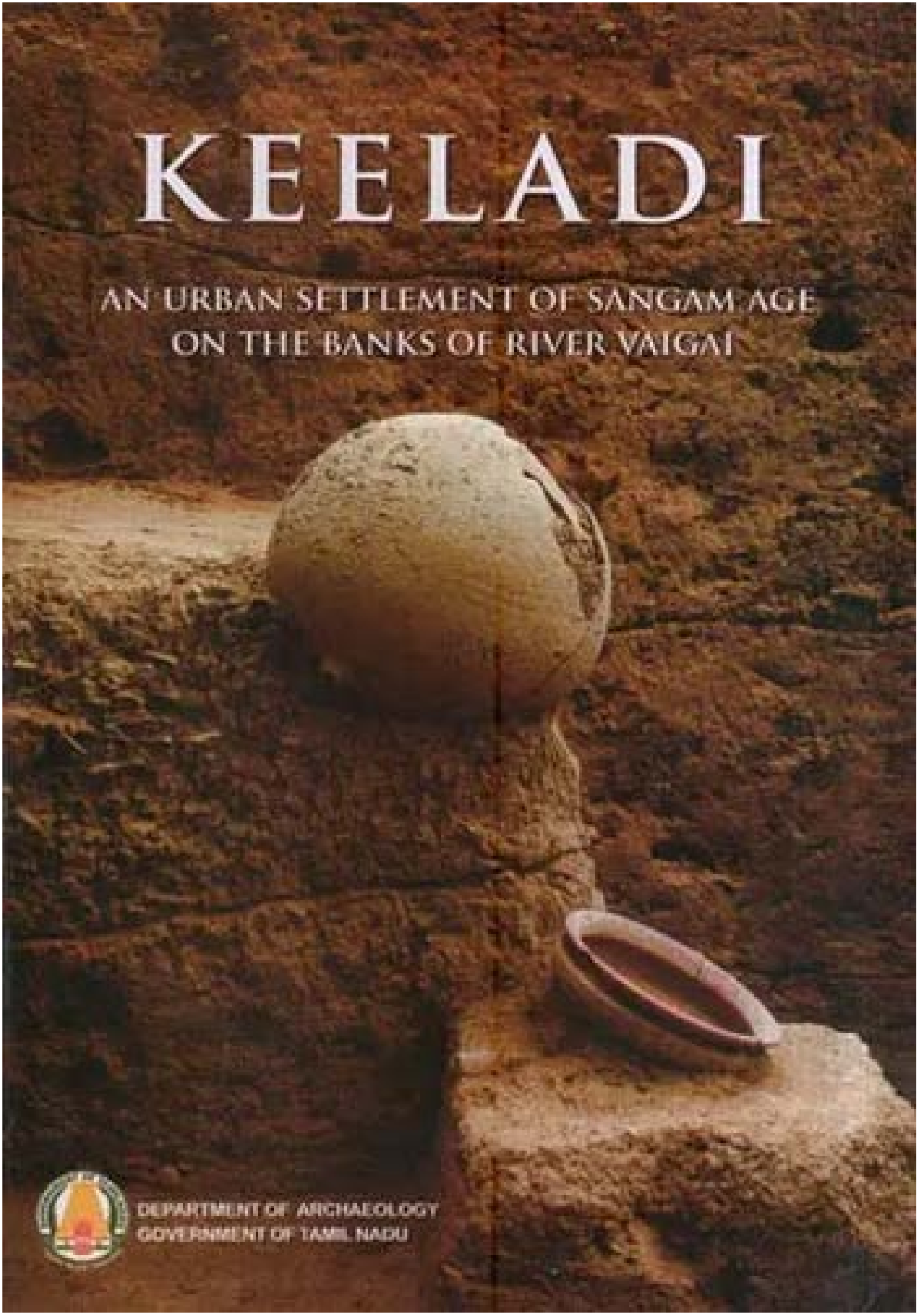
KEELADI

AN URBAN SETTLEMENT OF SANGAM AGE ON THE BANKS OF RIVER VAIGAI



DEPARTMENT OF ARCHAEOLOGY
GOVERNMENT OF TAMIL NADU

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AN URBAN SETTLEMENT OF SANGAM AGE ON THE BANKS OF RIVER VAIGAI

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KEELADI

AN URBAN SETTLEMENT OF SANGAM AGE

Prof. K.Rajan
Department of History
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The findings of the recent archaeological excavations at Keeladi generated tremendous amount of interest among the public and academic debate among the scholars. Keeladi excavation has yielded artefacts similar to Arikamedu Alagankulam, Kaveripattinam. Uraiyur, Karur, Kodumanal. Porunthal, Thandikudi, Korkal and many other sites of Early Historic period in Tamil Nadu and Pattanam (Muziri pattanam) in Kerala However, every excavated site had its own uniqueness due to its eco-settings, landscape, geographical advantage and resource base. In that way, the distinctiveness of Keeladi excavations is the exposure of the massive brick structures which we rarely come across in other contemporary archaeological sites of the Early Historic period of Tamil Nadu, except the major urban centres. In addition to this unique phenomenon, the occurrence of inscribed potsherds with early dates is another aspect that has received popular and academic attention. These two aspects that induced the academic debate are urbanization and date of Tamil-Brahmi. At the same time. the significance of other important artefacts cannot be ignored. The entire debate has revolved around three important complex issues, namely, 1) the relationship between the Indus Valley Civilization and Keeladi findings 2) the beginning of Urbanisation in South India and 3) date of Prakrit-Brahmi and Tamil-Brahmi scripts Besides these issues, there are sporadic debate on the rate of literacy, trade and technology, social hierarchy. belief system and several other such inter-related issues. The first point is the relationship between the Indus Valley Civilization and the Keeladi excavations, The Indus Valley Civilization comes to an end around 15 century BCE and the beginnings of Keeladi is placed around 6 century BCE based on AMS dates. Since the excavation is in progress and less than one percent of habitation area is exposed so far, there is a strong possibility of finding further crucial evidences in future. As on today, there is a cultural gap of thousand years between Indus Valley Civilization and Keeladi excavation. This cultural gap is generally filled with Iron Age material in South India. The graffiti marks encountered in Iron Age sites of South India served as the only residual link between Indus Valley Civilization and South India. Like any other excavated sites of Tamil Nadu. Keeludi also yielded more than thousand graffiti inscribed potsherds. Unlike other archaeological sites in India, the Iron Age and the Early Historic sites of Tamil Nadu yielded more than five thousand graffiti inscribed potsherds. As stated by B.B. Lal, considerable number of graffiti marks had a close affinity with the Indus script The similarity between the graffiti marks and Indus script forced the scholars to find the possible linguistic link The future decipherment of the graffiti marks and the Indus script alone could solve this crucial issue. At the moment, it is hard to ignore the occurrence of large number of graffiti inscribed potsherds of Tamil Nadu.

The second issue is the urbanization. The eco-settings of the Gangetic valley and South India always differ The general view is that the existence of large-scale brick structures is considered as one of the features of urbanization. The size of the settlement, internal and external trade activities, existence of trade routes, the level of technologies, the existence of multi ethnic and linguistic groups, usage of luxury/elite items, usage of script, codified language, literacy level, various industries, existence of state and statecraft and many other such features determine the existence of urbanization

In Keeladi the structural evidence and artefacts clearly suggests that Keeladi is one of the urban centre South India. This feature is also observed in other archaeological sites such as Arikamedu Kaveripattin Alagankalam Korkai, Uravur, Karur Kodumanal and others. One need not to depend on brick structures al for urbanization, as we could not come across any such massive brick structures in Tamil Nadu even the period of medieval dynasties such as Pallavas, Pandyas and Cholas. In tropical and sub-tropical climate zones, wooden super structures are favoured more than brick structures. The brick structures and other artefac unearthed at Keeladi clearly points to the existence of urbanization

The third complex issue is the date of Tamil-Brahmi. At Keeladi, the date of Tamil-Brahmi is pushed back to 6 century BCE (uncalibrated 580 BCE) based on the sample collected at the depth of 353 cm. It is a century earlier than hitherto held view of 5 century BCE Till date, twenty-seven AMS dates have been received from four Early Historic sites of Tamil Nadu yielding Tamil-Brahimi inscribed potsherds such as Keeladi (16) Alagankulam (4), Porunthal (2) and Kodumanal (5). The time range falls between 6 century BCE and j century BCE. Of the twenty-seven dates, five dates fall between 3 and 4 centuries BCE, four dates betwee and 3 centuries BCE fifteen dates between 3 and 2 centuries BCE, two dates between 2 and 1" century BCE and one date goes back to 6 century BCE The availability of more than thousand inscribed potsherds in different stratigraphical contexts, more than hundred cave inscriptions and four memorial stones, besides considerable number of inscribed seals, rings and coins in different parts of Tamil Nadu clearly suggests the long survival of this script. Of the twenty-seven AMS dates, five dates fall in 5 century BCE Hence, the availability of one date in 6 century BCE has to be studied along with the remaining AMS dates. As suggested earlier the excavation is in progress and less than one percent of the habitation area is excavated so far. There is every possibility of getting more dates in future while extending the dig and the future excavations would throw more light on this issue.

Besides all, it is time to appreciate both the Archaeological Survey of India and Tamil Nadu State Archaeology Department for bringing to the floor with invaluable artefacts. Every excavation solves some of the problems and hypotheses and at the same time generates new questions that need to be answered in future. One must congratulate wholeheartedly all the archaeologists and technical staff involved in the Keeladi excavations One of the important social responsibility and public accountability is the publication of the excavation report in time. The preparation of excavation report is a stupendous task as it involves many scientific studies and naturally it takes time. One must appreciate the Commissioner of Tamil Nadu State Archaeology Department Mr.T.Udhayachandran IAS for bringing out the preliminary report in the form of a brochure in a short time This preliminary report would definitely generate healthy academic debate. One must also appreciate the academicians and public for raising pertinent questions on the date of Tamil-Brahmi, urbanization, rate of literacy and many other such aspects. The constructive criticism would immensely help the archaeologists to chalk out the next course of action in a more fruitful and constructive way.

Padma Sri

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Cambridge University, Cambridge, UK
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A Note on Recent Archaeological Developments in Tamil Nadu

Some years ago, I had an opportunity to learn about archaeology in Tamil Nadu from Prof K. Rajan, currently at Central University, Pondicherry. We talked mostly about his work at Kodumanal That was before any radiocarbon date came from the site. What strongly emerged was that even on the basis of only stratigraphy, the site which yielded sherds inscribed with a variant of the Brahmi script known as Tamil-Brahmi in its early level, could be dated back to c.500 BCE. This meant that by c.500 BCE Tamil Nadu had entered the phase of early historic literacy and thus the early historic period itself. In northern India, the beginning of the early historic phase was a process roughly between 800 and 500 BCE. The emerging date from Tamil Nadu clearly fell in this bracket. Two points became immediately apparent. First, the beginning of early historic writing in Tamil Nadu was as early as the beginning of Tamil-Brahmi at Anuradhapura in Sri Lanka, for which a date around 450 BCE was postulated on the basis of radiocarbon dates by Siran Deraniyagala. Secondly, the beginning of the early historic phase itself in this region including Tamil Nadu was almost as early as the beginning of early history in the Ganga plain and elsewhere. For a long time, archaeology in Tamil Nadu has been subject to obsessions with megalithic burial sites and contacts with Rome. The result was that scholars did not see what was before them to see. When I published my book Ancient Routes of the Deccan and the Southern Peninsula in 2010. I had no hesitation to ascribe the general date of the formation of the Sangam literature to about 500 BCE and thought that the earliest ancient state of Tamil Nadu was the Pandyan kingdom which could be dated, even on the basis of the testimony of Megasthenes, to c.6-7 century BCE. The results of K.Rajan's excavations at Kodumanal and Porunthal and the excavations conducted by the State Archaeology Department of Tamil Nadu, which have all been strengthened by a large number of radiocarbon dates, have brought about a sea-change in our understanding of the archaeological developments in Tamil Nadu, taking our gaze from megalithic burials and the finds of Roman coins to megalithic habitation sites and their chronological developments. This is a great achievement on the part of these scholars. I take the liberty of drawing attention to one more point regarding the archaeology of Tamil Nadu. The State is very rich in epigraphic sources, on the basis of which many ancient features can still be identified on the ground and can give us a feel of the ancient land. I am too old to get involved in the field in this direction but earnestly hope that younger workers in this field will not forget the significance of this kind of ground study.

P J Cherian

Director PAMA

Institute for the Advancement of Trans-disciplinary Archaeological Sciences

The Keeladi archaeological site, close to the modern temple city of Madurai, on the banks of river Vaigai, in The Sevganga district of Tamil Nadu, marks a breakthrough in the history of advanced scientific research in the country. The multiple excavation seasons and post excavation studies so far undertaken and the scientific commitment and collaborative vision with which the Tamil Nadu State Archaeology Department is proceeding would transform the Keeladi site into a model archaeological site for the nation.

The rich literary traditions of the Sangam Age to which the informed Tamil mind turns back for cultural foundation, lacked, till recently, corresponding archaeological evidence corroborating the urban culture reflected in the textual sources. It was this absence which prompted a section of the academia to treat the Iron Age and consequent agrarian foundation of South Indian material culture as hunting-gathering, pastoral, megalithic etc implying primitivism

Numerous port sites such as Veeram Pattinam (Arikamedu), Poompuhar, Alagankulam, Korkai and Pattanam (Muziris) have often been treated as isolated pockets or colonies of foreign traders and sailors with the accompanying assumption that the then "chiefdom" polity and society of peninsular India had been ill-equipped to engage with the complex trans-oceanic trade mechanisms of the time.

Keeladi site with its rich and irrefutable evidence of urbanism seems to settle these issues fairly convincingly The recent AMS radio carbon dates of the 6 century BCE from secure stratigraphic context are a chronological land mark. This pushes back Tamilakam urbanism to the first half of the first millennium BCE demanding a re-evaluation of South Indian history and consequently the entire history of the subcontinent.

The most significant features of Keeladi archaeological record are, firstly, the enormity of structural features and the fineness of the artefact assemblage indicating advanced urban character. This could effectively challenge the existing historiographical predisposition that South Indian culture had been rural or backward compared to the urban culture that emerged in the Indo-Gangetic expanse following mature Iron Age

The new question the Keeladi assemblage of artefacts poses is on the antecedents of what we define as urban culture. The material culture, technology, engineering, aesthetics etc., reflected in the artefacts and features could not have magically materialised on the dates we deduce from them. The logical question would be as to when the early traits of urbanism appeared in peninsular India. Those who attribute primacy to technological shifts for major socio-cultural changes may consider the earliest phase of Iron Age as the beginning of organised living or the urbanisation process in South India. Adichanallur, one of the most illustrious Iron Age sites of the Indian subcontinent and several other sites in Ancient Tamilakam need extensive attention. Muciri Pattinam or Muziris site at Pattanam on the Periyar delta region has given stratigraphic, typological and chronometric evidence confirming the beginnings of Pattanam settlement to be around 1000 BCE. With this background, in would therefore be safe to assume that ongoing excavations would bring out reliable time-markers for the antecedents of Keeladi urbanism.

Secondly, the location of Keeladi in the deep interior of peninsular India suggests that urban cultures may not be confined to the coastal port cities of Ancient Tamilakam. A comprehensive study of the port sites with the hinterland sites of ancient Tamilakam can help to unravel the civilizational foundations of South India.

Thirdly, technological advances as reflected in the archaeological data at Keeladi, Arikamedu, Alagankulam, Kodumanal, Pattanam and many other sites clearly bring out the industrial vigour of Ancient Tamilakam. Taken together with the Iron Age revolution, as reflected in the wide variety of burial monuments, their architecture and contents, indicate the worldview, interfaces and economic stability in the Tamilakam region. Keeladi, along with her contemporary sites, confirm that the agrarian and technological revolution implied in the five thinai geographies of Tamilakam facilitated both hinterland and transoceanic trade during the Early Historic period.

Keeladi findings further substantiate the refinement and sublimity of urban life drawn from Tamilakam intellectual, agrarian, industrial, commercial and natural resources as revealed in the Sangam literary sources. The material evidence from Keeladi and her contemporary sites in Tamilakam represent the earliest expressions of Tamil genius.

Keeladi excavations so far have not produced any known religious symbols that demand close analysis. This conspicuous absence turns mind boggling, if we explore the entire assemblage of artefacts and features unearthed in numerous Early Historic sites of Peninsular India. Available indications point to the influence of Jain and Buddhist thought systems as reflected in the epics of Cilappadikaram and Manimekalal and other literary sources of the Sangam academy, which too is believed to have been located in the precincts of the ancient Madurai city Understanding or challenging Keeladi's (Ancient Madural) critical role as the cultural epicentre of Ancient Tamilakam in the light of the new archaeological evidence and the human geography revealed in the Sangam literary corpus is bound to preoccupy many scholars of varying perspectives in the future.

If we search for the antecedents of the Tamilakam cultural sophistication; the yawning gap between Indus Valley and Tamilakam might gradually disappear. The problem the Keeladi finds could solve in the near future would be whether they represent the bridging of an urban Chalcolithic turned pastoral culture, with urban Iron Age cultural transformation.

Treating archaeological sites in isolation is a bane of archaeological practices. South India is no exception.While engaging with the deeper history of the region we often fail to transcend 20 century administrative or language boundaries. Contextualising Keeladi would involve understanding Ancient Tamilakam comprising the modern states of Tamilnadu, Kerala, Pondicherry, Karnataka, Telangana and Andhra Pradesh.

The composite culture that was in harmony with nature, devoid of caste system and minimal manifestations of power and fear structures could be the subversive potential of Keeladi Excavations. Keeladi finds are likely to convince us that the rationale of secularism, inclusive and balanced social relationships were not alien to a society which was integral to nature.

Moving towards the goal of reconstructing a trustworthy, unbiased or unprejudiced genuine-past with Keeladi archeological record as a springboard, involves cutting-edge collaborative studies based on a multi-, inter- and trans-disciplinary master plan. Those who are proud and eager to know and experience their ancient Tamil roots, across the world should associate with the project to transform Keeladi into a "little heaven on earth". Without thoughtful intellectual-social networking, and science and technology exercising the defining role, the significance of Keeladi and allied sites would remain marginal

The present publication is an important step in the long scientific process of rediscovering ancient Tamil cultural legacy. It is my great honour to recommend the first publication on Keeladi archaeological research for your critical reading and reflection.

T. Udhayachandran, I.A.S.,

Principal Secretary and Commissioner
Department of Archaeology

Archaeology is an endless journey in search of our past. Archaeology as we have known always relies A heavily on the tools left behind by our forefathers and the human progress is based on technological development. It is true that those tools were the basis for human existence and modern devices have evolved from these simple stone, wheel and other artefacts invented by our ancestors. Archaeological excavations are no longer a treasure hunt but a search for information and obviously means of answering specific questions. Archaeologists are responsible in classifying and interpreting the artefacts of ancient societies with the evolution of mankind.

Archaeology requires the application of a wide range of skills, from discovery to interpretation of the findings. Exploring new ways of thinking about the past, gathering and maximising knowledge and adopting emerging technologies, will expand the knowledge base, improve interpretation of the past and capture everyone's interest and imagination.

In this endeavour, the Department has taken up a major initiative in adopting various technologies in Keeladi excavation like Unmanned Aerial Vehicle [UAV] Survey, Magnetometer Survey, Ground Penetrating Radar [GPR] Survey, etc., to identify the ideal spot for carrying out the systematic archaeological explorations and excavations with the help of reputed institutions like Indian Institute of Geomagnetism at Navi Mumbai, Institute of Remote Sensing of Anna University and Department of Remote Sensing of Bharathidasan University.

Having recognised the significance of multi disciplinary analysis of archaeological findings, it has been decided to collaborate with reputed institutions operating in the fields such as Archaeo-botany, Molecular Biology, Population Genetics, Environmental Archaeology and Linguistic Archaeology.

There has been a renewed interest in Archaeology and Heritage in our State. Hence, there is a huge scope for the study of past, to discover, care for, promote and enjoy our rich and diverse heritage, contributing to our wellbeing, knowledge and conclusively position the history of Tamil Nadu in the global context.

I am grateful to Prof. K. Rajan, Department of History, Central University, Pondicherry for having critically edited this publication and also writing an academically valuable foreword. The support and encouragement of Padma Sri Prof. Dilip K. Chakrabarti is appreciable. I do hope that the suggestions put forward by Dr. PJ Cherian of PAMA to have a holistic approach in the field of archaeology is noteworthy I sincerely thank all these scholars for guiding us throughout the journey to rediscover our past.

KEELADI

AN URBAN SETTLEMENT OF SANGAM AGE

INTRODUCTION

Archaeology as a discipline has developed into several dimensions and can be Abroadly divided into Pre-Historic Archaeology and Historical Archaeology Due to recent developments in the study of Archacology, the ecological changes have also been brought under consideration; separate focus is now given to the study of Environmental Archaeology and Ethno Archaeology which deals with the study of living people and their material culture. Archaeology includes not only excavation but also study of original source materials such as literature, epigraphs, coins and monuments. However, the role of excavation plays a pre-eminent part in identifying Mesopotamia, Egypt, Maya and the civilizations of the East like Chinese civilization were exposed mainly through excavations. In India, the excavations carried out in the respective sites uncovered the Palaeolithic, Neolithic, Chalcolithic and Iron Age settlements. Though the history of Tamil Nadu can be traced from Pre-historic period with the discovery of stone tools as accidental findings, it was those proper and systematic excavations in various sites by different agencies that lifted the curtain for understanding the past.

When we talk about Archaeology, it is our duty to remember the great pioneers at this juncture, especially in the excavation area. The work done by both Foreign and Indian Archaeologists, who shaped the field are to be recorded and recognized. The father of Indian Archaeology - Alexander Cunningham, Robert Bruce Foote, Lord Curzon, Sir John Marshall, Sir Mortimer Wheeler, Raymond Allchin, V.D. Krishnaswamy, A. Ghosh, M.N. Deshpande, B.K. Thapar, S.R. Rao, B.B. Lal, H.D. Sankalia, VN. Misra, R.S. Bisht and many other Indian scholars have done significant work in the field of excavation. The Archaeological Survey of India as the central body regulates the various activities in the field of Archaeology while at the State level, the State Governments Archaeology Departments, Universities and other private organizations carry out excavations in their respective domain.

In Tamil Nadu, the Archaeological Survey of India, Southern circle, State Department of Archaeology; University of Madras; Tamil University, Thanjavur,

Pondicherry University; Sharma Centre for Heritage Education; Sir Chandra Sekharendra Saraswathi Viswa Maha Vidyalaya (Deemed University) at Enathur of Kancheepuram, Kerala Council of Historical Research and Kerala University have undertaken excavations over the years and contributed significantly to the development of archaeology in the State.

The excavations are conducted at historically important sites, identified with the help of archaeological source through exploration by the Department. It has so far excavated 40 ancient sites and unearthed various artefacts of different periods. The excavations carried out at Parikulam, Tiruttangal, Mangudi, Modur, Kovalanpottal, Anamalai, Pallavamedu, Boluvampatti, Panayakulam, Kurumbanmedu, Kannanur, Tirukkovilur, Vasavasamudram, Poompuhar, Thondi, Korkai, Alagankulam, Pattarai perumbudur, Karur, Vasavasamudram, Gangaikondacholapuram and Perur are some of the important sites dating back from Pre-historic to that of Historic period. They have yielded excellent artefacts confirming the location of the ancient capitals, trade centers, and their relationship between South India and North India and between Tamil Nadu and the Roman Empire.

Vaigai River

The Vaigai river and its tributary Suruliyaru taking off from Suruli hills winds its way along Sinnamanur and Madurai and flows eastwards through a number of prosperous townships dating back to the middle ages like Tiruppuvanam, Rajagambhiram, Manamadurai, Partibanur, Paramakkudi and ultimately joins the sea, after feeding the big tanks of Rajasingamangalam and Ramanathapuram enters Bay of Bengal near Alagankulam. The showers in the lines during the southwest monsoon and the heavier receipts during the northeast help to raise two wet crops, besides plantains, betal in the plains and cardamom on the hill slopes. The Vaigai valley head-reach was the highway for the spices grown in the Western Ghats to be taken to the Townships in the east. The work of Paripadal, one among the eight anthologies of Sangam corpus vividly describes the greatness of this river as many as in eight long poems. Similarly, the work of Maduraikanchi also describes the grandeur of Madurai city.

Early History of Madurai

Madurai is one of the ancient cities in India that enjoyed continuity of history from Pre-historic times down to the present day. Due to its cultural prominence, Madurai is described as "The Athens of South India". It is also well known as a great centre for learning from very early times. As the seat of the Tamil Academy called the Sangam, it wielded great influence in the literary and cultural fields. During the glorious rule of Pandyas, Madurai had overseas connections for both commercial and cultural activities.

Some tools were collected by Robert Bruce Foote, on the left bank of the river Vaigai, immediately north of Madurai city and also a single Palaeolithic tool from Aviyur, about 20km south of Madurai. The archaeological explorations revealed about ten sites belonging to the Late Stone Age and Neolithic antiquities. About 60 sites with megalithic cultural materials have been identified in Madurai district.

The Pandyas and their capital city Madurai were well known to the Ancient Greeks and Romans Megasthenese, the Greek ambassador of Seleukos Nicator at the court of the Chandra Gupta Maurya (820 BCE), in his accounts gave a vivid picture of the South Indian Kingdoms. Strabo (25 BCE) stated that a Pandya king sent an embassy to the Roman Emperor Augustus Pliny (75 CE) mentioned about the Pandya king and his capital Madura. Ptolemy (150 CE) also referred Madurai as the royal city of the Pandyas.

The Arthasastra of Kautilya, while describing the trade between Northern and Southern India, spoke about the pearls and muslins of the Pandya country. The astronomer Varahamihirar referred to the Pandya kingdom in his Brhatiamhita. Kalidasa, the great Sanskrit poet and dramatist referred the Pandya kingdom as one of the provinces visited by Raghu during his tour of conquest.

The earliest datable Ashoka's rock edicts Nos. 2 and 13 mention the South Indian. Kingdoms viz, Chola, Pandya, Keralaputra and Satyaputra. The contemporary lithicrecords found around Madurai (Tamil-Brahmi inscriptions) bear references to Madurai city as well as Pandya king Neduncheliyan.

Jainism in Madurai

It is stated that Jainism spread to South India by the migration of Jaina followers under the leadership of saint Bhadrababu who settled at Sravana Belagola in Karnataka. Madurai and its surroundings were very suitable for the Jains for their secluded life and practices. They selected natural rock shelters for their stay around Madurai. At least fourteen such centers around Madurai were located in which polished rock beds were carved. All these rock caverns have early Tamil (Tamil-Brahmi) inscriptions which may be dated to 500 BCE to 500 CE. The earliest among them is at Mangulam village which have five natural caves and six inscriptions.

Archaeological Explorations

After the recovery of few stone age tools north of Madurai and a palaeolithic tool from Aviyur by Robert Bruce Foote, it was K. V. Raman, then at Southern Circle, Archaeological Survey of India in late 1950's undertook a systematic village to village survey in Madurai, Tirumangalam, Melur and Periyakulam taluks and reported number of archaeological sites and remains. In 2006, K. Rajan and his students reported 196 sites along the Vaigai valley particularly in its upper reaches subsequent to the discovery of inscribed hero stones datable to early centuries of Common Era at Thathakappatti in Dindigul district and Pulimankombai in Theni district. In 1987, the Tamil Nadu State Department of Archaeology through explorations at Ellappatti of Uttamapalayam taluk identified the existence of iron smelting spots. During the course of exploration by Archaeological Survey of India, various forms of antiquarian remains such as urn burials, menhirs, inscriptions, sculptures, hero-stones, habitation mounds etc., have been identified and documented all along the Vaigai river valley taking the total number of sites to 295. This includes both fresh discoveries and re-visitation of the earlier reported sites which revealed new findings hitherto unreported earlier.

Archaeological Excavations

During the pre-Independence era, Alexander Rea had conducted excavation at the urn burial sites of Paravai and Anuppanadi, a hamlet near Madurai. Later,

Archaeological Survey of India made the initiative to understand the archaeological potentiality of this region through systematic excavation at T. Kallupatti in the year 1976. The State Archaeology Department conducted excavations at Kovalanpottal (1979-1980), Alagankulam (1986-1987, 1990-1991, 1992-1993, 1994-1995, 1996-1997, 1997-1998, 2014-2015, 2016-2017) and Mangulam (2006-2007). Among them, the site of Alagankulam located close to mouth of river Vaigai has yielded remarkable evidences of Early Historic period and identified as a port city of early Pandyas.

Archaeological Excavations at Keeladi

The site Keeladi with the cultural deposit extending over a vast area of more than 110 acres, amidst the coconut groves, is located geographically between 9° 51' 40" northern latitude and 78° 11' 70" eastern longitude.

By road, it is 13 km east and southeast of Madurai, a Temple city of Tamil Nadu, On the northern side of this potential habitation mound runs the river Vaigai at a distance of 2 km. On the east, exists the village Manalur having its kapmai (tank) on its northern side and there by forming the northeastern natural water source of the site. Similarly, the village Agaram is located on the southeastern side of Keeladi archaeological mound. The western side of the site is engulfed by Kondagai village. All these natural location of adjoining places around this cultural mound provides a natural epithet for the settlement of contemporary to the early historical phase of Tamil history.

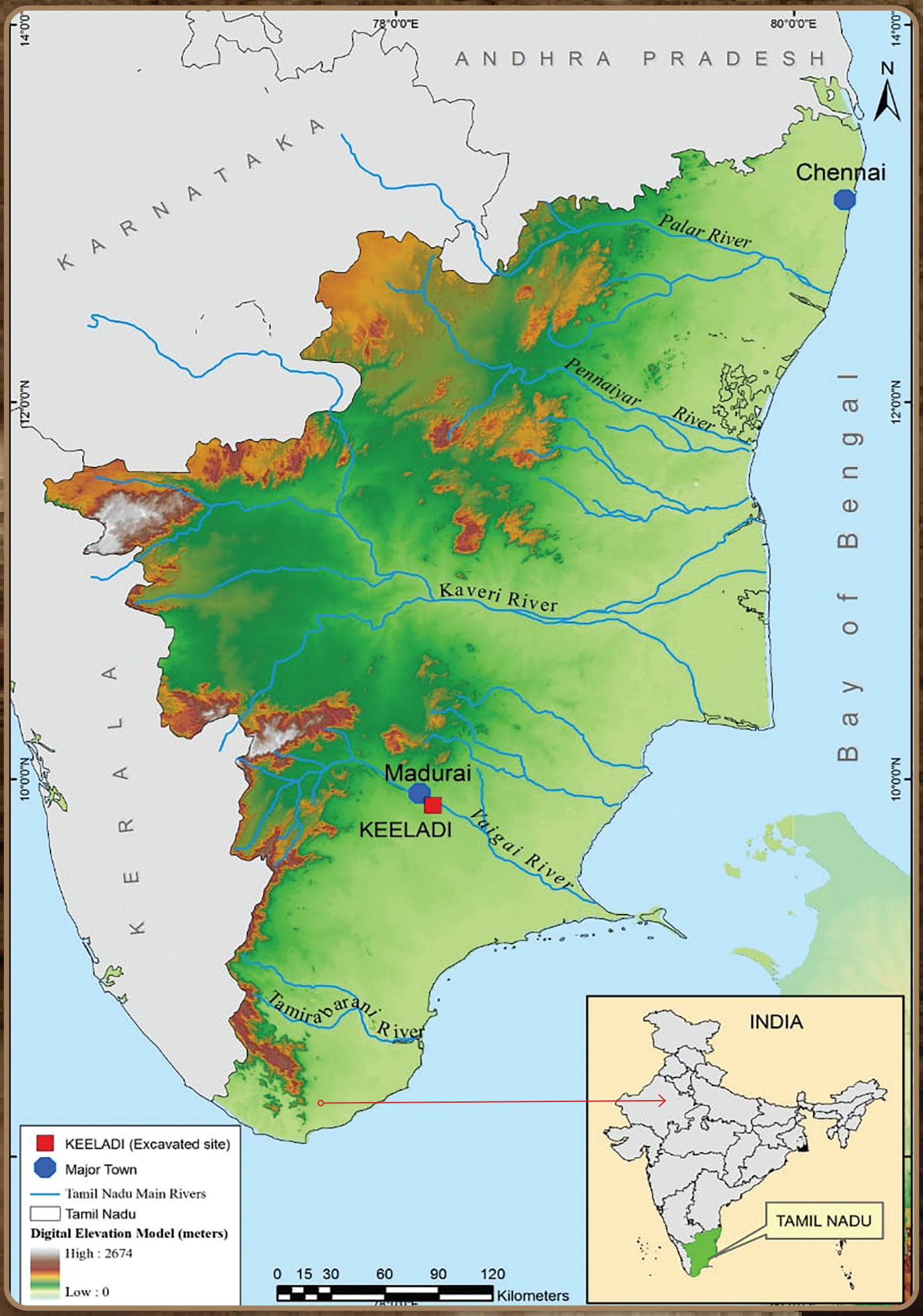
Previously in the years 2014-2015, 2015-2016 and 2016-2017 excavations were conducted for three seasons by the Excavation Branch of Archaeological Survey of India, Bengaluru. The fourth season was taken up by the Tamil Nadu State Department of Archaeology during the year 2017-2018. In continuation of exposing the hidden treasures and antique of this site, the State Department of Archaeology has been conducting large scale excavation at this site. The systematic archaeological excavation of the fifth season (2018-2019) has been completed.

Key Findings - Keeladi Excavation (2017-2018)

The fourth season of excavation has yielded 5820 antiquities with enough cultural traits in the form of structural activity (brick structures, terracotta ring wells, fallen roofing tiles with double holes and deeply finger pressed grooves to drain rain water).

Antiquities like few pieces of golden ornaments, copper objects, iron implements. terracotta gamesmen (chessman), hopscotches, ear ornaments, spindle whorls, figurines, beads of terracotta, glass and semi-precious stones (agate, carnelian, quartz, etc.)were unearthed. Popular ceramic types like finer variety of black-and-red ware, black ware, black polished ware, red ware, rouletted ware and few pieces of Arretine ware were also found.

There are also enough numbers of post-firing graffiti sherds. More than 50 Tamili (Tamil-Brahmi) sherds also have been unearthed. All these finds clearly indicate the cultural richness of the ancient civilization of the Tamils. Keeladi is having its close proximity to the historical and temple city Madurai. Hence, it becomes essential to continue to probe such cultural hidden treasures of Keeladi site in future and reveal the cultural wealth of the ancient Tamil society.



ON THE BANKS OF RIVER VAIGAI

Keeladi Excavation Site - Aerial View

A TURNING POINT IN THE CULTURAL HISTORIOGRAPHY OF SANGAM AGE

In order to reaffirm the antiquity of Tamils in the World arena, the Tamil Nadu State Archaeolog Department has placed the artefacts recovered from the Keeladi excavation for regressive scient analysis and for AMS (Accelerator Mass Spectrometry) dating. The results received from the repets laboratories are placed before the team of experts for their academic scrutiny. The comments suggestions of the experts are consolidated and the same is being placed before the public for the understanding and appreciation.

KEELADI
2600 YEARS OLD CULTURE

The six carbon samples collected by the Department of Archaeology, Government of Tamil Nadu, Trom the fourth season (2018) of excavator mechadi che sent to Beta Analytic Lab at Miami, Florida, USA for AMS dating and the reports have been received. The dates of all six samples fall between the 6 century BCE and 3" century BCE The sample collected at the depth of 365em goes back to 6 century BCE and another collected at the depth of 200cm goes back to early a century BCE. As there is a considerable deposit below the dated layer and also above the layers, the Keeladi cultural deposit could be safely dated between 6th century BCE and 1-2 century BCE.

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				NA	519481	KLD-2018/Sample No.6	2140 +/- 30 BP	(71.4%) 213 - 88 cal BC (2162 - 2037 cal BP) (19.4%) 353 - 296 cal BC (2302 - 2245 cal BP) (3.3%) 78 - 57 cal BC (2027 - 2006 cal BP) (1.4%) 229 - 220 cal BC (2178 - 2169 cal BP)	δ13C (‰)	-24.4	(Charred Material): Acid/Alkali/Acid	AMS-Standard delivery	Monday, February 25, 2019	Monday, March 11, 2019	
				NA	519480	KLD-2018/Sample No.5	2180 +/- 30 BP	(95.4%) 361 - 168 cal BC (2310 - 2117 cal BP)	δ13C (‰)	-25.7	(Charred Material): Acid/Alkali/Acid	AMS-Standard delivery	Monday, February 25, 2019	Monday, March 11, 2019	
				NA	519479	KLD-2018/Sample No.4	2190 +/- 30 BP	(95.4%) 361 - 177 cal BC (2310 - 2126 cal BP)	δ13C (‰)	-24.2	(Charred Material): Acid/Alkali/Acid	AMS-Standard delivery	Monday, February 25, 2019	Monday, March 11, 2019	
				NA	519478	KLD-2018/Sample No.3	1770 +/- 30 BP	(85.6%) 206 - 345 cal AD (1744 - 1605 cal BP) (9.8%) 138 - 200 cal AD (1812 - 1750 cal BP)	δ13C (‰)	-27.6	(Charred Material): Acid/Alkali/Acid	AMS-Standard delivery	Monday, February 25, 2019	Monday, March 11, 2019	
				NA	519477	KLD-2018/Sample No.2	2230 +/- 30 BP	(74.6%) 328 - 204 cal BC (2277 - 2153 cal BP) (20.8%) 384 - 339 cal BC (2333 - 2288 cal BP)	δ13C (‰)	-24.6	(Charred Material): Acid/Alkali/Acid	AMS-Standard delivery	Monday, February 25, 2019	Monday, March 11, 2019	
				NA	519476	KLD-2018/Sample No.1	2530 +/- 30 BP	(45.7%) 651 - 543 cal BC (2600 - 2492 cal BP) (35.8%) 797 - 731 cal BC (2746 - 2680 cal BP) (13.9%) 691 - 660 cal BC (2640 - 2609 cal BP)	δ13C (‰)	-23.8	(Charred Material): Acid/Alkali/Acid	AMS-Standard delivery	Monday, February 25, 2019	Monday, March 11, 2019	

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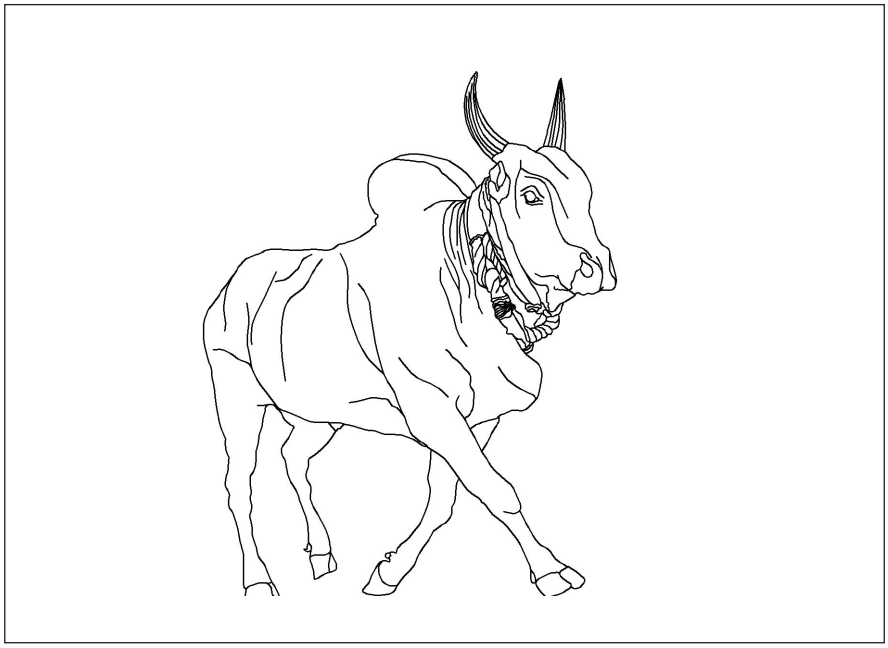
After analyzing the AMS dates obtained from Keeladi excavations, Prof K.Rajan, a noted archaeologist, felt that the recent excavations at Keeladi present strong evidence as well as clear answers to some of the hitherto held hypotheses. It is generally believed that the Early Historic phase of Tamil Nadu began with 3" century BCE and the second urbanization did not occur in Tamil Nadu. In contrast to this, the occurrence of large scale brick structures and associated artefacts of high economic value unearthed at Keeladi suggest that the second urbanization too happened in Tamil Nadu around 6 century BCE as happened in Gangetic plains.

Likewise, the date of st century BCE is considered as the date of Tamili (Tamil-Brahmi) based on radiometric dates recovered from Kodumanal, Alagankulam and Porunthal excavations. But, the recent scientific dates obtained for Keeladi findings pushback the date to another century i.e. 6 century BCE

The dates for the samples collected from Lower Palaeolithic phase of Attirampakkam, Tiruvallur District go back to 15 lakh years and Middle Palaeolithic phase to 5.85 lakh years ago. These dates are obtained through Cosmogenic-Nuclide burial dating methods. In the same way, the Microlithic tools belong to the following Microlithic/Mesolithic phase were encountered in Tirunelveli area and also in Vaigai and Gundar river valleys. The Neolithic culture was mostly discovered in northwestern part of Tamil Nadu, particularly in Dharmapuri, Krishnagiri, Tiruvannamalai and Vellore districts. The next cultural phase of Iron Age has been dated to second millennium BCE based on the samples recovered from the megalithic monuments of Mangadu and Thelunganur villages of Salem region. The carbon samples collected from Adichchanallur urn burials go back to 9" century BCE.

Thus, the recent excavations and the scientific dates clearly suggest that the people were living in Tamil Nadu continuously for the past 15 lakhs years and the Keeladi excavation clearly ascertained that they attained the literacy or learnt the art of writing (Tamil-Brahmi) as early as 6 century BCE during Early Historical period.

TRACE OF AGRARIAN SOCIETY AND CATTLE REARING



DECCAN COLLEGE
Pune

Bones of Bull with hump

The report on the faunal remains submitted by Deccan College, Post Graduate and Research T Institute, Pune provided broad picture on the subsistence pattern of the Early Histotimes. The total number of animal skeletal fragments is of 70 samples. The analysis is made under the category of large-sized animals and medium-sized animals due to the nature of specimens recovered from the excavation. Further, the limited nature of the samples restricted our understanding on the nature of species. However, the species such as Cow/Ox (Bos indicus), Buffalo (Bubalus bubalis), Sheep (Ovis aries), Goat (Capra hircus), Nilgai (Boselaphus tragocamelus), Blackbuck (Antilope cervicapra). Wild boar (Sus scrofa) and Peacock (Pavo cristatus) were identified.

If we put the ox, cow, buffalo and goat together, it occupies almost 55%, there by indicating that they were predominantly cattle raising people. The presence of antelope to the level of 6.66% and wild boar (1.35%) suggests that they were hardly domesticated. The availability of cut marks in some of the animals like antelope, goat and wild boar suggest that they consumed goat, boar and antelope.

Thus, the faunal remains recovered from the single season of excavation and the subsequent limited analysis suggests that the people mainly depended on agriculture and cattle rearing. The future analysis of botanical samples such as pollen and phytolith may reveal or substantiate the present findings. The excavation is in progress; therefore, there is a good chance of getting more number of samples

ANALYSIS OF THE STRUCTURAL REMAINS

The samples like bricks, lime-mortar, roof-tiles and the binding materials of the ring well collec analysis. The analysis revealed that every specimen contained elements like silica, lime, ferrous, alum and magnesium. The detailed report also furnishes of its constitution and nature. The bricks roof-tiles contained more than 80% silica mixed with 7% of lime while the lime plaster possessed of lime. In fact, the long survival of these materials with considerable strength and quality is due the quality of material deployed in the construction activities.

Exposed Brick Wall

Brick Walls

STRUCTURAL ENGINEERING

Two seasons of excavation conducted at Keeladi exposed limited structural activities. During the second season, a 13 m long wall with a courses of bricks was exposed. Bricks of two sizes measuring 36x23x6 cm and 38x26x6 cm respectively were used in the construction.

There is a negligible change in the breadth whereas the length and thickness were similar in size. As these bricks are similar in sizes to that of other excavated sites of the State with the ratio of 1:4:6, the technique of the construction could be realised. The well-laid floors, made of fine clay, associated with side brick wall were exposed in some portions of the excavated trench.

The side walls were not raised up to the level of roof. It seems, wooden poles were planted over which roof was erected. There are post-holes at regular interval to suggest that these were meant for planting wooden poles. Though we could not recover wooden poles due to its perishable nature, the occurrence of iron nails gives clues of fastening the poles and rafters. Few quadrants of the trenches met with roof tiles suggestive of the fall of the roof. The roof-tiles contained finger grove impressions meant to drain water and double holes at the top to be tied with rafters were recovered. Similar roof tiles were also recovered from Arikamedu, Poompuhar and other sites. Such structural activities express the high standards of living during the Sangam Age.

As the excavation is in progress, the future exposures of the structures and their subsequent analysis may reveal further technology involved in the structural engineering skill of the society.

GRAFFITI AND SYMBOLS

A mong the available scripts of India, the Indus script considered to be the earliest one and was 4500 years old. One kind of scripts that survived between the disappearance of Indus script and the emergence of Tamil-Brahmi script is called as graffiti marks by the scholars. These graffiti marks probably are the one evolved or transformed from Indus script and served as a precursor for the emergence of Brahmi script. Therefore, these graffiti marks cannot be set aside as mere scratches. Like Indus script, these graffiti marks also could not be deciphered till date.

These graffiti marks were found in Chalcolithic culture as well as in Megalithic culture, particularly on black-and-red wareThese graffiti marks were encountered both in Iron Age megalithic monuments and associated habitations.

Earlier excavations at Adichchanallur, Korkai, Alagankulam, Kodumanal, Karur, Teriruveli, Uraiyur Mangulam, Perur and all other excavated sites of Early Historic Period yielded such type of graffit inscribed potsherdsOutside India, these marks were recovered from the sites such as Tissamaharama KantarodaiManthai and Ridiyagama of Sri LankaOf the graffiti sherds collected from the sites of South India, more than 75% of the symbols are traced from Tamil Nadu alone.

The symbols and graffiti are very much suggestive of the symbolic and codified expressions and communication of the megalithic and Iron Age peopleIn this context, the recovery of 1,001 graffit sherds from Keeladi excavation recalls the preliminary writing expressions of the Iron Age people.

Graffiti and Symbols found in the black-and-red ware pot sherds

kuviraṉ-āta[ṉ]

ātaṉ

Tamiḻi [Tamil-Brahmi]

As far as Tamil Nadu is concerned, the large number inscribed potsherds available next to graffiti is of the Tamili (Tamil-Brahmi) inscribed potsherds. The scholars called the Tamili (Tamil-Brahmi) script as Tamili or ancient Tamil script. Majority of Early Historic sites excavated so far met with Tamili (Tamil-Brahmi) inscribed potsherds and a few of the sites yielded inscribed metal rings

In Tamil Nadu, nearly 110 cave inscriptions were documented from 32 sites and these inscriptions were deciphered and well documented in the book by Padma Sri Iravatham Mahadevan. At Keeladi. 56 *Tamiḻi* ((Tamil-Brahmi) inscribed potsherds were recovered from the excavation conducted by the Tamil Nadu State Department of Archaeology alone.

Some of the inscribed sherds carry the personal names such as kuviraṉ- ātaṉ and ātaṉ and few sherds with incomplete personal names carrying one or two letters. In these sherds, the name atan inscribed as ataṉ. In the early phase of *Tamiḻi* (Tamil-Brahmi) t, there is no diacritical mark to differentiate the long vowel from short vowel. This feature is well explained in the book written by Prof. K.Rajan Early Writing System-A Journey from Graffiti to Brahmi. This feature is observed in vowels. The availability of such features in Keeladi inscribed potsherds clearly suggests that the *Tamiḻi* (Tamil-Brahmi) t inscribed potsherds recovered from the site are older in date.

HIGH LITERACY LEVEL OF THE SANGAM AGVE

Tamil-Brahmi letters as part of inscriptions are found by means of pointed object engraved shoulder portions of the earthen vessels. In general, these letters were inscribed when the pot in leather condition or were inscribed /engraved after the pot became dry. The letters engraved leather condition could be made only by the potters at the time of making pots. In the case of Keela examples, they were all post-firing in nature and were engraved by the owners after purchasing t pots. The representation of various styles of writing also suggests this view. It clearly suggests the the high literacy level of the contemporary society that survived in 6th century BCE.

Tamil Brahmi Scripts engraved on Black-and-Red Ware and Red Ware pot sherds

HANDICRAFTS

Compressed Storage Vessel

Large Bowl of Black-and-Red Ware

In total, 17 pottery specimens were sent to the Earth Science Department of Pisa University, Italy through Vellore Institute of Technology for mineral analysis. The research analytical results received the content of constituent elements texture of the grains and their utility. The samples were analyzed and the results confirmed that water container and cooking vessels shaped out of locally available raw materials.

UNIVERSITÀ DI PISA

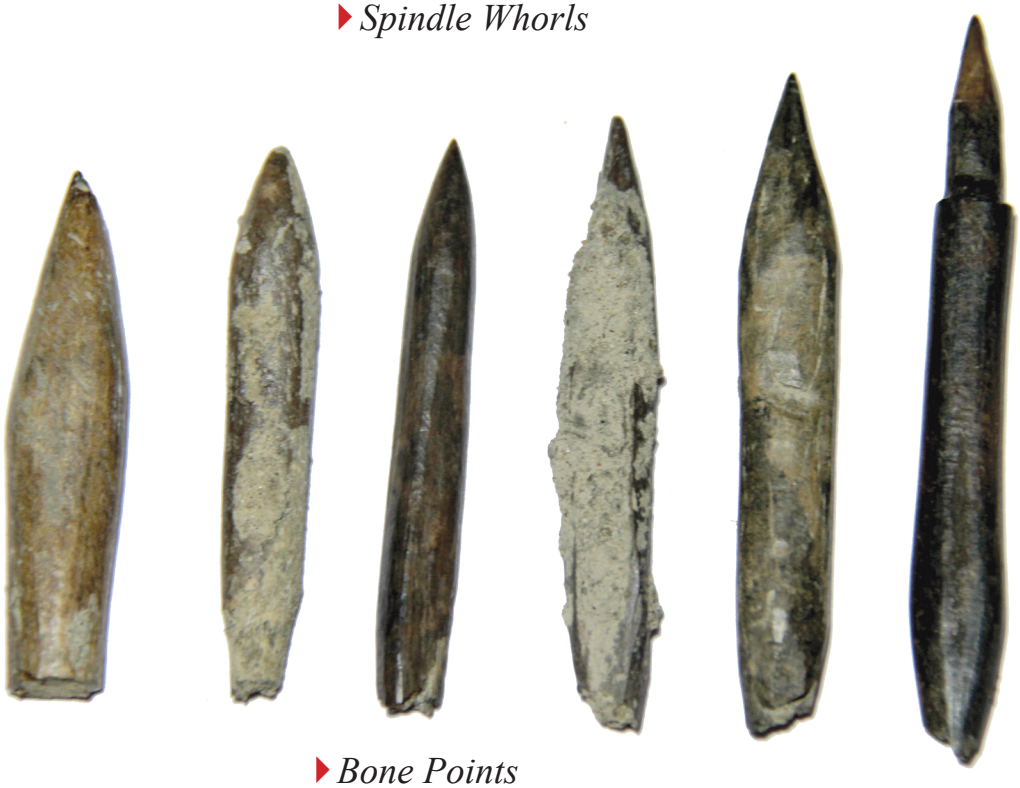
Interestingly, it is to be noted that two quadrants of adjacent trenches below the depth of 4m revealed heaps of potteries of many cart loads. The occurrence of such large quantity clearly suggests that there could have been a pottery making industry at this site.

The Spectroscopic analysis of the black- and-red ware sherds of Keeladi revealed that the reason for its black colour is due to the use of carbon material and for the existence of red colour is due to use and presence of hematiteThe potters of Keeladi were familiar with the technique and knew the art of raising the kiln temperature to 1100°c to produce the typical black-and-red ware pottery

The results of the samples sent to the Pisa University, Italy reveal that the earthen vessels produced by the Keeladi people of Sangam Age had followed the same technique and materials right from 6th century BCE to 2nd century BCEThe report also states that few pottery samples of 2nd century BCE do contain earth content similar to that of other region thereby suggesting that they exchanged the goods between the neighbouring regions probably through traders, craftsmen and visitors.

Deposits of Pot Sherds

Spindle Whorls



Bone Points

WEAVING INDUSTRY

Recovery of nearly 180 spindle whorls, 20 sharply pin-pointed bone tip tools used for . design creations, hanging stones of the yarn, terracotta spheres, copper needle and earthen vessels to hold liquid clearly attest the various stages of weaving industry from spinning, yarning, looming and weaving, later for dyeingThe archaeological findings of the Excavation win g of Archaeological Survey of India at this site also confirmed existence of the dyeing industrySo, the occurrence of recent antiquities also attests the existence of weaving industry.

LIFE STYLE OF ANCIENT PEOPLE

To understand the life style of the Sangam Age society, an approach of reconstructing the history To of the land based on the primary sources like epigraphy, numismatics, foreigners' accounts, literary works and artefacts become very important.

Pestle and Mortar

Ivory Comb

Long narrow necked globular water pot

Variety of beads

The antiquities of Keeladi excavation really reflect the facts of the ancient life style of the society In fact,agriculture seems to be its prime occupation being supplemented by iron industry, carpentry pottery making and weaving.

Pendant

Pendant

Bead

Bead

Ring

Needle

Plate

Glass Beads

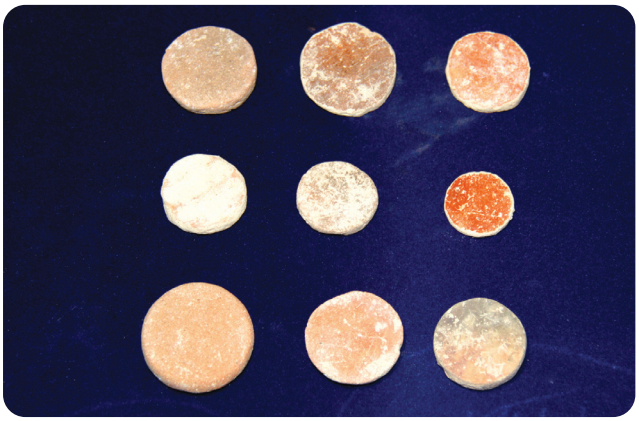
PRECIOUS ORNAMENTS

The occurrence of seven gold ornaments, copper articles, beads of gems, more than 4000 beads of semi-precious stones, glass beads, shell bangle pieces, ivory comb, ivory bangle piecescomb and terracotta objects particularly of the women folk indicate the cultural richness and economic prosperity.

GAMESMEN AND PASTIMES

The occurrence of artefacts such as dice, hopscotches and gamesmen, really reflects the pastime The activities of the ancient peopleMajority of the gamesmen recovered from excavations are of terracotta. In this contextKeeladi yielded 601 hopscotches. Even now the same game is prevalent in Madurai and other regions known as *Pāṇḍi* or *Noṇdiviḷayāttu*. . Dice was also recovered from the site. The occurrence of single and double holed terracotta discs represents that either they were used as wheel of the toy cart or twist disc game piecesApart from these, 80 gamesmen of similar shape but in different sizes were also collected from the excavation. So, the existence of these game objects posterize the games and pastime activities of the children, men and women of the ancient society.

Dice (six sides)



Hopscotches

Gamesmen

Agate and Carnelian Beads

Rouletted ware (Indigenous)

COMMERCE

The lengthy coastal stretch of the state really becomes the causative and favourable factors for trans-oceanic contacts of the Tamils with other parts of the world. Moreover the favour atmosphere of anchoring the laden ships near the coastal towns also become supportive rease of busy trade activities of the coastal towns. During the Age of Sangam, the estuaries of the river corse become popular as port towns to carry out trade with other minor ports of the Tamil country the confluence of Palar, Kaviri, Vaigai and Tamiraparani rivers of the East coast emerged with great port cities such as VasavasamudramPoompuhar, Alagankulam and Korkai respectively Similarly on the western coast at the estuary of river Periyar existed the Muziri Pattanam. Due to existence of port towns on the eastern and western coasts of the erstwhile Tamil country might have promoted the commercial activities of the ancient Tamils with the Occident and Oriental world particularly wit South-East Asian countries, Sri Lanka, EgyptRome, Greece and China. The commodities like pear steel, gemstone, textile, pepper and perfumes were exported to other countries from Tamil Nad Similarly, gold, wines and horses were imported from the West.

Keeladi excavation yielded beads of agate and carnelian which raw materials could have been brough from places of north-west India viz Maharashtra and Gujarat

Generally, rouletted wares are considered as Roman make. But recent researches clearly sugges that they are Indian ware. Indigenously made rouletted ware using locally available clay with imitated rouletting pattern in large numbers. The excavations at Alagankulam yielded consider quantity of Roman rouletted sherds. The finds from Keeladi are indigenously made variety of the same. The occurrence of Arretine, a unique Roman ware at Keeladi also adds information of the visits of Rom traders stationed at Alagankulam around 2 century BCE.

TERRACOTTA FIGURINES

Terracotta is the pioneering art specimens of mankindThis art made up of clay and burnt clay Temerged first than that of stonewood, ivory and metalThis craft doesn't require much of technology of specialized tools for shaping the contours. Just the fingers are enough for its creation. Pre-historic man shaped the stone tools with his handsLater, to stamp his feelings in the form of rock-art used the sameThereafter, they attempted the art of image making just with the fingers. In due course, they learnt the technique of kilning the clay images to the required temperature through experiencesIn this regard, considerable numbers of terracotta images were recovered from various excavated sites of Tamil NaduThey generally represent various forms of human and animal beings, besides gamesmen and toy objects.

Terracotta Figurines and mould

Of the terracotta objects recovered from Keeladi excavation, 13 are of human images, 3 of animalsmore than 600 represent gamesmen and 28 are of ear ornamentsOther than terracotta objects, the site also yielded jewellery pieces of gold and copper. Objects of iron were also recoveredBut it is to be noted that this site didn't yield any objects meant for worship so far.

SUMMARY

Pottery Yard

The artefacts recovered from the Keeladi excavation forced us to re-examine or The re-assess the hitherto held views or hypotheses.

Generally, the Age of Sangam is considered between 3rd century BCE and 3rd century CE. But, the available AMS dates obtained for the Keeladi carbon samples push the date of Tamili (Tamil-Brahmi) to 6th century BCE. These scientific dates forced us to re-assess the widely held view on the date of Sangam AgeThe AMS dates obtained from Kodumanal and Porunthal pushed the date of

Tamili (Tamil-Brahmi) to 5th century BCE. But, the Keeladi AMS dates further pushed the date to a century earlier i.e., 6th century BCEThis is one of the important findings of the Keeladi excavation. As the high literacy level is well achieved in 6 century BCE, naturally the beginning of historic period in Tamil Nadu goes back to 6 century BCE. The available evidences clearly suggest that the Early Historic period of Tamil Nadu begins in 6th century BCE and the Iron Age begins in 2nd millennium BCEOne should recall the recent AMS dates of second millennium BCE obtained for the samples collected from Iron Age megalithic graves of Mangadu and Thelunganur in Salem region.

It is generally believed that second urbanization observed in Gangetic valley did not occur in Tamil Nadu. But, the Keeladi excavations clearly suggest that the second barbanization too happened in Tamil Nadu in 6th century BCE.

The hunter gatherers of Prehistoric Palaeolithic Age started settling on the banks of the rivers during Neolithic phase and started their agrarian activities. At the time of Sangam Age, they raised surplus of the crops with their prime traditional occupation of agriculture and cattle rearing and thereby collected and stored the excess producersAccordingly, the settlement extended on the banks of the riversThe early historic site Keeladi located on the southern bank of river Vaigai revealed the existence of an agrarian society totally based on agriculture and cattle rearing with supportive secondary occupation based industries. The exposed brick structural remains of the site confirms of its strength and longevity of the building as a standing example of Sangam Age structural activityMoreover they also had pottery as well as weaving industries to cater to the day-to-day requirements of the contemporary societyOccurrence of ring wells near the industrial spot also confirm such activity.

Few names of Sangam Age poets are referred in some of the works mostly with place names prefixes. Common folk of Keeladi and other sites had engraved their individual names on the surfaces of the earthen vessels of possessioned utilitySo not only the poets of the Sangam epoch but also of the common people are also literate enough.

Relying on the analytical reports of the ancient carbon samples, the early date of Keeladi site goes as early as 6th century BCE.

People of this place lived during the Sangam period adorned themselves with jewels and ornaments made of gold, copper, ivory, quartz, carnelian, agate and glass. In turn, attest the richness of the society. The occurrence of gamesmen dice, chessman, hopscotches really projects their games and pastimes of a better society. The trade and transoceanic contacts of Keeladi people with other places of India and foreign countries like Rome could be summarized through the existence of foreign ceramic types, semiprecious stone beads etcBased on the scientific research, the settlements on the bank of river Vaigai were agrarian based prosperous society lived contentedly of their standards. They had erected brick structural houses, industries and engaged in trade and commerce with traders of other countries clearly confirms of their urban standard of living. Hence, these finds and features of the site are considered to be a turning point in the annals of the historiography of Sangam Age culture.

ANNEXURE

INTRODUCTION

LOCATION

The site Keeladi with the cultural deposit extending over a vast area of more than 110 acres, amidst the palm grooves, is located geographically by road, it is 13 km east and south east of Madurai, a Temple city of Tamil Nadu. On the northern side of this potential mound runs the river Vaigai at a distance of 2km. On the east exists the village Manalur having its kanmaai (tank) on its northern side and there by forming the north eastern natural water source of the site. Similarly, the village Agaram is located on the south eastern side of Keeladi archaeological mound. The western side of the site is engulfed by Kondagai and its kanmaai. All these naturals location of adjoining places around this cultural mound provides a natural epithet for the settlement contemporary to the early historic phase of Tamil history.

Previously excavation was conducted by the Excavation Branch (Bangalore), Archaeological Survey of India at the site in the years 2014-2015, 2015-2016, and 2016-17. In continuation of exposing the hidden treasures and antique of this site, the State Department of Archaeology has been conducting excavation at this site during 2017-2018 after getting approval from the CABA. and the sequel excavation still in progress.

The archaeological team of the Department comprising of the Director, Archaeological officers, Curators, Epigraphists, Technical Assistants, Draughtsman, etc., started the work initially of laying the trenches.

During the season totally 15 trenches were laid out, of which 8 in locality 1 and 7 in locality 2. Each trench is divided in to 4 quadrants in order to carry out the excavation work either vertically, horizontally or diagonally in accordance with the orientation of any structural features. There is a balk of 1 meter width left between the trenches; While ½ a meter balk runs across the trenches both vertically and horizontally so as to divide the trench into 4 equal quadrants.

The trenches of locality 1 were fixed on the east of X axis and numbered as A1,A2,A3,A4,A5,A6, A7 and XA7. While trenches marked at the east of Y axis and were numbered as B1,ZB5, YP6, YP7, YP8, YP9, YP10. There is also a trench on X axis at the extreme south west of the locality and it was numbered as XA7.

The excavation was initiated by the Director of Excavation Dr. R. Sivanantham of the Department, with a team of Archaeologists, trainee supervisors already trained in the field as scholars, to supervise the trenches for day to day recording of the excavation work. Precisely, the site observation of the antiquities, ceramic tiles, in-situ observation of the color, content and texture of the unearthed deposit meant for examination were meticulously carried out.

In the course of digging, some trenches revealed structural activities and a few with disturbances of dumps and pits. While the other trenches revealed the cultural deposit with clear cut stratigraphy and it becomes more appropriate to deal with the progress of excavation of the respective quadrants. So, following is the summation of the systematic observations noticed and recorded at the respective quadrant.

TRENCH NO : A1
NORTH EAST QUADRANT– 2

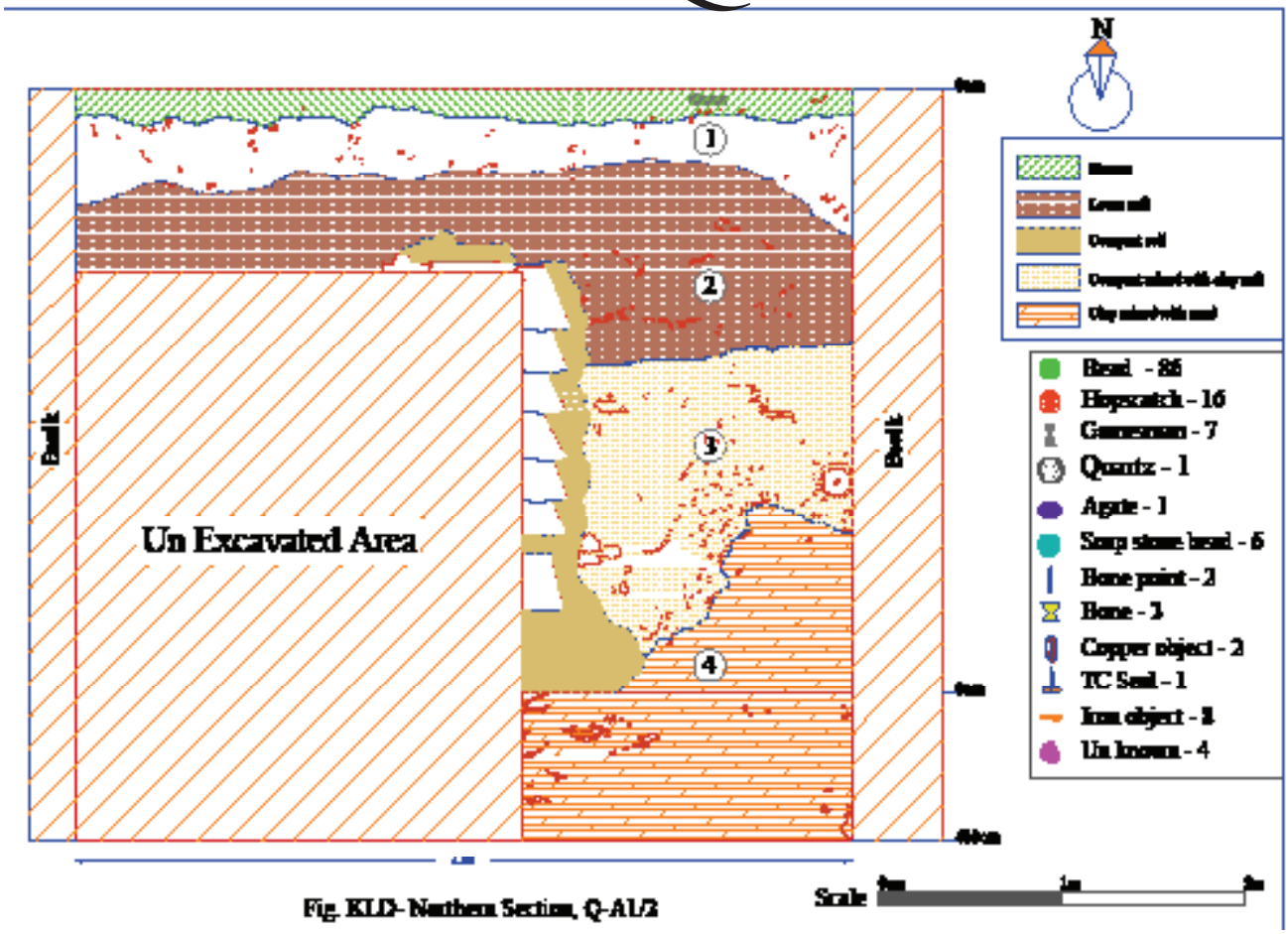


Fig. KLD- Northern Section, Q-A1/2

The section of the trenches revealed 4 layers with humus on the top and the natural soil at the bottom. The stratification of the deposit runs uniformly throughout the trenches from humus to layer 4 just above the natural soil and visibly recognized by color, content and texture distinct from each other. Humus comprised of fibrous materials mixed with sandy clay deposit to the maximum thickness of 14cm.

While layer -1 was highly compact due to clay content. The thickness of this layer ranges from 30cm to 66cm. Few large sized brickbats were found embedded on the southwestern section, while smaller brickbats and potsherds were noticed on the other sections.

Layer-2 also runs all around the trench and the content is loose with ashy powdery clay deposit. In fact the ring well emerged out of this level in 8 courses, probably cut out of lower level of layer-1 and upper level of layer-2 and the same continued till layer-4. It was traced at the middle of the trench adjacent to northern section. This layer contains more potsherds than the upper layer. The diameter and height of ring well measured 93 cm, 30 cm respectively and a thickness of 4 cm at the bottom.

The minimum thickness of this layer of 60cm was traced at northeastern quadrant, while the maximum thickness of the layer noticed on the eastern section near the southeastern corner of the quadrant. The ring well extended to a height of 2.02 m. The rings were placed one over the other and were found intact. The same gives an indication on the existence of the high water table during the contemporary period. Adjacent the ring well, the clear cut mark of the working pit on the southern as well as on the northern sections was observed. In situ the terracotta rings of the well were found placed to the required level of surface and the gap all around was probably filled with loose earth resemble to a dump like packing due to an admixture of all the materials found from the upper to the lower level of the well.

Layer -3 runs all around the trench with the thickness ranging from 92cm on the eastern section and reaches a maximum thickness of 1.66m on the northern side adjacent to the ring well. The deposit was semi compact in nature with yellow tinge of clay content, brickbats found embedded here and there besides potsherds. On the eastern section near the northeastern corner of the quadrant a well perforated (bigger holed) broken vessel was also found embedded. The perforated vessel with large pores was uniformly made at equal distance. Each hole measured a diameter of 2cm and the space between them vertically and horizontally measured 3cm. The vessel is with a tapering bottom.

It could be surmised that it could have been a jar to hold a lamp with the mouth placed upside down and making the defused radiating light of the lamp to glow in all the directions through the holes. This is like modern dim light lamps. In some cases such perforated vessels could have also been used for the purpose of fermentation, wherein the inner side of the perforation area will contain natural strains of the fruits, commodities used for the extraction of liquor which could to be scientifically tested and proved.

There were also indications of such perforated vessel used for filtration of drainage water and to maintain the natural water table without causing much pollution through filtration process done in 3 or 4 stages with similar number of jars kept one over the other containing river sand, coarser sand and smaller pebbles. It is an early concept of water filtration and purification method. So to say, recent method of rain water harvesting done at the concrete building of the metro city recalls the glory of ancient filtration method of the flash water.

Layer – 4 consists of a compact yellowish brown deposit of compact clay slightly mixed with sand. Its minimum thickness of 36cm was traced at the middle of the western section. While the maximum thickness of 88cm was noticed on the southern section. It was so clean all around with few brickbats and potsherds found at the lower side of this layer. The western section revealed a post hole vertically having a length of 40cm and the thickness varying from 8 to 14 cm from bottom to top containing comparatively loose material (sand) and the same gives an indication of a roofing existed above being supported by wooden poles and planks.

Just below this layer, is the dump material of blackish deposit with enough potteries comparatively larger in quantity and its thickness varies from 36 cm on the east and south of the southeast corner and 94 cm at the middle of the western section. More over the deposit of the layer contained more charred bone materials, and the same indicates dumping of the residual, and throw away materials of the kitchen.

TRENCH NO : A1/1

The stratigraphy of the trench from humus to top level of the layer-3 runs all around without much disturbance. Here too, the humus with clay fiber content of thickness ranging from 3cm to 13cm on the western section exists. It contained mostly of the modern glass bangle pieces and contemporary residual materials.

Layer – 1 with the minimum thickness of 20cm on the western section and maximum thickness of 58cm noticed on the eastern section. It consists of compact clay deposit with few brickbats and sherds interspersed here and there on the section. But for them, the entire section runs so neatly except the middle portion of the western section wherein the roots of neem tree standing adjacent to it to be so loose. This is followed by layer -2 underneath with some portions not dug out due to the required sloping level of this layer at the east of the revealed stratigraphy mostly of north and south western section. The thickness of the layer varies from the minimum thickness of 66cm on the western section near the northwestern corner and the maximum at the center of the western section measured 92cm. This was semi compact deposit found at the eastern quadrant of the trench similar to the color and content also exists, except a pit like area found cut and dumped found at the northern section near the northeastern corner consisting of more loose deposit with enough potteries of bigger size, brickbats and stone rubbles.

On the southwestern center point of the quadrant existed a terracotta oven with pinch design impressed all around externally. There is a hole at the center of the rear thickness. One of the unbroken

facing edge side contains widen and elevated facade like projection. The hole is meant to leave enough ventilation along with the gaps between the raised projection knobs of the facade and rear.

The southeastern corner of the trench revealed a separate course of fine clay deposit stretching to a length of 1.18m on the eastern section and 86cm on the southern section could probably due to dumping of such material utilized for pot making. Similarly the same deposit was also traced on the northeastern quadrant of the trench to a length of 3.5m of the western section from south to north and extending towards east on the southern section to a length of 1.18m. The spread of this fine clay found over layer-2 of the trench gives an indication of the raw material stored and used for making potteries. In this context large quantity of pottery collections noticed at the southwestern quadrant - 4 of the trench very well confirms of such ceramic activity.

The terracotta oven found contemporary to a layer of the deposit with the lower deposit with many carbonious and charcoal materials revealed the deposit to be of much blackish brown in color gives an indication of the kitchen area and hence the adjoining deposit got the stained color of either black or blackish yellowish brown with loose earth. Two rubbing stones were also recovered from this level probably used for floor polishing or ramming the surface.

The oven measured 20cm on the extending arm side while the rear side length is 30 cm. The height of the wall portion is 12cm at the non-knob area and 16cm at the knob area. The thickness of the wall section is 2cm. The façade is of wide, raised and volute at the top, while the rear central projecting knob is almost semicircular in shape. The space between these three knobs gives enough space for ventilation for the flames to uniformly spread heat of the vessel during firing.

TRENCH NO : A3/2

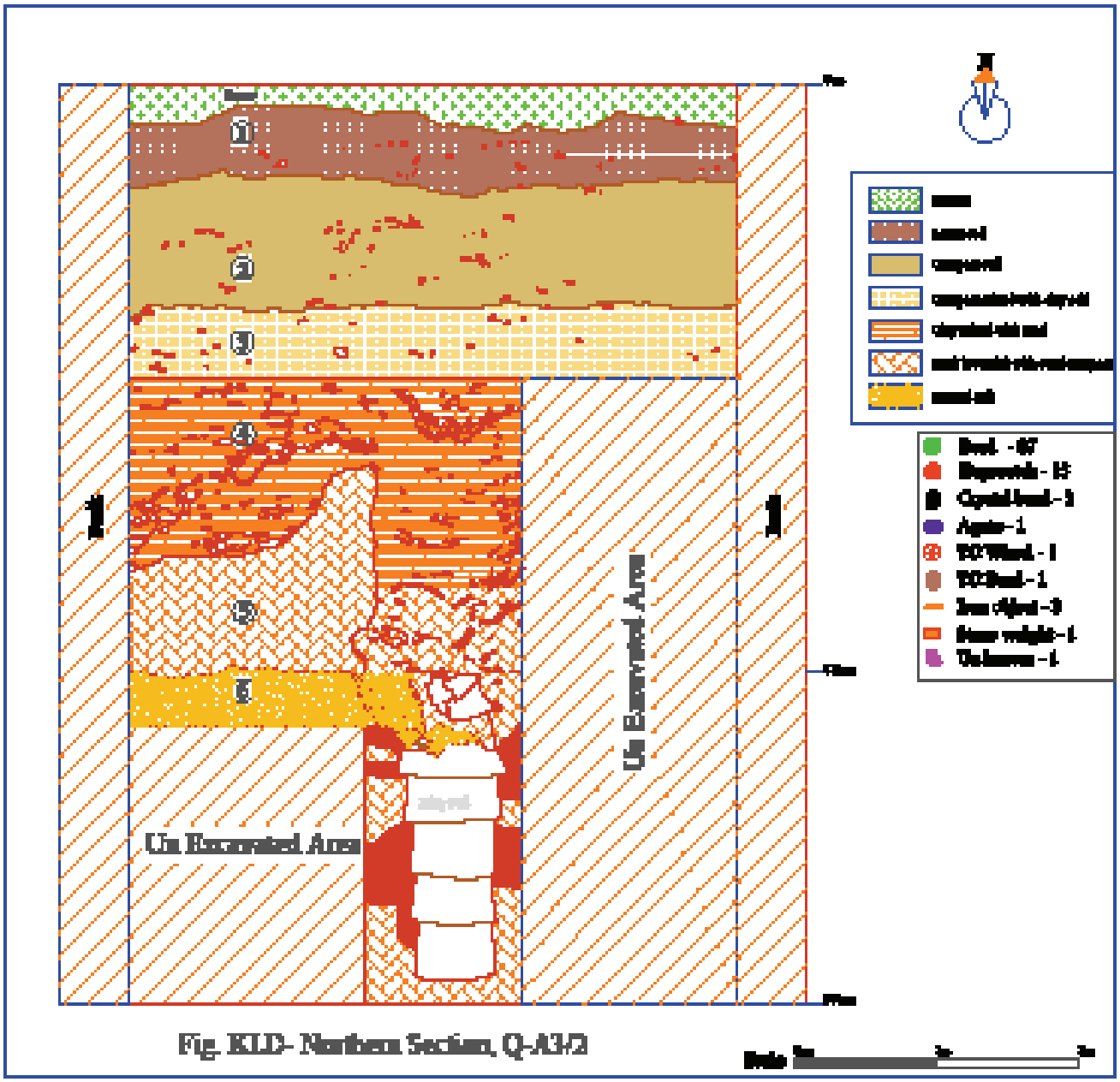


Fig. KLD- Northern Section, Q-A3/2

The dig of the trench at a depth of 4.08 m corresponding to the level of layers 4 & 5 revealed few larger portions of terracotta rings of the well as continuation of over toped dump material. Further digging at the same level of the trench started exposing the lower terracotta rings of the well. As such the excavation was carried out in order to trace its lower most level of erection. In total 5 terracotta rings of the well noticed besides few large pieces of the crumbled portions of the upper rings. Each ring approximately measured 62cm in diameter and slanting height measured 32 to 38cm with a thickness of 2 to 3cm from its lower point to the top and the total height of the ring well measured 2.20 m. It is quite interesting to observe that they have been perfectly erected within the sandy deposit seems to be the natural soil of the area and more over the river sand considered as a good sign of water table having its close proximity to river Vaigai flowing on the north of this cultural mound.

In fact, the top portion was completely filled and packed with cart load of ceramic tiles and to everyone's surprise an almost full shape like black-and-red ware vessel was found embedded.

The clear cut marks vertically on the western end was suggestive of the dig at a later period and dumped with such huge amount of discarded potsherds. Rest of that level running correspondingly

on the northwest, south and east was of high compact yellowish gritty clay sterile deposit with few sherds and brickbats. The large pieces found over the lower rings in full shapes indicate the crumbled nature of the upper rings of the well probably crushed due to heavy loading and dumping of the unwanted materials thrown in to the well due to its non-utility.

The trenches laid in locality-2 namely YP10, YP9, YP8 and YP7 also runs in north south orientation and each of them divided in to 4 quadrants, so as to facilitate the excavation work and trace the orientation of any structural remains. In this context every trench was opened for archaeological examination and they unearth the vestiges with proper recording and documentation at various stage. Following is the narration of excavation work, trench wise with detailed description of stratigraphy and deposit. The stratigraphy of the deposit of this quadrant A2/4 also revealed the same kind of deposit as noticed in other trenches. But with slight variation at some portion of layer 1 from the surface the stratigraphy comprised of humus, layers 1 to 6 found accumulated one over the other to a depth of 3.75m. The top most deposit namely the humus runs all around the trench with a minimum thickness of 12cm at a meter away north of eastern section and maximum of 32cm observed at the south eastern corner of the quadrant. This contains much of fibrous material and at some point's modern material like glass bangle pieces noticed.

Layer-1 succeeds immediately the humus at a lower level with a minimum thickness of 21cm on the western section and the north western corner of the quadrant of the same section. It is compact in nature with reddish yellow brown color containing few potsherds and tiny pieces of brickbats found noticed all around. In continuation of this layer exists layer-2 with the thickness ranging from 8cm to 1.65m. This stratum is of loose nature, comparatively ashy in color with powdery deposit contain more quantity of potsherds and few brickbats.

Layer-3 also running uniformly throughout with a minimum thickness of 4cm noticed at the middle of the western section and the maximum deposit of 1m recognized as the continuation of this stratum on the eastern section near the north eastern corner of the quadrant.

Layer-4 was somewhat complex of the existence due to semi compact deposit found in between the center of the layer stretching from major portion of northern, eastern, southern and some portion of western sections. In fact it contains more of loose earth with much ashy and carbonious material found mixed with enough quantity of potsherds and brickbats. And immediately succeeding this deposit of the layer continued the highly compact clay sterile deposit reached at a depth of 4.30m from humus. The natural soil emerged at this depth continues further below with river sand.

This trench also revealed 5 layers below the humus deposit running all around with much disturbance at the lower level particularly on the western, northern and eastern sections as noticed in other trenches with the same kind of content and texture. Its minimum thickness of 14cm was observed on the southern section at the southeastern corner while the maximum thickness of 32cm traced near the northwestern corner of the southern section. Immediately layer-1 succeeded with compact reddish brown clay deposit with its minimum thickness of 38cm at north eastern corner of the quadrant and the maximum thickness of 68cm noticed on the western section near the southwestern corner of the quadrant. Few brickbats and a thin course of loose sandy clay at the top of the layer running on the southern end portion of western section said to be of varied content of this compact layer.

Layer-2 runs immediately just below all around with loose ashy powdery deposit containing sherds and tiny pieces of brickbats. Its minimum thickness of 56cm was observed on the southern section near the southwest corner and the maximum thickness of 92cm noticed at the middle of northern section. At some point the content seems to be powdery due to tiny shreds of pottery.

Layer-3 revealed its minimum thickness of 13cm on the western section near the southwestern corner of the quadrant while the middle of the southern section exposed the maximum thickness of 75cm.The color of the soil with yellowish brown mixed was with enough of potsherds and few brickbats, roof tiles, amidst few bones noticed here and there. In fact the lower portion of this layer particularly on the west, north, and eastern sections constitute the heavy dumped material related to the filling material of the discarded well located at a depth of 1.74mts found accumulated over the collapsed ring well with 5 lower terracotta rings of the well found intact.

The next layer named as Layer-5 was typically a sterile deposit highly compact of yellowish brown clay content. Its maximum thickness noticed measured 1.55meters. The minimum thickness of this sterile deposit was 66cm at southwestern corner of the quadrant. Partly broken globular spouted vessel placed with its mouth at the lower level was traced near southeastern corner of the quadrant pertained to Layer-2. Another small vessel namely a shallow bowl with highly good neck and out turned rim of red slipped ware almost in full shape was found embedded at the lower level depth of 5 courses of terracotta rings.

TRENCH NO : YP7/ 2

Systematically the work at YP7 /2 was continued at the north eastern quadrant. During the dig a small pellet like copper coin with much encrustation was recovered at 35cm depth. More over few broken portions of a copper bowl (miniature) with curvilinear surface recovered. Examination of the same is properly conducted. Much antique remains of the deposit could be adjudged by means of extending dig at this quarter. The trace of the orientation of the brick structure was noticed at north of this quadrant. In this context further digging is advocated to pertinently search. The deposit was meticulously examined for recovery of significant antiquities along with associated ceramic types contemporary to stratified deposit.

This quadrant was not disturbed except the penetration of roots of the bushy thorny plants. During the course of the dig, partly broken pieces of hop-scotches were recovered. One piece with finely ground of the edges and inner of the side smoothened found while the other side was perfectly flat.

The Excavation at both the trenches reached a depth of 1.30m and which was the stage of two courses of brick structure noticed at the trench YP7/2. The quadrant YP8/3 did not reveal the continuation of thve brick structure running south west to north east of the other trenches found entering the balk portion between them

The quadrant YP8/3 just reached the level exhibiting large brick bats found embedded on the southern section of the trench. So, with an intention of tracing the alignment of the brick structure found at the quadrant YP7/2, a 1 m balk between the trenches was attempted of its removal by the slow steady and systematic process of digging. During the process of the excavation at balk, same color, content and texture of the respective stratified deposit observed.

Further digging at the lower level till the top of the brick structure was carried out. Whence, the continuation of the brick course at a higher level was identified and as a result careful exposition was under taken. In this context a systematic slow scraping was carried out, so as to identify the lower courses of bricks and accordingly the earlier course already traced continued underneath and the same continued till the middle of the eastern section. As surmised earlier, the brick structure continued its orientation diagonally towards the north east from the middle of the trench with same kind and size of bricks were utilized for its construction. The western side of the balk from the middle portion was also excavated in order to find the other end of the brick wall. Almost all this bricks of same size were found in few pieces of the other quadrant.

It is quite interesting to observe the offset projection of the bricks of the structure uniformly continued. Such a type of offset projection is mainly to with stand the over load. There is also a post hole noticed on the northern side completely with loose sandy deposit. Similarly there is another posthole on the southern side of the wall jutting into the eastern section. So the existence of post holes gives clear-cut provision of roofing supported by poles over and along the brick walls. Adjacent to the same level of the brick structure on the northern side was noticed a thick layer made of mud flooring of well levigated clay. Similar flooring was also noticed in YP8/4 quadrant at the same level. The existence of such well levigated compact flooring indicates the platform of the living quarter probably well within the four walls of the structure so that it could be protected from the wrath of rain and sun light.

TRENCH NO : YP7/2 AND YP8/3

The excavation at both the trenches reached a depth of 1.80m which marked the stage of two courses of brick structure noticed at the quadrant YP7/3. As the quadrant YP8/3 did not reveal the continuation of the brick structure running south west to north east of the other trench found by removing the balk portion in between the trenches.

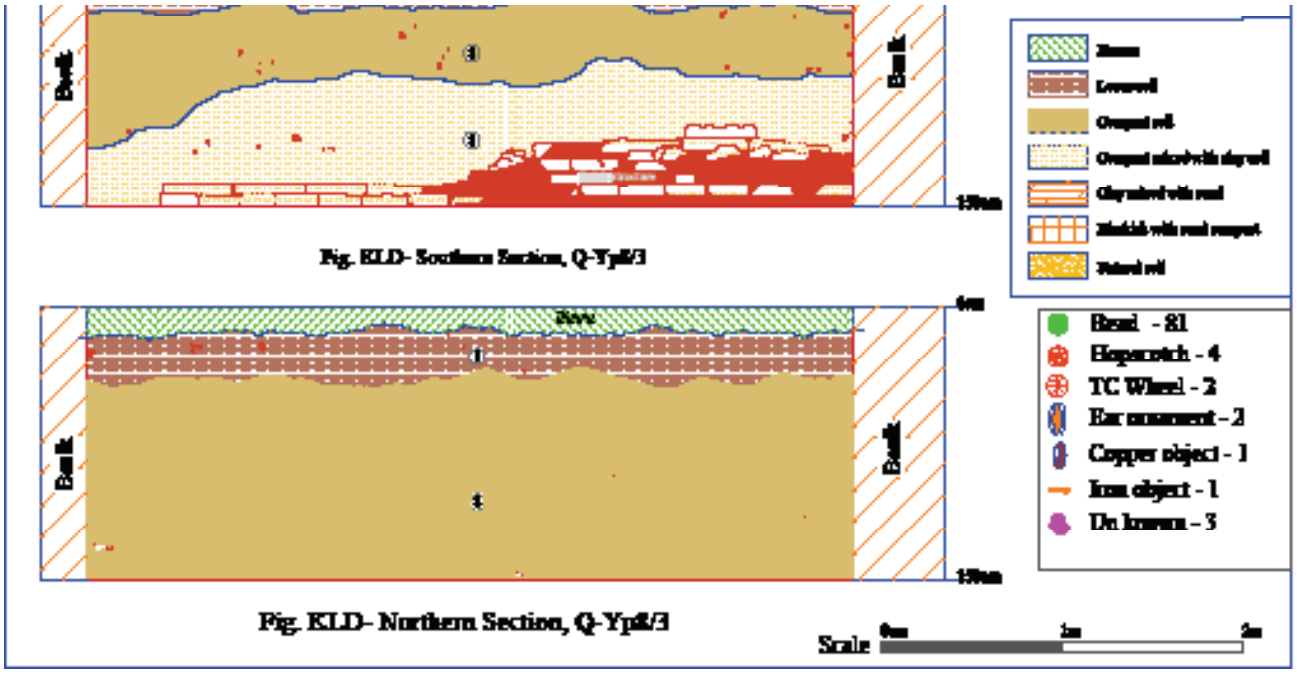


Fig. KLD- Southern Section, Q-Yp8/3

Fig. KLD- Northern Section, Q-Yp8/3

TRENCH NO : YP 7/4

The fourth quadrant of the trench YP7/4 has yielded an undisturbed cultural deposit of 3.60 m comprising the layers 1 to 4. The colour, context and texture of the all the strata are quite clear and distinctive in nature that run throughout the trench without any disturbance.

Humus

The top most deposit consisting of decayed organic remains mixed up with late materials exists in all the sections run uniformly throughout the trench. It is ashy, powdery in nature with pale grey colour and of loose texture with stray pieces of tiny sherds. Glass and paste beads of red, yellow, blue, green colours were recovered along with few pieces of hop-scotches. The minimum thickness of 10 cm was observed at the north-eastern corner of the northern section. While the maximum thickness of 24 cm was noticed at the south–eastern corner of the southern section, and also near the south-western corner of the western section.

Layer – 1

This strata emerged just below the humus also runs uniformly with semi-compact deposit of clay mixed with earth in dark brown colour with few potsherds and brick bats. The minimum thickness of this layer of 13 cm was traced at the south-eastern corner of the western section. The maximum thickness of 55 cm was noticed near the north-western corner of the northern section.

Layer – 2

It is comparatively harder than the earlier layer due tomore clay content. As a result, it appears pale yellowish brown in colour with traces of potsherds and brick bats noticed at some portions of the layer.

The minimum and maximum thickness of this strata were 68cm and 143 cm identified near the south-eastern corner of the eastern section and between the south-western corner and the middle of the western section respectively. This layer also runs in all the sections of the quadrant.

Layer – 3

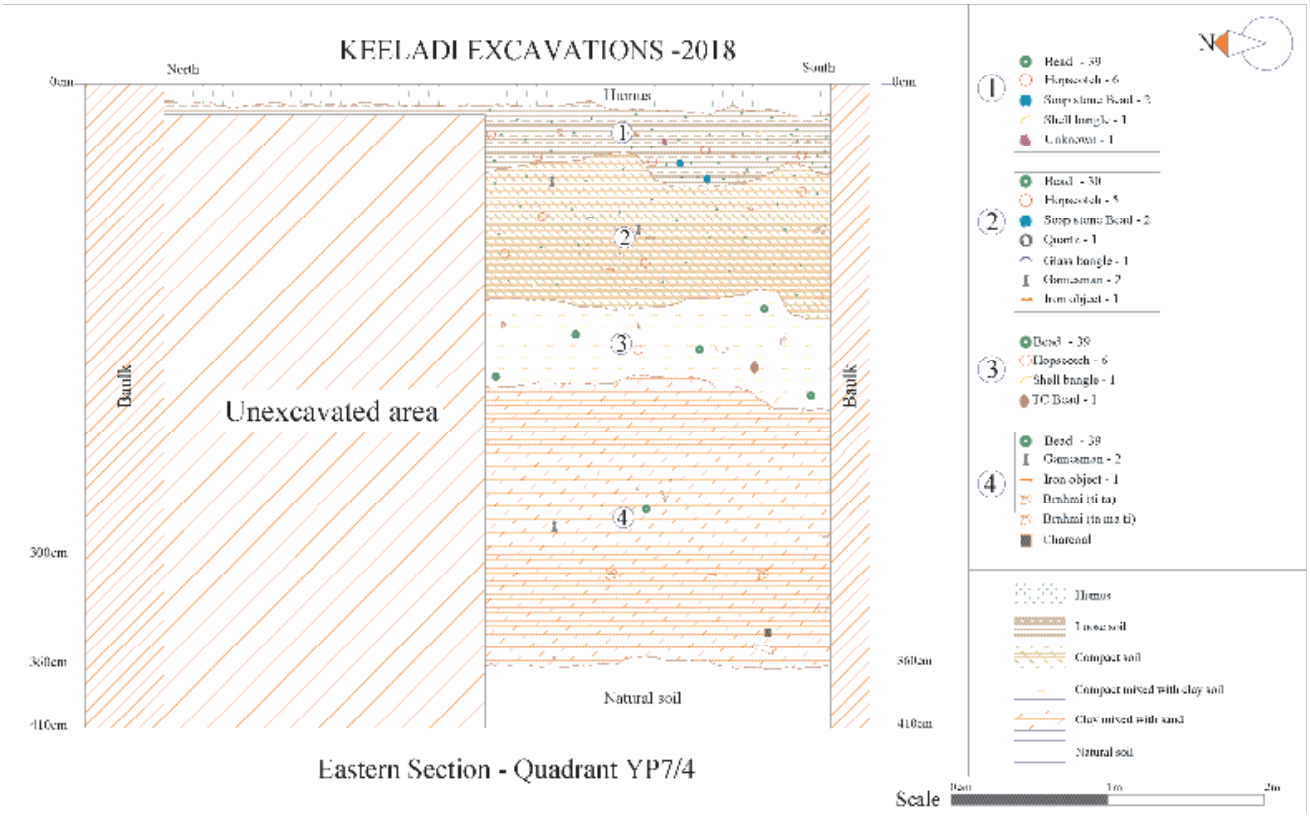
This is the next layer traced just below layer 2 and above layer 4. It resembled as if an intermediary strata of semi-compact coarser sand grain mixed clayey dark yellowish brown deposit. This is not much disturbed of its existence with its prevalence in all the sections of the quadrant. Its minimum thickness of 35 cm was observed near the middle of the western section and the maximum thickness of 79 cm spotted at the south-eastern corner of the southern section.

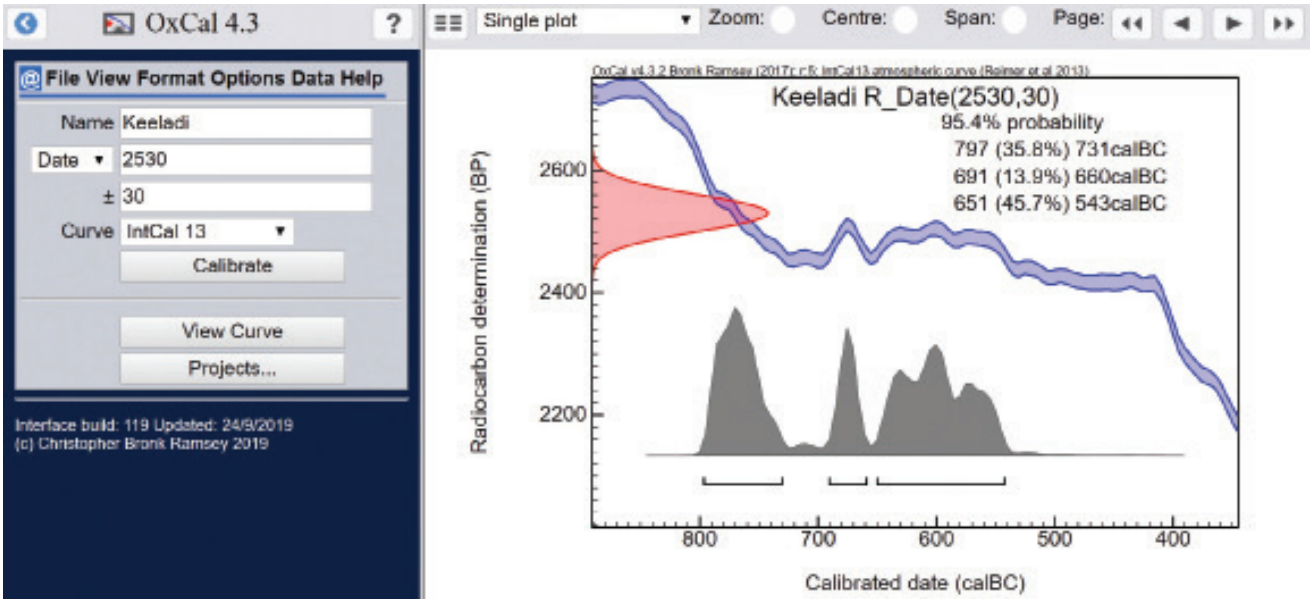
Layer – 4

This stratum is comparatively thicker in deposit than the other layers. In fact, its similarity of deposit made it to recognize as a single compact deposit of such larger thickness. Its minimum thickness of 156 cm was observed at the north-eastern corner of the northern section. Whereas the maximum thickness of 175 cm was identified near the south-western corner of the southern section. The colour, content and texture of the deposit of this layer were yellowish brown, semi-compact containing potsherds and brick bats. Two Tamil-Brahmi inscribed sherds reading tita and tamati were recovered from the same layer. Besides,a gamesmen and a hop-scotch were also recovered from this stratum. This layer contained partly broken portions of two pot stands of black ware. At the depth of 353 cm, 134.06 grams of carbon sample were collected. It was fine grained charcoal in dark black colour. The AMS date obtained for the sample goes back to 2530 ± 30 BP i.e., the uncalibrated date of 580 BCE. The midrange calibrated date goes back to 680 BCE (see graphs).*

Natural Soil

The natural soil comprising of river sand emerged at the depth of 3.60 m below the surface,It is quite distinct of its bright brownish yellow colour with coarser grain texture devoid of any man-made object and the same very well confirms the existence of such deposit as the natural soil of the site. Invariably all the trenches of this season as well as earlier seasons excavation revealed just this kind of rivers and deposit at the lowest levels of the excavated trenches. Further digging was continued to a depth of 4.10 m below the surface level in order to confirm the existence of the natural soil.





Beta Analytic
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REPORT OF RADIOCARBON DATING ANALYSES

J. Ranjith — Report Date: March 11, 2019
Tamil Nadu Government — Material Received: February 25, 2019

Laboratory Number	Sample Code Number	Conventional Radiocarbon Age (BP) or Percent Modern Carbon (pMC) & Stable Isotopes Calendar Calibrated Results: 95.4 % Probability High Probability Density Range Method (HPD)	
Beta - 519476	KLD-2018/Sample No.1	2530 +/- 30 BP	IRMS δ13C: -23.8 o/oo

(45.7%)	651 - 543 cal BC	(2600 - 2492 cal BP)
(35.8%)	797 - 731 cal BC	(2746 - 2680 cal BP)
(13.9%)	691 - 660 cal BC	(2640 - 2609 cal BP)

Submitter Material: Charcoal
Pretreatment: (charred material) acid/alkali/acid
Analyzed Material: Charred material
Analysis Service: AMS-Standard delivery
Percent Modern Carbon: 72.98 +/- 0.27 pMC
Fraction Modern Carbon: 0.7298 +/- 0.0027
D14C: -270.18 +/- 2.73 o/oo
Δ14C: -276.24 +/- 2.73 o/oo(1950:2,019.00)
Measured Radiocarbon Age: (without d13C correction): 2510 +/- 30 BP
Calibration: BetaCal3.21: HPD method: INTCAL13

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BetaCal 3.21

Calibration of Radiocarbon Age to Calendar Years

(High Probability Density Range Method (HPD): INTCAL13)

(Variables: d13C = -23.8 o/oo)

Laboratory number: Beta-519476

Conventional radiocarbon age: 2530 ± 30 BP

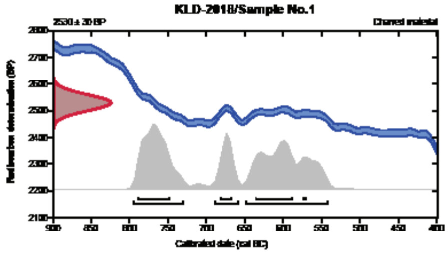
95.4% probability

(45.7%)	651 - 543 cal BC	(2600 - 2492 cal BP)
(35.8%)	797 - 731 cal BC	(2746 - 2680 cal BP)
(13.9%)	691 - 660 cal BC	(2640 - 2609 cal BP)

68.2% probability

(28.7%)	791 - 750 cal BC	(2740 - 2699 cal BP)
(28.1%)	638 - 590 cal BC	(2587 - 2539 cal BP)
(10.2%)	684 - 668 cal BC	(2633 - 2617 cal BP)
(2.2%)	576 - 571 cal BC	(2525 - 2520 cal BP)

KLD-2018/Sample No.1



Database used
INTCAL13

References
References to Probability Method
Bronk Ramsey, C. (2009). Bayesian analysis of radiocarbon dates. Radiocarbon, 51(1), 337-360.
References to Database INTCAL13
Reimer, et.al., 2013, Radiocarbon55(4).

Beta Analytic Radiocarbon Dating Laboratory
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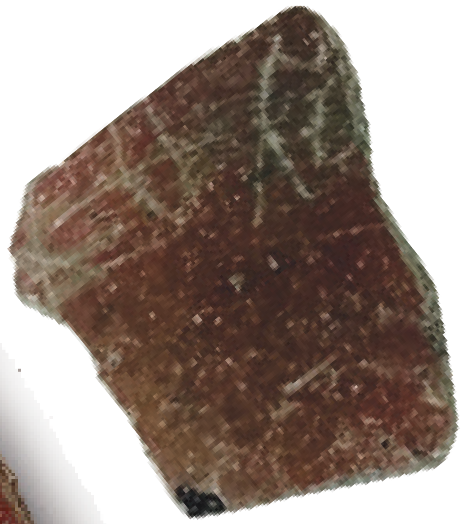
tita



tāmati

* The total cultural deposit of this trench is 360 cm and the carbon samples were collected at the depth of 353 cm i.e., 7 cm above the natural soil. The two Tamil̲i (Tamil-Brahmi) inscribed potsherds were collected at the depth of 300 cm. The thickness of the cultural deposit that exist between the spot (carbon sample) and the artefacts Tamil̲i(Tamil-Brahmi inscribed potsherds) is about 53 cm. The time-period for the accumulation of 53 cm cultural deposit would be a century or less. This chronological frame is arrived based on other AMS dates obtained at this site. All the five carbon samples collected between 353 cm and 207 cm of the cultural deposit were dated between 580 BCE (cal. 680 BCE) and 190 BCE (cal. 205 BCE). Thus, the time taken for the accumulation of 150 cm cultural deposit (353-207=146cm) is about four hundred years. In the sense, it took about a century or less to accumulate about40-50 cm cultural deposit. The calibrated date obtained at the depth of 353 cm is 680 BCE and the Tamil̲i (Tamil-Brahmi) inscribed potsherd collected at the depth of 300 cm could be easily dated to 6th century BCE (cal.580 BCE). The five AMS dates suggest that the early cultural deposit falls in the time range between 6th century BCE and mid-3rd century BCE (Phase-I of Early Historic phase). The later cultural phase (Phase-II of Early Historic phase) falls between mid-3rd century BCE and 1-2nd century BCE.

TRENCH NO : YP8/1 (FLOOR)

At a depth of 1.50m a spread of highly rammed clay floor was noticed on the eastern half of the trench. The western half slightly at the lower level revealed the same type of flooring. The texture was so hard and compact indicates clear pavement of clay flooring probably of fine clay mixed with herbal extract and lime in some proportions. As a result, the surface revealed ashy mass green color. This resembles and recalls the mud flooring of almost of recent past. So the habitation area gets extended in similar fashion for a different purpose. This is hard due to rubbles and brickbats found spread near the middle of the southern section.

TRENCH NO : YP10/4

The holding portion of a pot contains six radiating traces of parallel lines. Each radiation contains 14 small parallel lines probably of painting decoration. This gives an indication of the painted design as a glorified / magnified Sun symbol. This is quite interesting and unique to recognize that such a clubbed form of the Sun symbol as a developed version with circular spacing of the centre and the spokes found all around with different strokes.

TRENCH NO : ZB5/2

At a depth of 2.40m very close to the north western corner of the trench, a rim portion of a larger bowl of black-and-red ware was noticed. As a result much care was taken to expose the same without causing much damage. This large bowl had slight cracks at some portion. To everyone's surprise this seems to be the unique large single specimen of the bowl so far excavated from the state of Tamil Nadu. The rim is inturned with blunt beaked shape having the grove at the outer level just below 3 cm of the rim tip.

This vessel measures 62 cm in diameter. The shape seems to be round with slight portion found hidden in the western section. The thickness of the rim is 2 cm and that of the body is just a centimeter with typical nature of finer variety of black-and-red ware. This recalls the refined color, fabric and luster on either side of the vessel. To the best of knowledge this is a rare sized black-and-red ware

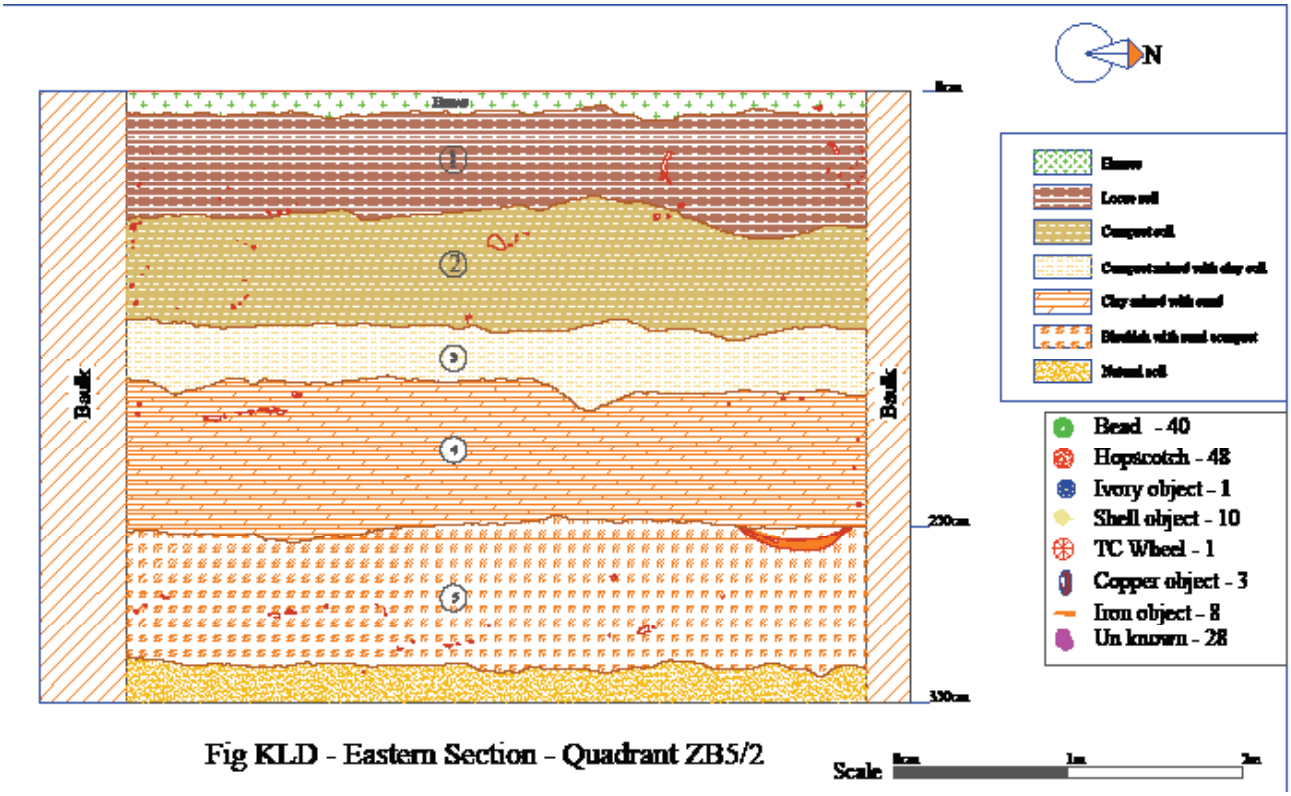


Fig KLD - Eastern Section - Quadrant ZB5/2

larger bowl. With an intension of retaining its location in situ the trench further digging was temporarily stopped. The contemporary yellowish patch probably comprising of fine river sand deposit running all around the trench gave a different indication from the lower.

In this context the top deposit was observed at the above level of the vessel with much lime mixed context needs to be critically related as for the utility of vessel is concerned with the lower deposit at the adjoining portions of the vessel. This deposit is also found running uniformly all around the trench with much semi compact blackish deposit. As far the stratigraphy is concerned, this level slightly recedes from north-south towards the south. Further dig revealed cluster of potsherds found emerging at the south western corner. The lower level of the trench was excavated and examined to continue the work and reach the level of natural soil. It is quite interesting to the observe the rope design on the shoulder level of the black-and-red ware vessel.

BRICK STRUCTURE

A row of bricks paved with proper alignment running east west is found traced from this Quadrant YP7/2 at a depth of 1.25m found adjacent to the northern section. After giving a fine brushing, the successive course of brick structure became clear. The structure extended towards the east and gave some indication that diagonally the continuation of the structure would either be traced on the east or on the north. The size of the bricks measured 36cm length and 24 cm breadth and 6 cm thickness. Further digging in the adjacent quarter without disturbing the structure would reveal either the lower courses of bricks underneath as such the thickness of the bricks could be measured.

The size of bricks clearly indicates on par with the sizes of the bricks of the brick structure exposed by earlier excavation at the site. Hence, the structural activity of the site runs at selected points thorough out the mound and indicates the standardized level of living. Moreover, this area in situ the other adjoining area seems to be the peak of cultural mound. The excavation on the eastern and north eastern side will reveal more spots of brick structural activity contemporary to the early phase of the Christian era. On the upper level of the brick alignment few brick pieces of the ruined structure were found embedded.

Further dig at this quadrant revealed another course of bricks just below with off-setting projection towards the south, with the bricks arranged breadth wise. Moreover they are of three fourth of the size, retaining square shape of bricks.

The upper course contained 4 bricks and the lower course with 7 square shaped broken bricks and the same found continued to the extreme end of the north eastern section of the trench. A refined treatment to the surface of the brick course of the brick structure really revealed the engineering technique of early century builders. It is very much suggestive of the structural extension of the same towards the north eastern direction at right angle

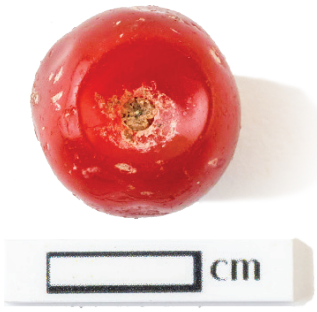
SILT FLOOR

The excavation work of the trench – YP7/1, is resumed for the day from the depth of 34cm. In the course of the pick, the texture of the deposit was semi-compact on the northern side and comparatively loose on the southern side. The color of the soil was dark-yellowish brown. After clearing the deposit, a course of fine silt like well levigated clay layer of flooring occurred on the southern section of the trench to a width of one and a half feet from the southern section. This seems to be contemporary to such a layer traced at YP7/4 in the same depth. So the continuation of such flooring existed at required area is suggestive of specific purpose of living of this settlement. The flooring thickness measured around 6 cm and made of fine levigated clay. Further dig at the adjacent area of the floor level revealed non continuation of the same. Hence, by means of observation and recording, the next dig was applied so as to continue the excavation.

Tamiḻi [Tamil-Brahmi]

Tamiḻi(Tamil-Brahmi) scripts found engraved on the outer surface of the shoulder portion of the black-and-red ware. The depth and nature of the characters on the sherds differ largely as they were individually written by different persons carrying their personal names. The outer shoulder portion of a black-and-red ware potsherd contained a six letter Tamiḻi (Tamil-Brahmi) inscription. They are read as kuviraṉ-āta. As the end portion of the potsherd is also found broken, the letter 'ṉ' as suffix could have existed to mean the name of a person kuviraṉ-āta[ṉ].

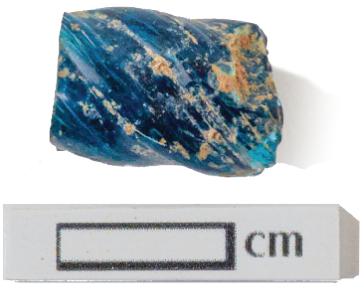
Carnelian



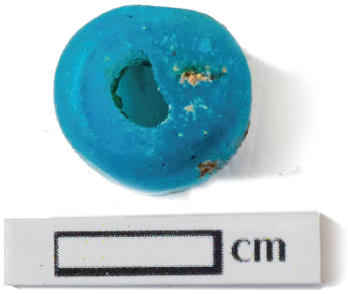
Carnelian

Crystal

Crystal



Glass



Glass

Quartz

Soapstone

Terracotta

BEADS

The collection of beads from Keeladi excavation accounts to 4429, which include beads of glass, paste, quartz, faience, agate, cornelian, terracotta. Glass and paste beads are found in various colours. The shapes of the beads are spherical, cylindrical, gooseberry, and barrel. A2/2 quadrant yielded large number of paste beads. Nearly 120 beads were recovered at the depth of 1.47m and another 357 beads at the depth of 1.55m.

HOPSCOTCHES

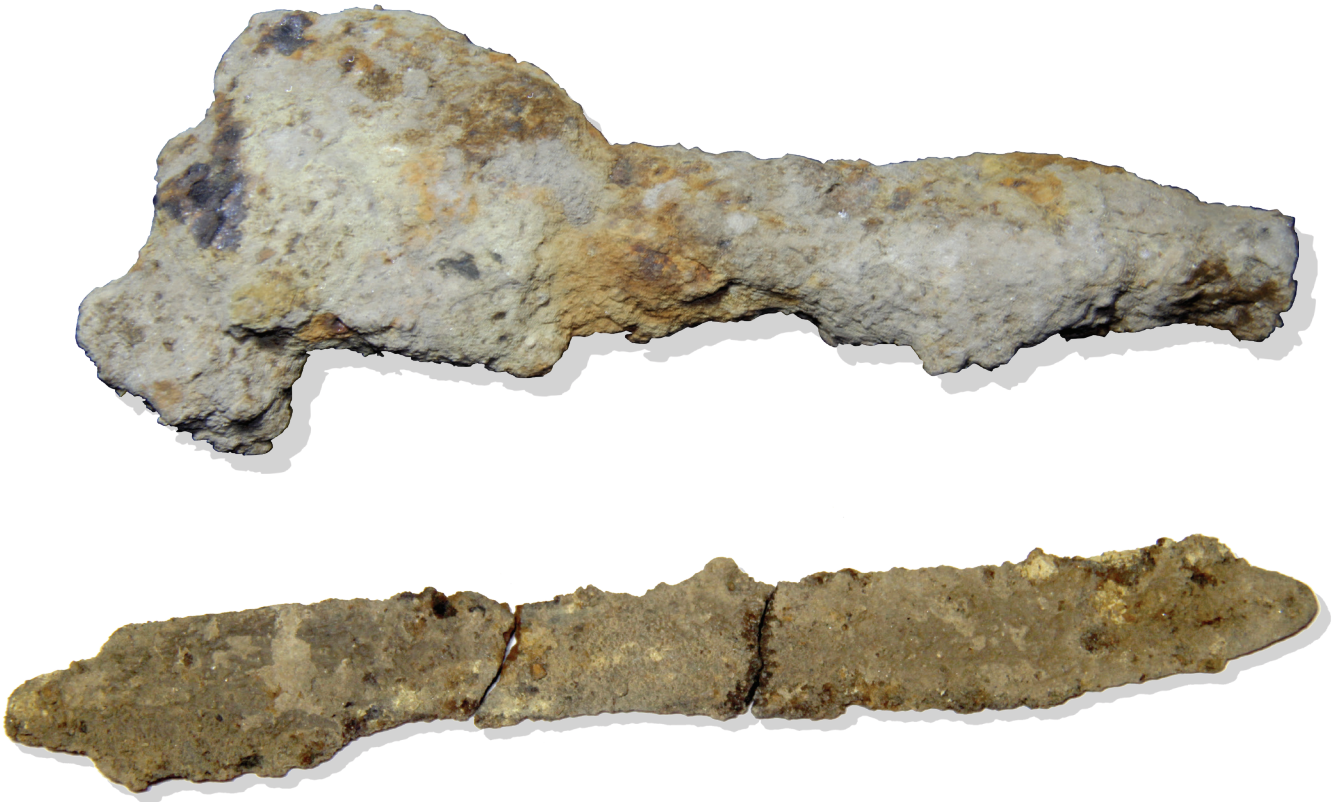
The flat portions of the potsherds were generally grounded and the edges were smoothened to bring a round shape locally called as sillu. They were used by children as game pieces. Hopscotches are collected from the entire quadrant. These are of various sizes as well as of different pot sherds like that of black-and-red ware, coarse red ware and red ware. Totally 601 hopscotches were collected from the current season of excavation

GAMESMEN

In the historic period gamesmen were made out of clay material. Two types of gamesmen were observed in Keeladi excavation. These objects might have been used to play the games like chess. The present session of the excavation work yielded 80 numbers of gamesmen. All are made of burnt clay and mostly black in colour.

IRON OBJECTS

Iron nails were collected in considerable numbers and pieces of knife portion were also recovered. They are fragmentary. During this season, 188 iron object portions were collected and they are mostly of iron nails and iron knives and some of them are of un-identified shapes and utility.



EAR ORNAMENTS

More than half size of a terracotta Ear ornament with a centrally depressed groove around the circumference on one side containing a Trident like pattern resembling the Tamil letter "ḷa"(ள) in a group of three lines besides the minute pointed holes spread around the palm leaves like trident motive along with the minute dot like design of pre-firing nature.Two varieties of ear ornaments were found in this season. They are of terracotta. One of the ear ornaments is of round shape with concave edge and looks like ear ornament of coiled palmleaf. But the other ear ornaments though seem to be same but decorated with a central hole. Totally 28 ear ornaments were unearthed from the excavation.

SPINDLE WHORLS

Spindle whorl is a circular object with a central hole used as a flying wheel of a spindle. It is a disc shape made of potsherd. Considering its light weight and small size, it is presumed that this could have been used for spinning thread out of cotton. 10 spindle whorls were unearthed from this excavation.

BANGLE PIECES

Excavation yielded 63 bangle pieces. The bangle pieces were made of shell and glass with varying sizes. They are thick and thin in cross section. One piece is noticed with a decoration executed on the outer portion of the shell bangle resembling two small lines going through all over the bangle.

TERRACOTTA MOULD & FIGURINES

This season excavation yielded 13 terracotta human figurines and other 3 that of animals. A human head mould was unearthed in the Keeladi excavation. The collected mould is a portion for making cast of a human head in metal or any other material with the inner side of the mould beautifully carved. The head decoration and elongated ear contain minute carvings. This mould is made of levigated clay and well fired.

Male Torso

Relief

Torso

Horse Head

Mould of a Head

Bull Head

Head

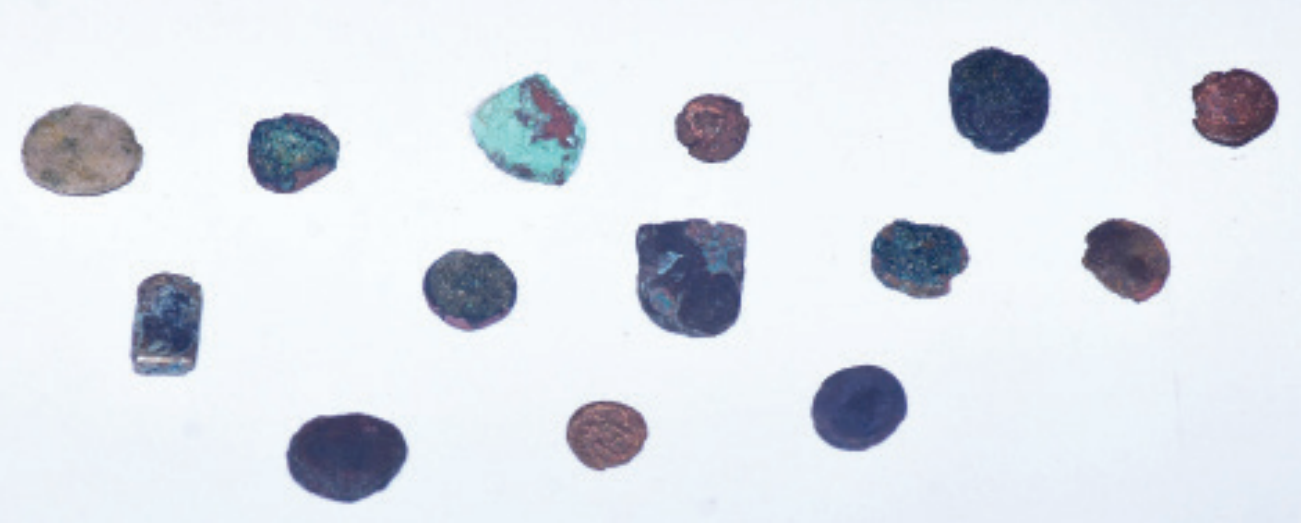
HORNS

The find of deer horns is also common in major excavations conducted in Tamil Nadu. Especially Uraiyur, Thirukkampuliyur, Boluvampatti, Karur and Alagankulam have yielded good number of deer horns. It is interesting to note that the Sangam literature has thrown enough light on this aspect. It has been traded to foreign countries as a valuable trading goods. Few pieces of horns were recovered from this season.

RARE FINDS

Few pieces of gold ornament like a star pendant, a small bell pattern like pendant, a broken bit of a small curved ring and, a flake of an un-identified gold ornament were found. This season's work yielded a comparatively larger bowl of a black-and-red ware which seems to be unique of its size and considered as a rare specimen from the excavations of Tamil Nadu.

The ring well traced at the trench A3-quadrant-2 seems to be the lowest level of terracotta rings so far found from this site. On the basis of its size and shape, this ring well is of diameter 62 cm, slanting height of odd and even numbers of the rings are 34 and 38 cm respectively and thickness measuring 4 cm and placed over the sandy materials of the riverine sand deposit fetching palatable drinking water.



During this season, the site Keeladi yielded 14 coins from the stratified deposit of different trenchesat various depths. Of which 13 are of copper and one of silver metal. Among the copper coinstwo are of square shape akin to Sangam Age numismatics issues. While, 7 are of medieval times andthe remaining are pellet coins. As most of the coins with much corrosion, the features of the sameare to be studied after proper cleaning. The only silver coin in rectangular shape is a punch markedissue is dated earlier than 5th century BCE.

FINDINGS

The excavation yielded enough cultural traits in the form of structural activity like brick structures, terracotta ring wells, fallen roofing tiles with double holes and deeply finger pressed grooves to draw rain water, besides antiquities like few pieces of golden ornaments, broken portions, copper objects, iron implements, terracotta gamesmen (chessman), hopscotches, ear ornaments spindle whorls, images portions, also beads of terracotta, glass, paste, semi-precious stones (agate, carnelian, quartz, etc.) popular ceramic types like finer variety of black-and-red ware, black ware, polished ware, red ware, rouletted ware, few pieces of Arretine ware. There are also enough numbers of graffiti sherds of both pre and post firing nature. A good number of Tamil̲i shreds also unearthed. All these finds clearly indicate the cultural richness of the ancient civilization of the Tamils of this region having its close proximity to the temple city Madurai. As the size of the habitation mound or settlements is so vast and major part of the mound is undisturbed and protected by the palm groves. It becomes essential to probe such cultural hidden treasures of Keeladi to reveal the cultural wealth of the ancient society dating back to 2600 years.

CULTURAL SEQUENCES AND CHRONOLOGY

The current season of excavation revealed a single cultural deposit of Early Historic period and was further divided into two distinct cultural phases namely phase-I and phase-II based on ceramics, coins, antiquities, structural remains, graffiti marks, Tamiḻi (Tamil-Brahmi) inscribed potsherds and stratigraphy supported with considerable number of radiometric dates. These two cultural phases are determined based on cultural material exposed in the excavation that are being carried out till date in a particular limited area of the habitation mound. The excavations are yet to be carried out in other parts of the 110 acres of extensive habitation mound that may expose the preceding or succeeding cultural phases of the present Early Historic period.*

Phase –I of Early Historic period

Represented by finer variety of black-and-red ware, black ware and associated red slipped ware of finer variety and well polished. Structural remains like terracotta ring wells and brick structures represent the buildings activity of the phase.

Phase –II of Early Historic period

Similar ceramic types exposed as that of the lower level but with medium fabric and fineness. Besides, roof tiles with grooved depressions and most probably double holed ones also observed. Antiquities such as terracotta ear ornaments, gamesmen of terracotta, bone and tusk, conch bangle pieces, semiprecious stone beads along with beads of paste found in the phase. Considerable numbers of spindle whorls were also recovered from the trenches. Apart from this few metal objects of copper (antimony rods, unidentified objects), copper coins(two square shapes with much corrosion) and a silver punched marked coin having punch mark constitute the sequence of cultural deposit of this period. There were also ivory objects such as cubical dice like gamesmen, arrow points of bone, hopscotches made of terracotta and potsherds, iron objects like broken portions of spearhead etc., are found. Ceramic types of red slipped ware, red ware and glass beads were found from this level of the deposit.

So, the chronology of Early Historic period of this site Keeladi could be assigned between 6th century BCE and 1st–2nd century BCE. The cultural deposit of the phase–I falls between 6th century BCE and mid-3rd century BCE. Phase-II belongs to the period between mid-3rd century BCE and 1st–2nd century BCE. Further investigations in other parts of the mound would give a comprehensive and clear picture on the long survival of the site Keeladi.

*The Archaeological Survey of India, subject to further scientific analysis, tentatively divided the cultural deposit at Keeladi into three broad cultural periods as Period-I: Iron Age (pre 300 BCE), Period-II: Early Historic period (300 BCE-300 CE) and Period-III: Post Early Historic period (post 300 CE). The last date of 10th century CE arrived based on the surface findings of a Chola coin. As stated above, the beginning of the Early Historic period goes back to 6th century BCE without any doubt. The habitation mound covers an area of 110 acres of land yielding cultural material from Iron Age down to pre-Colonial times. For instance, the Iron Age urn burial complex is noticed at Kondagai village close to the water tank. The inscriptions belong to 12th-13th century CE engraved on the walls of the Siva temple were assigned to the 23rd and 31st regnal year of the Pandya king Maravarman Kulasekara Pandya (SII XXII no. 447, 448, 449). The stone slab found near the burial complex at Kondagai carry the inscription issued in c.16th century CE during the reign of Nayaks. Thus, the future excavation may reveal the cultural deposits that precedes and succeeds the present Early Historic phase.

Keeladi Excavation Team

Under the guidance of

Thiru T. Udhayachandran, I.A.S,
Principal Secretary and Commissioner
Department of Archaeology

Dr. D. Jagannathan, I.A.S.,
the then Commissioner [FAC].,
Department of Archaeology

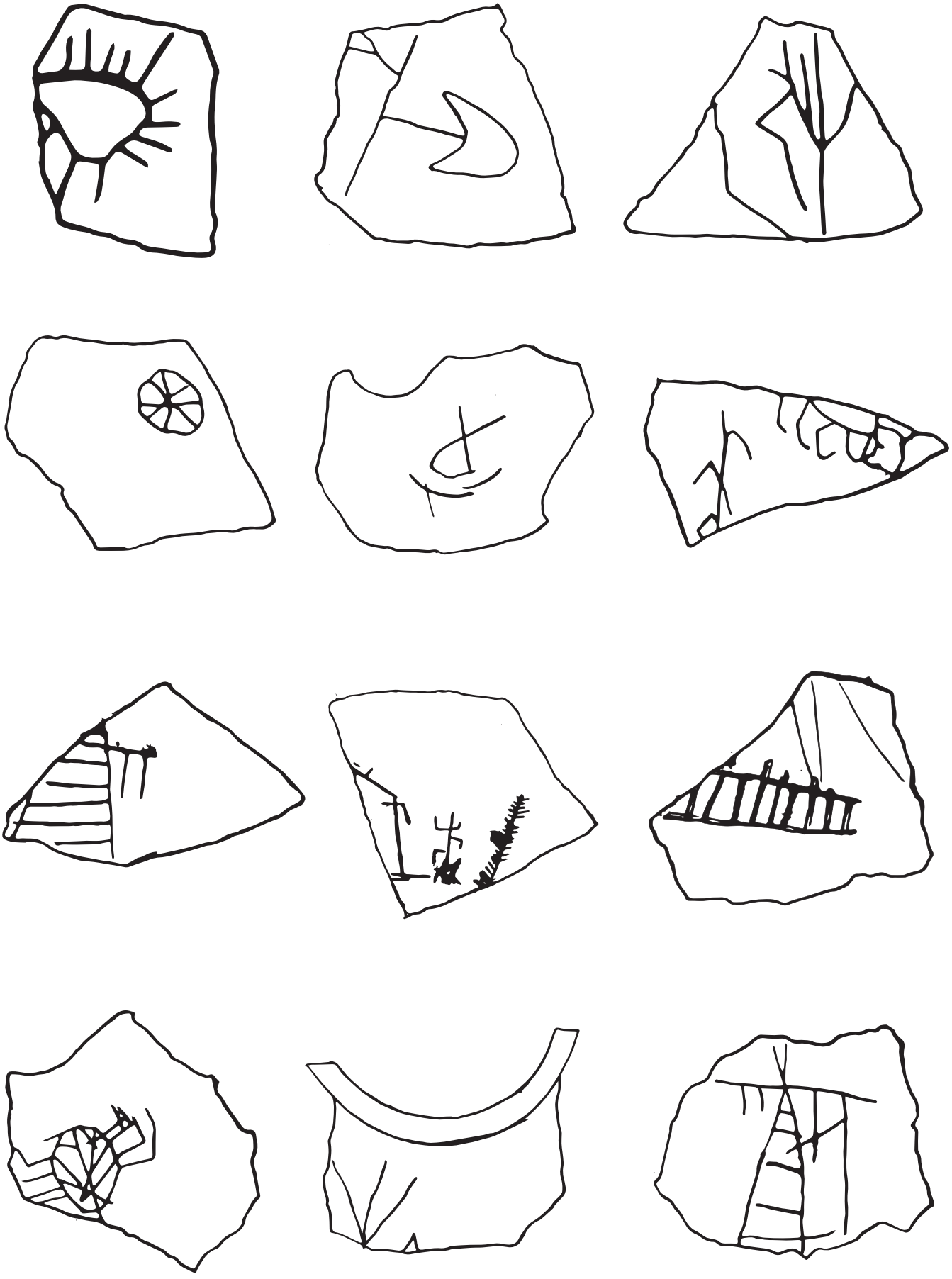
Excavation Team

Excavation Director	-	Dr. R. Sivanantham, *Deputy Director*
Excavation Co-Director	-	Dr. J. Baskar, *Archaeological Officer (i/c)*
Excavation Expert	-	*Thiru* M. Seran
Archaeologists	-	*Thiru* J. Ranjith *Thiru* M. Prabhakaran *Thiru* T. Thangadurai *Thiru* S. Nandakumar *Thiru* K. Sakthivel *Thiru* B. Asaithambi
Surveyor	-	*Thiru* T. Thangavel, *Executive Engineer* *Thiru* K. Olimalik, *Asst. Executive Engineer*
Chemist	-	*Thiru* P. Kaleeswaran, *Chemist* *Thiru* P. Senthilkumar, *Assistant Chemist*
Field Assistance	-	Institute of Epigraphy Students *(2017-2018 & 2018-2019)*
On site Supporting Staff	-	*Thiru* N. Muthukaruppu, *Sales Attender* *Thiru* P. Senthilkumar, *Driver*
Technical Assistance	-	*Thiru* S. Sree kumar, *Technical Assistant* *Thiru* D. Prakash, *Superintendent*
Administrative Supporting Staff	-	*Thiru* V. Sivanandam, *Assistant Director (H.Q)* *Selvi* R. Kavitha, *Assistant Accounts Officer* *Tmt.* D. Sridevi, *Superintendent* *Tmt* N. Nagarathinam, *Superintendent* *Tmt.* B. Mythili, *Superintendent* *Thiru* B. Nagesh, *Assistant* *Tmt.* G. Umavathy, *Assistant* *Thiru* S. Anbunambi, *Cashier*
Drawings prepared	-	*Thiru* M. Ramesh, *Research Assistant*

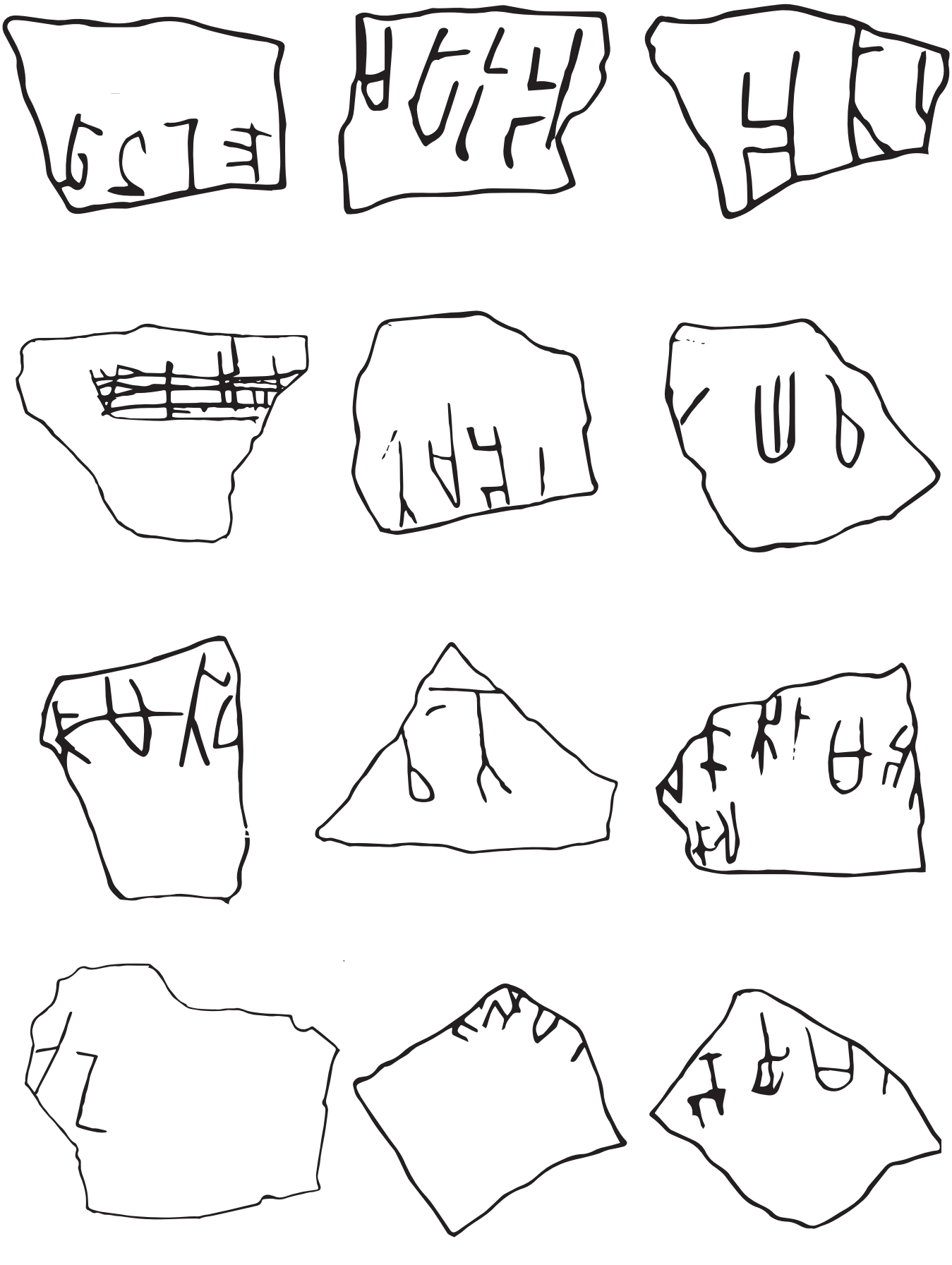
Places of Excavations carried out by Department of Archaeology

S. No	Place	District	Year of excavation	Nature of Site
1	Korkai	Thoothukudi	1968-1969	Early Historic
2	Panchalankurichi	Thoothukudi	1968-1969	Modern
3	Vasavasamudram	Kancheepuram	1969-1970	Early Historic
4	Anaimalai	Coimbatore	1969-1970	Megalithic
5	Pallavamedu	Kancheepuram	1970-1971	Medieval
6	Karur	Karur	1973-1974 1994-1995	Early Historic
7	Panayakulam	Dharmapuri	1979-1980	Early Historic
8	Boluvampatti	Coimbatore	1979-1980 1980-1981	Medieval
9	Kovalanpottal	Madurai	1980-1981	Megalithic
10	Thondi	Ramanathapuram	1980-1981	Early Historic
11	Gangaikondacholapuram	Ariyalur	1980-1981 1986-1987 2008-2009	Medieval
12	Kannanur	Tiruchirappalli	1982-1983	Medieval
13	Kurumbanmedu	Thanjavur	1984-1985	Medieval
14	Palayarai	Thanjavur	1984-1985	Medieval
15	Alagankulam	Ramanathapuram	1986-1987-1990-1991 1992-1993-1994-1995 1996-1997-2014-2015 2016-2017	Early Historic
16	Tirukkovilur	Villupuram	1992-1993	Early Historic
17	Kodumanal	Erode	1992-1993-1996-1997	Megalithic & Historic
18	Sendamangalam	Villupuram	1992-1993-1994-1995	Medieval
19	Padavedu	Tiruvannamalai	1992-1993	Medieval
20	Tiruttangal	Virudhunagar	1994-1995	Microlithic
21	Poompuhar	Nagapattinam	1994-1995 1997-1998	Early Historic
22	Maligaimedu	Cuddalore	1999-2000	Early Historic
23	Teriruveli	Ramanathapuram	1999-2000	Early Historic
24	Mangudi	Tirunelveli	2001-2002	Microlithic
25	Perur	Coimbatore	2001-2002	Early Historic
26	Andipatti	Tiruvannamalai	2004-2005	Early Historic
27	Modur	Dharmapuri	2004-2005	Neolithic
28	Marakkanam	Villupuram	2005-2006	Medieval
29	Parikulam	Tiruvallur	2005-2007	Palaeolithic
30	Nedunkur	Karur	2006-2007	Megalithic
31	Mangulam	Madurai	2006-2007	Early Historic
32	Sembiyankandiyur	Nagapattinam	2007-2008	Megalithic
33	Tarangambadi	Nagapattinam	2008-2009	Modern
34	Rajakkalmangalam	Tirunelveli	2009-2010	Medieval
35	Talaichankadu	Nagapattinam	2010-2011	Medieval
36	Alambarai	Kancheepuram	2011-2012	Modern
37	Srirangam	Tiruchirappalli	2013-2014-2014-2015	Medieval
38	Ukkiran Kottai	Tirunelveli	2014-2015	Medieval
39	Pattarai perumbudur	Tiruvallur	2015-2016-2017-2018	Later Palaeolithic
40	Keeladi	Sivagangai	2017-2018-2018-2019	Early Historic

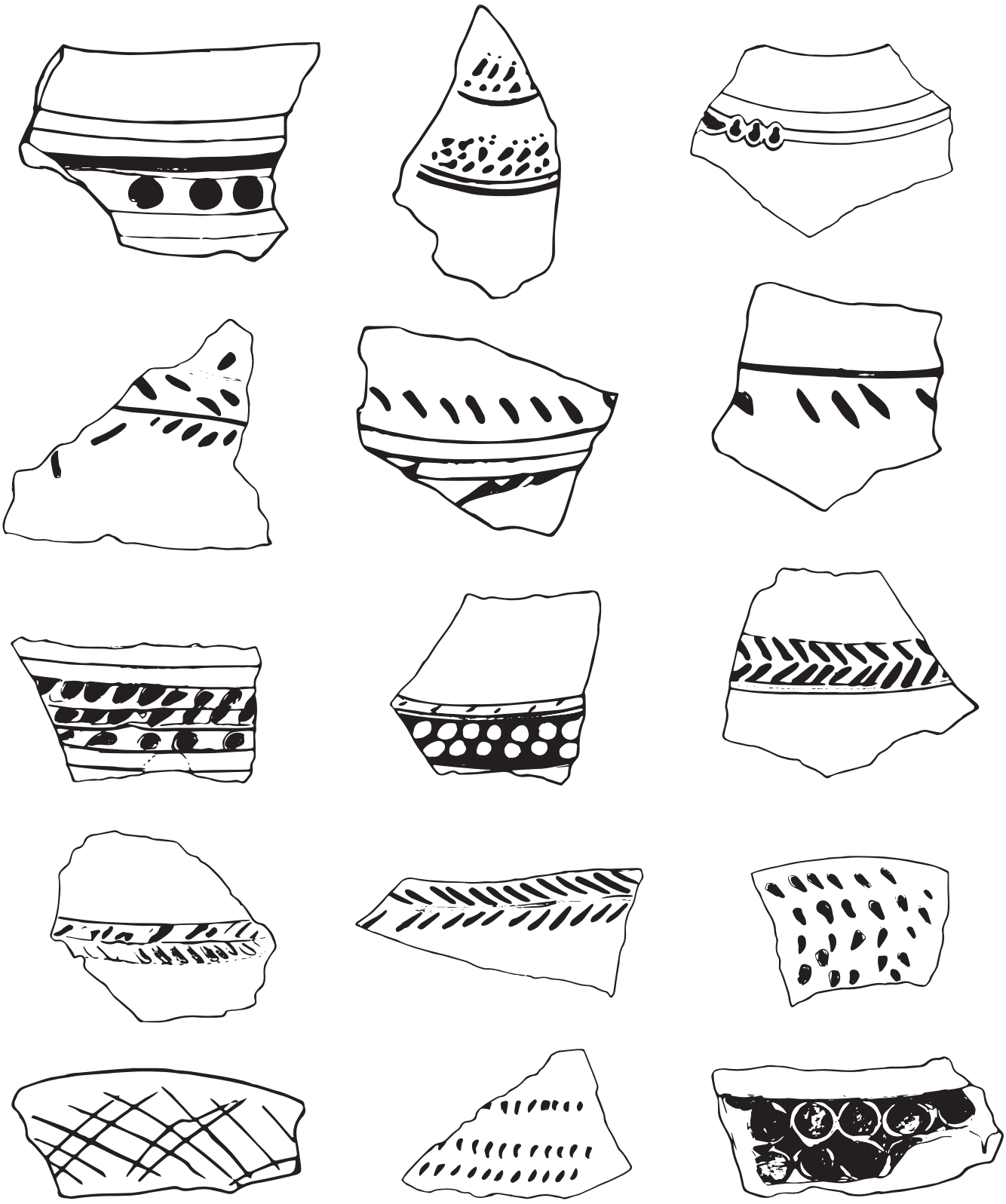
GRAFFITI AND SYMBOLS



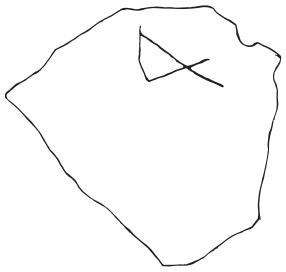
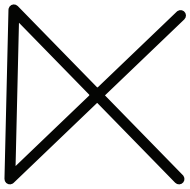
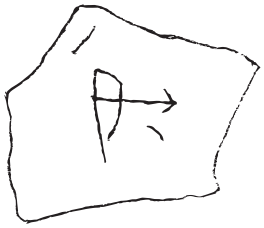
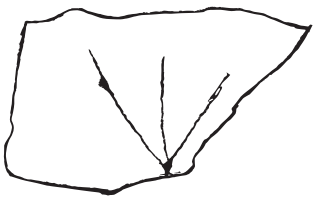
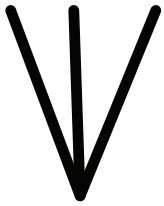
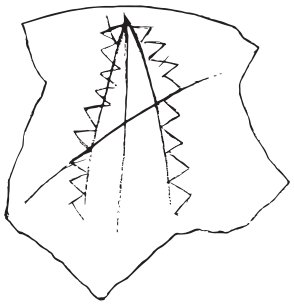
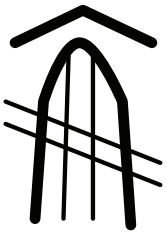
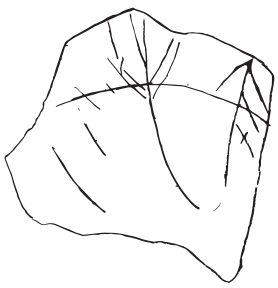
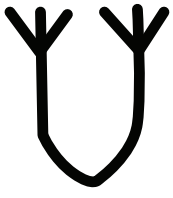
TAMIL BRAHMI



DECORATIVE WARE



SIMILARITIES BETWEEN GRAFFITI OF KEELADI AND SIGNS OF INDUS

Keeladi graffiti	INDUS sign	
		INDUS SIGN-225
		INDUS SIGN-307
		INDUS SIGN-365
		INDUS SIGN-318
		INDUS SIGN-347

BIBLIOGRAPHY

Wheeler, R.E.M., Ghosh, A., and Krishna Deva 1946 "Arikamedu An Indo-Roman Trading Station on the East Coast of India", *Ancient India*, vol.2, Archaeological Survey of India, New Delhi, Pp.17-125.

Begley, Vimala 1988 "Rouletted ware at Arikamedu: A New Approach", *American Journal of Archaeology*, vol.92, no. 3, July, Pp.427-440.

Begley, Vimala 2004 "The Dating of Arikamedu and its Bearing on the Archaeology of Early Historical South India", in Jean-Luc Chevillard (ed.), *South-Indian Horizons: Felicitation Volume for Francois Gros*, Institut Francais de Pondichery and EFEO, Pondicherry, Pp.513-537.

Raman, K.V. "Heritage in Clay", in K.V.Raman, Temple Art, Icons and Culture of India and South-East Asia, Sharadha Publishing House, Delhi, 2006. Pp.90-92.

Shanmugam, P., Terracotta Art in the Tamil country , *Bulletin of the Chennai Government Museum*, Vol.XV, no.8, 2007, Chennai, 2007.

Subramanian, A., Terracotta Art in Tamil Nadu", *Annals of Oriental Research, Silver Jubilee* Vol. 1975. Pp.140-144.

Rajan, Gurukkal, 1989 "Forms of Production and Forces of Change in Ancient Tamil Society", *Studies in History*, Vol. 5 (2), Pp.159-175.

Rajan, K., 1991d "New Light on Graffiti Marks", *Journal of Marine Archaeology*, Vol.2, Pp.47-54.

Rajan, K., 1995 "Traditional Bead Making Industry in Tamil Nadu, a report submitted to the Nehru Trust, New Delhi.

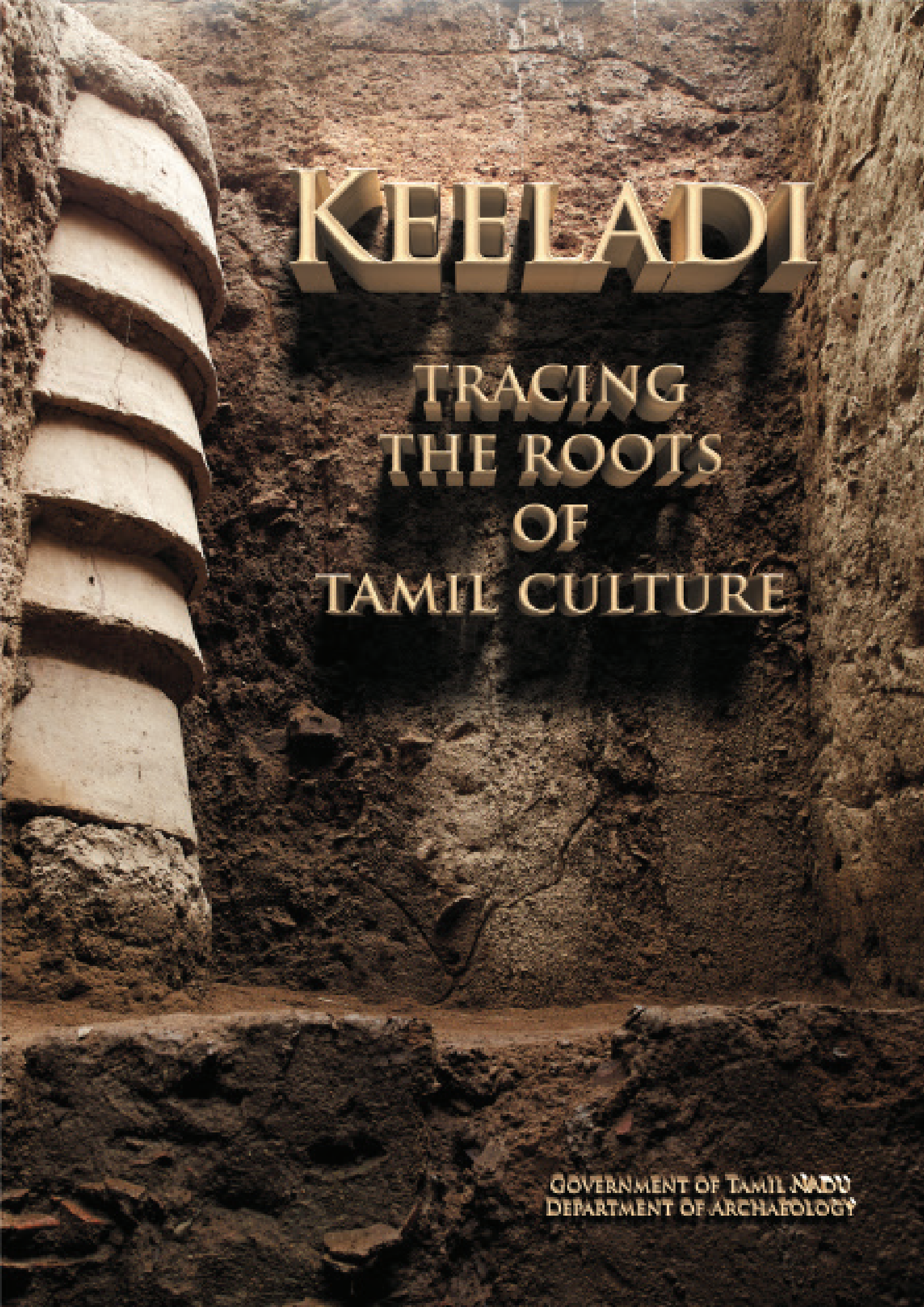
Rajan, K., and Osmund Bopearachchi, 2002 "Graffiti Marks of Kodumanal (India) and Ridiyagama (Sri Lanka) – A Comparative Study", *Man and Environment*, Vol.27 (2), Pp.97-105.

Rajan,K., 2015 "Early Writing System: A Journey from Graffiti to Brahmi", Pandya Nadu Centre for Historical Research, Madurai.

Raman, K.V., 1976 "Brahmi Inscription of Tamil Nadu: an historical assessment", *The Sri Lanka Journal of South Asian Studies*, Vol.1(1), Pp.64-75.

Subramanian, N., 1980 "Sangam Polity" – The Administration and Social life of the Sangam Tamils, Ennes Publications, Madurai.

Gurumurthy, S., 1999 Deciphering the Indus Script: From Graffiti on Ancient Indian Pottery, University of Madras, Madras.


KEELADI
TRACING
THE ROOTS
OF
TAMIL CULTURE
GOVERNMENT OF TAMIL NADU
DEPARTMENT OF ARCHAEOLOGY