# MAHABALIPURAM: A SAGA OF GLORY TO TRIBULATIONS

by

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**Summary**

**Mahabalipuram, a world heritage site, also famous as the sixth century centre of Pallava art and architecture in South India, was also a seaport right from the beginning of the Christian era. The epigraphical sources confirm Pallava kings' active contacts with Ceylon, China and the Southeast Asian countries. A few Roman coins of Theodosius (4th century AD) found from the region suggest that Mahabalipuram also had trade contact with the Roman world around Christian era. It came to the glory only after the Pallava started building the structural and monolithic temple architecture in this area. Mahabalipuram was dotted with `Seven pagodas' once up on a time as referred by the earlier mariners. Now all but one, ` Shore Temple' is standing tall overlooking the Bay of Bengal, rest all believed to have been submerged in the sea as per the local traditions and the foreign accounts.**

**The recent (March 2003) underwater archaeological explorations carried out by National Institute of Oceanography, Goa has revealed many structural remains including a fallen wall, with three coarses, scattered dressed stone blocks, a few steps leading to a platform and remains of many more fallen wall sections. These apparently man-made structures are present in 5 - 8 m water depth, about 800 m from the present shoreline. The structures were badly damaged due to underwater strong currents and swells. The data indicates that a large area comprising of building complex has been submerged.**

**Based on the archaeological evidences around Mahabalipuram, the earliest possible date of these structures could be around1500 years BP.**

**The major and important factor affecting Mahabalipuram coast is erosion as a recent study has indicated the rate of coastal erosion in and around Mahabalipuram as 55 cm/yr. Tamilnadu has other evidence of such sever erosional regime prevailing which may be the reason for our loss of heritage sites like Mahabalipuram.**

**Introduction:**

MAHABALIPURAM, situated on the shore, about 55 km south of Chennai on the east coast of India (Fig.1), is a World Heritage Site, famous for its architectural marvels like Shore temple, *Rathas* (Chariots) carved out of single rock, Arjuna's Penance and other caves with rock cut art sculptures. These beautiful monolithic temple structures were built during 8th Century AD by the Pallava kings Narasimha Varman and his successors, Narsimha Varman II, Rajasimha I. Mahabalipuram was well known to mariners as 'Seven Pagodas' since early times, however at present, only one, the Shore temple built around 8th century by a late king of Pallava dynasty, exists. The 2003 underwater explorations by National Institute of Oceanography has revealed presence of many structural remains including a fallen wall, with three coarses, scattered dressed stone blocks, a few steps leading to a platform and remains of many more fallen wall sections in 5 – 8 m water depth which are believed to be man-made. The present paper details the findings and indicate retreat of the shoreline due to erosion, caused by hydrodynamic regime as cause of their submergence.

**Background:**

Mahabalipuram is also known as Mamallapattana, Mamallapuram, Mavalipuram, Mavalivaram, Mavellipore, Mauvellipooram, Mahabalipur and so on, Mahabalipuram, literally meaning '*the city of great wrestler*' as also '*city of the Great Bali*' in the memory of incidence wherein *Vishnu*'s Dwarf *Avatar*, *Vamana* , humbled the demon king Bali and caused his splendid beachfront palaces to collapse beneath the sea.

Another name, by which Mahabalipuram was known to earlier mariners, at least since Marco Polo's days, is "seven pagodas" as seven tall structures were visible from far while approaching. Carr (1869) refers to the account given by William chambers after his second visit to Mahabalipuram in 1776 that " according to the natives of the place, the more aged people among them, remembered to have seen the tops of several pagodas far out in the sea, chinch being covered with copper, probably gilt, were particularly visible at sunrise as their shining surface used to reflect the sun's rays, but that now the effect was no longer produced, as the copper had since become incrusted with mould and verde grease".

Since at present only one temple is clearly visible from sea, the folk tradition of the region, recorded by European travellers in 18th and 19th century (Ramaswamy, 1989, Rabe. 2001), suggests that out of 7 temples 6 have been submerged and what is remaining now is known as "Shore temple". it was presumed that others must be submerged beyond the breakers.

SIMILARLY, Ramaswami (1980) refers to interesting narration by Robert Sotheby's 'Curse of Kehama' about the submerged remains of Mahabalipuram as follows:

*Of the ancient kings, which Baly in his power*
*Made in primeval times: and built above them*
*A city, like the Cities of the Gods,*
*Being like a God himself. For many an age*
*Hath Ocean warr'd against his palaces,*
*Till overwhelm'd they lie beneath the waves,*
*Not overthrown, so well the awful Chief*
*Had laid their deep foundations...*
*When now the Ancient Towers appeared at last,*
*Their golden summits in the noon-day light,*
*Shone over the dark green deep that rolled between*

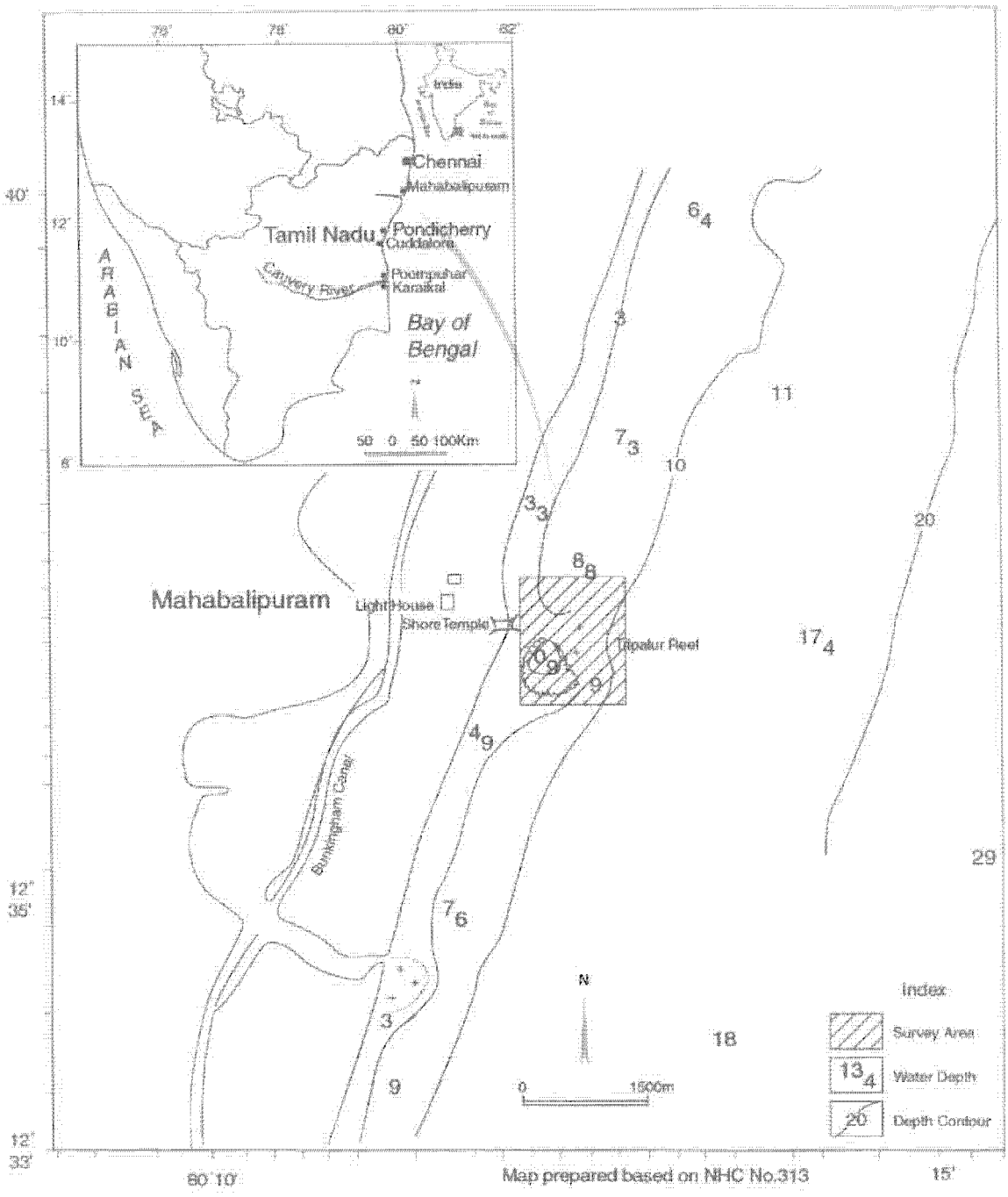


Fig. 1 Figure showing the survey area at Mahabalipuram

*For domes, and pinnacles, and spires were seen*
*Peering above the sea.. a mornful sight!*

SCHOLARS with different viewpoints have described `*seven pagodas'* differently. Robert Sewell (1882) says that "the seven pagodas is the English name for the remarkable group of monolithic temples, caves and sculptures known to the locals by the name of 'Mahabalipuram, Mavelipuram and to the English as Mavellipore' etc".

The first volume of the Manual of the Administration of the Madras Presidency, published in 1888, mentions the names of seven pagodas from the sailor's point of view. "The seven pagodas of Mauvellipooram, about 7 miles to the north of Sadras, are not discernible except when well in with the land. Two of them are near the sea, one of which, standing on a rock, is washed by it and is now nearly destroyed, although this pagoda, it is said, formerly stood at a considerable distance inland, the sea having encroached greatly on the land. Four of them are in the valley near the foot of the south island (probably five *rathas*) and the other on its extreme point. The woods often intercept the view of those in the valley, particularly when they bear to the west (Ramaswami 1980).

Archaeology of the Mahabalipuram: There are number of references suggesting that Mahabalipuram was a flourishing busy port in the beginning of the Christian era and continued to be so till the Pallava period, i.e., 8$^{th}$ century AD. Ramaswami (1989) mentions that before the Pallava period, Mahabalipuram actually was place of pilgrimage. Mahabalipuram was under control by Pallava kings from Kanchipuram, the capital of Pallava dynasty, from the Third Century to Ninth century AD.

**Geological Setting:**

The shoreline at Mahabalipuram is characteristically oriented NNE - SSW. River Palar joins the sea on the southern side of Mahabalipuram near Sadras. The Buckingham canal back waters, about 1.5 km west of the Mahabalipuram, with outlets at Covelong on the north and Kalpakkam in the south is also significant. Vasavasamudram - a flourishing port town during early centuries of the Christian era, is located on a stretch between Covelong in north and Vayalur in south, having vast hinterland area.

The shelf off Mahabalipuram is about 40 km wide and the shelf break occurs around 135 m depth and covered by carbonate-dominated sediments in the outer shelf and sandy silt and silty clay in the other parts (Vaz, 1996). The continental shelf of Mahabalipuram has two fold morphological divisions separated by a terrace at -120 m (Mohapatra et al 2002).

THE INNER SHELF in this region is mostly covered with sandy sediments (Selvaraj and Ram Mohan, 2003). In the near shore zone off Mahabalipuram, the seabed is uneven with rocky outcrops of granitic boulders with occasional sand patches and it gradually slops down towards east. There is a shoal called Tripalur reef, which is in the form of submerged rocks. A ridge is noticed southeastern side of the temple in about 8 - 10 m water depth that extends from South and narrows towards North and is more than 2 km in length and 0.5 km in width. At some places the top of ridges gets exposed during lowest tide waves break on them.

Shorelines / Sea level changes on the east coast are well studied. Merh, (1987) has reported that during mid-late Holocene period 2-3 time sea levels fluctuated between 2 to 6 m along the both coasts of India. Banerjee, (2001) has documented sea level fluctuation on the East Coast during last 5000 years.

A PRELIMINARY, joint underwater exploration programme by Scientific Exploration Society, UK and Marine Archaeology Centre, NIO, Goa for three days in April 2002 had provided clues on possibilities of man mad structures off Mahabalipuram, hence a detailed exploration programme was planned for 2003 (Technical report 2002). Owing to unavoidable reasons, it was not possible to carry out joint programme, hence present work was carried out by Marine Archaeology Centre only.

**Results and Discussions:**

While visual exploration was carried out through 91 dives, lasting for more than 60 hours at 25 locations to search the submerged structural remains, detailed survey was restricted to 5 locations where a large number of manmade structures were noticed (Fig 2 ). Underwater measurement of distances and bearing were carried out at important locations. At selected location videography was also carried out. The findings are described below in detail.

The seabed off Mahabalipuram in depth ranging from 6 - 15 m is highly undulating with variation in height from 1 to 6 m. Granitic rocks with patches of coarse-grained sand carpet the floor.

The findings of interest from archaeological point of view from the area include section of walls, some of them >10 m in length, fallen walls, rectangular and square scattered stone blocks, and a rectangular platform with steps leading to the structure etc. At some places the remains are in badly damaged condition as also thick marine growth of sponges, shells, barnacles and mussels is invariably found associated.

The area is comprised of several structures. The main structure in location 1 is at 6 m water depth and located about 700 m E of Shore Temple,. The upper portion of the structure, being very shallow, is visible from a boat during lowest tide. The structure covers an area of approximately 75 x 35 m. The structure is broader on the northern side where a heap of stone blocks are also observed, while on the southern side scattered small stone structures of various sizes were observed (Fig 3). The Structure has several N – S oriented wall sections. The width of the main structure varies from 34 m to 16 m. All the construction work appears to be on granitic stone blocks. A wall, about 25 m in length and 65 cm in width with two to four coarses is noticed. The dimensions of the block with which the construction has been done varies between 95 x 65 x 90 cm a and 45 x 50 x 50 cm. Huge rectangular blocks measuring approximately 2 x 1 x 1.5 m were also noticed on the top of the structure along with few blocks having joinery projections (Fig 4). As structures are covered with marine growth, few blocks were cleaned and chiselling marks were observed on them. One more wall, about 5.4 m in length was seen on the northern side along with two parallel walls on southern side of the main structure with steps like structure leading from down to up. There was a small platform along with a wall towards north-eastern side of the main structure. Further northern side remains of wall extended up to 15 m in length.

ON THE WESTERN side of the main structure, remains of wall were noticed on raised platform. Some of the stone blocks of western side were cleaned. One of the blocks shows that it has the joinery projections for interconnecting the blocks while construction. The maximum length of wall section observed is 32.5 m. however; other six shorter walls are also noticed. Huge square and rectangular stone blocks are noticed at the centre of the structure, at a height of 4 m from the seabed. The entire structure has a thick marine growth of sponges, shells, barnacles and mussels.

Second important structure is about 100 m N of the site I, where the remains of a N-S wall,

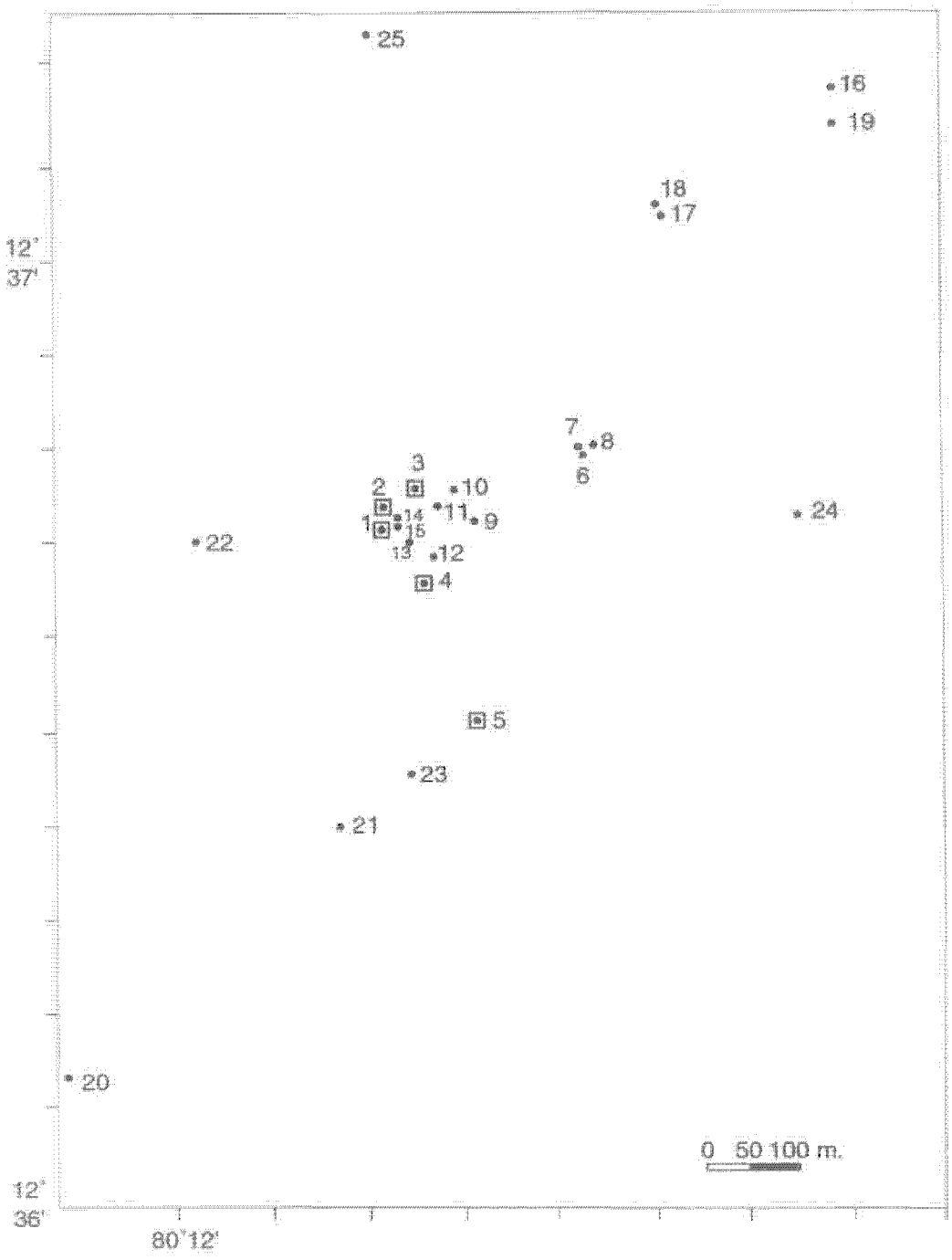


Fig.2 Map showing the diving locations off Mahabalipuram

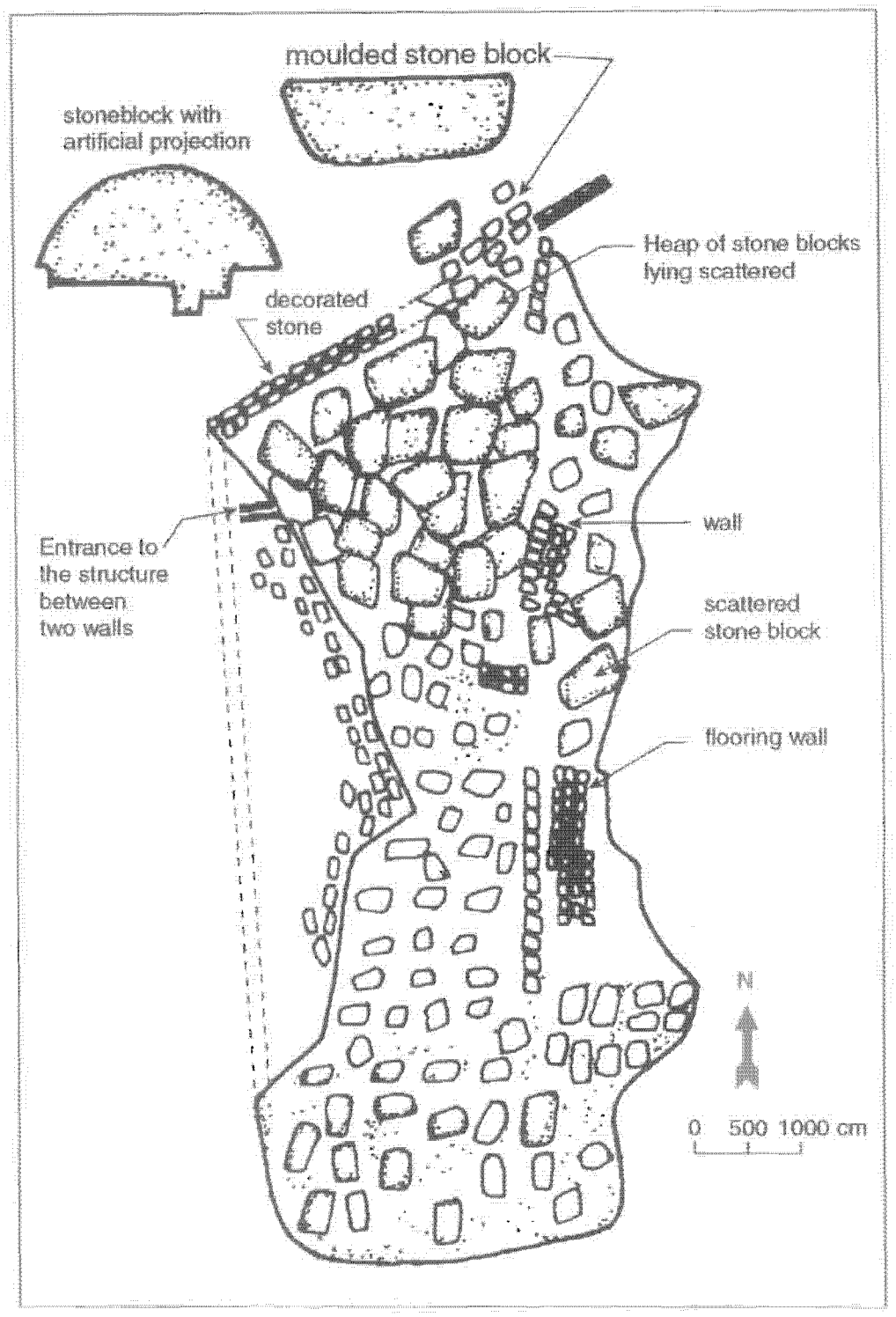


Fig. 3. Plan of the underwater structure at site I off Mahabalipuram

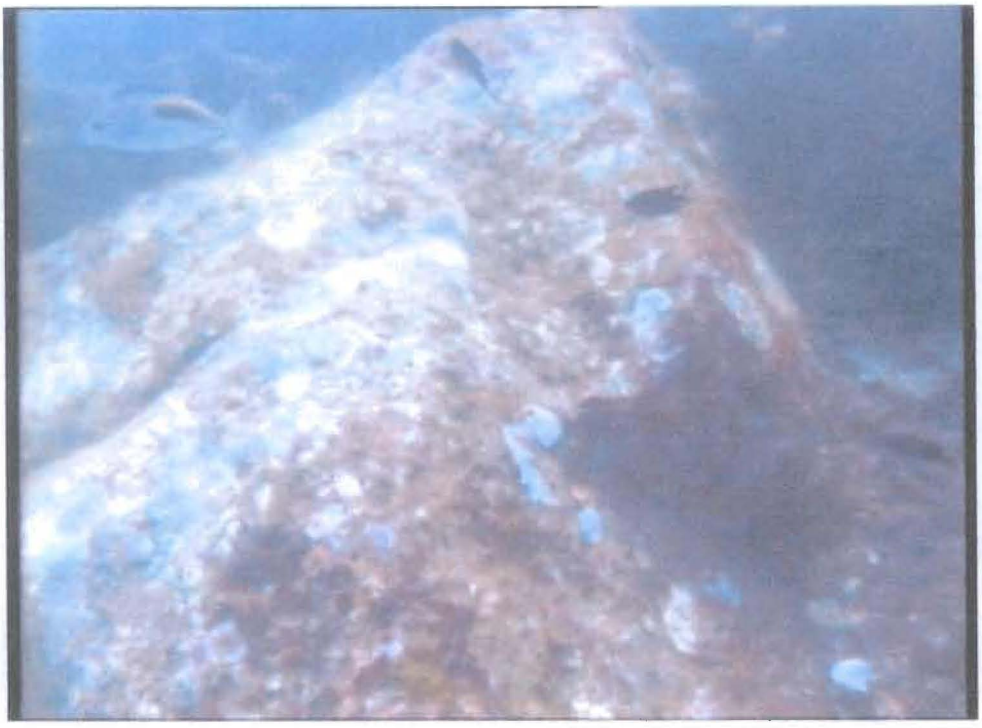

Fig. 4. Stone block with the joinery projections at site I off Mahabalipuram.

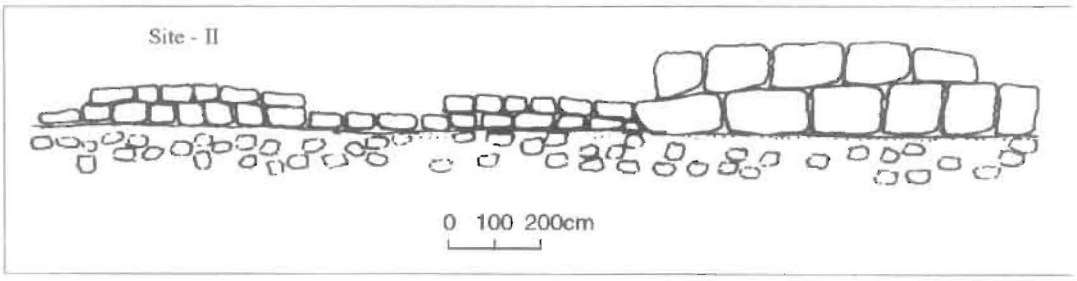


Fig.5. Figure showing the section of the fallen wall at site II off Mahabalipuram

having about 50 m length and 60 cm width, with 2 courses and about 10 cm thick marine growth of sponges and barnacles was noticed (Fig 5 ). Here also huge stone blocks were conspicuous by their presence.

AN INTERESTING find, a huge natural rock, >100 $m^2$ in size with chisel marks and query marks was observed on the eastern side of the site I at -8 m. Stone blocks used for construction were probably extracted from here. Another wall of L shape having two courses was also observed. There were three more lines of dressed stone blocks noticed at this site running towards northern side of the rock.

A structure located about 200 m towards the NNE of the site I in 5 – 8 m water depth is considered very important due to presence of remains of wall, dressed stone blocks and the natural boulders. Some of the stone blocks appear to have figurines carved on them, however their further identification was not possible due to thick marine growth. One of the most important finding of this location is a wall running more than 10 m with a width of 2.5 m. Similarly a E – W wall, 5 m in length and 2 m in width along with many fallen dressed stone blocks found scattered around it was also noticed. There are two hillock types of natural rocks noticed at one place 50 m apart with some dressed stone blocks scattered around it. Similar dressed stone blocks were also noticed on the eastern side of the structure. At some places the structures extend right from the sea bed to above the sea surface.

The presence of natural rocks, surrounded by several wall sections, on the south-eastern side of site I, in 6 - 8 m water depth, is another interesting location. Here a wall having seven courses of small stone blocks of 1.5 m height and 2 m length with 65 cm width was noticed. Also a connecting wall having only one course of about 5 m in length, part of which was buried in the sediment, is also observed. Apart from these, some huge rocks were noticed but due to extensive marine growth it was not possible to check them thoroughly.

It was difficult to prepare layout plan for all sites as the structures are in badly damaged conditions and are covered with thick biological growth, however it was possible to prepare the same for site I, which gives some useful information. The plan indicates that this construction could be of a big complex as the huge stone blocks and several fallen wall were noticed *in situ*. It appears that construction has been carried out on a raised platform with several walls and a floor made of granite blocks. An opening between two walls with steps has been noticed which probably may be the entrance to the complex from the southern side. The natural rock boulders noticed on SW side are similar in shape and size to those found on land at Mahabalipuram. Similarly, style of construction observed in the structures underwater is identical to one observed on adjacent land. It was not possible, however, to verify the binding material of underwater structure due to extensive marine growth and their damaged condition. There were many wall sections observed at different locations including at 'quarry area' on a huge rock. The dressed stone blocks required for the construction were probably extracted from the quarry found near by. In fact, most of the religious / ceremonial constructions including the present Shore Temple, at Mahabalipuram, have been built with granite. The stone was extensively used for the construction of temples during Pallava regime.

THE UNDERWATER inspections off Mahabalipuram clearly show the presence of wall sections, fallen and scattered long walls, structures at various locations, large number of dressed stone blocks of rectangular and square type of building materials at several places and perhaps a quarry. Many of them

appear to be man made in nature. Some times the extension of these structures can be noticed at least a few hundred metres parallel to the shore at various depths between 5 to 10 m. A few continuous remains of walls have been noticed at all the places The presence of dressed and regular blocks running sometime more than 25 m in length suggest that they are part of some building complex. At several places high platforms and steps leading to platforms are also noticed (Fig 6).

THE PRESENCE of man-made structures of Mahabalipuram in 6 – 8 m water depth raises many interesting questions, such as when they were constructed and how and why they happened to be there. If we had found some artefact or antiquity providing irrefutable clues, then answer would have been easy. Even some datable sample would have helped in solving this jigsaw puzzle. In the absence of datable evidences, the structures found underwater can be dated only based on the local traditions and available literature. The local tradition and the people of Mahabalipuram believe that five temples similar to the Shore Temple have been submerged in the sea.

Ancient Tamil literature does not directly mention Mahabalipuram, but a poem, *Perumpanarrupadai*, (dedicated to Tondaiman Ilamtiraiyan, a king of Kanchipuram), describes a port called *Nirppeyarvu* which could either be identified with Kanchipuram or Mamallapuram. The place has been dated to the end of 2nd century AD (Ramaswami 1980) Similarly, early foreign travellers also do not mention this site, but the author of Periplus of Erythrean Sea (Schoff, 1974) has mentioned a port called as Sopatma, which could be identified with Sadras, situated about 20 km south of Mahabalipuram which was a small port during early centuries of Christian Era. Ramaswami (1980) mentions that Pallava king Mamalla who sets his workers working on the rock for the first time here in 7th Century AD, thereafter this place names as Mamallapuram. The name Mahabalipuram, therefore, is of a very late origin. As early Tamil literature do not mention the name Mahabalipuram, it is reasonable to infer that the tradition of submergence of these structures is not earlier than 1000 years are so. If the shore temple is the last surviving temple, which is about 1200 years old, then other temples submerged in the sea should be of the same age.

The archaeology of Mahabalipuram commences from the early centuries of the Christian era as a few Roman, Chinese coins were found (Ramaswami 1980). Two Pallava coins bearing legends read as Srihari and Srinidhi have been reported in and around the Mahabalipuram (Dayalan,1992) One of the inscriptions of Narasimha I mentions that he (Narasimha I) is the first person to introduce the construction of caves, temples in granite stones. The zenith of human habitation around Mahabalipuram was during Pallava dynasty, therefore, the dates of these temples may not be earlier than the 1500 years BP.

Considering these evidences, it may be concluded that Mahabalipuram was a port before Pallavas. It became the principal port during Pallava rule and they had voyages to Sri Lanka and South East Asian Countries. The port was continued till early British period where a mention of British ship anchored at Mahabalipuram (Ramaswami 1980). With these it may be mentioned that Mahabalipuram was an active port since last 2000 years BP.

RAMASWAMI (1980) refers to the several accounts of Europeans about the submergence of the city and the tradition that 'a large city and 5 magnificent pagodas have been swallowed up at this place by the sea'. Robe (2001), Chambers (1788), Graham Hancock (2002), Mohan and Rajamanickam (2002) believe that out of seven temples carved out of granite during 8th century AD only one has survived and the rest have

**Fig.6 Figure shows the steps leading to the platform found at Mahabalipuram.**

submerged. However, based on the facts that the rock art sculpture was encouraged by the Pallavas at this place and most of them were made during that period, these structures may be dated as 1500 -1200 years BP.

THE EARLIEST stone constructions in India have been reported during Harappan period, i.e. around 2500 BC (Joshi and Bisht,1994) especially in Gujarat and other coastal areas. In Tamil Nadu it is only during Pallava regime ( 800 AD) stone was extensively used for the construction of temples and residential houses were of bricks and wood. The stone blocks are not very regular and mud mortar was used for the construction during harappan period. However, stone pillars, statues are made on finely dressed stones. In the case of Mahabalipuram, the stones are nicely dressed and chiselled properly. As archaeology of Tamil Nadu does not refer to stone masonry prior to the $4^{th}$ - $5^{th}$ century AD. Therefore, the dates of submerged structures may be dated to later than early centuries of Christian era.

It is also intriguing as how the structures got submerged. A common thinking would be to account for sea level rise. The sea level has fluctuated between 2 – 6 m about 2 - 3 times during mid-Holocene period on both the coasts of India (Merh, 1987). The sea level fluctuations has documented on the East Coast of India for the last 5000 years (Banerjee, 2000). However, by it self sea level rise theory do not satisfy the submergence aspect satisfactorily. An alternative explanation is required for the purpose. In continuation of general background on history of sea level changes Krishnan (Krishnan, 1968) and Mohapatra and Prasad (1999) point out that the major and important factor affecting Mahabalipuram coast is erosion. Severe erosion at Kalpakkam, south of Mahabalipuram due to long shore sediment drift (Mohapatra. and Hariprasad, 1999) has also been reported. A recent study (Ramaiyan et al1997) suggests the rate of coastal erosion in and around Mahabalipuram is 55 cm/yr. If the same rate has prevailed since last 1500 years, which is possible, then shoreline at that time might have been around 800 m eastward and all the structures noticed underwater would have been on the land. If the rate of coastal erosion derived for Poompuhar, located125 km to south, are applied for Mahabalipuram, then the structures in 5 to 8 m must be on the land 1500 yr. BP(Sundaresh et al, 1997)

Interestingly, due to construction of semi-circular breakwater recently, the shoreline over a stretch of 3 km towards north of Shore Temple experiences accelerated erosion (Chandramohan et al. 1997). There is no evidence of tectonic activity on the coast during last 1200 years BP as shore temple has not been affected (Mohapatra and Hariprasad, 1999)

IT IS INTERESTING to note here that a $12^{th}$ century AD city known as Dunwich in Baltic Sea, Europe, is lying between 5 -16 m water depth as a result of coastal erosion (Bacon,1978).

From above discussions, it may be attributed that coastal erosion followed by invasion of sea has played a major role in submergence of these structures and sea level changes might have played a contributory role. However, further data on this aspect need to be collected and analysed to confirm this.

**Conclusions:**

'Shore Temple' – believed to be only surviving 'pagoda' out of seven pagodas constructed by Pallava king was always beckoning to underwater archaeologists for dive and find out the truth. The legend was too popular and well known to ignore. The first ever underwater explorations provoked for further investigations, detailed explorations reported here, though fail to provide clinching evidence in favour, they do provide substantial material to carry out

further research, may be with higher technology and better preparedness. Meanwhile, further research on shoreline shift in the region will also help in understating cause of submergence.

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