni. Vol. III. Amaramuni and Kanhaiyālāl (eds). Delhi/Varanasi: Bhāratīya Vidyā Prakāśan, 1982.

Noda, K., Prakongvongs, C. and Chaiwiratnukul, L. 1985. *Topography of the seeds and leaves of tropical weed.* Bangkok.

Olsen, S. J. 1960. *Post-cranial skeletal characters of Bison and Bos*. Peabody Museum of Archaeology and Ethnology Papers 45, no. 4.

Pandey, S. N. and Chanda, A. 1996. *Economic botany*. New Delhi.

Payne, S. 1969. A metrical distinction between sheep and goat metacarpals. In P. J. Ucko and G. W. Dimbleby (eds). *The Domestication and exploitation of plants and animals*. London: 295–305.

Payne, S. 1972. Partial recovery and sample bias: The results of some sieving experiments. In E. S. Higgs (ed.). *Papers in economic prehistory*. Cambridge: 49–64.

Payne, S. 1973. Kill-off patterns in sheep and goats: The mandibles from Asvan Kale. *Anatolian studies* 23: 281–303.

Payne, S. 1975. Partial recovery and sample bias. In A. T. Clason (ed.). *Archaeozoological studies*. Amsterdam: 7–17.

Payne, S. 1985. Morphological distinctions between the mandibular teeth of young sheep, *Ovis*, and goats, *Capra*. *Journal of archaeological science* 12: 139–147.

Payne, S. and Bull, G. 1988. Components of variation in measurements of pig bones and teeth, and the use of measurements to distinguish wild from domestic pig remains. *ArchæoZoologia* 2: 27–65.

Payne, S. and Munson, P. J. 1985. Ruby and how many squirrels? The destruction of bones by dogs. In N. R. J. Fieller, D. D. Gilbertson and N. G. A. Ralph (eds). *Palaeobiological investigations*. British Archaeological Reports International Series 266. Oxford: 31–39.

Pearsall, D. M. 2000. *Paleoethnobotany. A Handbook of procedures*. New York, 2nd ed.

Pelling, R. 2005. Garamantean agriculture and its significance in a wider North African context: The evidence of plant remains from the Fazzan Project. *The Journal of North African studies* 10: 397–411.

Peng Xinwei. 1994. *A Monetary history of China*. E. Kaplan (trans.). Washington.

Penzer, N. M. 1968. *The Ocean of story: Being C. H. Tawney's translation of Somadeva's Katha Sarit Sagara.* New Delhi.

Peters, J. 1986. *Osteomorphology and osteometry of the appendicular skeleton of African buffalo, Syncerus caffer (Sparrman, 1779) and cattle, Bos primigenius f. taurus, Bojanus, 1827*. Occasional papers, Laboratorium voor Paleontologie, Rijksuniversiteit Gent, no. 1.

Pichard, P. 1994. *Vingt ans après Tanjavur, Gangaikondacholapuram*. Publications de l'Ecole française d'Extrême-Orient. Mémoires archéologiques, 20. Paris.

Pinto Orton, N. 1991. Red polished ware in Gujarat: A catalogue of twelve sites. In V. Begley and R. D. De Puma (eds). *Rome and India: The Ancient sea trade*. Madison: 46–81.

Pirenne, H. 1936. *Economic and social history of Medieval Europe*. London.

Pliny. *Natural History*. Vol. II, books III–VII. H. Rackham (ed.). The Loeb classical library, 1942.

Pokharia A. K. 2007. Table 1. Plant remains from Kanmer excavation 05–06. In T. Osada (ed.). *Linguistics, archaeology and the human past. Occasional paper 2*. Kyoto: 30–31.

Pokharia, A. K. 2008. Record of macrobotanical remains from the Aravalli Hill, Ojiyana, Rajasthan: Evidence from agriculture-based subsistence economy. *Current science* 94/5: 612–617.

Pokharia, A. K. and Saraswat, K. S. 1999. Plant economy during Kushana period (100–300 AD) at ancient Sanghol. *Pragdhara: Journal of the Uttar Pradesh State Archaeological Organisation* 9: 75–122.

Possehl, G. L. 1986. African millets in South Asian prehistory. In J. Jacobsen (ed.), *Studies in the archaeology of India and Pakistan*. New Delhi: 237–256.

Raeside, I. M. P. 1976. The Mahanubhavas. *Bulletin of the School of Oriental and African Studies* 39/3: 585–600.

Raja Reddy, D. and Suryanarayana Reddy, P. 1984. *Uninscribed coins of Andhra*. Hyderabad.

Rajgor, D. 1991. Recent researches in Kshatrapa numismatics. In D. Handa (ed.). *Numismatic studies* 1. New Delhi: 33–44.

Ranade, P. V. 1964. A new silver coin of Yajna Sri Satakarni. *Journal of the Numismatic Society of India* 26: 98.

Randhawa, M. S. 1980. *A History of agriculture in India. Vol. I: Beginning to 12th century*. New Delhi.

Rao, J. V. P. and Kennet, D. 1999. *Paithan 1999: An Interim report on the fourth season of excavations*. Unpublished report to the Archaeological Survey of India and the Society for South Asian Studies.

Rao, J. V. P., Kennet, D. and Howell, J. 1998. *Paithan 1996–1998: An Interim report on the first three seasons of excavations*. Unpublished report to the Archaeological Survey of India and the Society for South Asian Studies.

Rao, S. R. 1966. *Excavations at Amreli: A Kshatrapa-Gupta town*. Museum and Picture Gallery, Baroda. Bulletin Vol. 18. Baroda.

Rao, V. V. 1974. Bone remains from Bhokardan excavations. In S. B. Deo and R. S. Gupte. *Excavations at Bhokardan (Bhoqavardhana) 1973*. Nagpur, Aurangabad: 225–233.

Rapson, E. J. 1908. *Catalogue of Indian coins in the British Museum: Catalogue of the coins of the Andhra dynasty, the Western Ksatrapas, the Traikutaka dynasty, and the 'Bodhi' dynasty*. London.

Ray, H. P. 1986. *Monastery and guild: Commerce under the Satavahanas*. Delhi.

Ray, H. P. 2008. *Colonial archaeology in South Asia: the legacy of Sir Mortimer Wheeler*. New Delhi.

Ray, H. 1989. Early Historical settlement in the Deccan: An ecological perspective. *Man and environment* 14/1: 103–108.

Ray, H. P. 2009. The Shrine in early Hinduism: The changing sacred landscape. *The Journal of Hindu studies* 2: 76–96.

Redding, R. W. 1991. The role of the pig in the subsistence systems of ancient Egypt: A Parable on the potential of faunal data. In P. J. Crabtree and K. Ryan (eds). *Animal use and culture change. MASCA (Museum Applied Science Center for Archaeology) research papers in science and archaeology, supplement to volume 8*: 21–30.

Reddy, S. N. 1994. *Plant usage and subsistence modeling: An Ethnoarchaeological approach to the Late Harappan of Northwest India*. Ph. D. Dissertation, University of Wisconsin.

Reddy, S. N. 1997. If the threshing floor could talk: Integration of agriculture and pastoralism during the Late Harappan in Gujarat. *Journal of anthropological archaeology* 16: 162–187.

Reddy, S. N. 2003. *Discerning palates of the past: An Ethnoarchaeological study of crop cultivation and plant usage in India*. Ethnoarchaeological series 5, international monographs in prehistory. Ann Arbor, Michigan.

Rehm, S. and Espig, G. 1991. *The Cultivated plants of the tropics and subtropics: Cultivation, economic value, utilization*. Weikersheim.

Ritz, L. R., Glowatzki-Mullis, M.-L., MacHugh, D. E. and Gaillard, C. 2000. Phylogenetic analysis of the tribe Bovini using microsatellites. *Animal genetics* 31: 178–185.

Robbins, P. 1994. Goats and grasses in Western Rajasthan. *Pastoral development network paper 36a*. Overseas Development Institute, London: 6–12.

Rowley-Conwy, P. 1994. Dung, dirt and deposits: Site formation under conditions of near-perfect preservation at Qasr Ibrim, Egyptian Nubia. In R. Luff and P. Rowley-Conwy (eds). *Whither environmental archaeology?* Oxford: 25–32.

Rowley-Conwy, P. 1998. Improved separation of Neolithic metapodials of sheep (*Ovis*) and goats (*Capra*) from Arene Candide Cave, Liguria, Italy. *Journal of archaeological science* 25: 251–258.

Rowley-Conwy, P. 2000. Milking caprines, hunting pigs: The Neolithic economy of Arene Candide in its West Mediterranean context. In P. Rowley-Conwy (ed.). *Animal bones, human societies*. Oxford: 124–132.

Saldanha, C. J. 1984. *Flora of Karnataka, vol. I.* New Delhi.

Saldanha, C. J. 1996. *Flora of Karnataka*, *vol. II*. New Delhi.

Sali, C. 1998. Vakataka culture: archaeological perspective. *Sanshodhak* 66: 3–38.

Samuel, D. 2001. Archaeobotanical evidence and analysis. In S. Berthier (ed.). *Peuplement rural et aménagements hydroagricoles dans la moyenne vallée de l'Euphrate fin VIIe–XIXe siècle*. Damascus: 343–481.

Sankalia, H. D. and Deo, S. B. 1955. *The Excavations at Nasik and Jorwe*. Poona.

Sankalia, H. D., Deo, S. B., Ansari, Z. D. and Ehrhardt, S. 1960. *From history to prehistory at Nevasa (1954–56)*. Pune.

Sankalia, H. D. and Dikshit, M. G. 1952. *Excavations at Brahmapuri (Kolhapur) 1945–46.* Poona.

Sankalia, H. D., Subbarao, B. and Deo, S. B. 1958. *The Excavations at Maheshwar and Navdatoli 1952–53*. The Deccan College Research Institute and the Maharaja Sayajirao University publication No. 1. Pune.

Saraswat, K. S. 1986. Ancient crop remains from Sringeverapura, Allahabad, U. P. (ca. 1,050–700 B.C.). *Geophytology* 16(1): 97–106.

Saraswat, K. S. 1992. Archaeobotanical remains in ancient cultural and socio-economical dynamics of the Indian subcontinent. *Palaeobotanist* 40: 514–545.

Saraswat, K. S. 1993. Plant economy of Late Harappans at Hulas. *Purattatva* 23: 1–12.

Saraswat, K. S. 1996–97. Plant economy of Barans at ancient Sanghol (ca. 1900–1400 B.C.), Punjab. *Pragdhara: Journal of the Uttar Pradesh State Archaeological Organisation* 7: 97–114.

Saraswat, K. S. 1997. Plant economy of Barans at ancient Sanghol (ca. 1900–1400 B.C.), Punjab. *Pragdhara: Journal of the Uttar Pradesh State Archaeological Organisation* 7: 97–114.

Saraswat, K. S. 2002. Banawali (29'37'5"N; 75'23'6"E), district Hissar. *Indian archaeology 1996–97: a review*: 203.

Saraswat, K. S. 2004. Plant economy of early farming communities at Senuwar, Bihar. In B. P. Singh (ed.). *Senuwar excavations*. Varanasi: 416–535.

Saraswat, K. S. 2005. Agricultural background of the early farming communities in the middle Ganga Plain. *Pragdhara: Journal of the Uttar Pradesh State Archaeological Organisation* 15: 145–177.

Saraswat, K. S., Chanchala, S. and Pokharia, A. K. S. 2000. Palaeobotanical and pollen analytical investigations. *Indian archaeology 1994–95: a review*: 96–7.

Saraswat, K. S. and Pokharia, A. K. 2003. Palaeoethnobotanical investigations at Early Harappan Kunal. *Pragdhara: Journal of the Uttar Pradesh State Archaeological Organisation* 13: 105–140.

Saraswat, K. S., Sharma, N. K. and Saini, D. C. 1994. Plant economy at ancient Narhan (ca. 1,300 B.C.–300/400 A.D.). In B. P. Singh (ed.). *Excavations at Narhan (1984–1989)*. Varanasi: 255–346.

Sarkar, H. and Misra, B. N. 1972. *Nagarjunakonda*. New Delhi, 2nd edn.

Sarma, I. K. 1980. *Coinage of the Satavahana empire*. Delhi.

Sarma, I. K. 1982. *The Development of early Saiva art and architecture*. Delhi.

Sarma, I. K. 1993. Alampur temples: Rare evidences on constructional modes and consecrational rites. In A. V. N. Murthy and I. K. Sarma (eds). *Sri Ramachandrika (Professor Oruganti Ramachandaiya Festschrift): Essays on Indian archaeology, history, epigraphy, numismatics, art and religion*. Delhi: 351–368.

Sarma, I. K. 2000. *Numismatic researches (critical studies from excavated context)*. Delhi.

Sastri, T. V. G., Katsuri Bai, M. and Rao, J. V. P. 1984. *Veerapuram: A Type site for cultural study in the Krishna Valley.* Hyderabad.

Schlingloff, D. 1974. Cotton-manufacture in ancient India. *Journal of the economic and social history of the Orient* 17: 81–90.

Schoff, W. H. 1974. *Periplus of the Erythrean Sea*. Delhi (reprint).

Scott, H. R. 1908. The Nasik (Jogalthembi) hoard of Nahapana's coins. *Journal of the Bombay branch of the Royal Asiatic Society* 22: 223–244.

Senart, E. 1905–06. The inscriptions in the caves at Nasik. *Epigraphia Indica* 8: 59–96.

Settar, S. and Sontheimer, G.-D. 1982. *Memorial stones: a study of their origin, significance and variety*. Dharwad.

Shah, U. P. 1975. Beginnings of the superstructure of Indian temples. In P. Chandra (ed.). *Studies in Indian temple architecture: Papers presented at a seminar held in Varanasi, 1967*. American Institute of Indian Studies: 80–89.

Sharma, R. K. and Mishra, O. P. 2003. *Archaeological excavations in central India (Madhya Pradesh and Chhatttisgarh)*. New Delhi.

Sharma, R. S. 1965. *Indian feudalism, c. 300–1200*. Calcutta.

Sharma, R. S. 1972. Decay of Gangetic towns in Gupta and post-Gupta times. In S. Chandra (ed.). *Proceedings of the Indian History Congress, 33rd session*. Muzaffarpur: 92–104.

Sharma, R. S. 1980. *Indian feudalism c. AD 300–1200*. Madras, 2nd edn.

Sharma, R. S. 1983. *Material culture and social formations in Ancient India*. Delhi.

Sharma, R. S. 1987. *Urban decay in India (c. 300–c. 1000)*. New Delhi.

Sharma, R. S. 2001. *Early Medieval Indian society: A Study in feudalisation*. London.

Shastri, A. M. 1991. A terracotta proof piece of the silver coin of Vasishthiputra Pulumavi. *Journal of the Numismatic Society of India* 42: 115–117.

Shastri, A. M. 1992. Vakataka coins. In A. M. Shastri (ed.). *The Age of the Vakatakas.* New Delhi: 285–294.

Shaw, J. 2007. *Buddhist landscapes in central India: Sanchi Hill and archaeologies of religious and social change, c. third century BC to fifth century AD*. London.

Sherratt, A. 1999. Cash-crops before cash: Organic consumables and trade. In C. Gosden and J. Hather (eds). *The Prehistory of food. Appetites for change*. London: 13–34.

Shinnie, P. L. and Anderson J. 2004. *Capital of Kush 2 (Meroitica 20)*. Wiesbaden.

Shishlina, N. I., Orfinskaya O. V. and Golikov, V. P. 2003. Bronze Age textiles from the North Caucasus: New evidence of fourth millennium BC fibres and fabrics. *Oxford journal of archaeology* 22(4): 331–344.

Shrimali, K. M. 1987. *Agrarian structure in central India and the northern Deccan (c. AD 300–500): A Study in Vakataka inscriptions*. Delhi.

Siddham https://zenodo.org/communities/siddham/

Sidebotham, S. E. 1991. Ports of the Red Sea and the Arabia-India trade. In V. Begley and R. D. de Puma (eds). *Rome and India: The Ancient sea trade*. Madison: 12–38.

Singh, J., Erenstein, O., Thorpe, W. and Varma, A. 2007. *Crop-livestock interactions and livelihoods in the Gangetic Plains of Uttar Pradesh, India*. Crop-livestock interactions scoping study, report 2. Research report 11. Nairobi.

Singh, P., Lakshminarasimhan, N. P., Karthikeyan, S. and Prasanna, P. V. 2001. *Flora of Maharashtra State, Vol. 2*. Botanical survey of India, Calcutta.

Singh, U. 1994. *Kings, Brāhmaṇas and temples in Orissa*. Delhi.

Singh, U. 2011. Introduction. In U. Singh (ed.). *Rethinking Early Medieval India: a reader*. New Delhi: 1–44.

Sircar D. C. 1960. *Studies in the geography of ancient and Medieval India*. New Delhi.

Sircar, D. C. 1968. *Studies in Indian coins*. Delhi.

Sircar, D. C. 1974. *Studies in the political and administrative systems in ancient and Medieval India*. Delhi.

Small, E. and Cronquist, A. 1976. A practical and natural taxonomy for Cannabis. *Taxon* 25(4): 405–435.

Smartt, J. 1990. *Grain legumes: Evolution and genetic resources*. Cambridge.

Smith, A. B. and Jacobson, L. 1995. Excavations at Geduld and the appearance of early domestic stock in Namibia. *South African archaeological bulletin* 50: 3–14.

Soustiel, J. 1985. *La Céramique Islamique*. Fribourg.

Spate, O. H. K. and Learmonth, A. T. A. 1967. *India and Pakistan: a general and regional geography*. London, 3rd ed.

Spivak, G. C. 1988. Can the subaltern speak? In C. Nelson and L. Grossberg (eds). *Marxism and the interpretation of culture*. Urbana, IL: 271–313.

Staubwasser, M., Sirocko, F., Grootes, P. M. and Segl, M. 2003. Climate change at the 4. 2 ka BP termination of the Indus Valley civilization and Holocene South Asian monsoon variability. *Geophysical research letters* 30: 1425–1429.

Stein, B. 1980. *Peasant state and society in Medieval South India*. Oxford.

Stevens, C. J. 2003. An investigation of agricultural consumption and production models for prehistoric and Roman Britain. *Environmental archaeology* 8(1): 61–76.

Strabo. 1930. *Geography. The Geography of Strabo*, vol. vii. The Loeb classical library. T. E. Page, E. Capps and W. H. D. Rouse (eds). London.

Strouhal E. 1984. *Wadi Qitna and Kalabsha-South*. Prague.

Subbarao, B. 1953. *Baroda through the ages*. Baroda.

Sutta Nipata = K. R. Norman. *The Group of Discourses*. Pali Text Society. Oxford, 2001, 2nd edn.

Tadulingam, C. and Venatanarayana, G. 1985. *A Handbook of some South Indian weeds*. Delhi.

Tengberg, M. 1999. Crop husbandry at Miri Qalat, Makran, SW Pakistan (4000–2000 B.C.). *Vegetation history and archaeobotany* 8: 3–12.

Tewari, R., Srivastava, R. K., Saraswat, K. S. and Singh, K. K. 2000. Excavations at Malhar, district Chandauli (U. P.) 1999: A Preliminary report. *Pragdhara: Journal of the Uttar Pradesh State Archaeological Organisation* 10: 69–98.

Thanheiser, U. 2002. Roman agriculture and gardening in Egypt as seen from Kellis. In C. A. Hope and G. E. Bowen (eds). *Dakhleh Oasis Project: Preliminary reports on the 1994–1995 to 1998–1999 field seasons*. Dakhleh Oasis Project: monograph 11. Oxford and Oakville: 299–310.

Thapar, B. K. 1967. Prakash 1955: A Chalcolithic site in the Tapti Valley. *Ancient India* 20/21: 4–177.

Thapar, R. 1968. Interpretations of ancient Indian history. *History and theory* 7(3): 318–335.

Thapur, R. 1984. *From Lineage to state: Social formations in the mid-first millennium B.C. in the Ganga Valley*. Bombay. Reprinted in R. Thapar. 2000. *History and beyond*. Oxford.

Tisdell, C. and Gali, J. 1999. *Trends and developments in India's livestock industry*. University of Queensland School of Economics, economics, ecology and environment working paper 31.

Todywalla/Hurmuz Kaus. 2004. *Todywalla Auctions catalogue No. 8: Coins from the Hurmuz Kaus Collection, Hyderabad*. Mumbai.

Tomber, R. 2007. Rome and Mesopotamia: Importers into India in the first millennium AD. *Antiquity* 81, 972–988.

Tomooka, N., Vaughan, D. A., Moss, H. and Maxted, N. 2003. *The Asian Vigna: Genus Vigna subgenus Ceratotropis genetic resources*. The Netherlands.

Vaillancourt, R. E. and Weeden, N. F. 1992. Chloroplast DNA polymorphism suggests Nigerian center of domestication for the cowpea, *Vigna unguiculata*, Leguminosae. *American journal of botany* 79: 1194–1199.

van Schrötter, F. 1930. *Wörterbuch der Münzkunde*. Berlin.

Vasudeva Hindi = Vasudevhiṇḍi: a narrative text in archaic Prakrit. M. Caturvijaya and M. Punyavijaya (eds). Bhavnagar, 1930–31.

Vats, M. S. 1940. *Excavations at Harappa. I.* Calcutta.

Venkateshaiah, S. V., Varaprasada Rao, J. and Visweswara, M. V. 2006. Constructional modes and consecrational rites of a Rashtrakuta temple, Pattadakal, Karnataka. In P. Chenna Reddy (ed.). *Mahasenasiri: Riches of Indian archaeological and cultural studies (a felicitation volume in honour of Dr. I. K. Sarma)*. 2 vols. Delhi: 335–344.

Verdcourt, B. 1971. Phaeseoleae. In E. Milne-Redhead and R. M. Polhill (eds). *Flora of tropical East Africa, Legumonisae (Part 4), Papilionidae (2)*. London.

Viot, C. 2019. Domestication and varietal diversification of Old World cultivated cottons (*Gossypium* sp.) in the Antiquity. *Revue d'ethnoécologie* [Website, posted 30-6-2019, consulted 2-1-2020]. URL : http://journals.openedition.org/ethnoecologie/4404 ; DOI : 10.4000/ethnoecologie.4404.

Vishnu-Mittre. 1961. Plant economy in ancient Navdatoli-Maheshwar. In *Technical report on archaeological remains*. Pune: 13–52.

Vishnu-Mittre. 1968. Kaundinyapura plant economy in pre-historic and historic times. In M. G. Dikshit (ed.). *Excavations at Kaundinyapura*. Bombay: 140–147.

Vishnu-Mittre. 1971. Ancient plant economy at Hallur. In M. S. Nagaraja Rao (ed.), *The Protohistoric cultures of the Tungabhadra Valley*. Dharwad University: 125–130.

Vishnu-Mittre. 1990. Plant remains. In J. P. Joshi (ed.), *Excavations at Surkotada*. Memoirs of the Archaeological Survey of India. New Delhi: 388–392.

Vishnu-Mittre and Gupta, H. P. 1968a. Ancient plant economy at Paunar, Maharashtra. In S. B. Deo and M. K. Dhavalikar (eds). *Paunar excavations 1967*. Nagpur: 128–134.

Vishnu-Mittre and Gupta, H. P. 1968b. Plant remains from Ancient Bhatkuli, district Amraoti, Maharashtra. *Puratattva* 2: 21–22.

Vishnu-Mittre, Prakash, U. and Awasthi, N. 1971. Ancient plant economy at Ter, Maharashtra. *Geophytology* 1(2): 170–177.

Vishnu-Mittre and Savithri, R. 1979. Palaeobotanical and pollen analytical investigations. *Indian archaeology 1974–1975: a review:* 78–81.

Vishnu-Mittre, Sharma, A. and Chanchala, S. 1984. Palaeobotanical and pollen analytical investigations. *Indian Archaeology 1981–82: a review:* 105–106.

Vishnu-Mittre, Sharma, A. and Chanchala, S. 1986. Ancient plant economy at Daimabad. In S. A. Sali (ed.). *Daimabad 1976–1979*. New Delhi: 588–626.

Wakankar, V.S. 1967. Kayatha excavation number. *The Vikram: Journal of Vikram University, Ujjain*. Ujjain.

Walshaw, S. C. 2005. Swahili urbanization, trade, and food production: botanical perspectives from Pemba Island, Tanzania, A. D. 600–1500. Unpublished PhD Dissertation, Washington University, St. Louis.

Watson, J. 1979. The estimation of the relative frequencies of mammalian species. *Journal of archaeological science* 6: 127–137.

Watt, G. 1889–1893. *A Dictionary of the economic products of India*. 7 vols. London.

Weber, S. A. 1991. *Plants and Harappan subsistence. An Example of stability and change from Rojdi*. New Delhi.

Weber, S. A. 1998. Out of Africa: The impact of millets in South Asia. *Current anthropology* 39: 267–274.

Weber, S. A. 1999. Seeds of urbanism: Paleoethnobotany and the Indus civilization. *Antiquity* 73: 813–826.

Weber, S. A. 2001. Seeds of urbanism revisited. *Antiquity* 75: 413–414.

Weber, S. A. 2003. Archaeobotany at Harappa: Indications for change. In S. A. Weber and W. R. Belcher (eds). *Indus ethnobiology. New perspectives from the field*. Lanham: 175–198.

Weber, S. A. and Fuller, D. Q. 2008. Millets and their role in early agriculture, *Pragdhara: Journal of the Uttar Pradesh State Archaeological Organisation* 18: 69–90.

Wendel, J. F. 1995. Cotton. In J. Smartt and N. W. Simmonds (eds). *Evolution of crop plants*. Longman: 358–366 (2nd ed).

Wheeler, R. E. M. 1954. *Archaeology from the Earth*. Oxford.

Wheeler, R. E. M. 1955. *Still digging*. London.

Wheeler, R. E. M. 1962. *Charsada: A Metropolis of the north-west frontier*. Oxford.

Whitehouse, D. and Williamson, A. 1973. Sasanian maritime trade. *Iran* 11: 29–49.

Wild, J. P. and Wild, F. C. 1998. The textiles. In S. E. Sidebotham and W. Z. Wendrich (eds). *Berenike 96: Report of the excavations at Berenike (Egyptian Red Sea coast) and the survey of the Eastern Desert*. Leiden: 221–236.

Wild, J. P. and Wild, F. C. 2001. Sails from the Roman port at Berenike, Egypt. *The International journal of nautical archaeology* 30: 211–220.

Wild, J. P. and Wild, F. C. 2005. Rome and India: early Indian cotton textiles from Berenike, Red Sea coast of Egypt. In R. Barnes (ed.), *Textiles in Indian Ocean studies*. London: 11–16.

Wild, J. P. and Wild, F. 2008. Early Indian cotton textiles from Berenike. In E. M. Raven (ed.). *South Asian Archaeology 1999*. Groningen: 229–233.

Wilkinson, K. and Stevens, C. 2003. *Environmental archaeology: Approaches, techniques and applications*. Stroud.

Willcox, G. 1992. Some differences between crops of Near Eastern origin and those from the tropics. In C. Jarrige (ed.). *South Asian archaeology 1989*. Madison: 291–299.

Willis, M. 2009. *The Archaeology of Hindu ritual: Temples and the establishment of the Gods*. Cambridge.

Wilson, L. M. 1933. *Ancient textiles from Egypt in the University of Michigan collection*. Ann Arbor, Michigan.

Yazdani, G. 1960. *Early history of the Deccan*. Oxford.

Yusuf, S. 1938. Paithan excavations. *Indian art and letters* XII, 2: 1–7.

Yusuf, S. 1939. Appendix C: Paithan excavations. *Annual report of the archaeological department of His Exalted Highness the Nizam's dominions*. Calcutta: 39–42, pls XV–XX.

Zeder, M. A. 1996. The role of pigs in Near Eastern subsistence: A view from the southern Levant. In J. D. Seger (ed.). *Retrieving the past: Essays on archaeological research and methodology in honor of Gus W. Van Beek*. Winona Lake: 297–312.

Zhou, Z. and Bathelomew, B. 2003. Cannabaceae. In Zhengyi Wu, P. H. Raven and Deyuan Hong (eds). *Flora of China 5.* St. Louis: 74–75.

Zohary, D. and Hopf, M. 2000. *Domestication of plants in the Old World*. Oxford, 3rd edn.

Appendix I
List of recorded contexts

Context	Trench	Type	Description	Date	Trench phase	Period	Bone	Sherds (approx)
0	All		Virtual context used for surface finds and other unstratified finds.	10/04/00				
1	C	Topsoil	Pottery and tile inclusions.	17/03/96				
2	C	Layer	Lime mortar deposit from ring-well construction, and possible cap of context 3.	17/03/96				
3	C	Layer	Re-deposited erosional slump deposit.	17/03/96				
4	C	Layer	Lime mortar deposit, similar to context 2.	16/03/96				
5	C	Fill	Fill of cut 7. Very fine, with occasional large fragments of tile and stone limited to sides and very bottom of pit.	17/03/96				
6	C	Fill	Fill of animal burrows. No cut number.	22/02/96				
7	C	Cut	Cut for fill 5. Large sub-circular pit, steep sided with flat bottom.	17/03/96				
8	C	Layer	Fill of cut 19.	18/03/96				
9	C	Fill	Fill of cut 22. Occasional medium pebble and tile fragments in base.	19/03/96				
10	C	Layer	Fill of cut 21. Upper fill, representing disuse phase of feature.	18/03/96				
11	C	Fill	Fill of ring-well.	19/03/96				
12	C	Fill	Fill of cut 23.	19/03/96				
13	C	Fill	Fill of cut 24.	19/03/96				
14	C	Fill	Fill of cut 18. Possible post-hole, very similar to Fill 10.	19/03/96				
15	C	Fill	Fill of construction trench of ring-well. Discontinuous in places, but located between mortar of context 2 and wall of context 17.	19/03/96				
16	C	Layer	Inclusions of pottery and tile.	19/03/96				
17	C	Wall	Brick wall of a ring-well.	19/03/96				
18	C	Cut	Cut for fill 14. Sub-circular, steep-sided cut from the surface of Context 16.	19/03/96				
19	C	Cut	Cut for fill 8. SE portion of a steep-sided sub-circular cut. Too deep to excavate completely.	19/03/96				
20	C	Fill	Post-hole base and packing of cut 21. Large fragments of brick and stone packed around a central circular boulder.	19/03/96				
21	C	Cut	Post-hole cut with two fills. Upper fill 10 represents disuse of feature. Lower fill 20 is foundation of post.	19/03/96				
22	C	Cut	Shallow cut of fill 9. Not fully exposed.	19/03/96				
23	C	Fill	Lower silt in-washing fill of cut 24.	19/03/96				
24	C	Cut	Cut of shallow pit. Not fully exposed in plan, but similar to cuts 7 and 28.	19/03/96				

https://doi.org/10.1515/9783110653540-017

Context	Trench	Type	Description	Date	Trench phase	Period	Bone	Sherds (approx)
25	C	Layer	Ash lens in layer 16.	21/03/96				
26	C	Fill	Fill of cut 27. Possible organic dump, including lots of charcoal soot and flecks.	22/03/96				
27	C	Cut	Very shallow cut, almost on top of context 16, rather than into it. Extensive site horizon below.	22/03/96				
28	C	Cut	Cut of fill 13. Cut into context 16, but complete plan unknown.	22/03/96				
29	C	Layer	Mid-brown fine/medium sandy silt. Frequent small/medium river pebbles.	23/03/96				
30	C	Fill	Fills of cut 33. Mixed contexts of ash and clayey-silt.	25/03/96				
31	C	Layer	Rammed earth floor. One of several occupation/ dereliction deposits in connection with context 32.	24/03/96				
32	C	Wall	Single course of broken brick fragments, aligned on a slight curve East-West. Faced on southern side.	24/03/96				
33	C	Cut	Cut of fill 30. Cuts into context 34.	25/03/96				
34	C	Layer	Compact silt/clay with frequent large pebbles, brick, tile and flecks of lime or burnt shell. Not homogenous distribution.	25/03/96				
35	C	Drain	Brick drain. Two parallel lines of bricks on edge, with single line lying flat to form base, packed in by tile and brick rubble.	25/03/96				
36	C	Drain?	Two and a half bricks, roughly aligned with drain 35. May represent cap or channel bottom of drain.	25/03/96				
37	C	Layer	Sandy silt deposit. Small stone flecks, occasional burnt bone/lime, charcoal and brick rubble.	25/03/96				
38	C	Layer	Sandy silt deposit. Frequent brick rubble, stone fragments and charcoal, but no homogeneity of distribution.	26/03/96				
40	C	Layer	Sandy silt, of varying composition, compaction, and inclusions, but no clear differentiation.	27/03/96				
41	C	Not used	Last context number from PTN96.					
42	C	Topsoil	Soil wash accumulation across low level depression. Baulk sample.	05/03/97				
43	C	Layer	Latest make-up soil layer. Possible last packed earth floor, but very disturbed by mixing and wash. Baulk sample.	05/03/97				
44	C	Layer	Compact silt soil (baulk sample).	06/03/97				
45	C	Layer	Compact silt soil (baulk sample).	06/03/97				
46	C	Topsoil	Baulk sample.	06/03/97				
47	C	Layer	Compact silt soil.	06/03/97				
48	C	Layer	Compact silt soil.	06/03/97				
49	C	Topsoil	No record kept.	08/03/97				
50	C	Layer	No record kept.	08/03/97				
51	C	Layer	No record kept.	08/03/97				
52	C	Layer	No record kept.	08/03/97				
53	C	Layer	No record kept.	09/03/97				

Context	Trench	Type	Description	Date	Trench phase	Period	Bone	Sherds (approx)
54	C	Topsoil	Equal to context 56.	09/03/97				
55	C	Layer	Compact silt layer.	09/03/97				
56	C	Topsoil	Equal to context 54.	09/03/97				
57	C	Layer	Equal to context 58.	10/03/97				
58	C	Layer	Equal to context 57.	10/03/97				
59	C	Layer	Soil layer in baulk. Compact and silty, with pebble inclusions and sparse cultural material.	10/03/97				
60	C	Fill	Pit fill. Coarse chalky inclusions, stones and pottery.	11/03/97				
61	C	Fill	Rubble pit fill.	11/03/97				
62	C	Layer	Equal to context 63.	11/03/97				
63	C	Layer	Equal to context 62.	11/03/97				
64	C	Fill	Pit (top fill).	11/03/97				
65	C	Layer	Uncertain. Layer next to wall (?), north.	12/03/97				
66	C	Layer	Uncertain. Layer next to wall (?), south. Equal to context 71.	12/03/97				
67	C	?	No record kept.	12/03/97				
68	C	Topsoil	Topsoil.	12/03/97				
69	C	Fill	Lower pit fill.	12/03/97				
70	C	Layer	No record kept.	12/03/97				
71	C	Layer	Equal to context 66.	13/03/97				
72	C	Layer	Compact silt soil.	13/03/97				
73	C	Fill	Fill of possible post-hole 75.	13/03/97				
74	C	Fill	Fill, and layer of lower pit.	13/03/97				
75	C	Cut	Cut of possible post-hole.	13/03/97				
76	C	Fill	Lower pit, possibly of a ditch.	13/03/97				
77	C	Fill	Fill of cut 78.	13/03/97				
78	C	Cut	Cut of fill 77. Pit or post-hole.	13/03/97				
79	C	Layer	No record kept.	15/03/97				
80	C	Layer	Rubbly layer.	15/03/97				
81	C	Layer	Layer/wall?	15/03/97				
82	C	Layer	Layer/wall?	15/03/97				
83	C	Layer	No record kept.	16/03/97				
84	C	Layer	No record kept.	16/03/97				
85	C	Fill	Fill/layer.	16/03/97				
86	C	Layer	No record kept.	16/03/97				
87	C	Layer	Lowest ‘definite archaeology’ layer.	17/03/97				
88	C	Layer	No record kept.	17/03/97				
89	C	Layer	No record kept.	17/03/97				
90	C	Layer	No record kept.	17/03/97				
91	C	Layer	No record kept.	17/03/97				
92	C	Layer	No record kept.	17/03/97				
93	C	Layer	Semi-natural layer including ceramics.	17/03/97				
94	C	Layer	No record kept.	18/03/97				
95	C	Layer	Silt-like soil, mixed with ash deposits.	18/03/97				
96	C	Layer	Soil mixed with silt.	18/03/97				

Context	Trench	Type	Description	Date	Trench phase	Period	Bone	Sherds (approx)
97	C	Layer	No record kept.	18/03/97				
98	C	Layer	Lowest.	18/03/97				
99	C	Topsoil	No record kept.	18/03/97				
100	C	Layer	Mixed rubble layer.	18/03/97				
101	C	Layer	Compact silt.	19/03/97				
102	C	Fill	Fill of post-hole. Infrequent charcoal, moderate organic material, pebbles and grit.	19/03/97				
103	C	Layer	Natural?	19/03/97				
104	C	Wall	Stone wall, aligned East-West.	20/03/97				
105	C	Layer	No record kept.	20/03/97				
106	C	Fill	Upper fill of collapsed ring-well. May represent same context as 100.	20/03/97				
107	C	Layer	Red burnt clay.	20/03/97				
108	C	Fill	Fill of pit (against east-facing section).	21/03/97				
109	C	Ring-well	Terracotta ring-well pieces.	21/03/97				
110	C	Fill	Fill of cut 111. Upper fill of pit.	21/03/97				
111	C	Cut	Cut of narrow, deep pit. Squarish in plan, with rounded corners. Extends under baulk and not fully excavated. Possibly related to ring-well construction.	21/03/97				
112	C	Fill	Rubbly top fill.	21/03/97				
113	C	Fill	Fill of cut 114.	21/03/97				
114	C	Cut	Cut of 113. Cut into 117.	21/03/97				
115	C	Fill	Top fill of cut 119.	21/03/97				
116	C	Layer	Grey soil mixed with ash and flecks of charcoal. Large number of potsherds.	21/03/97				
117	C	Layer	Grey/brown compact sandy silt. Occasional lime/mortar and pebbles.	21/03/97				
118	C	Fill	Middle fill of cut 119. Soft, red sandy silt. Occasional mortar, charcoal and shell flecks, brick fragments and pebbles.	22/03/97				
119	C	Cut	Cut of fills 115, 118 and 121. Deep pit with lip at top. Cut into natural.	22/03/97				
120	C	Layer	Compact sandy, silty clay. Pale brown, with occasional pebbles, small stones and very occasional mica.	22/03/97				
121	C	Fill	Bottom fill of cut 119. Soft red/brown sandy silt, occasional pebbles, stone flecks, grit, mortar and shell flecks.	22/03/97				
122	C	Layer	Dark brown.	22/03/97				
123	C	Layer	No record kept.	22/03/97				
124	C	Cut	Construction cut for terracotta ring-well. Oval plan, due to collapse of ring-well. May have been cut from later layer.	22/03/97				
125	C	Layer	Cut by 124.	23/03/97				
126	C	Layer	Compact soil, mixed with ash, charcoal, brick bats and pot-sherds.	23/03/97				

Context	Trench	Type	Description	Date	Trench phase	Period	Bone	Sherds (approx)
127	C	Layer	Compact yellow.	23/03/97				
128	C	Layer	Lowest north of terracotta ring-well.	23/03/97				
129	C	Fill	Mixed pit fill of cut 136.	23/03/97				
130	C	Fill	Lower fill of cut 111. Pottery dump, with seepage of clayey silt into the deposit.	23/03/97				
131	C	Layer	South of terracotta ring-well and 111.	24/03/97				
132	C	Fill	Fill of construction cut for terracotta ring-well.	24/03/97				
133	C	Fill	Lower fill of ring-well. Possibly the original fill, before collapse of the upper levels of ring-well.	24/03/97				
134	C	Layer	South of ring-well (lowest).	24/03/97				
135	C	Fill	Lower fill of cut 136.	25/03/97				
136	C	Cut	Cut of fills 129 and 136.	25/03/97				
137	C	Cut	Cut of fills 60 and 69 'pit'?	25/03/97				
138	C	Cut	Cut of fills 61 and 64.	25/03/97				
139	C	Cut	Cut of fill 108.	25/03/97				
140	C	Cut	Cut for fill 85.	25/03/97				
141	C	Layer	Number allocated from section.					
142	C	Layer	Number allocated from section.					
143	C	Layer	Number allocated from section.					
144	C	Layer	Number allocated from section.					
145	C	Layer	Number allocated from section.					
146	C	Layer	Number allocated from section.					
147	C	Layer	Number allocated from section.					
148	C	Layer	Number allocated from section.					
149	C	Layer	Number allocated from section.					
150	C	Layer	Number allocated from section.					
151	C	Fill	Number allocated from section.					
152	C	Cut	Number allocated from section.					
153	C	Layer	Number allocated from section.					
154	C	Layer	Number allocated from section.					
155	C	Fill	Number allocated from section.					
156	C	Fill	Number allocated from section.					
157	C	Fill	Number allocated from section.					
158	C	Fill	Number allocated from section.					
159	C	Fill	Number allocated from section.					
160	C	Fill	Number allocated from section.					
161	C	Cut	Number allocated from section.					
162	C	Layer	Number allocated from section.					
163	C	Fill	Number allocated from section.					
164	C	Cut	Number allocated from section.					
165	C	Layer	Number allocated from section.					
166	C	Layer	Number allocated from section.					
167	C	Layer	Number allocated from section.					
168	C	Layer	Number allocated from section.					
169	C	Layer	Number allocated from section.					

Context	Trench	Type	Description	Date	Trench phase	Period	Bone	Sherds (approx)
170	C	Fill	Number allocated from section.					
171	C	Fill	Number allocated from section.					
172	C	Fill	Number allocated from section.					
173	C	Fill	Number allocated from section.					
174	C	Cut	Number allocated from section.					
175	C	Layer	Number allocated from section.					
176	C	Floor	Number allocated from section.					
177	C	Fill/layer	Number allocated from section.					
178	C	Fill/layer	Number allocated from section.					
179	C	Fill/layer	Number allocated from section.					
180	C	Fill/layer	Number allocated from section.					
181	C	Fill/layer	Number allocated from section.					
182	C	Cut	Number allocated from section.					
183	C	Layer	Number allocated from section.					
184	C	Layer	Number allocated from section.					
185	C	Floor	Number allocated from section.					
186	C	Layer	Number allocated from section.				Y	
187	C	Layer	Number allocated from section.					
188	C	Layer	Number allocated from section.					
189	C	Layer	Number allocated from section.					
190	C	Layer	Number allocated from section.					
191	C	Layer	Number allocated from section.					
192	C	Layer	Number allocated from section.					
193	C	Layer	Number allocated from section.					
194	C	Layer	Number allocated from section.					
195	C	Fill	Number allocated from section.					
196	C	Fill	Number allocated from section.					
197	C	Cut	Number allocated from section.					
198	C	Layer	Number allocated from section.					
199	C	Floor	Number allocated from section.					
200	C	Layer	Number allocated from section.					
201	C	Floor	Number allocated from section.					
202	C	Layer	Number allocated from section.					
203	C	Layer	Number allocated from section. Probably = 179 (same layer).					
204-299	Not used.		Numbers not used.					
300	A:TP1	Layer	Trample/backfill in bottom of Yusuf's trench.	23/02/98		4	Y	258
301	A:TP1	Layer	Layer of brick rubble and silt below 300.	24/02/98		4	Y	579
302	A:S of S Temple	Rubble	Brick jelly patches abutting the southern wall of the South Temple.	24/02/98		4	Y	219
303	A:S of S Temple	Rubble	Silt and rubble to south of the South Temple.	24/02/98		4	Y	2,088
304	A:TP1	Rubble	Bricks, possible *in situ* wall collapse.	24/02/98		4		
305	A:TP1	Layer	Trample under wall collapse 304.	24/02/98		3	Y	583
306	A:TP1	Layer	Deposit next to west wall of the North Temple; possibly top fill of foundation trench.	24/02/98		3-temple		125

Context	Trench	Type	Description	Date	Trench phase	Period	Bone	Sherds (approx)
307	A:TP1	Layer	Soapy trampled surface under rubble and brick collapse.	25/02/98		3	Y	263
308	A:TP1	Layer	Silty layer, may be contaminated by fill of construction trench.	25/02/98	TP1-4	3	Y	702
309	A:TP2	Layer	Silty layer between two temples.	28/02/98				344
310	A:TP1	Fill	Fill of construction trench 311.	28/02/98		3-temple	Y	56
311	A:TP1	Cut	Cut of construction trench for the South Temple (west end).	28/02/98		3-temple		
312	A:TP1	Layer	Layer cut by construction trench, same as 308 but no contamination.	28/02/98	TP1-4	3	Y	576
313	A:TP1	Fill	Fill of construction trench 311.	01/03/98		3-temple		17
314	A:TP2	Layer	Loose grey silty clay; no finds.	01/03/98				
315	A:TP2	Layer	Brick rich layer, may be back-fill post 1967 conservation.	01/03/98			Y	359
316	A:TP1	Layer	Whitish compact layer, possible floor in north-west corner of TP1.	02/03/98		3	Y	240
317	A:TP2	Layer	Deposit of brick bats, a few pot-sherds and brick jelly.	02/03/98			Y	451
318	A:TP1	Layer	Soft ashy layer. Not excavated 1998.	02/03/98		3		
319	A:TP2	Layer	Compact, dense grey clay layer – *mandapa* surface?	02/03/98				99
320	A:TP9	Layer	Silt accumulation in bottom of Yusuf's trench.	04/03/98		4		0
321	A:W Area	Layer	Silt accumulation in Yusuf's trench to west of both temples.	05/03/98		4		17
322	A:N Temple	Rubble	Rubble or crude wall on top of east wall, North Temple.	05/03/98				
323	A:TP2	Fill	Loose, granular, blackish fill adjacent to south wall of the North Temple filling 388.	08/03/98			Y	2,512
324	A:NWNT	Layer	Dark brown, stoney, clayey deposit north of the North Temple.	07/03/98		4?		
325	A:NWNT	Rubble	Rubble and stone linear deposit, probably post-Yusuf.	07/03/98		4?		
326	A:NWNT, TP9	Fill	Upper silty fill of robber trench 329.	07/03/98		4		366
327	A:NWNT	Fill	Fill of robber trench 377.	07/03/98		4?	Y	394
328	A:NWNT, TP9	Fill	Lower fill of robber trench 329 (west half).	07/03/98		4	Y	1,002
329	A:NWNT, TP9	Cut	Cut of robber trench of north wall of the North Temple (fills 326, 328 and 332).	07/03/98		4		
330	A:TP5	Rubble	Rubble and brick pavement within the South Temple.	08/03/98		4	Y	939
331	A:NWNT	Fill	Fill of robber trench 341 between remaining walls.	08/03/98		4?	Y	1,264
332	A:NWNT	Fill	Fill of robber trench 396.	08/03/98		4?		137
333	A:W Area	Fill	Fill of cut 393 within 323, with compact pale grey earth and brick bats.	09/03/98				
334	A:TP5	Fill	Fill of pit 335 cut into north-west corner of the South Temple.	09/03/98		4	Y	650
335	A:TP5	Cut	Cut of pit in north-west corner of the South Temple (fill 334).	09/03/98		4		
336	A:NWNT	Fill	Fill of robber trench 337.	09/03/98		4?		280

Context	Trench	Type	Description	Date	Trench phase	Period	Bone	Sherds (approx)
337	A:NWNT	Cut	Cut of robber trench in north-east corner of the North Temple (fill 336).	09/03/98		4?		
338	A:W Area	Fill	Brick jelly fill overlying 323 and cut 339.	09/03/98		3		59
339	A:W Area, TP3	Cut	Cut filled by 338 and 640.	09/03/98		3		
340	A:N Temple	Foundation	Phase I foundation of the North Temple.	10/03/98				5
341	A:NWNT	Cut	Cut of robber trench in north wall of the North Temple (fill 331).	10/03/98		4?		
342	A:TP6	Rubble	Compact rubble packing along the south of the South Temple.	10/03/98		3-temple	Y	189
343	A:TP6	Fill	Fill of pit 369 cut below 320.	11/03/98			Y	431
344	A:S Temple	Wall	Phase III east wall of the South Temple.	11/03/98				
345	A:S Temple	Wall	Phase IV extension to east end of north wall of the South Temple.	11/03/98				
346	A:S Temple	Surface	Surface to east of the South Temple (not excavated).	11/03/98				
347	A:S Temple	Cut	Foundation cut for wall 352, South Temple.	11/03/98				
348	A:EEST	Fill	Packing of foundation cut 347 after construction of wall 352.	11/03/98		3	Y	1,599
349	A:S Temple	Wall	Short wall abutting wall 345 to east of the South Temple (N side).	11/03/98				
350	A:EEST	Fill	Fill of robber trench 364.	11/03/98		3	Y	406
351	A:S Temple	Wall	Number originally given to part of wall 560. Equals 560.	11/03/98				
352	A:N Temple	Wall	Phase IV and V east wall of the South Temple.	11/03/98				
353	A:S Temple	Floor	Brick floor to east of wall 352.	11/03/98				
354	A:S Temple	Wall	Small, crude brick alignment abutting east end of wall 349.	11/03/98				
355	A:EEST	Stone	Unexcavated stones to east of the South Temple – may be later walling or flooring.	11/03/98		3		
356	A:EEST	Fill	Fill under 355, not excavated.	11/03/98		3		
357	A:EEST	Fill	Fill of small post-hole 358, east of the South Temple.	11/03/98		3	Y	251
358	A:EEST	Cut	Cut of small post-hole, east of the South Temple.	11/03/98		3		
359	A:S Temple	Wall	Phase IV extension to east of south wall of the South Temple.	11/03/98				
360	A:S Temple	Wall	Crude stone wall on top of wall 352, east of the South Temple.	11/03/98				
361	A:S Temple	Wall	Number originally given to part of wall 560. Equals 560.	11/03/98				
362	A:EEST	Layer	Layer under wall 354 (not excavated).	11/03/98		3		
363	A:EEST	Layer	Layer under 353 (not excavated).	11/03/98		3		
364	A:EEST	Cut	Robber cut in north end of wall 352 of the South Temple (fill 350).	11/03/98		3		

Context	Trench	Type	Description	Date	Trench phase	Period	Bone	Sherds (approx)
365	A:NWNT	Layer	Whitish/light grey silt layer, north-west corner Trench A.	11/03/98		4?	Y	91
366	A:S Temple	Layer	Layer beneath floor 330 inside the South Temple.	12/03/98			Y	1,631
367	A:NWNT	Fill	Foundation cut fill for brick pedestal 375 (with 368).	12/03/98		4?	Y	107
368	A:NWNT	Cut	Foundation cut fill for brick pedestal 375 (with 367).	12/03/98		4?		
369	A:TP6	Cut	Cut of a pit below 320 (fill 343).	12/03/98				
370	A:TP6	Layer	Hard greyish deposit along the south wall of the South Temple, fills cut 371.	14/03/98		3	Y	1,836
371	A:TP6	Cut	Cut filled by 370.	14/03/98				
372	A:TP6	Cut	Cut or re-cut of foundation trench of south wall of the South Temple.	14/03/98		3-temple		
373	A:TP6	Surface	Hard surface south of the South Temple.	14/03/98		3	Y	1,349
374	A:EEST	Layer	Silt deposit associated with floor 353.	14/03/98		3		
375	A:NWNT	Wall	Brick pedestal in the north wall of the North Temple with mortar pointing; possibly 1967 reconstruction.	14/03/98		4?		
376	A:NWNT	Fill	Fill of cut 377.	14/03/98		4	Y	3,544
377	A:NWNT, TP9	Cut	Robber trench cut in north wall of the North Temple.	14/03/98		4		
378	A:NWNT	Layer	Brick jelly patch, north of the North Temple.	14/03/98		4?		
379	A:NWNT	Layer	Brick jelly and rubble layer north of cut 377.	14/03/98		4?	Y	280
380	A:NWNT	Cut	Cut filled by deposit 365.	14/03/98		4?		
381	A:NWNT	Fill	Fill of cut 382, compact dark brown.	14/03/98		4?	Y	194
382	A:NWNT	Cut	Foundation cut for wall 514. Same as 515. Cuts through eastern end of 398.	14/03/98		4?		
383	A:N Temple	Wall	Thin Phase V partition wall in west of *mandapa,* North Temple (equals 544).	14/03/98				
384	A:N Temple	Wall	Internal cross wall above 383, North Temple. Possibly a 1967 reconstruction of a late internal wall.	14/03/98				
385	A:NWNT	Fill	Loose fill, probably robber fill (similar to 331).	14/03/98		4?		
386	A:NWNT	Cut	Robber cut, continuation of cut 377.	14/03/98		4?	Y	971
387	A:NWNT	Rubble	Medium-sized brick/rubble deposit within 379.	14/03/98		4?		
388	A:TP2	Cut	Cut filled by 323.	14/03/98				
389	A:TP2	Surface	Hard surface, cut by 388.	14/03/98				
390	A:TP2	Fill	Fill of foundation trench 391 of south wall of the North Temple.	14/03/98				
391	A:TP2	Cut	Cut of foundation trench of south wall of the North Temple (filled by 390).	14/03/98				
392	A:TP2	Layer	Brick jelly deposit below fill 323.	14/03/98				
393	A:TP2	Cut	Cut filled with 333.	14/03/98				
394	A:NWNT	Layer	Layer under brick jelly rubble, north-west corner of Trench A.	14/03/98		4?		278
395	A:TP9	Fill	Loose fill below walls 383/384. May be fill deposited during 1967 reconstruction.	15/03/98		4		0

Context	Trench	Type	Description	Date	Trench phase	Period	Bone	Sherds (approx)
396	A:NWNT	Cut	Cut of robber trench with fill 332 east of line of bricks.	15/03/98		4?		
397	A:N Temple	Wall	Upper rubble wall on the south wall of the North Temple – probably resulting from 1967 restoration.	16/03/98				
398	A:TP9	Layer	Top layer in interior of the North Temple; re-numbered 519.	16/03/98				62
399	A:NWNT	Fill	Foundation packing for wall 502.	16/03/98		4?		217
400	B	Layer	Surface.	12/03/98	B-58	4	Y	2,018
401	B	Wall	Late structure on eastern side of trench.	12/03/98	B-56	4		
402	B	Layer	Dump material deposit against 401.	12/03/98	B-57	4	Y	3,626
403	B	Pillar	Pillar base – south.	14/03/98	B-55	4		
404	B	Pillar	Pillar base – north.	14/03/98	B-55	4		
405	B	Fill	Fill of 406.	15/03/98	B-57	4		
406	B	Cut	Cut of pit for pot filled by 405.	16/03/98	B-57	4		120
407	B	Pillar	Fill of 408.	16/03/98	B-55	4		
408	B	Cut	Cut of northern side pillar base foundation (filled 407).	16/03/98	B-55	4		34
409	B	Cut	Cut for southern side pillar base foundation (filled 410).	16/03/98	B-55	4		
410	B	Fill	Fill of 409.	16/03/98	B-55	4		0
411	B	Cut	Cut for north-eastern side pillar base along wall.	16/03/98	B-55	4		
412	B	Fill	Fill of 411.	16/03/98	B-55	4		
413	B	Floor	Floor level into which pillar bases 403, 404 are cut.	16/03/98	B-54	4	Y	625
414	B	Layer	Deposit inside structure 401.	16/03/98	B-57	4	Y	315
415	B	Fill	Fill of 416.	17/03/98	B-53	4	Y	159
416	B	Cut	Cut along northern section of trench, filled by 415.	17/03/98	B-53	4		
417	B	Floor	Floor level into which pit 416 is cut.	17/03/98	B-52	4	Y	470
418	B	Fill	Fill of pit 419.	17/03/98	B-51	4	Y	171
419	B	Cut	Cut of pit below floor level 417 (filled by 418).	17/03/98	B-51	4		
420	B	Fill	Fill of pit 421.	17/03/98	B-51	4	Y	89
421	B	Cut	Cut of pit in north-western corner of trench (filled by 420).	17/03/98	B-51	4		
422	B	Fill	Fill of pit 423.	17/03/98	B-55	4		24
423	B	Cut	Cut of pit in south-west corner (filled by 422).	17/03/98	B-55	4		
424	B	Fill	Fill of 425.	17/03/98	B-55	4		
425	B	Cut	Foundation cut for south-eastern pillar base (filled by 424).	17/03/98	B-55	4		
426	B	Fill	Loose fill, north-eastern corner of trench.	18/03/98	B-53	4		15
427	B	Floor	Floor in which pits 419 and 421 are cut.	18/03/98	B-50	4	Y	378
428	B	Layer	Ash deposit on western side of trench.	18/03/98	B-49	4	Y	32
429	B	Floor	Compact floor deposit covering whole trench.	18/03/98	B-47	4	Y	510
430	B	Fill	Fill of pit 431.	18/03/98	B-48	4	Y	188

Context	Trench	Type	Description	Date	Trench phase	Period	Bone	Sherds (approx)
431	B	Cut	Pit cut into 429 (filled by 430).	18/03/98	B-48	4		
432	B	Fill	Fill of 433.	18/03/98	B-48	4	Y	385
433	B	Cut	Cut of pit into floor 429 (filled by 432).	18/03/98	B-48	4		
434	B	Layer	Stone deposit overlying pit 436.	19/03/98	B-48	4		
435	B	Fill	Fill of pit 436.	19/03/98	B-48	4	Y	4,224
436	B	Cut	Pit cut into floor 429, filled by 435.	21/01/98	B-48	4		
437	B	Fill	Compact brown deposit, north-eastern corner of trench.	21/03/98	B-43	4	Y	202
438	B	Layer	Thick clay deposit with few sherds.	22/03/98	B-46	4	Y	148
439	B	Floor	Floor level with white plaster patches.	22/03/98	B-44	4	Y	1,370
440	B	Layer	Loose ashy deposit with a lot of sherds and underlying red burnt deposit.	23/03/98	B-45	4	Y	729
441	B	Pot	Large pot covered with 442.	24/03/98	B-41	2	Y	1,318
442	B	Fill	Mud lining of pot 441, burnt to a high temperature.	24/02/98	B-42	2	Y	
443	B	Layer	Black burnt deposit in south-east corner of trench.	24/02/98	B-40	2	Y	182
444	B	Pot	Half pot in southern section, related to 441.	24/02/98	B-39	2	Y	175
445	B	Pot	Small pot in south-west corner next to 441.	24/03/98	B-39	2		
446	B	Pot	Pot on the western side of pit 436.	25/03/98	B-39	2		
447	B	Fill	Mud plaster lining of pot 446.	25/03/98	B-39	2		40
448	B	Fill	Fill of 449.	16/02/99	B-39	2	Y	607
449	B	Cut	Channel cut running from south section to cut of pit 436 (filled by 448).	17/02/99	B-39	2		
450	B	Floor	Floor level, loose blackish brown below 443.	17/02/99	B-38	2	Y	142
451	B	Floor	Compact brown yellow floor level below 450.	17/02/99	B-37	2	Y	182
452	B	Floor	Compact brown floor level.	18/02/99	B-36	1		645
453	B	Floor	Semi-compact brownish black floor level.	18/02/99	B-35	1	Y	588
454	B	Fill	Fill of 455.	18/02/99	B-34	1		
455	B	Cut	Pit cut (filled by 454).	18/02/99	B-34	1		
456	B	Layer	Compact yellow deposit in north-west corner of trench.	20/02/99	B-33	1		69
457	B	Floor	Compact floor level does not extend to western side of trench.	20/02/99	B-32	1	Y	196
458	B	Floor	Semi-compact floor level on western side of trench.	20/02/99	B-30	1	Y	470
459	B	Fill	Fill of post-hole 460.	21/02/99	B-31	1		
460	B	Cut	Post-hole cut, filled by 459, cutting 458.	21/02/99	B-31	1		
461	B	Fill	Fill of post-hole 462.	21/02/99	B-31	1		
462	B	Cut	Post-hole cut, filled by 461, cutting 458.	21/02/99	B-31	1		
463	B	Fill	Fill of post-hole 464.	21/02/99	B-31	1		
464	B	Cut	Post-hole cut, filled by 463, cutting 458.	21/02/99	B-31	1	Y	
465	B	Floor	Compact floor with brownish-black patches and burnt clay.	22/02/99	B-29	1	Y	501

Context	Trench	Type	Description	Date	Trench phase	Period	Bone	Sherds (approx)
466	B	Floor	White floor level on north side of trench.	23/02/99	B-28	1		
467	B	Floor	Floor with burnt clay lumps and charcoal.	23/02/99	B-27	1	Y	930
468	B	Floor	Floor level with white patches.	24/02/99	B-26	1	Y	255
469	B	Fill	Fill of pit 470, with a lot of pottery.	24/02/99	B-25	1	Y	2,305
470	B	Cut	Pit cut, filled by 469, cutting 468.	24/02/99	B-25	1		
471	B	Floor	Floor with patches of white lime.	24/02/99	B-24	1		154
472	B	Floor	Floor with white lime patches.	24/02/99	B-23	1	Y	109
473	B	Floor	Floor level.	25/02/99	B-22	1	Y	165
474	B	Floor	Very compact floor level.	25/02/99	B-19	1	Y	375
475	B	Fill	Fill of pit 476.	25/02/99	B-21	1		
476	B	Cut	Pit cut, filled by 475.	25/02/99	B-20	1		
477	B	Floor	Floor level with clay and silt.	25/02/99	B-18	1	Y	312
478	B	Floor	Floor level into which some post-holes have been cut.	27/02/99	B-16	1	Y	310
479	B	Fill	Fill of post-hole 480.	27/02/99	B-17	1		
480	B	Cut	Post-hole cut, filled by 479, cutting floor 478.	27/02/99	B-17	1		
481	B	Fill	Fill of pit 482.	27/02/99	B-17	1	Y	382
482	B	Cut	Pit cut into floor 478 (or 477?), filled by 481.	27/02/99	B-17	1		
483	B	Floor	Semi-compact floor deposit with charcoal and pottery.	27/02/99	B-15	1	Y	272
484	B	Floor	Floor with white and red patches.	28/02/99	B-14	1	Y	117
485	B	Floor	Thick floor deposit with some fire activity.	28/02/99	B-13	1	Y	130
486	B	Floor	Floor level with evidence of fire-related activity.	01/03/99	B-12	1	Y	145
487	B	Floor	Floor level into which two post-holes have been cut.	01/03/99	B-10	1	Y	133
488	B	Fill	Fill of post-hole 489.	01/03/99	B-11	1		
489	B	Cut	Post-hole cut into floor 487, filled by 488.	01/03/99	B-11	1		
490	B	Fill	Fill of post-hole 491.	01/03/99	B-11	1		
491	B	Cut	Post-hole cut into floor 487, filled by 490.	01/03/99	B-11	1		
492	B	Floor	Floor with hearth on western side.	01/03/99	B-09	1	Y	104
493	B	Floor	Floor with hearth and pit on north-east corner.	04/03/99	B-08	1	Y	217
494	B	Floor	Compact floor, black with white plaster.	04/03/99	B-06	1	Y	301
495	B	Fill	Fill of pit 496.	04/03/99	B-07	1		15
496	B	Cut	Pit cut, filled by 495, cut into 493.	04/03/99	B-07	1		
497	B	Fill	Charcoal-rich fill of pit 498.	04/03/99	B-07	1	Y	200
498	B	Cut	Pit cut into floor 494, filled with 497.	04/03/99	B-07	1		
499	B	Floor	Compact, black floor packing on northern side of trench.	06/03/99	B-04	1	Y	68
500	B	Floor	Yellow floor deposit on southern side of trench.	06/03/99	B-04	1		13
501	A:NWNT	Cut	Foundation cut for wall 502.	16/03/98		4?		

Context	Trench	Type	Description	Date	Trench phase	Period	Bone	Sherds (approx)
502	A:NWNT	Wall	Single line brick 'wall' within robber cut 377, lowest two courses probably remaining bricks of the North Temple wall 557.	16/03/98		4?		
503	A:NWNT	Cut	Linear East-West cut, equals 396.	16/03/98		4?		
504	A:NWNT	Fill	Fill of 503.	16/03/98		4?	Y	457
505	A:NWNT	Fill	Lower brick jelly/rubble fill in west of cut 377 under 376.	16/03/98		4?	Y	401
506	A:NWNT	Fill	Lower brick jelly/rubble fill in east of cut 377 under 376.	16/03/98		4?		
507	A:NWNT	Fill	Lower robber fill of 377 in north-east corner.	16/03/98		4?	Y	578
508	A:S Temple	Wall	Crude brick-bat repair to gap in south wall, South Temple.	16/03/98				
509	A:TP5	Wall	Single course thickening of interior of south wall of the South Temple.	16/03/98		3		
510	A:TP5	Wall	Interior wall in the South Temple *mandapa*.	16/03/98		3		
511	A:TP5	Wall	Interior wall in the South Temple *mandapa*.	16/03/98		3		
512	A:TP2	Fill	Fill abutting 397.	16/03/98			Y	596
513	A:South Area	Surface	Hard surface with brick bats and clay, south of the South Temple, below 300.	16/03/98			Y	293
514	A:N Temple	Wall	Remaining portion of original northern wall abutting shrine, North Temple.	16/03/98				
515	A:NWNT	Fill	Foundation fill of cut 516 for wall 514.	16/03/98		4?		
516	A:NWNT	Cut	Foundation trench cut for wall 514 (fill 515).	16/03/98		4?		
517	A:EEST	Fill	Lower foundation fill for wall 352, fill of cut 347.	17/03/98		3		57
518	A:TP9	Cut	Cut in interior of the North Temple (fill 519).	17/03/98		4		
519	A:TP9	Fill	Fill of 518.	17/03/98		4	Y	506
520	A:EEST	Fill	Fill of cut 521.	17/03/98		3		
521	A:EEST	Cut	Cut against wall 345/1240, north side of the South Temple.	17/03/98		3		
522	A:EEST	Fill	Fill of post-hole 523.	17/03/98		3		
523	A:EEST	Cut	Cut of post-hole against eastern side of Phase III South Temple.	17/03/98		3		
524	A:EEST	Fill	Fill of post-hole 525.	17/03/98		3	Y	139
525	A:EEST	Cut	Cut of post-hole against eastern side of Phase III South Temple.	17/03/98		3		
526	A:EEST	Fill	Fill of foundation cut 527.	17/03/98		3		
527	A:EEST	Cut	Cut against wall 359/1247 south side of the South Temple.	17/03/98		3		
528	A:TP5	Wall	Thickening to interior face of north wall, South Temple.	16/03/98		3		
529	A:NWNT	Fill	Lower fill robber trench 377 to west.	18/03/98		4?	Y	1,062
530	A:S Temple	Cut	Cut into north-west corner of the South Temple, cutting 334.	18/03/98				
531	A:S Temple	Fill	Fill of cut 530.	18/03/98				
532	A:NWNT	Fill	Fill of circular pit 533.	18/03/98		4?	Y	515

Context	Trench	Type	Description	Date	Trench phase	Period	Bone	Sherds (approx)
533	A:NWNT	Cut	Cut of pit (fill 532), similar to 541.	18/03/98		4?		
534	A:S Temple	Rubble	Brick-bat rubble overlying south-west corner of the South Temple, appears to have been deliberately placed.	18/03/98				
535	A:NWNT	Fill	Lower robber fill of 377 (equal to 506).	18/03/98		4?	Y	537
536	A:N Temple	Fill	Fill of cut 537.	18/03/98			Y	98
537	A:N Temple	Cut	Cut of north-south trench in interior of the North Temple, perhaps by Yusuf or 1967 restoration.	18/03/98				
538	A:TP2	Rubble	Rubble packing on the southern wall of the North Temple. May result from 1967 restoration.	19/03/98			Y	631
539	A:N Temple	Layer	Surface or compact layer in interior of the North Temple; may represent limit of later disturbance.	19/03/98				
540	A:NWNT	Fill	Soft ashy pit fill of cut 541.	19/03/98		4?		263
541	A:NWNT	Cut	Truncated pit cut filled by 540, east of north-east corner, North Temple.	19/03/98		4?		
542	A:TP9	Wall	Crude tile alignment in south aisle of the North Temple. May result from 1967 restoration.	19/03/98		4		
543	A:TP9	Layer	Deposit under tile wall 543, south aisle, North Temple.	19/03/98		4		255
544	A:TP9	Wall	Thin Phase V partition wall in south aisle of *mandapa,* North Temple (equals 383).	19/03/98				
545	A:TP9	Layer	Black cotton soil behind wall 544, south aisle, North Temple (equals 551).	19/03/98				255
546	A:NWNT	Fill	Lower fill of cut 541.	19/03/98		4?	Y	733
547	?	?	Not used. This number was added in Sept 2008 as 88 sherds were recorded under it in the pottery book, probably in error.					88
549	A:NWNT	Fill	Lower brick jelly fill of cut 377.	21/03/98		4?		69
550	A:NWNT	Surface	Interior surface of the North Temple, probably originally abutting wall 514.	21/03/98		4?		
551	A:TP9	Layer	Black cotton soil in western end of North Temple *mandapa*.	23/03/98		3		80
552	A:NWNT	Fill	Ashy fill of pit 553.	23/03/98		4?		
553	A:NWNT	Cut	Pit cut in north-east corner of Trench A.	23/03/98		4?		
554	A:N Temple	Wall	Phase I wall, North Temple.	23/03/98		3-temple		
555	A:N Temple, TP9, GG North	Wall	Phase I platform, North Temple.	23/03/98		3-temple		
556	A:N Temple, GG North	Wall	Phase II structure with offsets, North Temple.	23/03/98		3-temple		
557	A:N Temple, TP9	Wall	Phase III *mandapa* wall, North Temple.	23/03/98		3-temple		

Context	Trench	Type	Description	Date	Trench phase	Period	Bone	Sherds (approx)
558	A:N Temple	Wall	Phase IV interior wall, North Temple.	23/03/98				
559	A:N Temple	Wall	Rebuilding of outer face of wall 514.	23/03/98				
560	A:S Temple, TP3, TP5	Wall	Phase II wall of the South Temple.	23/03/98		3		
561	A:S Temple, TP5	Wall	Rebuilding of north wall, South Temple.	23/03/98		3		
562	A:S Temple	Wall	Thickening of inner face of south wall, South Temple.	24/03/98				
563	A:N Temple	Wall	Northern lime-mortar mud levelling, 'ghost wall' under 514.	01/04/98				
564	A:N Temple	Wall	Southern lime-mortar mud levelling, 'ghost wall' under 514.	01/04/98				
565	A:N Temple	Layer	Foundation levelling under wall 514 + 557.	01/04/98				
566	A:N Temple	Layer	Brick jelly north of robber cut 377 (west).	02/04/98				
567	A:N Temple	Layer	Brick jelly north of robber cut 377 (east).	02/04/98				
568	A:South Area	Layer	General post-Yusuf accumulation.	25/01/99		4	Y	743
569	A:S Wall of N	Cut	Robber or excavation cut alongside south wall of the North Temple.	28/01/99		4		
570	A:TP5	Layer	Rubble and brick bat foundation of possible later wall.	28/01/99		4	Y	382
571	A:S Wall of N	Fill	Fill of 569.	28/01/99		4	Y	342
572	A:S Wall of N	Layer	Layer cut by 569 and 585, next to north wall of the South Temple.	28/01/99				
573	A:S Wall of N	Fill	Fill of 569, beneath 571.	30/01/99		4	Y	684
574	A:South Area	Wall	Possible wall below 568 or collapse of 578.	30/01/99		4		
575	A:S Wall of N	Fill	Fill of cut 576.	30/01/99		4	Y	207
576	A:S Wall of N	Cut	Cut filled by 575 next to south wall of the North Temple.	30/01/99		4	Y	
577	A:South Area	Cut	Robber trench cut to rob wall foundation 699.	30/01/99		3		
578	A:South Area	Wall	Wall foundation in cut 577.	30/01/99		3	Y	669
579	A:TP5	Founda-tion	Packed stone foundation under 570.	30/01/99		4		
580	A:TP6	Fill	Stone rubble fill of 581 with brick fragments, tiles, pottery.	31/01/99		4	Y	772
581	A:TP6	Cut	Filled by 580. May represent post-Yusuf activity.	31/01/99		4		
582	A:TP5	Fill	Silt packing in foundation cut 595 at southern end.	31/01/99		4	Y	266
583	A:South Area	Fill	Fill of pit/pot dump filling cut 587.	31/01/99		3		370
584	A:S Wall of N	Fill	Fill of possible robber trench 585.	31/01/99		4	Y	197

Context	Trench	Type	Description	Date	Trench phase	Period	Bone	Sherds (approx)
585	A:S Wall of N	Cut	Possible robber trench cut.	31/01/99		4	Y	
586	A:South Area	Fill	Fill of pit/pot dump 588.	31/01/99		3	Y	223
587	A:South Area	Fill	Shallow pit/scoop cutting wall 578.	01/02/99		3		
588	A:South Area	Cut	Shallow cut/scoop cutting wall 578.	01/02/99		3		
589	A:South Area	Layer	Cleaning layer, equal to 568.	01/02/99		3	Y	852
590	A:TP5	Fill	Foundation fill between and under stone packing 579.	01/02/99		4	Y	283
591	A:South Area	Fill	Fill of robber cut 577 below 578, remains of wall.	02/02/99		3	Y	1,570
592	A:South Area	Layer	Laminated slope wash.	02/02/99		4	Y	267
593	A:TP5	Fill	Northern end of foundation fill 330.	02/02/99		4		64
594	A:TP5	Cut	Foundation trench cut for lost Medieval wall (with fill 330; 593; 604).	02/02/99		4		
595	A:TP5	Cut	Foundation trench cut for lost Medieval wall (with fill 570; 582; 579; 590).	02/02/99		4		
596	A:TP6	Fill	Fill of cut 597.	02/02/99		4	Y	151
597	A:TP6	Cut	Cut, filled by 596. May be post-Yusuf.	02/02/99		4		
598	A:TP5	Layer	Mud mortar levelling course of wall 511.	02/02/99		3		
599	A:TP5	Fill	Foundation fill of cut 600.	02/02/99		3	Y	149
600	A:TP5	Cut	Foundation trench cut for wall 511.	02/02/99		3		
601	A:TP5	Layer	Mud mortar levelling course for wall 510.	02/02/99		3		
602	A:TP5	Fill	Foundation fill of cut 603.	02/02/99		3		246
603	A:TP5	Cut	Foundation cut for wall 510.	02/02/99		3		
604	A:TP5	Fill	Stone foundation packing for lost Medieval wall, north end of cut 594.	03/02/99		4		
605	A:South Area	Rubble	Rubble tumble, slope wash below 592.	04/02/99		4	Y	417
606	A:South Area	Fill	Fill of pit 607.	04/02/99		3	Y	378
607	A:South Area	Cut	Pit cut, filled by 606.	04/02/99		3		
608	A:South Area	Fill	Lowest fill of robber cut 577, below 591.	04/02/99		3	Y	569
609	A:TP5	Layer	Mud levelling under wall 528.	04/02/99		3		
610	A:TP5	Foundation	Foundation for wall 528.	04/02/99		3	Y	138
611	A	Fill	Fill of last phase of interior structure of the North Temple, post-Yusuf.	04/02/99				
612	A:W Area	Layer	Layer immediately to south-west of the North Temple (equals 644).	06/02/99		4	Y	158
613	A:TP6, South Area	Layer	Slope wash/tumble below rubble 605.	06/02/99		4	Y	393
614	A:TP5	Foundation	Possible foundation fill put down during re-build of north wall of the South Temple (561).	06/02/99		3		

Context	Trench	Type	Description	Date	Trench phase	Period	Bone	Sherds (approx)
615	A:TP5	Layer	Silt and stone packing under wall 589.	06/02/99		3		38
616	A:W Area	Fill	Fill of 617.	06/02/99		4	Y	518
617	A:W Area	Cut	Cut for possible boundary wall.	06/02/99		4		
618	A:W Area	Layer	Homogenous layer below 612, to west and south-west of the North Temple.	07/02/99		4	Y	802
619	A:South Area	Layer	Patch of rubble tumble/slope wash south-east of robbing 607.	07/02/99		4	Y	
620	A:TP5	Cut	Possible foundation cut for wall 509.	07/02/99		3		
621	A:TP5	Cut	Cut made during rebuild of north wall of the South Temple (fill 614).	07/02/99		3		
622	A:TP5	Layer	Latest surviving floor foundation inside the South Temple, associated with walls 509 and 528.	07/02/99		3	Y	2,392
623	A:South Area	Cut	Shallow pit/scoop filled with 624, south of robber cut 577.	07/02/99		3		
624	A:South Area	Fill	Fill of 623.	07/02/99		3	Y	75
625	A:TP5	Fill	Lower foundation fill of cut 620.	08/02/99		3	Y	114
626	A:TP5	Layer	Made-up construction layer for later internal surface of the South Temple.	08/02/99		3-temple		
627	A:W Area	Layer	Layer or fill almost completely removed by Yusuf.	08/02/99		4	Y	290
628	A:South Area	Cut	Cut of pit in western section.	08/02/99		3		
629	A:South Area	Fill	Uppermost fill of pit 628.	08/02/99		3	Y	241
630	A:South Area	Fill	Ashy lens fill of pit 628, below 629.	08/02/99		3		
631	A:South Area	Cut	Cut of pit.	08/02/99		3		
632	A:South Area	Fill	Uppermost fill of pit 631.	08/02/99		3	Y	474
633	A:TP5	Fill	Fill of cut 335.	08/02/99		4	Y	456
634	A:TP5	Floor	Floor surface inside the South Temple.	08/02/99		3-temple		99
635	A:South Area, TP6	Layer	Slope wash below 613.	08/02/99		4	Y	843
636	A:W Area	Layer	Rubbly layer with silty matrix.	09/02/99		4		120
637	A:TP9	Surface	Trample surface in layer 551 in the North Temple.	09/02/99		3		
638	A:TP5	Layer	Foundation and make-up layer under floor 634.	09/02/99		3-temple	Y	954
639	A:TP9	Layer	Black cotton soil in the North Temple below 637.	09/02/99		3	Y	75
640	A:W Area	Rubble	Brick rubble layer against wall 357, fill of 339.	09/02/99		3		55
641	A:TP9	Layer	Thin layer in west end of south aisle, North Temple.	09/02/99		4	Y	283
642	A:TP5	Layer	Silt layer under 638.	10/02/99		3-temple	Y	1,301
643	A:W Area	Layer	Compacted silt and brick layer around west end of the North Temple.	10/02/99		4		194

Context	Trench	Type	Description	Date	Trench phase	Period	Bone	Sherds (approx)
644	A:W Area	Layer	Equals 612.	10/02/99		4	Y	109
645	A:South Area	Rubble	Rubble patch, possibly equal to 619.	10/02/99		4	Y	425
646	A:GG North	Wall	Rough rubble wall in *garbhagriha* of the North Temple.	11/02/99		3-temple		
647	A: South Area	Layer	Ashy dump.	11/02/99		3	Y	419
648	A:TF5	Layer	Stones in *garbhagriha* of the South Temple.	11/02/99		3-temple		
649	A:TP6	Layer	Deposit underlying 635.	11/02/99		4	Y	634
650	A:W Area, TF6	Floor	Hard surface (floor level) below 649.	11/02/99		3	Y	157
651	A: South Area, W Area	Layer	Silt deposit from trial sounding. Contaminated.	11/02/99		3	Y	358
652	A:GG North, W Area	Layer	Black cotton soil fill of *garbhagriha*, North Temple.	11/02/99		3-temple		
653	A:TP5	Layer	Silt layer under stones 648 in *garbhagriha*, South Temple.	11/02/99		3-temple	Y	272
654	A:TP5	Fill	Regularly spaced stone packing within fill 642.	11/02/99		3-temple		
655	A:W Area	Fill	Fill of 656.	11/02/99		4	Y	24
656	A:W Area	Cut	Post-hole cut(?) (fill 655).	11/02/99		4		
657	A:W Area	Surface	Trample surface to west of 617.	11/02/99		4	Y	616
658	A:GG North	Layer	Layer of stones and black cotton soil in *garbhagriha*, North Temple.	11/02/99		3-temple		
659	A:W Area	Fill	Fill of 660.	13/02/99		4	Y	149
660	A:W Area	Cut	Cut, truncated by drain made by Yusuf.	13/02/99		4		
661	A:TP5	Layer	Brick jelly layer under 654, interior of the South Temple.	13/02/99		3-temple	Y	231
662	A:TP5	Layer	Clayey deposit against internal sides of South Temple walls.	13/02/99		3-temple		
663	A:TP5, South Area	Fill	Uppermost fill of ditch 688, silt and rubble.	13/02/99		4	Y	748
664	A:GG North	Rubble	Hard rubble surface in *garbhagriha*, North Temple.	13/02/99				
665	A:TP5	Deposit	Lower stone packing in *garbhagriha*, South Temple.	14/02/99		3-temple		
666	A:TP5	Fill	Silt fill under 665, *garbhagriha* of the South Temple.	14/02/99		3-temple	Y	251
667	A:TP5	Layer	Compact brick-rubble jelly under 661.	14/02/99		3-temple	Y	1,459
668	A: South Area	Fill	Fill of pit 669.	14/02/99		3	Y	297
669	A: South Area	Cut	Cut of pit (fill 668).	14/02/99		3		
670	A: South Area	Layer	Gravel rich silt fill of 688.	14/02/99		3	Y	170
671	A: South Area	Cut	Linear North-South cut along west section. Similar to 688.	14/02/99		3		

Context	Trench	Type	Description	Date	Trench phase	Period	Bone	Sherds (approx)
672	A:South Area	Fill	Fill of 671.	14/02/99		3		
673	A:South Area	Cut	Linear cut along wall/boulder fill 591.	14/02/99		3		
674	A:South Area	Fill	Fill of 673.	14/02/99		3		
675	A:South Area	Fill	Gravely stony fill of 688.	14/02/99		3	Y	186
676	A:GG North	Layer	Stone layer in *garbhagriha*, North Temple.	14/02/99		3-temple		42
677	A:GG North	Layer	Pure black cotton soil fill below 676 in *garbhagriha*, North Temple.	14/02/99		3-temple		38
678	A:South Area	Layer	Laminated slope wash (equals 635).	14/02/99		4	Y	275
679	A:South Area	Layer	Thin calcareous wash in ditch 688.	14/02/99		3		
680	A:W Area	Fill	Fill of 681.	14/02/99		4	Y	40
681	A:W Area	Cut	Possible grave cuts in north of trench.	14/02/99		4		
682	A:TP3	Fill	Black cotton soil fill of 683.	14/02/99		3	Y	386
683	A:TP3	Cut	Linear cut.	14/02/99		3		
684	A:TP9	Layer	Layer in south aisle, North Temple, building under 641.	15/02/99		4	Y	933
685	A:GG North	Layer	Stone layer below 677 in *garbhagriha*, North Temple.	15/02/99		3-temple	Y	
686	A:TP5	Layer	Stone packing layer below 666, *garbhagriha*, South Temple.	15/02/99		3-temple		
687	A:GG North	Layer	Black cotton soil fill below 685 in *garbhagriha*, North Temple.	15/02/99		3-temple		15
688	A:South Area	Cut	Shallow U-shaped ditch following line of wall 691.	15/02/99		3		
689	A:TP6	Deposit	Deposit under 635.	15/02/99		4	Y	587
690	A:TP6	Layer	Dark brown earth below 689.	15/02/99		4		
691	A:South Area	Wall	Wall of large irregular igneous boulders.	16/02/99		3		
692	A:South Area	Cut	Cut; possible edge of Yusuf's excavation trench.	16/02/99		4		
693	A:South Area	Layer	Remnant 'finger' of *in situ* stratigraphy between cuts 692 and 577.	16/02/99		3		
694	A:GG North	Surface	Trample surface in front of *garbhagriha*, North Temple.	16/02/99				16
695	A:GG North	Step	Crude brick step in west entrance to *garbhagriha*, North Temple.	16/02/99				
696	A:W Area	Layer	Soil covering a compact layer in north-west corner of Trench A.	16/02/99		4	Y	367
697	A:GG North	Surface	Trample surface over walls and hearting in west entrance, *garbhagriha*, North Temple.	16/02/99				
698	A:GG North	Layer	Black cotton soil and brick flecks in *garbhagriha*, North Temple.	16/02/99		3-temple		
699	A:TP6, GG North, South Area	Foundation	Possible wall foundation of broken bricks cut by 577.	16/02/99		3		

Context	Trench	Type	Description	Date	Trench phase	Period	Bone	Sherds (approx)
700	A:TP5	Layer	Construction layer under 667 inside the South Temple.	16/02/99		3-temple	Y	2,573
701	D2	Layer	Loose compact dump deposit.	31/01/99	D2-24	2	Y	18
702	D2	Layer	Semi-compact yellow deposit.	01/02/99	D2-23	2	Y	252
703	D2	Layer	Compact black brown deposit.	02/02/99	D2-22	2	Y	652
704	D2	Floor	Compact white floor.	03/02/99	D2-21	2		73
705	D2	Layer	Compact yellow brown deposit, packing for floor 704?	04/02/99	D2-20	2	Y	303
706	D2	Layer	Loose brownish deposit.	04/02/99	D2-19	2	Y	323
707	D2	Floor	Compact brown floor deposit.	05/02/99	D2-18	2	Y	147
708	D2	Cut	Pit cut, filled by 709.	05/02/99	D2-17	2		
709	D2	Fill	Fill of 708.	05/02/99	D2-17	2		282
710	D2	Floor	Floor sloping towards the north.	06/02/99	D2-16	2	Y	488
711	D2	Floor	Compact white floor deposit.	06/02/99	D2-15	2	Y	443
712	D2	Floor	Compact brownish floor.	09/02/99	D2-14	2	Y	1,401
713	D2	Fill	Fill of 714.	10/02/99	D2-13	1		38
714	D2	Cut	Cut of a root hole, filled by 713.	10/02/99	D2-13	1		
715	D2	Floor	Compact floor.	10/02/99	D2-12	1	Y	1,228
716	D2	Fill	Fill of 717.	11/02/99	D2-11	1		14
717	D2	Cut	Circular post-hole cut, filled by 716, cuts 718.	11/02/99	D2-11	1		
718	D2	Floor	Compact blackish brown floor covered with pottery.	11/02/99	D2-10	1	Y	2,567
719	D2	Fill	Ashy fill of 720.	11/02/99	D2-09	1	Y	109
720	D2	Cut	Pit cut, filled by 719, cutting floor 721.	11/02/99	D2-09	1		
721	D2	Floor	Compact floor level.	13/02/99	D2-08	1	Y	687
722	D2	Floor	Compact brownish black floor.	14/02/99	D2-06	1	Y	885
723	D2	Fill	Fill of 724.	15/02/99	D2-07	1		94
724	D2	Cut	Pit cut, filled by 723, cutting 725.	15/02/99	D2-07	1		
725	D2	Floor	Floor with ashy patches and pit cut.	15/02/99	D2-05	1	Y	194
726	D2	Floor	Less compact floor with fire place in south-west and south-east.	16/02/99	D2-04	1	Y	1,143
727	D2	Fill	Ash and charcoal fill of 728.	17/02/99	D2-03	1	Y	297
728	D2	Cut	Shallow pit, filled by 727, cutting floor 729.	17/02/99	D2-03	1		333
729	D2	Floor	Less compact blackish brown floor.	17/02/99	D2-02	1	Y	69
730	D2	Layer	Natural black cotton soil.	17/02/99	D2-01	1		
731	B	Fill	Fill of 732.	06/03/99	B-05	1		1
732	B	Cut	Pit cut along eastern section of trench, cut into 735, filled by 731.	06/03/99	B-05	1		
733	B	Fill	Fill of 734.	06/03/99	B-05	1		
734	B	Cut	Pit cut along western section, cut into 735, filled by 733.	06/03/99	B-05	1		
735	B	Floor	Black soil floor with pottery and charcoal.	07/03/99	B-02	1	Y	809
736	B	Floor	Compact, black floor.	08/03/99	B-02	1	Y	311
737	B	Fill	Fill of 738.	08/03/99	B-03	1		
738	B	Cut	Post-hole cut, filled by 737.	08/03/99	B-03	1		
739	B	Fill	Fill of 740.	08/03/99	B-03	1		

Context	Trench	Type	Description	Date	Trench phase	Period	Bone	Sherds (approx)
740	B	Cut	Post-hole cut, filled by 739.	08/03/99	B-03	1		
741	B	Fill	Fill of 742.	08/03/99	B-03	1		
742	B	Cut	Post-hole cut, filled by 741.	08/03/99	B-03	1		
743	B	Natural	Natural soil.	09/03/99	B-01	1		
751	D1	Layer	Loose wash material.	01/02/99	D1-13			356
752	D1	Floor	Semi-compact disturbed lime floor.	02/02/99	D1-12			18
753	D1	Layer	Black earth with very few sherds.	03/02/99	D1-10	1		
754	D1	Layer	Pottery dump.	03/02/99	D1-10	1	Y	2,236
755	D1	Fill	Fill of pit 756.	06/02/99	D1-11	1		
756	D1	Cut	Cut of pit, cutting 752 and filled with 755.	06/02/99	D1-11	1		
757	D1	Fill	Ashy fill of pit 758.	07/02/99	D1-09	1		
758	D1	Cut	Pit cutting floor 759, filled with 757.	07/02/99	D1-09	1		
759	D1	Floor	Mud and pot-sherd floor.	07/02/99	D1-08	1	Y	180
760	D1	Fill	Fill of pit 761 containing large sherds of a storage jar.	09/02/99	D1-07	1		416
761	D1	Cut	Pit cut to hold storage jar, filled by 760, cutting floor 766.	09/02/99	D1-07	1		
762	D1	Fill	Fill of two post-hole cuts 763.	09/02/99	D1-07	1	Y	642
763	D1	Cut	Cut of two post-holes, cutting 766, filled by 762.	09/02/99	D1-07	1		
764	D1	Fill	Fill of 765.	09/02/99	D1-07	1		49
765	D1	Cut	Cut of a small pit or post-hole, cutting 767, filled with 764.	09/02/99	D1-07	1		
766	D1	Floor	Compact mud floor.	10/02/99	D1-06	1	Y	495
767	D1	Floor	Semi-compact mud floor beneath 766.	11/02/99	D1-05	1	Y	2,288
768	D1	Fill	Fill of pit 769.	11/02/99	D1-07	1		20
769	D1	Cut	Cut of pit, cutting floor 767, filled with 768.	11/02/99	D1-07	1		
770	D1	Floor	Compact black grey floor level.	13/02/99	D1-03	1	Y	138
771	D1	Fill	Fill of 772.	14/02/99	D1-04	1	Y	51
772	D1	Cut	Pit cut, cutting floor 770, filled with 771.	14/02/99	D1-04	1		
773	D1	Fill	Fill of 774.	14/02/99	D1-04	1		112
774	D1	Cut	Cut of post-hole, cutting 767, filled with 773.	14/02/99	D1-04	1		
775	D1	Fill	Fill of 776.	14/02/99	D1-02	1		87
776	D1	Cut	Irregular cut of pit, cutting 777, filled with 775.	14/02/99	D1-02	1		
777	D1	Layer	Natural soil.	15/02/99	D1-01	1	Y	58
778	F	Layer	Surface layer, thick washed material and dump.	20/02/99	F-16	3	Y	1,286
784	F	Floor	Mud floor.	23/02/99	F-14	2	Y	329
785	F	Hearth	Fill of hearth 786.	24/02/99	F-15	2		34
786	F	Hearth	Shallow cut of hearth, cutting floor 787, filled with 785.	24/02/99	F-15	2		
787	F	Floor	Compact mud floor.	24/02/99	F-13	2	Y	732
788	F	Floor	Compact blackish grey mud floor.	25/02/99	F-12	2	Y	1,749
789	F	Floor	Mud floor.	27/02/99	F-11	2	Y	228
790	F	Floor	Brick floor.	27/02/99	F-09	2		
791	F	Fill	Fill of post-hole cut 792.	28/02/99	F-10	2		
792	F	Cut	Cut of post-hole, cutting 790, filled with 791.	28/02/99	F-10	2		

Context	Trench	Type	Description	Date	Trench phase	Period	Bone	Sherds (approx)
793	F	Fill	Fill of post-hole cut 794.	28/02/99	F-10	2		
794	F	Cut	Cut of post-hole, cutting 790, filled with 793.	28/02/99	F-10	2		
795	F	Fill	Fill of post-hole cut 796.	28/02/99	F-10	2		
796	F	Cut	Cut of post-hole, cutting 790, filled with 795.	28/02/99	F-10	2		
797	F	Layer	Hard surface beneath brick floor 790.	28/02/99	F-08	2	Y	246
798	F	Layer	Gravel deposit beneath 797.	28/02/99	F-07	2	Y	92
799	F	Hearth	Fill of hearth 800.	01/03/99	F-06	2		
800	F	Hearth	Hearth cut into floor 846, filled with 799.	01/03/99	F-06	2		
801	E	Surface	Surface wash.	10/02/99			Y	74
802	E	Wall	Stone wall extending from east section.	10/02/99				
803	E	Wall	Stone wall extending from north section.	10/02/99				
804	E	Wall	Stone wall.	10/02/99				
805	E	Fill	Fill of 806.	10/02/99			Y	105
806	E	Cut	Foundation cut for stone wall 804.	10/02/99				2
807	E	Fill	Fill of 808.	10/02/99				
808	E	Cut	Rectangular cut near north section, filled by 807.	10/02/99				
809	E	Fill	Fill of 810.	10/02/99			Y	45
810	E	Cut	Pit, filled by 809.	10/02/99				
811	E	Surface	Compact floor surface.	13/02/99				
812	E	Fill	Fill of 813.	14/02/99			Y	50
813	E	Cut	Wavy cut feature.	14/02/99				
814	E	Cut	Foundation cut for wall 804, equals 806.	16/02/99				
815	E	Floor	Plastered floor.	14/02/99			Y	408
816	E	Fill	Fill of 817.	17/02/99			Y	700
817	E	Cut	Pit cut, filled by 816.	17/02/99				
818	E	Floor	Rubble packing below floor 815.	20/02/99			Y	96
819	E	Fill	Fill of 820.	20/02/99				24
820	E	Cut	Shallow cut.	20/02/99				
821	E	Layer	Rubble and silt deposit.	21/02/99				
822	E	Layer	Loose yellow deposit abutting stone packing 823.	21/02/99				128
823	E	Layer	Stone packing.	21/02/99				
824	E	Layer	Semi-compact yellow deposit below stones 823.	21/02/99			Y	60
825	E	Layer	Brick bat packing in pit 817.	22/02/99				96
826	E	Layer	Semi-compact yellow silt deposit on north side.	22/02/99				181
827	E	Layer	Brick deposit on line of pit 817.	23/02/99				101
828	E	Layer	Compact deposit below 827.	24/02/99				35
829	E	Fill	Fill of 830.	27/02/99			Y	441
830	E	Cut	Cut of pit in north section, filled by 829.	27/02/99				105
831	E	Fill	Brick lining to circular pit 832.	28/02/99			Y	882
832	E	Cut	Circular pit or well.	01/03/99				261

Context	Trench	Type	Description	Date	Trench phase	Period	Bone	Sherds (approx)
833	E	Floor	Compact rammed floor.	01/03/99				65
834	E	Floor	Floor with traces of fire.	01/03/99				70
835	E	Hearth	Hearth or circular fireplace.	01/03/99			Y	33
836	E	Cut	Cut for hearth 835.	01/03/99				
837	E	Fill	Fill of hearth 838.	03/03/99				
838	E	Cut	Cut of circular hearth or ash pit.	03/03/99				
839	E	Layer	Silt deposit.	03/03/99			Y	30
840	E	Floor	Semi-compact floor deposit.	04/03/99				
841	E	Fill	Ash deposit, fill of 842.	04/03/99			Y	69
842	E	Cut	Irregular cut, filled by 841.	04/03/99				
843	E	Layer	Loose brown clayey silt deposit.	07/03/99			Y	248
844	E	Wall	Bottom course of mud and stone wall.	07/03/99			Y	480
845	E	Cut	Foundation cut for wall 844.	07/03/99				
846	F	Floor	Mud floor beneath 798.	01/03/99	F-05	2	Y	3,009
847	F	Fill	Fill of hearth 848.	01/03/99	F-06	2		4
848	F	Cut	Cut of hearth, cutting 846, filled by 847.	01/03/99	F-06	2		
849	F	Fill	Fill of pit 850 below 846.	04/03/99	F-04	1	Y	74
850	F	Cut	Round pit cut, cutting 851, filled with 849.	04/03/99	F-04	1		
851	F	Floor	Hard clay surface below 846.	04/03/99	F-03	1	Y	5,409
852	F	Floor	Hard yellow floor.	07/03/99	F-02	1	Y	250
853	F	Natural	Natural black cotton soil.	09/03/99	F-01	1		54
901	A:TP5	Layer	Thin brick dust layer in *garbhagriha,* South Temple.	16/02/99		3-temple		
902	A:TP5	Layer	Clay layer under 901.	16/02/99		3-temple	Y	166
903	A:W Area	Fill	Five large stones set in cut 617, possible remains of boundary wall.	16/02/99		4		
904	A:W Area	Rubble	Silty layer with brick rubble, fill of 909.	16/02/99		4	Y	372
905	A:TP6	Fill	Fill of 906.	16/02/99		4	Y	218
906	A:TP6	Cut	Cut, filled by 905.	16/02/99		4		
907	A:GG North	Fill	Third deposit of stones in *garbhagriha*, North Temple.	16/02/99		3-temple		
908	A:TP1	Layer	Layer of silt and ash, equal to 312.	17/02/99	TP1-4	3	Y	309
909	A:TP3, TP10	Cut	Cut around west end of the North Temple (equals 939).	17/02/99		4		
910	A:GG North	Layer	Black cotton soil below 907, *garbhagriha*, North Temple.	17/02/99		3-temple		10
911	A:GG North	Fill	Brick hearting within wall 555, North Temple.	17/02/99		3-temple	Y	80
912	A:TP1	Layer	Water-derived silt layer below 908.	17/02/99	TP1-4	3	Y	99
913	A:TP1	Layer	Ashy silt layer below 912.	17/02/99	TP1-4	3	Y	576
914	A:TP6	Fill	Fill of cut 915.	17/02/99		4	Y	133
915	A:TP6	Cut	Cut, filled by 914.	17/02/99		4		
916			Number changed to 940.	17/02/99				
917	A:GG North	Fill	First stone fill in base of *garbhagriha*, North Temple.	17/02/99		3-temple		
918	A:TP5	Layer	Silt layer underlying 700, South Temple interior.	18/02/99		3-temple	Y	2,205

Context	Trench	Type	Description	Date	Trench phase	Period	Bone	Sherds (approx)
919	A:TP5	Layer	Silt layer under 907, *garbhagriha,* South Temple.	18/02/99		3-temple	Y	369
920	A:W Area	Fill	Rubble layer filling cuts 909 and 939.	18/02/99		4		955
921	A:TP1	Layer	Ash and brick rich silt below 922.	18/02/99	TP1-4	3	Y	1,081
922	A:TP1	Layer	Clay rich silt almost black cotton soil below 913.	18/02/99	TP1-4	3	Y	77
923	A:TP9, GG North	Floor	Brick powder floor, *garbhagriha,* North Temple under 917.	18/02/99		3-temple		1
924	A:TP6	Fill	Fill of cut 925.	18/02/99		3	Y	765
925	A:TP6	Cut	Cut, filled by 924, 930.	18/02/99		3		
926	A:TP6	Layer	Rammed floor of sandy silt with course of fine sand and specks of brick jelly.	18/02/99		3	Y	434
927	A:TP9, GG North	Surface	Hard clay upper foundation fill, *garbhagriha*, North Temple.	18/02/99		3-temple	Y	616
928	A:TP10	Fill	Silty fill with some brick rubble in cut 909 (equals 934).	18/02/99		4	Y	425
929	A:TP6	Fill	Early fill of 925.	18/02/99		3		18
930	A:TP1	Layer	Ashy layer below 921.	20/02/99	TP1-4	3	Y	829
931	A:South Area	Fill	Fill of robber cut 577. Equals 608.	20/02/99		3		297
932	A:GG North	Surface	Brick surface or inner construction inside wall 969.	20/02/99		3-temple		
933	A:TP1	Layer	Mix clayey loam layer below 930.	20/02/99	TP1-4	3	Y	928
934	A:W Area, TP3	Fill	Silty fill of 909 (equals 928).	20/02/99		4	Y	100
935	A:TP6	Feature	Rectangular stump of clay silt associated with floor 926.	20/02/99				
936	A:TP6	Fill	Fill of 937.	20/02/99		3		45
937	A:TP6	Cut	Circular cut filled by 936.	20/02/99		3		
938	A:GG North	Layer	Below 927, layer of foundation fill for Phase I shrine, North Temple.	20/02/99		3-temple	Y	111
939	A:TP3	Cut	Cut running alongside west wall of the North Temple (equals 909).	20/02/99		4		
940	A:TP9	Surface	Trodden earth floor above 916 in Phase III of the North Temple.	20/02/99		3		15
941	A:GG North	Rubble	Rubble hearting under 932.	20/02/99		3-temple		
942	A:TP3	Fill	Brick jelly fill of 683.	21/02/99		3		65
943	A:TP10	Fill	Brick rubble fill of 909.	21/02/99		4		22
944	A:TP1	Rubble	Accumulation of brick and topsoil forming an occupation horizon.	21/02/99	TP1-3	2	Y	981
945	A:TP1	Fill	Ash fill of pit 946.	21/02/99	TP1-3	2	Y	81
946	A:TP1	Cut	Pit cut into 944.	21/02/99	TP1-3	2		
947	A:TP3	Layer	Silty layer, possibly accumulated since Yusuf's excavations.	21/02/99		3		365
948	A:TP1	Deposit	Ash dump on 944.	21/02/99	TP1-3	2	Y	35
949	A:GG North	Layer	Foundation fill for Phase I shrine, beneath 938, *garbhagriha,* North Temple.	21/02/99		3-temple	Y	243
950	A:TP10	Layer	Surface remnant, excavation not continued below.	21/02/99		4		121

Context	Trench	Type	Description	Date	Trench phase	Period	Bone	Sherds (approx)
951	A:TP5	Rubble	Small brick rubble dump on north end of 953.	21/02/99		3-temple		
952	A:TP3, TP5	Deposit	Stone packing laid on 955.	21/02/99		3-temple		
953	A:TP5	Floor	Floor surface layer in *garbhagriha*, South Temple (equals 955?).	21/02/99		3-temple		
954	A:TP5	Packing	Small stone packing laid on floor 953.	21/02/99		3-temple		
955	A:TP5	Floor	Mud floor in the South Temple (equals 953?).	21/02/99		3-temple	Y	148
956	A:TP3	Layer	May be fill of cut 982, but truncated by drain cut by Yusuf.	22/02/99		3-temple	Y	450
957	A:TP3	Layer	Tumble from a brick structure.	22/02/99		3	Y	317
958	A:TP5	Fill	Uppermost fill of foundation trench 963.	22/02/99		3-temple	Y	16
959	A:TP3, W Area	Layer	Thin spread of material.	22/02/99		3		298
960	A:TP5	Fill	Sandy silt fill of 963 below 958.	22/02/99		3-temple	Y	17
961	A:N Temple	Cut	Small cut into top of wall 554.	22/02/99				
962	A:N Temple	Fill	Fill of cut 961.	22/02/99				20
963	A:TP5	Cut	Foundation cut for the South Temple.	22/02/99		3-temple		
964	A:TP5	Layer	Clay surface in South Temple *mandapa* (equals 965?).	22/02/99		3-temple	Y	275
965	A:TP5	Layer	Clay surface in South Temple *garbhagriha* (equals 964?).	22/02/99		3-temple	Y	50
966	A:TP1	Layer	Soft silty loam below 944.	22/02/99	TP1-3	2	Y	1,081
967	A:GG North	Fill	Hearting of wall 556, North Temple.	22/02/99		3-temple		
968	A:GG North	Wall	Internal thickening of wall 554 of *garbhagriha*, North Temple.	22/02/99		3-temple		
969	A:GG North	Wall	Possible earlier phase of wall 555, North Temple.	22/02/99		3-temple		
970	A:GG North	Wall	First two courses of wall 554, North Temple.	22/02/99		3-temple		
971	A:GG North	Wall	Rebuilds to wall 556, North Temple using purple bricks.	22/02/99		3-temple		1
972	A:TP3	Layer	Compact layer with gravel inclusions.	23/02/99		3	Y	
973	A:TP3	Surface	Compact, well-defined clay surface.	23/02/99		3	Y	286
974	A:TP3	Fill	Fill of 975, probably equals 981.	23/02/99		3	Y	606
975	A:TP3	Cut	Cut of pit, filled by 974.	23/02/99		3		
976	A:TP9	Deposit	Hard clay feature at western end of North Temple interior.	23/02/99		3		4
977	A:TP9	Deposit	Loose crumbly material filling cut 980.	23/02/99		3		
978	A:TP5	Layer	Silt layer under 964 in South Temple *mandapa* (equals 979?).	22/02/99		3-temple	Y	203
979	A:TP5	Layer	Silt layer under 963 in South Temple *garbhagriha* (equals 978?).	22/02/99		3-temple	Y	106
980	A:TP9	Cut	Cut into 976 at western end of North Temple interior.	22/02/99		3		
981	A:TP3	Fill	Fill of 982.	23/02/99		3-temple	Y	5,877
982	A:TP5, TP3	Cut	Foundation cut for the South Temple.	23/02/99		3-temple		

Context	Trench	Type	Description	Date	Trench phase	Period	Bone	Sherds (approx)
983	A:TP9	Structure	Brick altar base? Interior of North Temple *mandapa*.	23/02/99		3		4
984	A:TP1	Cut	Pit cut.	24/02/99	TP1-3	2		
985	A:TP1	Fill	Upper fill of pit 984.	24/02/99	TP1-3	2	Y	79
986	A:TP1	Fill	Ash fill of pit 984 below 985.	24/02/99	TP1-3	2	Y	106
987	A:TP6	Surface	Hard surface strewn with brick fragments and pot-sherds.	24/02/99		3	Y	1,737
988	A:TP1	Fill	Ash and sand fill of pit 984, below 986.	24/02/99	TP1-3	2	Y	197
989	A:TP1	Cut	Small post-hole cut.	24/02/99	TP1-3	2		
990	A:TP1	Fill	Fill of post-hole.	24/02/99	TP1-3	2	Y	42
991	A:TP3	Rubble	Brick rubble layer.	24/02/99		3-temple		
992	A:TP9	Surface	Surface in *mandapa* of the North Temple, associated with 983.	24/02/99		3		
993	A:TP3	Fill	Fill of feature 994.	24/02/99		3	Y	503
994	A:TP3	Cut	Shallow pit.	24/02/99		3	Y	
995	A:TP1	Cut	Pit cut.	24/02/99	TP1-3	2		
996	A:TP1	Fill	Upper fill of pit 995.	24/02/99	TP1-3	2	Y	177
997	A:TP1	Fill	Ash fill of pit 995, below 996.	24/02/99	TP1-3	2	Y	159
998	A:TP9	Deposit	Deliberate sandy deposit under 992, *mandapa* of the North Temple.	24/02/99		3		
999	A:TP5	Deposit	Gravely construction layer deposit overlying north end of 1002.	25/02/99		3-temple		11
1000	A:TP5	Packing	Stone packing in South Temple *mandapa,* overlying 1002 (equals 1001).	25/02/99		3-temple		
1001	A:TP5	Packing	Stone packing in South Temple *garbhagriha* (equals 1000).	25/02/99		3-temple		
1002	A:TP5	Layer	Compact clayey silt layer under 1000 in *mandapa* of the South Temple (equals 1003).	25/02/99		3-temple	Y	496
1003	A:TP5	Layer	Compact clayey silt layer under 1001 in *garbhagriha* of the South Temple (equals 1002).	25/02/99		3-temple	Y	82
1004	A:TP3	Fill	Fill of 1005.	25/02/99		3		94
1005	A:TP3	Cut	Truncated feature.	25/02/99		3		
1006	A:TP3	Fill	Fill of 1011.	25/02/99		3		
1007	A:TP9	Cut	Cut into *mandapa* floor, west end of the North Temple.	25/02/99		3		
1008	A:TP9	Fill	Fill of 1007.	25/02/99		3		
1009	A:TP1	Rubble	Rubble spread in sand matrix below 966.	25/02/99	TP1-3	2	Y	1,053
1010	A:TP9	Floor	*Mandapa* floor of the North Temple (equals 1100, 1080, 550?, 319?).	25/02/99		3-temple		474
1011	A:TP3	Cut	Cut of shallow feature.	25/02/99		3		1
1012	A:TP3	Layer	Homogenous layer.	25/02/99		3	Y	1,083
1013	A:TP1	Layer	Compact clay and rubble spread below 1009.	25/02/99	TP1-3	2	Y	1,341
1014	A:TP1	Deposit	Pot and rubble dump filling 1029.	25/02/99	TP1-3	2	Y	1,060
1015	A:TP3	Fill	Fill of post-hole 1016.	25/02/99		3		
1016	A:TP3	Cut	Post-hole cut, cutting 1030.	25/02/99		3		
1017	A:TP3	Fill	Fill of post-hole 1018.	25/02/99		3		
1018	A:TP3	Cut	Post-hole cut, cutting 1030.	25/02/99		3		
1019	A:TP3	Fill	Fill of post-hole 1020.	25/02/99		3		

Context	Trench	Type	Description	Date	Trench phase	Period	Bone	Sherds (approx)
1020	A:TP3	Cut	Post-hole cut, cutting 1030.	25/02/99		3		
1021	A:TP3	Fill	Fill of 1022.	25/02/99		3	Y	603
1022	A:TP3	Cut	Possible post-hole cut, cutting 1030.	25/02/99		3		
1023	A:TP3	Fill	Fill of 1024.	25/02/99		3		
1024	A:TP3	Cut	Cut of uncertain feature, cutting 1030.	25/02/99		3		
1025	A:TP3	Fill	Fill of post-hole 1026.	25/02/99		3		123
1026	A:TP3	Cut	Post-hole cut, cutting 1030.	25/02/99		3		1
1027	A:TP3	Fill	Fill of post-hole 1028.	25/02/99		3		
1028	A:TP3	Cut	Possible post-hole cut, cutting 1030.	25/02/99		3		
1029	A:TP1	Cut	Irregular cut filled by 1014.	27/02/99	TP1-3	2		
1030	A:TP3	Layer	Occupation layer cut by a series of post-holes and other features.	27/02/99		3	Y	742
1031	A:TP6	Fill	Fill of cut 372, compact clayey deposit.	27/02/99		3-temple		180
1032	A:TP9	Fill	Loose fill below floor 1010 interior of the North Temple.	27/02/99		3-temple		66
1033	A:TP6	Packing	Stone packing filling foundation cut 1246.	27/02/99		3-temple		
1034	A:TP6	Deposit	Deposit below stone packing 1033.	27/02/99		3-temple		26
1035	A:TP6	Deposit	Deposit below the compact floor 987.	27/02/99		3	Y	1,700
1036	A:TP3	Fill	Ashy lenses and silty clay matrix.	27/02/99		3	Y	204
1039	A:TP3, TP5	Fill	Compact layer, fill of cut 982.	27/02/99		3-temple		52
1040	A:TP1	Layer	Olive green clay and rubble layer below 1013.	27/02/99	TP1-3	2	Y	1,953
1041	A:TP3	Fill	Silty loam, fill of cut 982.	27/02/99		3-temple		
1042	A:TP9	Surface	Hard surface under 1010 in *mandapa* of the North Temple.	28/02/99		3-temple		
1043	A:TP1	Fill	Fill of pit 1044.	28/02/99	TP1-3	2	Y	53
1044	A:TP1	Cut	Shallow irregular cut.	28/02/99	TP1-3	2		
1045	A:TP5	Fill	Third foundation deposit of stones and sand filling cut 963.	28/02/99		3-temple	Y	
1046	A:TP5, TP3	Fill	Stone layer, fill of 982.	28/02/99		3-temple		
1047	A:TP5, TP3	Fill	Compact clay layer, fill of 982.	28/02/99		3-temple		153
1048	A:TP5	Fill	Compact clay fill of foundation cut 963 above 1045.	28/02/99		3-temple		
1049	A:TP9	Cut	Small cut, filled by 1032 in interior of the North Temple. Possible shrine.	28/02/99		3-temple		
1050	A:TP9	Layer	Loose silt deposit in *mandapa*, North Temple.	28/02/99		3-temple	Y	256
1051	A:TP6	Layer	Deposit below 1035.	28/02/99		3	Y	1,589
1052	A:TP1	Rubble	Rubble layer below 1040. Contaminated.	28/02/99	TP1-3	2	Y	1,332
1053	A:TP5, TP3	Fill	Silty fill of foundation cut 982.	28/02/99		3-temple		94
1054	A:TP6	Layer	Compact deposit below silt 1034 and 1033.	28/02/99		3-temple		
1055	A:TP9	Cut	Cut against walls 555, 556.	28/02/99		3-temple		1
1056	A:TP9	Fill	Fill of cut 1055.	28/02/99		3-temple		

Context	Trench	Type	Description	Date	Trench phase	Period	Bone	Sherds (approx)
1057	A:TP1	Cut	Pit cut, filled by 1058.	01/03/99	TP1-3	2		
1058	A:TP1	Fill	Fill of pit 1057.	01/03/99	TP1-3	2	Y	310
1059	A:TP6	Packing	Stone packing below 1054.	01/03/99		3-temple		
1060	A:TP6	Layer	Deposit beneath 1059.	01/03/99		3-temple		143
1061	A:TP3, TP5	Fill	Stone layer in fill of foundation trench 982.	01/03/99		3-temple		
1062	A:TP3, TP5	Fill	Layer beneath 1061 in foundation trench 982.	01/03/99		3-temple	Y	161
1063	A:TP1	Layer	Rubble deposit, equals 1052 but uncontaminated.	01/03/99	TP1-3	2	Y	1,206
1064	A:TP5	Fill	Clay fill of foundation trench 963, below 1045.	01/03/99		3-temple	Y	
1065	A:TP9	Layer	Stone layer, interior of the North Temple (equals 1115).	05/03/99		3-temple		
1066	A:TP9	Layer	Surface in interior of the North Temple *mandapa*.	01/03/99		3-temple		
1067	A:TP9	Layer	Crumbly brick and green sand layer; interior of *mandapa* of the North Temple.	01/03/99		3-temple		
1068	A:TP5, TP3	Fill	Silty layer, fill of 982.	01/03/99		3-temple	Y	202
1069	A:TP5, TP3	Fill	Stone layer, fill of 982.	01/03/99		3-temple		
1070	A:TP5	Packing	Stone packing under the South Temple (equals 1071).	01/03/99		3-temple		
1071	A:TP5	Packing	Stone packing under the South Temple (equals 1070).	01/03/99		3-temple		
1072	A:TP5	Fill	Compact clay layer, fill of South Temple foundation trench, under 1070.	01/03/99		3-temple	Y	78
1073	A:TP3	Fill	Compact black cotton soil, fill of 1171 (equals 927).	01/03/99		3-temple	Y	893
1074	A:TP1	Fill	Fill of pit 1075.	01/03/99	TP1-3	2	Y	168
1075	A:TP1	Cut	Pit cut.	01/03/99	TP1-3	2		
1076	A:TP6	Layer	Deposit below 1060, less compact clayey silt.	03/03/99		3-temple		
1077	A:TP1	Rubble	Rubble layer below 1063.	03/03/99	TP1-3	2	Y	1,365
1078	A:TP9	Cut	Cut related to late rebuilding, western end, north aisle, North Temple.	03/03/99		3		
1079	A:TP9	Fill	Fill of 1078.	03/03/99		3		
1080	A:TP9	Surface	Surface of *mandapa*, North Temple (equals 1010 and 1100).	03/03/99		3-temple		108
1081	A:TP9	Layer	Green sand deposit, south aisle, North Temple (equals 1107).	03/03/99		3		
1082	A:TP9	Cut	Cut (by Yusuf?) into south aisle, North Temple.	03/03/99		4		
1083	A:TP3	Fill	Fill in cut 1171.	03/03/99		3-temple	Y	1,463
1084	A:TP9	Cut	Post-hole cut into 1089.	03/03/99		3		
1085	A:TP9	Fill	Fill of cut 1084.	03/03/99		3		
1086	A:TP1	Fill	Stone and green silt fill of foundation cut 963 below 1064.	03/03/99		3-temple	Y	
1087	A:TP9	Cut	Cut against west wall, south aisle, North Temple.	03/03/99		3		
1088	A:TP9	Fill	Fill of 1087.	03/03/99		3		
1089	A:TP9	Layer	Brick jelly layer on floor of south aisle of *mandapa*, North Temple.	03/03/99		3		

Context	Trench	Type	Description	Date	Trench phase	Period	Bone	Sherds (approx)
1090	A:TP9	Cut	Post-hole cut, north aisle of *mandapa*, North Temple.	03/03/99		3-temple		
1091	A:TP9	Fill	Fill of 1090.	03/03/99		3-temple		
1092	A:TP5	Fill	Silt layer/fill around stones 1093, South Temple foundations (equals 1130).	03/03/99		3-temple	Y	
1093	A:TP5	Packing	Stone packing in 1092.	03/03/99		3-temple		
1094	A:TP3	Fill	Stone layer within cut 1171.	03/03/99		3-temple		
1095	A:TP3	Fill	Compact clay and silt layer in cut 1171.	03/03/99		3-temple	Y	669
1096	A:TP9	Surface	Surface below 1080, northern aisle of *mandapa*, North Temple.	03/03/99		3-temple	Y	
1097	A:TP9	Layer	Green silt (dung?) on floor, south aisle of *mandapa*, North Temple.	04/03/99		3		
1098	A:TP6	Packing	Thick stone packing.	04/03/99		3-temple		
1099	A:TP1	Layer	Rubble/clay layer filling pit 1114, below 1077.	04/03/99	TP1-3	2	Y	1,684
1100	A:TP9	Floor	Floor in south aisle of *mandapa*, North Temple (equals 1010 and 1080).	04/03/99		3-temple		
1101	A:TP9	Cut	Re-cut against wall 556, south aisle of *mandapa*, North Temple.	04/03/99		3		
1102	A:TP9	Fill	Foundation fill of 1101.	04/03/99		3		
1103	A:TP3	Fill	Foundation fill of 1171.	04/03/99		3-temple	Y	386
1104	A:TP3	Fill	Foundation fill of 1171.	04/03/99		3-temple		
1105	A:TP1	Fill	Fill of pit 1057 below 1058.	04/03/99	TP1-3	2	Y	166
1106	A:TP6	Layer	Fine sand and silt with pot sherds.	04/03/99				
1107	A:TP9	Layer	Green sand deposit, south aisle, North Temple (equals 1081).	04/03/99		3		
1108	A:TP9	Surface	Second surface, south aisle of *mandapa*, North Temple.	06/03/99		3-temple		515
1109	A:TP3	Fill	Foundation fill of 1171.	06/03/99		3-temple	Y	
1110	A:TP1	Rubble	Rubble below 1099, fill of 1114.	06/03/99	TP1-3	2	Y	489
1111	A:TP1	Fill	Gravel patch below 1099, fill of pit 1113.	06/03/99	TP1-3	2	Y	283
1112	A:TP3	Fill	Foundation fill of 1171.	06/03/99		3-temple	Y	390
1113	A:TP1	Cut	Cut of irregular and disturbed pit.	06/03/99	TP1-3	2		
1114	A:TP1	Cut	Shallow pit/sump filled with 1110 and 1099.	06/03/99	TP1-3	2		
1115	A:TP9	Layer	Stone packing below 1108, south aisle, *mandapa*, North Temple.	06/03/99		3-temple		
1116	A:TP5	Layer	Compact clay foundation layer of the South Temple, under 1093.	06/03/99		3-temple	Y	
1117	A:GG North	Layer	Fill of Phase I foundations, North Temple.	06/03/99		3-temple	Y	591
1118	A:TP5	Deposit	Silt matrix around stones 1119.	06/03/99		3-temple	Y	
1119	A:TP5	Packing	Stone packing in foundations of the South Temple.	06/03/99		3-temple		
1120	A:TP1	Layer	Compact, clay rich layer below 1110, cut by 1114.	07/03/99	TP1-2	2	Y	823
1121	A:TP9	Deposit	Silt in between stones, foundation layer of *mandapa*, North Temple.	07/03/99		3-temple	Y	268
1122	A:TP3	Fill	Stone layer in foundation fill of 1171.	07/03/99		3-temple		
1123	A:TP5	Layer	Compact clay layer under 1071, South Temple foundations.	07/03/99		3-temple		33

Context	Trench	Type	Description	Date	Trench phase	Period	Bone	Sherds (approx)
1124	A:TP5, TP3	Layer	Compact layer in pre-temple deposits.	07/03/99		3	Y	1,217
1125	A:TP1	Fill	Clay fill of foundation cut 963, below 1086.	07/03/99		3-temple	Y	
1126	A:TP1	Fill	Deposit below 1120, fill of pit 1131.	07/03/99	TP1-2	2	Y	798
1127	A:TP1	Layer	Compact clay deposit below 1120.	07/03/99	TP1-2	2	Y	494
1128	A:TP5	Layer	Compact clay foundation layer under 1119 in South Temple foundations.	07/03/99		3-temple	Y	
1129	A:TP3	Layer	Pre-temple deposit consisting of thin ash lenses.	07/03/99		3		612
1130	A:TP5	Layer	Soft silt under 1123 in South Temple foundations.	07/03/99		3-temple		718
1131	A:TP1	Cut	Pit cut, filled with 1126.	07/03/99	TP1-2	2		
1132	A:TP9	Layer	Red brick jelly under 1115, *mandapa*, North Temple.	07/03/99		3-temple		
1133	A:TP9	Layer	Yellow brick jelly under 1132, *mandapa*, North Temple.	07/03/99		3-temple		
1134	A:TP3	Layer	Ashy layer in pre-temple deposits.	07/03/99		3		
1135	A:TP5	Deposit	Soft silt matrix around stones 1136, South Temple foundation.	07/03/99		3-temple	Y	151
1136	A:TP5	Packing	Stone packing under 1128/1135, South Temple foundations.	07/03/99		3-temple		
1137	A:TP9	Structure	Possible traces of shrine under 1132, *mandapa,* North Temple.	07/03/99		3-temple		
1138	A:TP3	Fill	Fill of 1139.	07/03/99		3		
1139	A:TP3	Cut	Post-hole, cutting 1134.	07/03/99		3		
1140	A:TP3	Layer	Silty clay layer in pre-temple deposits.	08/03/99		3		808
1141	A:TP1	Layer	Small patch of burning on 1127.	08/03/99	TP1-2	2		
1142	A:TP9	Surface	Surface of *mandapa*, North Temple.	08/03/99		3-temple		
1143	A:TP9	Layer	Brick jelly under 1142, *mandapa,* North Temple.	08/03/99		3-temple	Y	
1144	A:TP1	Fill	Fill of pit 1145.	08/03/99	TP1-2	1	Y	1,238
1145	A:TP1	Cut	Pit cut (fill 1144).	08/03/99	TP1-2	1		
1146	A:GG North	Layer	Stone layer under *garbhagriha,* North Temple.	08/03/99		3-temple		
1147	A:GG North	Layer	Fill of foundation of Phase I shrine, beneath 1146, North Temple.	08/03/99		3-temple	Y	329
1148	A:TP3	Layer	Pre-temple layer with remnant of brick surface.	08/03/99		2	Y	1,906
1149	A:TP9	Layer	Crumbly silt under possible 'altar', *mandapa*, North Temple.	08/03/99		3-temple		
1150	A:TP1	Fill	Second fill of pit 1145, below 1144.	08/03/99	TP1-2	1	Y	2,215
1151	A:TP9	Layer	Hard clay fill of *mandapa* foundations, North Temple.	08/03/99		3-temple	Y	349
1152	A:GG North	Layer	Fill in Phase I foundations, North Temple.	08/03/99		3-temple		314
1153	A:TP5	Packing	Stone packing under *garbhagriha*, South Temple (under 1130).	09/03/99		3-temple		
1154	A:TP3	Layer	Lowest level of pre-temple deposits reached 1999.	09/03/99		2		
1155	A:TP3	Layer	Lowest level of pre-temple deposits reached 1999.	09/03/99		2	Y	

Context	Trench	Type	Description	Date	Trench phase	Period	Bone	Sherds (approx)
1156	A:TP9	Layer	Slightly clayey yellow silt in *mandapa* foundations, North Temple.	09/03/99		3-temple		
1157	A:TP9	Layer	Lowest stone layer in *mandapa* foundations, North Temple.	09/03/99		3-temple		389
1158	A:TP1	Fill	Primary fill of pit 1145.	08/03/99	TP1-2	1	Y	43
1159	A:TP1	Layer	Subsoil above natural.	08/03/99	TP1-1	1		4
1160	A:TP1	Natural	Natural soil.	09/03/99	TP1-1	1		
1161	A:TP5	Layer	Compact clay under stones 1153 in South Temple foundations.	08/03/99		3-temple		
1162	A:GG North	Layer	Stone layer in *garbhagriha* foundations, North Temple.	09/03/99		3-temple		
1163	A:GG North, TP5	Layer	Hard layer below 1162 in *garbhagriha* foundations, North Temple.	09/03/99		3-temple	Y	218
1164	A:GG North	Layer	Looser layer below 1163 in *garbhagriha* foundations, North Temple.	09/03/99		3-temple	Y	
1165	A:TP9	Layer	Lens of brick jelly under 1168, *mandapa* of the North Temple.	09/03/99		3-temple		
1166	A:TP9	Cut	Cut into foundation deposits of *mandapa*, North Temple.	09/03/99		3-temple		
1167	A:TP5	Fill	Silt matrix surrounding stones 1174 under 1161, South Temple foundations.	09/03/99		3-temple		
1168	A:TP9	Layer	Hard surface under walls of *mandapa*, North Temple.	09/03/99		3-temple		
1169	A:TP9, GG North	Surface	Brick dust surface under Phase I shrine, North Temple.	09/03/99		3-temple		
1170	A:TP9	Layer	Hard layer in bottom of foundation trench of *mandapa* wall, North Temple.	10/03/99		3-temple		244
1171	A:TP3, GG North	Cut	Foundation cut for *garbhagriha*, North Temple.	10/03/99		3-temple		
1172	A:GG North	Layer	Stone layer below 1164, in Phase I foundations, North Temple.	10/03/99		3-temple		
1173	A:GG North	Layer	Bottom foundation fill of 1171, Phase I North Temple.	10/03/99		3-temple		
1174	A:TP5	Layer	Stone layer in 1167, under *garbhagriha*, South Temple.	10/03/99		3-temple		
1175	A:GG North	Natural	Natural soil.	10/03/99		3-temple		
1176	A:TP5	Layer	Compact clay under 1174, *garbhagriha*, South Temple.	10/03/99		3-temple		
1177	A:TP7	Fill	Fill of foundation cut 1178.	10/03/99			Y	209
1178	A:TP7	Cut	Foundation cut of southern *mandapa* wall, South Temple (fill 1177).	10/03/99				
1179	A:TP5	Layer	Silt layer under 1176, *garbhagriha* foundations, South Temple.	11/03/99		3-temple		
1180	A:TP5	Layer	Compact silt under 1179, *garbhagriha* foundations, South Temple.	11/03/99		3-temple		
1181	A:TP5	Cut	Bottom of foundation cut under the South Temple.	11/03/99		3-temple		
1182	A:TP8	Layer	Hard surface layer on north eastern corner of the South Temple.	11/03/99				242

Context	Trench	Type	Description	Date	Trench phase	Period	Bone	Sherds (approx)
1183	A:TP1	Fill	Clean silt fill of foundation cut for the South Temple observed in section only.	11/03/99		3-temple		
1184	A:TP8	Layer	Silt layer underlying 1182.	11/03/99			Y	135
1185	A:TP8	Layer	Less compact layer under 1184.	12/03/99				177
1186	A:TP5, TP9, GG North	Surface	Top of Phase I foundation fill, North Temple (equals 927).	11/03/99		3-temple		479
1187	A:TP7	Fill	Fill of cut 1188.	11/03/99				
1188	A:TP7	Cut	Small rectangular cut filled with 1187.	11/03/99				
1189	A:TP7	Fill	Fill underlying 342.	11/03/99				102
1190	A:TP7	Packing	Rammed floor with rubble packing cut by 372.	11/03/99				128
1191	A:TP7	Surface	Compact surface.	11/03/99				121
1192	A:TP3, TP5	Fill	Compact layer in which stones 1069 are set, fill of 982.	11/03/99		3-temple		
1193	A:TP5	Fill	Thin mud, uppermost fill of foundation for the South Temple.	11/03/99		3-temple		
1194	A:TP5	Fill	Green silt and stones below 1193, part of uppermost fill of foundation for the South Temple.	11/03/99		3-temple		
1195	A:TP5	Fill	Green grey silt, fill of foundation cut 963 for the South Temple.	11/03/99		3-temple		
1196	A:TP9	Layer	Pre-foundation of the North Temple *mandapa* deposit.	11/03/99		3-temple	Y	524
1197	A:TP7	Layer	Yellowish brown silt layer overlying 1190.	11/03/99			Y	
1198	A:TP7	Fill	Fill of cut 1199.	11/03/99				
1199	A:TP7	Cut	Circular cut, filled by 1198.	11/03/99				
1200	A:TP7	Layer	Thin yellowish silt deposit underlying 1197.	11/03/99				67
1201	E	Fill	Loose grey fill of cut 1202.	07/03/99				
1202	E	Cut	Circular cut, possibly a post-hole.	07/03/99				
1203	E	Layer	Compact ashy deposit.	07/03/99			Y	207
1204	E	Fill	Fill of post-hole 1205.	08/03/99				
1205	E	Cut	Cut of post-hole cut, filled by 1204.	08/03/99				
1206	E	Layer	Loose brown clayey silt deposit, possibly a surface.	08/03/99			Y	1,364
1207	E	Layer	Rubble packing.	09/03/99				581
1208	E	Layer	Compact yellowish brown silt deposit.	09/03/99			Y	408
1209	E	Layer	Brownish clayey deposit.	09/03/99				190
1210	E	Layer	Semi-compact brownish deposit.	09/03/99				153
1211	A:TP7	Layer	Ashy patch underlying 1200.	13/03/99				
1212	A:TP5	Layer	Lowest stone packing in construction levels under the South Temple.	13/03/99		3-temple		
1213	A:N Temple	Wall	Moulding added to north face of wall 514.	13/03/99				
1214	A:TP6	Fill	Fill overlying 373, south-west of the South Temple.	13/03/99				147
1215	A:TP8	Cut	Cut.	13/03/99				
1216	A:TP8	Layer	Floor deposit underlying 1182.	13/03/99				98

Context	Trench	Type	Description	Date	Trench phase	Period	Bone	Sherds (approx)
1217	A:N Temple	Feature	Striations on upper surface of wall 555 of the North Temple.	14/03/99				
1218	A:N Temple	Wall	Ledge on west side of *garbhagriha*, North Temple.	14/03/99				
1219	A:TP8	Packing	Stone packing underlying 1245.	14/03/99				76
1220	A:TP8	Floor	Compact pinkish silt clay floor abutting eastern wall of temple and underlying 1219.	14/03/99				448
1221	A:TP7	Fill	Fill within the foundation core make-up of the South Temple.	14/03/99				59
1222	A:TP8	Fill	Rubble fill of foundation cut 1226.	14/03/99				88
1223	A:TP8	Packing	Stone packing fill underlying 1222.	15/03/99				33
1224	A:S Temple	Wall	Foundation wall for Phase I of the South Temple.	15/03/99		3-temple		
1225	A:TP7	Fill	Fill within the foundation core make-up of the South Temple.	15/03/99				103
1226	A:TP8	Cut	Possible cut of foundation trench for the South Temple, filled with 1222 and 1223.	15/03/99				
1227	A:TP8	Surface	Hard surface below floor 1220.	15/03/99				183
1228	A:TP8	Fill	Hard surface below 1227, may be foundation fill.	16/03/99				
1229	A:TP7	Packing	Stone packing part of core filling of foundation of South Temple *mandapa*.	16/03/99				
1230	A:TP7	Cut	Foundation cut of the South Temple in south-east corner.	16/03/99				
1231	A:TP7	Layer	Deposit underlying 1191 and cut by 1230.	16/03/99				
1240	A:S Temple	Wall	South Temple Phase II wall, north side.	16/03/99		3-temple		
1241	A:S Temple	Wall	Phase V? rebuild of south wall, South Temple (equals 1242).	16/03/99		3		
1242	A:S Temple	Wall	Phase V? rebuild of south wall, South Temple (equals 1241).	18/03/99		3		
1243	A:TP9	Cut	Foundation cut for *mandapa,* North Temple.	16/03/99		3-temple		
1245	A:TP8	Fill	Yellowish silt, top fill of foundation (was 1218A).	14/03/99				
1246	A:TP6	Cut	Foundation cut of the South Temple on south side.	16/03/99		3-temple		
1247	A:S Temple	Wall	South Temple Phase II wall, south side.	17/03/99		3-temple		
1248	A:N Temple	Wall	Late rebuild of *mandapa* wall 557, south side, North Temple.	17/03/99				
1249	A:TP5	Cut	Foundation cut of wall thickening 528 inside the South Temple.	17/03/99		3		
1250	A:TP5	Cut	Foundation cut for the South Temple foundation under 1212.	18/03/99		3-temple		
1251	A:S Temple	Wall	Phase II wall of *garbhagriha* of the South Temple.	29/10/06		3-temple		
1252	A:TP9	Layer	Layer numbered '551 cleaning' in 1998 season.	21/03/98				

General Author Index

https://doi.org/10.1515/9783110653540-018

General Subject Index

https://doi.org/10.1515/9783110653540-019