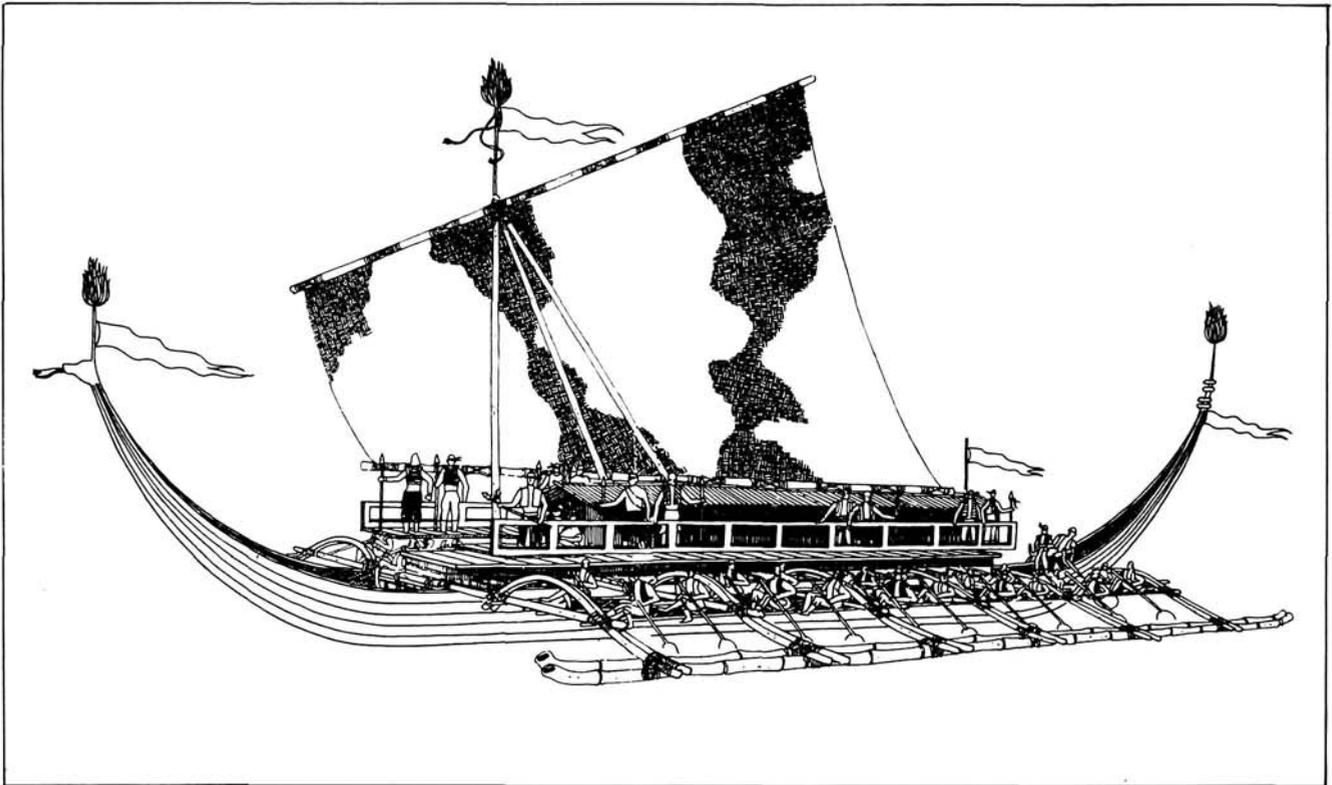


# Boat-Building and Seamanship in Classic Philippine Society.

by *William Henry Scott*



*Fig. 1 Artist's reconstruction of classic Philippine caracoa, by Raoul Castro.*

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## PLANK-BUILT BOATS IN THE PHILIPPINES<sup>1</sup>

In October 1976, Butuan City Engineer Proceso S. Gonzales excavated four planks of an ancient Philippine boat in sitio Ambangan

of barrio Libertad, which had been discovered by unauthorized "pot-hunters" looking for marketable Chinese trade porcelain. The find was promptly announced in the public press, using Antonio Pigafetta's early sixteenth-century Italian

spelling, *balanghai* for *barangay*, presumably because that author mentions one that belonged to the Rajah of Butuan's brother. Dr. Jesus Peralta, Curator of the Anthropology Division of the National Museum, then took charge of salvage archaeology at the site, and Research Assistant Leonard Alegre subsequently removed the planks for chemical treatment and preservation. Just one year later, nine planks from another vessel of the same type were discovered a kilometer to the southeast of the first find, and were systematically salvaged and removed to Manila by National Museum researcher Cecilio Salcedo. There they have been treated by a preservative process known as PEG — i.e., polythylene glycol — and will eventually be reassembled for public display.

The location of the two finds appears to be a former shoreline — even a harbor waterfront — subject to the strong currents of one of the mouths of the Butuan River which evidently washed away all the disintegrating parts of the vessels except the hull planks, which presumably survived because they collapsed flat on to the clay bottom and so presented no resistance to the current. Other than these planks, nothing was recovered except a short piece of one rib and three small pieces of what was probably a mast. It is therefore impossible to reconstruct whatever interior fittings, thwarts, or superstructure the vessels may have had, or even to determine whether they had outriggers or not. On the other hand, the configuration of the planks themselves is recognizable as a distinctive style of marine architecture which once extended from Scandinavia to the South Pacific, from the third century B.C. until the present time in a few remote corners of the South Seas. These facts, taken together with a Carbon-14 date of the thirteenth and fourteenth centuries for the second find, determined by the University

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of Tokyo from wood samples, make the Butuan discoveries one of the most significant events in Philippine archaeology. Moreover, an even earlier date for the first find — it lay more than a meter below a layer of midden materials containing Sung porcelain — makes the discovery an important event in marine archaeology as well. Happily, too, comparison with other Southeast Asian vessels built in this tradition makes it possible to describe the sort of boat these Philippine specimens must have been and moreover, by recourse to Spanish records, to describe their role and significance for Philippine social life and progress.

The planks of the older vessel run the full length of the hull in one continuous piece — almost fifteen meters — and thus constitute what nautical jargon calls strakes. Those of the second boat are made of two sections of *doongon* wood (*Heretiera litorales*) joined by Z-shaped scarfs, and those next to the keel — i.e., the garboard strakes — are twenty cm. wide, three cm.

thick, and pegged to the keel every twelve cm. by hardwood pins or dowels nineteen cm. long, driven into holes in the edge of each board. The pegs fastening the other boards together are shorter — twelve cm. — and those which have come loose are 1.5 cm. in diameter and pointed at one end. The keel itself is hardly worthy of that designation — it is simply a plank one to two cm. thicker than the other planks, though forty-five cm. wide amidships and tapering to a point at both ends, thinning slightly to about 2.25 cm. The most distinctive feature of the planks is a series of flat, rectangular protrusions or lugs carved out of the surface of the wood on the upper side of each plank — that is, the inside of the boat. They are seventy-eight cm. apart, exactly opposite one another on each strake, average 30.7 cm. long, 16.5 cm. wide, and 2.5 cm. thicker than the planks themselves, and have four holes along their edges through which cords or lashings can be passed. The purpose of both the lugs and the holes is made clear by the fact that

a fragment of transverse ribbing was found securely bound to the lugs of the several planks it crossed by cordage of *cabo negro* palm fibers. These lugs are called *tambuko* in Visayan and Maguindanao, as well as in many of the languages spoken in the maritime cultures to the south of the Philippines. Their presence is the earmark of this older ship-building technique.

In the more familiar modern ship-building technique, developed in both China and Europe as long ago as the Middle Ages but still in use, a rigid framework of keel and ribs is first constructed, not unlike the spine and ribs of a whale or carabao in appearance and function, and the wooden planking of the hull is then nailed to it with metal spikes or wooden trenails. The older technique was to build the hull like a shell first, plank by plank carved to fit, and to fasten the ribs in afterwards. This technique is probably a natural development of the one-log dugout canoe by adding one board to each side to obtain higher freeboard. The prototype seems to have survived in Taiwan to be described in the eighteenth century by Huang Shu-ching in the following terms:

*A mangka is a single tree-trunk hollowed out, with wooden planks fastened on both sides with rattan; since they have no putty for caulking and water easily enters, the barbarians keep bailing with a ladle.<sup>2</sup>*

By increasing the number of such additional planks, a fully developed boat or ship is produced. But as the sides of the canoe, or banca, are thinned, some transverse strengthening is required, and this can be provided by running strut-like thwart across the vessel, securing them to the sides without nails by means of tambukos and lashing. Similarly, as the number of strakes is increased, not only is such transverse reinforcement necessary, but the planks themselves must be firmly attached to one another. For this purpose, a flexible rib can be pressed down across all of them and lashed securely to the matching

tambukos carved on each plank. Finally, a combination of such thwarts and ribs lashed together, and even tightened by tourniquet action in the lashings themselves, produces a sturdy vessel whose hull and other structural parts are held firm under prestressed tension. This is the sort of hull the Butuan boats must have had.

Of course, since this technique provides no solid ribs to fasten the planks to, they cannot be steamed, bent to shape, and held in place by nails. Instead, they must be carved to shape in advance, no mean feat of carpentry in a boat the size of the Butuan examples. It is because of the essential nature of this feature that boats constructed by this technique are called "plank-built boats." On the testimony of Spanish records, Philippine plank-built boats usually had strakes hewn of one piece from stem to stern, even in twenty-five-meter warships manned by crews of over 200. Each of these planks was literally hand-carved out of half a tree-trunk with an adze. Saws, had they been available, would have been of little use for such shaping, especially considering the projecting tambukos along one surface. Although these adzes were made of metal during the Spanish period, it is worth noting that the same results could have been attained with neolithic tools. Indeed, there is an elegant nephritejade chisel in the National Museum which could perform such work.

Historically, there are two methods by which the planks in plank-built boats are fastened together — sewing and edgepegging. Sewing — or, better said, lacing — the boards together is done by drilling a matching row of holes through the two boards near their adjoining edges, and running rattan strips through them in the manner of lacing up a shoe or basketball. This is the older technique and it can be performed with even a simple stone or bone drill, as was still being done

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in modern times in remote Pacific islands. Sewing boats was a Luzon technique noted in the San Buenaventura Tagalog-Spanish dictionary of 1613, which continued in use into the present century. *Barangays* or *cascos* with a capacity of two or three thousand cavans of rice for loading and unloading ocean-going steamers were being constructed in Cagayan by this method in the 1920s. The timbers were cut in the Sierra Madres and floated downstream to Aparri where they were reduced to boards, and then carpenters working in teams of two, one inside the hull and one outside, drilled the holes, laced them with *barrid* rattan, and caulked them at the rate of ₱ 15 per hole. During the preceding decade, the turtle-eating, seafaring Dumagats of Ambos Camarines were constructing nine-meter *benitans* by sewing overlapping strakes together on a keel thirty cm. thick, plugging up all the openings afterwards with coconut coir and *pili* resin. On the rare occasions when they lived ashore, they simply took their boats apart and stored them under the house, ready to reassemble whenever they had reason to take to the sea again.

Stone tools are probably inadequate for drilling deep holes in the thin edges of boards, and it is therefore not surprising that edge-pegging does not appear in those distant Pacific islands whose inhabitants presumably migrated there

without metal. Edge pegs do not provide much strength for binding strakes together — for that, tambuko lashing is necessary — though seventeenth-century Spanish accounts indicate that Philippine edge pegs were secured within the planks by having hardwood nails run through them, planks and all, after they were in place. But pegs prevent the planks from sliding lengthwise and thus resist the shearing forces exerted on a vessel as it twists in heavy seas, and are therefore sometimes found in ships built on rigid frames in the modern manner. Edge-pegged plank-built boats are still being constructed in the Batanes Islands with solid futtocks and ribs inserted afterwards with nails or trenails instead of tambukos, and a Vietnamese specimen with a completely nailless hull of handhewn planks arrived in Lubang Island in July of 1981 with thirty-five refugees aboard. But tambukos survived the introduction of saws and nails right into this century: an old boat-builder in barrio Katuli of Cotabato City recalls *kinalawong* bancas built in this manner with a five-piece hull — that is, a dugout canoe base with two boards pegged to each side, with thwarts called *tang* or *balawog* lashed to them. And the force of tradition is such that tambukos still show up anachronistically in handhewn bancas in Butuan where they serve no functional purpose whatever, not even having holes in them.

### THE PLANK-BUILT MAN-O-WAR

By the time of the European arrival in Southeast Asia in the sixteenth century, the plank-built boat had been developed into a highly refined man-o-war, nicely adjusted to the tools, techniques, and materials available, and local political and commercial needs. They were called *korakora* in Indonesia, but *caracoas* by the Spaniards in the Philippines. They were sleek, double-ended warships of low freeboard and light draft with a keel in one continuous curve, steered by quarter

rudders, and carrying one or more tripod masts mounting a square sail of matting on yards both above and below, with double outriggers on which multiple banks of paddlers could provide speed for battle conditions, and a raised platform amidships for a warrior contingent for ship-to-ship contact. Their tripod masts and characteristic S-shaped outrigger supports show up in the ninth-century stone carvings of Borobudur, and their other features appear in Chinese, Portuguese, Italian, Dutch, Spanish and English accounts over a period of half a millennium.

Wang Ta - yuan a medieval Chinese author, recognized the essential features of the plank-built boat — i.e., light, flexible and nailless — in Madura in the early fourteenth century. Writing at a time when the second Butuan boat might still have been afloat, he says:

*They make boats of wooden boards and fasten them with split rattan, and cotton wadding to plug up the seams. The hull is very flexible, and rides up and down on the waves, and they row them with oars made of wood, too. None of them have ever been known to break up.<sup>3</sup>*

Pigafetta noted the wooden dowels and bamboo outriggers in 1521, and Urdaneta gives the dimensions of the outriggers five years later: they are six meters shorter than the hull, their supports are three and a half meters long, and the inner-most row of paddlers sit about a half meter outside the hull. An Italian pilot with Villalobos in 1543 reported a ship with Negro oarsmen in the Visayas, and the anonymous account of the 1565 Legazpi expedition says of a Bornean three-master taken in Bohol, "It was a ship for sailing anyplace they wanted."<sup>4</sup> Longer and more detailed accounts were given, in almost identical terms, by Portuguese Governor Antonio Galvano of the Moluccas in 1544, Dutch Admiral Jacob van Neck in

1598, and Mindanao missionary Francisco Combe's, S.J., in 1667, while Manila Auditor Antonio de Morga's famous 1609 *Sucesos* includes a shorter but perceptive description. But it was Combe's brother of the cloth, Francisco Alcina, who recorded the most valuable description of all in his unpublished 1668 *Historia de las Islas e Indios de las Bisayas* — three chapters in which the construction of the plank-built warship is set down step by step by a man who had actually built some.

To the casual observer familiar with the great Chinese war junks of the Ming Dynasty or the Spanish galleons towering over the native caracoas, the plank-built man-o-war looks like a primitive and flimsy craft indeed. Its planking seems skin thin and its bamboo tripods a sorry substitute for those oaken masts which are almost symbols of strength and security in western literature. Their low freeboard and wide-spreading outriggers crowded with seamen outside the hull make them hardly recognizable as ships at all. A careful observer like Pigafetta realized that their hulls were "very well made of boards with wooden pegs [though] above this they are nothing but very large bamboos,"<sup>5</sup> but Ch'uan-chow, Superintendent of Trade Chao Jukua, thought they were simply bamboo rafts. Their paddles with blades like dinner plates or elephant ears show up in Chang Hsieh's 1613 sailing directions as being "shaped like a gourd cut in half and left hollow as waterbailers."<sup>6</sup> Caracoa seamanship was also inexplicable; the sailors were often in the water outside the boat. To bail out a swamped vessel, for example, they went over the side to rock it and slosh out the water with paddles; and when emergency speed was needed, the paddlers on the outrigger floats were literally in the water. Chang confuses these two actions in the following terms; "On occasion, the men with these bailers jump

into the water to rock the boat and the speed is doubled."<sup>7</sup> And who could imagine that a warship could be launched by the simple manoeuvre of picking it up and running into the surf with it? This outlandish detail reached the remote mainland study of scholarly Superintendent Chao to be expressed in his 1225 comment on Visayan mariners as follows:

*They do not travel in boats or use oar, but only take bamboo rafts for their trips; they can fold them up like door-screens, so when hard-pressed they all pick them up and escape by swimming off with them.*<sup>8</sup>

But the comparisons are gratuitous. The caracoa was not designed to cross high seas in any weather before any winds, out of sight of land and provisions for months at a time, carrying heavy cargos financed by international banking houses, and even heavier artillery for slugging it out with competitors of their kind. Rather, they were intended to carry warriors at high speeds before seasonal winds through dangerous currents on interisland raids and high-profit ventures mounted by harbor princelings with limited capital. For this purpose they were superbly fitted. If a fair comparison is desired, it may be found in the Viking ships of Scandinavia. A third-century example excavated in Nydam, Schleswig-Holstein, has a double-ended hull like the Butuan finds, with one-piece strakes lashed to flexible ribs by cleat-lugs. But by the time of the later Butuan boat, the Viking ship had developed along its own line of specialization into a heavy, rigid-ribbed, deepsea vessel capable of withstanding the buffeting of some of the roughest waters in the world — those of the North Atlantic between Europe and America. In Southeast Asia, on the other hand, specialization ran to speed and manoeuvrability in shallow coastal waters.

The flexible hull, curved keel, shallow draft, quarter rudders, and protective outriggers give the caracoa life-saving advantages in waters

entailing a high risk of banging on coral reefs, grounding on rocky coasts, or beaching on sandy shores. The force of direct underwater blows that would stave in the hull of a rigid vessels, or at least loosen its nails, is instantly redistributed to other parts of the prestressed plank-built hull, and rattan lashing that comes loose can easily be tightened again or replaced. Nails entail a special disadvantage of their own: they loosen as they rust and induce rot into the surrounding wood in the process. Quarter rudders are actually large steering oars on one or both quarters that can be raised on a moment's notice to avoid underwater obstructions, and outriggers effectively act as fenders against contacts at water level. Nor is the presence of the tripod mast on the plank-built hull mere coincidence. The pliant caracoa hull precludes the stepping of a tall mast into a rigid keel on which it would exert the strain of great leverage: instead, the more agile tripod can safely shift its burden with the movements within the hull itself.

Outriggers serve a half dozen distinct functions in sailing caracoas. Their most obvious purpose is to prevent rolling. They run just above the surface on a well-trimmed ship — "kissing the water," as Morga says — and are slanted upwards at the ends to lessen water resistance. (The seventeenth-century Mindanao equivalent of keel-hauling was to tie the culprit to one of the outrigger floats.) They add the necessary bouyancy to keep a swamped vessel afloat, and missionary accounts contain grateful tales of friars being brought safely to port by Filipino crews working in water up to their necks. Outriggers receive the first force of heavy seas on the beam and, if worse comes to worst, come apart first and so give a vessel time to seek shelter before breaking up. Thus an anti-Moro task force dropped anchor of Panay in 1618 when its port outriggers began to be strained by

strong northeasterly *brisas*. Outrigger beams also provide support for as many as four banks of paddlers for high speed in battle, and the whole outrigger structure provides the handles by which the crew picks up a caracoa for beaching and launching. (A hundred men can easily carry a five-ton vessel if they can get ahold of it.) Speed in launching was an essential feature of self defense for coastal villages exposed to raiding attacks, for boats were regularly beached high and dry at night. Encumbering and destructive marine weeds accumulate on an exposed hull in tropical waters in one or two weeks' time, and shipworms — according to Hernando de Los Rios Coronel in 1619 — could eat up the hull of a galley anchored in the Pasig River in just twelve months.

The fact that the caracoa was double-ended made it extremely manoeuvrable in battle: its paddlers could back it down as rapidly as drive it forward simply by turning around in their places and shifting the helm to the other end. Paddles have the advantage of giving direct control of the depth, length, and frequency of stroke — as Fr. Combés said, "Their paddling is precise because they strike directly with the paddles right in their hands without being fastened to anything."<sup>9</sup> It is the use of paddles, of course, which requires such low freeboard. Oars permit greater length and leverage, and can generally be worked longer than paddles without tiring, though Fr. Alcina testifies that Visayans born and raised to the task can be relied on to paddle from sunrise to sunset.

The caracoa's shallow draft makes it less responsive than deeper vessels to the vicious currents of the narrow channels and interisland passages of the Philippine archipelago which were the constant bane, and frequent undoing, of Spanish galleons. But it is a distinct disadvantage for sailing in any wind other than one dead astern — for which reason Southeast Asian trade-raiding was strictly seasonal. With no keel, center-or

lee-boards, or large, deep center rudder, and very little hull beneath the water, the caracoa was easily blown sideways on a smooth sea and impeded by a choppy one. When running before the wind, its speed was proverbial — probably twelve to fifteen knots to a galleon's five or six — and a factor in the Sulu Sultanate's survival as an independent maritime principality until the advent of steam. But with a wind on the beam, the caracoa was already close-hauled, and it performed poorly in rough water in even a quartering wind, and could hardly tack under any conditions. Thus when Commander Morga sailed out of Mariveles Bay in October 1600 in a fresh northwester with choppy seas and headed due south to intercept Dutch Admiral Oliver van Noordt off the Batangas coast, he had to leave his two caracoas behind to cross over to Cavite inside Corregidor Island.

This same shallow draft, however, was an essential feature of the fine lines of a hull of such hydrodynamic excellence the caracoa actually planed with a following wind — that is, lifted up in the water. The common Philippine barangay shared this design, and its performance was praised in such a pleasant and informative paean by Fr. Alcina that it is worth quoting at length:

*Let us say something about the speed of these ancient boats of the Visayans, which was certainly great in a barangay of one encomendero of these islands called Pedro Mendez, which — though I did not see it, I heard about it from many who embarked on it many times — was so fast that nobody in it could keep his footing when they were rowing; even though it had no more than two banks of paddlers, one on each side, it was of low freeboard and long, so they struck the water well with their paddles. It used to travel by paddling between sunrise and sunset from the town of Paranas — where many of these barangays are made, and the same Filipino expert who made them made me a little one — to the City of Cebu, where the said Pedro Mendez had his house, this being a distance of more than forty leagues between leaving the one town as the sun was rising and reaching the other before it set, which seems unbelievable since they were traveling at more than four leagues an hour, but the number of witnesses leaves no room for doubt. And I experienced practically the same thing in this little barangay which was made in the same town, for I never met another boat and made*

*romba — which is what the Filipinos call recateado in Spain, which, for those who do not know it, is to race — that could keep up with me, and oftentimes when I was sailing near the edge of the sea or some river, I noticed that no man could keep up with me no matter how long he ran along the beach following me.<sup>10</sup>*

European explorers had the good sense to use native vessels from the very beginning of their invasion of Southeast Asia. The ship Magellan's friend Francisco Serrano ran aground in Banda, and when Governor Gonzalo Pereira sent some Portuguese officers to threaten Legazpi in Cebu in 1567, they made the trip from Ternate in two caracoas. So, too, when Spanish Governor Acuna attacked the Dutch in that island forty years later, they escaped with their families in four *joangas*, a sort of king-sized caracoa. Legazpi himself used Filipino-built and Filipino-manned vessels for exploring the Visayas, and sent Martin de Goiti to Luzon with fifteen of them in 1570. Smaller craft called *biroco* formed part of the Spanish fleet sent to Borneo in 1579, and more of them were stationed below Manila during a Japanese threat in 1592. Morga regularly used caracoas as dispatch boat and tenders, and by 1609 they were in such common use the Spanish King was moved to order some improvement in their design to protect their overworked *indio* crews from inclement weather. In the seventeenth century, whole fleets of them were being built to fight fire with fire as Moro Filipinos contested Spanish control of the Visayas. All the major naval engagements joined during Sultan Kudarat's long lifetime were fought by opposed fleets of plank-built men-o-war with a thousand-year pedigree. And the six boats Captain Francisco de Atienza carried up to Marawi in pieces in 1639 and reassembled on Lake Lanao were genuine Philippine pre-fabs, too.

Hernando de los Rios Conronel once remarked that a caracoa was a boat that could be sunk with one oar of a galley. As a matter of strict fact, Spanish galleys did not often

get the chance. As Fr. Combés accurately said, "The care and technique with which they build them makes their ships sail like birds, while ours are like lead in comparison."<sup>11</sup>

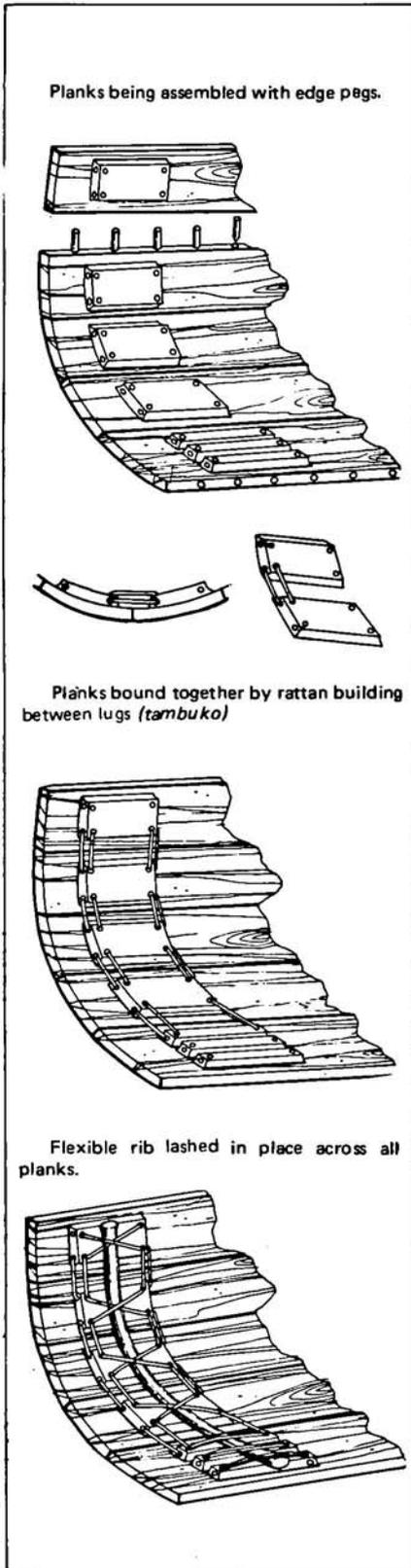
European explorers had the good sense to use native vessels from the beginning of their invasion of Southeast Asia.

#### CONSTRUCTION OF THE PLANK-BUILT BOAT

Chapters 8-10 of Book 3 of Part I of Francisco Alcina's unpublished *Historia de las Islas e Indios de las Bisayas* are a detailed description of Visayan ship-building techniques in the first half of the seventeenth century. Fr. Alcina was eminently qualified to write such a description. He was a master shipwright of the first class himself when he arrived in the Philippines in 1632, and by the time he wrote his four-volume *Historia* in 1668, he had built several Philippine vessels himself and traveled thousands of kilometers along the coasts of Leyte and Samar and other Visayan Islands. He was a keen observer of everything he saw from flora and fauna to natural phenomena and human behavior. He spoke the people's language, learned their sea chanteys and folklore, and more than once saved galleons from grounding in San Bernardino Straits by the expertise he had acquired. And he admired Filipino ship-building skills warmly and entrusted his life to their seamanship gladly. His description of their methods of constructing plank-built boats is as follows.

The master shipwright is called a *panday*, a title he shares with

Fig 2. Construction details of plank-built edge-pegs hull.



other craftsmen like iron-workers and goldsmiths. He goes to the forest with his ax, a straight adze called a *dallag*, a curved one called a *bintong*, and a spoon-bit called a *lokob* about twenty cm. long with a wooden handle across it, and selects his tree. *Lawaan* is preferred because it is a strong hardwood which grows large enough for a canoe 120 cm. wide to be hewn out of a single trunk. In the Philippines, tropical trees generally have a punky center — the Visayans called it *bokag* — caused by a fungous infection which enters through the root system and eventually rots and splits the trunk. The center must therefore be rejected, though the two halves will be solid timber if the tree is carefully selected. The outer four or five centimeters are also rejected as being *aramay* — soft, spongy, or fibrous — and liable to grubs and wood-lice. (Fr. Alcina accepts the Filipino belief that if a tree is cut during the dark of the moon — say, after the 22nd of the month — the *aramay* will crumble to dust in three days, but that if the tree is cut in the moonlight, even the worst-infested *aramay* will not infect the rest of the trunk.) Since the tree is too large to be moved conveniently on the ground, it is felled in just the position the panday wants. Then he marks out straight guidelines along it with a cord called a *kutur*, and sets to work.

The entire outer form of the hull is adzed to shape before hollowing out the inside — sharp at the bottom like a keel, pointed at both ends, and V-shaped amidships with sides no thicker than a board. (The adze is evidently sometimes used like a chisel, for Fr Alcina says it is hammered with a mallet called a *pakang*.) to check the progress of the thinning process as he works, the panday keeps boring holes through the sides with the *lokob*, all of which will be plugged up water-tight later. Then the interior is hollowed out, leaving

the necessary *tambukos* projecting for seating thwarts or ribs called *agars* with rattan. A good panday can make such a hull nine or ten meters long and a meter and a half wide working by himself in just eight or ten days.

Such a boat carved out of a single piece of wood is called a *baroto* — what the Tagalogs call a *banca*, Fr. Alcina says — or a *balasiyan*. (Some are small enough for one man to lift.) Usually a baroto or banca has one board added to each side — indeed, this may be the basic meaning of *bangka*, for Taiwanese boats of this build observed by Fukienese coast guard officer Chu Wen-ping in 1662 were called *mangkas* or *vankas*. Since the boards themselves are called *timbaw*, the baroto is now technically *tinimbaw*. To increase freeboard, from twenty to forty cm. of *opak* or *dagpak* bark may be added to the gunwales and secured with thin strips and nails of rattan, or plaited palm leaves may be added as washboards called *dolopi*. But if the sides themselves are raised high enough for cargo-carrying purposes to require oars instead of paddles, the boat is called a *birok* or *biroco*. In Fr. Alcina's day, these *birocos* were being replaced by *champans* of Chinese design, except for short trips in local waters. It is impractical, however, to build larger vessels on dugout canoe bases, so those above ten meters or so are constructed on squared keels as real edge-pegged, plank-built boats. This is the size and style which was known by the famous name of *barangay* or *balangay*, although the Tagalog version was sewed or laced, not edge-pegged. Largest of all are the full-fledged warships called *caraocs*, among which the *joanga* appears as an oversized model for special duty, the term itself probably deriving from the huge, triple-planked Malay *jong*. A *joanga* that retired up the Pasig River with a crew of more than 300 in the face of Goiti's attack in 1570 was

probably a royal flagship providing maximum security for the person of rajah Solayman or Rajah Acheh Matanda.

It is to be noted that the flat- or round-bottomed Butuan boats, lacking either a real keel or a canoe base, do not fit any of these categories, though they are within the barangay size range. In addition, they display another unique feature — the center plank which serves as a keel has two or three thin tambukos parallel to one another instead of the broad ones appearing on the adjoining planks, though of the same length and thickness. This special feature has not been encountered elsewhere — in vessels with true keels, that is — and may therefore be intended to facilitate additional lashings at the critical point where the ribs cross the keelplank.

Construction of the caracoa begins with a keel of hard, red *barayong* or *tugas* wood. Since this may be more than twenty-five meters long and has a gentle curve in profile — both Combes and English privateer William Dampier call Philippine warships “half-moon shaped” — its product demands considerable skill and manpower. It is small wonder that Filipino shipwrights could handily lay out and construct and thirty-meter mast ten meters in circumference for a Manila galleon with no more Spanish assistance than a few soldiers to keep them working without pay. The keel is extended at both ends about a meter by stems of the same wood mortised into it, which continue its graceful lines into serpent-like projections at both prow and stern which are gaily decorated for full-dress occasions. Because of this curve, as much as a fifth of the total length of the vessel may be out of the water.

Next comes the carving of the first two boards to be fitted to the keel on either side, the most crucial stage in the entire con-

struction because it is their flare and curvature which will determine the final contour of the hull and the consequent speed of the vessel. For this reason, they are distinguished by special terms: the garboard strake is called *dokot* and the next one *lonor*. The curvature itself is called *lubag* and the skill to produce it is the hallmark of the master panday. Additional planks are then added with *mangle, bahe* (the trunk of the *anahawis* plam) or brazilwood dowels every twenty cm. to a total of six or more boards on a side, depending on the size of the boat. (Three to five appear to be normal for a barangay.) The tambukos have already been carved out, of course — twenty cm. long and six to seven cm. thick on top but flush with the surface of the plank below, and a meter to a meter and a half apart. (They are therefore thicker, shorter, and farther apart than the Butuan specimens.)

Now the shell is left to season for a month or two, carefully elevated to avoid infestation by termites. When it is sufficiently dried out, the planks are removed one by one and all the broken pegs — “which are many” — removed and replaced. Then it is reassembled in three distinct stages called *sugi* (“matching”), *os-os* (“tightening”), and *pamota* (“closing”). *Sugi* is accomplished with a little wooden tool that acts like a scribe: it has a sharp iron point two to three mm. above a projecting tongue or lip, and is small enough to fit in the palm of the hand. After the planks have been put together again but not hammered tight, a carpenter with a strong grip places the little lip on the upper edge of a board with the point biting into the side of the board above. Then he runs it from stem to stern both inside and out, applying enough pressure to incise a sharp line along the upper board near its lower edge. This mark naturally reproduces whatever irregularities the

original adzing may have left in the upper edge of the lower board. The wood below this line can now be removed to leave a chink between the two planks of constant thickness from one end to the other. This chink is then stuffed with *pugahan-* or *idiok-*palm fibers called *barok*, as fine as goat’s hair, and the planks are ready for os-os tightening.

Os-os means to prevent something from sliding up or down by pulling against it with cords: the belt a weaver uses with the back-strap loom to keep tension on the warp threads is called an *os-osan*. In boat-building, the term means to run stout rattan lines under the hull, fastening them securely at both ends to logs laid across the gunwales. Wedges are then driven into the ends of each log, splitting them enough to increase their dimension and so draw the rattan lines tight. While the planks are under this tension, their “eyelids are closed” (*napirnga*) by pamota. This is done by driving holes through the pegs in each plank, locating them by marks inscribed on the planks beforehand, by the use of a little tool like a nail punch with square cross section. The nails themselves are square pins four cm. long of *ipil*, a strong wood which produces a resin in salt water which remains so sticky the pegs may break off but the pins themselves never loosen. Then the os-os equipment is removed and the planks are left so tight you can hardly see the joints between them, Fr. Alcina says, and the whole hull is as strong as if carved from a single block of wood.

Now, the shell having been finished, the hull itself is completed by the insertion of ribs and thwarts. The thwarts are smoothed branches of wood chosen for its strength, toughness, and light weight, with one or two holes at each end. By means of these holes they are lashed across the boat between matching pairs of tambukos in corresponding strakes, seated on

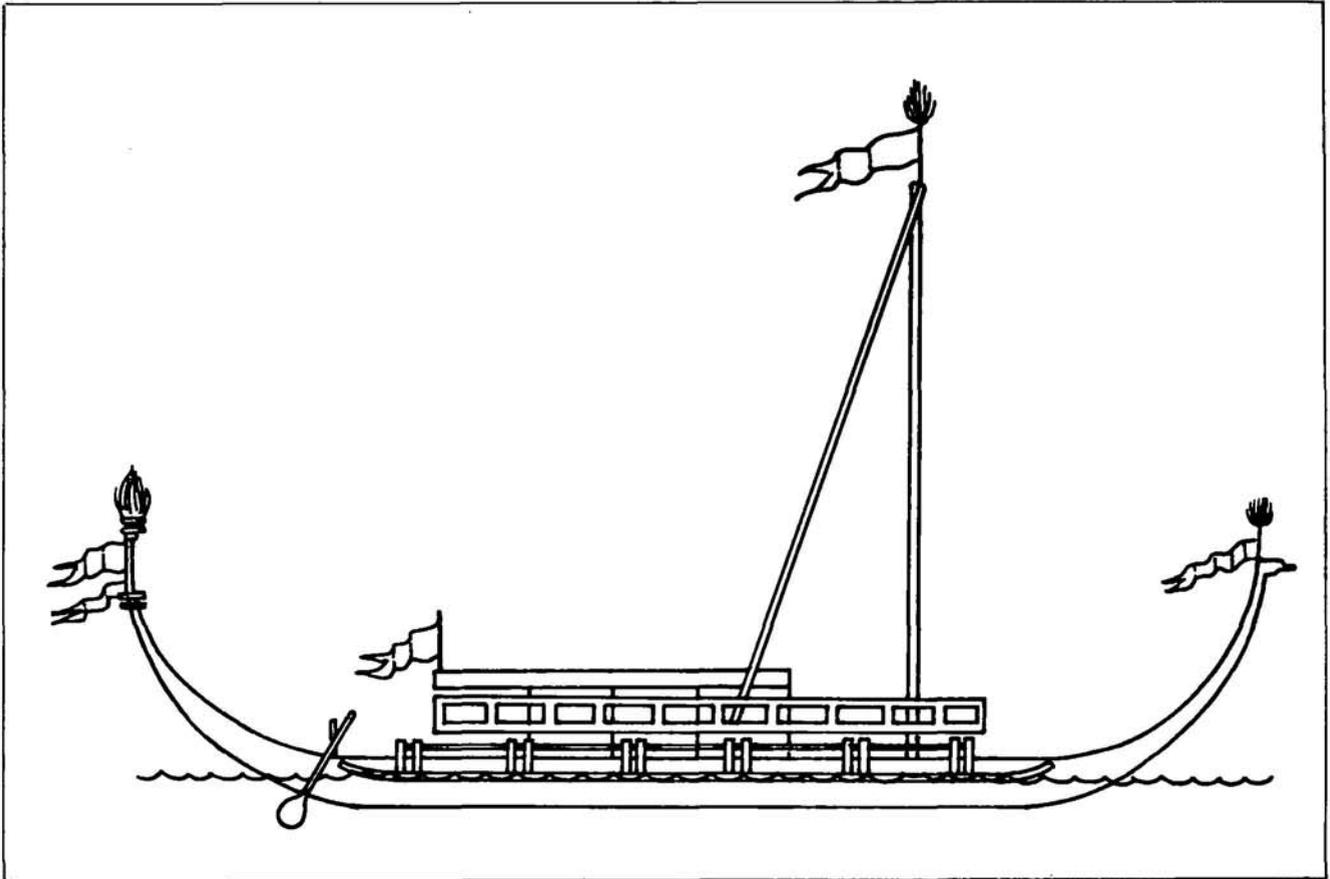


Fig 3. Superstructure of a Visayan caracoa.

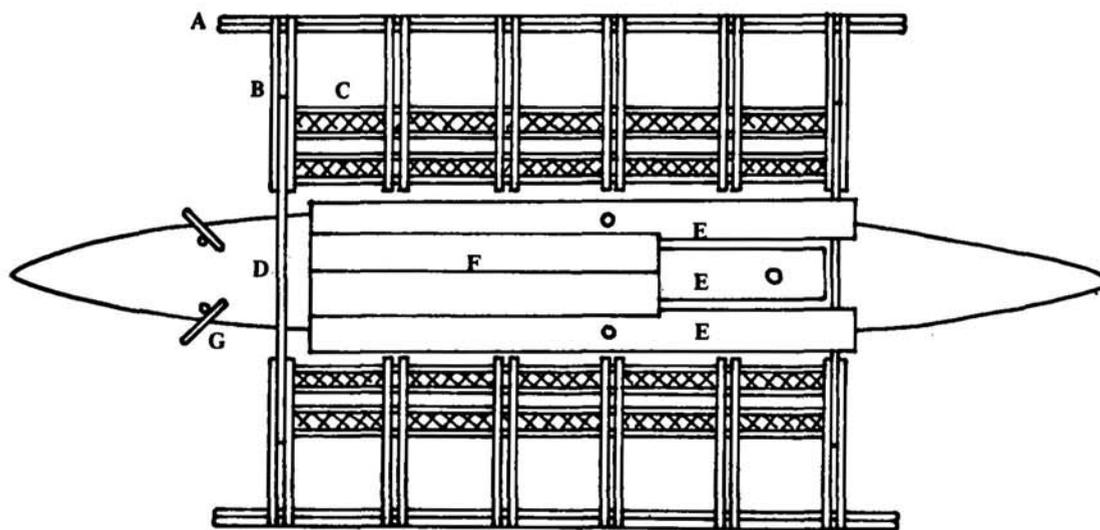
the tambukos themselves. Fr. Alcina says they look like the rungs of a ladder running from stem to stern — as the tambukos themselves look like a little flight of steps up the inside of the hull from keel to gunwale. On the uppermost of these thwarts the paddlers sit, and to all of them the longitudinal and upright elements of the superstructure are lashed. The ribs also have holes in both ends, by which they are lashed to the uppermost tambukos opposite one another after they have been forced down in an arc and lashed to each plank they cross by braided rattan bindings — or palm fibers, in the case of the Butuan boat — which pass through the tambuko holes and over the ribs. The caracoa hull generally has a very narrow beam-to-length ratio of one to eight, or even one to ten, and this interior bracing enables it to resist shearing and twisting forces which

a more rigid vessel of these proportions could hardly endure. But since these thwarts are only a meter or so apart down the whole length of the boat, and occur between each set of strakes from keel to gunwale, the hold has little space for cargo. This configuration calls attention to the fact that the caracoa is a man-o-war, not a merchantman.

The caracoa hull is shallow enough in contour to draw very little water and to assure low enough freeboard for four-foot paddles to reach the waves. This shallow draft not only gives the caracoa a vital advantage over the Spanish galley, but in the seventeenth century guaranteed the Maguindanaoans almost complete freedom of action in the labyrinthine estuaries of the Pulangi River delta during their defense of that territory against foreign invasion. All European observers com-

ment that Filipino mariners are willing to sail with only one plank above the water, or even "three fingers" in the case of small boats, or with bark or palmleaf washboards half submerged. Yet the caracoa carries a considerable load of superstructure. The one taken in Bohol in 1565 "had three decks, although there was little space between one deck and another,"<sup>12</sup> and some observed in the Visayas in 1543 were "well wrought and nicely adorned, and the lords were seated above and down below some negroes with kinky hair, according to their stations."<sup>13</sup>

The superstructure begins with the outrigger supports. Four or more crossbeams called *batangan*, square or round in cross section and extending at least a meter beyond each gunwale, are lashed to thwarts. Fastened to both ends of each of these with large square pegs and rattan bindings are one or



- A. *Kate* (outrigger floats)
- B. *Tadik* (outrigger supports)
- C. *Daramba* (paddlers' platform)
- D. *Batangan* (crossbeam)
- E. *Burulan* (decks)
- F. *Kayang* (awning)
- G. Quarter-rudder

two outrigger supports of mangle wood called *tadik* — parallel to each other with the *batangan* in between, if there are two. These *tadiks* are shaped like a letter-S lying on its side, with the middle of the S crossing the end of the *batangan*, the inner arm rising above it and fastened to it nearer the hull, the outer arm curving downward to hold the outrigger floats at water level. The floats themselves — *kates* — are two, three, or four thick bamboos extending to within two or three meters of both prow and stern at least two meters away from the hull, slightly raised forward to reduce water resistance. The *batangan*s carry one or two *darambas*, bamboo or split-bamboo seats running fore-and-aft for additional banks of paddlers — or actual oarsmen if an inner *daramba* is too high for the use of paddles. Inboard, the *batangan*s carry three

cane-decked platforms or catwalks running the length of the vessel called *burulan*. The middle one serves as an actual deck for the sailors handling the rigging and the persons and cargo of important passengers like the master himself, or a *raja* with his entourage of ladies — seated on a still higher platform — and is just enough narrower than the full beam of the vessel to leave room for the paddlers. The other two *burulan*s are narrower (though still wide enough to sleep on), far enough outboard to overhang the hull, and high enough to clear the heads of the paddlers when they stand up to enter, leave, or handle cargo. Because of this configuration, the two outboard *burulan*s are called *pagguray* — “eyebrows.” All three *burulan*s serve as fighting platforms for the ship’s marines, but especially the two *paggurays*, and all have planks standing on edge like strakes

along the side, or decoratively carved railings. Such railings, covered with canvas guards, saved Spanish soldiers from poisoned arrows in 1570 when Juan de Salcedo was attacking a *Batangas kota* in Balayan from the deck of a Panay caracoa.

A tripod mast is technically not a mast at all but what nautical terminology — and Dr. Morga — call shares — two poles fastened together like an inverted letter-V for use as a derrick. In caracoas they are made either of wood or bamboo, and their legs stand on the *darambas* pivoted on a pin which permits them to be lowered to decrease wind resistance in adverse weather. The third leg stands on the centerline, forward. (What is probably the foot of such a mast recovered at Butuan is fifteen cm. in diameter and has a 2.5 hole running through it.) The caracoa carries two, or sometimes, three, such tripods, each mounting

one huge rectangular sail wider than high, kept taut between two bamboo yardarms, a shape Fr. Alcina considers an advantage in sailing close to the wind. Running rigging is simple — a block and tackle (*bognoson*) for raising and lowering the sail, and braces of rattan rope at the ends of the yards. The sail itself is made of matting woven of *gaong*, *burí*, or *nipa* fibers, or the burlap-like growth called *gonot* which forms between the fronds of certain palms. Filipinos seem not to have used cloth for their sails, although the Manila galleons were regularly propelled across the Pacific on Ilocano canvas woven on back-strap looms. Such matting is also used for an awning called a *kayang* which covers the whole working space of the vessel and elicits admiring praise from European observers: sun and rain, Fr. Alcina aphorizes, "are the two great enemies of sailors."<sup>14</sup>

Paddles are called *bugsey* and are about a meter or 120 cm. long, with a leaf-shaped blade twenty by forty cm. — sometimes used as a chopping board for preparing meals — and a cross-bar handle at the top. Sailors take pride in the manufacture of their own paddles, and carve out pony-sized ones for their sons as soon as they are old enough to hold one. Good paddling requires athletic coordination and long practice, and the outcome of naval engagements can be decided by the discipline of precise timing to the rhythm of sea chanteys or the beat of a brass gong. Longer paddles called *gaors* for use in birocos or from the "upper deck" of caracoas are actually oars, with thole-pins in the gunwales slanted toward the stern, a feature Fr. Alcina considers an improvement over the European model which permits a careless oar to slip off. The blade of a *gaor* is shaped like a large dinner plate and fashioned from a separate piece of wood. In addition, the foreign-style oar

with long slender blade was coming into use in the seventeenth century and was called a *gayong*. So, too, the center rudder beneath a raised stern was replacing the one or two quarter-rudder steering oars — or four in joangas — as early as Morga's time, and the western-type ram was being constructed on Philippine bows before 1600.

The caracoa carries four to six, banks of paddlers of twelve to twenty men each, and can add two more by manning the bamboo outrigger floats for emergency manoeuvres like outdistancing pursuers. Galvano reports royal joangas in the Moluccas with 200 oarsmen to a side in addition to 100 men-at-arms, and four joangas which attacked Fort Gazang, Marinduque, as late as 1754 were reported — somewhat hysterically, perhaps — to be carrying 500 Moros each. But such large crews must have reached or exceeded the optimum point between manpower and dead weight, for the ordinary Philippine man-o-war rarely carried more than a hundred. A Bohol Chieftain was buried in the early 1560s with seventy slaves as crewmen for his voyage into the afterlife, Procurator Rios Coronel thought eighty to a hundred was normal in 1619, and Italian Jesuit Marcelo Mastrilli traveled in a caracoa with ninety oars in 1637. The Spaniards used still smaller ones in their Moro Wars: a fleet of thirty to forty outfitted in Cebu and Oton in 1627 carried only, 1,600 Filipinos and 200 Spaniards. The fighting elite who manned the burulan decks in these warships counted less than a quarter of the ship's total complement. But the whole crew, oarsmen and all, were fighters in shore raids and were promoted from outboard to inboard in recognition of their valor in action. And they enjoyed the prestige of knights or samurai in prehispanic Philippine society. They were called *timawa* — a term which quickly degenerated under Spanish domination into "commoner."

## SEVENTEENTH-CENTURY FILIPINO SEAMANSHIP

It need hardly be said that the two or three thousand Spaniards who occupied the Philippines at any one time could not have done so without the Filipino manpower and skill to build their galleons, teach their pilots how to get them in and out of Philippine waters, and then sail them across the frigid upper latitudes of the Pacific. Early seventeenth-century attempts to construct ordinary Spanish vessels produced some noteworthy disasters. Seven galleons built in 1610 to keep colonial competitors away from Philippine shores, so huge that the mast for one of them cost the labor of 6,000 Filipinos for four months, were lost at sea without ever seeing action. Mediterranean-style galleys could not keep up with Filipino men-o-war or follow them into shoal waters, and their oars were too heavy for underfed Filipino slaves on convicts to handle: two of them dropped dead in 1606 after six hours of rowing. Once the Dutch threat was removed, however, the Spanish settled down to building heavy galleons to transship Chinese goods over the Manila-Acapulco run, and light caracoas to fight independent Filipinos in the Southern part of the archipelago.

All these ships were built by raw Filipino manpower, but also by a certain amount of skilled labor on the part of Filipino coopers, caulkers, smiths, and master carpenters. The Manila government was rarely, if ever, solvent enough to meet royally approved pay scales, but at least the scales themselves reflect official assessment of such skills. In 1619, for example, a day when the minimum wage for forced labor was set at ₱.03 a day plus rations — and a first-class slave cost ₱80 — a Filipino shipwright who could lay out a mast or yardarm was supposed to receive ₱3 to ₱4 a month and a double ration of rice.

**Filipino mariners did not practice celestial navigation... Their observations... were for meteorological purposes: by the appearance of the atmosphere; the hue, thickness and configuration of clouds; the direction, force and steadiness of winds; and the colors of the sun and the moon....**

And in 1636 when the price of rice was fluctuating between ₱.50 and 1 per cavan and a Filipino seaman's wages were ₱4 a month and fifteen gantas of rice, a Filipino master blacksmith in the Cavite shipyards was listed at ₱8.50 and fifty gantas of rice. Only Visayan pandays were taken on at this rate with no previous experience in government yards, however, and Fr. Alcina has preserved the names of two of them—Figuman and Francisco Polacay of Palapag. Another testimony to the value of the Filipino carpenter was the number carried in Spanish fleets: of the 700 Filipinos lost in the Singapore expedition of 1616, 200 were carpenters. Nor was their presence in shipyards ignored by Moros destroying Spanish galleons on the ways — 400 were carried off in one raid alone in 1617.

Filipino mariners did not practice celestial navigation, though Visayans distinguished the major constellations to set their agricultural calendars. Their observations of the heavens were for meteorological purposes: by the appearance of the

atmosphere, the hue, thickness, and configuration of clouds, the directions, force and steadiness of winds, and the colors of the sun and moon—Fr. Alcina says — they could predict typhoons three' or four days in advance, and, less accurately, the amount of moisture to be expected a whole season in advance. They knew the Chinese mariner's compass — they called it *padaloman*, literally, "place for the needle" — but used it mainly at night-time. For the most part, they navigated by piloting — that is, by proceeding from one landfall to another, following island chains wherever they wished to go. Even when islands cannot actually be seen, their presence is betrayed by ocean currents, floating objects, the movement of birds or fish, and especially cloud formations on the horizon and the kind of lightning they display. Magellan's survivors took the *Victoria* from Cebu to what is now Indonesia by sailing from one island to another, and in Timor they found a Luzon ship which had no doubt got there by the same method. Similarly, Luzon traders carried their gold, wax, and honey to Malacca by passing down the north coast of Borneo — where, as a matter of fact, they were most probably business partners of the Sultan of Brunei to begin with. Even the mainland coast of China can be reached by following the Babuyan and Batanes Islands to

**...the nautical skill which made Filipino seaman absolutely indispensable to galleon shipping was his knowledge of the powerful and capricious currents of Philippine seas.**

Taiwan in sight of mountain peaks almost the whole way, and when Visayan caracoas raided the Fukien coast at the end of the twelfth century, that is just where the Chinese thought they came from.

But the nautical skill which made the Filipino seaman absolutely indispensable to galleon shipping was his knowledge of the powerful and capricious currents of Philippine seas. A current flows down the east coast of Mindanao, for example, at about the speed of a Spanish galleon, and in the sixteenth century effectively doomed all survivors of the Loaysa, Saavedra and Villalobos expeditions to Portuguese or Filipino captivity because they could get no wind to oppose it. Ships could be spun around 180° in the terrifying whirlpools off the northwest corner of Samar, and unwary boats were literally held captive for days at a time before being broken up on coral reefs. Worst of all were the San Bernardino Straits between Luzon and Samar — rushing torrents of water through which the colony's mercantile lifeline passed as if between the blades of coral knives. No Spanish captain could hope to get a returning galleon through that channel after the *vendavales* started blowing from the southwest without a dozen Filipino boats as tugs and a good Samareno pilot at his elbow. Such pilots were sometimes rewarded with princely sums like ₱100 or ₱200, contributed on the spot by grateful passengers — ₱50 from a general, slightly less from an admiral or commander, and ₱6 or ₱8 each from investors with cargo aboard. But, alas, colonial abuse eventually made it difficult to obtain such expert services. An arrogant *Piloto Mayor* who ran the *San Francisco Jávier* aground at Borongan in 1655, for example, rewarded a Filipino pilot who saved the galleon *Concepción* for him thirteen years later with nothing more than a blow with a cane. It is perhaps not surprising

that public opinion in the Philippines attributed the loss of the *San Francisco Javier* to God's judgment on the cruelties connected with building it — and pleasant to record that the only silver recovered from it went directly into the pockets of Filipino salvagers.

Filipino seamanship was appreciated by the colonial regime from the days when Morga used to send his caracoas out with only one Spaniard aboard. Laws of navigation and commerce promulgated in 1620 took it for granted that any Filipino born along the seacoast was qualified to ship out as a common seaman on government vessels, and the sailors of Malate were renowned for carrying Manila merchants to Cavite in any weather without ever having lost a passenger or his goods. Galleons sailed in those days with an equal number of Filipino and European deckhands — about seventy each, counting the Spanish gunners — but by the 1720s Filipinos outnumbered the others two to one. By the middle of the eighteenth century they had won such a reputation abroad that there was hardly a Spanish ship in European waters which did not have some on board. A memorial written in 1765 by Francisco Leandro de Viana says three is no people in the whole world more dexterous on shipboard, or quicker to learn nautical terms or skills, a judgment echoed by another Spanish author sixty years later: a Filipino will learn as much seamanship with a few days' practice as a European does in twenty years. Viana also says of the Acapulco run, "There is hardly an indio who does not understand the mariner's compass, and therefore on this trade-route there are some very skillful and dexterous helmsmen."<sup>15</sup> By the nineteenth century, Filipinos were migrating in such numbers to sell their skills outside the Philippines that other colonial regimes placed restrictions on employing them. In 1827, for example, the British in India limited

them to four or five per vessel, and strung up offenders from waterfront gibbets as a warning to their fellows.

Filipino seamanship and the importance of seafaring in seventeenth-century Visayan life is nicely illustrated by a contemporary dictionary like Mentrída's 1637 *Bocabulario*. It is significant at the outset that boats seem to dominate the author's consciousness even when he is not defining nautical terms. *Hugut*, for example, he defines as "something taut, like the rigging of a ship," and *kilikal* as "to fasten one thing to another, like a boat towed astern," and he gives *andoloy* as "fast, like a ship" despite the fact that there is a special adjective for the swiftness of ships — *makilas*. Not surprisingly, some nautical terms are extended to more general meanings, while others provide the bases for colorful metaphorical images. *Sangkap*, for instance, is to equip a ship with its full crew, while *kasangkapan* is by extension, "everything needed for something", and *dapak*, the sheathing of a ship's hull, also means "To steal in the presence of the owner" — perhaps like English, "to fleece." Conversely, a common word may also be given a special nautical meaning: *ulat* "scar," can mean either to raise a scar or to raise a sail. However, as Visayan life styles changed over the centuries, so did the Visayan vocabulary. The modern word *lawig* includes tethering and pasturing cattle, and sailing and travel in general, but used to be defined:

*Lawig*: for a caracoa to drop anchor, even if not in port, and it refers to the ship, or the people on it; *lawigon*: the anchor cable; *lalawigan*; to let out the cable a bit; *lawigan* is the anchorage, which is usually a port but not necessarily.

*Sakayan* is the basic term for boat or ship, and its root is *sakay*, to travel by water, whether by paddling, rowing, or sailing. The absence of any such word in

English may serve as a reminder that the Filipino people were a maritime people connected, not separated, by interisland channels and seas. Filipinos and their culture passed throughout the archipelago by *sakay*, and the connecting links are called *bungalos*, channels between islands. Indications in the water of safe channels are *sibir*, and the dark waters which indicate the presence of shoals are *halum*. Ordinarily, the Filipino sailor stays within sight of land if possible, though there is a special term for a small boat putting out to sea — *lu-aw*. *Hamgir* is to follow the coast, and *oway* is to track a vessel — that is, pull it along the shore or riverbank by a rope. To steer directly toward some point like a tree or peak, or a star, is *tuhur*, and to proceed from one point to another without tacking or changing course is *tagal*.

Paddling — or rowing — is the basic method of *sakay* and has a well-developed vocabulary. To row backwards without turning around in your seat is *sibug*, and to row at forced speed is *sagaysay*. The sound of such fast rowing or paddling is *hagulut*, but striking the side of the boat is *hakdol* or *dakoldakol*, and to splash water in the process is *bungkalis*. *Lamba* or *lumba* is an actual race between boats. Paddle-power is also used to assist a vessel under sail. This is called *dalabay* in general, but if it is done primarily to keep wind in the sails when close-hauled, then it is called *sogot*. To sail at top speed lightly loaded — for scouting, for example, or to deliver messages — is *langpas*, and a special boat for this purpose is *lampitaw*, such as a Spanish attack force sends out in advance. Only two winds are distinguished in relation to a vessel underway — *tampiyok*, a head wind, and *tolot* or *solosor*, a following wind ("as is necessary," the *Bocabulario* comments). In the case of *tampiyok*, the ship lowers its mast with sail furled around it (*hagukun*)

and removes its awning to reduce wind resistance. (Awnings are carried away often enough for the process to have its own term — (*kakas* or *katkat*.) Then it proceeds against the wind — *somlol* or *sompong* — by manpower. To strike sails suddenly, however, because of high wind, to anchor, or for tactical purposes, is *landak*. For a vessel to be delayed by adverse winds is *bungbung*, and to be carried adrift or off course by either wind or current is *pilpil*, or *samapay* if actually driven ashore.

The effects of the sea on Philippine shipping have a rich vocabulary of their own. Of the four basic motions of a ship at sea — yawing, pitching, rising and falling, and rolling — the first three are distinguished as *waling*, *powat* or *limpowat*, and *luyan*, but rolling is restricted to *kiyakiya*, "the rolling of a boat without outriggers." For waves to pound a vessel is *amuk*, and to drop one on shore, shoals, or reefs is *buntar*. *Dapiya*, *dalapiya* or *tapowak* is the general term for destruction of all kinds — breaking up in heavy seas, beaching, striking reefs or rocks — while *sanglar* is grounding or failing in less dramatic ways. *Tokbol* is to strike submerged obstructions while underway, *sigaksak* to run aground on a sandbar or reef and be stranded or broken up, and *bungkag* is to be destroyed in a flood. In distress, *dagdag* is to jettison cargo, *hinubig* is to work pumps or bail, and *laka* is for tambukos to be broken off or stems to be loosened from the keel. *Tikyaob* is to capsize, *polang* is to be lost at sea with all hands without a trace, but *sangbat* — happily — is to go to a distressed vessel's aid or pick up survivors or exhausted swimmers.

Another set of terms enables us to picture the waterfront of a port like Butuan — so busy, perhaps, that men pass from one boat to another across the outriggers — *tapon*. The anchorage itself is the *lawigan*. *Awil* is to anchor offshore

or outside the shoals, *hampil* is to anchor inshore with the bow touching the beach, and *bulibuli* or *mulibuli* is to moor by a stern line. *Hangiya* or *sangiya* is to beach a boat, or to beach it enough so that it looks like a crocodile with its head on the snad and its tail in the water. Sakay is to embark and *kawas* or *hawas* to disembark or unload cargo, and cargo itself is *lolan*, though cargo stowed on the 'upper deck' *burulan* for special handling is *orong* or *tampapaw*. To shift or remove cargo to find something or get water out of the hold is *bungkal*, but to do so for the purpose of trimming the ship to an even keel is *kankan*. As the boat is loaded it naturally sinks deeper in the water — *lobo* — and if it is down by the bow, it is *sukmur*. But added buoyancy may be given it by lashing bamboos along the hull — *kilikili*. If the vessel is small, the captain himself — *toway* or *tomoway* — will be in charge of all cargo, but if it is large enough, it will have a *tugub* — supercargo or pursur. Joint ownership is *tapi*. A busy port will have boats under repair, too. *Tokor* is to put a ship in drydock — that is, shore it up with blocks under the keel. *Lombo* is to remove and replace some of the planks, *balarbar* is a more extensive refitting by replacing the planks on both sides, and *ungkag* is to strip it right down to the keel, rebuilding it with the old or new planks, or constructing a smaller vessel on the same keel, or even scuttling it. A boat so old it actually becomes a useless derelict is an *apal*.

The maritime vocabulary also permits an insight into ancient Philippine culture deeper than the mere details of nautical architecture and boat handling techniques. Sakay is to embark and travel by water, but the motivation for such embarkation and travel is revealed by another form of the same word, *hinakay* — to pay freightage, rent a boat, or take passage in one. Filipinos took

to the sea, in short, for purposes of trade. But raiding was also an endemic part of their interisland contacts. The Bacabulario defines *bangga* as "for two or more vessels to attack or assault each other in battle, either because their crews intend to fight, or by chance," and *abay* as "ships in convoy, or any enterprise for which people promise to stick together unto death." Moreover, as befits a real maritime culture, Philippine ships and boats partake of the sacred. The common baroto without outriggers is used for a form of divination called *kibang*: the occupants sit perfectly still amidships and the *diwata* (spirit) answers their questions by rocking the boat. And the great war caracoas which the Chinese said made the name Visaya a terror to all the islanders of the Eastern Sea, were dedicated with human sacrifices: *damilit* is to lie on the ground prostrate, and *mamamilit* is to launch a ship over a slave in that posture.

#### THE ROLE OF BOATS IN PHILIPPINE SOCIETY

Boats supplied almost all the Filipino's personal transportation needs from carrying *basura* out to fertilize his crops to attending weddings or wakes. The farmers of Bantayan Island went to farm their fields in Cebu, and the miners of Camarines to work the gold deposits of Masbate, by boat. But mainly, Philippine boats were used for four purposes — fishing, trade, warfare, and a combination of the last two which the Spaniards called piracy but which might more meaningfully be called trade-raiding. Fishing has always provided the major source of protein for coast-dwelling Filipinos, but local waters are too rich in this food to offer much incentive for the development of large and complex vessels. A barangay with only two or three planks on a side will satisfy most needs, or even a baroto with nothing more than woven

*sawali* sides coated with beeswax or almaciqa sap. It was trade that supported the Filipino boat-builder, whether hewing out one-man canoes for carrying a bunch of bananas to the next barrio, or constructing sea-going cruisers for handling such luxury cargo as gold, slaves, and Chinese porcelains. A consideration of this trade, together with its related activities of warfare and raiding, suggests that it inspired the refinement of the plank-built caracoa, justified the capital investment of building and maintaining one, and made possible whatever political vassalage existed between Filipinos in different islands.

In the early sixteenth century, Manila — or, more accurately, Luzon — was the only point in the archipelago regularly sending Filipino traders to foreign ports. New converts to Islam, these "Luzones" carried gold, wax, honey and foodstuffs to their partners or kinsmen in Borneo, picked up camphor, and proceeded to Malacca for Indian textiles, hardware and jewelry. They traded as far south as Timor, and were the easternmost agents of a larger network which included the colony of 500 of their countrymen at Minijam, 250 kilometers up the west coast of Malaysia from Malacca, and such notables as the Tumenggong of Malacca, Arejimute Raja, who regularly sent vessels to Siam, Sunda and China, or Curede Raja who dispatched his annual *jong* to China laden with pepper. It is not insignificant that Tome Pires, describing the great Chinese metropolis of Canton before the Portuguese reached that port, ends with the note, "So the Luzones say who have been there." An Italian pilot of the Villalobos expedition has left a tantalizing hint of possible direct trade with the Chinese mainland — an oared vessel encountered in Visayan waters in 1543 that boasted of making the China run in five or six days, but, alas, with no mention of its port of origin. Whatever the case, by the

middle of the century, Luzones were no longer sailing direct to China if ever they had done so. Instead, they were dominating or monopolizing the resale of Chinese goods within the archipelago which had been carried to Luzon in Fukienese junks. One of them told Legazpi that:

*since what they carry are goods from China, they call boats from Borneo and Luzon Chinese junks in these islands, and even they themselves are called Chinese among these islands, but in fact Chinese junks do not reach there [Butuan] because they are very big ships not fit for sailing between these islands.*<sup>16</sup>

Thus it does not appear that the China-Philippine trade was conducted in Philippine bottoms. That plank-built boats were able to do so is clear, but that they were regularly used for this purpose is not. We know that Visayan caracoas were on the Fukien coast in the twelfth century. Governor Wang Ta-yu of Ch'uan-chow was eye-witness to a raid by three chiefs with several hundred followers sometime between 1174 and 1189; he said "the Visayan complexion is as dark as lacquer, so their tattoos can hardly be seen."<sup>17</sup> Two centuries earlier, in 982, Mindoro merchants appeared on the Canton coast with merchandise for sale, but the Chinese report of the contact is too brief to reveal whether they arrived in their own ships or not. At any event, in the thirteenth and fourteenth centuries, Ma-i on the southern coast of Mindoro opposite Ilin Island was an entreport for foreign merchantmen, and from there these imports were redistributed by domestic shipping. The cotton cloth from Ma-i which was noted on the west coast of the Malay Peninsula in the 1349 *Tao I Chih Lüeh* was therefore probably delivered by non-Filipino traders, no doubt of the same sort as those who flooded the Philippines with so much Sung, Yuan, Ming and Sawankhalok porcelain that hundreds of thousands of pieces have survived. By the fifteenth century, Ma-i had been eclipsed by another trading port in northern Mindoro

which the Chinese called Mao-li-wu, whose ruler sent a Muslim emissary to China in 1405. And by the sixteenth, Chinese merchants were delivering their wares direct to Manila. By under contract to Rajah Lakan Dula of Tondo whence they were retailed for local consumption in native outriggers.

The picture of Philippine domestic trade, however, is rather clearer — every community traded with other communities, and most of them did it by boat. The inter-barrio feuding which appears as endemic in Spanish accounts might suggest at first reading that such barrios were perforce isolated from one another and therefore self-sufficient. But the same accounts specifically name the betrayal or amicable intercourse as the major cause for war — "If a Filipino goes to a town and they kill him there without cause," as Loarca says, "or if they friends and they offend or maltreat them there and commit treachery against them under cover of firendship."<sup>18</sup> If there were any Filipino communities which supplied all their own food, clothing, tools and weapons, Spanish accounts do not describe them. Rather, the total impression is one of continual movements of rice, camotes, bananas, coconjts, wine, fish, game, salt and cloth between coastal barrios — to say nothing of iron, gold, jewelry, porcelain, and slaves. That is no doubt why the Suluan Filipinos' first reaction to Magellan's appearance on Homonhon was to go home and get two boatloads of coconuts and bananas to sell him.

When the Spaniards reached the Philippines, the main long-range trade item was rice. Cebu was a redistribution center for the Visayas, drawing supplies from as far away as the east coasts of Mindanao, and Panay, which was second only to Manila in output. Rajah Katuna of Bohol received a boatload of rice from a Leyte vessel in Cabalian during Legazpi's visit in April 1565, and that Adelantado himself only survived a two-year

attempt by Cebuanos to starve him out because of Moro deliveries from Manila at inflated prices. (It may be worth noting that both these Surigao-Cebu and Leyte-Bohol rice lines could be controlled from a little island called Limasawa where the Rajah of Butuan and his brother Kolambu used to go "hunting.") The Manila Bay area was supplied from four Pampanga towns with controlled irrigation — Betis, Lubao, Guagua and Mexico — except during February and March when Ilocano shipping brought it from both the Ilocos and Cagayan. The Bikolanos even had a word for loading rice directly in to a ship's hold in bulk without anything under it — *oray*. But there was a wide variety of specialized trade as well. The breeding of goats, for example, caused Simara Island to be called Cabras Island, just as the sale of swine (*babuy*) and sugarcane wine (*basi*) branded the Babuyan Islands and the Bashi Channel. Expert shipwrights supported the economies of Cagayan de Sulu and tiny Buracay off Panay, while those of Catanduanes literally peddled their wares by loading smaller ones into larger. Cuyo Islanders wove cotton but did not grow it, and kept the inhabitants of neighboring islands in mat-weaving and salt-making subjugation. Farmers on Batbatan Island raised wheat on the north coast of Panay, and Bohol potters marketed their wares in Butuan, where prehispanic samples have been recovered from archaeological sites.

The extent and value of this trade is indicated by the fact that Cebu was the second largest settlement in the Philippines despite not having access to the ricefields, inland forests or goldmines enjoyed by the competing ports of Manila and Butuan. Cebuanos told Fr. Alcina that the prehispanic town had stretched along the beach for eight kilometers, and he believed them on the evidence of ancient graveyards and houseposts exposed by erosion. But the

most impressive demonstration of Filipino merchandising was the delivery of imported trade porcelains to every Filipino language group from Bontoc to Bohol, from Manila to Marawi — war-making, slave-raiding or head-taking as they may have been. This is a distribution achieved by no other product until American colonial power made twentieth-century marketing techniques feasible. Rajah Kolambu wined and dined Pigafetta out of Chinese porcelain, and when Magellan requested rice, presented him with unhusked palay in Chinese porcelain. Such jars and plates were priced in terms of human slaves, and included along with gold in that heirloom wealth called *bahandi* without which no Filipino datu could demand respect or exercise leadership. Nor were the Spaniards slow to assess the situation. When they sacked Sarangani Island in 1543, they dug up some hastily buried porcelain and carried it off as prizes of war for the Viceroy of Mexico, but traded it off for food in Samar instead.

Another evidence of prehispanic Philippine commerce is the vocabulary it produced, samples of which can be found in the early seventeenth-century Spanish lexicons. The Mentrída 1637 Visayan *Bocabulario*, for example, provides such retailing divisions as dealing in basic foodstuffs by sea (*baligiya*), rice and grain (*dalawat*), second-hand goods (*lito*), slaves (*botong*), or notions for the ladies (*biniyaga*). Specialized terms running from barter to big business can be selected from Marcos de Lisboa's 1618 *Vocabulario de la Lengua bicol* — e.g., *balabag*, to exchange goods; *bahay*, to pay in gold or silver; *balos*, to pay in labor; *bongto*, to sell on commission; *sangholi*, to go into partnership; and *hampil*, a raid in which the junior partner supplies half the outfitting expenses to the ship's owner and receives one-third of the take. Really high finance, however, is best displayed in the San Buenaventura Taga-

log dictionary of 1613. There, *tapa* shows up as capital or company (e.g., *Mag kano ang iniyong pinagtapa?* — [How much have each of you put in the company?]) *Momolong salapi ang aming pinagtapa* — [We are each putting in ten *tostones* as capital]). *Angka* means to corner the market, and a dozen terms for the usury to finance such ventures start with *laba*, 20 percent (*pagihit* if calculated monthly, *ganda* if annually), and range up to *ibayiw*, 100 percent, and *dalawalima*, 150 percent. The underlying ethic of this economy is probably to be found in the word *bitang* which refers to the inexorable daily increase of the traditional agricultural loan. Fr. San Buenaventura defines its basic meaning as "a mortgage such that while it is unredeemed the debtor and the one who gave the money divide the field every year."

Still another evidence of the extent of caracoa-carried commerce was the news they also carried along Philippine coasts and from island to island all the way to the Moluccas. When Loaysa's flagship, the *Santa Maria de la Victoria*, anchored in Lianga Bay in 1526, its crew ignored a local report of Spaniards shipwrecked farther south, not realizing that they had been preceded a few weeks by the *Santa maria del Parral*. A year later one of those Spaniards, then serving a local chieftain by the name of Katunaw, was told about the *Victoria's* visit by a native of the Marianas Islands who had been impressed with ten others to work the leaking *Victoria's* pumps and then escaped. Two other survivors of the *Parral* would up in Maguindanao, where they were notified in 1528 by the Sultan of Brunei that he had been informed of their presence by the Portuguese Governor of Malacca who was requesting their delivery to him, and that the Sultan would gladly provide transportation if they wished to go — and they did. Magellan's own *Victoria*, leaving the Philippines

after his death, found somebody on Palawan who could speak enough Spanish to translate for them, and captured a Moro off the coast of Mindanao who had been in the house of his good friend, Francisco Serrano, in Ternate. And all four of the post-Magellanic expeditions were given word of the fate of the survivors of the Cebu Massacre of 1 May 1521, two of whom survived as Filipino *bihags* (captives) for forty years.

But the caracoa is basically a warship, not a cargo carrier, and Philippine languages distinguish even more tactics of war than of commerce. These include terms of raids, sneak attacks, camouflage and ambush, bow-to-bow boarding, razing coastal villages, and probing strikes to test enemy strength — as well as such refinements of personal conduct as Bikol *togkod*, "to await enemies without fear," Visayan *patay*, "to fight to the death rather than surrender," or Tagalog *puli*, "to take a fallen comrade's place to avenge him." All these variations fall under the general heading of ngayaw or *kayaw*, a word which means "raid" and appears as *mangayaw* in all the major languages of the Philippines and, indeed, of insular southeast Asia from Mindanao to Malacca as well. This is the activity Spanish accounts inaccurately call "piracy." Modern international law defines piracy as robbery on the high seas, and although it is true that mangayaw raiders took weaker vessels at sea, when they did so they were not breaking any recognized law but rather performing a socially approved deed. Like the epic cattle raids of Ulysses or Irish folk hero Cu Chulainn, mangayaw was the esteemed occupation of the able-bodied male who could afford it. Its heroes' feats were the stuff of lyric and legend, and Fr. Alcina cites a Samareno ballad whose heroine is so coy she keeps sending suitors off on raids to Mindanao and Jolo, then Ternate, and finally Grand China itself. What

was reprehensible in Philippine morality was not the act of plunder itself, but doing it to those who had not done it to you. That is why one of them climbed up in a tree in Cainta soon after the Spanish seizure of Manila and shouted out in the middle of the night, "What did we ever do to you, or what did our ancestors owe yours, that you should come to plunder us!"<sup>19</sup>

Although mangayaw raiders took booty both ashore and afloat when they could, their real object was slaves. Chattel slavery was common to civilized societies in the sixteenth century all over the world and Spain was no exception: friars carried slaves across two oceans as personal servants at His Majesty's expense. But in economically diversified Europe, the trade was licensed by national governments as separate monopolies. It is to call attention to this difference that the mixed merchandising of caracoa commerce is here referred to as "trade-raiding." Potential customers for this trade in the Philippines were legion because the purchase of slaves was an ordinary area for investing surplus wealth — Bikol *saleu* means "To buy slaves, dogs, houses, or boats." Filipino communities supplied most of their own slave labor locally by usury and panel action, but always preferred aliens for religious purposes — that is, sacrifice. (Loarca considered this a commendable attitude: "They always see that this is a foreign slave, not a native," he says, "for they really are not cruel at all")<sup>20</sup> A foreign market was vided by the petty potentates of maritime principalities to the south, and after the seventeenth century, colonial plantations and households expanded it.

In the sixteenth century, however, ransom appears to have been a more regular source of profit than outright sale: Visayan *utao*, for example, means "to display captives for exchange on the boat without letting them go ashore." Capture and liberation were daily

facts of life, and communities collected contributions to rescue victims or render them charitable aid afterwards. If a man invested in a raid as a silent partner, he was obligated to put up half his active partner's ransom money as soon as he was captured, and was himself entitled to no return on his original investment. A datu's rank among his peers was indicated by his ransom worth — or what would be called *wergeld* ("man-price") if he were killed — and the capture of a high-priced individual was the bonanza every raider dreamed of and planned for. Such men were treated with respect and quickly ransomed since anybody who could afford to do so could expect to be reimbursed at twice the sum he had advanced. As a matter of fact, to underestimate a man's exchange value was a non-too-subtle affront to his dignity — or what Mindanao Moros call *maratabat*. When Spaniards captured a dignitary in 1521 whom Pigafetta called "the Governor of Palawan" and ransomed him off for rice and livestock, he generously added coconuts, bananas, sugarcane, and jars full of wine, as it befitted his station to do.

The importance of mangayaw trade-raids in Philippine society is indicated by the fact that they were carried out by a separate social class. These are called *timawa*, and in classic Visayan culture they are the sons or descendants of datu's by secondary wives, who neither work fields nor pay tribute but are obligated to man their datu's boat, armed at their own expense, whenever he puts to sea. In return, they receive a share of the spoils, and have the right to transfer their services to another datu if they choose. But their captain — *tomoway* — is a datu and has both authority and responsibility: there is a Bicol term, *bonglo*, which means "for a captain to ransom his captured comrades." His *timawa* are rewarded at his pleasure, just as their children inherit at his pleasure, and all cap-

tives belong to him: a crewman must reimburse him if he kills one. These are professions which were destined to disappear under foreign occupation, of course: the mangayaw skills which could defend a Visayan community against Mindanao and Sulu attack could also be turned against invasion from Leon and Castile. And as they disappeared, the popular image of one group of Filipinos as helpless victims of another was created by Spanish disarmament of all those who accepted their sovereignty.

Timawas assigned to paddle on the outrigger darambas were held in lower status than those inside the hull, and those manning the burulan fighting deck were considered a real warrior elite. In Malay, these latter were called "men-of-the-baileu [i.e. burulan]," and Antonio Galvano describes their full hierarchy in the Moluccas as follows:

*And the King travels up on the baileus with his captains and mandarins, and their sons who are still youths down below paddling, and others at the paddles on the cangalhas [darambas], and when they want to promote them, they elevate them to the baileu and they do not paddle. This is the highest honor that is given. So long as they do not perform any deed of valor, they may not carry a sword or receive such a promotion, which is like a knighthood; and when they move them inside the hull, it is already a greater dignity; afterwards, if they deserve it, they elevate them to the baileu and they give up their paddles.<sup>21</sup>*

Filipino expertise in boat-building and seamanship was employed by the Spanish colonial regime in caracoa fleets to fight Moros and in mercantile galleons to cross the Pacific. Filipino nautical skills are attested by Spanish accounts, and the importance of the seafaring life in classic Philippine culture is demonstrated by the vocabularies contained in early seventeenth-century Spanish dictionaries of Philippine languages. A detailed description of Philippine boat-building techniques is included in Francisco Alcina's unpublished 1668 *Historia de las Islas e Indios de las Bisayas*.

Boats were the only Philippine transportation, and all commercial and political contacts depended upon them. Trade included the

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local exchange of foodstuffs, the exploitation of special marketing patterns, and the distribution of imports like Chinese procelain throughout the archipelago. Slaves were taken in raids called mangayaw by trade-raiders whose exploits were acclaimed in lyric and legend. Trade-raiding formed the basis of pacts between maritime leaders in which precedence was expressed in terms of personal deference rather than political domination. Communities that did not have the means for such trade-raids achieved security through alliances by blood, marriage or vassalage with those who did. The caracoa may therefore be seen as the key to the political scene in the sixteenth-century Philippines: those who had them dominated those who did not.

In the Philippines, it appears that the lower ranks of this naval hierarchy even included those commoners the Spaniards indiscriminately called "slaves." Such a non-timawa crewman could theoretically save enough from his share of the spoils to buy his freedom and then work his way up the military ladder until, if he were man enough for it, he might even attain a following of his own and become a datu. The first conquistadores, however, accustomed as they were to galley slaves in their own navies, did not recognize these Viking-like professionals: Bernardo de la Torre in 1543 thought a Samar chieftain by the name of Iberein was rowed out to his flagship by slaves wearing gold collars. The real

timawas was usually an experienced seafarer who shared such trade-raiding sophistication as his master's command of Malay, the lingua franca of southeast Asian trade. Thus Magellan's Malay-speaking slave was immediately understood in Limasawa by the oarsmen serving the brother of Rajah Awi of Butuan, one of the most cosmopolitan ports in the archipelago.

The caracoa may therefore be seen as a key to the political scene in the sixteenth-century Philippines: those who had then dominated those who did not. Coastal communities that had none — or could not launch them fast enough if they had — would, at the least, have been potential victims for the slave trade. This is, in fact, precisely the condition later suffered by Filipinos under Spanish occupation: as some of them told Rios Coronel, "Let us be free, and let us have arms, and we shall be able to defend ourselves as we did before the advent of the Spaniards."<sup>22</sup> Yet not every community could build or man a caracoa. The manpower, social organization, and mechanical skill to extract two dozen curved planks twenty-five meters long from hardwood giants in some interior forest, and then convert them into a sophisticated sea-going vessel along the beach, could not have been available to all. Moreover, those burulan runways indicate that the caracoa were designed for more advanced naval warfare than the simple running down of the inhabitants of some defenseless fishing village. The crew of a caracoa engaged in a naval duel who could get 200 paddles in the water simultaneously and carry out a captain's orders quickly could expect to survive the battle, carry off enough booty to contract brides of their choice, and rear up another generation with skills like their own. The only alternative to active participation in this seafaring, trade-raiding life style was alliance by blood, marriage, or vassalage to those who practiced it.

To whatever extent the caracoa produced this political scene or was the product of it, it was obviously an integral part of it. At the time Spanish friars started describing Philippine society, there were coastal communities that purchased their security with annual tribute to a distant overlord who sent his caracoas to collect it. But those with caracoas of their own are not portrayed in such roles of outright subjugation. Rather, their chieftains appear as being related to one another in a kind of political pecking order characterized by deference rather than domination. Thus Katuna of Bohol had a rice-producing supporter in Leyte but himself deferred to another Bohol rajah called Si Gala, and both of them were outranked by a Boholano with the fine name of Pagbuwaya who migrated to Dapitan in 1563, quickly established lordship over the Subanon there, and then joined the Spanish cause in 1565. Such peer relationships are still distinguished in Maranao as *pegawid* "support" and *pegawidan* "supported." There were also those who topped a sufficient network of vassals, *primus inter pares*, to become harbor princelings collecting anchorage fees in their own biliwicks. How much an armed cruiser paid in such fees in any particular port of call depended upon the relative ranks of the parties involved, and these ranks were established by the protocol of exchanging gifts. That is what Saripada Humabon of Cebu was evidently trying to establish after Magellan's *Victoria*, *Trinidad* and *Concepcion* fired off the heaviest guns ever heard in Philippine waters, and dropped anchor. When he was informed that his visitors were not going to pay harbor fees because their overlord was so powerful, he simply asked whether gifts were expected by three captains or if one would receive for all. And it is also what Rajah Sultan Mansur of Tidore was doing eight months later when he swore allegiance to

the King of Spain on the Koran, and then loaded the rotting *Trinidad* with so much spices her seams opened.

## SUMMARY

Planks from two ancient Philippine boats were discovered in Butuan in 1976-77, excavated by the staff of the National Museum, and dated to the fourteenth century by radiocarbon-14 technology. The boats were edge-pegged and plank-built — that is, their planks were hand-carved, fastened together by pegs in adjoining edges, and lashed to ribs by means of wooden lugs carved out of the planks themselves. This is a style of boat-building which once extended from Scandinavia to the South Pacific from the third century B.C. to the present time in a few remote islands.

By the sixteenth century, a highly refined plank-built warship had been developed in Southeast Asia which was called a caracoa in the Philippines. It was a sleek, double-ended vessel twenty to twenty-five meters long, with low freeboard and light draft, quarter rudders and tripod masts with square sails, a raised fighting deck amidships, and double outriggers with accommodations for several banks of paddlers. In contrast to Spanish galleons or Chinese junks, the caracoa was especially adapted for carrying warriors at high speed before seasonal winds through reef-filled waters and dangerous currents. It was used mainly for interisland trade-raids by harbor princelings with limited capital.

## FOOTNOTE

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2. Huang Shu-ching, *Fan Shu Liu K'ao* (1736), quoted by Ling Shu-sheng, *Ming-Tsu-Hsueh Yen-Chiu-Suo Ch'i-k'an* (*Bulletin of the Institute of Ethnology*) (Academis Sinica, Taipei), Vol. 27 (1968), p. 3.

3. Wang Ta-yuan, *Tao I Chih Lueh*, chap. 45.

4. Anon. *Relacion* in Isacio R. Rodriguez. *Historia de la Provincia agustiniana del Smo. Nombre de Jesus de Filipinas*, vol. 13. (Manila 1978), p. 463.

5. Antonio Pigafetta, *Primo Viaggio intorno al Mondo* (MS 1522), text in Blair and Robertson eds., *The Philippine Islands, 1943-1898*, 33: 224.

6. Chang Hsieh, *Tung Hsi Yang K'ao*, ch. 5.

7. *Ibid.*

8. Chao Ju-kus, *Chu Fan Chih*, Part I: *P'i-she-ya*.

9. Francisco Combes, *Historia de Mindanao y Jolo* (Madrid 1667), 2nd ed. Pablo Pastells and W.E. Retana (Madrid 1897), pp. 70-71.

10. Francisco Alcina, *Historia de las Islas e Indois de las Bisayas*, MS 1668, cap. 10.

11. Combes, *Historia de Mindanao y Jolo*, pp. 70-71.

12. Anon. *Relacion*, p. 463.

13. Antonio Galvano, *Tratado dos descobrimentos antigos e modernos* (1563), 3rd ed. (Oporto 1731), p. 278.

14. Alcina, *Historia delas Islas*, cap. 9.

15. Francisco Leandro de Viana, *Memoria* (Madrid 1765), translated in Blair and Robertson, 48, p. 301.

16. Anon. *Relacion*, p. 467.

17. Lou Yao, *Kung Kuei Chi*, chap. 88.

18. Miguel de Loarca, *Tratado* (MS 1582), text in Blair and Robertson, vol. 5, p. 140.

19. Letter from Fray Martin de Rada dated Calompit, 16 July 1577, in *Nouveau Journal Asiatique* 8 (1831): 377.

20. Loarca, *Tratado*, p. 134.

21. Antonio Galvano, text in Hubert Jacobs, *A Treatise on the Moluccas* (c. 1544), probably the preliminary version of Antonio Galvano's lost *Historia das Moluccas* (Rome 1971), p. 41.

22. Hernando de los Rios Coronel, *Memorial y Relacion* (Madrid 1621), translated in Blair and Robertson, eds., *The Philippine Islands*, 19:218.