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Sri Lankan nautical culture and technology: an overview of studies from the 19th century to date.

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Introduction: The power of a myth

Myth and legend are both fascinating and informative. Yet, they can lead to self-deception and a refusal to look at reality. This paper – a very preliminary one and therefore very simplistic – deals with this latter aspect of one of these myths: the myth that Sri Lankans had no nautical culture and that the surviving traditional little craft were picturesque but primitive and nothing to be proud of.

This Great British Colonial Myth, perpetuated by colonial officials, scholars and Missionary schools, was that the Sinhalese were not a sea-going people. Even Buddhist schools which were meant to counter-balance the colonial mindset fell victim to this and tacitly accepted that the only way to assert ourselves was to be a better Englishman than an Englishman. Jawaharlal Nehru, in his "The Discovery of India" stresses that the discovery of the greatness of Buddhist culture and civilization by Western scholars laid the foundation of the Indian pride in India: so that today we say that "You can take an Indian out of India, but you cannot take India of an Indian". Unfortunately this salutary effect was not repeated in this country. We still do not instill a pride in what we really are: our patriotism is a blend of anger and nostalgia, and the trigger is a win at a "World Cup". Today students of Madhyama Maha Vidyalayas, who were educated in their mother tongue, perpetuate the Great Colonial Myth as Gospel Truth. The final triumph of Imperialism, Urbanization, the "Call of the West" or what you will. It has triumphed, and there is no turning back.

Farmers' children and fishermen's children do not want to follow in their fathers' profession. Neither do their parents want them to follow them to. So – to come back to the nautical theme – these children do not know, nor want to know why an *oruwa* is built that particular way, how she sails, what is unique about these craft, why they are an important part of our culture and heritage. They can talk about the invasion of Arakan by Parakkramabahu I in the 12th. century; they can quote from Sinhala *kāvya* (poems) about a multitude of boats plying the rivers; they can recite *pāru kavi* (songs of the boatmen) – but they cannot tell you what an *oruva* is. There is a mystery here: why we glorify *sangha* (monks), *veda* (physicians), *guru* (teachers), *govi* (cultivators), *kamkaru* (manual workers) as the keepers of our heritage – but turn a blind eye to *dhīvara* (fishermen).

These remarks are by way of an introduction only. They are not my subject today, but are the motivation for my personal voyage of discovery into a particular aspect of the field of maritime archaeology.

The scope of this presentation

Although this is titled "**Sri Lankan nautical culture and technology: an overview of studies from the 19th century to date",** my actual scope is far narrower for the reason that this is an introduction to an area of study that needs immediate attention. I shall, therefore, proceed to place it in its context and, having done that, get to my focal point.

I am talking, now, only about one facet of maritime archaeology, not of maritime archaeology itself. Maritime archaeology is a large and diverse area of study which serves as context for what I intend to speak about. Just as you do not need to be a sailor to write maritime history, you do not need to be a diver to be a maritime archaeologist. This subject area contains within it several sub-disciplines, one dealing with ships, shipping, the inter-face between ships and shore, and the need for shipping in the economy of a country, skills, technology and so on. This is what I refer to as the "nautical culture".

Let me start with defining Maritime Archaeology. The specialist most often quoted today on this subject is James Delgado who, in his **Encyclopaedia of Underwater and Maritime Archaeology,** (1997), concisely defined maritime archaeology as follows:

- **The study of human interaction with the sea, lakes, and rivers**
- **through the archaeological study of material manifestations of maritime culture,**
- **including vessels, shore-side facilities, cargoes, and even human remains**.

You will note that the first of these refers to an environmental dimension: the link between Man and Water Transport. This is what used to be called "the Heritage of the Sea" in layman's words.

The second of these refers to an archaeological dimension, namely, that the study is of material artifacts. It is not to be confused with the intangible underwater cultural heritage. This is hard archaeology, the study of material remains.

The third focuses on the artifact "ship". From this focus several lines of inquiry emanate. Delgado speaks of shore-side facilities (harbors etc.), cargoes (trading goods) and human remains (crew and passengers remains). There are many more, but a listing will only lead to confusion. What is important is the word "vessel". A "vessel" is a watercraft, whether it is a raft, boat or ship. It is not born, nor does is grow. It is made. Hence, the making of watercraft, the technology of building a ship for a particular purpose, with particular materials, and its use and maintenance, design concepts etc. form the particular study we refer to as "nautical (or naval) architecture." It is the architecture of building a ship that can be sailed. 'Wikipedia", the online Encyclopedia, defines "**Naval architecture"** as :

> "an engineering discipline dealing with the design, construction and repair of marine vehicles. Naval architecture involves basic and applied research, design, development, design evaluation and calculations during all stages of the life of a marine vehicle…..Traditionally, naval architecture has been more craft than science……"

Simply put, the principal elements that a naval architect would consider are:

- Hydrostatics – Buoyancy, Displacement and Stability.
- Hydrodynamics – the flow of water around the ship's hull.
- Resistance – to the ship by water flow around the hull.
- Propulsion – means used to move the vessel through water.
- Ship motions – how the vessel responds to waves.
- Structure – selection of material for construction, structural analysis of the strength of the vessel
- Arrangements – the design and layout of spaces and capacity.
- Construction – choice of material used.

This presentation – which is deliberately kept simplistic and hence, not quotable as a learned source – is about the architecture of the last surviving indigenous vessels which have been with us for over two millennia – the earliest dated example (it is somewhere in the Colombo Museum, but I no longer know where) – dates to the time of Kelani Tissa and Viharamaha Devi. To emphasize the importance of this period of time, let me quote geologist, Dr. Katupotha, who has described the stages by which the present island of Sri Lanka, became an island about 7,000 years ago, due to sea-levels receding during the onset of a glacial period.

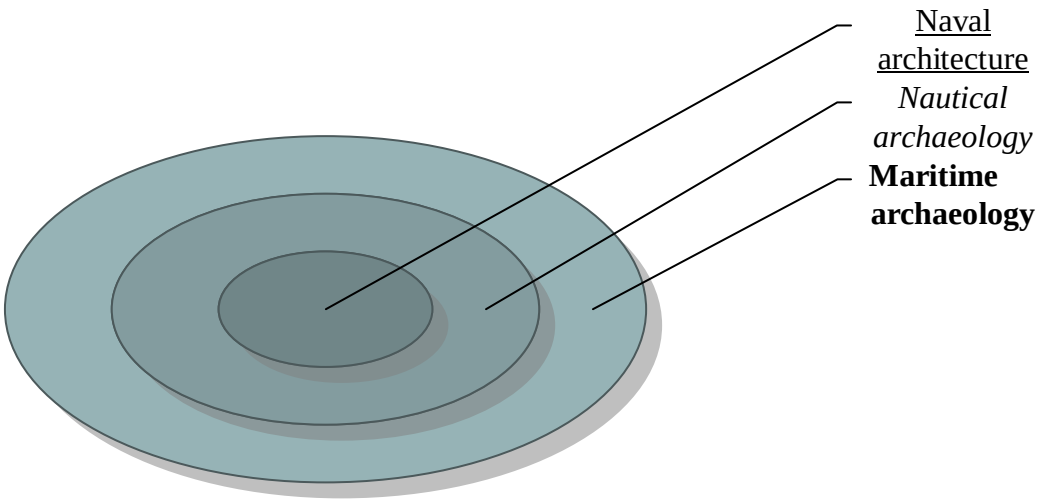
Stages	**Impact**
1. From 11,000 years ago to 6,240 years ago, the sea level was rising.	*We were yet part of the Asian mainland*
2. From 6,240 years ago to **2,270** years ago, sea-levels fluctuated: sometimes 1.5 meters higher than today and sometimes a little less.	*We were an island and the sea – the Gulf of Mannar and the Palk Strait – lay between us and the Asian mainland*
3. At 2,270 (i.e. 230 B.C.) years ago, the sea-level became stable at today's levels.	*That was some 175 years after the date commonly attributed to the arrival of Prince Vijaya.*

The Museum boat has been ^{14}C dated to 2,380 years, ± 100 years ago and calendar calibrated by Dr. Mohan Abeyratne of the CCF to 200-550 B.C. This could make the boat as being in existence even when the legendary Prince Vijaya stepped ashore, and even before the present sea-level had stabilized. This boat is, probably, the oldest scientifically dated artifact found in this country.

I will be speaking of these wooden boats, those that developed into ships, sailed the seven seas, disappeared into oblivion as late as the 20th century, leaving us with what we contemptuously call simple and crude fishing craft but which are, in fact, marvels of shipbuilding technology found only in and around Sri Lanka and in the vast wastes of Oceania.

Recording techniques

So far I have dealt with the scope of naval architecture, narrowing the focus down, like this:



The scope is vast. Before we can analyze the fishing craft today in the sophisticated way described above, we need to know details of these craft. These have not been easily found. How many of you can draw a reasonably accurate picture of an *oruwa?* I would say none. How many who read this can give the Sinhala names for its parts? I would say ONE – Prof Vini Vitharana. Why do we know so little about these ubiquitous craft? Because we consider them below our notice: beneath the notice of us "educated" persons. Can we find a drawing of an *oruwa*, *paruwa* or *yathra dhoni* in any of our ancient wall paintings? In India, we can find many representations of ships and boats in wall paintings, as graffiti, on coins, on seals etc. It is not an aspect of Hindu culture as ships are shown in Buddhist paintings at Ajanta: in fact, in Ajanta, there is a painting depicting a scene from the *Valahassa Jatakaya* – which is an alternative story of the colonization of Sri Lanka by the merchant Prince Simhala – that shows an army coming here by sea, complete with elephants on board.**Fig.1** Can we find a reference or specific description of one in our great Chronicles or *ola* books? We have to shamefacedly say that the first descriptions, the first drawings, the first recordings were all the work of the western powers who colonized us.

It is no wonder, then, that they said the Sinhalese could not have been a seafaring nation and we, for some strange reason, agreed. Let alone sail, said the Europeans, the Singhalese cannot even swim. Early British officials, often with an education in the Classics, set about recording our craft; recording our own craft technology. And it is from their records that we start.

What I hope to do is to show how our water craft were recorded. By "recording" I meant how they were depicted in a visual or two-dimensional manner, so that we know what they looked like. Models were also made but we shall deal with them selectively as they were made as a recording process.

First, let me deal with the earliest depictions found in our own sources. I really do not know why, but every one that I am aware of dates to the second century BCE. It is probably due to gaps in knowledge and lack of access to archaeological records. The three depictions are:

Fig. 2. This is from a rock inscription in Duvegala, Polonnaruwa, quite away from the coast. It is not shown like this but vertically, in an inscription that is inscribed both horizontally and vertically. It has been described as a three-log raft, with mast rigged for sail. From the text we can infer that it is an Indian craft and that it is not an objective representation. In other words, it is not a picture of a ship upon the sea, nor is it an *oru* or any specifically Sri Lankan craft.

Fig. 3. This is an inscribed potsherd found in Anuradhapura. Simply drawn, but sufficient for us to distinguish bow from stern, and identify the two steering oars. It is no mere river barge but a ship powered by sail, probably a cargo carrier. The "Jewel of Muscat", the Omani replica of a 9th century ship that was wrecked off Indonesia and which recently visited Galle, was fitted with these identical steering oars would have seen the same type. **Fig.4** Whether this was a Sri Lankan vessel or not, is open for discussion.

Fig. 5. This is from the south, from a potsherd at Godawaya. Ruhuna, with a coastline stretching from Kalutara to Trincomalee was a maritime-oriented society with a nautical culture, an export-import oriented industrial base and many anchorages that attracted ships from elsewhere. 9th century Arabs have located, by latitude, some thirty settlements on interest to them along this coast.**(Fig.6)** This picture shows a wealth of detail and the ship is obviously a sea-going trader, and no details suggest it is a Sri Lankan ship. The wreck of a trading ship has recently been found in the vicinity but has yet to be studied

.

In addition to these, John Carswell drew me a sketch of another from a potsherd discovered in Mantai, which shows fairly obvious similarities to some Indian depictions. However, it is a hastily-drawn sketch and I hesitate to publish it.

The sole wall painting showing a credible watercraft is in Polonnaruwa. It is a damaged painting of the Buddha on a twin-hulled craft which can be identified as an *añgula*.**(Fig. 7).** The theme is a common Buddhist one and is shown in much the same way in South East Asia and China where the craft shown are local craft. It is more than reasonable to identify this as an indigenous one.

No other Sri Lankan depiction is known to me from the pre-colonial period. During the colonial period there are several unsophisticated Temple paintings of sailing ships of European type, which are neither accurate enough for study. They are not of indigenous craft: it may be said that, as long as they were European, watercraft were worth depicting: but not so if they were indigenous ships. Even comparatively recent artists like Soliyas Mendis who painted the walls of Kelani Vihara, drew romantic and fanciful ships which are of no use for a study of our watercraft. It is a pity that no Sri Lankan seems to have drawn picture of even an outrigger-equipped sailing craft like the *yathra dhoni*. We built ships, serviced them, sailed them and fitted them out, traded in them, transported Buddhist *bhikkus* and *bhikkunis* in them, went to war in them, but we did not think of them as worthy of memorializing. There is a lesson somewhere: we seem to be caught up in the same trap, yet.

Through European eyes.

When the Europeans reached the Indian Ocean they came across vessels that were strange to their eyes. The Portuguese built ships from plans, measurements, textbooks and other data derived from an old craft culture, but they had no idea of how the Asians and other "orientals" built theirs. They did attempt to record them as sailors are not an artists: engravers built up a picture out of the information given to them. So the result was twice removed from reality. In their writings there are references to a common type of craft called *champanas* (possibly what we call *sampans* in English and *hamban* in Sinhala) but, to my knowledge, there are no credible engravings or sketches of our craft made by the Portuguese.

The Dutch were more helpful. They were always looking to record anything. Sketch-books of artists are available and they are worth looking at. I will not go into great detail, but illustrate a few as a sample

Fig. 8 is a couple of pages from the sketchbook sketch book of Brandes, an 18th century traveler, that appears in the website <http://cf.hum.uva.nl/galle/> devoted to our maritime archaeology and titled "Maritime Lanka". It is full of interesting and authentic detail and one can easily identify boats with sewn hulls, *yathra dhonis,* woven lug sails, for'ard-raking Arab-type masts and sails on long booms, the use of paddles on *oru* etc. This is the most useful type of recording up to that point, and its value is that the artist was himself the observer. But it has its limitations in that these are works of art and not technical drawings. Still, they were made for the purpose of recording. There are several other Dutch drawings of *oru* which they classed as *dhonis.* So, to the Dutch must go the distinction of giving us the first records of the appearance of the ubiquitous *oru*.

It is in the 19th. century that we first find drawings made according to the conventions of nautical architecture. Certainly, painters continued to make good pictures, but the introduction of nautical architectural conventions brought in a new dimension – the difference between building a wattle-and-daub hut following craft traditions and a substantial house built according to an architect's plan.

Nautical architectural conventions

In the last two centuries western researchers recorded our watercraft in greater detail. Even the best known 19th.century recorders were interested in pictorial representations of a high order of artistry. The drawings of the French Adm. Edmund Pâris in 1840 fall into this category. Pâris set out on a monumental task: to record in words and drawings, and even technical drawings, all ships of non-European origin from all over the world. His book, titled *Essai sur la construction navales des peuples extra-europeens* is a massive volume which I had to read at a special table and is a fascinating manuscript. A naval officer, Pâris was not satisfied with pictures and drawings. He also made technical drawings of local craft, showing them in plan, elevation, section and detail.**Fig. 9**

Prior to Pâris there was John Edye, of the British Admiralty who served in Trincomalee and India. In 1831 he made a major contribution to Volume 1 of the Journal of the Royal Asiatic Society of Great Britain and Ireland in which he gave more detailed,

though not so artistic, drawings of South Indian and Ceylonese vessels, along with descriptions. Edye was a naval architect and he more closely adheres to the conventions of that discipline. **Fig. 10**

Sundry other writers and travelers who were impressed by the endless lines of *oru* along our beaches, by the way they were sailed and their sea-keeping qualities. Many had seen them far out at sea long before they sighted this island. Being sailors in one way or another, they tried to record them by camera, drawing, painting and occasionally by technical drawing. One example, which was published in an old Journal called *Forest and Stream,* shows an *oruva* both pictorially and in technical detail. **Fig. 11 and Fig.12.**

Perhaps the first person from this country to make some sort of record of the ships and boats that called at our ports or carried cargo along the rivers and canals was J.P.Lewis of the Ceylon Civil Service. In his illustrated record, "Boats and canoes of Ceylon", in the Times of Ceylon Christmas number of 1914, he has sketched and described several types of Sri Lankan craft as well as several Indian sailing ships that used to call at our ports: interestingly, one was called "Kalla-dhoni", a name later used of illicit immigrants from India. But Lewis' sketches, though fascinating, were not technical drawings.

A more accomplished artist-recorder was Van Dort who did drawings, paintings and engravings which showed craft in great detail. It is a great loss to us that his sketchbook of drawings of boats has vanished from the Colombo National Museum, although his other sketchbooks and paintings are yet available. Once again, however good his work is, it is yet not a technical record when compared to the work of Pâris and Edye a hundred years before Van Dort. I must confess that the comparison I have drawn is not quite fair. Fig.13

The next star that swam into our ken was James T. Hornell, an ethnographer who, in the 1930s and 1940s, worked as a Fisheries expert in India and Ceylon and published several papers of special interest to this country. Perhaps the most useful to us are his on the "The origins and ethnological significance of Indian Boat designs" (1920) and on "Fishing and coastal craft of Ceylon" (1943). It was our fortune that he worked for the Fisheries Department as an expert on the Pearl Fisheries and it is this stay here that, for the first time, recorded such indigenous ships as the *Yathra dhoni*, the *Thoni* and the *Vattai (*or *Vattal)* of Jaffna. All of Hornell's learning and experience was distilled into a monumental work on the evolution of ships and watercraft, "Watercraft. Origins and early evolution"(1946) which is considered the baseline upon which all modern studies have developed. However, Hornell's interest was not so much recording of craft but, using the recording for ethnographic study.

After Hornell, a new approach to recording watercraft began to emerge. Up to his time all recording was either by artists or photographers and the interest was of the educated onlooker. With Hornell, the ethnographic approach came to the fore. The objective technical approach of Pâris and, particularly, Edye remained unmatched. The post-war world saw the emergence of an age of technology and the application of the conventions of naval architecture to the designing of ships. As an Architect designs a building and reduces his idea to two dimensions using the conventions of Plan, Elevation and Sections, a Naval Architect does the same, using the basic conventions of Sheer plan, Half-breadth plan and Body plan. Fig. 14 These are specially used to design ships, which

is to say that the drawings are made before the building of the ship is commenced, and that the ship is built according to the drawings. In recording traditional watercraft that were not built according to drawings the drawings are made after the ship has been built, which is to say, the drawings are made after measuring and studying the ship. Obviously it is best to record the traditional ship's lines according to the Sheer, Half-breadth and Body plans but. Since the recording often takes place on the field, with access to few tools it is often easier to record using the Plan-Elevation-Section, as if it were a building. Fig.15

In the post-1950 period, all over the world, the new breed of recorders used both systems to draw the lines of traditional watercraft. In Sri Lanka, the Research Station of the Fisheries Department produced several valuable monographs. But the first study of all *oru,* inclusive of the *yāthrā dhōni*, as one specific class with multiple variations, was that of Prof. Vini Vitharana in his modest, self published but very comprehensive book "**The *Oru* and the *Yāthrā"***. Published in the 1992 it draws on work done a decade or two earlier. A new edition is necessary as there is demand locally and abroad. Combining Anthropology and Sociology with Technology it deals with the history, distribution, construction, variations, linkage with the Sinhala people and includes several Glossaries dealing with technical terms, names of variant types, terms for equipment, terms for personnel, nautical terms used by fishermen, names of ocean drifts, winds and stars, personal names associated with the *oru*, and names of fish and plants.

Others followed. Eric Kentley wrote a paper on the *mā-däl-pāruva* and Tom Vosmer did a computer-backed study of the construction of the *yāthrā dhōni* for our Maritime Archaeological study of Galle. I, myself, contributed with studies - on the evolution of our watercraft, our inland watercraft, traditional ship-building technology, a tentative typology of pre-modern watercraft, the geomorphologic prerequisites for a pre-modern port site - and conducted heritage impact assessments of the proposed new port sites in Colombo, Galle and Hambantota.

The next and important study was by Gerhard Kapitan who came to Sri Lanka in 1983 to record all our existing traditional fishing craft but could only work in the western and southern coasts. His work comprising of photographs, scale drawings and a typological classification, published by the Nautical Archaeology Society (NAS) in England ***Records of Traditional Fishing Craft in South and West of Sri Lanka*** as NAS Monograph No.2 and British Archaeological Report (BAR) International Series No. 1931, was prepared for publication by the Editor of the Monograph Series and me. Its 172 photographs are in full colour only because of the enlightened generosity of the PGIAR. I believe that this book which sets a standard that will last a long time to come, and a glimpse at my own, related, publication which is now in preparation.

This brief overview is dedicated to our fishermen who kept alive a unique technology for millennia until the end of the 20th century.