

Vernacular Nautical Architecture in Transition: A case study of traditional Sri Lankan fishing craft

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Abstract

This paper traces recent changes to the form of the oru, the archetypal Sri Lankan craft commonly (but erroneously) called “catamaran”. Of great antiquity, oru evolved from the need for a watercraft for use in inshore water, built of naturally occurring bio-resources. It is a wooden craft, fastened with coconut coir rope—a technology common to many Indian Ocean cultures. It comprises two elements: a dug-out hull connected to an outrigger float. Being non-rigid, it can cope with surf-induced torque and its round bottomed monoxylon hull can withstand abrasion due to frequent contact with sandy surfaces. A “skimming” craft with negligible displacement, it differs from double-outrigger craft of some other cultures rimming the Indian Ocean and may be linked to outrigger canoes of Oceania. But these related forms are not dealt with here as this is a study of transition.

In Sri Lanka, the craft remained unchanged for millennia and began to manifest major changes in the latter 20th century: the use of iron nails, nylon cordage, outboard motors, Glass Reinforced Plastic hulls, and the resultant loss of the double-ended hull configuration. Reasons for change included deforestation, urbanization, cost of manufacture, loss of skills etc. Significantly, no change affected the dual-element form of the craft: a form which—technologically speaking—had been made redundant by the process of change. This paper, a first attempt to record these processes, poses a fundamental question: when, in the course of transition, does a vernacular form cease to be vernacular? The case study approach, using an example from vernacular Nautical Architecture would also help to extend the horizons of the vernacular beyond the built environment and settlements while remaining within the ambit of Architecture. This paper does not seek to answer these questions: rather, it is hoped, that the case study presented will lead to new thinking.

Keywords: Fishing craft, *Oru*, nautical architecture, Sri Lanka

1. Introduction

Ships and other major watercraft are, today, built following an architectural design process: “Naval Architecture”, is the formal term for this process, and is recognized both as a discipline and a specialization. Pre-modern crafts however, while being products of an architectural process, were—and still are—‘built’ in accordance with a traditional craft technology. In this paper the term “nautical” is used in preference to “naval” in relation to vernacular craft as in their building and design, the norms and disciplines of modern Naval Architecture were—and still are—not followed. Such craft were purpose-built, by builders who drew upon traditional knowledge, training and experience, and not on drawings, calculations, controlled trials, computer simulations etc. They are, in fact, the products of a design process, but one far removed from that of formal “Naval Architecture”.

The ‘Oru’: the national and dominant design

The *Oru*—to use its plural, or stem form in Sinhala¹ (*oruwa* being the singular form) – is an 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 accident of history and lack of specialist knowledge which has spawned further errors, and cannot now be undone. A recent dictionary of watercraft lists thirteen geographical regions in which the word “catamaran” is used to denote a raft, and is very specific in its overall definition described as follows.

“catamaran

1. Generic term for a shaped raft of bamboo or logs found in numerous parts of the world...
- 2-4. [omitted as not relevant to the discussion]
5. Sometimes mistakenly applied to an **outrigger canoe.**”

(Mariners’ Museum, 2001: 123)

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 it has since become the standardized. Modern “Catamarans” and “Trimarans” are, really neither *oru* nor *Kattumaram*, but “double-hulled” craft inspired by the Pacific model. For readers of this paper it is essential to know the difference between these and the *oru*.

The *oru* of the fishermen is basically a hollowed out log (*orukañda*) which retains a thin, linear shape and is thus considered a ‘canoe’. The basic dugout is later modified in two ways:

- (a) By the addition of washstrakes (“planks”) sewn to the *gunwales* (top edges of the log hull) to increase its freeboard (i.e. height above waterline), and
- (b) By connecting a single outrigger balance-log (*kollääwa*) to the dugout hull using two flexible wooden booms.

¹ Sinhala is the native language of the Sinhalese of Sri Lanka.

By neither process is the shape of the original dugout altered. The composite structure, comprising dugout hull and outrigger, is the *oru*. On completion, the *oru* is made up of and comprises the following major elements which are permanently joined together.

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

Other elements, which are detachable but essential for sailing are,

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

All parts firmly attached to the dugout hull are fastened with coir rope, either sewn or lashed. As can be seen, *oru* are dual-element crafts, comprising dug-out hulls connected by spars or booms to outrigger floats. The entire craft was ‘flexible’, meaning that they were non-rigid and could cope with surf-induced torque. The hull being a monoxylon, its rounded bottom could withstand abrasion due to crossing sand spits and being hauled up the beach. It was essentially a “skimming” craft, with a hull that barely caused any displacement.

Oru are made in several configurations: variation being dictated by function. In wave-free inland waters, the washstrakes, masts, sails, rudders and leeboards are not used while at sea they are essential. Here—the working environment of the dominant form of *oru*—the type of fishing it is engaged in dictates the size, and sometimes such additional features as rowing rails.



Fig. 1: A view of an *Oruwa*

Although this paper is focused on *oru*, brief references will also be made to two other types of fishing crafts in use in Sri Lanka which will be helpful in understanding its immediate context. They are as follows.

(1) The “shaped-log raft”, already referred to, exists in two forms – *kattu-maram* and *theppam* – common to both South India and Sri Lanka and bearing Tamil names. *Kattu-maram* (“lashed log rafts”), the larger, has 3-5 logs lashed to each other with coir rope, with a removable, shaped bow-piece attached to the bow. The smaller *theppam* (“pegged-log rafts”) has no bow-piece: the logs are more finely fitted, and pierced across to permit two, long, flexible rods inserted with ends protruding on either side. These protrusions are the “pegs” which are lashed to each other across the craft, forcing the logs against each other. In both forms, the lashings are frequently replaced and the logs dismantled and dried out.

(2) The other type of fishing craft is the beach-seine boats called *mā-dāl-pāru* in Sinhala. It is a large, scow-ended craft with vestigial twin-hulls, rectangular in plan, with high freeboard, used only for laying off-shore seine nets. They are rowed and not sailed.

2. An overview of studies on the oru

There is a paucity of studies of *oru*. Although 19th century studies by persons with a nautical background such as Edye (1934) and Pâris (1841-43) produced very useful technical and descriptive drawings, they do not fulfill the needs of modern scholarship. There have also been descriptive accounts and sketches over the years by perceptive observers such as Lewis (1913), and in the Fisheries Department Bulletins (1956, 1958). These too, while being useful, suffer from the same shortcomings.

The earliest studies of importance to watercrafts the world over, begin with James T. Hornell, commonly regarded as the father of such studies. His enduring work was “Water Transport: Origins and Evolution” (1946), but as he had extensive experience of work in India and Sri Lanka, he has left behind two documents of specific interest: “The origins and ethnological significance of Indian Boat designs” (1920 and 2002) and “Fishing and coastal craft of Ceylon” (1943). It is the latter that first makes specific reference to *oru* and, even though the paper is only a few pages long and is concerned with other watercrafts than the *oru*. The information and his observations are most pertinent and reflect a global view.

It was not until 1987 that anyone studied a vernacular Sri Lankan craft. That year, Kentley (with Gunaratne) undertook a serious study of the *mā-dāl-pāru* for the International Journal of Nautical Archaeology (1987) which he (Kentley) revised in 2003. While very useful, this work is confined to one specific craft and not the *oru*. A few years later, Vitharana (1993) undertook the most comprehensive study of Sri Lankan watercraft, “The *oru* and the *yathra*” which served as a baseline study for years to come. The same year appeared Vosmer’s “The *yathra* dhoni of Sri Lanka”, (1993) which again was concerned with one craft, and not the *oru*.

Between 1984 and 2009, there appeared a series of in-depth studies on different classes of *oru* published in several European journals and notably in the International Journal of Nautical Archaeology. These were the work of Kapitän, who had walked the beaches photographing, measuring, drawing and interviewing till he became too feeble to continue the work. The published papers, classification of types, unpublished photographs and scale drawings

were collected and prepared for publication by Grainge and the present writer as a Nautical Archaeology Society Monograph and a British Archaeology Report (Kapitan: 2009). This work will form the other baseline (along with Vitharana's) for future studies. The present writer himself has been writing widely on Sri Lankan ships and watercrafts since 1987, the latest published being "Ships and ship-building in Sri Lanka, with particular reference to a vernacular nautical architectural idiom" (2011), "Sailing on a string and a prayer: The 'oru' culture in Sri Lanka and the Indian Ocean" (2010, unpublished). Both these papers are concerned with the structure and building of *oru*. Grainge's paper, "Sailing a Sinhalese Outrigger Logboat", dealing with the other aspect of the *oru*—that of actually sailing it at sea—has been accepted for publication in the Journal of the Nautical Archaeological Association and will appear in the September 2011 issue.

3. The 'Oru': from Vernacular to post-Vernacular

The subject of this paper is how the traditional fishing boats mentioned above have been transformed in the 20th century. Change manifested itself in the middle years of the century and is possible that wartime (1939-46) austerity was a factor that brought about change. However, the major changes took place nearer the last quarter of the century, due not to any plan but to a plethora of contributory factors, including (but not limited to) the rise of mechanized fishing and the consequent marginalization of traditional fishing crafts, the shortage of traditional materials and the availability of new and cheaper materials, deforestation and population shifts following on societal changes, and the greater upward social mobility engendered by the availability of free education up to University level. The list is open-ended as this subject has not been systematically researched.

The paper is structured as follows:

- Reasons for considering the *oru* a vernacular form.
- The form and structure of *oru*.
- The heart of this paper namely, the transformation of the *oru* into something not strictly vernacular in form, and the parallel process in the *theppam* and the *mā-dāl-pāru*. Questions that arise from this transformation process.

The *oru* as a vernacular form

An objective definition of the term "vernacular" was sought to provide a balance to the writer's own understanding of the term, which had been derived from the sphere of linguistics. Vernacular has most often been defined in architectural terms. In this paper, such definitions will not be dwelled upon. Commonly used definitions² suggest both the noun and adjectival forms, as noted below (underlines mine).

² Derived from www.answers.com accessed on

- “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.”

Further, the Oxford English Dictionary provides an interesting extension, particularly in the adjectival form and more pertaining to the field of architecture:

- “6. Of arts, or features of these: Native or peculiar to a particular country or locality. spec. in **vernacular architecture**, architecture concerned with ordinary domestic and functional buildings rather than the essentially monumental”

In sum, it is clear that “vernacular” refers to a structure that is (a) particular to a region, (b) indigenous in style, (c) uses local materials (d) uses traditional construction methods (e) is functional rather than monumental and (f) is characterized by traditional forms of ornament. According to these parameters, the *oru* is definitely a vernacular watercraft.

In understanding its vernacularity, it is necessary to begin by identifying the specific region from which *oru* as a craft has originated. Its inherent characteristics can be used for this task. *Oru* has been described as a dugout canoe with a single-outrigger. Apart from that form, there are two other related forms: double outrigger and double hulled craft. Both single and double outrigger canoes are to be found, in the global context: (a) in Madagascar and the east coast of Africa, (b) in and around Sri Lanka, (c) in the Indonesian archipelago, and (d) in the countless islands of the Pacific. In each area, they are distinctively different with multiple forms sometimes co-existing. In the Indian Ocean, the double outrigger crafts are found in the western and eastern rims while the single outrigger common in the Pacific Ocean is found only in Sri Lanka, Kerala and the Andaman Islands. (Hornell: 1946: 255 and map). It is not intended to speculate why the two single-outrigger areas are not contiguous, beyond noting that the double-outrigger area occurs between, and separates them. In the northern Indian Ocean, Sri Lanka takes centre stage with Kerala and *Lakshadweep* (Laccadive Islands) to the north, the Andaman Islands to the east and the Maldiv Islands (where this craft is no longer in use) to the west. It is in Sri Lanka and Kerala that the *oru* culture developed to the level not achieved elsewhere and maintains its vibrancy to date.

Within Sri Lanka itself, the *oru* culture flourished in the west and south of the island: and elsewhere, other, more localized nautical cultures existed. James T. Hornell, who once served as an advisor to Department of Fisheries of Ceylon, made the oft-quoted perspicacious remark that,

“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 degrees 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, with the dug-out restricted to its proper sphere of usefulness on rivers and inland waters.”

Hornell: 1943: 40 (Emphasis mine)

Thus, even though Sri Lanka was the centre of the Indian Ocean, single outrigger culture, the heartland of the culture was the area that Hornell delineates: south of the Gulf of Mannar, meaning, the western, southern and eastern coasts. It may be noted in passing that, responding to the change of the monsoons, migrant Sinhalese fishermen in the west and south moved overland with their *oru* to the east and back again. This migration came to an end in 1983 and hence the presence of *oru* in the east coast has diminished. A Fisheries Department map of 1958 gives the following distribution of *oru*: Western Coast (*Kalpitiya* to *Galle*) – 4000; Southern Coast (*Galle* to *Hambantota*) – 1900 [a grand total of 5900]; and Eastern Coast (*Kuchchaveli* to *Akkaraipattu*) – 1500. These figures underline the fact that the west and south were the heartland of the *oru* where it flourished and, in fact, may have been born. Two years ago a definitive record of the last of the vernacular *oru* of this area was published (Kapitan: 2009). Eric Kentley, who systematically studied the *mā-dāl-pāru* of Sri Lankan and the *masula* boats of the Coromandel Coast, was moved to say:

“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

Note that he places our maritime ethnotechnology outside the Indian Ocean boat building culture, thus lending credence to the position that our nautical culture was a vernacular one.

Form and Structure

The first requirement necessary for considering the *oru* “vernacular” was to demonstrate that it was a regional, local and native form. This has been done, briefly, by separating the cultures of the north and south of the Indian Ocean, placing Sri Lanka at the centre of the northern culture and by identifying the heartland of the culture within the country. It is now possible to consider whether the heartland of the *oru* culture held the potential to give rise to a watercraft of that form and structure, given the available bio-resources and the inshore marine environment.

The working environment

Oru were in use both on the sea and in sheltered inland waters. On river, lake, canal and lagoon where waters were calm, the *oru* was merely a hollowed-out log joined by round timbers or spars, to a balance log (the *pilā oru* form) which was quite stable. At sea, however, a *pilā oru* could ship water and be swamped and, hence, vertical plank extensions were sewn on to increase freeboard and prevent this. This made the hull ride higher in the water than the outrigger, and the outrigger booms had to curve downwards from the top of the washstrakes to the outrigger. These modifications proved satisfactory and made it possible to row or sail the craft in a dynamic environment. With both ends (fore and aft) of the dugout hull identically shaped and sails rigged on masts or sprits, the sea-going *oru* could efficiently sail to windward by “changing ends” (sometimes called “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. 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* actually sails to compare his findings with a previously published paper (Kapitan: 2009:176-181). Grainge has commented on the sailing efficiency of the craft as follows.

“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.”

Grainge,2011: forthcoming

However, he adds the following cautionary words:

“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.”

Grainge,2011: forthcoming

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

- Tough hulls, of readily available material, that could work both at sea and on river and withstand abrasion encountered while crossing sand spits and being hauled up the beaches in fair weather.
- Fastenings of easily replaced “sewing” and lashing material, which assured a ‘flexible’ (i.e. non-rigid construction) craft at sea.
- A double-ended, dual element configuration, of shallow draught to facilitate ‘skimming’ over the surf and beaching in an upright position.

The oru with its shallow draught (it had no keel), its dual element form, having no keel but with the ability to flex to meet the surf generated torque (due to its rope fastenings) satisfied all requirements.

Materials and resources

The preceding section demonstrated that the oru appear to have generated as a response to the specifically demanding context of the inshore maritime environment. Whether the necessary bio and human resources were available for building the craft have now to be examined.

For the oru culture to flourish, the construction materials had to be easily found in the heartland of Sri Lanka. Until the 19th century, the south-west of the island was 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* (*val del* in sinhala). *Artocarpus* species are used for boat-building in Kerala (locally *anjili*) and Sri Lanka even today. Vitharana (2009:175), speaking of the last surviving fishing *oru* lists thirty-eight different types of wood that could be used for seven major parts of the craft: three for the Hull, five for the washstrakes, five for the Booms, two for the Balance log, eight for the Rudder, four for the Mast, five for the blade and six for the loom (handle) of the oar. A wider range may have been available earlier.

Earlier, the boat-builders were carpenters who learnt the craft under the *guru-sishya paramparawa* (teacher-pupil continuum). However, during the last six hundred years or so fishermen began building their own boats. Iron and steel were being produced locally at least two millennia ago and they would have had axes for logging, adzes for hollowing-out the log boats and, perhaps drill-bits. Importantly, iron nails were not used to fasten parts of the boat together; they were “sewn” or lashed, with rope. This appears to have been a matter of choice because, wood was a material used to build houses or furniture from the ancient times of Sri Lanka, which would have involved the use of either iron nails or treenails. Such structures were certainly not sewn or lashed.

Since the coconut palm propagated itself around the coast, and was widely cultivated inland, there was no shortage of fiber ropes. Coconut timber and fiber (coir) were widely used for ship-building elsewhere in other Indian Ocean cultures too. Gunawardana (1990:31), quoting Al-Idrisi, says that Arab ships from Oman came here to obtain ropes, coconut tree trunks for masts and spars and timber for planking. Orders were also placed for ships constructed 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) writes,

“...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

The bio-diversity of south-western Sri Lanka thus provided the raw materials to build vernacular craft, namely:

- Large trees for timber.
- Other timbers with specific characteristics.
- Coconut rope in commercial quantities.

The *oru* required very few materials: wood, coir rope and cotton sail-cloth. Since these were always available, the *oru* and *pāru* forms persisted—responding to encountered imperatives—and flourished throughout the known history and perhaps even earlier. The oldest example found, studied, recorded and dated is (as noted earlier) of *Artocarpus nobilis* (*‘Val-del’* in Sinhala) and is C14 dated to 2300 ± 100 BP (circa 360-460 BCE). This places it very close to the beginnings of traditional history, and its high level of workmanship speaks of advanced boat-building skills that must have either existed here from before that date or have been introduced here as a fully developed technology by the Indo-Aryan settlers. Since the *oru* culture lay far south of the Indo-Aryan homeland, where the coconut palm cannot grow, the latter possibility is considered unlikely. The greater likelihood is that the technology emerged in Kerala (South India) and, in the *oru* heartland of Sri Lanka and interaction may have followed. If one sets sail from Kerala for Sri Lanka, the first landfall is south of Mannar. The oldest log boat found in Sri Lanka and referred to above was recovered from a river bed in the heartland. All factors appear to support the view that *oru* is a vernacular watercraft of Sri Lanka that has originated in the Southern and Western regions.

Its possible birth and development from log to cargo ship is traced, in sequence, in Fig.2, below. Here the two main boat types, *ORU* and *PARU*, are identified as two separate forms within the overarching *oru* culture.

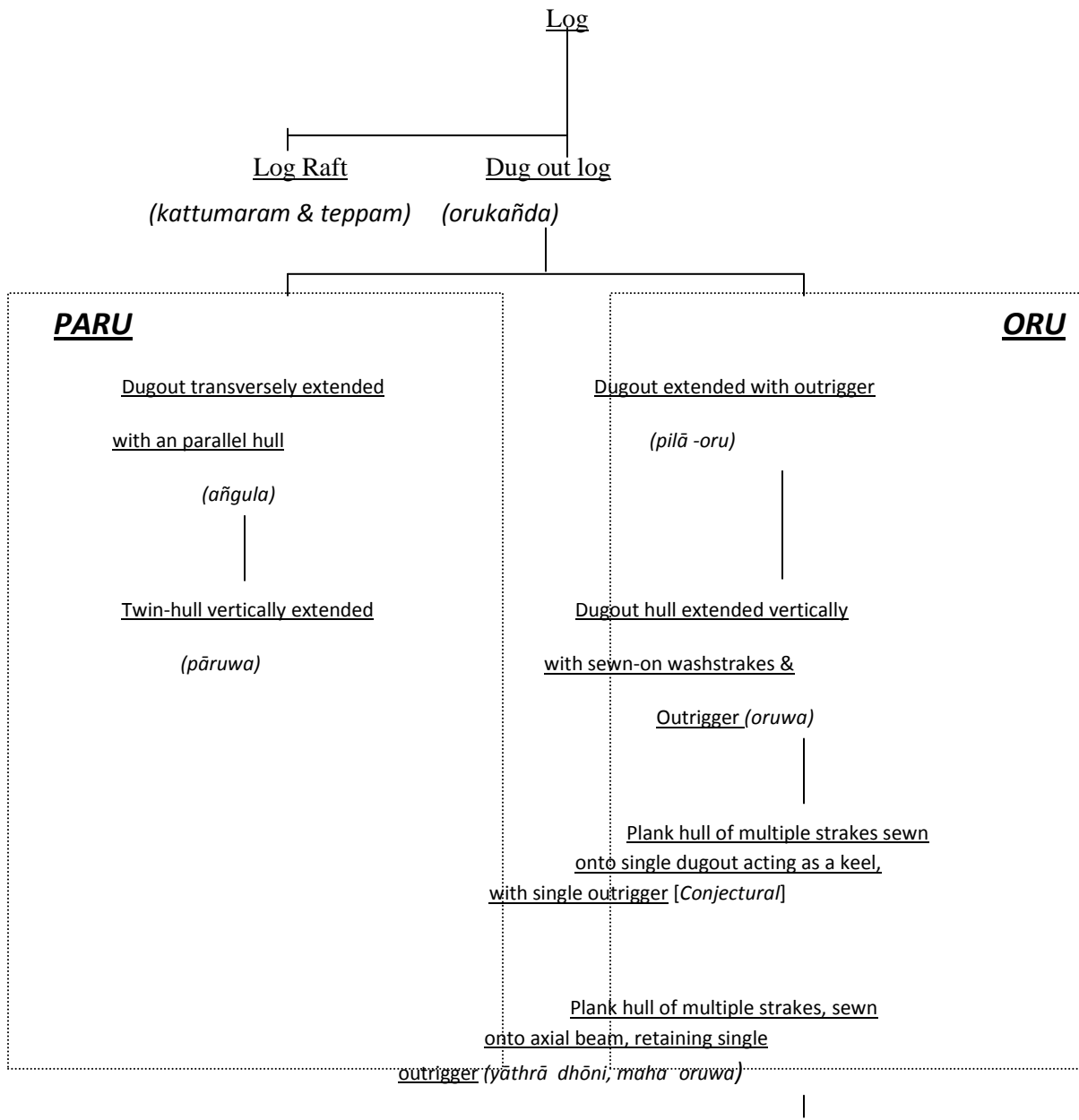


Fig. 2 The main boat types: *ORU*, *PARU* and their development

[NOTE: Of the configurations above, only the Dug out log (*orukañda*) is unstable in the water. It becomes stable when linked to a twin hull (in *PARU* form) or an outrigger (in *ORU* form)

For purposes of clarity, and ease in following the argument, these craft above are illustrated below:



Fig. 3: *orukañda* - log being hollowed out
Source: Kapitan, G.



Fig. 4: *kattumaram* - lashed-log raft
Source: Kapitan, G.



Fig. 5: *teppam* pegged-log raft
Source: author



Fig. 6: *añgula* twin-hulled ferry
Source: Kapitan, G.



Fig. 7: *pāruwa* twin-hulled cargo craft
(www.imagesofceylon.com)



Fig. 8: *pilā -oru* outrigger without washstrakes and sails
Source: Kapitan, G.



Fig. 9: *oruwa* seagoing outrigger craft
Source: Kapitan, G.



Fig. 10: [From Kerala. Must have occurred here, too, but evidence is lacking]
Source: Hawkins, C.



Fig.11: *yāthrā dhōni* plank-hulled, seagoing cargo ship with outrigger
Source: www.imagesofceylon.com

The last two forms are included to illustrate the final forms in which the *oru* form developed but are not dealt with at length in this paper.]

4. Transformation

The base form of the *oru* has now been described; particularly its dependence on forest and cultivated produce and pre-modern craft technology. It is now possible to trace the changes that took place in the course of the last century and to foresee the future of the craft.

Imperatives for change

Transformation of this base form was sparked off by one or more of such factors as:

1. Dwindling of bio-resources
2. Socio-economic shifts
3. Redundancy (of larger craft)
4. Shrinking pool of skilled workmen
5. Emergence of alternative materials
6. Altered life-styles

No doubt there are other factors. But, among those listed, only the third (“redundancy”) did not affect the *oru*, *kattumaram*, *theppam* and *mā-dāl-pāru*. These crafts were all fishing crafts. There is a steady demand for fresh fish in a country where meat-eating is not widespread, and fishermen and their craft fill a niche in community life. However, all other factors listed above did affect the fishermen.

Major socio-economic developments had begun to influence the south and west, following from the arrival of European colonialism in the 16th century. For the purpose of this paper, it is sufficient to note its impact on the south-west: that this least “developed” region in ancient and medieval times was transformed into the most commercial and urban region in the country, and that the new economy touched and radically changed the life of all those who lived there.

With the European powers controlling all major sea-borne traffic, through their control of the seaboard, the larger traditional cargo craft (i.e. *yāthrā dhōni*) were first confined to coastal and barely viable role and finally became economically non-viable. Smaller fishing craft were not so affected, as they had a role—albeit domestic—to perform. But, with the disappearance of the larger ships, the fishermen too were faced with problems of keeping their craft in good order.

These problems made the boat builder and owner resort to various stratagems in building, maintaining and using their craft. Building of new *oru* ceased to be easy with the sacrifice of the forest cover for the new plantation-based economy, based on deforestation and urbanization. Simply put, suitable trees were difficult to find and the laws pertaining to their felling were equally difficult to deal with. Coconut fibre also became a scarce commodity, but for a different reason. Rope has to be woven by hand to reach the standards required for high-risk work, but coir manufacture became mechanized and catered for less discerning consumers. Fishermen were forced to weave their rope themselves and they found themselves marching at a slower pace than the rest of the developing community. New boats were not built regularly and those that were tended to be smaller and costlier. The fishing fleet became smaller, both in size and numbers and means had to be found to maintain the older ones in operational condition. The last traditional builders found insufficient markets for their skills though, for a while, they were useful for the upkeep of the older boats. But that was a limited field and, as they were basically carpenters, they sought other work. When the Omani builders of the “Jewel of Muscat”, (a replica of a 9th century Arab ship) came to Sri Lanka in 2008 to find specialists in caulking and sewing planks with coir rope (*galappatti karanawa*), they could find only one who was sufficiently skilled and they decided to recruit them from Cochin (in Kerala) and Minicoy (in *Lakshadweep*) where the skill survives. As large trees, high quality coir rope and skilled builders were not available and as fishing was both a livelihood and a community need, alternatives had to be found.

Transformation: the process

Transformation was effected in several ways, namely, by:

- Substitution of non-traditional materials for traditional ones.
- Adoption of new forms of propulsion, and
- Resultant changes to form and structure.

Nails.

The first non-traditional construction material was iron nails, clenched or riveted. It was first used to fasten wooden patches on to the hull. The earlier practice had been to cut around the damaged section, making a neat rectangular opening which was filled in and covered over by a rectangular wooden “plug patch” sewn on to the main hull. The practice of using nails, which (perhaps) emerged during the war years continued into the 1960s, if not later. Patches were nailed, or riveted to the hull, instead of being sewn on (Fig.12). The reason may have been a lack or high cost of skilled labour, or merely simplification. Iron nails/rivets corroded upon interaction with oxygen and these would later have been replaced by copper nails. (The large river *pāru* – cargo carriers on river and canal – which were regularly exposed to salty water and breezes, were all fastened with copper fittings since, perhaps, the 19th. century.) Copper (and later aluminum alloy) coins first served as ‘washers’ (the technical term being ‘rove’) between the nail head and the wooden hull to reduce contact with the wood. It is likely that the coins would have been used after iron nails or rivets, by themselves, had proved unsatisfactory. Nails were thus the first non-traditional material to be used but were, in turn, rendered redundant with the adoption of other non-traditional materials



Fig. 12: Use of nails and coins for quick repair
Source: Grainge, G.

Nylon cordage

The traditional material that made its absence felt, in a major way, was coir rope. By this time the builders had already become maintainers, and they required quantities of quality rope to keep the *oru* seaworthy. All sewing and lashings on board were replaced within 12-18 months, generally soon after the Sinhala New Year. If there was no rope, there was no boat and so alternatives had to be found. Merchant ships and Fisheries Department multi-day trawlers used imported Manila rope. This was expensive, but quite satisfactory and those discarded or replaced during periodic refitting were bought by the fishermen. While this was a satisfactory

substitute, it was no solution as the fishermen had no control over the supply, and importation was beyond their financial reach. At this point, nylon cordage became a viable alternative (Fig.13). It was already in use on merchant ships trawlers and harbour craft. It was in demand for a variety of uses, which led to it being manufactured locally. Freely available in a variety of sizes by the early 1970s, it had some disadvantages, but price and availability were strong arguments in its favour. However, for use in sewing, coir rope was largely persisted with.



Fig. 13: Manila rope and nylon cordage

Source: Devendra, Mihiri

Mechanization

So far, the transformation was entirely a matter of substitution of one construction material for another. The next stage was the transformation of the *oru* from a sailing craft to a mechanized one. The first outboard motors (OBMs) made their appearance in the 1970s. In the first stage of the transformation process the motor was clamped to the after boom. The OBM provided both motive power and steering capability. In the second stage, once the motor had proved its value, one end of the craft was sawn off, and a flat surface created ('transom stern') to which the motor could be permanently affixed (Fig.14). This change improved the sailing qualities of the craft but made it impossible to sail her.



Fig. 14: Outboard motor on transom stern of a mechanized *vallam oru*

Source: Kapitan, G.

Changes brought about by mechanization

The effect was to change the entire rationale of the *oru* form. The *oru* was a double-ended craft with each end serving as the bow whenever the sail, rudders and leeboards were adjusted as necessary. With the OBM fitted to the stern, the craft acquired a fixed bow and stern. The outrigger, though retained, was no longer required to be to windward. Now that there was a Bow and a Stern, the terms “Port” and “Starboard” had a meaning in the new *oru*. When it was double-ended *oru* had only a ‘windward’ side (which was where the outrigger was) and the other side was, therefore, the ‘leeward’ side. Perhaps more importantly, there was no longer any use for sail, mast, rudder and leeboard. Not all *oru*, however, were/are mechanized. Mechanization was opted for only by fishermen whose chosen mode of fishing called for greater speed, larger hulls and fishing grounds located further off-shore.

Fibreglass hulls

While this transformation was taking place, another new material was marking its appearance. “Glass Reinforced Plastic”, or GRP, locally called “fiberglass” was already in use for building mechanized fishing craft. It first entered to *oru* scene as a material for applying patches to even old wooden hulls. Soon, small paddled *oru* hulls, complete with washstrakes were made on moulds (made from discarded wooden hulls) and found to be satisfactory (Fig.15): however only the hulls were of GRP, with the booms and balance logs being yet of wood and lashed to the hull. Next, hulls of larger, seagoing *oru* were made on moulds. By this time it was no longer necessary for moulds to be made of existing craft and the manufacturer now made moulds based upon the demands of the user. Thus the stern was specifically fashioned to accommodate larger outboard motors. Greater power meant greater speed. The stern-mounted motors, when ‘revved-up’, “dug” into the water lifting the bow partly out of the water.



Fig. 15: Small *oru* with hull and washstrakes moulded as one. Behind: a *mā-dāl-pāru* of GRP
Source: Grainge, G



Fig 16: Large *oru* with prominent prow, and GRP outrigger but retaining wooden booms.
Source: www.alluringsrilanka.com

The change in the way the hull behaved under extra power required it to be redesigned. Accordingly, the prow was sharply – and exaggeratedly – raked upwards to lift as much of the hull as possible out of the water to reduce resistance (Fig.16). In some, a fin-like feature was incorporated lengthwise along the hull, on the purpose of which the writer cannot comment. Interestingly, given the versatility of GRP as a boat-building material, the fiberglass hulls continued to follow the linear shape of the log in the older form.

Since a GRP hull could be made to any specifications, there was no technical need to be bound to this ‘canoe’ form, a form which calls for an outrigger to ensue stability. One can attribute this to an ingrained conservatism or a culturally determined bias. In the long history of outrigger craft in Sri Lanka, the *oru* morphed into a plank-hulled, outrigger-equipped cargo ship (*yāthrā dhōni* – last stage of evolution in Fig.2). At that stage, the dugout was replaced by a keel log around which a boat-shaped plank hull was built, but even then the outrigger was retained. In the GRP *oru* both the ‘canoe’ shape of the dugout hull (as opposed to the ‘boat shaped’ *yāthrā dhōni* hull) and the outrigger are retained, although they are now made of fiberglass. A distinction can be drawn between the *oru* that opted for fiberglass and the *vallam-oru* that followed the same path: in the latter, a variant form, the hull component is beamier and the washstrakes narrower.

A possible reason for preferring the dual-element configuration is economic, not technical. There are large numbers and types of wooden and GRP Motor Fishing Vessels (MFV) fitted with inboard engines in Sri Lanka. Their range of operations is cross-oceanic and they are often used in people smuggling. Their cost of purchase and operations are quite beyond the *oru* fishermen and their improved sea-keeping qualities of little interest. To them, it is obvious that a modest OBM fitted to an *oru* hull can give them a very respectable turn of speed to take them to the known off-shore fishing grounds and to the edge of the continental shelf. Using diesel powered motors, they can achieve all this at a comparatively modest cost; the cost of purchase and maintenance are also within limits. These crafts do not need built-up Fisheries Harbours as the beach is free for their use. All these factors, considered together, could give a fair rationale for one to opt for a GRP *oru* equipped with a ‘Yamaha’ OBM.

Yet booms and (most) outriggers from old craft were, for a long time, lashed onto these “state of the art” GRP hulls. GRP outriggers are common now, but none yet with booms of GRP (Fig.16).

It is interesting that the booms have been the last to fall victim to GRP. Vitharana writes,

“Of any dugout outrigger canoe it is the boom, of all its parts, that comes under almost constant and, at times, the most tremendous strain; and a broken boom means, invariably, a capsized hull. If a mast, rigging and sail stand the onslaught of a gale-force wind and the outrigger remains buoyant, a weak boom – just one of the pair – can spell death to the crew.”

(2009:175)

Perhaps the safety levels required of a boom cannot yet be met by GRP.

The last aspect of the transformation process is “ornamentation”. If we take surviving *oru* as the standard what stands out is that no ornamentation was used. Ornamentation was in use in all other Asian countries, whether for aesthetic or ritual purposes, and even in the ships of *Kayts* and *Velvettiturai* where *oculii* (eyes on either side of the bow) and *surul* (inward-coiling stem post) were the norm. This is an area that needs to be explored. The *oru* that we know are no-nonsense, workmanlike craft, quite advanced technologically though retaining a vernacular form. We do not know whether they were equally plain a thousand years or more ago, when a “grand” culture prevailed in the country, and not a post-medieval folk culture. The use of colour is an aspect of ornamentation different from the ritualistic type mentioned earlier. The *oru* were traditionally unpainted, undecorated craft. At a point in time, some paintwork was used, particularly in the Negombo area, among Roman Catholic fishermen and by Muslim fishermen of the east coast. The use of paint became more popular when wooden Mechanized Fishing Vessels (MFVs) made their appearance. With their wooden hulls and inboard engines they were no lineal descendents of the *oru* and paint was a common way of establishing individuality. Slight traces of paint began to appear, gradually, on wooden *oru*. When fiberglass hulls came to be factory-made, the new craft ceased to have the same emotional bond between “user” and “craft”, as the craft were bought off the shelf. Ornamentation thus became the decision of the manufacturer (Fig.16) and not of the fisherman-owner. Even then, the purpose of ornamentation is not ritualistic and does not follow traditional decorative motifs (which are far from lacking in Sri Lanka).

These transformations can be summarized as follows:

- Hulls are not made of dugout logs but moulded of synthetic material.
- Sewing is no longer common as the vertical washstrakes are now part of the moulded hull. Where still essential, lashing is done with Manila and nylon – not coir – rope.
- The hull form is no longer double-ended, but has a considerably modified prow and a transom stern.
- The seagoing *oru* are no longer sailing craft but mechanized craft. They do not need to ‘tack’ or ‘change ends’ and have acquired a fixed ‘bow’ and ‘stern’, and one can now speak of their ‘port’ and ‘starboard’ meaningfully.
- In smaller sailing *oru* on the east coast Polypropylene fertilizer bags are used for sails instead of the costlier cloth.
- *Theppam*, are also moulded of GRP in one piece without any lashings.
- River *pāru* hulls have been known to have been constructed of steel.
- *Mā-dāl-pāru*, which were not built a decade or two ago due to high cost, have re-emerged in GRP, courtesy of aid flowing in after the tsunami of 2004 (Fig.15).

5. Concluding remarks: Is “transformation” the end of the “vernacular”?

This is the question that confronted the writer after this study. This question is not specific to the *oru* but is equally applicable to all forms of vernacular structures. The *oru*, before transformation, was a regional craft, built of wood and coir rope (available materials) to suit a particular maritime environment. It was double-ended, married to an outrigger and propelled by sails. Today it is built of GRP and nylon (synthetic materials); powered by an outboard motor

that provides both propulsion and steering (no sails, rudders and leeboards and, hence, no longer a sailing craft); and it is not double-ended anymore. It uses no single material of which it was originally built. The traditional shipbuilders have gone, and factory-built craft are bought off the shelf. It is no longer a modest, workman-like craft but a colourful one which derives its ornamentation from popular rather than traditional culture. On the other hand, the craft—even after modification—still retains its dual-element form and, it is still used in the same limited region. Significantly, the dual-element hull form has not changed: although a change to a monohull is easily achieved and would render the outrigger redundant. The new craft is also not “eco-friendly” as the traditional *oru* used to be.

In India and the Gulf States, the writer has witnessed the same phenomenon: old boat forms cloned in GRP, or the use of new materials for old. Reviewing ‘Boats of South Asia’ (McGrail et. al.:2003) for the International Journal of Nautical Archaeology, the following question was raised in relation to our own fishing craft:

“... how far must the materials of traditional boats change before they [i.e the boats] cease to be traditional? In extreme cases—as in the *vallam*, *oru*, and *teppam* of Sri Lanka and more complex craft seen in the UAE—the traditional form is reproduced completely in fibreglass and made on a mould”.

Devendra:2004:57

At the time this was written, it was meant to be read by persons knowledgeable about watercraft. No response was received for the question as it was considered a marginal issue. Now, when targeting a readership more knowledgeable about the “vernacular”, and thus able to view this from a different perspective, the present writer would re-phrase this question thus:

“If the craft retains the form of the older, vernacular craft, but is built of completely different materials and, at the same time is used only within the same regional limits, can we consider it as continuing to belong to the vernacular tradition?”

Once this question is formulated thus, many other questions crop up. Is the resulting craft an *oru*? Why do we say “yes” or “no”? What criteria would help one to make a judgment? Can, or cannot, one say that the newer form is linked organically to the older? Do the new *oru*, in fact, belong to the same tradition as the former, linked by “the twisting molecular strands of memory”? Or is the similarity merely superficial?

It is not quite usual to end a paper with questions but, in this instance, it is justified as the questions arise from the case-study itself. The questions are being raised before a readership capable of seeing these questions as being relevant to a wider variety of vernacular structures. The writer is, therefore, of the opinion that it is not only appropriate but also necessary to consider these questions—which sprang up in the course of the study undertaken—as milestones on a road yet to be travelled.

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