SEMINAR ON
MARINE ARCHAEOLOGY

EDITOR

NATANA. KASINATHAN



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FOREWORD

References abound in ancient literature evidencing the submergence of extensive areas of Tamil territory during repeated deluges in the years of yore. Even as the legendary Kumarik kandam, along with the cities like Then Madurai and Kapatapuram, where the earlier Tamil sangams flourished, had perished in the great pre-historic deluge, sizeable portion of Poompuhar is said to have been devoured by the sea. The city now existing as Kaveripoompattinam, which was one of the affluent centres of trade and commerce during pre-Sangam period, is located near the confluence of the river Kaveri with the Bay of Bengal.

Poompuhar is elaborately described in Silappatikaram, Manimekalai and Pattinappalai. The location of the city, its different divisions, the life and career of its citizens, the market place, the parks, the ponds, the sea shore, and the temples dedicated to various deities are found portrayed in vivid detail. Graphic depictions of the city in the classics provide us with invaluable source of information to comprehend and appreciate the rich cultural heritage of ancient Tamils. Corroborative evidences to vouch for the veracity of the literary allusions have also not been lacking.

The onshore excavation carried out here by the Archaeological survey of India had revealed ruins

of the magnificent city consisting of a number of brick structures such as Buddha Vihara, Water Reservoir, and Wharf which is datable to 3rd century B.C. These structures are believed to have formed part of the ancient city and it is conjuctured that a portion of the city may still be lying submerged under the sea. In the hope of finding further ruins deep down the sea which may help unravelling several historical mysteires, the Government of Tamilnadu were pleased to undertake sub-marine exploration off Poompuhar coast and entrusted the work with the State Department of Archaeology to be done in collaboration with the National Institute of Oceanography, Goa. The task is great and expectations are lofty and whatever be the outcome of the stupendous effort, the subline intention and urge would appear to be worthy of the endeavour and cost.

In order to elicit technical information from scholars of various disciplines and assess their applicability to the undertaking a "Seminar on Marine Archaeology" was organised by the Tamilnadu Government. The papers presented in the seminar is being published as a monograph. These papers throw more light on several aspects of the proposal and give us ample information about Poompuhar.

A strong case is made out for continuing the Under sea Exploration apart from further efforts along the

coast line to retrieve the hidden structures and get at the antiquities which are of immense consequence to archaeology, history and culture of Tamilnadu.

I congratulate Dr. S. R. Rao, the reputed Archaeologist and Emeritus Scientist and Thiru. Natana. Kasinathan our Director of State Archaeology Department for having successfully conducted the purposeful seminar and compliment the Director and the staff of the Department of Archaeology in having brought out this volume in stipulated time.

Secretary **AVVAI. NATARAJAN**
Tamil Development-Culture Department

FELICITATIONS

Way back in the summer of 1962, when I undertook preliminary exploration of the vicinity of Kaveripumpattinam, one could hardly believe that there were any vestiges of the ancient city left. The land was so flat and featureless except for a few ancient temples. But we were thrilled to discover a few sites like Vanagiri, Neidavasal, Manigramam, Melapperumpallam, Melaiyur, Kilaiyur which yielded the ancient artifacts like the Black and Red and the Rouletted pottery, the square copper coins with the chola emblem of the tiger, a Roman coin and hundreds of the beads of the semi-precious stones - clearly indicating the prevalence of ancient industries and the foreign maritime contacts. This was followed by systematic excavations from 1963 to 1969, under my personal supervison which resulted in many more interesting discoveries, the most important being the three significant structures - the brick - built wharf at Kilaiyur, the beautiful brick facade and the channel of the water reservoir at Vanagiri and the large Buddha - Vihara at Melaiyur or Pallavaneswaram. The discovery of the lime stone Buddha Pada, a Buddha Bronze and the painted stucco figures go to confirm Pumpuhar's association with Buddhism as attested by *Silappathikaram* and the Buddhist literature like the *Abhidammavatara.*

But what about the portions of the ancient city that were submerged by the sea? Archaeology from the sea should be correlated with the archaeology from the earth. There is no better place to do this in South India than the great emporium of trade 'Khaberis Emporiam' as Ptolemy described it. The ancient Sangam work *Pattinappalai* gives a graphic description of the goods that were coming into Pumpuhar from distant lands as well as other parts of India. There is also a reference to the traders from different countries living at Pumpuhar in perfect harmony. Later on, the Coromandal coast witnessed greater maritime activity particularly under the imperial Cholas with South East Asia and China so that the Bay of Bengal became virtually a Chola lake.

So it is the dream of every archaeologist - nay every one interested in the past history and heritage of our country - that marine archaeology should be undertaken in the Bay especially near Pumpuhar. I am glad that this exciting task is being undertaken by the Dept. of Archaeology, Govt. of Tamilnadu, in collaboration with National Institute of Oceonography, Goa under the leadership of the well-known archaeologist Dr. S. R. Rao. Dr. Rao has already brought to light some of the submerged portions of the ancient city of Dwaraka in the Arabian sea. I am sure this explorations in the Bay of Bengal would not only result in the discovery of the submerged portions of Pumpuhar but also the several sunken ships that lie buried there. The preliminary

probings have already indicated certain promising areas and features which deserve more detailed investigations. The Govt. of Tamilnadu and particularly the learned Secretary, Dept. of Tamil Development - Culture, Dr. Avvai Natarajan, a renowned Tamil scholar deserves our congratulations for his untiring efforts to launch this important scheme which would open a new Chaper in the history of the ancient Tamilagam.

Thiru. Natana Kasinathan, Director of Archaeology, Govt. of Tamilnadu has done well to organise this seminar on the Marine Archaeology which goes to highlight the prospects and potentialities of such an undertaking in the vicinity of Pumpuhar. I have no doubt that the publication of the seminar papers would pave the way for the continuation of the efforts in the marine archaeological explorations not only in and around Pumpuhar but also in other important port - towns of Tamilagam like Arikamedu, Nagapattinam, Mamallapuram and Alakankulam.

K. V. RAMAN
Professor and Head
Dept. of Ancient History
and Archaeology

University of Madras
Madras - 600 005

PREFACE

This volume consists of the research papers presented by the eminent scholars in view of the Seminar on Marine Archaeology, held at Madras. This Seminar was sponsored by the joint auspices of the Tamilnadu State Department of Archaeology and the Marine Archaeology branch of the National Institute of Oceanography, Goa. Dr. S.R. RAO. Emeritus Scientist and the Head of the Marine Archaeology branch had kindly co-operated for the success of this Seminar.

To conduct this Seminar Tamilnadu Government were kind enough to sanction a considerable amount. DR. AVVAI NATARAJAN, Secretary, Tamil Development and Culture Department was the guiding force all along this Seminar. I am thankful to the Government of Tamilnadu as well as the Secretary, Tamil Development and Culture department for the same.

Our Honourable Chief Minister Puratchi Thalaivi DR. J. JAYALALITHA is evincing great interest in contit nuing the exploration off the shore of Poompuhar and in publishing seminar papers in a book form. I am more grateful for Hon'ble Chief Minister's kind and affectionate gesture.

I owe a debt of gratitude to the Secretary, Tamil Development Culture Department and Dr. K. V. Raman, Professor and Head of the Department of Ancient

History and Archaeology, Madras University for their illuminative foreword and felicitations respectively.

It is my bounden duty to thank the scholars who had contributed the learned research papers to this seminar and Dr. S. R. RAO, for his untiring co-operation extented in conducting the Seminar. I am also to thank the staff of the Department of Archaeology for their unstinted co-operation for organising the seminar and bringing out this publication within the stipulated period.

Lastly I crave the indulgence of the readers to kindly bear inconvenience for not printing the foot notes of the articles due to some technical difficulties.

Natana. Kasinathan
Director

தி. மா. சந்திரசேகரன், எம்.எ.,

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Key-note Address

by

Dr. S. R. Rao,

Emeritus Scientist,

National Institute of Oceanography, Dona Paula, Goa.

I consider it a great privilege to be invited to deliver the key-note address of an important Seminar on Marine Archaeology organised by the Government of Tamilnadu headed by a Chief Minister who has given very high priority to the preservation of the Cultural Heritage of this country. Even as I was thinking of appealing to the Governments of the littoral States of India to initiate steps for marine archaeological research with a view to discover, retrieve and preserve the underwater cultural remains, Hon'ble Chief Minister has taken us by surprise by anouncing in his budget speech that Marine Archaeological research in respect of the submerged Chola Emporium of Poompuhar (Kaveripattinam) will be undertaken in collaboration with the Marine Archaeology Centre of the National Institute of Oceanography, Goa, and made budget provision for the same.

Furthermore he has geared the Department of Archaeology to organize a seminar on the problems of, and potential for marine archaeological studies

in Tamilnadu. The State will be an active participant in joint exploration. We are aware of his contribution to restore the glory of the past and to infuse the present generation to live up to the ideals of great ancestors. The Hon'ble Education Minister who is a scholar of repute is keen on early implementation of the plan for unearthing and preserving the submerged shipwrecks which are a treasure house of ancient culture. He is also keen on bringing to light the antiquities of sunken Poompuhar. The Department of Culture is fortunate in having Dr. Avvai Natarajan as its Secretary who can push things through.

Perhaps very few have realised that thousands of ships that carried goods and men were lost in Indian waters due to natural calamities. Each ship is an epitome of the society that built it. By retrieving atleast a few of the historically and culturally significant ones, we will be able to reconstruct the maritime history of India and trace the cultural interaction between various ocean countries of the world. By occupying a strategic position in the Indian Ocean India has played a major role in spreading Indian art, letters and culture to South Asia and the far west right from the days of the Indus Valley Civilisation to the present day. The Harappans were the first to build a unique dock for handling cargo on the Gujarat coast at Lothal 4,300 years ago. Their ships visited Sumerian and Persian Gulf ports. Their contribution to communication of thought through the first phonetic script which spread to

Bahrain also is of immense significance. Who were these Harappans? This question has baffled many scholars. A careful study of the skeletal remains of Harappa, Mohenjo-daro, Lothal, Kalibangan and Rupar shows, that besides the groups normally called Aryan, there were other ethnic groups also. In fact the population of Indus towns and cities was cosmopolitan in character and the religious practices of the population were rich and varied. Some were fire-worshippers as can be made out from the fire-altars of Lothal and Kalibangan and they also offered sacrifices. There were other groups who worshipped animals such as the tiger, buffalo, bull, rhinoceros etc. but it must be said to the credit of the Harappans that they brought about the cultural integration of different religions and perhaps, ethnic groups. This is not imagination. A whole series of seals from Mohenjo-daro and Harappa depicts integration of animistic groups into the higher Fire-worshipping group which itself recognised the Fire God as representing the visible forms of energy static Sun, Fire and Lightning. Our history books must highlight the integration of ethnic and cultural groups from the very dawn of civilization instead of writing about the Aryan destruction of Non-Aryan cities which is a myth. There is no archaeological evidence for the so called Aryan invasion. As I said earlier, for the flowering of the Indus Civilization several groups did contribute, but the unity and integrity of the people is remarkable for the age. This unity in diversity has survived through the Vedic, epic and later periods.

My decipherment of the Indus script is now being gradually accepted in the academic fields, especially in Universities and Research Institutions of repute in India and abroad, although there is a vociferous group that is reluctant to accept it. The evolution of the Indus script into Brahmi has become clear from the Bet Dwarka inscription written in evolved Indus Script in the mid- second millennium B.C. At the other end we have the Tamil Brahmi script datable to the third century B.C. The missing link, I hope, will be provided by the Megalithic culture in the South. The reason for entertaining this hope is that the signs inscribed on Megalithic pottery are closer to Late Indus Script, and megaliths are now datable to 1380 B.C. in Karnataka. My excavations at Paiyampalli in North Arcot District gave 600 B.C. date for Megalithic levels and 1200 B.C. for Neolithic, but both the cultures have earlier origins. I am mentioning all this because gradually we have to trace the cultures of the second millennium B.C. in the region of Megalithic fields of Tamil Nadu and neighbourhood. We have some clues to Neolithic - Chalcolithic cultures of this region at Banahalli discovered by me and excavated by Narasimhiah. The latest find is a unique bronze deer very similar to the figures painted on central Indian Chalcolithic pottery. This Bronze comes from Kendatti in Kolar District where there are Neolithic - Megalithic sites and a Chalcolithic site, also. In view of the fact that the gold of Mohenjo-daro, Lothal etc. came from Kolar region, South India could not have been a cultural

backwash. If we carefully study ancient Tamil literature some clue to the hoary past can be had.

Literary and Archaeological Evidence for Pre-Sangam Culture

The first archaeological evidence for the existence of a Pre-Sangam Period emporium of trade on the east coast was obtained in the course of my excavations at Kaveripattinam in Tanjore District where a third century B.C. brick wharf was uncovered in one of the ancient channels of the River Kaveri. Other important finds include a Buddha vihara and a reservoir. Subsequently, Dr. K. V. Raman and K. V. Soundara Rajan also excavated the site. Indigenous sources for the early history of Tamilnadu, are *Silappadikaram* and *Manimekhalai* besides the *Tolkappiyam* and Asokan inscriptions. Tolkappiyam the most comprehensive grammer is assigned by Prof. S. Ilakkuvanar to 7th century B.C. while others give it a later date. Be that as it may, Tolkappiyar was undoubtedly a great poet, linguist, historian, philosopher and sociologist besides being a grammarian. What interests a marine archaeologist is that Tolkappiyam is said to, "have been introduced for the first time into the Royal Court of Nilan Tharu Thiruvin Pandiyan who ruled immediately after the great deluge which had submerged Lemuria, an extensive land south of Cape Comerin stretching out far into the Indian Ocean". When did this calamity befall the southern extremities of the Peninsula; and what was the

cause? The legend about the destruction of Poompuhar by sea seems to be a subsequent event. An urgent need is the reconstruction of the history of South India in general during the Pre-Mauryan days. We know that mining and metallurgy as well as irrigation are two important industries of the Megalithic folk; the third one could have been overseas trade which presupposes boat-building and maintenance of sea and river ports. From what little evidence we have been able to gather from very limited offshore-survey, about which I shall have occasion to say more, it appears that the sea has encroached on land at an enormous rate during the last 3000 years or more. Have the habitations of these Pre-Mauryans been swallowed by the sea? This is what Marine Archaeologists intend investigating, by adopting the most modern techniques of underwater search.

Methodology

As Marine Archaeology is a new inter-disciplinary study so far as Archaeologists, Geophysicists, Marine Geologists and Scientists of related disciplines such as remote sensing in India are concerned, a quick glance at the technique of search may be necessary. All offshore exploration must take note of evidence on shore, for example coastal Geological features, erosion rate during the last couple of hundred years atleast as can be gathered from old survey maps. Geological features of sea bed, information gathered from Archival and literary sources and oral tradition regarding submergence of ports or near by islands or sinking of ships should be taken note of,

Pottery and other artifacts from onshore survey are very important for ascertaining the date while the drainage system may give a clue to the location of ports etc. George Bass and other marine archaeologists are of the view that sonar survey may not be of much use in underwater search for wrecks. In the absence of information from sailors and sponge divers, we in India, have to depend on ancient texts and Geophysical and Magnetic Surveys. The first Geophysical Survey by deploying Side Scan Sonar, Echo Sounder, Sub-bottom Profiler and shore-based electronic radio position-fixing system was undertaken by the National Institute of Oceanography in 1982 with the collaboration of the Tamilnadu Government, seaward of Kaveripattinam, and 17 "objects of geometric shapes of one to two metre height" were recorded by the Sonar instruments. But this could not be followed up by visual and optical survey so much so that it was not possible to confirm or deny whether they were man-made objects. The Marine Archaeology Unit established in National Institute of Oceanography in 1981 started a vigorous course of training archaeologists and technicians in diving, underwater exploration, survey and photography. We had to develop a technique of target search and excavation suitable for Indian waters where visibility is very poor, swells and currents too many. Even then within 3 years we have reached a standard of underwater search and photography which is equal to the international standard, a fact acknowledged by the foreign experts who participated in the First and Second Indian Conference on Marine

Archaeology of Indian Ocean Countries organized by us in 1987 and 1990 respectively. All the findings of our underwater search and excavations in Dwarka, Tranquebar and Goa waters were discussed by the delegates and the three publications brought out by the Marine Archaeology Unit and the Society for Marine Archaeology have been very well reviewed by experts in reputed Indian and foreign Journals and Newspapers. I must offer a few words about the Recent Underwater Explorations in Dwarka and Poompuhar Regions.

I summarise here the results of the explorations of Dwarka during the last seven years. The details are available in :

(1) Progress and Prospects of Marine Archaeology in India 1987

(2) Marine Archaeology of Indian Ocean Countries, 1988, and

(3) Journal of Marine Archaeology 1990

The discovery of the submerged city of Dwarka has set at rest the doubts expressed in certain quarters whether the legendary city ever existed. When you see the Video film you will be convinced that it did exist. The fort walls, gateways flanked by bastions and the port installations built after reclaiming land from the sea when the sea level was atleast 10 metres lower, support the description of the plan of the city mentioned in the epic. The erection of protection walls on dry boulder foundation in waterlogged areas was an

important measure of reclamation. The submergence of the city is now proved beyond doubt. The use of seal (mudra) as an identity card to which the Harivamsa makes a reference is attested to by the small but exquisitely carved Late Indus type seal from the under-sea excavation of Bet Dwarka which was a satellite town of the city State of Dwaravati or Darukavana. The high level of civilization of Dwarka of Mahabharata times can be guaged from the literacy of the society, its town-planning, technological advancement made in metallurgy with the introduction of iron and above all, the vigorous overseas trade which is indicated by the large three-holed triangular stone anchors of the type used in Syria and Cyprus in the 14th century B.C. The date of the Mahabharata war may now be fixed at 1500 B.C. on the basis of the Thermoluminiscence date of pottery from Bet Dwarka. A Pre-Dwarka township *viz.* Kusasthali to which the epic makes reference seems to have existed in Bet Dwarka island which was connected in ancient period with the mainland when the sea level was lower. The submergence of Dwarka referred to in the Mahabharata is now an established fact.

After the success achieved in locating and excavating the legendary city of Dwarka, the Marine Archaeology Unit resumed exploration of Tranquebar (Tarangampadi) and Poompuhar regions in May 1989.

The Marine Archaeology Unit in collaboration with the Regional Centre of the National Institute of

Oceanography at Waltair, carried out Geophysical Survey and found a number of "circular objects" in seven mts depth and some others in 11 mts. depth Mr. Vora had reported earlier some objects in 18 mts. depth. In March 1990 we came across what appeared to be a beach rock. After considering all these facts, it was decided to examine some of the circular objects manually. The diver-archaeologists excavated one of them about 500 mts. seaward of the Temple at Tranquebar. The barnacles, and other sea organisms settled on the circular monument rendered difficult deeper excavation. After removing a part of the pebbly covering the larger boulders used in the inner and outer circles of what can be termed as "Cairn circle of Megalithic affinity" came to light. The pottery from the circle consists of Coarse Red ware and Grey ware. The Cairn measures 10.5 mts. along the longer axis and six mts. along the shorter axis. Two courses of boulders could be traced in the sea bed, but there must be more of them, which was not possible to be excavated owing to poor visibility, swell and current. The pottery has been sent for Thermoluminiscence dating. In this connection it is necessary to mention that the Megalith of Komaranahalli in Karnataka has been dated 1380 B.C. The Megalith at Paiyampalli in North Arcot District of Tamilnadu is assignable to 600 B.C. and elsewhere the date ranges from 300 B.C. to 300 A.D. The Cairn Circle of Tranquebar seems to be earlier because it is at seven mts. water depth in the sea and below it is the beach rock of inter-tidal origin. The Cairn circles submerged in the sea extend upto Vanagiri. At Kaveripattinam, the

excavation by the author in the locality known as Manigramam yielded Rouletted Ware and Megalithic pottery.

Besides the Megalithic remains and the beach rock below, the geophysical survey has revealed submerged river valleys seaward of Porayar and Nandalar estuaries The deeper waters opposite Vanagiri where the Kaveri joins the sea are likely to yield evidence of submerged river channels. T. C. S. Rao's seismic profiler surveys in the Bhimilipatnam and Pudimadaka Bays on Andhra coast brought to light submerged cannons Palaeobeaches are noticeable in Poompuhar, and Tarangampadi in water depths of 8 to 11 mts. It is not too much to expect here human artifacts of prehistoric age. The sites covered by the sediments in low energy environment, that is in former estuaries, lagoons and bays, are better preserved Tamilnadu and Andhra coast are potential areas where not only early historic relics but also megalithic, neolithic and even palaeolithic implements can be expected in palaeobeaches. I must admit that in the near off-shore regions of Tamilnadu, the diver can hardly see anything, a preliminary high resolution seismic profiler survey was found essential and this was done in March 90. The result is the discovery of beach rock and submerged megaliths which establishes the usefulness of Geophysical survey for underwater archaeological investigations.

An important find of this season has been the shipwreck about 4.5 km., seaward of Vanagiri at 19 mts

water depth. The heavy growth of vegetation and sea organisms will have to be removed when the sea is calm. So far, our divers have been able to collect a few samples and record the visible portion of the bow of the ship which seems to be steel-hulled. The Marine Records of the Archives mention a number of ships of the British, French, Portuguese and Dutch lost in naval battles and storms. Some were lost near Kanyakumari, some near Cuddalore and a few near Tranquebar and Madras. One of them carried military hardware. The Indus which carried the famous Barhut Sculptures sailed from Madras and was lost in Sri Lankan waters. Efforts are on to come to an understanding for the recovery of this treasure of Buddhist art. Excavation of a wreck needs sophisticated equipments especially if it is in deep sea. Fortunately except the Lakshadveep wreck, most others are in shallow waters, and the Marine Archaeology Unit is geared to retrieve wrecks.

Training

We have some important clues to submerged ports and cemetries on the east coast and we plan to get a profile through intensive underwater search and excavation from Chinnarpet to Poompuhar. The sea being very rough along this coast for most of the time the field operation will be limited to certain fovourable periods only and photographying relics may be difficult. But intensive training in diving, underwater photography and sound knowledge of archaeological objects and their environment, the process of giving

first aid to them and ability to analyse data for scientific purpose are needed. I am sure the Government of Tamilnadu will get the archaeologists and technicians trained and procure the necessary equipments to establish a Centre for Marine Archaeology. The Marine Archaeology Unit will train the new recruits and also jointly carry out exploration.

I hope the learned scholars will in the course of this Seminar give us guidelines for specific areas of research both onshore and offshore.

In the end I express my grateful thanks to the Hon'ble Education Minister for taking such keen interest in preserving the underwater heritage of the country. My thanks are due to Dr. Avvai Natarajan but for whom I would not have been involved in the project for Marine Archaeological Research in Tamilnadu. I must also express my thanks to Dr. Kasinathan for the arrangements of this Seminar made at short notice.

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Welcome Address

by

Natana. Kasinathan,
Director,
Department of Archaeology, Madras.

We, the Tamilnadu State Department of Archaeology and the National Institute of Oceanography have great pleasure in welcoming you all for this august function i.e. the inaugural function of the seminar on Marine Archaeology of Tamilnadu. First of all we express our sincere gratitude to our Honourable Education Minister for having kindly accepted to grace this memorable occasion. Inspite of his tight schedule for attending a number of Administrative works, he is very kind enough to spare some time for inaugurating this seminar by which he gives a fillip to the Marine Archaeologists for venturing in their endeavour of under sea exploration off the shore of Poompuhar.

Our Honourable Chief Minister of Tamilnadu had announced in his glorious budget speech that the under sea exploration would be undertaken with the co-operation of the National Institute of Oceanography, Goa. As a follow up action Dr. S. R. Rao, the Emeritus Scientist and eminent Archaeologist has prepared an ambitious proposal and submitted it to Government through the State Department of Archaeology, keeping

in view of the results derived from the preliminary survey carried out off the shore of Poompuhar in the year 1982.

Dr. Avvai Natarajan, Secretary. Tamil Development-Culture Department, who is himself a profound scholar, is evincing enormous interest in retrieving the submerged city of Poompuhar. He is taking all necessary steps to get the proposal accepted and sanctioned considerable money by the Government.

It is hoped that the Honourable Education Minister who is an erudite and experienced Professor of Tamil and a crusador for reconstructing the cultural heritage of Tamilnadu would definitely direct us to undertake this exploration by allotting sufficient fund.

In order to gather more information about the cultural wealth emdedded under the sea and to get valuable advise in our earnest endeavour to expose them, this seminar has been organised. Scholars from various disciplines are invited to present valuable research papers on the submerged city of Poompuhar and its role in moulding the cultural arena of Tamilnadu.

Nearly, twenty scholars, some of whom from other states, are participating in this seminar. In addition to the eminent scholar, Dr. S. R. Rao, Dr. T.C.S. Rao from Visakhapatnam, Dr. Margabandu, Dr. Narasimhayya, and Dr. I. K. Sharma from Archaeolagical Survey of India, Delhi, Dr. Victor Rajamanickam, Dr. Y. Subbarayalu and Dr. Rajan from Tamil University, Thanjavur,

and Dr.K.P. Aravanan from Pondicherry University are participating. The scholars who are not directly connected with archaeology like Dr. Kalaikkovan of Trichy, Thiru. Thyagarajan and Rajasekaran of Poompuhar have also responded to our invitation and would present valuable papers. Some young and enthusiastic scholars from the State Department of Archaeology, are also expected to throw some new light on the position of Poompuhar in ancient Tamilnadu.

Some stalwarts in the archaeological field like Dr. K.V. Raman, Professor and Head of the Department of Ancient History, Archaeology, Madras University and Dr. C. E. Ramachandran, Professor and Head of the Department of History of the same University and Dr.R.Nagaswamy, former Director of the State Department of Archaeology, have all along been an inspiration and guiding force to us to conduct this seminar and to start the Under Sea Exploration at Poompuhar.

Hence, I feel that it is my bounden duty to extend hearty welcome to the Hon'ble Education Minister, the Secretary, Tamil Development-Culture Department, Dr. S. R. Rao, Dr. C. E. Ramachandran and you all to this inaugural function of the Seminar on Marine Archaeology and request you one and all tomake the function a grand success.

Marine Geophysical Surveys off Kaverippattinam for Archaeological Investigations

by

T. C. S. Rao,

National Institute of Oceanography, Visakhapatnam.

Marine geophysical surveys are carried out in March, 1990 in the offshore regions of Tranquebar and Poompuhar covering the area between 5 and 15 mts. water depth. In addition to several isolated objects, a continuous belt of small objects extending parallel to the coast on eight mts. water depth is recorded for a distance of more than two km. between Chinnakudi and Chinnamedu. From the diving operations, it is confirmed that they correspond to heaps of shells (Gasteropods) with their relief varying from few centimeters to half a mtr. At 11 to 13 mts. water depth several isolated objects of strong reflectivity are recorded off Poompuhar and also off Tranquebar. A shipwreck is also recorded off Chinnamedu but no detailed investigations are carried out since the object is covered with broken pieces of fishing nets and barnacles. Many of the objects recorded at 7 to 8 mts. and 11 to 13 mts. water depth both off Tranquebar and Poompuhar appear to correspond to man made structures.

More detailed and systematic surveys are to be carried out to map all these features and to undertake the archaeological investigations.

Side Scan Sonar and Echosounder surveys are carried out from 17th to 25th March, 1990 in the offshore region between Tranquebar (Tarangampadi) and Poompuhar to search for the underwater objects/structures of archaeological importance. These surveys are undertaken between 5 and 14 mts. water depth both parallel and perpendicular to the coast. Plans were also made to carry out the seismic profiler and magnetic surveys but they could not be carried out due to rough sea conditions and shortage of time.

Among the several objects recorded in the Side Scan Sonar records, those recorded at 7 to 8 mts. and 11 to 13 mts. water depth appear to have greater significance from the geological and archaeological point of view. Between Chinnankudi and Chinnamedu (Chinna Vanagiri) scattered objects of different sizes are recorded continuously for a distance of more than two km. extending along the coast at eight mts. water depth. From the diving operations, it is confirmed that they are the heaps of shells, long spiral type (Gasteropods) and they project over the ocean bed to a height of about half a meter. These shells require shallow water environment and hard substrata for their formation and growth. Because of poor visibility the divers could not make any digging operations to confirm the type of material

present beneath these shell heaps. Since they occur continuously at a particular depth of eight mts. and extend more than two km. length parallel to the coast, it is suspected that the hard substrata beneath these shells could be a man made structure constructed when this area was exposed and later got submerged possibly due to rise in sea level. Alternatively, Gasteropods are also found in warm region of comparatively shallow water of very less salinity, preferably the Estuarine environment. Dredging operations are required to know the details of the nature of the substrata beneath the shells in this area.

In addition to the lineated shell structure, isolated groups of objects with strong reflectivity and a sand bar, indicated as a topographic high of about one mtr. relief in the echosounder records are also recorded at the northern end of Chinnamedu at about seven to eight mts. water depth. A circular object of considerable size and strong reflectivity is also recorded at about eight mts. water depth at the southern end of Chinnamedu.

At 11 to 13 mts. water depth several isolated objects of different sizes are recorded. These are more prominent particularly between Poompuhar (Vanagiri) and Chinnamedu. Some of them circular in shape while others are rectilinear or linear. In the absence of any topographic undulations as evidenced from the echograms collected in this area, these images which are of very strong reflectivity may correspond to man made objects/structures that are scattered over the ocean floor.

As per the information obtained from the local fishermen, a ship wreck is suspected to be present at about 19 mts. water depth off Chinnamedu. Side Scan Sonar surveys carried out in this area recorded an object that resemble a ship wreck. From the Sonograms it appears that this object is present as two separate pieces. Diving operations are carried out and confirmed that a large object is lying over the sea bed with a pillar of about two mts. height projecting above the ocean floor. The object is fully covered with broken pieces of fishing nets and barnacles grown over it. Unless the barnacles and fishing nets are fully cleared it is not possible to assess the size and shape of the object. From the images recorded in the sonographs it is suspected that some more ship wrecks could be present particularly between Poompuhar and Chinnamedu. Some images in the sonographs recorded with long shadow at about 13 mts. water depth appear to correspond to submerged ship wreck.

Off Tranquebar, the Side Scan Sonar recorded several objects at seven to eight mts. water depth off Masilamani Temple. Fairly large size objects are also recorded at six to seven mts. water depth of the southern end of the Tranquebar Museum. Some isolated objects of fairly large size are also recorded at 11 to 12 mts. water depth off Masilamani Temple and Museum off Tranquebar. The diving operations carried out off Masilamani Temple at seven mts. water depth have revealed the presence of rocks arranged in circular fashion which may correspond to the burial grounds of

that period. Detailed investigations could not be carried out due to rough sea and poor visibility.

Side Scan Sonar and Echosounder surveys are also carried parallel to the coast between five and nine mts. water depth upto about five km. south of Masilamani Temple. The Sonographs and Echograms have recorded the extension of submerged river valleys of Nandalar and Uppanar rivers upto six mts. water depth. These river valleys got covered up by sediments beyond seven mts. water depth. Opposite these two river mouths, objects of considerable sizes and strong reflectivity are recorded at seven and eight mts. water depth.

From the preliminary surveys carried out, it could be provisionally inferred that the human habitation was quite active upto about present eight mts. water depth in the ancient period. Many of the objects recorded in this area could correspond to the man made objects/structures which are later submerged due to transgression of the sea.

Similar to seven to eight mts water depth, the area between 11 to 13mts water depth also show the presence of several isolated objects of considerable size and strong reflectivity all along the coast between Poompuhar and Tranquebar. At several places all along the east coast and west coast of India, coarse sand regions are located at depth between 20 and 30 mts. Investigations on the occurrence of these coarse sand patches at these depths have lead to the conclusion

that these coarse sands are deposited during the still stand at about 7000 to 8000 years B.C. If the objects recorded at 11 to 13 mts. water depth are found to be man made structures, it may provisionally be inferred that they may belong to the age much older than those recorded at seven to eight mts water depth.

All these surveys are carried out at random and without proper position location system. In order to map those objects accurately and to assess their nature it is important to carry out detailed and systematic geophysical surveys comprising of Side Scan Sonar, Shallow Seismic Profiler, Magnetometer and Echosounder with close profile interval and proper position location system. It is estimated that at least 30 days are required for mapping the area between Chinnamedu and Poompuhar from 5 to 20 mts. water depth and to make some preliminary investigations such as dredging and diving before undertaking detailed archaeological investigations. It is also essential to make necessary arrangements to stop the fishing activity in this area during the survey period because the fishing vessels including the catamarans not only obstruct the survey operations but also produce false images in the sonographs and spurious anomalies in the Magnetometer readings.

From Peddavegi to Poompuhar

(Cultural contacts and explorations on sea routes)

by

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The long South-east coastline is dotted with several convenient anchorages during the ancient period. Several port towns developed as a consequence of brisk trade. The patrons were religious propagators too. The expansion of Buddhist and Brahmanical religions to the sealocked lands of the South-east Asian countries and Far East was amply attested through art objects, epigraphs and accounts of foreign travellers. The famous manual of the first century A.D. Periplus of Erythrean Sea, described the Indian ocean with astonishing precision. Ptolemy mentions port towns on south-east coast. Extending beyond Tamralipti even, important port towns in a descending order were Dosarne (Dhauli, Orissa), Kainapara (Konarak), Palura (Gopalpura District, Orissa), Kalingapatnam (near Salihundam, District Srikakulam), Vengipura (Peddavegi), Maisolia (Machilipatnam, District Krishna (A.P.), Utukuru-Krishnapatnam, *Malange* or *Kadal Mallai* (Mahabalipuram) also Dugarajupatnam, (Nellore District (A.P.), Mylarpha (Mylapore, Madras), Poduke or Poduce (Arikamedu, Pondicherry), Sopatna (Marakkanam), Kaberis (Kaveripumpattinam), Nikam (Nagapattinam), Kayalpattinam,

Periapattinam, Colchi (Korkai) and Comari (Kanya Kumari) at the tip of South India.

During the Mauryan times the navy appears to have been streamlined. Kautilya refers to *Navadhyaksha* who regulated the trade through waters. Traders and Buddhist monks worked together and spread both religion and commerce.

It is important to note that at Dharanikota excavations (District Guntur), a wharf and an excavated navigational channel connected to the river Krishna came to light. The glass objects of various colours and millifiori technique, ear-rings and bangles of Indo-Greek origin were found in the pre-Roman levels. The brick wharf lined with wooden posts unearthed by S.R. Rao at Kaveripumpattinam was like the above Dharanikota port, an important emporium of trade on the southeast coast. Both had close exchanges, commercial and religious, right from third-second century B.C. to third century A.D.

The Mauryan impact and early Buddhism at the centres like Dharanikota-Amaravati, Bhattiprolu and Vaddamanu, clearly indicate the brisk exchange between Southeast coast on the one hand and Srilanka on the other which received Buddhism right from Asokan times. Nellore district and the Pennar river are taken as the farthest line of the Mauryan empire in South. Recent evidences at Duvvuru and Alluru, reveal the existence of early fortified towns with silver punch-marked coins of the Mauryan times.

In Krishna-Godavari valley, the hill monastery of Guntupalli was known as *Mahanagaparvata* being a seat of *Mahanaga* King Muchalinda. What is more interesting is the monastery of Tissa, the ancient Magawa, in Southern Srilanka, which has its name as *Mahanaga Stupa* decisively due to its close link with the *Mahanagaparvata* of Guntupalli right from Mauryan times.

I. Archaeological Discoveries in Tamilnadu Coast

The earliest historical period, as traced at the excavations at Kanchi-IA (Palar basin), Kaverippumpattinam, Uraiyur (Lower Kaveri) and Korkai and Alagarai, was assigned to circa 3rd-1st centuries B.C. Kanchi has also given two C14 dates, KCM-1, 480 B.C. ((PRL-22), and another at KCM-4 235 B.C. (TF 1216). The finds are mostly, fine Black-and-red ware and brick structural remains which do not appear to belong to a stupa. But at Kaverippumpattinam, in second century B.C. levels, along with Black-and-red ware, a structure of what appears to be a wharf has been exposed. The wood remains were C14 dated to 316 $\pm$ 103 B.C. (TF-207).

We are unable to give a convincing explanation as to where the Asokan built brick *stupas* of Kanchi and Kaverippumpattinam have been? Perhaps a *bigger* and systematic excavation of the early phase at these

sites might provide an answer. Kanchi was the most vividly known religious centre, a richly colourful and civilized city, (*nagareshu kanchi*) and even the emperors as well as intellectuals, hailing from this city gained recognition after its great name as *Kanchipuraka Mahabhasya* of Patanjali and Kancheyaka Visnugopa in Allahabad prasasti. There is no doubt that in circa 2nd century B.C. several powerful kings were ruling in the south-east coast of Tamilnadu and the Mahameghavahana king Kharavela of Orissa speaks of a confederacy of the Tamil countries *(Tramiradehasamghatam)* during his 13th regnal year, with whom he had confronted.

Han annals speak of close maritime contacts, apart from religious, between China and South-East coast from the time of Emperor Wei (185-140 B.C.). Apart from indigenous accounts, we learn from a Chinese text Chi ien Han Shu, dated to circa first century A.D. that Kanchi is called Huang-Che (A D) and the Chinese Kings sent presents to the ruler of Huang Chi The famous Kanchi silk industry may have originated out of these overseas contacts. Periplus confirms about the Chinese silks reaching *Damirika* having come from the overland route (North China to Lhasa). Lokesh Chandra held that the name '*Manimekhalai*' is due to the overflowing riches at the city of Kanchi with which Chinese traded in a variety of jewels and pearls as early as second century B.C.

II The Cultural and Commercial Exchanges on the East Coast

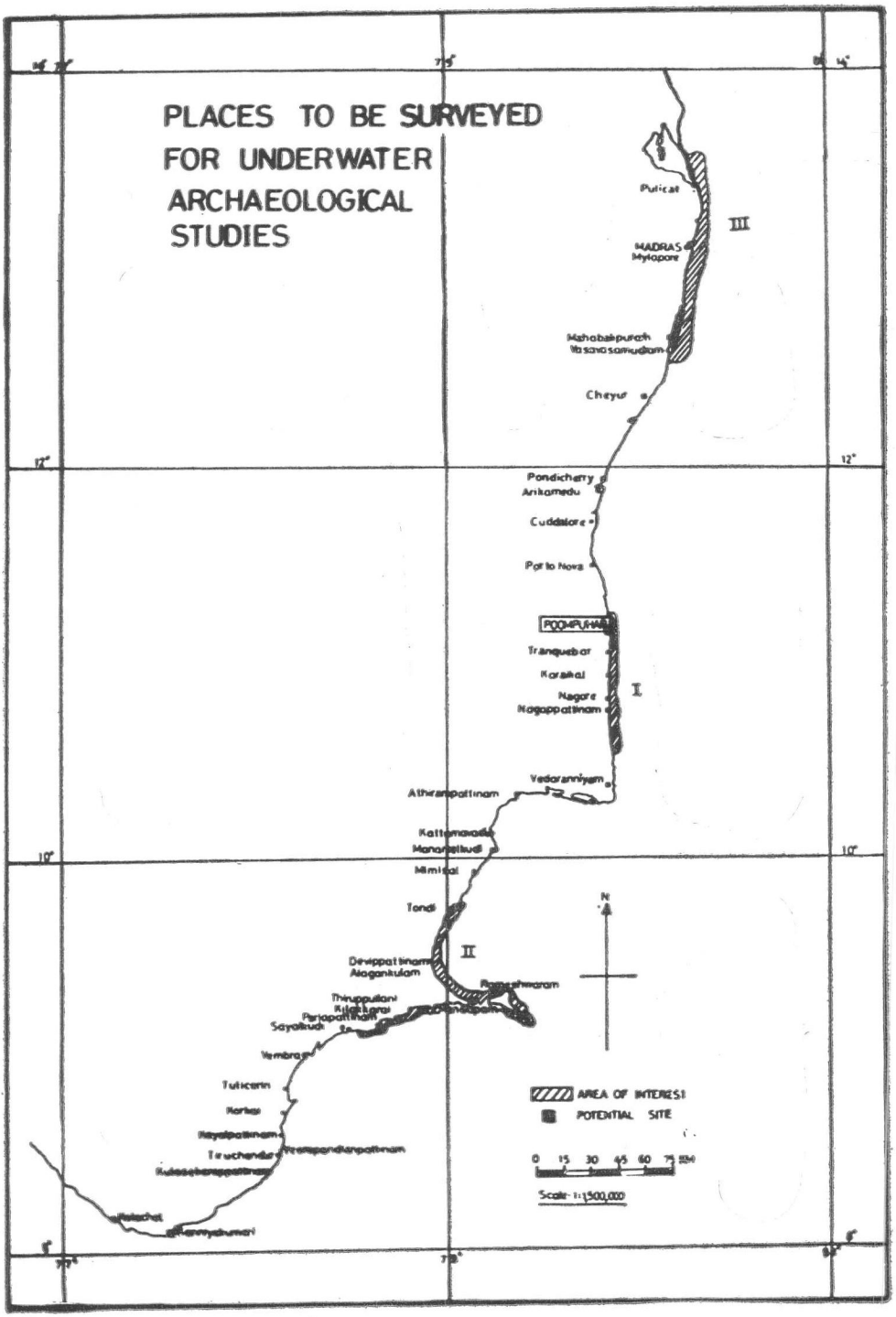
A detailed examination of the structural remains unearthed at the excavations at Kanchi and Kaverippumpattinam suggests that during the 2nd-3rd century A.D. there was a great movement of Buddhist monks and teachers from *Andhrapatha* to the Tondaimandalam through the east coast. This movement was backed by flourishing trade. The *Mahasanghika* schools, like *Caityaka*, *Sailas* and *Mahaviharavasins* with their epicentres at Sriparvata (Nagarjunakonda) and Dhanyakataka captured the intermediary regions on the east coast on their way to Ceylon and beyond. As a result, we can see clearly that at Kaverippumpattinam and Kanchi excavations, more specifically Kaverippumpattinam, not only Buddhist *viharas* and *stupas* but also cult objects like Buddha *padas* of Palnad lime stone, metal images of Buddha for personal worship and *Caitya grhas* of the same type as at Nagarjunakonda-Amaravati, have come to light. There seems to be a virtual transportation of cult objects and pillars of Palnad limestone as seen from the ruins of square pillar stumps at the frontage under the granite floor slabs of the smaller west facing Rajasimhesvara grha at the Shore Temple complex. There are traces of brick structures and lime stone workings over the back of the hill containing the large mandapa caves at Mahabalipuram itself. A limestone panel of the Nagarjunakonda type was also reported from a

temple at Royapettah in Madras. In the pre-Pallava period Kanchipuram area was perhaps under the later Satavahanas, their allies Naga kings and subsequently came under the Ikshvaku influences, though not political but of Buddhist and Brahmanical cults.

III. New Evidences from Vengipura

Excavations at ancient city of Vengipura, (Ptolemy's Banagouran) now a sprawling village called Paddavegi, 12 kms. south of Eluru town in west Godavari district of Andhra Pradesh have yielded certain significant art objects and inscriptions which shed new light on the routes of cultural contact between North-west India, and coastal Andhra and Tamilnadu.

The Salankayanas and *Salankayanaka* i.e. the country of the Salankayanas were first mentioned by Panini (6th century B.C.). It is quite probable that some members of this *gana* migrated from their North-west homeland to the lower Ganga valley during 2nd-3rd century A.D. as we came to know of a Salankayana minister (*amatya*), named Bhutila stationed at Kausambi. However, 'Salakenois' find mention by Ptolemy (140 A.D.) as rulers of the country north of *Maisolia* on the south-east coast. Vengi was their seat (*adhisthana*). A clay sealing with the legend *Salankayanasa* in 2nd century A.D. in Brahmi from Adam Excavations (Taq. Kuhe, district Nagpur), conclusively proves that 'Salankayanas'



The map showing the important Ancient Ports and Archaeological sites.

STATE DEPARTMENT

were in powerful position and in touch with the rulers of Vidarbha region during the later Satavahana times.

(a) Inscriptions

From Brahmi epigraphs of 2nd century A.D., we come to know, for the first time, a king named Kakichi, (*Rano Kakichikaya maharajasa*), and certain monks and nuns connected to *Mahanagaparvata*, the hill monastery of Guntupalle which is 27 km. north of Vengipura. This king is stated to be a monk internee *(antevasaka)* at the Buddhist *Sangha* of the place. Who this ruler kakichi was? where from he has come to Peddavegi? Do we find in him the origin for the place name Kakinada or was the name ending *Kaka* or *Kaki* denote the daughter as in Janaki from Janaka? In Silappadikaram we find a reference to the city named *Kakandi Nagara* i. e. Kaverippumpattinam. King Kakichi might be its founder or ruler and being a Buddhist might have paid a visit to Vengipura and caused gifts to the *Stupa* and *Sangha* of this place.

(b) A Carnelian Intaglio

An outstanding discovery from Peddavegi is a carnelian intaglio. It is an oval shaped locket measuring 2x2.6 cm. made out of transparent carnelian stone over which a female deity is carved. She holds in her right hand a lotus while the left is at *Kati* which is gracefully bent in *abhanga*. The

elongate neck, sturdy shoulders, sumptuous breasts slender waist and prominent navel refelect her beauty. The be-jewelled crown on her head is like a *tiara* with twigs and festoons. The highly transparent silken frock and trouser resemble those found depicted on the Indo-Sythian or Greek coins and seals datable to 1st cent B.C. or A.D. from North-west India. But the *hara* in the neck, wristlets, armlets, *makara* and patrakundalas characterising the right and left ear-lobes, reveal the Indianness of the deity, which appears to be Lakshmi or a goddess (amba) presiding over the city *(Nagara-devata)* of Vengipura. What is more interesting is such an intaglio of Carnelian was reported from the excavations at Jetavana monastery (3rd century A D.), in Anuradhapura, Sri Lanka. It appears then that the tradition of worship of protectness of the city or monastery *(Durga* or *Amba)* came from the Gandhara region to Peddavegi and Sri Lanka as well.

(c) A Lime Stone plaque depicting Siva-Parvati.

Among the other art objects, an important find is a lime stone plaque (12x9 and 2.1 cm. thick), depicting in relief the devine couple Siva-Parvati in *Sukhasana* over a *manchaka adhisthana* (*Sukhasinam Sahomaya*). This is the earliest art object (3rd-4th century A.D.) from South India portraying *Siva-Parvati* in human form and clearly anterior to the known depictions of *Somaskanda* among the early Pallava reliefs. The symbolic-anthropomorphic

plaques obtained from Madugula, Kunidene (Guntur district) and Peddamudiyam (Cuddapah) are later in point of time. The head dress, style of depiction and posture of the Gods bear closeness to Saka-Kushan examples of Mathura. Smaller cult plaques of limestone depicting Mahishamardini, *Srivatsa Sri* are similarly early examples having parallels in Kushan art. Some more evidences may be taken note of here. According to Mahavamsa king Dutthagamani (Circa. 101-77 B.C.) of Ceylon celebrated with pomp the laying of great *stupa* Many monks and kings from foreign lands reached Ceylon and one Mahadeva from Pallavabhogga with a large number of monks, and one *yonamaha-Dharmmarakshita* from Alasanda (Alexandria) reached Sri Lanka S. Levi associated 'Pallavas' with Pahlavas, i.e. Parthians and according to Geiger *Palava* is a persian name, the sanskrit *Pallava* or Pahlava and *Bhoggam* means a feudal domain or landed estate. This land is regarded as the present day *Palnadu* i.e. *Pallavanadu* in Guntur-Prakasam districts of Andhra where from early Pallavas of the Pre-Simha Vishnu line (of copper plate charters), have been ruling soon after the Ikshvakus of Vijayapuri. It is very likely that these Pahlavas and monks from North-west tracked down right upto Srilanka during the early centuries B C. and A.D. touching the Buddhist epicentres of Vaisali, Srvasti, Rajagriha, Nalanda, Sarnath, Tamralipti down to coastal Orissa and Andhradesa. In fact Dhanyakataka (Amaravati, Dt. Guntur) was an emporium of trade on the South-

east Coast and early Buddhism right from Mauryan times. Sriparvata Vijayapuri (Nagarjunakonda) was a center of Mahayana Buddhism during 3rd-4th centuries A.D. and had close religious as well as commercial contacts, both inland and overseas, with the Gandhara country at one end via coastal port, towns of Andhra-Tamilnadu on the way to Sri Lanka.

The Periplus Maris Erythraei clearly points out that mariners of the Roman empire visited Scythia during the Parthian rule. It is clear therefore that the ruling family of Salankayanas, like Pallavas, migrated from North-west during the early historical periods. Finally we may take note of a momentous discovery made by Prof. B.N. Mukherjee of numerous seals and terracotta sealings bearing Kharoshti-Brahmi legends from the sites like Chandraketugarh, Bangarh, Hadipur and Tamluk on the Bengal Coast. These circular sealings of terracotta depicted a wide variety of sea-going vessels and boats carrying grains, corns and other cargo. The legends refer to voyages in different directions and not only objects of trade but religious banners, and symbols depicted over them. Prof. Mukherjee held 'in early centuries of the christian era a certain community or several communities migrated from the zone of *kharoshti* and North-western *Prakrit* to one are more than one area in the territory of lower west Bengal'. We may go a little ahead and state that this sea-trade

and cultural intercourse has very much influenced the entire east coast right upto Kanyakumari. The nearer coastal Andhra and Tondaimandalam perhaps had more impact-the Satavahanas and their successors, Salankayanas issued ship type coins, spread not only the Brahmanical cults and Mahayana Buddhism further south and beyond through the Sea route.

A recently discovered rock inscription from Tamilnadu (Pulankurichchi, Ramanathapuram district) refers to the chief donor as *Kadal-agapperum-padaittalaivan*, obviously a captain of a big naval force during the year 192 of Tamil era of the founder king Chendan Kurran of the Kalabhra family. Though this record is assigned to circa fourth century A.D., Kalabhras had originally come to the south by sea and the king Chendan Kurran probably lived in the second century A.D.

According to an interesting analysis of Buddha Prakash (1971) the Guptan king Samudragupta took to the then popular east coast route and subdued all the powers of coastal Andhra right upto Kanchi and asserted his influence on Ceylon too.

The field is now widely open to the Marine Archaeologists to document further on the maritime activities of the South east Coast.

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MARINE ARCHAEOLOGICAL EXPLORATION ACTIVITIES FROM THE CENTRE OF TAMIL UNIVERSITY, TAMILNADU

by
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Within the last 40 years International community has established a new field of science 'Marine Archaeology' on the basis of well found facts and figures. The success of locating the sites of Archaeological interest, the experiences gained in excavating/salvaging the ancient wrecks and harbours have made an impression on modern scientific community that the marine archaeology can be developed only through an integrated multi-disciplinary co-operation. Though the field of science is expected to kindle the interest of a society and its culture, it is highly unfortunate that the navigational contacts, trade, commerce, technology of building the ships, etc. have not been properly recorded by our forefathers. It is only from the Christian era, we get some particulars about the logs, but getting the location of respective site is still an elusive factor.

The study of marine archaeology is nothing but the study of the past sea faring and the evaluation of the

efficiency of our ancestors from the material remains of the antiquity. The various excavations throw light on the conditions of the materials used and their power to withstand the different environmental changes in the sea bed The objects recovered from ancient ship wrecks reveal the nature of the ship building technology, the type of materials exchanged in trade, etc., and also the effects of marine environment on metal, wood, boat leather, cloth and terracotta. It is also expected that the same may be better known from the study of the datable finds among the submerged archaeological sites and ship wrecks.

Marine Archaeology is a very young science getting momentum in our country. As this field of science is being a multi-disciplinary one, it is not getting the recognition as expected in our Indian Universities. In order to bring out the ancient cultural heritage, archaeological excavations are the main sources in the place where no written records available. In the south, though there are lot of literature made available in the languages like Tamil, Malayalam, Telugu and Kannada, the writings about the scientific and technological aspects and involvement of the social life of the people have not been given much importance

As far as Tamilnadu is concerned, the activities of Tamils in utilizing sea trade and exploiting the sea for food are found to be well advanced even before any other race of this continent managed to achieve the same. The famous proverb prevailing among Tamilians '*Thirai Kadal Odium Thiraviyam Thedu*' (one

has to amass wealth even by crossing the sea) emphasises that importance given to wealth and sea by the ancient society of Tamilnadu and ultimately it brings out the fact about our ancestor's priority to sea voyages and sea trade.

Though Tamilnadu had a very rich traditional value in Maritime contacts during the dynasties of Chera, Chola and Pandya kingdoms, very few records, inscriptions have given a concrete support for undertaking excavations. The moment, the marine archaeological study was emphasised in India, i.e. in the year 1979, Tamil University, though started in 1981 without giving any time to breath, came forward to give importance for the marine archaeological research. It is due to the great stalwart Prof. V.I. Subramoniam, the former Vice-Chancellor of Tamil University, who could convince the University Grants Commission (UGC) to accept the study of the marine archaeology under the regular curriculum of one University, probably the first University in India. Soon, the Centre of Underwater Archaeology in Mandapam Camp was established in the year 1983, with the great effort of Prof V.I. Subramoniam. The centre could convince the Department of Ocean Development (DOD) also to provide a token grant and consider the revised proposal of the University for strengthening the centre in the East coast of India.

In order to strengthen the marine archaoelogical studies, Tamil University has initiated first the study of early literature in the language concerned. In this part, we have already completed the compilation on the

knowledge of traditional navigation and ship building in Tamil, Malayalam and Kannada languages. In a month or two, the compilation work on Telugu language will be completed. The study of languages has given a lot of informations about the existence of many traditional ancient ports along the coast. For instance, the sangam literature has given a very good picture about the early Chola's port of Poompuhar (3rd century B.C.), but we are not in a position to locate that site exactly. When one accounts the number of harbours mentioned in the literature and the other evidences, it is undoubtedly considered that ancient Tamilnadu must have maintained wide sea trade and cultural exchange through the number of popular ports like Kaveripoompattinam, Korkai, Pulicat, Mylapore, Mamallapuram, Puduke (Pondicherry), Tranquebar (Tharangambadi), Karaikal, Nagapattinam, Kayal, Alagankulam and Periapattinam. Already the excavations at Poompuhar, Korkai, Alagankulam, Arikkamedu and Periapattinam have shown enough evidences on the nature of our International sea trade. Whatever the existing excavations at Poompuhar are made available, they have shown clearly the popularity of the port and a partial corraboration of the facts mentioned in Tamil literature like *Pattinappalai*, *Cilappatikaram* and *Manimekalai*.

In order to evaluate the rich traditions involved in maritime activities and provide informations to marine archaeology centre, the Department of Ancient Industries, Tamil University has compiled the different statements related to navigation and ship-building in ancient Dravidian literatures. In that connection, a seminar on Maritime History was conducted in this

University and the proceeding of the above has already been released. That proceeding entitled History of Traditicnal Navigation (Eds. G. Victor Rajamanickam and Y. Subbarayalu, 1989, pp. 221) is comprised of papers related to literary sources, oral traditions ship logs, historical findings, evidences from inscriptions and rare manuscripts, etc.

On finding the corroboration of the literary collection with the existing historical evidences, the Council of Scientific and Industrial Research (CSIR) New Delhi, appreciating the value of maritime history, has sanctioned a major project to Tamil University for recording the oral tradition through a standard form of questionnaire from fishermen, ship builders and the mariners in South India. The results are much encouraging and attesting the worthiness and the need for corroborating the existing cultural facts with the earlier practices.

During the oral tradition, we could gather lot of informations about the study of marine archaeological interests like the submerged Tiruppulani temple, the submerged Jerusalam Church of Tranquebar, etc. It is noticed that the names used in navigation and ship-building in the Dravidian literatures are not in use now-a-days. The sangam literature has given more than 18 kinds of boats of that period. But, none of those names of the boats are found in use today. Such a vast change has taken place in our tradition in the last 2000 years. When the tradition is to that extent, if we can locate an old vessel in Poompuhar or any other place really, I do not know how happy, it would have been for every

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citizen of this country. To trace back such tradition when the port was an International one and the port in which the big cargo vessel used to enter into the port without furling the sails, during the oral tradition collection lot of informations regarding stellar navigation, winds, tides, currents, etc. have been collected. More than 500 terms have been used in this field. The method of ship building techniques is also being gathered in the field trip. Really, all the above informations will help us to trace our ancestral marine archaeological facts.

Having established the keen interest on Marine Archaeology, Tamilnadu which is the first state to initiate the marine archaeological studies in the University level, encouraged Tamil University to successfully introduce the marine archaeological research in the regular curriculam and initiated to get the recognition from UGC, too. Tamil University Under Water Archaeology Centre could exploit successfully the tips provided by the divers and fishermen and has retrieved the historical important anchors, i.e. one of Thondi and another of Crusadai Island. The earlier one is an iron anchor of about 2 tonnes by weight with inscription "1864 GUERIGNY No. 11 P 730 K GX". When the finding was informed to the French Institute of Indology, they have conveyed that the name inscribed, might be either a place of an old village in France where the fabrication of anchors are done or it is the name of one French Naval Vessel.

Similarly, the oral tradition helped the centre to retrieve a very ancient stone anchor of grapnel type

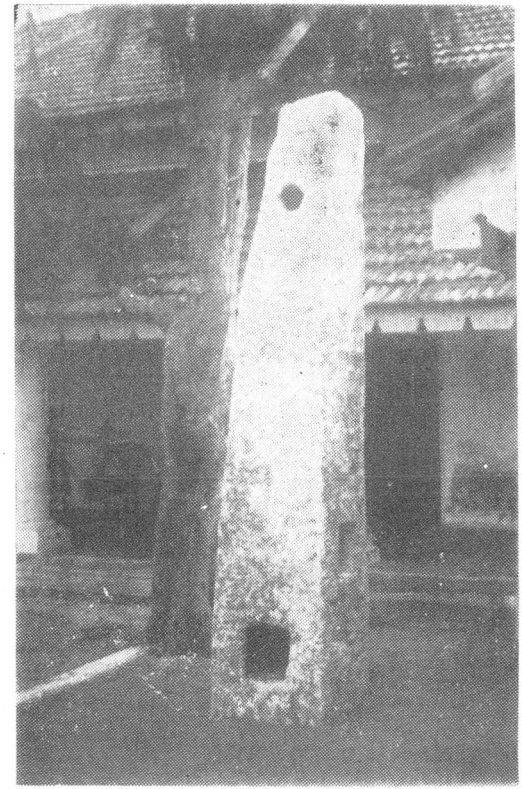
which was sought by many Archaeologists in the world and another broken one of such type. It is having 3 holes, one of round at the top and two rectangular holes perpendicular to each other at the bottom. As per Dr. Kapitan of Sicily, it is a typical anchor of Persian type belonging to a period of 1000 B.C. In case, if one can educate the amateur divers with the informations to be provided during the diving operations many more such archaeological interests may be brought out. Likewise, another small anchor of similar type has been recovered in Vedalai near Mandapam, and very recently in April 1990 another stone anchor of grapnel type but little smaller than the earlier one have been recovered on such informations.

The research of the archival records in Tamil University have shown nearly 167 wrecks in the Bay of Bengal alone. But many of them have no positioning. In order to locate the wrecks, one has to comb the whole of Bay of Bengal. It will be very difficult to complete such tasks by marine archaeologists.

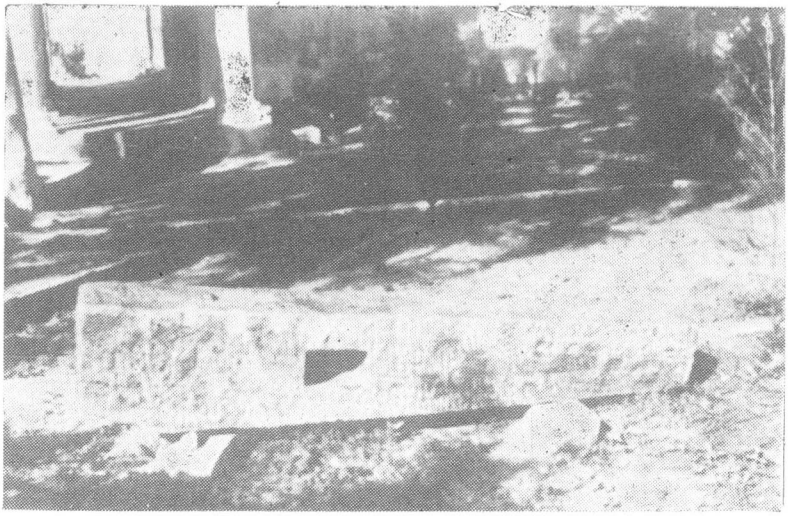
For the purpose of strengthening the marine archaeological studies in this University, Tamil University has taken up the study of sea level variation and coastal geomorphology. Without knowing whether the particular coast, mentioned in literature or inscription, is now submerged or emerged, it may lead to the wastage of time and energy. If one is searching the port in the offshore when it is emerged, one can assume the quantum of wastage in time and effort. Keeping in the base, the purpose of avoiding such wasteful exercises, we have done a detailed work



Metal Anchor off Thondi



Grapnel type of Persian Stone Anchor off Kurusadai Island



Broken Stone Anchor from Vedalai

between Kanyakumari and Mandapam and we could able to succeed, in locating the port of Periapatinam in the right place of emergence. Though the village Periapatinam is somewhat much inside, the port is found just close to the pond called as *Kappalaru urani* (kappal-ship: urani-Tank). In the trial excavation, conducted by the Tamil University large amount of Celadon wares and coins, metal etc. were recovered. After getting the benefit of such studies, now we are continuing the same to the other parts of Tamilnadu.

In addition to cultural values, data of Scientific value to Oceanographers and other Earth Scientists on the nature of sedimentation, coastal erosion, environment of deposition and effects of sea level changes will be brought out in underwater archaeological excavation. A national seminar on 'Sea level variation and its impact on coastal environment' was conducted in the Department of Ancient Industries, Tamil University. In this seminar, valuable articles have been presented. In some papers the location of the possible burial sites have been identified by using the aerial photographs, i.e., satellite imagery.

The establishment of an Underwater Archaeological Research Centre is considered to be highly expensive one, because of the requirement of many expensive electronic underwater towing equipments along with the maintenance of such sophisticated equipments by keeping specially trained multi-disciplinary personnel. Over and above maintaining a research vessel is considered to be

a luxury affair. Even the institution like National Institute of Oceanography could not maintain a small boat within the economic feasibility limit of such boat like the one maintained by private bodies. Knowing all these draw-backs Tamil University giving more weightage to the valuable information going to be obtained under such efforts came forward to establish a centre of Underwater Archaeology at Mandapam in the year 1983 itself. Now the centre is functioning with efficient diver cum surveyor and other staff.

With the help of University Grants Commission and Department of Ocean Development, this centre could go for some offshore survey equipments and recruitment of skeletal staff. With the advent of new Government in Tamilnadu it is proposed to take up actively the study of underwater archaeology in collaboration with State Department of Archaeology in and around Poompuhar. This University has planned to keep a field unit at Poompuhar.

It may not be possible for some one to excavate the whole coastal zone or seabed for marine archaeological purpose. To start with, it is worth to excavate only the definite ports or shipwrecks already known or established. In that too, the deployment of geological and geophysical survey has to be restricted only to a zone upto which the divers can reach. These three phases of work have been arrived at only on the basis of existing evidences.

As the location of the buried Poompuhar has already been broadly estimated from the Survey of NIO coupled

with local fisherman's information, it is the time to pursue first phace of the excavations without much further delay.

A survey with Echosounder, Side scan sonar, Shallow seismic profile and Magnetometer with the good positioning system will be undertaken in close intervals of atleast 50 m. Photographs using under-water camera may be collected. Detailed diving operation will be done with mini-ranger system but initially by hiring, subsequently, it has to be procured

A detailed excavation in Poompuhar may be under-taken with the deployment of number of divers and best positioning systems. A Shallow Television Camera will be deployed. Analysis of the representative samples will be campleted.

Numerous ancient ports like Alagankulam and Periapatinam have been explored on shore. The Rameshwaram port log books have also indicated the existence of ports like Mandapam and Pamban till the middle of 19th century. The stone anchors salvaged by Tamil University of Crusadai Island suggests the possible wrecks of ancient nature around that region. The local fishermen believe that the ancient Tirupullani temple must have been submerged. The chunk and pearl divers have confirmed the occurrence of large number of metal anchors off Thondy, Davipatinam and Pamban. The frequent occurrence of such anchors lead to the possibilities of many wrecks in this region. So this region has been considered for

exploration in phase II though offshore exploration could not be undertaken.

In the third phase, the existence of ancient ports like Pulicat, Mylapur, Vasavasamudram and Mahabalipuram have been confirmed from the literary and epigraphical records. Large number of ship wrecks have also been reported. However, offshore surveys have yet to be carried out for indicating the possible locations because of the monumental value of Mahabalipuram. Marine Archaeological Exploration has to be considered for this region.

With the help of existing evidences made available from the literatures, epigraphs, foreign travellers accounts and the Archaeological explorations and excavations we can trace out ancient culture.

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IMPACT OF CLIMATE AND SEA LEVEL FLUCTUATIONS IN HISTORICAL CONTEXT

by

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The long survival and evolution of biological ecosystem and its dependent human society was invariably influenced from time to time in a regular cycle by the erratic climatic changes or fluctuations, rise in sea level, episodic volcanism, tectonic movements and recurrence of physical bombardment of the earth by comets, particles and radiation. The paucity of the reliable data and uncertainty prevailed in the relevant geological time scale so far failed to resolve these geophenomena either caused by exogenetic factors or endogenetic factors.

However the recent studies clearly have demonstrated the striking features in the releation between atmosphere and the earth. The solar radiation impinging on the earth's surface effectively controls the terrestrial climate cycles. It is also known that the so called ice ages such as Gunz, Mindel, Riss and Wurm consisted of several regular intervals of maximum glaciation intervened or followed by non-glacial periods.

The impact of the sea level changes in respect to a particular region is based on multiple factors and phenomena such as the temperature and salinity, density of sea

water, currents, long waves, meteorology, atmospheric pressure, different wind effects, evoporation and precipitation, hydrology, water discharge from rivers, geology, land uplift and land subsidence, astronomy, gravitation, tide generation forces, seismology, etc.

It is now known that approximately 36000 years BP sea level stood at present day shoreline. From 36000 until 22500 BP there was a lowering of the sea between 10 and 20 m. The maximum low stand might have occurred at 18000 years BP (Blackwelder, 1979: 618-620). The sea level had started rising systematically from 18000 years BP at an extra-ordinary rate and rose nearly 100-150 m. at some places in the next 12000 years. These sea level changes slowed down or, rather we may say, stabilized around 6000 BP (Negi and Tiwari, 1988 : 79-82). It is easy to understand that stabilisation of sea level is also associated with stabilisation of average global temperatures and climate in different regions. It is well known that agricultural era had started only after stabilization of global sea level and climate around 6000 BC.

These climatic changes are said to have occurred in both 567 and 1134 year astronomical cycles. Every 1134 years one major planetary conjunction took place and also one hemicycle in every 567 years.

The critical year 1433 AD was first brought to attention by Petterson who believed that it correlated with catastrophic tides and flooding. This 1433 AD is the year of all-planetary conjunction, the so called zero check year. The year 1433 AD coincides with a remarkably

high but short-lived period of sunspot activity and also a major rise in C^{14} flux. Historical climatic analysis shows that 1433 AD initiated a time of great instability throughout the world, culminating in the great medieval ice age, with its attendant human suffering. It seems that the conjunction time coincided with a high sunspot state, which was immediately followed by a low-spot condition indicating a minor glacial event. Accordingly, taking 1433 AD as the base year, the major planetary conjunctions have been traced back through the Holocene by keeping the 567 years and 1134 years as cyclic periods. Going back from 1433 AD the turning points on the 567 and 1134 year cycles were 866 AD, 299 AD, 268 BC, 835 BC, 1402 BC 1969 BC, 2536 BC, 3103 BC, 3668 BC, 4235 BC, 4802 BC, 5369 BC, 5936 BC, 6503 BC, 7070 BC, 7637 BC, 8204 BC, 8771 BC, 9348 BC, 9925 BC and so on.

An attempt is made here after studying the above data to correlate the mojor cultural and historical events that took place in the above said cyclic period. Close observation made in the above chronological sequences clearly has demonstrated that there was a rise and fall in human activities, in both material and spiritual fields, in every 550 year-cycle (the round off of 567 year cycle). For instance, let us consider the period between 835 BC and 268 BC in which India had seen the birth of Buddhism, Jainism, Upanishads and Hinduism, China evolved Confucianism and Taoism, Iran Zoras-trianism and Middle East produced classical Judaism.

A bird's view of the available data pooled togother since prehistoric times gives a better and reliable picture

to realise the cause of the events that happened in the long historical matrix and its close relation with environment. The palaeolithic tools, particularly the lower and middle, recovered from different altitudes of the terraces in the river valleys like Korttalaiyar valley near Madras, Narmada valley in Maharastra and Soan valley in Punjab help to determine its age (Sankalia, 1963).

One of the reasons for the formation of the river terraces is the sea level variation. The date of this fluctuation indirectly helps to determine or to fix the date of the particular prehistoric tool collected from particular river terrace. The succeeding phase of microlithic period also faced arid climatic condition in the early part of the Holocene period around 10000 BP in which most of these tiny tools were collected from sand dunes in the sites like Sawyarpuram in Tirunelveli Dt. (Zeuner, 1956).

Leaving these prehistoric data behind in which much precision could not be attained due to the paucity of the reliable data, one could see the advent of agriculture from the neolithic site of Mehrgarh dated back to 6000 BC which exactly matches with the stabilization of the terrestrial climate.

The rise of civilization could be seen in India between 2300 and 1800 BC. The excavations carried out in the type sites like Harappa (Vats, 1941), Mohenjodaro (Marashall, 1931), Lothal (Rao, 1973) and Kalibangan (Lal, 1967) exposed the monumental architecture like granary, great bath, dockyard, citadel respectively to testify its glorified civic administration and cultural contact with neighbouring world.

The technological advancement made in the field of art, architecture, town planning, civil administration, trade, shipping, dockyard, knowledge of writing, usage of seal and sealings, social hierarchy in the form of citadel and lower town, fortification wall used either for defensive or offensive purpose stand testimony for the evolutionary nature of the civilization that prevailed between 2300 - 1800 BC. This great civilization came to an end around 1800 BC due to vast floods as noticed at Harappa and Mohenjodaro, tectonic movement, change of river courses like Saraswati, sea level change causing the disuse of the tidal dock at Lothal.

The rise and fall of this civilization directly moves with the fourth planetary conjunction back from 1433 AD. In 550 years it reached its peak and disappeared subsequently without any trace The central Indian chalcolithic cultures like Banas, Kayatha, Malwa and Jorwe observed in the type sites of Ahar, Kayatha, Navdatoli and Nevasa respectively coeval with the subsequent cyclic year also met with the same fate (Dhavalikar, 1979 : 229-269).

The post-Harappan phase dated between 1500 BC and 900 BC saw great intellectual activity in the Gangetic plain. The Vedic hymns and the two epics emerged in the succeeding cyclic period of 567 years. The excavations carried out in sites like Hastinapur (Lal, 1955 : 31 - 32) and Hulas (Dikshit 1970 : 21-28) clearly indicate the nature of that culture. These also disappeared without much impact on the succeeding phase The succeeding

cyclic period saw the birth of Buddhism and Jainism, and emergence of 16 Janapadas, and Magadhan empire in the north.

In Tamil Nadu too, the next cycle of 268 BC - 299 AD. i.e. between 3rd century BC to 3rd century AD saw the proliferation of Sangam literature, advent of Brahmi writing, widespread megalithic culture, trade contact with Roman world and other related activities. The availability of large amount of Roman coins in the sites like Vellalur (Nicholson, 1887) and Roman ceramics like Arretine ware, Rouletted ware, Amphorae unearthed in the subsequent excavations at Arikamedu (Wheeler etal., 1946) and Kaveripattinam (Raman, 1968) provide voluminous data to support the trade contact that Tamilnadu then had with the Roman world. Recently a sherd having graffito in Tamil-Brahmi bearing the name Cattan was found at Quseir-al-Qadim or Ancient Quesir the Arab name of the Egyptian port called Laucos Limen or "White Harbour" in classical times. This Egyptian port is situated northeast of Ancient Coptos on the Nile and served as a Roman window opening to the East in the first and second centuries of Christian era (Whitcomb, etal., 1981).

To this cyclic period may also be attributed some other interesting human activities. The recent excavations carried out in the sites like Arikamedu (Wheeler, etal., 1946), Karur (Nagaswamy, 1984), Uraiyur (Gururaja Rao, 1972), Kaveripattinam (Raman, 1968), Alagankulam (Nagaswamy, 1988, Kasinathan, 1991), Kodumanal (Subbarayalu, 1989), Tirukkampuliyur (Mahalingam, 1970), Alagarai (Mahalingam, 1970), Vallam

(Subbarayalu, 1984), Adichchanallur (Rea, 1902-03 : 111-143) etc., in Tamil Nadu and Brahmagiri, Chandravali (Wheelar. 1948 : 181-310), T. Narasipur (Seshadri, 1971), Hallur (Nagaraja Rao, 1971), in Karnataka and many other sites in other parts of India yielded cultural deposits of the early historical period. The striking feature common to all these sites is that all these sites came to an end or one could say the related culture or cultures were brought to a halt around the third century A.D. What made those people to abandon the sites at that particular time even though belonged to different geographical zones, if not due to an enviromental compulsion and ecological imbalance?

It may therefore plausibly be suggested that one has to study the palaeo-ecosystem for better understanding of the very survival of the human society which depends on the environmental onslaughts like sea level variation etc.

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PUNJERI - A PALLAVA SEA-PORT NEAR MAMALLAPURAM

by

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Mamallapuram, the famous centre of Pallava art, is also said to have been a sea-port right from the beginning of the Christian era. *Perumpanarruppadai*, one of the Sangam classics written by the poet Katiyalur Uruthiran Kannanar refers to a place called Nirpeyar, the city which abounds in sea-borne goods as an active sea-port of Tondaiman Ilanthiraiyan of Kanchi. Nirpeyar has been identified with Mamallapuram by some scholars and opposed by others. It is also suggested by many scholars that one of the east coast ports referred to in the *Periplus of the Erythraean sea*, a manual for sailors written by an unknown Greek navigator of the first century AD and the place called Malange mentioned by Ptolemy, a Greek geographer of the second century AD may be Mamallapuram. On the basis of the find of Roman coins of Theodosius (4th century) at Mamallapuram it would not be wrong to say that Mamallapuram had contact with countries beyond the sea, particularly with Roman Empire.

But the first authentic evidence to prove that Mamallapuram was a sea-port comes from the Tamil

work *Periya Tirumozhi* written by Tirumangai Alwar (8th century AD) who described this place as Kadal Mallai, "Where the ships rode at anchor bent to the point of breaking laden as they were with wealth, big trunked elephants and gems of nine varieties in heaps". The epigraphical sources also say that the Pallava kings had active contacts, cordial as well as inimical with the nations like Ceylon, China and the South-East Asian countries. These maritime activities were most probably carried on through Mamallapuram, the notable sea-port of the Pallavas throughout their rule.

From the few references made above, it is clear that Mamallapuram flourished as a sea-port atleast during the Pallava period, though the early existence of this place as such is yet to be proved with other concrete evidences. Then there arises the interesting but difficult question as to the exact location of the sea-port.

Fortunately a small village called Punjeri, seems to answer this question. This village is situated just 1·5 kms, west of Mamallapuram on the western bank of the Buckingham canal, which is the back-waters of the sea. The reasons for identifying the ancient sea-port at Punjeri are :-

1. The name Punjeri may have been known in ancient times as Puhum-Ceri, which means, "the village of first entry". So the very name of the village itself indicates that it was a place, where the ships used to enter with loads of gems and big trunked elephants as mentioned by Tirumangai Alwar. Likewise the Kaveri-pumpattinam, the famous sea-port of the early cholas is

also the corrupt version of Kaveripuhumpattinam which means, "the Pattinam where Kaveri enters to the sea".

2 Previous excavations and explorations of ancient sea-ports at Arikamedu, Alagankulam, Korkai, etc., prove that they are all situated either in the backwaters area or at the mouth of the rivers which join the sea At Kaveripumpattinam, the wharf where the boats used to be anchored is found only on the bank of the river Kaveri. Punjeri is also situated in the back waters area (now known as Buckingham canal) near Mamallapuram. The back-water joins the sea at about 2 to 3 kms. south of Mamallapuram. Probably the boats in the early days might have entered the land at the point where the backwater join the sea and came to Punjeri through the channel formed by backwaters.

3. The huge buried remains of structures and ceramic varieties of the early historic and early medieval period found at this site on the western bank of the backwaters (Buckingham canal) prove its flourishing existence in the past. Through exploration and excavation in this area would certainly reveal the location of the wharf or any other related structures.

4 A few metres away, towards the western side of the Buckingham canal is a small knoll. Running throughout on the western side of this has been noticed a set of 3 to 4 deep-cut lines like grooves. It is most likely that these were meant to receive the first course of any foundation for a fortification wall. Similar type of grooves are also noticed running throughout the western edge of the hills at Mamallapuram, apparently for the

same purpose. On the northern side, these grooves take turn towards east near the Kotikal mandapam, which is dedicated to goddess durga, known in Tamil inscriptions as "Vadavayil Chelvi", i.e. the Goddess of northern quarters. So it is quite possible that the Pallavas excavated a cave-temple to Goddess Durga on the northern side of their fort. In Punjeri the purpose of the fortification may be to store the imported and exported cargo during the Pallava's times.

5. A survey of the coastal Tamil Nadu by Dr. A.V.N. Sharma, Temple University, Philadelphia in collaboration with the Archaeological Survey of India (IAR 1972-73) and by the United Nations Ground water project noticed as many as four coastal terraces, located at the heights of 24-30 mts., 12-15 mts., 6 mts and 3 mts. The 12-15 mts. terrace were closest to the Microlithic sites. Perhaps by inference they could be dated around 10,000 B C. The 6 mts. terrace was associated with archaeological remains of the early centuries of the Christian era. The wharf excavated at Mangaimadam (Kaveripumpattinam) is located in between 3 to 6 mts. in height. This evidence was important in pinning the 6 mts. terrace, as a positive oscillation of the sea around 250 B.C. to A.D. 100 or so. This 6 metre terrace checks up elegantly with the physical location of Nattamedu, Arikamedu, etc., The 3 metre terrace may have belonged to 6-7th century A.D. The Vasavasamudram, an Indo-Roman trading station situated nearly 11 kms south-west of Mamallapuram, is at about 6 mts in height from the main sea level. It suggest that Vasavasamudram, is played as a foreign trading station or probably a sea-port only in the

early centuries. This fact is also attested by the archaeological finds like Roman Amphorae, rouletted ware, ring wells and other local wares of the early historical period So Vasavasamudram is not the coastal port of Pallavas, as the sites of these period are found at the height lesser then 6 metre.

Then there arise the question where is the exact location of the sea-port of the Pallavas. On the basis of the archaeological evidences mentioned above, it is possible to say that Punjeri most probably served as a sea-port during the Pallava times. This argument is strengthened by the geological evidence that Punjeri is located at about 3 mts. in height from the main sea level. This coastal terrace is tentatively dated to early Medieval period.

Another interesting thing, though not directly connected with the present topic is that Punjeri has the credit of giving epigraphical information about the names of the sculptors, who probably made the magnificent stone creations at Mamallapuram.

All the above mentioned points strengthen the argument that Vasavasamudram flourished as a sea-port near Mamallapuram in the early centuries of the christian era and later it lost its importance. Around 5-6th centuries or so. Punjeri, the nearest place to the important art centre of the Pallavas, probably substituted Vasavasamudram as a sea-port and flourished throughout the Pallava period. However further intensive exploration and excavation in this area is needed to establish this hypothesis.

TRADE RELATIONS BETWEEN TAMILNADU AND SOUTH EAST ASIA AS GLEANED FROM INSCRIPTIONS

by

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The Commercial and cultural contacts between Tamilnadu and South East Asian countries seem to have existed even from the beginning of the Christian era. Sangam Literatures say that the import and export of articles between these countries had happened in great vigour, through the ports located on the Coromandal coast, *viz* Kollam, Eyilpattinam, Kavirippum-pattinam, Tondi, Marungurpattinam, Korkai and Kumari. The author of the Periplus of the Erythrean sea describes the ports of the Coromandal coast as follows. "Among the market-towns of these countries and harbour where the ships put in from Damirica and from the north, the most important are, in order as they lie, first Camara, then Poduca, then Sopatma". It is said in Pattinappalai, a Tamil literature, datable to 2nd century A.D. that the pearls from Eastern sea, spices from Burma and black pepper from Java were imported to Tamilnadu.

Recent Archaeological researches have undoubtedly proved that these ports had played vital role in promoting the trade contacts with Far East countries. Especially the excavations conducted at Arikkamedu, Kavirippumpattinam and Alagankulam had disclosed some interesting authentic evidences to prove that there were foreign settlements at the above three important cities. Not only the merchants of Eastern countries but also from the western countries like Greece and Rome had settled here and traded with Tamils. Alagankulam is identified with Marungurppattinam of literary fame.

The visit of Chinese pilgrim Huin-tsang to Kanchipuram during 7th century A.D. at the time of Narasimhan I is a clear indication of the cultural contact of Tamilnadu with China in those days.

During Pallava period the trade relation between these countries had grown appreciably. The concluding portion of Vayalur inscription of Narasimhavarman II *alias* Rajasimha states as follows:

> "May he exercise the royal prerogative and take up the vow of administering (his) subjects upto the extremities of his kingdom as even to include the *Thousand Islands*".

Even though it has not been clearly stated what these Thousand Islands were, it is believed that they could not be other than the Islands in the Archipelago.

Chinese annals state that Narasimhavarman had sent ambassadors to China and erected a Buddha Vihara for the use of merchants of Chinese origin at Nagappattinam. This Vihara was frequently visited and worshipped by Chinese travellers. It is also belived that the collateral branch of Pallava was settled at Kampujadesa and at the request of Ghatikaiyar and Mulaprakritis Hiranyavarman, the descendant of Bimavarman, brother of Simhavishnu, had agreed to send Nandivarman his youngest son to Tamilnadu to crown as Pallava king. The earlier settlement of Tamils seems to have taken place at Siam, as the earliest among all the Tamil inscriptions found in South East Asia, comes from Takuvapa. On the basis of palaeography this epigraph is ascribed to the period of Nandivarman III. It states that a tank called Avaninaranam was dug by an individual Mandan of Nangur, and was left under the protection of Manikkiramattar and Senamukattar. Since Avaninaranan was the title of Nandivarman III, it is believed that the tank was named after him. Manikkiramattar is identified with the merchants of Manikkiramam a village situated near Kavirippumpattinam. Nangur, another village near Kavirippumpattinam was the village of the donor of this inscription.

The relationship with Far Eastern countries was amazingly strengthened during Imperial Chola period. The Chola emperor Rajaraja seems to have had amicable relation with the Sailendra Kingdom of Sumatra. During his time he had granted permission to Sailendra king Mara Vijayotungavarman to build a Buddha stupa

at Nagappattinam and issued an order to endow the total revenue accrued from the village Anaimangalam for the upkeep of this stupa.

This relationship appears to have little strained in the time of his son and successor Rajendra. It is not known under what circumstances he took an expedition over Srivijaya Kingdom. Rajendra the illustrious son of Rajaraja the Great, claims to have annexed the following places in Far East countries during his expedition. The relevant portion of his prasasti is as follows :

"Having despatched many ships in the midst of the rolling sea and having caught Sangarama Vijayotunga-varman, the king of Kadaram, together with the elephants in his glorious army (took) the large heap of treasures which (that king) had rightfully accumulated ; captured with noise (arch called) Vidyadharatorana at the war gate of the extensive Capital (nagar), Srivijaya, with the jewelled wicket gate adorned with the great splendor and the gate of large jewels, Pannai with water in its bathing ghats, the ancient Malaiyur with the strong mountain for its rampart, Mayirudingam surrounded by the steep sea (as) by a moat; Ilangasoka undaunted (in) fierce battles ; Mappappalam having abundant (deep) water as defence: Marrilimbangam guarded by beautiful walls, Valaippanduru possessed of Vijaippandiru (?) Talaitakkolam praised by greatmen (versed in) the sciences, the great Madamalingam (capable of) strong action in dangerous battles ; Ilamuridesam whose fierce

strength rose in war; the great Nakkavaram in whose extensive gardens honey was collecting and Kadaram of fierce strength, which was protected by the deep sea"

Most of these places have been identified and accepted by scholars. This shows, the magnificent command of the Cholas in sea faring activities and their control over the Kingdom of Far East countries.

This expedition should have paved the way for trade contacts with more parts of south East Asia The traders from all those places that had been brought under the control of Cholas seem to have visited Tamilnadu and sold their commodities not only on the coastal regions but also in the interior parts of Tamilnadu. To prove this fact, number of celedon wares of East Asian origin have been collected recently. The wares, unearthed from the excavation of Gangaikondacholapuram, the capital of Rajendra Chola, are ascribable to 11th 12th centuries A.D

The epigraphs found on two pillars, from Burma, assignable to 11th century on palaeographical ground, are believed to be demonstrating the victorious march of Rajendra Chola upto Burma. The pillar which bear the inscriptions are considered as the Jayasthamba erected in memory of Rajendra's conquest.

The relationship of the Cholas with the Sailendra king was somewhat improved during the period of Kulottunga I as he had renewed the grant of Anaimangalam village to the stupa of Nagappattinam.

The merchants who settled in South East Asian countries had not only expanded the commercial horizon but also ventured in spreading the Hinduism. In view of this they built Hindu temples, dug tanks and made lavish endowments. Their religious enthusiasm is reflected from a 13th century inscription found at Pagan in Burma. Beginning with a sloka of Mukunta Mala, it states that in the temple of Nanadesi Vinnagar Alvar of Pulckan alias Arivarthanapuram a mandapa with door was built and standing lamp for constantly burning was gifted by Irayiran Siriyan alias Kulasekara Nambi of Makotaiyar Pattinam of Malaimandalam. That this Kulasekaranambi was a merchant is clear as he hailed from a pattinam known as Makotai and settled at a town called Arivarthanapuram. Pattinam and Puram are the Tamil words which relate to commercial centres.

China's commercial contact during Medieval Chola period is also attested with the discovery of Chinese coins on the Coromandal coast.

For their overseas voyage the merchants had used ship built of wood. Due to some natural havoc some ship wrecks had also occurred under sea. Recently a bronze bell was recovered from a wrecked ship by fishermen. What is more intersting is the Tamil inscription found on it. It has been read as follows :

"Ma-Jaka-pa-ci-te-ca" which is interpreted as "Majapakitesa". It is understood from this epigraph that the Majapakita Kingdom was in powerful position

and had good relation with Tamilnadu. Due to good relations prevailed between these two countries during 13th century A.D. it was possible for the merchants of Tamil country to sail to Java to find market for their commodities.

The commercial contact between Tamilnadu and China seems to have continued in 16th century also. This has been revealed from the panel of a painting drawn on the wall of a tier in the gopura of Narumbunatha temple at Tiruppudaimarudur in Tirunelveli Kattabomman District.

It is found in the paintings of the second tier, a chinese tribune talking to a native. This shows that the Chinese had mingled among ordinary citizens of Tamilnadu during Vijayanagar period.*

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* I am thankful to the organisers of the "Seminar on Silk Roads-Maritime Route Expeditions" for having permitted me to include this article in this volume.

MUD MORTAR TECHNIQUE IN ANCIENT PUMPUHAR

by

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Pumpuhar the celebrated port of the early Cholas in the Tamil country was one of the leading ports at the beginning of the Christian era. The word 'Puhar' in Tamil stands for a place where a river enters a sea. Pumpuhar is the place where the Kaveri joins the Bay of Bengal.

This city is described in glowing terms in Tamil literary works like the Silappatikaram and Manimekalai. Puhar was an important Buddhist centre from 2nd cen.B.C. onwards.

Buddha Vihara

The site of Buddha Vihara (1600 years old) at Pallavanisvaram of Kaverippumpattinam (Pumpuhar) was excavated by the Archaeological Survey of Indiaand it is proved that it formed part of old Pumpuhar.

This ancient Buddha Vihara was built with well burnt bricks of various sizes and the binding substance was only mud mortar. The size of the bricks used for the basement were 36·25×18·75×7·5 cm., whereas the size of the bricks used for the superstructure were 23 75×12·5×5 cm.

Analysis of 1600 year old Mud Mortar used in Buddha Vihara :

Research on ancient mud mortar mix used in Buddha Vihara is necessary to find out the chief ingredients in the mortar-mix for their stability even after 1600 years.

Generally, mortar is used to bind together the stone or bricks of the walls of a superstructure to provide smooth hard surface. What is required for mortar is obviously some substance that will harden and adhere strongly to brick or stone for putting these materials together in a structure. Here mud mortar was used in Buddha Vihara as binding substance.

Mud consists of clay, silt and sand. Smallest particles in the soil have dimension less than 0.002 mm. It is nothing but minerals having different composition. They are *Albite*, *Quartz*, *Illite*, *Montmorillonite and Kaolinite*.

All of them are silicates. Due to the action of aluminium oxide and iron oxide with H_2O they become slushy. On drying they cement together like a rock due to combination of aluminium and iron with silicate group in the centre forming layers of, Tetrahedral and Octahedral (4 and 8 Molecules of H_2O) rings.

Detailed analysis of the ancient mud mortar (1600 years old) used in Buddha Vihara showed that fine fibrous materials (PANDANUS - SPECIES) (தாழைநார்) had been used as the chief ingredient for binding besides sand and jaggery. The analysis showed that with the ageing of the Buddha Vihara, the sugary taste of the sucrose is lessened but not the binding capacity. ★

SALIYUR-AN ANCIENT PANDYA PORT IDENTIFIED

by

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In ancient times, sea ports were situated at the confluence of the rivers that flow near the capital cities of reputed empires ultimately merges with sea. Because, the goods that were imported and those that required to be exported would be easily transported by boats as rivers were serving as inland water ways.

The famous sea port Kaveripoompattinam was situated at the confluence of the river Kaveri that flows near Uraiyur the capital of Sangam Cholas, with the sea. Likewise, the Chera port city Musiri was on the western coast, where the river Periyaru, flowing near Vanji, the Chera capital city, joins the sea. Therefore, there should have been an active sea port at the confluence of the river Vaigai, which runs through the Pandya capital city Madurai, with the sea.

In the 1st century A.D., there was a very close commercial contact between Rome and Tamil country. Sangam literature and the accounts of foreign writers like Pliny, Ptolemy and the author of Periplus, give ample evidences about the multifarious activities of Romans in ancient Tamilnadu.

Strabo says that Pandyas had sent two embassies to the Roman Emperor Augustus. Roman soldiers were enlisted in the armies of certain Pandya Kings. There is a reference in Silapathikaram to Roman guards at the palace of Pandya king Nedunchezhian. Purananuru speaks that the Pandya Kings had consumed the delicious wine imported from Rome. The close relationship of Pandyas with Romans, might have led to the establishment of a Roman colony and a sea port at the confluence of river Vaigai *i.e.* near Alagankulam.

It is understood from that literature Pandyas had two port cities *viz.* Korkai and Saliyur on the Coromandal coast. Korkai has been identified by the Archaeological excavations conducted at Korkai near Srivaikuntam in Tirunelveli District. But Saliyur is yet to be identified.

The Tamil Sangam Classic "Maduraik Kanchi" refers to a Pandya sea port called "Nellinoor" situated on the east coast. Ptolemy mentions a sea port called 'Salur' situated north of Korkai in Pandya country. E.H. Warmington cites the port Salur might have been situated just opposite the northern tip of Sri Lanka. Sali the Sanskrit word means paddy (Nel) in Tamil. So, it may be concluded that the Nellinoor and Salur are one and the same place. Alagankulam is about 80 Kms. north of Korkai and situated opposite to the northern tip of Ceylon. The antiquities from the excavations, like Roman coins, pot sherds of Mediteranean origin, semi-precious stone beads and conch bangle pieces prove that Alagankulam was none other than Salur or Saliyur the ancient sea port referred to in Sangam literature.

TERRACOTTA ART OF POOMPUHAR

by

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The art of clay is as old as man himself. Terracotta is the use of clay in its simplest state, either dried by the sun or fired at a low temperature. In Archaeological parlance objects made of clay both sun-dried and fired are referred to as terracottas.

The antiquity of terracotta art in Tamilnadu may now be traced back to neolithic times as evidenced by the finds like terracotta figurines obtained from the excavations at Paiyampalli a Neolithic site in the North-Arcot District.

The terracotta art of Tamilnadu seems to have had tremendous religious association with it. This is also evident from the ancient Sangam literature of the Tamils which speaks of the terracotta artist being held in great veneration and respect. It also mentions well-known colonies of terracotta artists in ancient cities like Madurai and Kaverippoompattinam. Such artists were called 'Manneettalar' and their art was known as 'Manneedu'.



"Terracotta art of Poompuhar" Melapperumpallam

The temples and royal houses were constructed by burnt bricks as referred in literature

சுடுமண் ஓங்கிய நெடுநிலை மனைதொறும்

—மணிமேகலை-காதை-3, வரி 127-131

Terracotta objects include bricks, tiles, figurines, ornaments like beads, ear lobes etc

The excavation at Poompuhar revealed brick structures at places like Vanagiri, (water reservoir) Kilayur, (wharf) and Pallavaneswaram (Buddhist-Monastery). The bricks are of various sizes and have rounded edges. These bricks might have made in the required shape when the brick was as wet clay.

Manigramam, Vellaiyan Iruppu. and Sayavanam are the other places from where terracotta figurines were collected. The place Vellaian Iruppu yielded two royal heads in typical Chola style. They may be dated to 10-11th cen. A.D. as the associated find was the copper coins of Rajaraja Chola-I. Sayavanam had yielded three terracotta figurines, being one of them in double mould technique. One of the figures is Mother and child. Similar figures are found from Thirukampuliyur, Manmangalam, Aravakurichi (Trichy Dist), Uttamanayakkanpalayam (Q. Millat Dist.) and Tirukoyilur (South Arcot Dist.). Similar figures are also found in Folk Bronzes that are still under worship in some places of Tamilnadu. Similar figures in stone are being worshipped at Korkai.

Around Kaveripoompattinam, Kilaiyur, Melaiyur Vellaian-Iruppu, Sayavanam, Kilaperumpallam, Melaperumpallam, Manigramam, Radhanallur, Tiruvengadu are some of the places that were explored Many of these sites yielded black and red ware and bright red-slipped ware. Urn Burial sites were found at Kilaperumpallam, Manigramam, Viramethiruppu and Vanagiri.

Recently the department of Archaeology collected two figurines from Melaperumpallam. Actually they are applique figure on the exterior of the profile of a big round bellied pot. One figure represents an old lady in lying position with outstretched hands. The fingers look like bones. The other figure so appears to have been attached on the rim portion of the pot. It is also a lady figure with a thick hip.

Similar applique figure was collected from Thirukkampuliyur excavation. The applique figure has got the same material as the fabric of the pot. The pot with the figure might probably have served for ritualistic purposes connected with funerary ceremonies. In Tirukampuliyur it is dated to 10th to 11th centuries A.D. The Melaperumpallam finds are assignable to 4th-5th century A.D. Further exploration and study in this area will throw more light on the cultural significance of these finds.

SITES IN AND AROUND POOMPUHAR

by

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Puhar or Kaveripoompattinam was the capital and port city of Sangam Cholas. Silappathikaram mentions that the city of Poompuhar was covering an area of four Kavatham (Approx 30.sq.miles). It extended upto the present Karuvendanathapuram and Kadarankondan on the west, Thirukadavur on the south, Kalikamur on the north and Bay of Bengal on the east. The villages within the above four boundries formed part of the ancient Kaveripoompattinam. About 30 villages flourished in those days with Poompuhar as its nucleus. It is learnt from Silappathikaram that about 60,000 families lived in Kaveripoompattinam and the total population was about 3 lakhs.

Silappathikaram also describes about the general plan of the town of Poompuhar. The town was located on both the banks of Kaveri. It was divided into three parts, Pattinapakkam on the Western side and Maruvurpakkam on the Eastern side while Nalangadi at the Centre.

The Tamil classic Manimekalai tells us that Puhar was submerged into sea due to non-performance of the annual festival to Indira during the period of

Killivalavan. However only the eastern part of Poompuhar forming the Maruvurpakkam must have been submerged and not the entire Poompuhar.

Maruvurpakkam

A portion of Puhar lying on the sea-shore was called Maruvurpakkam.

It had several streets exclusively ear-marked for traders specialising in colouring materials, white wash, fragrance and other incense materials, flower bazaars, traders dealing with the silken cloth and experts dealing with gems and gold.

Pattinappakkam

This was the place where from the kings of the age ruled and was situated to the west of Nalangadi. According to Silappathikaram this area consisted of several temples dedicated to Lord Siva, Shanmuga, Vishnu and Baladeva. Apart from the residential complexes of the Commander-in-Chief and other royal officials, the merchant community and agricultural people, the residence of artists who excelled in fine arts were also located there.

Nalangadi

It was guarded by the deity called Sathukkabutham. This guardian deity did all the good to the people of the place. This area was abounded by many gardens. The five kind of Mandrams supposed to have been created by Indira were deemed to have been located here.

A study of suburbs around Poompuhar leads us to many valuable details and historical evidences.

Kazhaar Munturai

It lies on the south bank of the river Kaveri. Presently it is called by the corrupted name 'Kazhudakkaran Thurai". It was the Bathing Ghat of Puhar during the Indira Festival. The highway leading to this place was known as 'Thanpatha Peruvithi' according to Ilangovadigal.

Saikadu

This place on the south bank of the river Kaveri has been eulogized by the Sangam classic Agananuru and also by Sambandar's Thirupathigam. The Sambapathi temple lies south of Saikadu, This ancient place is presently called by the name Sayavanam.

Vanagiri

It also lies on the southern bank of the river Kaveri. The excavation conducted here by the Archaeological Survey of India has brought to light a small water reservoir fed by brick-built inlet-channel from the river Kaveri.

Manigramam

It lies on the northern bank of the river Kaveri. It is noted for its colony of foreign trade merchants. The trial excavation at this place has yielded the rouletted ware in grey, pink and black fabrics, the megalithic black and red ware, terracotta figurines, coloured beads

etc. They are suggestive of the occupation of the sites in the beginning of the christian era.

Kappakarappu

The fisherman of the area call the place where the confluence of the river Kaveri takes place into the sea as Kappakarappu. Perhaps in ancient days this place must have been a sea port and a ship must have sunk near here due to a big storm.

Neidavasal

It lies on the sea shore to the north of Kaveripoompattinam. The Sangam Classic Purananuru notifies it as belonging to Ilanchetchenni. Ilangovadigal too praised this place. This place had within its bounds sacred tanks such as Somakundam, Suriyakundam, and also the temple dedicated to Manmatha. The present day Neithavasal must have formed a part of the ancient Maruvurpakkam.

Kariappar

It is believed that this is the place that contains the submerged portions of the eastern part of Poompuhar and also Kamavel Kottam. A few years ago the fishermen stumbled upon a Kalyanasundara bronze and a deity of Parvathi under sea and recovered them to the shore.

Velliyaniruppu

It is adjacent to Saikadu. It was here the temple of Baladeva located. The copper coin of Roman king Agustus has been collected from this place. Broken pieces of Roman pottery are another important finds. Perhaps this place was the Roman settlement in Puhar.

சிலம்பின் வரிகளுக்குச் சிற்பச் சான்றுகள்

டாக்டர். இரா. கலைக்கோவன்

இயக்குநர்

டாக்டர் மா. இராசமாணிக்கனார் வரலாற்றாய்வு மையம், திருச்சி.

சிலப்பதிகாரத்தைப் போல் பழந்தமிழர் கலை வடிவங்களைத் தொகுத்துத் தரும் இலக்கியம் வேறொன்றில்லையெனலாம். அரங்கேற்றுக் காதை, கடலாடு காதை, கானல் வரி, ஊர்காண் காதை, ஆய்ச்சியர் குரவை, குன்றக் குரவை, நடுகற் காதை என்று எந்தப் பகுதியைப் புரட்டினாலும் அங்கே ஆடற்கலை பற்றிய செய்திகள் அளப்பரிய நிலையில் வரிசைப்படுத்தப்பட்டுள்ளதைப் பார்க்கலாம். இவற்றுள் கடலாடு காதை பதினொரு ஆடல் வகைகளைப் பட்டியலிடுகிறது. கோவலனை மகிழ்விக்க ஆடற் கலையரசி மாதவி ஆடியதாக இப்பதினொரு வகை ஆடல்களையும் இளங்கோ இனம் காட்டுகிறார்.

நின்றாடல், படிந்தாடல், வீழ்ந்தாடல் என்று மூப்பெரும் பிரிவுகளாய்ப் பகுக்கப்பட்ட இப்பதினொரு வகை ஆடல் வடிவங் களுள் குடக் கூத்தும் ஒன்று. இது நின்றாடல் வகையைச் சேர்ந்த தாகும்.

வாணன் பேரூர் மறுகிடை நடந்து
நீணிலம் அளந்தோன் ஆடிய குடமும்

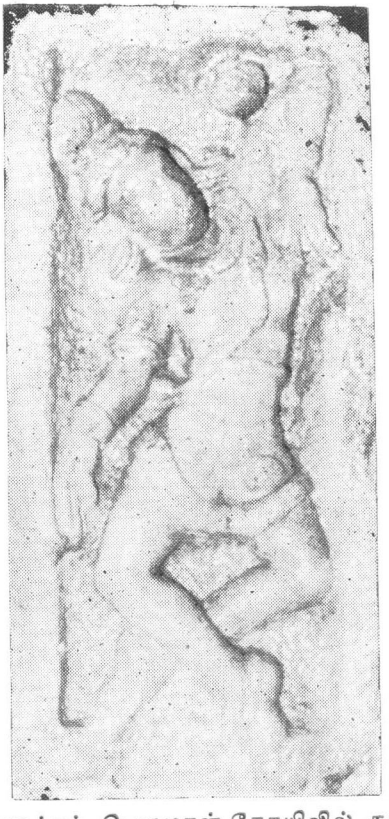
என்ற சிலம்பின் வரிகள் குடக் கூத்து நிகழ்ந்த இடத்தையும், நிகழ்த்தியவர் பெயரையும் தருகின்றன. வாணன் என்னும் அசுரன் தன் மகள் உழை காரணமாகக், காமன் மகன் அநிருத்தனைப் பிடித்து, 'சோ' என்னும் தன் தலைநகரில் சிறை வைக்கிறான். நெடிய இந்நானிலத்தைத் தன் திருவடிகளால் அளந்த திருமால், சிறைப்பட்ட அநிருத்தனை மீட்பதற்காக 'சோ' நகர வீதிகளில் குடங்களைக் கொண்டு நிகழ்த்திய திருக்கூத்தே **குடக்கூத்து.**

விநோதக் கூத்து வகையைச் சேர்ந்த இதன் உறுப்புகள் ஐந்தென்பர்.

இளங்கோ இலக்கிய வரிகளில் இழைத்துக் காட்டும் இந்தக் கலை வடிவத்தைச் சிற்பிகள் கல்லில் படம் பிடித்துள்ள அற்புதத்தைச் சில கோயில்களில் மட்டுமே காணமுடிகின்றது. இதுவரை ஆறு கோயில்களிலிருந்து குடக் கூத்துச் சிற்பங்கள் கண்டறியப்பட்டுள்ளன. இவற்றுள் கொற்றமங்கலம் விஷ்ணு கோயில், கீழப் பழுவூர் ஆலந்துறையார் கோயில், திருவல்லம் வில்வநாதீசுவரர் கோயில், துடையூர்த் திருக்கடம்பந்துறை மகாதேவர் கோயில் ஆகிய நான்கு கோயில்களிலிருந்து இச்சிற்பங்களை இனம் கண்டு வெளிப்படுத்திய பெருமையை டாக்டர் மா. இராசமாணிக்கனார் வரலாற்றாய்வு மையம் பெறுகிறது. திருவெள்ளறை புண்டரிகாட்சப் பெருமாள் கோயிலில் இடம் பெற்றுள்ள சிற்பமும், திருப்பத்தூர் திருத்தளி நாதர் திருக்கோயில் சிற்பமும் ஏற்கனவே ஆய்வாளர்களால் நூல்வழி அடையாளம் காட்டப்பட்டவையாகும்.

இந்த ஆறு குடக்கூத்துச் சிற்பங்களுள் நான்கு, கருவறைப் புறச்சுவர்களிலும்; ஒன்று உள் மண்டபமாய்க் கருதப்படும் சிதைந்த மண்டபத்தின் தூணொன்றிலும், ஆறாவது உள் மண்டபத்து வட புறச் சுவரின் கொடுங்கை முகப்பிலும் இடம் பெற்றுள்ளன. திருவெள்ளறை, திருப்பத்தூர், திருவல்லம், துடையூர்க் கோயில்களில் காணப்படும் குடக் கூத்துச் சிற்பங்கள் ஆடவர் ஒருவர் கூத்து நிகழ்த்துவதைப் படம் பிடித்துக் காட்ட, கொற்றமங்கலம், பழுவூர்ச் சிற்பங்களில் பெண்ணொருத்தி ஆடுவதைக் காணலாம். ஏறத்தாழ சமகாலத்தைச் சேர்ந்தவையான (கி.பி. 900-1000) இவ்வாறு சிற்பங்களுக்குள்ளும் சில ஒற்றுமைகளும், சில வேற்றுமைகளும் காணப்படுகின்றன.

திருவெள்ளறை புண்டரிகாட்சப் பெருமாள் கோயில் கீழ்த்தளத் தென் புறச் சுவரின் தாங்குதளப் பகுதியில் காணப்படும் ஆடவர் குடக் கூத்து கலை நயமும், தனித்துவமும் பொருந்திய ஓர் அற்புத ஆடற்கோலம். வலக்கையைத் தொங்கும் கையாய் நெகிழ்த்தி, முழங்கையளவில் மடக்கிச் சரித்த இடக்கையைத் தோள் பட்டையருகே செங்குத்தாய் உயர்த்தி, இரண்டு கால்களையும் ஸ்வஸ்திகமாக்கி ஆடும் இவரின் ஆடையணிகளும், உடல் அசைவு



புண்டரி காட்சப் பெருமாள் கோயிலில் காணப்படும்
குடக்கூத்துச் சிற்பம்



கொற்றமங்கலம் விஷ்ணு கோயில் தூணில் காணப்படும்
குடக்கூத்துச் சிற்பம்

களும் மிக நேர்த்தியாகக் காட்டப்பட்டுள்ளன. செவிகளை அலங்கரிக்கும் பனையோலைக் குண்டலங்கள் ஆடலின் விரைவுக்கேற்பப் பக்கவாட்டில் அசைந்தாட, சடா மகுடத்துடன் கூடிய தலையை வலப்புறம் சாய்த்து, இடப்புறம் திருப்பி இதமாய்ப் பார்க்கும் இந்த ஸ்வஸ்திக வித்தகரின் வலப்பாதம் அக்ரதல சஞ்சாரத்திலும், இடப் பாதம் சூசியிலும் உள்ளன. உயர்த்திய இடமேற்கையின் கங்கணத்திற்கு மேலாகச் சாய்ந்த நிலையில் குடம். நளினமும், நயமும் பொருந்திய நடன அசைவுகளை நயம்பட எடுத்துக்காட்டும் அழகுப் புதையலாய்க் காட்சியளிக்கும் இந்தக் குடக் கூத்தரின் திருமுகம், கருணையும் கனிவுமாய் ஒரு சிற்பக் கவிதையெனத் திகழ்கிறது.

திருவல்லம் திருக்கோயில் கருவறையின் மேற்குப் புறக் கோட்டத்து மகர தோரணத்தில் காட்சியளிக்கும் குடக் கூத்தர் சற்று வசதியானவர். மண்டல நிலையில் பார்சுவகப் பாதங்களுடன், இடக்கையைத் தொங்கும் கையாக்கி, வல மேற்கையில் குடம் சுமந்து ஆடும் இவருக்கு, இருபுறமும் இசைக் கருவிகளை முழக்கும் கலைஞர்கள், பக்கத்திற்கொருவராய், நின்ற நிலையில், இவரின் பாத அசைவுகளுக்குப் பாங்குறத் தாளம் சேர்க்கின்றனர். இரண்டு வகை மத்தளங்கள் சற்று நீள வடிவிலானதை வலப்புறமிருப்பவர் இசைக்க, சிறிய மத்தளத்தை இடப்புறமிருப்பவர் இயக்குகிறார்.

துடையூர் திருக்கடம்பந்துறை மகாதேவர் திருக்கோயில் கருவறையின் வடபுறக் கண்டப் பகுதியில் காணப்படும் குடக் கூத்தர் 14 சென்டிமீட்டர் அகலமும், 13 சென்டிமீட்டர் உயரமும் கொண்ட சிறிய பகுதியில் சித்தரிக்கப்பட்டுள்ளார். இடக் கை தொங்கும் கையாக உள்ளது. அர்த்தரேசிதமாய் வீசப்பட்டுள்ள வலக்கையில் குடம். மற்ற சிற்பங்களிலிருந்து பெரிதும் மாறுபட்ட நிலையில் இங்குக் குடம் முழங்கைக்கும் சற்றுக் கீழே கீழ்க்கைப் பகுதியின் மேலே காணப்படுகிறது. மண்டல நிலையில், முவ் வளைவுக் கோலத்தில், பார்சுவகப் பாதங்களுடன், வலப்புறம் திருப்பிய முகத்துடன், வனப்பு கொஞ்ச நிற்குமிந்தக் கலைவடிவம் இடைக்காலச் சோழர்களுடையது.

திருப்பத்தூர் திருத்தளிநாதர் கோயில் கருவறையின் மேற்குப் புறக் கொடுங்கையில் ஒரு குடக் கூத்துச் சிற்பம் அமைந்துள்ளது. இச்சிற்பத்தைப் பற்றி திருப்பத்தூர் என்னும் நூலில் திருமதி வள்ளி சொக்கலிங்கம் எழுதியுள்ளார். அதில் தென்புறக் கொடுங்கையில் உள்ளது என அவர் எழுதியுள்ள இச்சிற்பம், மேற்குபுறத்தில்தான் அமைந்துள்ளது. மண்டல நிலையில் பார்சுவகப் பாதங்களுடன் இடக்கையைத் தொங்கும் கரமாக்கி, முவ்வளைவுக் கோலத்தில் இடப்புறம் சாய்ந்து வலப்புறம் திருப்பிய முகத்துடன், குடக் கூத்து நிகழ்த்தும் இவரின் வல மணிக்கட்டு வல மார்பருகே சரிந்துள்ளது. குடம், வலமேற் கையில் சமனீட்டு முயற்சியில் பராமரிப்பின்மையால் இவ்வரிய சிற்பம் பெரிதும் பொரிந்துள்ளது.

கொற்றமங்கலத்துக் குடக் கூத்துப் பெண்ணரசி ஒல்காப் பேரெழிலும், ஒசிந்த தோற்றமும் கொண்டவர். இவரது குடமும் மேலே உயர்த்திச் சரித்த வல மேற்கையில்தான் அமைந்துள்ளது. தலையில் அழகாய் எழுந்து இயல்பாய்ச் சரிந்த கொண்டை வலப் பாதம் பார்சுவகமாய் அமைய, இடப்பாதம் சூசியில் பட்டாடையின் மடிப்புகள் பாத அசைவுகளுக்கேற்ப அலைக் கோலம் காட்ட, இடக்கையைத் தொங்கும் கரமாக்கி, இனியதோர் கூத்தை இங்கே நிகழ்த்திக் காட்டும் இந்த இளைய சுந்தரி, உத்தமசோழன் காலத்துக் கொற்றமங்கலத்து நெஞ்சங்களில் கோடி கோடியாய்க் கற்பனை களை வளர்த்த கோமளப் பேரழகி போலும் !

பழுவூர்ப் பெண் கொடுங்கை முகப்பில் குடக் கூத்து நிகழ்த்து கிறார். இடப்பாதம் பார்சுவகமாய் இருக்க, வலப் பாதம் சூசி காட்டுகிறது. தொங்கும் வலக்கைக்கு மேலே சரிந்த தலைக் கொண்டை. உயர்த்திய இடமேற்கையில் குடம். காலத்தின் கடுமை யால் பொரிந்த நிலையிலும் பொலிவு குன்றாப் பேரழகு.

இவ்வாறு சிற்பங்களையும் வகைப்படுத்திப் பார்க்கும் போது சோழர் காலத்தில் குடக் கூத்து நிகழ்த்தியோர் மேற்கொண்ட பாத உத்திகள், அலங்கார அமைப்புகள், மண்டல நிலைகள், இசைக்

கருவிகளின் பங்கேற்பு எனப் பல செய்திகளும், இவற்றுக்கிடையே உள்ள ஒற்றுமை, வேற்றுமைகளும் தெளிவாய்ப் புலனாகின்றன.

ஒப்பீட்டு அட்டவணை

சிலப்பதிகாரத்து மாதவியாடிய இக்குடக் கூத்து சோழர்கள் காலத்தில் தொடர்ந்து புரக்கப்பட்டமையும், அந்தக் கலை வடிவம் ஆடவர், மகளிர் என இருபாலராலும் ஆர்வத்தோடு ஆடிக்காட்டப் பட்ட உன்னத நிலைமைகளும், தனித்தும், இசைக் குழுவினருடன் இணைந்தும், குடக் கூத்து நிகழ்ந்த சூழல்களும், கோயில் சுவர்களில் காலக் கவிதைகளாய்க் கனிந்திருக்கும் இவ்வாறு சிற்பங்களால் இனிதே விளங்குகின்றன. கலை மரபுகளின் வேர்களையும், அவற் றின் வகைபாடுகளையும், வளர்ச்சி நிலைகளையும் இனம் காண, இலக்கிய வரிகள் உதவினாலும், அவற்றை மெய்ப்பிக்கும் வகையில் சிற்பச் சான்றுகளோ, கல்வெட்டு அரவணைப்போ கிடைக்கும் போது, 'இது கற்பனையல்ல, மெய்தான்' என்ற உறுதிப்பாடும், உற்சாகமும் ஒருங்கே ஏற்படுகின்றன. கடலில் மூழ்கிய பூம்புகாரைக் கரையேற்ற நடக்கும் முயற்சிகளோடு, சிலம்புக் கடலில் சிதறிக் கிடக்கும், ஆடல் புதையல்களை அடையாளம் காணவும், அவற்றை உரிய சிற்பங்களோடு ஒப்பீடு செய்து உருவம் காட்டவும், புதிய முயற்சிகள் பெரிதாய் எழுந்தால், கரிகால் வளவனுடன் இளங்கோவும் வாழ்த்துவார்; கலைகளும் வாழ்த்தும்.

DATE OF SANGAM KINGS AS GLEANED FROM THE EPIC CILAPPADIKARAM

by

A. Padmavathy
Epigraphist

The Tamil epic Cilappadikaram gives a detailed account on poompuhar. All these references given by cilappadikaram, are further supported by many poems of Sangam Literatures, such as Agananuru, Padirrupattu and Purananuru.

According to Agananuru, a Maghada ruler marched towards South with vadugar, *i.e.* Telugus to attack Palaiyan Maran, a feudatory of the Pandya king Nedunchelivan.

Pandian Nedunchelivan attacked the Musiry port during the period of Imayavaramban Neduncheralathan, the father of Ceran Chenguttuvan. Ceran Chenguttuvan is said to have given his support to the chola ruler Killivalavan in the war with the seven minor chiefs. From this it can be assumed that Killivalavan should be the immediate successor of Karikala. It can be surely said that the kings who were depicted in the epic Cilappathikaram were the real contemporaries. They are not fictitious characters, or the kings belonging to different periods.

Mamoolanar, a poet in one of his poems in Agananuru says about the Nanda king who had hidden his treasures in the caves of Ganges. These treasures were washed a way by some flood. This poem also tells us about the war expedition of Mauryas towards the Mohur Palaiyan.

From the above, we can conclude that the kings Neduncheliyan, Karikalan, Killi, Ceralathan, Chenguttuvan were all contemporaries. Then the next question is who was that Maurya king?

Mamoolanar says about the above incident of the last Nanda king Dana Nanda, and the war expedition of the Maurya king. Chandragupta maurya established the Maurya dynasty, defeating the Nanda kings.

Mauryas had ruled the Magadha Country from the 4th century B.C, to 2nd century B.C. Among them, Asoka had not attempted any war towards South. But some of his ambassadors had come to the south just to propagate Buddhism.

There is no evidence to show, that the kings who had ruled after Asoka, attacked the South. So, only the kings who had ruled before him, might have attacked the South. Those two kings were Chandragupta and Bindusara.

Chandragupta fought Alexander, and his son Seluces and Anga, Vanga, Kalinga, Yuddheyas etc., etc, He

extended his kingdom from Persia to South India. His son Bindusara ruled the kingdom extablished by his father, peacefully. So the only remaining Maurya king Chandragupta should have made war expedition towards the South.

There is no evidence for his victory over the south. His empire had extended in the South upto the Telugu country only (*i.e.* Deccan). On the contrary our Chola ruler Karikala is said to have defeated the Magadhan ruler.

It is already mentioned above that the kings referred in Cilappadikaram were contemporaries of Magadha king Chandragupta. So, we can say that the defeated Magadhan king might have been the Chandragupta Maurya.

Karikala Chola defeated the Avanthi ruler also. Both the Magadha and the Avanthi kings presented Magarathoranam and Patti Mandapam respectively to Karikala.

Cilappadikaram says that the Chola king Karikalan carved his emblem Tiger on the Mountain Himalaya. Some poems in Agananuru say that the father of Ceran Chenguttuvan, after having defeated the Arya kings, carved his emblem Bow and Arrow on Himalaya.

Moreover Cilappadikaram and Agananuru tell us about the victory of Chera kings over Yavanas. It is said that the Yavanas had exchanged their gold for

spices like pepper. In Cilappadikaram, there are some references that Yavana warriors were guarding the Pandya palace. It also tells us, that there was a Yavana street in Poompuhar, the capital city of Karikala, the Chola king.

So, it is clear that the Chera, the Chola, and the Pandya kings were strong enough to defeat the Mauryas, Aryas and Yavanas. It has already been accepted by scholars that the Nandas ruled between 463 B.C. to 324 B.C., and Chandragupta ruled between 324 B.C. to 300 B.C.

From the above, we can safely conclude that the Tamil kings referred to in Cilappadikaram, namely Karikalan and his successor Killi, Neducheliyan and his successor Vetrivel Cheliyan, Ceralathan and his successor Ceran Cenguttuvan had lived in the second half of the 3rd century B.C.

Hence in all probability the period of Karikalan should be the middle of 3rd century B.C.

ANCIENT INDUSTRIES OF POOMPUHAR

by

S. Vasanthi
Archaeologist

Kaverippumpattinam otherwise known as Poompuhar was a beautiful maritime city of the Sangam age, situated at the confluence of the river Kaveri with the Bay of Bengal. It served as the centre of political, cultural and commercial activities of the ancient Tamils.

There were references of its flourishing trade, planned layout, beautiful building and harbour area from the early Tamil works such as Pattinappalai, Manimekalai and Silappathikaram. The excavation conducted at Poompuhar confirmed the existence of a great industrial civilization dating back to third century B.C. The excavation at Poompuhar has widened the scope for the study of the ancient industries at Poompuhar. The following are the next prominent industries that flourished in Poompuhar of ancient days.

Generally the professions of the artisans were heriditary. They inherit professional talents from their parents and their involvement in the art right from childhood must have helped them to attain a great degree of perfection. Silappathikaram mentions thirty two

different kinds of cotton cloths. Pattinappalai mentions that the Vannam means colour was normally used for dying the cloths.

Manimekalai also tells the artistic pattern of the expert weaving. The art of stitching fabrics of cotton, silk and wool was also known. All these stand as testimony to the early technical advancement in the art of weaving.

Ship Building

Wood carving was fairly well developed during the sangam age. Several types of tools, weapons, utensils, furniture, toys, boats, ships and chariots are stated to have been made by the carpenters. The sangam literatures refers to the city of Puhar as the celebrated sea port. The ship building must have been one of the major industries of Puhar. The larger vessels were called as Marakkalam, while the small fishing boats as Cattumaram. The epic Silappathikaram speaks different shapes of ships with faces like horse, elephant; and lion It reveals the artistic outlook of the Tamils in as early as second century A.D. According to Pattinappalai the ships standing in the port looked like huge elephants.

Salt Industry

Salt industry was widespread all along the sea coast. In Pattinappalai there were many references to salt industry.

Industry of Jewellery

A variety of jewels made of various materials are mentioned in the sangam literature. Making of beads, bangles, chain, anklets is elaborately discussed. The excavation has thrown more light on bead making industry of Puhar. The semi-precious stone beads, shell beads, shell bangle pieces, glass bangle pieces were unearthed from excavations. The people who made bangles, rings and beads made out of conch shells, lived in parallel streets of the western side of the palace in Puhar city. They were called as 'Vela parpans'. The sawed conches collected from the excavation corroborate the literary evidences.

Earthenware Industry

The art of pottery making and clay figurines is referred to in the ancient Tamil works like Silappathikaram and Manimekalai. The potters were known as Vetko. The excavated trenches at Poompuhar have yielded different varieties of potsherds which proves the fact that pottery making was also an important industry of Puhar.

A considerable number of terracotta figurines were found at a place called Melapperumpallam near Kaveripumpattinam. This reveals that the potters had also made clay figurines. The artisans who made these figurines were called as Mannittalar.

The brick structure, almost semi-circular in plan, exposed during excavation may be the same as

'peraikeni' mentioned in Sangam literature. A vihara complex built of burnt bricks was also exposed. All this attest the fact that the art of brick making was also known to the people of Puhar.

Mint

Some square copper coins bearing the royal crest of the Chola, *i.e.* the tiger on one side and the elephant on the other were found from Poompuhar. These prove the fact that the art of minting coins was very popular at Puhar.

The industrial workers of Puhar lived in Maruvur-pakkam, a place where most of the industries were situated.

It is found that the archaeological evidences from Kaverippumpattinam strongly substantiate the literary references. The existence of number of industries at Puhar indicate that it was an urban settlement.

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