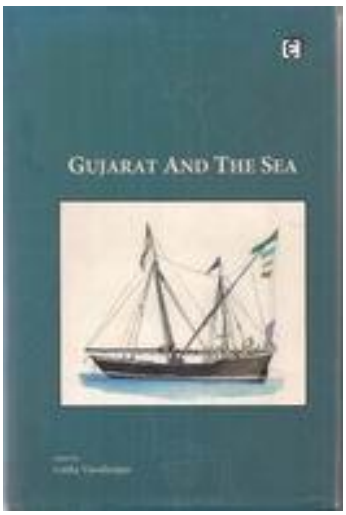

2011
"Gujarat and the Sea".Lotika Varadarajan (ed.)
(Pub) Darshak Itihas Nidhi, Gujarat, India.

"SAILING ON A STRING AND A PRAYER":
The "ORU culture" in Sri Lanka and the Indian Ocean

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(Paper presented for the International Seminar "Gujarat and the Sea" at Kutch Mandvi, India. October 2010 with additional illustrations not included in the published version)

A Prefatory Note:
Sri Lanka-Gujarat links in History and Legend

Sri Lanka's written history dates back to the 3rd.century BCE. What was written down then as History was, in fact, a traditional historical prelude to recitation of the Buddhist scriptures. The scriptures came to be written down because they were in danger of disappearing due to a drought of unprecedented intensity which had made life barely sustainable in the heartland of the country. Its effect on the Sangha, the Buddhist clergy, was drastic: monks who depended on lay persons for alms could no longer burden the struggling laymen and began seeking refuge in India. The oral tradition was in danger of disappearing and the last of the senior monks set about writing down all that had been orally transmitted before. This included the historical prelude and so, "History" came to be written: a History that was later added to and expanded till it reached its apogee in the "Mahavamsa", Sri Lanka's Great Chronicle.

"Vijaya ā gamana":*(The coming of Vijaya)*

The historical prelude thus recorded included the story of the settlement of Sri Lanka by people who came by sea from India. From which part of India did they come? Throughout History, we have had close connections and contacts with both North and South India, but the "Mahavamsa" is tells us that it was from the old Buddhist kingdom of Lala, today's Gujarat, that the First Colonist, Prince Vijaya set sail with his followers.

Through the legend of Prince Vijaya the "Mahavamsa", traces our beginnings to a feisty Princess from "Vanga desa," (*Sinh. "bangali desa",* today's Bangladesh). She leaves home, consorts with a lion (*Simha)* and gives birth to twins, a boy and a girl. To cut a long story short, they escape from the lion and ultimately end up in Lala, where Sinhabahu becomes King, builds a city, "Sihapura", and takes his sister as wife. They had many children, the eldest being Prince Vijaya who (says the *Mahavamsa*) was "of evil conduct" and with his followers, "committed intolerable deeds of violence". Unable to tame him and to appease his people, Sinhabahu arrested seven hundred of the group and, along with Vijaya, "put them on a ship and sent them forth upon the sea". Their ship first landed at Supparaka, near Mumbai, but Vijaya and his men were yet untamed and were soon forced to leave. Finally, "Vijaya, the valiant leader landed in Lanka, in the region called Tambapanni on the day that the Tathagata lay down….to pass into nibbana". But, says the Mahavansa, the Buddha knew of the landing and called on Sakka (Indra) king of gods, to "carefully protect him (Vijaya) and his followers and Lanka" because "In Lanka, O lord of gods, will my religion be established." And so, Sakka (Indra) appointed, as guardian god of Lanka, "the god who is blue in colour", Upulvan (Vishnu, or Krishna). The King of Lanka, Vijaya, married a princess from Madurai but died childless and was succeeded by his nephew from Sihapura who married a princess from "the further side of the Ganges".

What do we gather from this story? That the Sinhala people believed their ancestor(s): (1) came by ship, (2) from present day Gujarat, (3) sailing down the west coast of India, and (4) landing at Tambapanni (modern day Mantota) which was to be a great Emporium in later years. The significance of this place to the "ORU culture", which is the core of this paper, will become evident below. Lastly, Vanga and Lala are identified as where the roots of Sinhala people lie, though Madurai also plays a part in the settlement myth.

"Lankani ladi ane Ghoghano var":(*A bride from Lanka and a groom from Goghar)*

And in Gujarat, from where Vijaya started his voyage, there is an old folk tale behind this saying. It is pure fantasy, with some parallels to the Vijaya legend, about a voyage, but in the reverse direction: from Sri Lanka to Gujarat. The story is about a Princess Padma, the daughter of King Sinhalraj (*lit.* "King of Sinhala") from Lanka. She has a childhood friend, Deval, a boy from a humble family, whom she plays with but also bullies. Once, in a fit of childish anger she wounds him, scarring him. A roving astrologer, on being asked about the princess' future says that his calculations show that she would marry a man of ordinary stock who lives to the south of the palace. The description and the name he gave pointed, to the King's horror, to Deval. Determined to see that the princess would not marry anyone not of royal birth, the king decided to do away with Deval: however, influenced by the soft-hearted Queen, he orders: "Put Deval on a boat and send him away beyond our shores."

Deval (like Vijaya) is thus sent cast adrift on a boat. Finally the boat reaches a distant port. Deval does not know it, but it is Gogha, an old port of Gujarat near Bhavnagar. Tired and hungry, he goes to a nearby town in search of food. While he is standing near a shop a she-elephant comes up to him and pours water on him from a

'*kalash*'. He is puzzled. He does not know that the King of Goghar was old and had no male heir. Needing to find a successor the King sends the royal elephant around, trusting him to choose one who would succeed him. The elephant, in his wisdom, chooses Deval, who is then taken to the palace and, in time, is crowned King.

While all this was happening, Princess Padma of Lanka has been growing up, but her parents had failed to find her a royal husband. Finally, King Sinhalraj sends his trusted advisor, the *Rajpurohit* to go around, carrying a coconut, in search of a suitable groom. He goes from one kingdom to another till he finally reached Deval's kingdom where, seeing the young, unmarried King, he presents him the coconut. Deval accepts the proposal but as he cannot go to Lanka in person, he sends his sword as his proxy, as was the practice, to Lanka. And so, Padma is married to Deval's proxy, and she sets out for Ghoga. When she reaches Ghoga and comes face to face with King Deval she thinks there is something familiar about him, but cannot believe that her husband could be Deval till she finally, sees the scar on his forehead. The moral of the tale is that you cannot change your Destiny.

But what is relevant is that the traditions linking Gujarat and Lanka are yet alive in both countries. In the course of this paper, sea voyages, Tambapanni, the land south of Mannar, and coconut will figure. Perhaps Legend and folklore can add colour to History and Technology

Abstract

On retirement, twenty-five years ago, I began a search for to certain that had long intrigued me, namely: "Did Sri Lankans build their own ships? If they did, what did the ships look like? How were they built? To which Indian Ocean ship building culture or sub culture did they belong? Were the outrigger craft of indigenous or foreign origin?" I sought them in maritime history, archaeology, ethnography and nautical architecture, sometimes reaching a dead-end or a conclusion I later revised. The standard books of reference on this subject were hardly available in Sri Lankan libraries and because, as a, independent researcher without institutional backing, few doors were open to me. My exploratory writings, however, won me readers who volunteered information or referred me to sources that would, otherwise, not have been available to me. These were particularly valuable. I was thus able to access Sinhala and Tamil writings which had eluded foreign writers. Finally, when I had acquired the necessary background, I was able to narrow my focus down to the vernacular boat-building culture that I term the "ORU culture", most visible today as our outrigger fishing craft, or "Oru". Recognizing that the "oru" as not merely a fishing craft but as one of the last surviving examples of long tradition was the key to understanding that the Sri Lanka nautical culture was a vernacular one: a culture that, while being a sub-regional Indian Ocean culture, had parallels elsewhere in the Indian Ocean and in the Pacific Ocean. The present paper seeks to explain the essence of this culture as I have come to understand it.

Introduction

Towards the beginning of my search I chanced upon a view expressed by Toussaint which I – being a native and thus privy to more information than was available to him – knew was more than suspect.

> "The Sinhalese people never looked towards the sea and the navigators whom history records were always foreigners. The outriggers themselves are of foreign origin, and it is not in Ceylon that we shall really comprehend the ocean's story" (Toussaint, A. 1966. History of the Indian Ocean. London.)

At that time I was unable to dispute this sweeping statement. Today I look at it with greater understanding and, while I can identify its weaknesses I can also understand what made him take up this position.

Much later I came across this observation by Kentley, who had systematically studied the *mā-däl-pāru* of Sri Lankan and the *masula* boats of the Coromandel coast, that:

> "Although the boats of Sri Lanka share with several other boat types of the Indian Ocean a common technique in fastening planks, indeed a special method of sewing, this is a single attribute and not sufficient to place Sri Lanka within a broad 'Indian Ocean boat building culture'. In terms of maritime ethnotechnology, Sri Lanka has a distinctive culture: sewing may be the only imported trait (though it cannot be ruled out that it developed here first)." (Kentley:2003: 180)

I found it easy to follow Kentley's reasoning as I had arrived at a similar conclusion. Perhaps where I differ from him most is my understanding of what "a broad 'Indian Ocean boat building culture' " is. I deal with this in greater detail below.

What follows is an account of how I came to understand the way in which an indigenous boat-building technology developed into a fully-fledged shipbuilding culture and how, consequent to the arrival of the European power in the 16th.century, it regressed, leaving us only inland and coastal craft. These craft, the "*oru*", have not only survived, but are yet undergoing change in response to new imperatives without departing from its basic form. This ability to survive in the face of a changing environment is the measure of the deep roots of a culture that deserves serious study.

Shipbuilding in the Indian Ocean

As stated earlier, I hold a different view from Kentley of what "a broad 'Indian Ocean boat building culture'" is. I have noted a variety of (ethno)technological zones in the Indian Ocean previously (Devendra:2002:145) and, while my thinking has changed marginally since then, it is my understanding that the ships that sailed the Indian Ocean were the products of different technological zones. Each had specific characteristics and all were sea-worthy craft. Several technological zones existed, namely:

The Sewn boat zone

The Dhow zone

The Single Outrigger zone

The Double Outrigger zone

The Shaped-log-raft micro-zone

The Hybrid craft zone

Sewn Boats are, unlike all the others, not a type of craft but a method of fastening planks by sewing then with coconut fibre rope. It is a technique common to all other zones listed above and is, perhaps, the only ethno-technological feature common to all Indian Ocean cultures.

Of the other zones, four have been previously identified (Hornell 1946: unnumbered last page) (MacPherson 1990: 261-264), while I have postulated the other two on the basis of research and interpretation. This differentiation into zones on the basis of archetypal craft requires some explanation.

Dhows are plank boats of carvel build with quarter rudders (or steering oars) which were superseded by rudders, forward raking mast topped by a sheave for raising or lowering the large Indo-Arab lateen sails on a long boom. Largely (but not exclusively) used in the Red Sea, Arabian Gulf, west coast of India, east course of Africa and, in general, throughout the Arabian Sea.

Single Outrigger. A monoxylon, or untransformed log-boat, with vertical plank extensions (optional), of shallow draught, with attached single outrigger for stability, double-ended, with square or lug sails. In larger versions the monoxylon is replaced by a plank hull with fore-and aft rig and rudder fitted to the sternpost. Hornell (1946:255) says "It is the only type met with on the coasts of Ceylon and India". In his map he locates it in the Andamans, Sri Lanka, the Maldives and Kerala, in addition to the Pacific islands.

Double Outrigger. Bears a similarity to the Single Outrigger craft but carries two outriggers instead of one. Plank hulls more common than monoxylons, as also the common use of bamboo in building. Double-hulled craft form an important part of this culture. Hornell (1946:253) traces the origin to Indonesia but, today, there is general agreement that this form arrived in Australasia from a point of origin in or around Taiwan, after which where it spread from New Guinea eastwards into the Pacific and westwards into the Indian Ocean to Madagascar and East Africa.

Hybrid technology. This zone, which I proposed in 1990, covers the old Erythrean Sea and its limits are (subject to correction) the lands and seas referred to in the *'Periplus of the Erythrean Sea'*. This is the area where ships from the Mediterranean encountered those of Arabian, African and Indian craft and an interchange ideas and knowledge took place; where the peculiarities of one type were adopted or adapted by another to create a number of hybrid types. This cross-pollination process continued even after the Indian Ocean became a "British Lake". Adaptations of the hull-forms of Portuguese Caravels and British armed merchantmen are examples of West-to-East flow. In India, for instance, it is generally held that "outside influence on boat building techniques" characterized the west coast. The reverse flow the East-to-West flow also took place: the use of Indian timber and dependence on craftsmen bred in the Indian craft tradition being the most notable examples.

Shaped-log-raft technology. Rafts made of baulks of wood shaped to permit sailing, fastened with wooden pegs or lashed, with shaped bow-pieces and sometimes with sides built up with planks lashed upright (not as strakes). Dismantled when not in use and re-assembled when necessary. Exclusively used in south Indian-Sri Lankan waters (Thivakaran and Rajamanickam: 1992: 23). Noted by Hornell and Paris and, earlier, in the *Periplus*. Depicted in a 2nd century BCE Sri Lankan rock engraving and a description in a chronicle of the same period of triple-decked rafts that sailed from north of Sri Lanka to he east coast of India

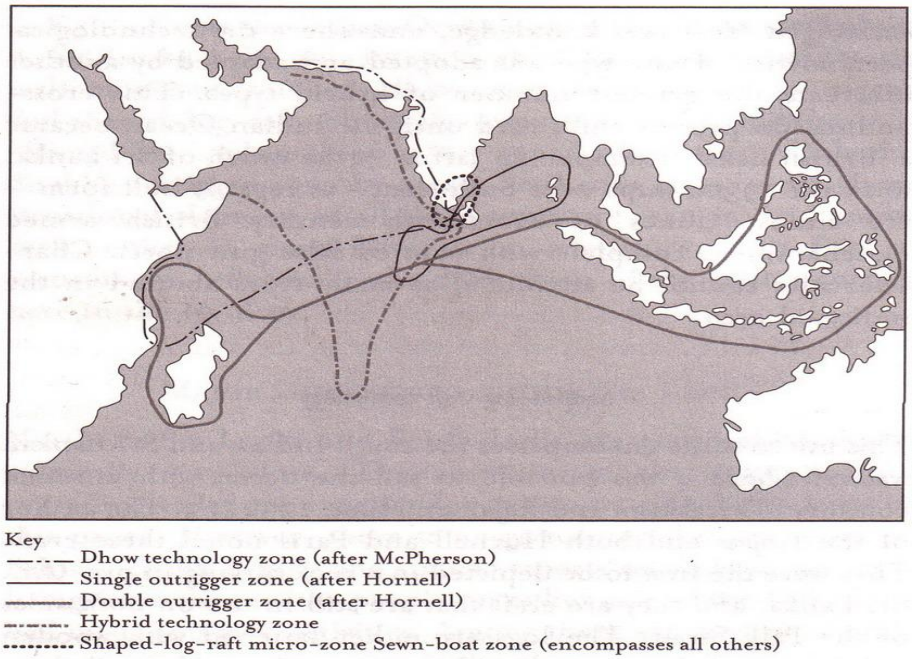


Fig. 1. Ethnotechnological zones in the Indian Ocean (*Source:* Devendra)

Figure 1 shows the Indian Ocean with all the zones marked on it. Sri Lanka, by virtue of its position, came into contact with ships from all zones. Features from almost all these zones are seen in Sri Lankan craft, either in pure form or in admixture. The double-outrigger zone, alone, by-passed Sri Lanka completely.

A diversion into semantics: how did the "*Oru*" become a "*Catamaran*" ?

It is central to this paper to define the craft called the *oru.* The *Oru* – to use its plural, or stem form in Sinhala (*oruwa* being the singular form) – is a single outrigger canoe. It is a dual-element craft: a marriage of a dugout log hull and a balance log (or outrigger). *Oru* are commonly, and incorrectly, called "catamarans" in English. This nomenclature is an unfortunate accident of history that cannot be undone. A catamaran is actually a raft. A recent dictionary of watercraft (Mariners' Museum, 2001: 123) lists thirteen geographical regions in which the word "catamaran" is used to denote a raft, and is very specific in its overall definition:

"**catamaran**

1. Generic term for a shaped raft of bamboo or logs found in numerous parts of the world….

5. Sometimes mistakenly applied to an **outrigger canoe."**

The word "catamaran" is, in fact, derived from the Tamil word *kattu-maram* which denotes a shaped-log raft. Early English writers mistakenly applied the latter name to denote the *oru*, and this misnomer became standardized: so much so that today's "catamaran hull" yachts are really "double hulled" craft, based on a design common in the Pacific islands. The power of a misnomer can be seen from the fact that "triple hull" yachts are now called "trimaran". This is a matter of semantics but I dwell on it because, it is necessary to use correct terms for indigenous craft. To continue to use such catch-all colloquialisms as "Catamaran", "Proa" and "Masula", is to perpetuate – by choice –

19th century archaisms rather than to be in step with this, more scientifically exact and non-judgmental 21st.century. Kentley (2003:120-121) is on record as saying:

> "Early accounts by Europeans of the sewn boats on India's east course refer to these as craft by a variety of related labels: *masoola, massoolah, mossel, masoola, macule* etc. ….. In the twentieth century the name has become largely standardized as *masula.* However, the origin if the term is not known. It is not a word currently employed, or known to, the builders and users of this type of craft".

This statement, by a writer whose work I respect, is to be appreciated but I cannot concur with his reason for continuing to use the term (in that same paper). He says:

> "Therefore, as *masula* is used specifically to mean a sewn boat of this region, albeit not by its operators, and has a widespread currency among those interested in ethnographic craft, there is a good case for its retention and will continue to use it here." *(emphasis mine)*

It is therefore clear that the paper is written for English readers, more comfortable with archaisms than accuracy, who expect even Indian scholars to "toe the line" and continue the use of these terms. I find this patronizing and unacceptable. As for "proa", I note that modern American writers "interested in ethnographic craft" are increasingly willing to use local terms. For this reason, in a book on Sri Lankan watercraft which I helped to bring out (Kapitan: 2009), I included an Appendix titled "Standardization, orthography and pronunciation guide" showing the diacritical marks used in rendering South Asian names into English, using no more complex a tool than the 'Character Map' available with MSWord. For example, you will note that, in this paper, I use the stem form *oru* instead of *oruwa*, as the latter translates into "the *oru*", and its use would entail a repetition of the definite article.

The *ORU* of Sri Lanka

The "*Oru* culture" is/was the pre-eminent boat building culture in Sri Lanka. There are others yet alive and perhaps there were yet more in the past. But the "*Oru* culture" is the one which produced the greatest variety of indigenous watercraft, ranging from simple inland craft to ocean going cargo ships. What these various forms have in common is an untransformed dugout hull that is made stable by the addition of *either* a single outrigger *or* a twin hull. The same basic form is used both on river and sea; all were – till the 1990s – built of wood by carpenters; and all elements fastened and lashed with coir rope.

What is an *oru*? I have defined the craft itself above, but let me explain further. The *oru* of the fishermen is basically a hollowed out log (*orukañda*) which retains its linear shape, and is thus a 'canoe'. As the canoe shape lacks stability, a balance log (*kollääwa*) is attached to it by two spars, or booms (*viyala*). In this configuration it is the *pilā –oru* used on inland waters. The basic dugout hull is modified for use at sea by (a) the addition of plank washstrakes sewn to the gunwales to increase freeboard, and avoid shipping water, and (b) the substitution, for the spars, of two flexible booms of wood. In neither configuration is the shape of the original dugout altered. The composite structure, comprising dugout hull and outrigger, is the *oru.* It is made by *either* sewing *or* lashing together the following parts:

The dugout hull which retains the shape of the original log;

Plank washstrakes sewn to the gunwales of the hull and closed off, fore and aft, to form a box-like superstructure with upward sloping ends;
A shaped wooden outrigger, or balance-log;
A pair of wooden booms lashed to, and connecting the hull and the outrigger;

Additionally there are the following detachable parts, essential for sailing the craft:

Masts and Sprits (of Bamboo or wood), Sails (of treated Cotton cloth), Rigging (of coir rope) and Rudders and leeboards (of wood, attached the hull by grommets.)

All parts firmly attached to the dugout hull are fastened with coir rope, either by sewing or by lashing.

Oru are found in several configurations, according to functional needs. In calm inland waters, the plank strakes, masts and sails, rudders and leeboards are not used while, at sea – the working environment of the dominant form of *oru* – the type of fishing it is engaged in dictates the size, and sometimes requires additional features such as rowing rails.

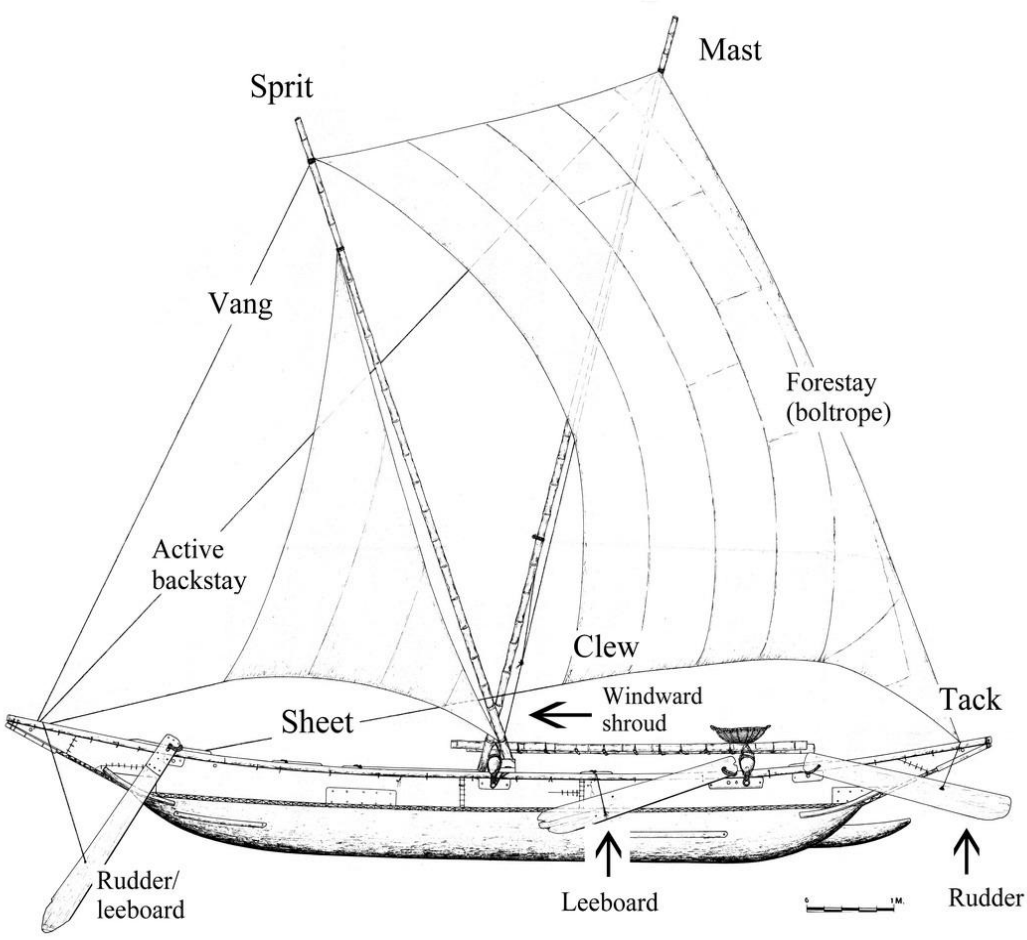


Fig. 2. Elevation of leeward side of an *oru*,, showing sails and rigging, rudders and leeboard. The outrigger is to windward and not shown, but visible lower right.(*Source:* Grainge)

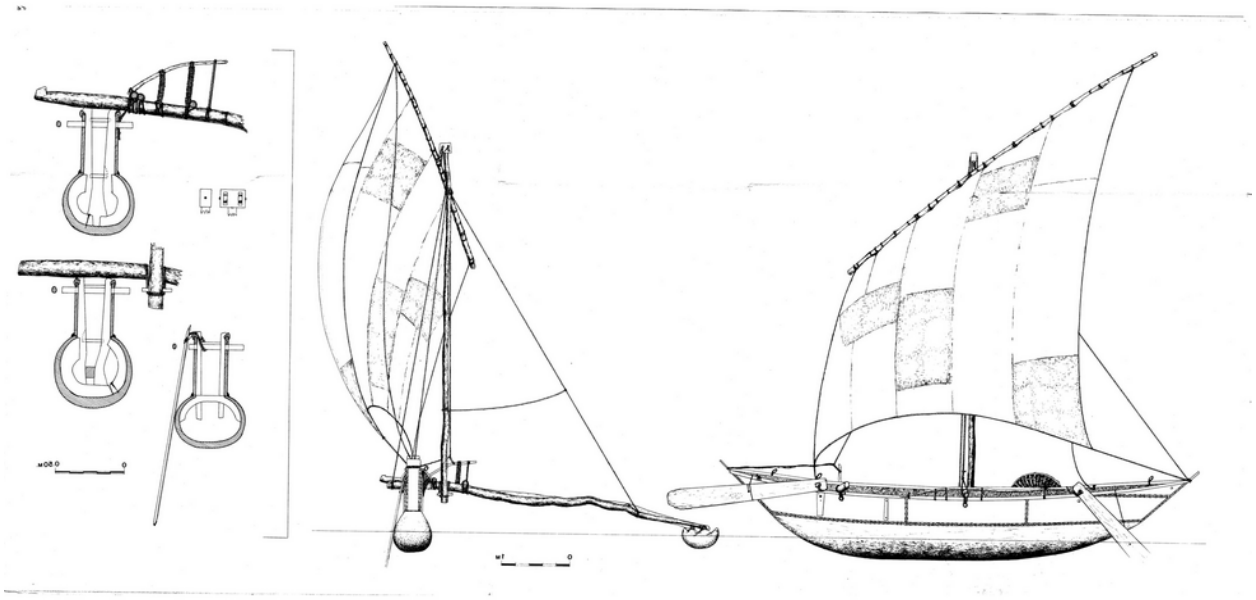


Fig.3. Scale drawing of an *oru*, with single mast and Indo-Arab lateen sail and, inset at L, details of attachment of booms and other features to hull. (*Source:* Kapitan)

"Oru culture" as specific to the Indian Ocean

The *oru culture* is described as a vernacular form as the thrust of my argument is that it was not exotic in origin but evolved in this region of the Indian Ocean. To buttress my understanding of the term "vernacular" (derived from language studies) I sought an independent definition. On the internet www.answers.com provided definitions of both the noun and adjectival forms. As our interest is essentially the latter form, I give it below, with my emphasis underlined:

1. Native to or commonly spoken by the members of a particular country or region.
2. Using the native language of a region, especially as distinct from the literary language: *a vernacular poet.*
3. Relating to or expressed in the native language or dialect.
4. Of or being an indigenous building style using local materials and traditional methods of construction and ornament, especially as distinguished from academic or historical architectural styles.
5. Occurring or existing in a particular locality; endemic: *a vernacular disease.*
6. Relating to or designating the common, nonscientific name of a plant or animal.

Other sources will, no doubt, mirror these definitions. “Vernacular” refers, in essence, to something that is (a) particular to a region; (b) is indigenous in style; (c) made according to traditional technology (d) using local materials and (e) ornament. Within these parameters, the *oru* is definitely a vernacular watercraft, as will be demonstrated.

1.Regional limits

The “Oru culture” is, therefore, native to a region. The region can be located. Broadly speaking, single (i.e. the *oru*) and double outrigger canoes are to be found in (1) Madagascar, the Comoros and the east coast of Africa, (2) in and around Sri Lanka, (3) in the Indonesian archipelago, and (4) in the islands of the Pacific. These craft have hulls extended transversely using *either* outrigger(s) *or* another hull. In each of these areas they are distinctively different, with the main difference being those between single outrigger craft and double outrigger/double hulled craft. Within the Indian Ocean, double outrigger craft are found along its western and eastern rims (the “southern Indian Ocean”). The single outrigger is dominant only in the limited area of Sri Lanka, the Kerala/ Lakshadweep area and the Andaman Islands (the “northern Indian Ocean”). In the Pacific Ocean, on the contrary, single outriggers are found in most islands. Sri Lanka is the centre of the northern Indian Ocean grouping. Beyond its shores, the nearest neighbours – in terms of nautical culture – are Kerala/ Lakshadweep (India) and the Andaman Islands. Hornell included the Maldives in his map, but no evidence is now available there, unless one counts Minicoy – now the largest of the Lakshadweep islands – where the inhabitants are yet Divehi-speakers.

This is an interesting grouping. As far as mainland India was concerned, the Andamans are of peripheral interest, while traces of the “Oru culture” are yet healthy in Minicoy/Lakshadweep/ Kerala. Kerala, in fact, has had a long history of maritime and political contact with the western coast of Sri Lanka. Interestingly, it is in the western and southern coasts of Sri Lanka that the *oru* is mainly found. Hornell, who once served as an advisor to the Sri Lankan Department of Fisheries, made the oft-quoted perspicacious remark:

> No greater contrast can be found in small craft designing than that between the types used on opposite sides of the Gulf of Mannar, South of latitude 9° N. On the Indian, or Tamil, side the catamaran or boat canoe alone are employed; on the Sinhalese side, the outrigger canoe is the national and dominant design, the catamaran being used only in the northern, or non-Sinhalese part of the island and by migrant Tamil fisherman in Colombo (Hornell: 1943: 40-53)

(Harking back to the legends prefacing this paper, it is worth noting that Tambapanni, where Price Vijaya made his landfall, is the northernmost point of Hornell’s “Sinhalese side”). Thus, while Sri Lanka was the centre of the Indian Ocean single outrigger culture, the heartland of the culture was south of the Gulf of Mannar, essentially the western and southern coasts. As for the east coast, one must look towards the monsoons. Sri Lanka experiences alternating monsoons, the south-west and the north-east. Responding to their rhythm, fishermen and their *oru* move overland from west to east and back again. This migratory pattern came to an end in 1983 and the numbers of *oru* in the east coast has diminished, though it is yet extant.

A Fisheries Department map of 1958, Figure 4, gives the following distribution of *oru* before the separationist war began, and is useful for gauging the distribution ratios prior to 1983:

Western Coast (Kalpitiya to Galle) – 4000; Southern Coast (Galle to Hambantota) – 1900 [*a grand total of 5900*]; and Eastern Coast (Kuchchaveli to Akkaraipattu) – 1500. The west and south, taken as a unit was, therefore, the heartland of the *oru*. Here it was that it flourished and, in fact, may have been born. Last year the definitive record of the vernacular naval architecture of the last of the *oru* of this area was, at last, published (Kapitan:2009:2), here shown as Figure 5.

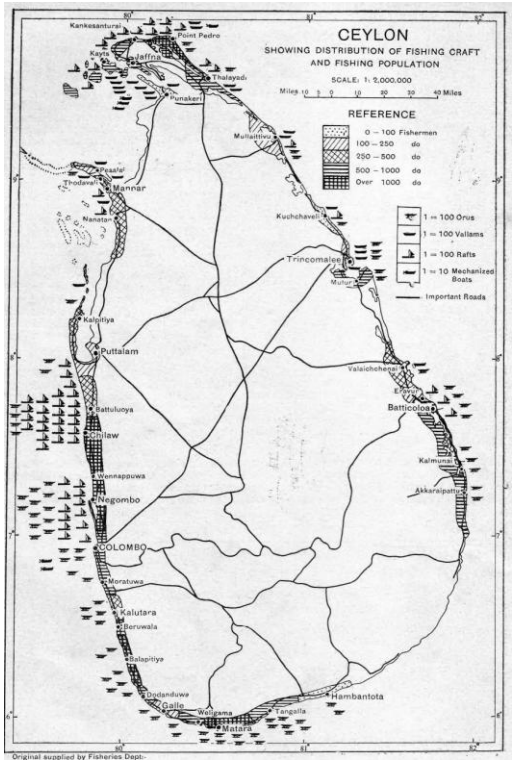


Fig.4 (*Source:* Department of Fisheries)

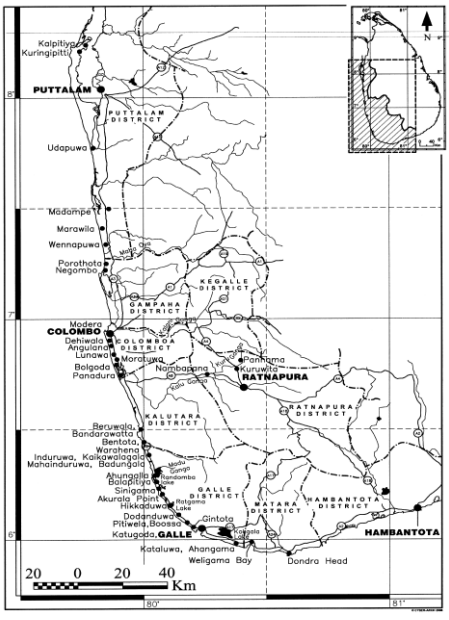


Fig.5. (*Source:*Kapitan)

The region and sub-region of the single outrigger "*Oru* culture" is, therefore, the Sri Lanka-Kerala/Lakshadweep/Andamans area, with its heartland in western and southern Sri Lanka.

2.Indigenous building style

The next question is: does the *oru* demonstrate an "indigenous building style"? In fact, it is not a matter of following a style but of giving birth to one. The form and structure of the *oru* is not a borrowed style one that has evolved from the interaction between its working environment, the available building materials and resources. The environment in which the craft operates will be dealt with, first.

The working environment of the *oru* is both the open sea and sheltered inland waters. On river, lake, canal and lagoon, where the water was generally calm, the form used was the *pilā oru*, a hollowed-out log (without washstrakes) joined by simple spars to a balance log. Such a simple dugout is inherently unstable, and calls for a counter-balance to be a useful craft: in the *pilā oru* the counter-balance was the balance log, or outrigger. At sea, however, in a dynamic environment of wind and wave, this simple dugout could ship water and be swamped. Hence, the sides are built up vertically with plank washstrakes sewn on to the gunwales. The increased freeboard makes the outrigger booms curve downwards from the vertically extended hull to the balance log which is now at a lower level. These modifications make it possible to either row or sail the craft. With both ends (fore and aft) of the dugout hull identically shaped and sails rigged on mast or sprit, the sea-going *oru* could efficiently sail to windward by "changing ends" (or "shunting"), instead of 'tacking' as a craft with fixed 'bow' and 'stern' would. It is a fast and maneuverable sailing craft capable of sailing close to the wind, though Grainge *(pers.comm)* has concluded that:

> … in a dynamic context in which other forces, in particular the aerodynamic heeling force, are taken into account…. the single outrigger logboat is a poor performer in terms of stability compared with a properly designed monohull…

This is undoubtedly true, and borne out of experience. The *oru*, it has to be emembered, was not *designed*, but *developed* in a particular context.

Earlier this year, Gerald Grainge, (yachtsman and Series Editor for the International Journal of Nautical Archaeology Monographs) undertook a study into how an *issan oruwa* – a form of seagoing *oru* – is actually sailed to compare his findings with a previously published paper and has commented (*pers.comm*), as follows, on the sailing efficiency of the craft:

> Using a hand-held GPS and a hand-held anemometer, I was able to record some performance data for the *oru*. The wind was north to north-easterly 6 to 9 knots (Force 3 occasionally dropping to the top end of Force 2). On various points of sailing from hard on the wind to running downwind, boat speeds in the range of 4 to 6 knots were recorded, averaging 4.75 knots. In terms of the apparent wind, windward performance looked respectable at some 45° off the bow. However, converted to true wind, this seems disappointing – *c.* 75° off the bow. Even so, few modern cruising yachts will do better than 40° off the bow in terms of the apparent wind.

He has, however, cautioned:

> Such data, recorded on one occasion over a period of some three hours, must be treated with caution…. In spite of this the overall impression is of a capable sailing craft.

Oru operate in comparatively shallow inshore waters, with shelving beaches, off-shore reefs, heavy surf close to land, a negligible tidal range, prevailing currents and counter-currents which are subject to abrupt change. In such waters, the craft had to be of shallow draught and hardy construction with a sturdy bottom. It must also be able breast, or ride the surf while remaining essentially a workboat. What this environment called for was a craft with the following:

- Tough hulls, of available material, able to work both on wave and river and withstand abrasion when crossing sand spits and being hauled up the beaches.
- Fastenings of easily replaced material, reasonably resistant to salt water, for "sewing" and lashing.
- A double-ended, dual element configuration, of shallow draught (no keel) to enable it to face the surf and be beached upright.

The *oru* with its shallow draught (it had no keel) and its dual element form has the ability to flex in the torque experienced in the surf (due to its rope fastenings). It is thus a craft that evolved in response to the needs of a specific environment, and was not designed on the drawing board nor copied from a foreign model.

3. Materials and resources

The evolution of the form and structure described also depended on the structural materials and resources easily found in the heartland of the *oru* culture. The south-west of the island was, until the 19th.century, under heavy rain forest cover which afforded builders a wide spectrum of timbers. The oldest boat recovered from a river bed was built of *Artocarpus nobilis* (*Sinh.* "val del"): varieties of *Artocarpus* are used for boat-building in Kerala (*locally* "anjili") and in Sri Lanka even today. Vitharana (2009:175), speaking of the fishing *oru* surviving in the 1970s, lists thirty-eight different types of wood that could be used for seven major parts of the craft: 03 for the Hull, 05 for the washstrakes, 05 for the Booms, 02 for the Balance log, 08 for the Rudder, 04 for the Mast, 05 for the Oar blade and 06 for the oar handle. A wider range may, possibly, have been available earlier.

The artisans who built these craft were carpenters, who had learnt their craft under the *guru-sishya paramparawa* (teacher-pupil continuum). They had been the boat-builders till about six hundred years ago, when fishermen began building their own boats. Unfortunately it is unknown why this change took place. Iron and steel were produced locally two millennia ago, or earlier, and they would have had axes for logging, adzes for hollowing-out the logs and, perhaps drill-bits for the bow drills. Importantly, nails were never used to fasten parts of the boat together: instead, they were "sewn" or lashed, with coir rope. The decision not to use nails appears to have been a matter of choice as the iron nails were available. Other wooded structures used of either iron nails, or treenails, and were, certainly, neither sewn nor lashed.

The coconut palm provided the fibre for sewing and lashing. Since the palm propagated itself around the Sri Lankan coast, and was also widely cultivated inland,

there was no shortage of rope. Coconut timber and fibre (coir) were widely used for shipbuilding by other Indian Ocean cultures as well. Gunawardana (1990:31), quoting al-Idrisi, says that Arab ships from Oman came here to obtain rope, coconut tree trunks for masts and spars and timber for planking. Orders were also placed for ships constructed

Fig. 6. *Oru*, with painted fiberglass hull, showing outrigger, booms and platform above booms for fishing gear. (*Source:* Kapitan)

Fig.7. Lashing to an *oru*. (L to R) A rudder on a grommet, two bamboo sprits (main lashed to a boom), both booms lashed to the hull, and Platform above the booms
(*Source:* Kapitan)

here. Well laid-out coconut plantations are referred to in the reign of King Mahadathika Mahanaga (9-21 A.D.). Aelian, (170-235 A.D) says that:

> "…this island in the Great Sea which they call Taprobane has palm trees wonderfully planted in rows, just as in lush parks the park keepers' plant shady trees." (Weerakkody:1997: 235)

Even in medieval times shipbuilding for export was undertaken by Sri Lanka, as seen in the letter of King Bhuvenekabahu 1 (1272-1284 CE) to the Marmaluke Sultan of Egypt (Queremere: 284)

The bio-resources of south-western Sri Lanka provided the raw materials for building vernacular craft, namely: large trees for dugout hulls, timbers with specific characteristics and coconut rope in commercial quantities. The *oru* required only these few materials and cotton sail-cloth. Since these were always available, the *oru* and *pāru* forms persisted – responding to any changes called for – and flourished throughout known History and even earlier.

The oldest example found, studied, recorded and dated is (as noted earlier) is of *Artocarpus nobilis* (*sinh.*'Val-del') and is ^{14}C dated to 2300 ± 100 BP (*circa* 360-460 BCE). McGrail (quoting Kapitan, the present writer and the Laboratory that carried out the analysis), has this to say about the find which is worth noting:

> "There is clear evidence for the use of South Asian rivers and also for overseas trade… However, only one excavated craft is known in the whole subcontinent: a logboat from the Kelani Ganga in the Colombo district of Sri Lanka, which is dated to the to the sixth/fouth centuries BC…."(McGrail:2003:14)

In fact, there have been at least four craft recovered from rivers in Sri Lanka, none are older than this particular boat. The ^{14}C date places it very close to the beginnings of recorded History, while the level of workmanship is high speaks skills that must *either* existed before the arrival of the Indian settlers *or* been introduced here as a fully developed technology by the Indo-Aryan settlers. Since the *oru* culture in India lay within the coconut belt, far south of the homeland of these settlers, the latter is unlikely.

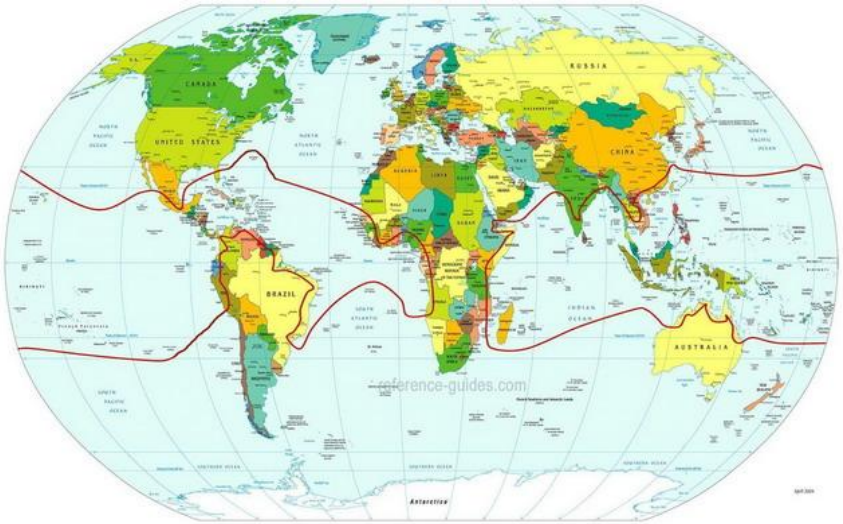
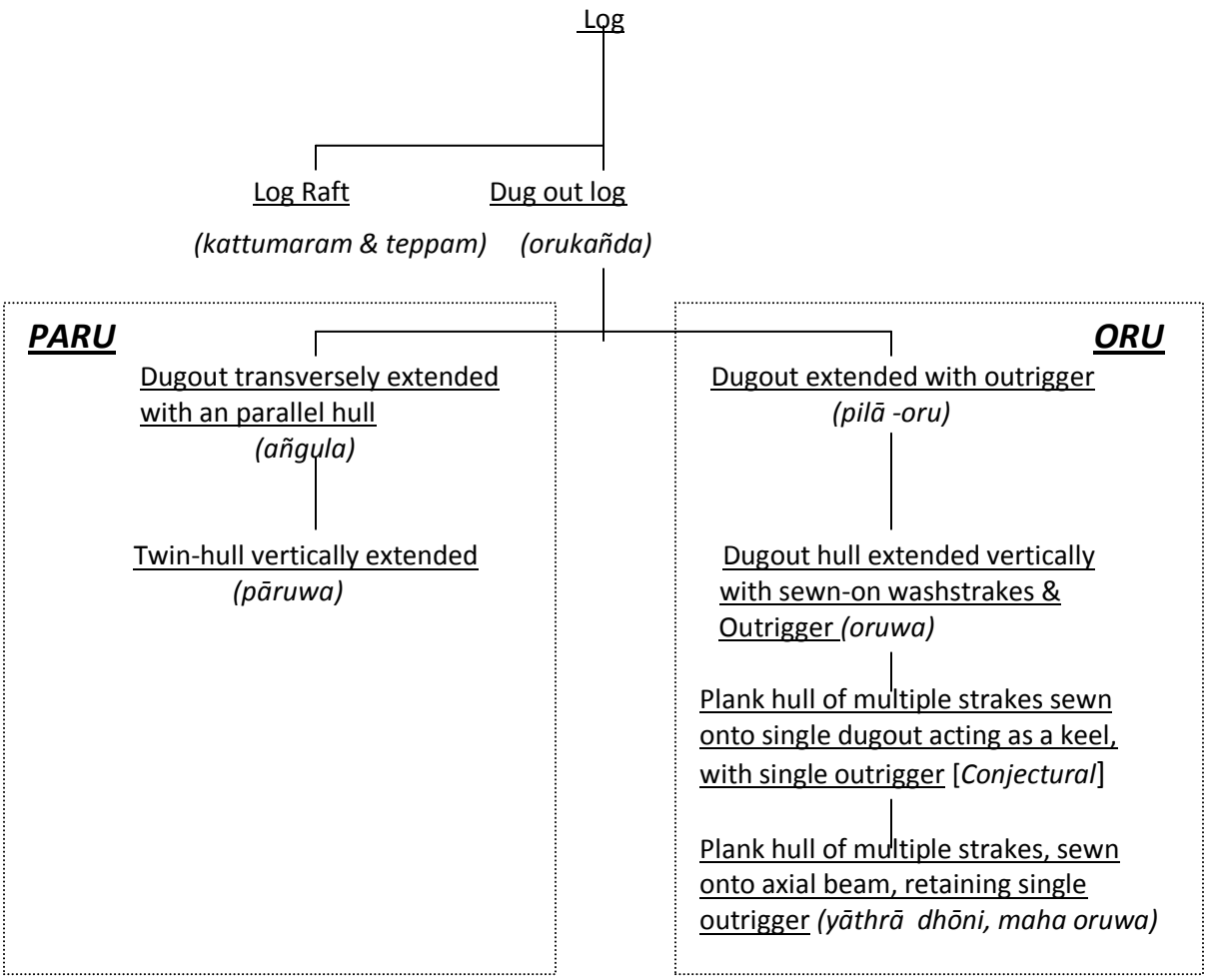


Fig. 8

Figure 8 shows the area where the coconut palm can grow: it barely touches Gujarat and the Indo-Gangetic plain is outside its limits. It is more likely that the birth of the "*oru* culture" is linked to areas with rich biological resources and, particularly where the coconut palm grows and propagates itself: namely, in Kerala (South India), the *oru* heartland of Sri Lanka and the islands off the Indian coast. In fact the oldest log boat, referred to above, was recovered from the bed of the bed of the Kelani ganga in the Sri Lankan heartland.

If the *oru* is a vernacular watercraft, can the development of its form and structure be demonstrated within the Sri Lanka – Kerala axis be demonstrated? This exercise was undertaken in respect of Sri Lankan craft, only, but with one reference to Kerala which is treated as conjectural. The following chart is the result.



The development of the ***ORU*** culture (Sri Lanka): A schematic representation

The form of the craft and Sinhala or Tamil names are indicated.

Here, the ***ORU*** group is identified as the main group and ***PARU*** is shown as a sub-group. This being so***,*** the ***PARU*** will be mentioned only when relevant to the argument or to place them in context.

This flow chart traces the linear development of the *oru* form from the log to the cargo boat. The log rafts, though shown here, are not dealt with as they do not fall into the category of "boats". The first step in the progress of a log to a constructed watercraft is by hollowing out or 'reduction'. In the dugout form that results, it cannot be stable in the water. Stability can be achieved by several means, and at this point an important decision is made which affects both the ***ORU*** and ***PARU.*** This is to achieve stability through transverse extension: (1) by the attachment of a balance log (in the *oru*

form) and (2) by attachment of another logboat, to form a twin-hulled craft (in the *paru* form). At this point the two forms diverge as shown above.

The next stage is when both forms, *oru* and *paru,* undergo vertical extension: *pāru* do not progress beyond this stage in Sri Lanka. Unlike the *oru* the *pāru* does not take to the sea, venturing only just off-shore to lay the beach seine nets for fishing (*mā-däl-pāru*). In inland waters *pāru* flourished as cargo carriers. A major difference between the twin (or double) hull forms in Sri Lanka and the Pacific is that here this form did not adapt itself to the open sea while, in Pacific waters, the double hull gave rise to the most advanced voyaging craft. Within the Indian Ocean "Oru culture" zone, too, the *pāru* seems to have arisen only in Sri Lanka. These are matters for further study. The *oru* hull form, on the other hand, metamorphoses (as described earlier) to successfully meet the requirement of a seagoing craft. This is the archetypal *oru* form. It should also be noted, at this point, that the *oru* always had only one outrigger and that this was attached to the hull by only two booms: no more, no less. Here again is a major difference between the Indian Ocean *oru* and its cousins in the Pacific and even in the Indian Ocean: in the Andamans three booms are standard. Interestingly, once again, in Sri Lanka, the single outrigger fishing craft remains only as a fishing craft. In the Pacific, on the other hand, a sturdy, elevated platform is built straddling the hull and the outrigger, thus making it a passenger and cargo craft. While this platform is present in Sri Lanka, it is in a rudimentary form, used only to store the gear of the fisherman. Here is another indication that the development of the *oru* was choked off at a particular point.

At the bottom of the chart, is the *yāthrā dhōni* or *maha oruwa* of Sri Lanka, a ship used in international trade, a form of ship that has not been reported anywhere except in south-west Sri Lanka and the east coast of India (Reith:1993:137, Planche 21). Here is the ultimate difference between the nautical cultures of the Indian and Pacific Oceans: in the former no voyaging craft are known and in the latter no cargo ships are known. The *yāthrā dhōni* was in use till the 1930s and has even been photographed. Its single outrigger marks it as belonging to the *oru* culture, but its hull configuration is not found in other forms of the *oru*: a broad beamed, double-ended, boat-shaped plank hull (typical of seagoing ships) built on an axial beam instead of a log hull, with a rudder mounted on the stern-post.

Fig.9. *Yathra* beached. Note outrigger to starboard. (*Source:* www.imagesofceylon.com)

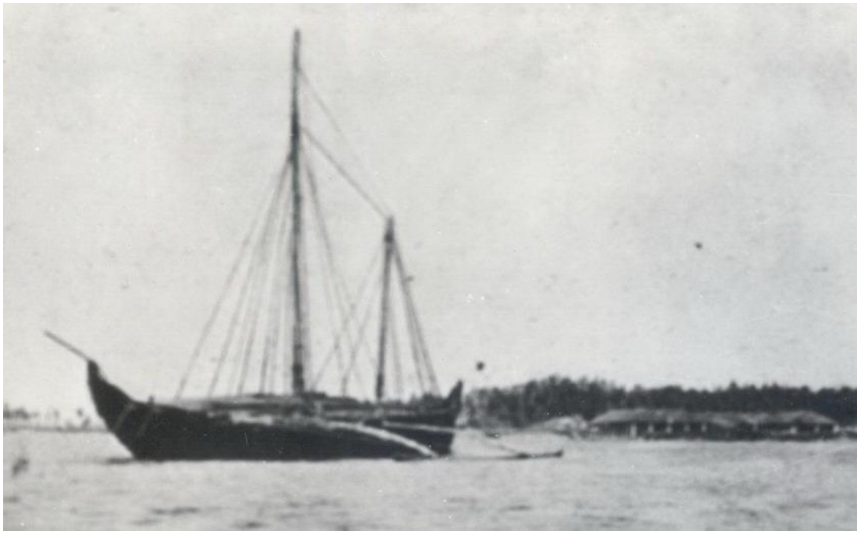


Fig. 10. *Yathra* at anchor off Kalpitiya. (*Source:* Lewis)

If the *yāthrā dhōni* is to be considered a product of the "*oru* culture", it is necessary to demonstrate how the *yāthrā* hull evolved from the *oru.* Every other craft in this chart can be shown either in use or from photographs. It is not possible to similarly demonstrate the change in hull form from Sri Lankan sources alone. Here, there is a piece missing from the puzzle. Fortunately it has been reported from, and photographed in India (Dona Paula, near Panaji, Goa). In one example, a vestigial dugout hull is retained as a keel-log and plank strakes sewn edge-to-edge, slanting outwards and upwards to form a V-section hull very reminiscent of the "Dhow" hull.(Hawkins:1980:11). Another example, described as "A big sewn balam(India)" is shown by Phillips-Birt (1979:127:Pl.111) with the remark "Note the finish-off forward"- this feature being the characteristic blunt bow of the *oru* proper. In this example, however, the planking is affixed upright. The same author also gives a drawing of a cross-section of a hull, from Dawki, showing the dugout keel (*ibid*:134: Pl.116) . All these examples demonstrate that the metamorphosis of the *oru* into a plank hull begins with the dugout hull changing its function from being the hull itself to become a keel-log. In the next step, this logboat keel is replaced by an axial beam in a process of simplification. The stage has been commented on by Hornell:

> "The final stage in the conversion of the dugout into a fully plank-built boat is attainewhen the dugout under-body is reduced to a keel-like axial beam, with sides raised upon its edges by numerous strakes of sewn-on planking. This was the method of construction employed by Persian and Arab shipwrights...and the Sinhalese coaster of the Gulf of Mannar …"(Hornell, 1946: 192)

The "Sinalese coaster of the Gulf of Mannar" referred to is the *yāthrā dhōni*. Unlike both these examples the *yathra* hull is boat shaped, rather like a naval whaler, but carvel built.

These examples may explain how the *oru* hull became the *yathra* hull, but leaves unanswered the question of why it retained the outrigger and booms. Hornell and Vosmer have commented on the retention of this feature. The former, whose had seen *yathras* in the early 20th.century, has this to say:

> "These outrigger craft traded up and down the western coast of Ceylon during the north-east monsoon usually sailing from their home ports (i.e 'the coast villages lying between Colombo and Galle') on the first northward trip in September or October as soon as the strength of the south west monsoon showed definite signs of weakening ….Later in the season the diurnal land and sea breezes were utilized – the afternoon sea breeze helping the boats along the northern run, while the land breeze at night was favourable on the voyage south. Hence the reason for fitting the outrigger upon the port side, for according to the tactics employed, the port side was always the weather side." (Hornell, 1943:45)

Hornell's explanation does not touch upon why the *yāthrā* (that he had seen) carried an outrigger. The ship he has made a drawing had sails on two masts and a bowsprit and had a rudder mounted on the stern post. Instead of questioning its presence he tries to explain why the outrigger is placed on the windward side, as in the double-ended *oru.* The explanation for this is that the craft sailed only during a particular season and only on the western coast of the island and, therefore "… according to the tactics employed, the port side was always the weather side." Certainly, "the tactics employed" in the single outrigger *oru* is that the outrigger is always to windward; but how can this be extended to the *yāthrā*? The *oru* is a double-ended craft (having no fixed bow and stern), with adjustable sails, leeboards instead of a fixed rudder astern, and does not tack but changes ends. It employs a maneuver ("tactic") which involves keeping the outrigger to windward, changing ends by manipulating plank rudders, leeboards and sails. It has no bow and stern (as they change each time it "changes ends") and no port nor starboard but only a weather side and a lee side. Its mode of progression is the complete antithesis of that of Hornell's *yāthrā*, which had three masts, a fixed bow and stern and a rudder hung on the stern post. With such a rig, it is questionable whether it needed to keep the port side (i.e. where the outrigger was fitted) as the weather side. Some twenty years earlier, he (Hornell, 1920: 124-141) has said that the *yāthrā* sailed north past Velvettiturai on the northern-most tip of the eastern coast, and later (Hornell:1946:258) says that the "large and Weatherly design of the Sinhalese hull is probably a legacy from the days when trade between Sumatra and Ceylon and South India was active…". If we were to accept this position we have then to reject the other which limited the *yāthrā* to a particular period and particular area of operations. Pâris, too, has a drawing of a *yathra*, (Figure 12) which also shows the outrigger on the port side, which he attributes to *"Ceylan et côte de Coromandel".* Thus, one is left with no choice but to conclude that he offers no clue to why the *yathra* required an outrigger. The rationale for the retention of an outrigger on that kind of *yathra* has to be sought elsewhere.

Vosmer, who measured a large and accurate model, taking the lines off, and tested them on MacSurf software, (Figure 12) makes an interesting remark:

> "A large outrigger is fitted on the port side of the vessel, on what is apparently the 'windward' side, according to the set of the sails. The use of an outrigger is curious on a vessel that appears to possess a rather stable hull rig configuration. Hydrostatic analysis of the hull form showed it to be a reasonably seaworthy vessel even without the outrigger. Its use demonstrates how firmly wedded are the Sri Lankan builders to the concept of the outrigger." (Vosmer: 1993:113)

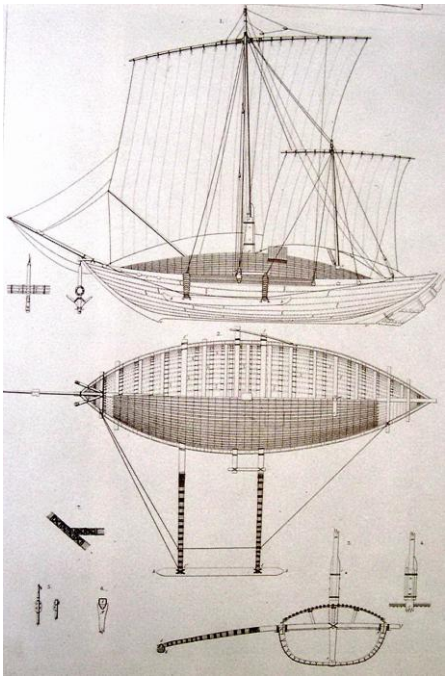


Fig. 11. *Yathra* (*Source:* Reith, after Pâris)

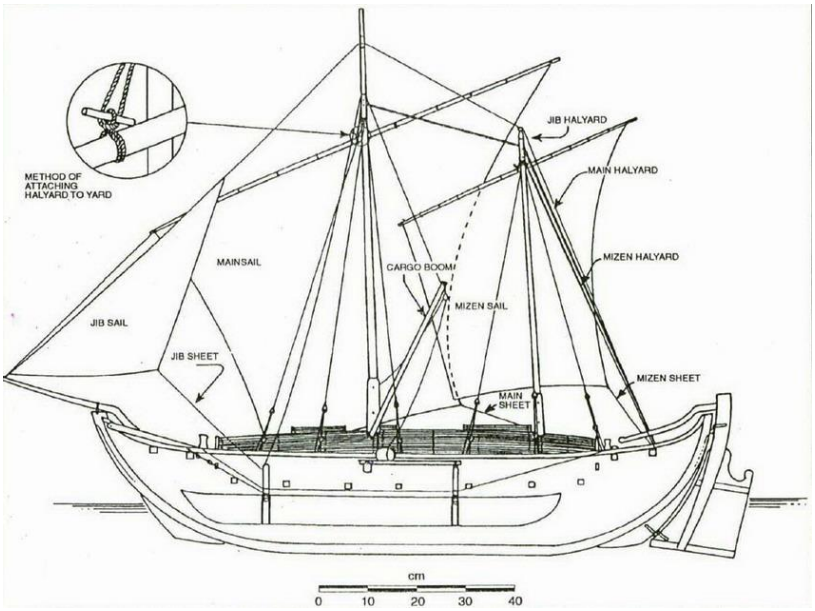


Fig.12. Computer generated drawingof a *Yathra* (*Source:* Vosmer)

Here he makes it clear that, from the perspective of hydrostatics or nautical architecture (perspectives from which he conducted his study) there was no technical reason for the *yāthrā* (in the configuration he studied) to have an outrigger. In his opinion, therefore, its presence is a cultural, and not a technical choice.

There is another aspect to this. Vosmer, Hornell and Pâris all speak of the late 19th and 20th century *yathra dhoni* which, as noted above, were schooners with two masts, with fixed bow and stern, and fitted with rudders on the stern-post. *Yathra* in 20th century photographs are remarkably similar to both the model studied by Vosmer and the drawing made by Pâris.

However it is possible that the *yāthrā dhōni* form permitted some variation. A model in the Museum of Mankind (London) shows a different, perhaps smaller, version. (Figure 13).This shows sewn plank strakes and a single square sail on a pole mast (lashed to the main boom as in an *oru*). It is undecked, but there are the remnants of a cadjan canopy. It is double-ended, and does not have a fixed rudder. In this configuration, where every constructional detail (other than the substitution of a plank hull for a dugout hull) conforms to the "*oru* culture", the craft can keep the outrigger always to windward, just as any *oru* would. It is undoubtedly a product of the "*oru* culture". The *yāthrā* yet has much to reveal to us.

Fig.13. Smaller version of a *yathra.*(*Source:* Museum of Mankind, London)

4. Ornamentation

The last aspect of the *oru* culture needed to complete my overview is the matter of ornamentation. Ornamentation should also be indigenous in style for the *oru* to be considered a vernacular craft. Taking surviving *oru* (post-medieval configuration) as the standard, what stands out is the total lack of ornamentation. Ornamentation was the norm in all other Asian countries, either for aesthetic or ritual purposes. The lack of ornamentation should therefore indicate something. The *oru* that we are aware of are no-nonsense, workmanlike craft: very well built but lacking in ornamentation. As has been noted earlier, the building of *oru* was taken over from traditional carpenters by the fishermen themselves. We are aware of only these latter craft. Whether the craft were equally plain a thousand years or more ago, when a "grand" culture prevailed in the country before it was supplanted by a post-medieval folk culture, is something we cannot know. The *oru* we know are unpainted, unornamented craft. This is a feature that sets the "*oru* culture" apart from those of most other Indian Ocean cultures.

A new development, stemming from the substitution of fiberglass hulls for dougout log hulls, has to be noted. While the process of the change to the *oru* by the substitution of other, synthetic materials for to wood, coir rope and of outboard motors for sails has been dealt with in another paper (Devendra: 2010) it is necessary to note here that the new hulls are ornamented. This takes the form of painting the hull in

several colours but it is not influenced by any religious or ritualistic intent, but is purely individualistic.

Nineteenth century *yāthrā,* however, have hulls painted black with white trim. In Kayts and Velvettiturai the ships of the northern tradition (see below) *oculii* and the *surul* (inward-coiling stem post) were the norm, as were painted false gun-ports on a black hull. Ships owned by Muslims were generally painted green. These are the only forms of ornament influenced by religion or ritual seen in Sri Lankan craft.

Craft outside the *oru* tradition.

In this paper, craft outside the *oru* proper have been only referred to but not been dealt with. Of these, the *añgula* and *pāru* fall into the *Pāru* class and the *kattumaram* and *teppam* into another class – the "shaped-log rafts" – outside both *Oru* and *Pāru* classes. The *añgula* – a twin hull – is constructed of two dugouts joined, at some distance from each other, by spars above which is a platform deck. Several variations are found, ranging from simple to large (for carrying bullock carts and even motor vehicles) and all are used as ferries, only. The *pāru* of the rivers and canals carry the development the twin-hull form much further. Here, the two dugouts become vestigial chine strakes (*vide* Kentley: 2003: 167), which are joined (almost) in parallel by planks, forming a flat bottom. The sides are then built up vertically, as are the fore- and after-ends which are extended beyond the ends of the chine strakes. The whole is punt-shaped in plan – slightly broader-beamed amidships and with a slight toe-in (a feature common to all *oru, pāru* and *yāthrā).* It was used for the transport of bulk cargo and could be towed, rowed, poled or sailed as necessary. The last to be built were standardized at an overall length of 50 feet but several chine strakes have been found in inland waters: the largest, ^{14}C dated to the 9th.century CE, is over 60 feet in length. The later craft were not sewn but built of nails, nuts and bolts by a carpenter-cum-Boatwright and it is surmised that, in earlier times, they were sewn craft. The other form of *pāru* is a large fishing craft, the *mā-däl-pāru,* which is similar in shape. However, it is of sewn construction, with fore- and after-ends slanting upwards in the fashion of *oru.* They are used to lay large beach-seine nets, and nothing else.

While the *oru* and *paru* belong to the dominant "Oru culture", there was at least one other boat-building culture in the island. This was the northern culture which came within the ambit of south Indian cultures. The main forms are the sailing rafts: *teppam* (pegged log-rafts) and *kattumaram* (lashed log-rafts). Neither is sewn, but both are lashed and can, hence, be linked to the *oru* culture. They form a micro-zone encompassing the north of Sri Lanka and the south-eastern coast of India, with the larger and more varied forms being found in India. There are also the *vallam,* of entirely Indian origin. This term is not a specific term and in India it is applied to a wide variety of craft. In Sri Lanka, however, they are of large logs and thick planks, transformed by heat to make broad-beamed, flat bottomed fishing craft with sharp ends, strengthened by sturdy ribs inserted after building. These were originally imported from India.

While the *teppam, kattumaram* and *vallam* are rafts or boats, the northern tradition also produced a large cargo vessel which traded with India, the Maldives and in the Bay of Bengal. The largest vessels, the *padagu,* commonly called the *Thoni*, belonged to the 'hybrid' tradition and, in its last known form, looked like 19th.century British

warships, complete with false gun ports painted on. However, these imported elements must have been superimposed on an indigenous base form which, unfortunately, it is not possible to trace at the present time. A smaller ship used for localized trading was the *vattai/vattal.* Hornell (1943: 49-51) has recorded them both in words and by photographs. None remain for study now but it is possible that these types were common to both India and Sri Lanka.

Was the *oru* native or an exotic?

This is, arguably, the most important question to be considered, even if it may not conclusively answered here. Everything said so far has been in support of the position that the *oru* is a regional and sub-regional culture specific to the Indian Ocean, the development of which can be traced stage-by-stage in the south and west of Sri Lanka. Being vernacular, it differs from the outrigger cultures of both the eastern and western rims of the ocean and of the Pacific. Between the craft of these different cultures there are significant morphological differences. The norm in the "*oru* culture" is the single outrigger connected to the hull by two booms, whether the craft was a modest inland water craft or a seagoing cargo carrier. In the south-east Asia / east Africa region the norm is the double outrigger in coastal fishing craft and voyaging craft that can easily undertake cross-oceanic sailing; the number of booms being variable. In the Pacific Ocean, small single outrigger craft are in use but its signature craft is the double hulled voyaging vessels in a wide range of variations, sometimes with more than two booms, but almost all fitted with a platform deck.

It is in view of these morphological differences, as well as the two opposing views referred to above (i.e. those of Toussaint who says that "The outriggers themselves are of foreign origin" and Kentley who says "Sri Lanka has a distinctive culture: sewing may be the only imported trait, though it cannot be ruled out that it developed here first") it is necessary to compare the northern Indian Ocean (single outrigger) "*oru* culture" with the outrigger cultures in the southern Indian and Pacific Oceans. This is a major task that needs to be undertaken. While I feel unequal to the task, I shall make some observations in keeping with my thesis that the *oru* culture is a vernacular.

The basic morphological differences have been mentioned. In the *oru* culture, a single outrigger joined to the hull be two booms is never deviated from, unlike elsewhere where there is no such uniformity. The fishing *oru* operate in coastal waters although they have been said to have sailed over twenty miles off-shore, but only to known fishing grounds. The similar craft in the Pacific appear to have been limited in range to calm waters: they do not appear to have plank washstrakes sewn on to the gunwales to avoid taking in water. However there are single outrigger canoes with booms of naturally curved timber which curve upwards and downwards between the hull and the outrigger: this must be to deal with wave-generated stresses. Outrigger/ Double canoes with platform decks raised well above the water level were the chosen form for open sea sailing. In the double outrigger region, the original form of large craft is still built in Indonesia. The "Borobudur ship" replica was built a few tears ago of locally available materials by local builders and she literally "flew" across the Indian Ocean in one reach in almost no time: a considerable vindication of that craft form. Variations of this form still exist in Madagascar, although only as fishing craft. In recent times, fishing

boats in coastal waters have dropped one outrigger although the two vestigial booms are retained for the 'missing' outrigger.

In their largest forms, the craft from the three regions reveal much. The Pacific double hulls were not outriggers craft proper, but an acceptable variation. These truly remarkable craft – one of which was recently built of modern materials and sailed very successfully – were those on which long voyaging was undertaken. They carried even small communities on board as well as provisions, but they were for voyaging purposes, not for trade or carriage of cargo. The Indonesian double outrigger craft, too, were for voyaging. Although they may have made many a voyage across the Indian Ocean once communities were established in Madagascar and East Africa, they were meant for purposes other than the carriage of cargo for trade. The *yāthrā* of Sri Lanka – belonging to the *oru* culture – was different in that it was a cargo-carrier and was used in carrying trade goods from Sri Lanka to India, the Maldives and across the Bay of Bengal to Malacca. This difference between the *yathra* and the large craft of Indonesia and the Pacific is a cardinal one.

How old were these outrigger craft is their various regions? The oldest is likely to be the craft of the Pacific which are said to have originated around Taiwan and gradually spread southwards to Papua-New Guinea. From there, in a series of movements connected with the Lapita culture, with millennia separating one movement and the next, they spread across the whole of the Pacific. The start of this movement cannot yet be dated.

> "The Lapita complex is the archaeologists' name for the cultural group who colonized the Polynesian islands between about 1400-900 BC. In turn the new Polynesians colonized several island groups outwards out of Tonga and Samoa beginning about 500 BC, arriving in the Marquesas about AD 300, the Hawaiian islands by 800-900 AD, and finally in New Zealand about 1200 AD." (Smith: 2008))

The entire movement may have taken 30,000 years or more. It is one of the great unsolved riddles of History. The movement of the Indonesian peoples to Madagascar is another such riddle. However, in terms of chronology, it was not so long ago. There have been several conjectures on when and how this movement commenced, and whether the route followed was across the Indian Ocean or whether it started long before history and – like the Lapita in the Pacific – progressed in short steps along the northern coast of the Indian Ocean, southwards to East Africa and later, from Africa to Madagascar. Hornell himself gave credence to this. If that were so, then the possibility that the outrigger was introduced to Sri Lanka by them will have to be considered. But the consensus today seems to be less romantic: the Indonesian presence in Madagascar is now believed to be after the 5th.century CE. By this time the pattern of alternating monsoons and the route across the Indian Ocean was well-known to the Chinese; the Arabs, under the impetus of Islam, were soon to be sailing these waters. Indonesians, who were experienced sailors, would have been aware of all this. The idea of incremental moves along the coast has to be re-examined in this light. Sri Lanka, on the other hand, is said to have been settled by a more advanced Indian maritime culture around the 6th.century BCE. The chronicles of the settlers – and now of the country – say nothing of the indigenous people. Pre-historic remains of settlers here have been found, dating to millennia before Sri Lanka was made an island by rising sea-levels 7000 years ago. Yet, as noted above, a large logboat of a high degree of workmanship, with indications that an outrigger *may* have been fitted to it, has been found in a major

inland waterway, and this has been ^{14}C dated 2300 BP (380 BCE) ± 100 years. This is material and objective evidence that the *oru* culture was at least a millennium older than the Indonesian presence in Madagascar. How long ago the coast-wise sailors made a landfall in East Africa cannot, however, be indicated with any degree of accuracy.

It is suggested, on the balance of probabilities, that the Indonesian movement had no impact on the *oru* culture of Sri Lanka and the Indian Ocean. This would be in keeping with the position that this culture was a vernacular one.

No argument, however, has a neat ending, and it is interesting to note a matter that can lead to further argument. Vitharana, whose work on the ethnography of the *oru* and *yāthrā* examined the etymology of the word *"oru"*. Among its other uses in the language, the meaning is "to hollow out": there are instances of it being used as a suffix to the name of a stone or wooden trough used for storing water or cooked rice, for medicinal baths and for dying the robes of Buddhists monks. The hollowed gourd used for making the musical instrument *veena* has also been referred to as an *oru*. A non-specialist had mentioned that, in the Malay language there was a watercraft called "ORU-U" and both Vitharana and I tried to track this down in Malay language Dictionaries, unsuccessfully. Recently, however, I found this elusive word in a Dictionary of Watercraft (Mariners' Museum: 2000: 419).The word there is not "oru-u" but "ORO-U". It is defined as:

> "A Double canoe of Mailu Island, close of the eastern end of the south coast. Used mainly for trading. Dugout hulls; the main hull larger, the somewhat smaller hull serving as an outrigger. Hulls almost round in cross section: centre hewn out. Sides raised with vertical planks to form washstrakes, and ends closed off with breakwaters; often carved; washstrakes and breakwaters lashed to dugout. Caulked with inner bark of a special tree. Canoe ends bluntly pointed……"

The similarities and differences of this craft are both quite apparent. More interesting is that Mailu Island is in the SE end of Papua-New Guinea where the first movement of the migration from near Taiwan ended, and from where the next movement into the Pacific began.

<u>Conclusion: Toussaint and Kentley re-visited</u>

I have now come full cycle and can make my comments on the two quotations with which this paper begins. If the little clue about Papua-New Guinea that I have given above – a clue I respect as it is based on material evidence – leads to the discovery of a specific and demonstrable link to Sri Lanka, I would willingly accept Toussaint's assertion that

> "The outriggers themselves are of foreign origin"

In the interests of objective truth, I hope someone will do so. But as for his other assertion,

> "The Sinhalese people never looked towards the sea and the navigators whom history records were always foreigners"

I am afraid that almost all non-European navigators – but not all – remain yet unrecorded in western History, and the silence of recorded History does not mean that nothing existed. In fact, as Vitharana observes after a review of all Sri Lankan historical chronicles and literary works (which were not available to Toussaint):

> "(There) is no reason to doubt the continued existence of the *oru* in Sri Lanka although literary and archaeological evidence is not in abundance. On the other hand there is not the slightest clue – even a belief of legend of a regional sort, at least – to lead one to the merest conjecture that it once existed and disappeared to reappear during relatively modern times" (Vitarana: 1992: 24)

When Vitharana wrote these words, the ancient logboat referred to above (and also by Vitharana himself) had not been dated (at the Weizmann Institute, Rehovot, Israel) to 380-480 BCE, and he was unaware of the existence of archaeological evidence. Naturally, Toussaint, too, could not have been aware. And herein lies the danger of making *ex cathedra* pronouncements based on the current state of scholarship in a climate of change.

Kentley's statement, on the other hand, was based on his hands-on experiences with South Asian boats, particularly the *mā-däl-pāru* of Sri Lanka and the *masula* boat of the east coast of India. He has rightly concluded that the sewing pattern on both are similar, and has left it open as to whether the technique originated in Sri Lanka or not. Sewing was also used in Kerala. When Tim Severin constructed the "Sinbad", a sewn boat of the Dhow tradition, he called on carpenters from Kerala. Last year, when Tom Vosmer built the "Jewel of Muscat" modeled on the evidence of a 9th.century wreck of an Arab sewn vessel found off the Indonesian coast, he sought specialist caulkers from Sri Lanka (*Sinh*: "galappatti karayo") who could sew on planks using wadding on both sides of the plank. This was called for according to the details available from the wreck and Vosmer, when working on the *yathra* in Sri Lanka had noticed that this method was used on the *mā-däl-pāru.* However, by this time, there were no more skilled workers to be found here as we had switched over to fibreglass hulls and he, too, found them in Lakshadweep/Kerala. So the sewing technique was found on the SW and SE coasts of India and in Sri Lanka, in which areas the use of coir ropes for fastening was found. But sewing is just one of the means of fastening: lashing is perhaps as important, if not more. No study of this has been done in India, or of Indian boats, to my knowledge, but some material is available in Sri Lanka. Kapitan (2009), and Vitharana before him have made detailed drawings of the manner the booms are lashed on to the hull so that all the stresses experienced are transferred to the hull. The lashing of the bamboo sprits to the main boom and the hull, the fastening of the outrigger to the booms, the use of rope grommets for detachable features such as the leeboards are all very important in the construction of an *oru.* A craft belonging to the *oru* tradition has more lashing than sewing: however, there is no similarity between their lashing and the "lashed-lug" tradition of Indonesia, where lashing takes the place of sewing.

Finally, when Kentley speaks of "fastening planks, indeed a special method of sewing" as being a single attribute…not sufficient to place Sri Lanka within a broad 'Indian Ocean boat building culture' " it means that such a broad culture must exist and, with due respect I must try to repeat that the only attribute common to all the boat building cultures in the Indian Ocean was the practice of fastening timbers using coir rope. My position, as at the time of writing, is that

- the single outrigger "ORU culture" was a specifically regional and sub-regional culture of the northern Indian Ocean, and

- it lay squarely within the sewn-boat culture of the Indian Ocean: the only "broad 'Indian Ocean boat building culture' ".

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Acknowledgements

Acknowledgement is made, with thanks, of the following sources of illustrations, which have been acknowledged below each:

Department of Fisheries, Sri Lanka

Gehard Kapitan

Gerald Grainge

Mihiri Devendra

The Palinda Stephen de Silva Collection: www.imagesofceylon.com

J.P.Lewis, *Times of Ceylon Christmas Number 1913*

Tom Vosmer

Eric Reith