

The Ingenious Filipino Boat

By FR. Gabriel S. Casal, Eusebio Z. Dizon, Wilfredo P. Ronquillo, Cecilio G. Salcedo
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Skill and creativity have seen the people of the Philippine archipelago through many difficult situations. About a thousand years ago, these were the very same talents they used to succeed in a flourishing maritime trade with other Asian countries. Their close affinity with the waters around them help improve their seamanship and boatbuilding skill, placing them on equal footing with their Asian neighbors.

This also earned them due notice from season European and Asian voyagers, as well as their chroniclers.

Actual maritime trade records dating to as early as the 13th century have been found. Chao Ju-Kua's work, *Reports on the South Sea Barbarians*, completed in 1225, gave a detailed account of maritime activities in the Philippines during those times. Wang Ta-Yuan, another Chinese chronicler, made similar reports in 1349. The most detailed description, however, may be found in the accounts from Francisco Alcina's *History of the Visayan Islands* of 1668.

Early boats of the Philippines



The front end of a Butuan boat or balangay, made of wood with wooden pegs, from 1320 A.D.

The discovery of the *balangay* boats in Buturan, Agusan del Norte in the late 1970s served as further testimony to the ingenuity of the early Filipino.

What were the *balangays*? These were the first wooden watercraft excavated in Southeast Asia. When first announced to the media in 1977, the find was described by the National Museum of the Philippines using Antonio Pigafetta's early 16th-century Italian spelling "*balangha*" for "*barangay*", a term which has been adopted by the Philippine government as a name for the smallest of political units. This was perhaps in deference to the unique brand of unity evident among the builders of these boats.

There are nine existing *balangays*, three of which have been systematically excavated by National Museum archaeologist, with others still waterlogged in specific sites in Butuan City. Keeping the remaining boats *in situ* has proven to be the best way to preserve them, while they await eventual excavation.

The first boat, now preserved and displayed in a site museum in Libertad, Butuan City, had a carbon-14 date of 320, while the second boat, which has been transferred to the Maritime Hall of the National Museum in Manila, was dated to 1250. The third boat remains in a conservation vat at the Butuan Regional Museum, undergoing preservative measures.

The *balangay* was basically a plank boat put together by joining the carved-out planks edge to edge, using pins or dowels. The planks, which were made from a hardwood called *doongon* in the Philippines (*Heritiera littoralis*), were fastened together every 12 centimeters long, which were driven into holes on the edge of each plank. On the inner side of the boat the planks were provided, at regular intervals, with raised rectangular lugs, carved from the same plank, through which holes were bored diagonally from the sides to the surface.

Rib-like structures made of lengths of wood were then lashed against these lugs to provide a flexible bulkhead, to reinforce and literally sew the boat together. Cordage known as *cabo negro* (*Arenga pinnata*) was used for the purpose. The hull, measuring about 15 meters long and 4 meters wide, was ordinarily semicircular in cross-section and with no marked keel. Provided with huge outriggers, the boat was propelled either by a sail or by paddling. The boats were finely manufactured without any blueprints, using a technique still employed by the boatmakers of Sibutu Island in the southern Philippines.

There is no basic difference in the technology of boatbuilding seen in the first two dated *balangays*, suggesting the stability of this construction technique over the last 900 years. The third boat, which was recovered in 1986, likewise exhibits the same mode of construction. This is a style of boatbuilding which was once popular from Scandinavia to the South Pacific, from the 3rd century B.C. to the present time in a few remote islands.

The master shipwright selects his tree

Noted historian William Henry Scott elaborated on Francisco Alcina's account of boatbuilding and seamanship in the Philippines by describing the basic methods of constructing plank-built boats in detail.

A master shipwright was called a *panday* a title he shared with other craftsmen such as iron-workers and goldsmiths. The *panday* went to the forest with his ax, a straight adz called a *dallag*, a curved one called a *bintong* and a spoon-bit about 20 centimeters long with a wooden handle called a *lakob*. He then selected his tree. *Lawaan* was preferred because it is a strong hardwood which grows large enough for a canoe 120 centimeters wide to be hewn from a single trunk.



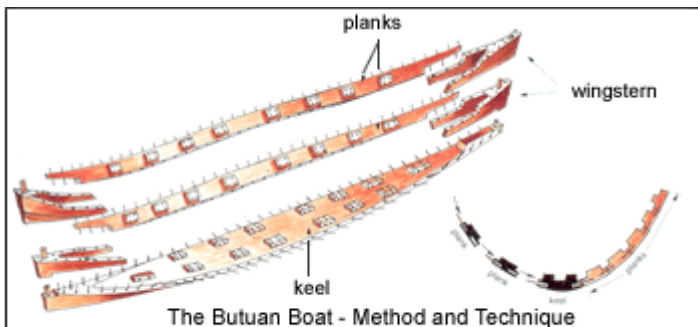
Boat Building: A natural consequence of an island and maritime culture.

In the Philippines, tropical trees generally have a decayed center – the Visayans call it *bokag* – caused by a fungus infection which enters through the root system and eventually rots and splits the trunk. The center therefore had to be rejected, though the two halves could be solid timber if the tree was carefully selected. The other 4 or 5 centimeters were also rejected as being *aramay* – soft spongy or fibrous – and thus vulnerable to insects. Since the tree was too large to be moved conveniently on the ground, it was felled in the exact position the *panday* wanted. He then marked out straight lines along it with a cord called a *kutur*, and set to work.

A boat emerges from the wood

The entire outer form of the hull was carved into shape before hollowing out the inside – sharp at the bottom like a keel, pointed at both ends, and V-shaped, with sides no thicker than a board. The adz was sometimes used like a chisel, hammered with a mallet called a *pakang*. To check the progress of the thinning process as he worked, the *panday* frequently bored holes through the sides with the *lakob*, holes which would later be plugged watertight. Then the interior was hollowed out, leaving the necessary projections or *tambukos* for the ribs or *agara*. A good *panday* could make such a hull, 9 to 10 meters long and 1-1/2 meters wide, working by himself, in eight to ten days.

Such a boat carved out of a single piece of wood was called a *baroto*, what the Tagalogs called a *banca*. Some were small enough for one man to lift. It was impractical, however, to build larger vessels on dugout canoe bases, so those above 10 meters in length were constructed on square keels as edge-pegged, plank-built boats. This was the size and style known by the name of *barangay* or *balangay*, although the Tagalog version was sewed or laced, not edge-pegged.



Preparation of the keel, wingstern and planks

Putting the pieces together

The flat or round-bottomed Butuan boats, lacking either a real keel or a canoe base, did not fit any of these categories, though they were within the *balangay* size range. In addition, they displayed another unique feature: the center plank, which served as a keel, had two or three thin *tambukos* parallel to one another instead of the broad ones appearing on the adjoining planks, though these were of the same length and thickness.

In the absence of other known examples, a definite function has not yet been assigned to this special feature. It was possible that the plank-shaped timbers standing on edge may have been lashed to these *tambukos* to serve as a kind of interior keel, though these would have been cut out to fit the transverse ribs.

The shell was then left to season for a month or two, carefully elevated to avoid infestation by termites. When it was sufficiently dried out, the planks were removed one by one and all the broken pegs removed and replaced. Then the shell was reassembled in three distinct stages called *sugi* (matching), *os-os* (tightening), and *pamota* (closing).

Sugi was carried out with the use of a little wooden tool for making lines. It had sharp iron point 2 to 3 millimeters above a projecting tongue or lip, and was small enough to fit in the palm of the hand. After the planks had been put together again but not hammered tight, a carpenter with a strong grip placed the little lip of the upper edge of a board, with the point biting into the side of the board. Then he ran 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 reproduced whatever irregularities the original adzing may have left on the lower board.