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Remains of riverine craft: source material for ecological and community studies

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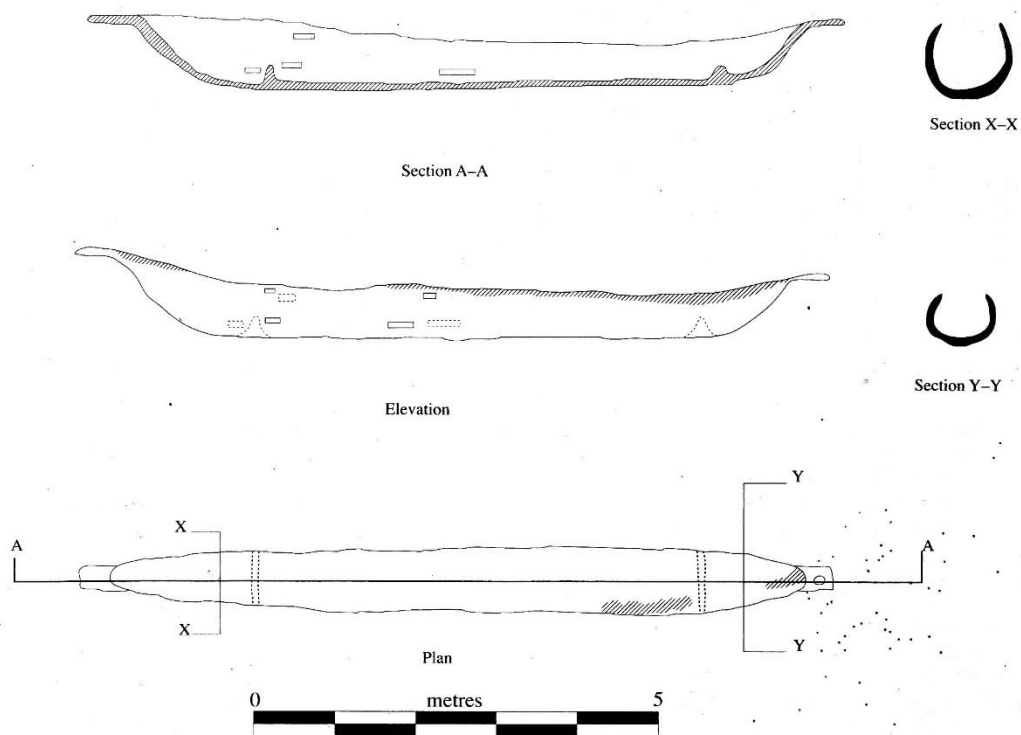


Figure 1. Log boat in Colombo Museum.

Introduction

While not venturing beyond the theme of this year's conference, Shipwrecks and Community, this paper aims to turn your eye away from the maritime context towards another aspect of the underwater cultural heritage, namely, the study of remain of river craft. Although the case study I present is Sri Lankan, I believe my thesis is valid in other contexts too.

Recently, several wrecks of river craft have either been discovered, studied or conserved in Sri Lanka and, although I have not had the opportunity of examining all of

them, a significant fact that emerged from our studies is that many of them could not have been used today, on the waterways in which they were found. One likely explanation is that the waterways narrowed, silted up, or both, since the days these craft were in use. In our recent history, there is evidence to link this development to the change in nature of the country's economy from 'rural-agrarian' to 'commercial-plantation', and this change, in turn, became an agent of drastic ecological change. The third aspect of this paper concerns a particular phenomenon affecting certain key areas of the coast of Sri Lanka, namely the south-western coast. This phenomenon is the buildup of sand spits at river mouths which has been going on for centuries or even millennia. However, during the last six or seven centuries the central and south-western parts of the Island emerged as the politically dominant community centre, and this increased the relative importance of the older, smaller communities that had inhabited these parts earlier. One consequence of this development was the increase in the usage of the rivers of the South-West as a means of accessing the interior of the country from the sea. We know that a large number of ports were, in ancient and medieval times, situated at or near river mouths. As I hope to show, the purely indigenous craft of the country were based upon the monoxylon and variations of these craft could be used, equally felicitously on river and sea, making them particularly suitable for navigation up-river from the coast. However, for reasons I hope to explain, which are connected to those that led to the narrowing of streams upriver, the buildup of sand-spits appears to have increased in intensity making most rivers in this part of the country completely unapproachable from seaward.

My thesis therefore, is that the river traffic which played an important part in linking community centres, was finally choked off: up river by the narrowing of the feeder streams, down river by the denying of access to the sea and, in terms of economics, by the emergence of more economically viable means of transport. On the craft themselves, these had a drastic consequence. They became smaller and less sophisticated in construction, because of their decreasing importance, and today they survive only in the more rudimentary forms.

I will deal with the overall picture in three separate sections, namely:

1. A description of the remains of riverine craft.
2. The economic changes which led to the physical narrowing of the waterways up river.
3. Coastal changes which compounded these environmental changes affecting the utility of river craft.

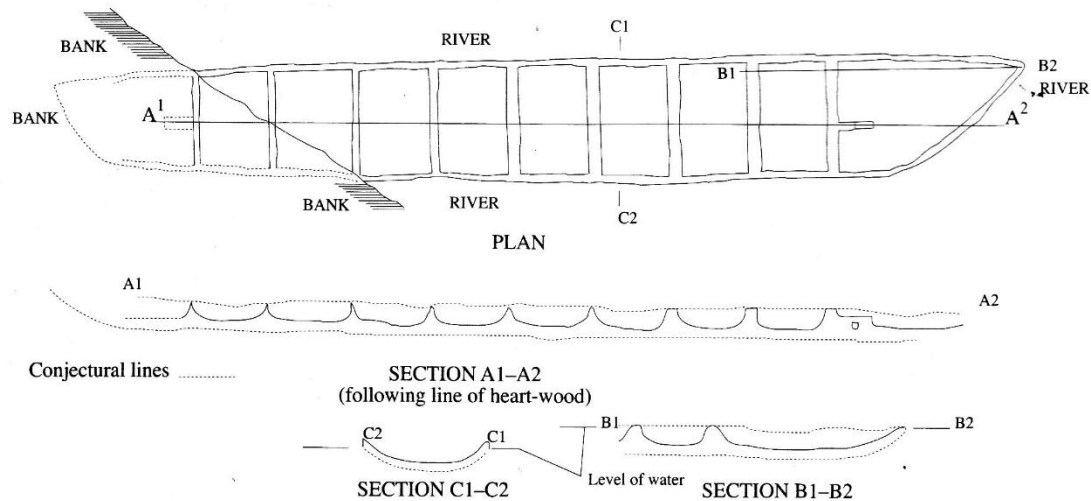


Figure 2. Chine strake still unrecovered.

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The remains of the river craft

The first log boat recovered from a river bed was raised and brought to the Colombo Museum in Colombo 40 years ago, but attracted no interest till 3-4 years ago. The next is of greater interest to me, personally, as a group of us tracked down a vague reference in a newspaper and after a study of it in situ, made a report to the Department of National Museums leading to its rescue, conservation and display in the Museum at Ratnapura. The third is really only a part, but a part of a large craft (which is yet unrecovered) and which was examined and reported on this year, at my suggestion, by a team of conservators and maritime archaeologists from the Western Australian Maritime Museum. There have been three more log boats discovered this year which I have not been able to examine at first hand. Before the details of the boats are examined it is necessary to note the significance of the areas in which they were found.

All the rivers in Sri Lanka flow down from the central hill country and follow the contours of the land to the sea, in an overall radial pattern. In the central and south-west parts—the 'Wet Zone' which receives the bulk of the rain brought in by the SW monsoons—the rivers generally flow all the year round: elsewhere, in the dry and intermediate zones, the flow considerably diminishes in the dry season. Tennant, a competent and scholarly recorder, who made his observations in the 1840s, just at the beginning of the economic changes I will be dealing with, describes the rivers in the following words:

From the mountainous configuration of the country and the abundance of rains, the rivers are large and numerous in the south of the island.

... in the plains there are comparatively few rivulets of running streams....But in their course through the hills, and the broken ground at their base, they are supplied by numerous feeders, which convey to them the frequent showers that fall in these high altitudes. Hence their track is through some of the noblest scenery in the world; rushing through ravines and glens, and falling over precipitous rocks in the depths of wooded valleys, they exhibit a succession of rapids, cataracts and torrents, unsurpassed in magnificence and beauty. On reaching the plains, the boldness of their march and the graceful outline of their sweep are indicative of the little obstruction opposed by the sandy and porous soil through which they flow. Throughout their entire course dense forests shade their banks, and as they approach the sea, tamarisks and over-arching mangroves mark where their waters mingle with the tide (Tennant, 1859).

Remains of the river craft must also be viewed against a frame of reference. A tentative typology of traditional 19th and 20th century craft drawn up by me in the course of another study is given as Appendix A. As evident from this table almost all craft utilise the monoxylon as the basic unit of construction, demonstrating how widespread was its use. The remains themselves can now be described.

First, the boat recovered in 1952 and displayed since then at the Colombo Museum (Fig.1). When it was first examined critically, about four years ago, I concluded that it was 300-400 years old, on the basis of its construction, deduced evidence of the nature of tools used in construction, location and comparison with surviving types, particularly at the same location. It was satisfying to have a subsequent Carbon 14 date of 2300 BP (380) \pm 100. Its unique characteristics are the girth and length of the log from which it had been hollowed out as those of this type today are hardly half as long and much smaller in girth. The river on which it was found is still a major one and similar craft continue to be used as ferries at the location; this particular boat could still be used, if it were watertight, in that environment. Thus the characteristic of this boat, which fits with my major thesis, is the fact that no boats of this size are made now, essentially because it is not economical to fell such large trees for this purpose. Trees big enough, of the same species (*Artocarpus nobilis*) grow along this river, but they are few in number and highly priced. This boat which is about 30 ft (9.1 m) long had been in use for over a hundred years either as part of a double-hulled ferry boat (Type 1.1.4) connected by a platform, or even by itself, as a ferry, since it is large enough to carry passengers standing inside. Today all log-boats used on rivers either have outrigger attachments or are double hulled. This fact, and certain unexplainable features in the side, makes it likely that it was part of a doubled hulled craft or had an outrigger attachment. However, in view of certain features in the next craft described, another interpretation may be possible.

The second craft is much more interesting mainly because it was found not just on the river bottom but 15 ft. (4.5 m) under the river bed. It had been discovered by gem miners who routinely sink pits on river beds in this part of the country when the flow is at its lowest. Thinking it was a log they had tried to raise it by sawing it in two, discovering it to be a log

boat only in the process. Although it is a pity that this was done, we have obtained a fine cross-section as a result.

The river here is about 25 ft (7.6 m) broad but shallow and silted up and the channel is no more than 5-6 ft (1.5-1.8 m) wide and 2-3 ft (0.6-0.9 m) deep. A 30 ft (9.1 m) boat such as this could not navigate this in any way, today. Yet it was obviously used here. This boat is very different from the one previously described. Although as long it is narrower. It has no indication of an outrigger attachment or of being part of a double-hulled craft. It is extremely crudely hollowed out and shows no signs of the use of steel adzes. [Steel, incidentally, has been produced in Sri Lanka for more than 15 centuries.] The inescapable conclusion is that it is an extremely old boat. It has since been removed from the site, conserved and displayed in the Ratnapura Museum but, unfortunately, it has not been dated nor has even the timber been identified. In fact, at one end, the heartwood is still in place and it may be possible that it has not been made of the currently used hardwood species where the heartwood separates fairly early to leave a knot-hole. The evidence available is that the boat operated as a pure monoxylon and, as indicated in the typology, that type is not in use today on rivers, though a variant, with minimal sewn wash strakes (Type 2.2.5) is used for inshore fishing in northern waters and is associated with a different ethnic horizon as well. This craft therefore constitutes a true discovery.

The third craft is again quite distinctive but easily related to a known type. It is only one of two hollowed out logs [identified by Kentley and Gunaratne (1987) as Chine strakes] which formed the basic part of what is identified as Type 1.1.7 (Fig.2):

A double-hulled log-boat, almost flat-bottomed, with high freeboard of sewn plank extended fore and aft, decked, with roofshaped, sliding cadjan cargo-hatches with provision for double lug-sails in bows.

These craft, known as 'Paru' in Sinhalese, became obsolete about 40 years ago, but a sea-going variant, undecked, is still used for seine fishing (Type 2.1.2).

These craft were the work-horses of the rivers. They could be sailed, poled, rowed or towed and were characterised by shallow draught, broad beam, great stability and capaciousness. They represented, in fact, the largest cargo craft which could be evolved within the narrow confines of a log boat technology. Lewis (1914), at the turn of the century and Homell (1942), 30 years later, described them as rectangular in plan (punt-shaped) and varying in size from 12 ft x 4 ft x 3 ft (3.6 m x 1.2 m x 1.5 m) to 50 ft x 9 ft x 5 ft (3.6 m x 2.7 m x 1.5 m). The largest could carry a cargo of 25 000 coconuts.

The chine strake discovered, and yet not retrieved, is about 45 ft (13.7 m) in length, but part of it is under a built up bank and it cannot really be measured. Its workmanship compares very favourably to the first boat described and has been hollowed out with steel adzes. It can probably be dated to a similar period. What is improbable is that it lies in a stream barely 12 ft (3.6 m) wide, with a heavy concentration of sandbanks and barely 18 in

(0.45 m) of water in the deepest parts.

Apart from these three craft, three other submerged river craft have been reported to the Department of Archaeology this year. While they have not yet been examined by either the Department or myself, it is worthwhile recording the sparse information available and noting a certain commonality in context. The first of these was found a few miles up-river from the site of the first boat described earlier. It was discovered by people engaged in sand collection from the river bed; no description is available. The next was found very close to the site where the chine strake was discovered and it too is described as a Paruwa, the type of cargo boat with chine strakes referred to earlier. It is described as being about 40 ft (12 m) in length and 9.5 ft (2.8 m) in breadth and had been discovered by sand collectors. The last was discovered about 40 miles (64 km) inland, along a fairly large river which enters the sea about 30 miles (48 km) north of Colombo. It has since been removed from the site and it is known that this too, was partly buried under the bank, and a mooring chain had also been found.

A cursory study of the craft examined revealed that:

- a) the boats were of considerable size and hence could not navigate the streams in which they were found;
- b) boats of this size were in common use during the last few centuries, at least;
- c) logs of the size necessary to build such boats are rare today and certainly will not be used for so uneconomic a purpose;
- d) for such boats to be built and used, there must have been heavy river traffic and the waterways would have been broad enough to be navigated easily by them;
- e) many were discovered in the course of collecting sand from river beds and some had been buried under river banks.

The waterways and their decline

The word 'waterways' is used instead of rivers because, in addition to the rivers, the cargo boats also routinely used the network of canals constructed north and south of and in Colombo, by the Dutch in the 17th and 18th centuries. These canals have also suffered the same fate as the up-river streams: from being broad waterways of clear water, full of fish, on which sailed cargo boats bringing agricultural produce to the city, they have become narrow, polluted and foul smelling, flowing sluggishly at best and blocked from emptying into the sea by sand-bars. Only one is navigable now. As for rivers themselves, it is necessary to determine what kind of traffic they supported.

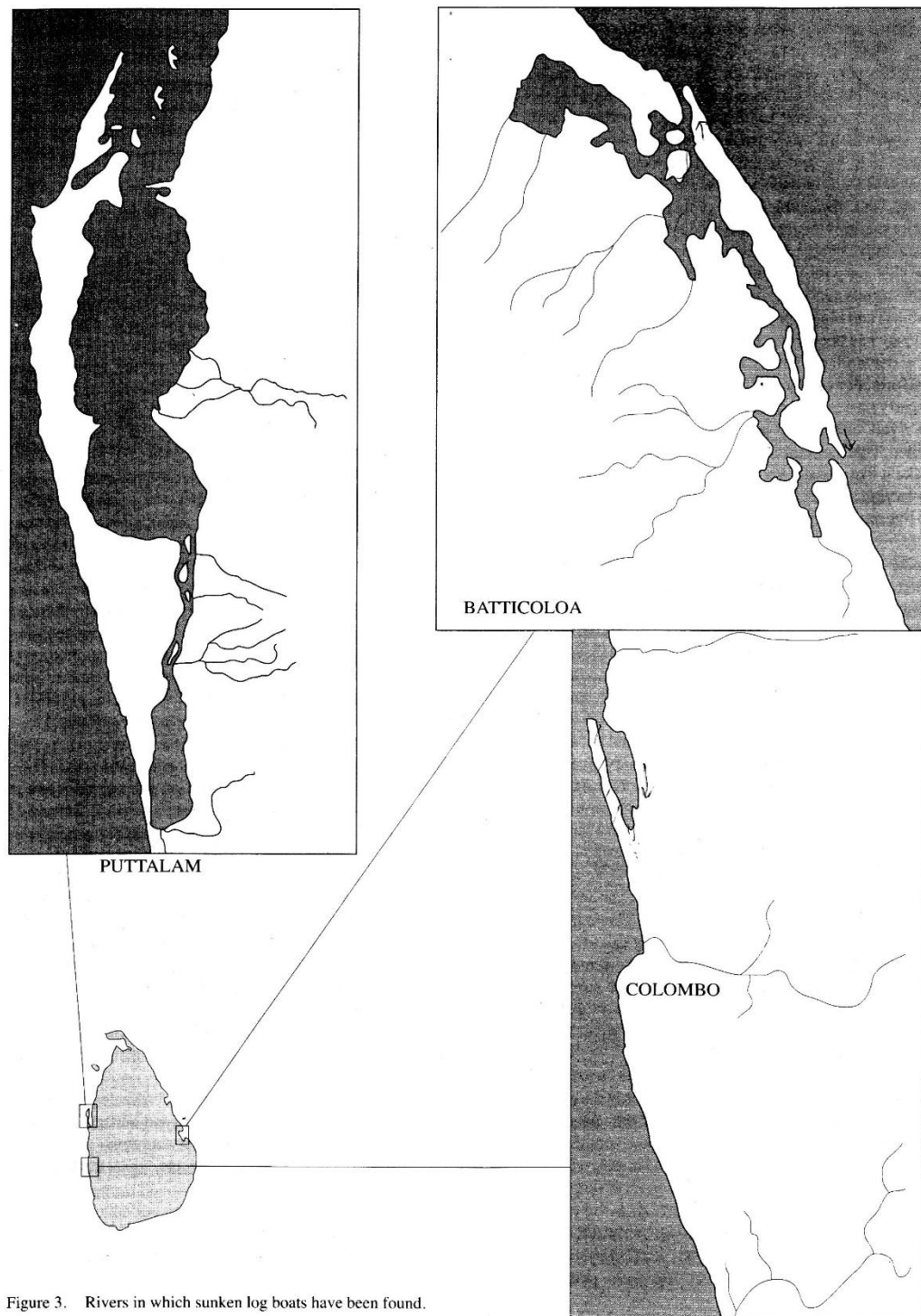


Figure 3. Rivers in which sunken log boats have been found.

If we simplify the types of river craft recorded we will see that they were either rafts, small outrigger equipped log-boats for fishing or crossing the river, double log boats connected by a platform for ferrying passengers and goods and different types of cargo carriers. If one disregards the rafts and smaller outrigger craft as being purely private craft, it is evident that the only economically or commercially necessary craft were the large ferries and the cargo carriers.

Ferries were important in a country with a network of unsurfaced roads along which many goods were carried in large ox-drawn carts. Travelers were also quite common. However, Tennant (1859), in the 1840s, states 'None of the larger rivers have been bridged

except those which intersect the great high roads'. Other than at these intersections, passengers and goods were ferried across. Even today, many traditional ferry boats exist, equipped with ramps to take on board and discharge cars, buses, trucks, tractors, etc., in addition to passengers.

More important than ferries would have been the cargo carriers. Larger than ferries, they played a significant part in the carriage of agricultural produce from the interior to the coast. Sailing down-river from the foot of the hill country, they converged on the main rivers through their tributaries, in which at least three craft were discovered. Cave, in 1908, commented on the 'extent of river craft' bringing a 'variety of merchandise' including 'pottery, building materials, coconut, chests of tea, bamboos, timber trees'. These craft carried chests of low-grown teas 60 miles (96.6 m) down river under sail to the sea off Colombo and thence into harbour and the warehouses there. This was about a hundred years ago. Some decades earlier Tennant (1859) stated that these craft could navigate up-river until they encountered the rapids and rocks marking the boundary between the hill country and the plains. These craft were essentially low-country craft and their cargoes were agricultural and other produce of the low-country being transported from point of origin to point of consumption.

However, while Tennant (1859) was describing the interior, the seeds of destruction had already been sown. This began with the discovery that the hill country was suitable for commercial plantations of coffee and, later, when coffee failed, of tea. These crops required vast tracts of land which had to be cleared of forest for cultivation. The means adopted by the Colonial Government to acquire the necessary acreage was legislation; for example the Crown Lands Encroachments Ordinance, No. 12 of 1840 by which all lands not cultivated and all lands for which the occupants could not prove documentary title were forfeit to the Crown. This ordinance stated, *inter alia*, that:

All forest, waste, unoccupied or uncultivated land shall be presumed to be property of the State until the contrary thereof be proved, and all chenas and other lands which can be only cultivated after intervals of several years shall, if the same be situate within the districts formerly comprised in the Kandyan provinces (where no thombo registers have been theretofore established), be deemed to belong to the State, except upon proof only by such person-

- (a) of a sannas or grant for the same, together with satisfactory evidence as to the limits and boundaries thereof; or
- (b) of such customary taxes, dues or services having been rendered to the State...; or
- (c) of his or his predecessor in title having made and maintained a permanent plantation in and upon the same for a period of not less than thirty years...

The relevant ingredients of this section of the Ordinance are that it applied only to the lands that were part of the last independent Kingdom in Sri Lanka, the Kingdom of Kandy in the

hills, which had been captured only 25 years before this Ordinance was passed; and that it calls for the kind of proof that could only be produced by landed aristocracy and the ecclesiastical establishments. The lands thus proclaimed as State land was, therefore, the forest land of the hill country customarily cultivated in small patches or clearings by the peasantry. Equally relevant is the fact that the Kings of Kandy depended on the preservation of the forests for, in conjunction with the mountainous terrain, the forests afforded them the best protection against attacks and invasions by the European powers in the Maritime Provinces.

The economic value of coffee was understood barely ten years after the fall of the last independent Kingdom in 1815. Coffee was found to be a successful plantation crop in 1825 and its expansion to the level of a major industry began as a consequence of the equalization of tariffs on East and West Indian Coffee in 1835. By 1845, there were over 400 plantations cultivating 64,000 acres on which there were over 130,000 workers from South India. The forest retreated before the planters' axe. Major Skinner, an Army Officer turned Surveyor, who surveyed the pristine jungle and enthusiastically propounded the suitability of the hill country for coffee plantations, had this to say to the Governor of the Colony:

Who can view this exquisite scenery, enjoy this perfect climate.. .without feeling that it would be conferring a blessing upon humanity to be the means of removing some 20,000 of the panting, half-famished creatures from the burning, sandy plains of Southern India to such (comparative) paradise, benefiting not only them, the colony, the individual by means of whose capital they would be brought here, but also our own native Sinhalese people inhabiting the margin of this wilderness, living as they now are like monkeys... (Skinner, 1891).

The ultimate result of this altruistic capitalism was the denudation of almost the entire hill country of its primary forest growth, depriving the streams and rivers of a steady supply of water substituting, instead, an over-abundant supply during the monsoons which washed away the top soil unprotected by forest and ground cover from the plantations into the rivers, silting them up, depositing sandbanks and turning the clear waters into mud. Today's natural vegetation distribution is revealing: the entire hill country, too heavily forested for settlement for over two millennia of history, is denuded. As late as 1930 John Still (1930) recalled a timber reserve in one of the plantations in a classic description of primeval rain forest and the life it harboured, and voiced a wryly understated comment:

Eagles built their nests there in the tops of age-old trees, whose towering forms stood like giants looking out over scores of miles of hills and valleys, once the home of ten thousand of their kind but now given over to tea, a humble white-flowering camellia, precious to man the destroyer, grown in neat rows (Still, 1930).

The clearing of the forest and the cultivation of coffee and tea on a commercial scale brought about many other social consequences which are not gone into here save only to mention the banishment of the original tenants, who had been permitted to farm the King's lands, to tiny village settlements bordering the plantations; the mass importation of

indentured labour from India to work the plantations under near-slavery conditions, (described as a 'comparative Paradise' by Skinner), and the mutual antipathy and political antagonism that grew up between these two groups, which persists unhappily to this day. More relevant to my central theme, however, was the need that arose to transport the produce of the plantations from the hills to the coast, leading to the spread of the road and rail network, first to service the plantations and, later, all over the country, which marginalized the role of the cargo carrying river craft.

Mention has been made of the impact of the denudation of the hill country on the water levels of the rivers; particularly the feeder streams. The massive erosion that resulted deposited large quantities of sand and soil along every river bed and, in the case of the larger rivers, led to the building up of sandy shoals. As the feeder streams received lesser amounts of water from the hills they became mere brooks with no economic value. The growth of the road network, following the river banks, brought about population concentrations at crossroads and market centres. Land on either side of the roads became attractive and utilitarian real estate. Attempts to widen the river-ward strips of land led to the construction of embankments on the new sluggish streams, encroaching constantly upon the streams themselves, till the streams became merely ditches for surface run-off. When, finally, the larger river craft came to be abandoned, they were left behind, half buried by the encroaching embankments, buried under the ever growing sand deposits till, finally, the sand collectors of a hundred years or so later discovered them. The commercial sand collectors, collecting the sand deposited in the process of silting are, perhaps, the only beneficiaries of this environmental catastrophe. Their own contribution to the further progress of this development is dealt with later.

In a parallel development, the canal system north and south of Colombo suffered an even less enviable fate, their banks being encrusted with the shanty towns of the thousands of workers streaming into the city in search of employment. The canals scarcely flow and have become little more than sewers constantly liable to flood affecting, once again, the least envied segment of the population in a landscape of urban decay.

Changes at the river mouths

The choking off of the up-river feeder streams was a development that can be traced back to a little over a hundred years. But, the changes at the river mouths cannot be assigned so recent a history. These changes, i.e. the building up of sand spits at river mouths, have resulted from the interaction of the longshore drifts upon the increased quantum of sediment carried down by the rivers to the sea. While the growth of sand spits can be reasonably assumed to be of very great antiquity there is reason to believe that their growth has accelerated as a result of the heavy sediment flow resulting from the erosion caused by the

developments described earlier.

The currents off Sri Lanka are strongly influenced by the north-east and south-west monsoons which dominate that part of the Indian Ocean. The West Coast of India Pilot notes that Sri Lanka is a meeting or dividing point for the current systems of the Indian Ocean, Arabian Sea and the Bay of Bengal. Currents are strong, even up to 5 or 6 knots, abrupt changes can occur within short intervals of time or distance, and the major component tends to be parallel to the local coast-line though there may be inshore currents flowing in an opposite direction. It is not intended to go into further detail on changes in current. The points of note are their strength off the coast and the tendency for them to run parallel to the coast. The increased sediment flow down-river, particularly during the monsoonal rains, on countering these two factors has had an affect on the formation of the sand spits. The sediment, on reaching the river mouth, encounters the longshore currents flowing parallel to the coast. These, in turn, prevent it from being carried out to sea, resulting in it to being deposited on the inner side of the spits at the river mouths. Once the initial obstruction, i.e. the spit at the river mouth, is established, the river mouth changes course slightly, to depositing more sediment upon the spit making it longer and further consolidating it and, in course of time it runs a considerable distance parallel to the sea. This phenomenon occurs both on the east and west coasts. In course of time, the river, being constantly prevented from reaching the sea, becomes an estuarine lagoon or even a lake, and loses much of its force. These lagoons are well established in different parts of the island, notably Trincomalee and Batticoola on the east coast and Negombo and Chilaw on the west coast, and lakes have built up along the south-west at Ratgama, Balapitiya, Dodanduwa and Bolgoda.

Historically, these lagoons have been commented upon by Arabic travelers who refer to them as 'Gobbs'. These have been located not only in Sri Lanka but also in India and Burma and a Turkish nautical manual explains the terms as a 'gulf full of shallows, shoals and breakers'. The description perfectly fits the fully established lagoons, with an emergent sand spit at the existing point of flow into the sea. The references, quoted by Tennant (1859), are from *The tale of two Mahomedans*, by one Abou-zeyd and another, dated to ad 851 and an explanatory note by Edrisi. These lagoons are described as valleys full of gardens and forest into which merchants sailed their ships to ride out the monsoons in perfect safety and agreeable surrounds. In fact, as the natural vegetation map shows, these are the very areas in which mangroves flourish. The point of interest is their navigability, because today, no river or lagoon is accessible from seaward due to the continued development of the sand spits. The Pilots describing these coasts make this observation pointedly. While about four centuries ago, seagoing craft entered the lagoons, today even the simplest of log boats—fishing craft—can hardly enter any but the largest of rivers. Yet it is the same craft that are used both in the lower reaches of the rivers and for fishing at sea. Today, one sees fleets of these craft drawn

up on the beach, and it would seem logical for the craft to be sailed a little up river, behind the low sand spit for much greater protection from wind and weather. The question is whether this stratagem was ever resorted to by fishermen, even though resorted to by the Arab sailors, for good reasons unknown to us. However, the fact that the fishing craft did sail up river to places of shelter became evident to me when I was engaged in buying land for a hotel project situated at the very point at which one of the rivers took its first turn after having deposited its sediments upon an emergent sand spit. In the process of tracing ownership through title-deeds and plans dating to the 1850s, several relevant facts came to my notice. One was that the successive plans showed that the sand-bar had not only extended nearly half a mile in length since the first plan and survey but had broadened inwards towards the lagoon, indicating that sediment was still being carried down by the river and deposited on the inner side of the spit. The Hotel was built at a point just at the start of the sand-bar and there is a marked difference in the nature of the soil of that property and that of the sand spit proper—particularly in respect of the quality of ground water. At this point—the point where the river originally flowed into the sea—the names of properties shown on the title-deeds clearly indicated that these sites were landing places of fishing craft, locally known as *Oru* (sing: *Oruwa*). Some of these names are '*Oru adinaa pitiye watta*' which translates as 'the garden of the plain on to which boats were hauled' and '*Oru goda watta*' which translates as 'the garden where boats were beached'. These are a few examples. The important element in the names is the word *Oru*. Vitharana (1992) has conclusively asserted that the word *Oru* is used only to mean a log boat equipped with an outrigger (Types 2.1.1. and 2.2.1.) More specifically, it is the monoxylon vertically extended with sewn wash strakes for seagoing; a variant without such extension is used in inland water and are specifically differentiated as *pila-oru* (Type 1.1.1.). Hence the evidence seems to support the conclusion that these rivers were once all accessible from sea. The question then arises as to when they ceased to be so accessible. This cannot be established with a degree of certainty. Although the names were recorded in title-deeds, and in use about 150 years ago, one cannot rule out an earlier vintage. However, it is suggested that the known incidence of large scale erosion engendered by the clearing of the hill country forests accelerated the formation of sand-bars both by reason of bringing down more sediments and by reason of reducing the flow of water necessary to, even seasonally, wash over the emergent sand spits out to sea. Today, concern is growing of the activities of the sand collectors whose activities, too, are suspected of inducing settled sand to once again enter the flow and continue seaward to contribute to the growth of sand-bars. These are the concerns of today and surveys have been undertaken and opinions expressed on this theme.

Conclusion

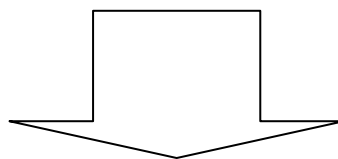
The aim of this paper, as explained earlier, is to use the evidence of the sunken river craft to

view certain disparate phenomena holistically. The remains of craft have been sought to be viewed against a change of economy, land use, consequent environmental and ecological changes, social and political problems. It started with the question as to why these craft were abandoned; whether the conclusions reached by stitching together a patchwork quilt of facts collected from different disciplines and experiences emerges as rational and acceptable yet remains to be seen.

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Appendix A



Appendix A

A tentative typology of pre-modern Sri Lankan ships and watercraft.

Type	Common Local Names (S-Sinhala, T-Tamil)
1. INLAND WATER-CRAFT	
1.1. River and canal craft	
1.1.1. Bamboo rafts	<i>Pahura</i> (S)
1.1.2. Log boats without outrigger	<i>Vallam Oru</i> (S & T)
1.1.3. Log boats with sewn gunwales & outrigger (wash strakes optional)	<i>Pila Oru</i> (S)
1.1.4. Double-hulled log boat ferry, connected by platform deck, with optional railings & awning	<i>Angula</i> (S), <i>Sangadam</i> (T)
1.1.5.*Double-hulled log boat, with wash strakes and provision for sail and half-round, cadjan-thatched cabin	(Prototype of) <i>Paruwa</i> (S)
1.1.6.*Double-hulled log boat, with/without wash strakes, fully covered passenger cabin	
1.1.7.*Double-hulled log boat, flat bottomed, extend vertically and fore & aft with high freeboard of sewn plank, decked, with cadjan-covered, roof-shaped, sliding cargo hatches, with provision for sails in bows	<i>Paruwa</i> (S)
1.1.8. Lagoon boat, ribbed construction but conforming to log boat shape	<i>Vallam</i> (T)
1.1.9.*Double-hulled log boat, undecked, punt-shaped with low freeboard, extended fore & aft, used mainly for sand collection from river-bed	
1.2. Lake craft	
1.2.1. Same as 1.1.3.	
1.2.2. Same as 1.1.7.	
2. MARINE CRAFT	
2.1 Inshore fishing craft	
2.1.1. Log boat with vertically extended sewn wash strakes and gunwale, with outrigger	<i>Oruwa</i> (S)
2.1.2. Large seining boat, punt-shaped: variations of 1.1.7. but undecked and without superstructure	<i>Madel Paruwa</i> (S), <i>Pattai</i> (T)
2.1.3. Small seining boat, as at 2.1.2. with addition of outrigger (used in pairs with one having outrigger to port and the other to starboard)	<i>Madel Paruwa</i> (S)
2.2. Offshore fishing craft	
2.2.1. Large 'Oru' (2.1.1.) double-ended, with sprit sail/lugsail	<i>Bala Oruwa</i> or <i>Varakan Oruwa</i> (S)
2.2.2. Small 'Oru' single ended, with Arab/Indian lateen sail	<i>Oruwa</i> (S)
2.2.3. Same as 2.1.1. with provision for single reversible sail, double-ended	<i>Oruwa</i> (S)
2.2.4. Lashed log raft, made of 3-5 shaped logs with optional sails and outrigger	<i>Katumaram</i> (T), <i>Teppam</i> (S & T)
2.2.5. Log boat without outrigger, minimal sewn wash strakes	<i>Vallam</i> (T)
2.3. Sea-going/coasting craft	
2.3.1.*Shell built hull of sewn planks (carvel) fitted to keel plank. Fore & aft rigged on one or two mainmasts and headsail on bowsprit. Rudder and tiller. Partially decked with roof-shaped, cadjan thatched sliding cargo hatches in the waist, large single outrigger, and cargo handling boom	<i>Yathra Oruwa</i> , <i>Yathra Dhoni</i> or <i>Maha Oruwa</i> (S)
2.3.2.* Same as above, but double-ended, without rudder. Square sail on single mast, sometimes undecked.	<i>Yathra Oruwa</i> , <i>Yathra Dhoni</i> or <i>Maha Oruwa</i> (S)
2.3.3.*Shell built hull of sewn planks (carvel) partially decked with covered cargo-hatches in waist, rudder and tiller with semi-circular deck aft extending beyond ship's side for use of helmsman, single mast abaft covered cargo hatches, no outrigger.	<i>Varakan Oruwa</i> (S)
2.3.4.*Large schooner, two tall mainmasts, well-developed bowsprit carrying several spritsails, shell built of sewn planks (carvel), partially decked, with sliding cargo hatches in the waist	<i>Dhoni</i> or <i>Thoni</i> (T)
2.3.5.* Shell built of sewn plank (carvel) with low freeboard, with convex stern and stern, single mast, carrying square sail, rudder & tiller, decked with wooden cargo hatches on deck	<i>Vattal</i> (T)
2.3.6.*Shell built of sewn plank, undecked, with rudder and tiller, large single sail hoisted on forward raking mast with block & tackle	<i>Battal</i> (S & T)
(* Indicates obsolete types)	