

Cham Maritime Technology: Basket-Hulled Boats

David G. Sox, aka Che Sah Binu
Independent Champa Scholar⁴

Summary: Basket-hulled boats appear to be unique to Central Vietnam, and their present-day geographic distribution is congruent with the historic culture area of the primarily Austronesian-speaking Champa from modern Quang Binh to Binh Thuan. It is believed that no modern Cham population in mainland Southeast Asia still regularly uses boats for transportation or fishing, but the Vietnamese of Central Vietnam traditionally used a large variety of hand-made row- sail- boats with sewn planked upper hulls and flexible hull bottoms. The flexible hull bottoms consisted of woven strips of bamboo that have been caulked with various substances including buffalo dung, tree resin, flaked *malaleuca leucadendron* cork, coconut husk fibers, and/or ground bamboo. The woven-bamboo basket-hulled boats ranged from small circular coracles (thúng) to ocean-going sailing boats with a capacity of 100 tons or more of cargo. This unique boat technology appears to be an indigenous independent development peculiar to the Austronesian-speaking Cham people that could date back several millennia. However, all evidence of attributing the origin of the boat technology to the Cham is circumstantial.

There is much research that could be done to illuminate the Cham connection to traditional boat technology in Vietnam. The following research questions are suggested: (1) conduct additional maritime archaeology to find early historic or prehistoric examples of basket-hulled boats; (2) search the large body of Cham-language manuscripts for descriptions of boat and fishing techniques; (3) complete the planned inventory/ethnology of boats in Vietnam that was proposed by the British Museum; (4) determine why this geographically unique distribution of boat architecture did not spread outside Central Vietnam; and (5) determine if the Cham population of sailors and fishermen historic were the same as the Cham population that were primarily farmers.

In *Địa Lý Biển Đông và Hoàng-Sa và Trường-Sa* by Vũ Hữu-San, a former Republic of Vietnam naval officer and destroyer commander, the author states that “From the remotest times, *Bien Dong* (The Vietnamese Eastern Sea) was the cradle for the sea-oriented culture of the sea-faring Viet people.” San claims that Vietnamese pioneered boat (ghe thuyền) design by inventing the rudder, water-tight compartments, fore- and aft lugsails, and a wooden xiêm [spar?] that is connected to the sails so that boats could automatically follow the direction of the wind.⁵ These claims are made in the context of prehistoric Vietnam’s key location adjacent to the coastal lowlands underneath the present-day South China Sea that were uncovered up to minus 325 feet below present-day sea level before being drowned by melting glaciers after the last Ice Age ended about 17,000 years ago. Nowhere in Vũ Hữu San’s extensive writings on the maritime origin of the Vietnamese people does he acknowledge even the existence of the Cham people or the Champa culture region. This is unfortunately typical of the popular Vietnamese-Vietnamese writers that most Vietnamese-Americans read. Fortunately, this is not the norm for Vietnamese scholars who specialize in Champa studies, such as Trần Kỳ Phương.⁶

Without denying that Vietnamese have been plying the sea since prehistoric times, Anthony Reid is cited to show a broader perspective (1999:40):

⁴ Sr. Environmental Protection Specialist, U.S. Coast Guard Maintenance & Logistics Command Pacific, Oakland, CA, USA.. Works on Champa studies at home in Pleasant Hill, California.

⁵ Vũ Hữu San, Chapter 4, “Vinh Bac Viet, Noi Khai-nguyen Hang Hai.” <http://vinhbacviet.tripod.com/chuong4.htm>

⁶ Trần Kỳ Phương (Institute for Vietnamese Culture & Education), “Góp phần tìm hiểu về nền văn minh của vương quốc cổ Champa tại miền Trung Việt Nam” at <http://www.ivce.org/magazine/ns9/ns19.html>.

The Cham...were a maritime and mobile people whose influence was felt as far afield as Java, Sulawesi, and the Philippines, but who defied attempts to draw lines on the map indicating where they “belonged”. In this they were characteristic of Austronesian-speakers, the mariners and rovers par excellence of the pre-modern world.⁷

Reid cites William Dampier in the late 17th century as praising some Hindu Chams whose “very pretty neat vessel” he encountered in the Gulf of Siam, carrying a crew of forty and a cargo of rice and lacquer to Dutch Melaka in 1687:

They were of the idolators, Natives of Champa, and some of the briskest, most sociable, without Fearfulness or Shyness, and the most near and dextrous about the Shipping, of any such I have met with in all my Travels. (Dampier 1697, 272).⁸

An intimate familiarity with the sea, fishing, boats, and naval warfare (or piracy depending on who is writing the history), can be easily be attributed to all the peoples of prehistoric Southeast Asia, particularly those living on islands that archaeological studies have shown have been occupied for thousands of years. Wilhelm Solheim provides a good summary of Southeast Asian prehistory in terms of what he terms the Nusantao maritime trading network, and the dependence on ocean-going boats since the 4th to 3rd millennium B.C.⁹

Beginning as early as 248 A.D., Linyi and then kings of Champa and Panduranga began a history as the most faithful senders of tribute mission by sea to the Chinese court of any Southeast Asia state (or mandala), whenever the Cham king was well enough organized to do so.¹⁰ These tribute voyages continued intermittently for some thirteen centuries! Tribute and trade missions were also sent south to Java mostly likely from prehistoric times, but were first historically recorded in a 911 A.D. Đông Duong (Amaravati) inscription, and to Northern Sumatra as mentioned indirectly a 1438 A.D. complaint to the Chinese emperor that the Siamese had blocked the mission. Reid also mentions the Cham were trading with Philippine ports prior 1001 A.D. as recorded in the Sung Annals.¹¹

These seaborne tribute missions, and the additional seaborne trade they that is reflected by the spread of artifacts that can be traced back to Champa or is apparent predecessor, the Sa-Huynh culture, all presume that ocean-going ships were used, and many very likely manufactured in the Cham culture region.

The earliest historic record of the ships that sailed the South China Sea and beyond appears in a Chinese text published in 817 A.D. but relating information from hundreds of years earlier.¹² This text in

⁷ Anthony Reid. Charting the Shape of Early Modern Southeast Asia. Chang Mai, Thailand: Silkworm Books, 1999, 298 pp.

⁸ Reid, as above, 1999:43.

⁹ Wilhelm G. Solheim II, “Taiwan, coastal south China and northern Viet Nam and the Nusantao maritime trading network,” *Journal of East Asian Archaeology*, Vol. 2, nos. 1-2, 2000, pp. 273-285. Bill Solheim was one of the author’s M.A. thesis advisors, and the author had the privilege of editing Solheim’s manuscript for a book on the Nusantao maritime network in 2003.

¹⁰ Reid assumes that the people of Linyi (Lam Ap), Champa-pura, and Panduranga were all Cham [Chamic speakers], and lumps the various river states or *mandala* together as “Champa” for the purposes of statistical comparison. A *mandalas* are defined as an independent political entities, whose rulers viewed their domains as circles of influence of influence without specific define geographical boundaries. Momoki mentions some 70 tribute missions from Linyi from the 5th to early 8th centuries, A.D. in Shiro Momoki (Osaka University), “Mandala Champa” Seen From Chinese Documents.” Abstracts of speakers at the Workshop on New Scholarship on Champa, 5-6 August 2004, National University of Singapore.

¹¹ Reid, as above, 1999:46-47.

¹² Paul Pelliot, “Quelque textes chinois concernant l’Indochine hindouisée,” *Études Asiatiques*, Publications de l’École Française d’Extrême-Orient, Vol. XIX. Paris: Van Oest, 1925

part describes *K'un-lun po* [K'un-lun ships] as having bulwarks of sewn planks, a quarterdeck of bamboo, and a hull caulked with a dammar resin.¹³ The "*kun-lun*" is thought to refer to people from within the Malay [or Southeast Asian] world (in Pelliot, 1925:259-261). The hull in this case is only described as being caulked, but later in the tenth century there is a detailed description of small round boats with bamboo hulls that were "varnished" with resin. The sighting and subsequent reproduction of these boats was made by a Vietnamese general attacking to the south in Champa (Dumontier, 1910, cited in Thai-van-Kiem, 1957:120).¹⁴

A 3rd century A.D. Chinese texts describe these K'un-lun ships as follows, based on Manguin (1980:275):

The people of foreign parts call ships *po*. The large ones are more than fifty meters in length and stand out of the water four to five meters.... They carry from six to sever hundred persons, with 10,000 bushels of cargo [according to various interpretations, from 240 to 1,000 tons].

The people beyond the barriers, according to the sizes of their ships, sometimes rig [as many as] four sails, which they carry in rows from bow to stern. From the leaves of [an unidentified tree]...they weave their sails. The four sails do not face directly forwards, but are set obliquely and so arranged that they can all be fixed in the same direction, to receive the wind and to spill it.

Another Chinese text from the 8th century A.D., also cited in Manguin (1980: 275) states that "With the fibrous bark of the coconut tree, they make cords which bind the parts of the ship together...³⁶ Nails and clamps are not used..."¹⁵

Manguin lists the following design features of these 1st Millennium A.D. [to early 2nd Millennium] K'un-lun (Southeast Asian) ships (1980:275-277):

- [Up to] 50 meters [ca. 160 ft.] length able to carry [up to] 500-1,000 people and[or] 250-1.000 tons;
- Ship parts fastened with vegetable cord; no iron used in fastening;
- Ship sides had several layers of planks
- Steering gear not specified but likely double quarter rudders. 12th century ships described by Chinese having a stern-post rudder and two oars stuck down into the water behind the deckhouse;
- No outriggers, because the Chinese would have described them if present.¹⁶

There are no descriptions of the ships that can be unambiguously tied to the Cham sailors and traders who sailed to Canton and to island Southeast Asia during either the 1st or early to middle 2nd millenniums A.D., or descriptions of the ships on which they undoubtedly loaded their warriors and war elephants for the many raids and invasions north to Vietnam and south to Kambodja. The Chinese and Vietnamese histories constantly mention these seaborne attacks, but to my knowledge the Cham ships are not described. Except for the 10th century mention of small round boats with bamboo hulls that were

¹³ *Dammar* is hard resin or pitch from Southeast Asian pine trees, including the Amboyna pine, *Dammara orientalis*. It is also called Manila copal or mastic [<http://www.ibiblio.org/herbmed/eclectic/bpc1911/dammara.html>].

¹⁴ Thai vãn Kiem, *Viet-Nam, Past and Present*. Saigon: Commercial Transworld, 1957. 336 pp.

¹⁵ P.Y. Manguin, "The Southeast Asian Ship: An Historical Approach." *Journal of Southeast Asian Studies*, Vol. IX, 1980, pp. 266-276. Internal footnote #236

¹⁶ Outrigger boats are common in modern island Southeast Asia and the Pacific Islands, and were presumably so in the early historic and prehistoric period. The boat appears to be remembered in the Cham word *kajσ*, which refers to the double-float used to stabilize a boat (Aymonier & Cabaton, 1904:45-47). The naval ethnographer Paris noted that the boat engraved on a rock near Phan-rang resembles those ships found on the wall-reliefs at the mid-ninth century Borobourdur temple in Java, the latter which also carry such double-float accessories (1955:65).

"varnished" with resin, there is no direct evidence that specifically describes a Cham boat or ship. However, there is much indirect evidence from which can infer Cham maritime technology.

This short research paper describes one of the most unique Cham inventions, one found no where else in the world. Present-day (20th century) examples of this technology are, to my knowledge, no longer part of the native Cham repertory of tools and equipment. This invention was the construction of small to medium sized [or larger] boats with the flexible hulls made of woven strips of bamboo (Fr. *coques vannerie enduite*) that are caulked, or waterproofed with a mixture of tree pitch or resin mixed with bamboo shavings and/or buffalo dung to create a primitive form of glass fiber.

The documents used describe the basket-bottom boats are mainly derived from the author's 1972 master's thesis, "Resources Use Systems of Ancient Champa," supplemented by more recent literature, but notably, unfortunately, without any reference to Françoise Aubaile-Sallenave's 1987 Bois et Bateaux du Vietnam, which was not available. Hoa Đình Sỏi talks about Cham boat construction in her 2003 Vijaya article, but the basket hulls are not mentioned (2003:94).¹⁷ Pierre-Yves Manguin has written several articles about South Asian and Southeast Asian boats, and recognizes the unique contribution of the Cham to Vietnamese boat design today, but he mentions the basket-hulled boats only very briefly in passing (Manguin, 1984:321):

...Campa was only progressively conquered by Vietnam in the 2nd millennium AS, during which process much of the culture and technical knowledge of the Cams was absorbed by the Vietnamese settlers. Shipbuilding techniques, among others, developed into a very original hybrid tradition in which southern Chinese and Malay world inputs blended harmoniously. Due to such specific historical developments, and to the consequent isolation of the area from the rest of the Malay world during the past three centuries, it turned into a repository of craft designs elsewhere forgotten: stem-post leeboards, wicker-work hulls or sewn-plank craft are among these technical peculiarities.¹⁸

The smaller types of these boats are made nearly entirely of the basket weave, but the larger ones added planks (or strakes) above the basket hull that were traditionally sewn together with coconut husk cord. Sewn-strakes along with a stem-board at the ship's bow and a rudder at its stern, and woven bamboo lateen sails are the most distinctive design characteristics of the traditional Southeast Asian (Nusantao) boat prior to design influences from China and Europe. However, the woven bamboo hull is apparently unique to Central Vietnam.

Attributing this boat technology to the Cham is possible because the various types of basket-hulled boats were distributed in the first half of the 20th century only in coastal regions of Central Vietnam, coinciding almost exactly with the maximum historic extent of the Champa culture region. Among modern Vietnamese boats up to the middle 20th century, distinctly regional traits such as hulls made from varnished bamboo lattice, retractable drop-keels in stem-posts and sliding rudders in stern-posts survive as vestiges of former Cham use in Central Vietnam (Trung-bô) from Đông-hoi to Vung-tau, virtually the territorial extensions of Champa, (Morechand, 1955:312-313).¹⁹ These regional boat design

¹⁷ Hoa Đình Sỏi, "SỰ BẢO TỒN VĂN HÓA DÂN TỘC CHAMPA QUA CHÍNH SÁCH CỦA CÁC CHẾ ĐỘ ĐẠI VIỆT-VIỆT NAM," Vijaya (Annual of The Champa Cultural Preservation Association of the U.S.A.) No. 4 (9/2003): 84-115.

¹⁸ "Sewn-Plank Craft of South-East Asia--A Preliminary Survey" in Sean McGail & Eric Kentley (eds.), Sewn Planked Boats. archaeological and ethnographic papers based on those presented at a conference at Greenwich in November 1984. Oxford: National Maritime Museum, Greenwich, (Archaeological Series 10/ B.A.R. International Series 276, 1985: 319-343. P.Y. Manguin is currently Director of Studies at the Ecole Francaise d'Extreme-Orient (EFEO) in Paris and Malaysia, and a friend of the author since our student days in Paris.

characteristics are depicted in the following map in Figure 1 by Pierre Paris (1955). This map needs to be read together with Table 1 to fully understand the types of boats that are depicted in the map.

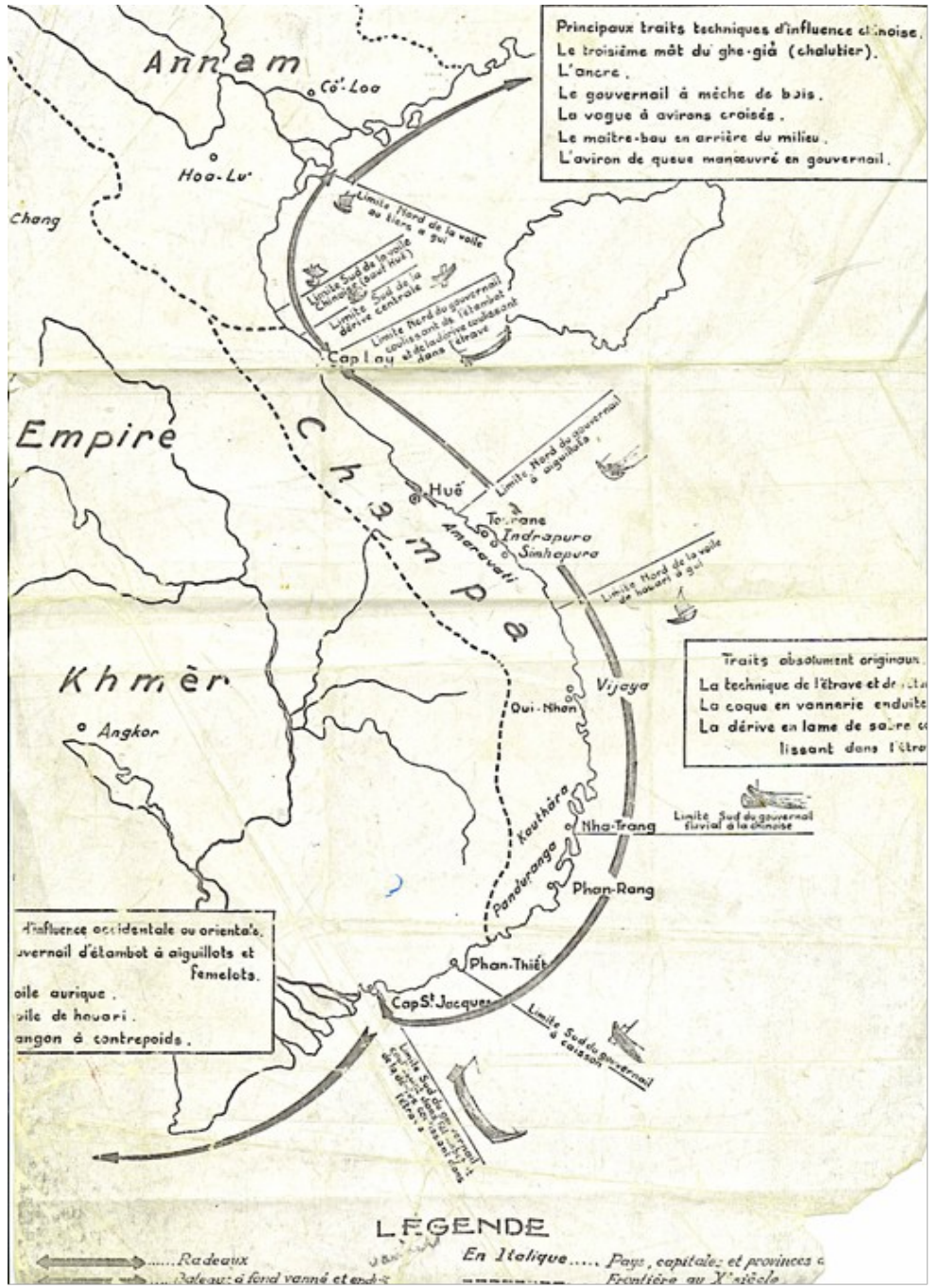


Figure 1. Map of the Distribution of Basket and other Vietnamese Boats in Vietnam, and the boat design elements believed to be absolutely original to the Champa culture area.²⁰

¹⁹ Guy Morechand, “Characters économiques et sociaux d’une region de peche maritime du Centre-Vietnam.” *Bulletin de l’École Française d’Extrême-Orient*, Vol. XLVII, 1955, pp. 291-354.

In addition, there is a local use of sewn-plank hulls in the Hue region, but apparently little caulking is used. In previous centuries, this latter ship may have been the now-disappeared "sinha" or thuyen-gia that Thomas Bowyear in 1695 and Pierre Poivre in 1750 described as plying the seas between Champa and Siam and as weighing between 100-150 tons (Paris, 1955:10). Perhaps the best description of the Cham boats, and least known by present-day scholars of maritime Southeast Asia, was by an American naval lieutenant in 1819, at a time when Cham construction techniques were still much in evidence and perhaps even by the hands of actual Cham themselves (see Landgrand, 1946:46)²¹. John White, the lieutenant, closely examined one vessel he estimated to be above fifty tons:

...(the) bottoms were composed of basket work...the timbers...are so contrived as to be taken apart, and replaced again, with very little trouble, and no injury;...they are taken to pieces, and secured from the vicissitudes of the weather. Their bottoms...are covered outside to the thickness of half an inch with gulgui, which is a mixture of dammer, or pitch, oil and chunan, or lime and when properly amalgamated, is very tenacious and elastic. They possess a great degree of stability, bearing a great press of sail, and are most excellent sea boats; they carry from one to three, very well cut, and neatly made, latteen sails, with the exception of a few from the north, which carrying lug-sails. Their sails are of Batting. Their shrouds and cables are mostly of rattan, and their running rigging, of coaier, the veil known cordage, made from the husk of the cocoa nut...(White, 1823:56-57).²²

I have summarized pertinent information describing those boats that I guess were most typical of the ones that existed in old Champa in Table 1 at the end of this article. Ranging from the ubiquitous round basket boat to ships the ships of the one mentioned above—likely a *ghe mành*, I can fully imagine that the Cham once had even bigger ships, but not necessarily one with a basket hull. Assuming Vietnamese mal-adaptation in the maritime sector like that which occurred with Cham irrigation technology, from de-evolution through time and also from the previous existence of Sinhalese ships over 40-50 meters long in the third century A.D. (cited in Pelliot, 1925:256) and the mention of Funanese dugouts up to 24 meters long also in the third century (1925:252-253), I would argue that the largest Cham ships may have ranged up to 40 meters long with a payload of 200 tons.

The Cham devised in the construction of the hull of their boats a strong, pliable, tough and lightweight lattice. When treated with a resin binder it became a resourceful adjustment to the tropical teredo wood worm, small bivalves and other marina organisms that commonly attacked the hulls of untreated wood. Perhaps more importantly, it was also adjustment to the abrasion caused by beach landings through the pounding surf or by hovering over reef surfaces. An anonymous author has said:

The basket bottom is flexible to allow easy passageway over the treacherous sand bars at the entrance to small river mouths or lagoons, where rigid, all wooden hulls would become dangerously embedded in the sand upon contact (Viet-My, 1961).

In this context it is easy to see the advantage of retractable keels and rudders too.

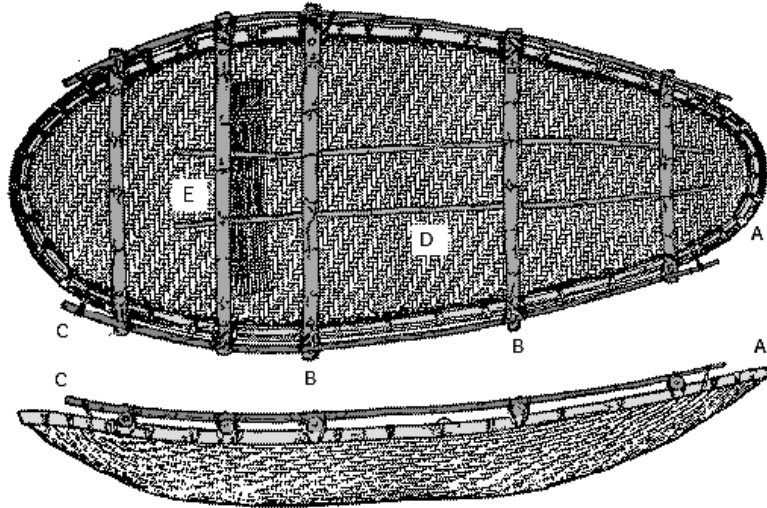
Here are some drawings of two of these basket-bottomed boats: first the Ghe Sõng and second, what is probably a Ghe Nang:

²⁰ When I copied this map, I failed to include a citation. Based on an analysis of my 1972 thesis bibliography, and the fact the Pierre Paris is described as geographer, I believe the correct attribution is Pierre Paris. 'Esquisse d'une ethnographie navale des peuple annamites.' Extracted from *Bulletin des Amis du Vieux Hue*, Vol. 14 (Oct-Dec, 1942), Reprint. Rotterdam: Museum voor Land- en Volkenkunde en Het Maritime Museum "Princ Hendrik", 1955.

²¹ Landgrand, Gustave, *Vie sociale er religieuse en Annam, monographie d'un village de la côte Sud-Annam.*, Lille: Univers, 1945.

²² John White, *History of a Voyage to the China Sea*. Boston: Wells and Lilly, 1823.

FIGURE 1. A GHE SÔNG



According to M. James Hornell in his 1946 Water Transport: Origins and Early Evolution (p. 109ff) (Cambridge University Press), basket boats were found only in Vietnam, and "although very light and easily carried by one man, they are able to carry several passengers together with a quantity of baggage."²³ The dimensions of one measured by Nishimura [shown below] were as follows..." 12' 7" long -- 5' beam -- 26" draft (4m/1.6m/0.7m), but Hornell indicated that "Usually they run smaller, about 6' by 4' by about 10 inches deep."

The description of the Ghe Sông is based on James Hornell's Water Transport, p. 109 as This is a light, graceful craft made of inch-wide strips of split bamboo, closely woven into stiff matting, a material of great strength, resiliency and resistance to strain.

The Letters correspond to the following features:

A -- The bent-up sides of the bamboo body are embraced around their margin by several broad bands of split bamboo on each side and bound together into a stout cylinder with rattan strips to form a stout, continuous gunwale.

B -- Four or five stout bamboos stretch from gunwale to gunwale to prevent spreading; they are secured partly by lashing and partly by pegging into the gunwales.

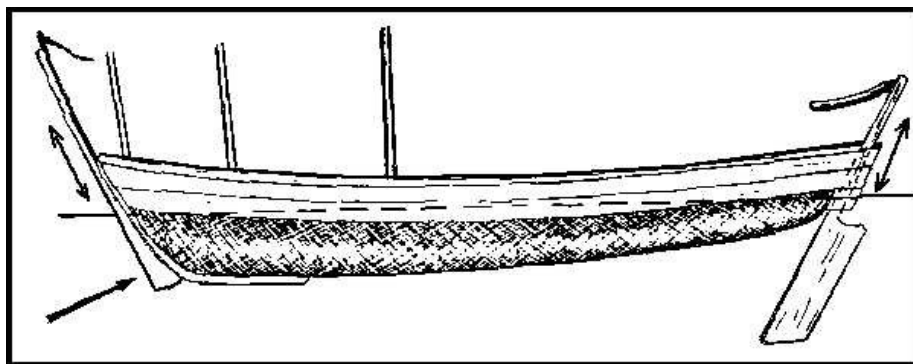
C -- Along each side above the gunwales and over the ends of the cross beams, a slender bamboo pole is lashed to form a top rail.

D & E -- On the floor two long bamboos, spaced some distance apart, serve as inner stringers. "... The skin of the hull [is] daubed with a caulking mixture of cow dung and coconut oil (Nishimura, 1928, 36), periodically renewed. Strips of split bamboo are fitted over the floor to serve as dunnage and so keep cargo and passengers dry against moderate leakage."

Figure 2 is taken from Vũ Hữu San's, Chapter 4, "Vinh Bac Viet, Noi Khai-nguyen Hang Hai, cited in Footnote #4, although he does not identify the boat as a Ghe Nang. The three vertical poles are mast.

²³ Reproduced in Craig O'Donnell's website Cheap pages at http://www.friend.ly.net/~dadadata/n_the/bamboo_boat.html.

FIGURE 2. A GHE NANG



Thuyền làm bằng nan tre và gỗ. Loại này có lái và cây xiêm mũi (thường gọi là lui-hạ) điều-chỉnh được chiều sâu..

In local villages, boats up to the size of the *Ghe Nang* could probably have been constructed by the farmer-fishermen themselves from locally procured materials (Figure 2). Easily replaced woven hulls and sails were built and repaired from *Tre la-nga* (giant bamboo) and *Tre gai* (prickly bamboo) that are both apparently cultivated by the Vietnamese (La Marchant de Taignon, 1905:1278).²⁴ Timber for the upper wooden hull, planking, the mast, and other uses such as the oils and resins to make the caulking binder were all found in the then-readily available dense tropical evergreen forests on the ocean side of the mountain slopes and upper plains (Battelle Memorial Institute, 1967:73; Cobban, 1968:3-4).




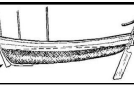
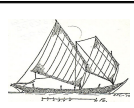
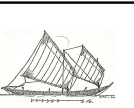
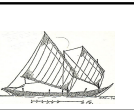
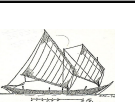
For ships such as the *Ghe Cau*, *Ghe Mành* and presumably the larger ones, much man-labor would have been needed for the procurement of raw materials, the original construction and the periodic repairs (Battelle: 1967:364-469, passim). I suspect that there were boat construction cooperatives at this more complex level, if not at the lower one as well, whose leaders could have corresponded to the On Banok and Trum Xe in the construction of irrigation works (see Langrand, 1946:46). However, with the construction of larger ships the objective may have also changed from strict acquisition of food to supplementary activities of internal and external trade, piracy and warfare (see Majumdar, Vol. II, 1927:224; Maspero, 1928:33 & 42).²⁵ In the development of ships, such “supplementary activities” centered on the transportation of men and goods over the relatively easier route by the quickest means. For the smaller boats, the primary objective was much more mundane; the boat was a vehicle by which man extended his exploitation of aquatic resources from shore to water.

This brief examination of the basket boats of Champa is a work in progress. There is more information available about the role boats played in the life of ancient Champa, and more new information about the maritime activities of the Cham. There are also many unanswered questions about why the Cham of Central Vietnam no longer use boats, and whether the Cham of the Mekong River Delta and of Cambodia use traditional Cham or Vietnamese boats in their role as fishermen. I have also long wondered whether the segment of the Chamic speaking population of traditional “Champa” who were sailors, fishermen and sea-warriors were the same people who were farmers. There is some reason to speculate that there were substantial differences between these two professions and peoples, but that is something to explore at a later time.

²⁴ La Marchand de Taignon, H. “Notices sur la province de Quang-Ngai.” *Revue Indochinoise*, 2nd pat. 1905: P. 1110.

²⁵ Ramesa Chandra Majumdar, *Ancient Indian Colonies in the Far East*. Vol. 1. *Champa*, Book III. *The Inscriptions of Champa*. Punjab Oriental Series, No. 15. Lahore: Punjab Sanskrit, 1927; Maspero, George. *Le Royaume du Champa*, Paris E Bruxelles: G. Van Oest, 1928.

Table 1. PROBABLE BASKET-HULL CHAM BOAT TYPES^a

BOAT NAME	DESCRIPTION ^b	LENGTH ^c	BEAM	CARGO	PROPULSION ^d	REGION—RANGE ^e	USE	PHOTO (NOT TO SCALE)
O Thúng	Circular basket w/ few rigid parts (see Photo #1)	1-2 m. diameter			Oars; single lugsails seen occasionally.	Throughout Vietnam: streams, lagoons, open sea < 2 miles offshore, near mother ships	Fishing, setting out and attending nets & traps; movement of people and cargo	
Cái Sồng	Bamboo gunwales w/stringers (see Photo #2)			1-1.5 tons	1-2 lugsails	Phu-yen to Hue, esp. Quang-ngai; in estuaries; often not operating in winter.	1-2 lugsails	
Ghe Xuồng	Simple wooden. Gunwales w/ reinforcing stringers, ribs and thwarts.	6-10 m	1-2 m.	1.5-4 tons	2 lateen sails	Phan Rang and Qui-nhon: up to 10 mi. from shore; not active in winter.	Fishing w/ hooks and lines and gill nets. Sets out beach seines. Up to 100 kg. catch.	
Sồng Vành	Hard-chine, sewn. plank; weak construction; no retractable rudder or	7-14 m	8-12 m.	5-6 tons	Poles and sweep; 1-2 lugsails.	Hue to Quang-tri: mostly streams and lagoons but some up to 10 mi. offshore.	Fishing yr. around w/ X- and V-frame dip nets. Cargo, ferry, houseboats.	
Ghe Nang	Similar to Ghe Xuong w/longer higher Gunwales and topside	8-12 m.	1-3 m.	2-8 tons	1-2 lugsails	Phan Thiet to Quang-tri: 10-20 mi. offshore up to 5 days; active yr. around in-shore water in northeast; monsoon use.	Fishing yr. around w/ hooks and lines, encirc-ling gill nets, lift nets, 40-300 kg. catch.	
	Arched canopy of thatched bamboo.	12-20 m.	2.5-5.5 M.	30 tons	3 lateen sails	Prom Da Nang: up to 50 mi, offshore for 2 vreeks. To Ilha Trang along coast. Kha Trang to Hue,	Fishing yr. around w/ all equipment. Carries salt to preserve catch of up to 1000 kg. daily Cargo carrier of rice.	
Ghe Cầu	Arched canopy of thatched bamboo.	12-20 m.	2.5-5.5 M.	30 tons	3 lateen sails	Prom Da Nang: up to 50 mi, offshore for 2 vreeks. To Ilha Trang along coast. Kha Trang to Hue,	Fishing yr. around w/ all equipment. Carries salt to preserve catch of up to 1000 kg. daily Cargo carrier of rice.	
Ghe Cầu	Arched canopy of thatched bamboo.	12-20 m.	2.5-5.5 M.	30 tons	3 lateen sails	Prom Da Nang: up to 50 mi, offshore for 2 vreeks. To Ilha Trang along coast. Kha Trang to Hue,	Fishing yr. around w/ all equipment. Carries salt to preserve catch of up to 1000 kg. daily Cargo carrier of rice.	
Ghe Cầu	Arched canopy of thatched bamboo.	12-20 m.	2.5-5.5 M.	30 tons	3 lateen sails	Prom Da Nang: up to 50 mi, offshore for 2 vreeks. To Ilha Trang along coast. Kha Trang to Hue,	Fishing yr. around w/ all equipment. Carries salt to preserve catch of up to 1000 kg. daily Cargo carrier of rice.	

^a Battelle Memorial Institute, Columbus, Ohio. Renote Area Conflict Information Center, Blue Book of Coastal Vessels of South Vietnam. Columbus: Battelle, 1967. Pietri, Les Voilliers d'Indochine. Nouvelle ed. Saigon: Societé des Imprimeriers et Librairies Indochinoises, 1949

^b All boats have elongated bamboo basket hulls, retractable rudders and bow stem boards unless noted. Descriptions are generally cumulative toward the larger boats for region, range, and use.

^c Measurements represent only ranges.

^d Estimated, based on Petri (1949), may either represent poor guessing or recent disappearance of larger boats, according to the Blue Book.

^e Range is based on speed, serviceability in open seas, and miles from shore, according to the Blue Book.