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SAILING BOATS.

joined sent to L.B.W.A.

DRAFT.

Sailing boats of Western Sarawak.

new Year, 1965-66.

Original sent to L.B.W.A. for criticism

3. 1. 66

Printed in "Mariners Mirror" —

copy with pamphlets in boxes

Sailing boats of Western Sarawak.

Sarawak forms part of the southern shore of the South China Sea. The Sarawak coast lies between 1 E. and 5 N., and between 109 E. and 114 E. Cape Datu, at the western end, is about 400 miles east of Singapore and some 700 S.E. of Saigon.

The sea between these points is nowhere more than 50 fathoms deep and, like the North Sea, was once dry land. Tides run strongly along the coast and between these waters and the Java Sea: because it is shallow, the water is very quickly turned into a nasty chop by a squall, especially when the wind is contrary to the tide. Sudden, short, equatorial storms strike from the South and West during the "summer" months, and fierce storms lasting several days come from the North during the North-East Monsoon.

As usual in these latitudes, the barometer has a regular variation during the twenty-four hours for most of the year: and winds tend to die away when the sun is high, but Borneo is big enough to create off-shore and on-shore winds morning and evening, which are all the local fisherman normally needs. These breezes also served the tea-clippers of the last century, which would often have been becalmed for days, between the Sunda Straits and the China coast, had they kept to the shortest course.

There are sand bars at the mouths of the rivers, and the tides run fast. Cape Datu, and the two capes between the mouths of the Sarawak river are steep to the water and rocky, as are the few small islands in the bay; but the rest of the coast is lowlying, and consists of swamp behind sandbanks. The ten fathom line is about twelve miles offshore and much of the fishing is done within this line. The bottom is mud and sand, brought down the rivers by flooding ~~afterxix~~ and the heavy rainfall.

Boats for use in these conditions must be of shallow draft, capable of riding out a sudden squall, and easily driven under oars. They cannot, and do not need to, go well to windward: the tide is so strong near the river bars that, when it does not serve, the usual course is to anchor until it does. The largest boats now are about 36 feet in length over all. Formerly, and further to the East, much larger boats were built for trading: in particular, the sago-carrying schooners.

Malay boats have a dug-out keel, ~~made in the same way as an~~
~~upriver longboat.~~ A tree is felled and ^a suitable length of the trunk _^ cut: from this nearly a quarter is removed with the axe to make a flat side. The baulk is then set up on rough trestles a foot or two above the ground with the flat side uppermost. The flat side is then attacked with the axe and hollowed out. The hollowed log is spread out wider by putting in water, or letting the rain fill it, and heating it with fires lit beneath it. Spreader thwarts are forced in as the spreading and hollowing proceeds. It is a matter of nice judgment to decide at what point to stop the process: an attempt to get an additional half inch may result in a bad split and complete waste of labour.

The resulting "keel" will be twice ~~thx~~ as wide as the original diameter of the log; 2"-3" thick in the middle, tapering to about $1\frac{1}{2}$ " at the edges. The ends are tapered to meet the stem and stern-posts, and the ~~whole~~ piece is about 4" deep inside. The spreading of the timber has the effect of bending the ends upwards: this gives a fine curve to the line of the keel, so that the boat will float with bow and stern barely in the water. It also simplifies the making and fitting of the strakes. The keel-piece is really keel and garboard strakes made in one piece.

When any large pieces of timber are to be sawn, the work is usually done in the forest to save the labor of moving large baulks. Sawing is done on a scaffold and not over a pit. Green timber is in plenty for rollers, windlasses, and scaffolds, ^{whenever required; and the two hot stuffs work in even if it did not} ~~and a pit would soon fill with~~ ^{water} ~~water~~ in a rainy climate. The saw used is a larger version of

a carpenter's frame-saw, having a central beam with two end-pieces. The saw blade is stretched between the end pieces by twisting rotan cane (Calamus spp.) between the other ends of them. The blade is always set at an angle of about 30° to the frame: the skill needed for its use lies in keeping the saw-frame at the same angle to prevent it twisting and binding ~~in the cut~~, and to secure a straight cut of anything up to thirty feet. The angle of blade to frame allows an unlimited length of cut.

For boats, however, and where there is no shortage of timber, axe and adze are used more than the saw, but these tools will get no more than two planks out of one tree, and there is a deal of wasted wood in chips and shavings. Planes, saws, brace and bit and other modern tools are used, of course, but are not necessary for the construction of the hull. Much of the finer work can be done with a parang or bush knife, which always has a back-swept blade to give a glancing blow and cleaner cut. Much use is also made of the long-handled "penknife", which is used with the handle lying along the inside of the forearm, and by cutting away from the body against the forefinger.

When the keel-piece of a boat is ready, it is brought from the forest to the village and set up on stocks near the water. A rough shelter of palm thatch is made over it so that the heat of the sun will not crack or warp it by drying it too rapidly. As usual

where craftsmen are concerned, it may appear that nothing is being done at all, or very little, for weeks on end. In fact, of course, other work is going on elsewhere: treenails are being made indoors at home, other timber and spars are being prepared, sails and nets are being planned and made; and all the time the hull timbers are seasoning. Then, suddenly there will be a different keel laid down, and the boat that never seemed to grow has been finished as by magic and is away to sea.

The planking is built up first: floors, timbers, stem and stern-posts are fitted afterwards. The hull is of carvel construction and the strakes are joined one to another by edge-pegging. Corresponding holes are bored in the edges of the two strakes to be joined, hardwood treenails are fixed in one edge and the new strake fitted onto them. Strips of papery glam bark ~~xxx~~ (Melaleuca leucadendron) are laid as caulking before the strakes are joined: when construction is complete, any remaining crevices are filled with a paste made of damar powder heated in kerosine or kruin oil (resin, and an oleo-resin, obtained from Dipterocarp trees).

Fire is again used to bend the wood to the required shape. A ~~stake~~ is set between wooden posts driven into the earth or sand, bent a little by force, and held firmly by doubled rotan cane twisted by wooden spikes. It is then smeared with nipah sugar (made by boiling down the juice obtained by tapping the flower of Nipa fruticans, a common stemless estuary palm); and a fire is built to heat the wood without charring it. This softens the wood and allows it to be bent and twisted to the desired shape, but slowly. ~~By~~ Steaming is never employed.

Strakes are sprung into place on the hull and held there by temporary timbers, set inside and out as clamps; the strain being got by twisting rotan right round the hull. By the time the top strake is in place, some of the floors will be in and timbers will be ready. These are grown to shape, although pieces sawn from straight wood may be used in small boats ~~which are~~ intended mainly for river work. The pieces are laid so that they overlap on the lowest strake and the edge of the "keel": they are fixed to the hull but often not to each other; indeed, they sometimes do not even touch their partners. All is done with treenails, and no metal is used at all. Sets of floors and timbers are always of an odd number or the hull will be "closed" or "shut in".

The boats are double-enders, with a little more rake to the bow than to the stern. The stem and stern-posts are each of one piece, rabbeted to take the ends of the strakes, so that there are no aprons: breast-hooks and deadwood are the last to be fitted. A small deck is often built at each end, partly for extra strength and partly to protect such things as firewood, earthenware water jars and the portable fireplace. This last is a box, or half of a four-gallon kerosine tin, filled with clay. Thwarts are set low near the bilge, except the one that serves as the mast-partners, and they hold the flooring. This may be of planks but, in a fishing boat, most of it will be made of slats of bamboo or nibong (Oncosperma filamentosa) woven with ~~xxx~~ creeper so that it is easily rolled up to allow baling or the stowage of fish.

A boat of four fathoms, 24'-25' LOA, would be 20'-21' LWL and would appear of a very slightly V-shape in section: this lessens rolling and enables it to ride over seas rather than through them.

The depth from sheer to keel would be less than three feet and the greatest beam would not exceed six feet. The "keel" will have taken a curve in the spreading process, so that the boat will lie on the beach or the mud of a creek on its mid-section only, the stem and stern being clear by a foot or two. Boats are tarred, or painted, (outside at least) against teredo, unless one of the very hard and heavy timbers has been used, when no protection is necessary. Big boats, such as trading bandong of 36 foot and more, are very often given clipper bows, with scroll work and vestiges of a carved figurehead. They will be provided with an open ended deckhouse with palm thatch ~~in the sides~~ right across the boat, leaving no side decks. This may be only eight feet long, or it may extend from the mast aft to leave only a small cockpit for the helmsman. The thatch will be strengthened inside by planks under the ridge so that the crew may jump up and run across the top ~~when~~ without falling through it. The inside will be impassable, because it will be full of passengers or deck cargo.

The smallest version of this deck housing is the covering of a ferry-boat. These boats are small, ~~balok of 12' x 22'~~ 12'-20' long, with plank sides and thatch roof over the whole boat except ~~3~~ about 4' of the bow. From here the boat is rowed, and a wooden rod and a cord run back aft to control the lifting quarter-rudder. These ferries ply in the towns and about the rivers over quite long distances, but they do not sail.

There are four main types of boat: the bandong for trading, which is less common than it used to be; the bandong peranto, for drift net fishing (ranto) and any other method suitable to the season, the tide and the locality (24'-36' in length); the

slim, fast peleleh, or bandong temuai, of small size; and the now very common balok (pronounced bay-lok). The peleleh has less beam than the others; and a taller, more pointed and raking stem and stern-post. The balok is distinguished by ~~x~~ snub ends stopping just below the sheer ~~strake~~. In small boats it is often the practice to make a detachable ~~sheer~~ top strake to give more freeboard at sea and greater convenience for work in sheltered water. The ~~strake~~ strake is fitted with very short timbers: ^{these are} pierced for pegs with which it is secured to the hull timbers.

These boats are all rigged alike and in the simplest fashion. A single pole mast is stepped in one of the floors about a quarter of the boat's length from the bow: it passes down through a hole cut in a stout thwart but is not wedged tight. The wood preferred for masts is bintangur, especially the yellow kind, Calophyllum obliqui-
nervium (family Guttiferae). It is a tall, slender tree, yielding a straight pole, light and strong. Masts are rarely, if ever, painted or varnished. Another kind of timber, penaga, (C. inophyllum) is a squatter tree yielding a hard, tough wood used for timbers and floors grown to shape.

There is no standing rigging except on the larger trading vessels. A single sheave at the masthead takes the halyard: when the sail is hoisted, the fall of the halyard is made fast to one of the boat's timbers to windward and so serves as a shroud. Headsails are not normally worn and, indeed, are not often made. A single lug-sail is laced to a yard, preferably of brus (Bruguiera cylindrica -- a mangrove) or some other timber which is stiff and yet of small size. The yard is hoist by the head until it is nearly vertical, and the throat is bent to a traveller consisting of a cane grommet: there is

no downhaul.

The boom is a bamboo cut with a notch at each end to which the clew and tack are bent: there is no lacing to the boom. A piece of rope, or the rest of the fall of the halyard, is hitched to the mast and made into a bowline for the notch of the boom to rest in. There is no separate clew earing: the sheet is bent to the clew and to the boom end. There are no cleats, and no sheaves except the one at the mast head. The fall of the sheet may be secured ~~to the strong~~ aft to the rudder post ^{if} ~~when~~ it is long enough to let fly ^{in safety in case} while still secured.

The sail is a dipping lug with very little angle at the throat. It is possibly derived from the lateen, by imitation of European ships' boats. The first Rajah of Sarawak, Sir James Brooke, arrived on this coast in his own topsail schooner "Royalist", R.Y.S., and ships like H.M.S. "Dido", Sir Henry Keppel, with their boats and crews were familiar only three or four generations ago.

Cloths are laid parallel to the leach, and the sailcloth used on all except the largest boats is a cheap cotton drill. A light boltrope is sewn to all edges of the sail. A few people preserve their sails with tannin extract, but the majority leave them white to be more easily seen from a distance and so to serve as ^{an automatic} ~~A~~ distress signal when necessary. The tannin is readily available from a number of plants, and particularly from the bark of Bakau, swamp trees of Rhizophora and Bruguiera species. When under way the sails appear as triangles point downwards, because the yard is set nearly vertical and both sail and boom are light enough to lift easily. Mast and spars are between 20' and 25' long for a 24' boat, and will stow easily for rowing or tending nets.

Reefing is simple with such a rig and consists of lowering the yard, lifting the boom from its mast loop, rolling the sail on the boom, replacing the boom-end in its loop and getting under way again. Heaving to in heavy weather would entail loosing the boom and stowing it, furling leach to luff, lowering yard, and perhaps lifting out the mast and laying it in the boat as well. In the unlikely event of ^{a Malay} being caught unawares, the boat could be saved by letting go sheet and halyard.

The rudder is made from a single piece of heavy wood about 3" thick. The post is five feet long ^{with} ~~and~~ the blade taking nearly half that length and about 18" wide. The top of the post is pierced to receive a line with which it is secured to a short strongpost ~~not~~ stepped through the after-decking: the rudder hangs over the lee quarter and is secured to the side by another line passed round ^{it} ~~and~~ through two holes in the top strake.

The tiller is simply a two foot stick tapered square, to be jammed in a square hole cut through the rudder post. Putting about is clumsy with such a rudder, because it must be unshipped and secured again on the other quarter, whether or not the sail is also dipped and the halyard reset to windward. Nobody seems to carry two rudders.

No ballast is used except in the bigger boats. Very occasionally a board is used to get the benefit of human ballast, but I have only once seen this.

Anchors are still made of the old-fashioned Admiralty pattern with a stock, but small boats do not carry them: common anchors are wooden antler-like hooks (similar to the haft of an adze) weighted with a stone, a rough mushroom made with wood and cement or a bit of iron plate, or a grappling hook with four small home-made flukes.

Although outboard engines are now coming into use, and light diesels on bigger boats, rowing has by no means been ousted. Fishermen commonly row many miles at sea and, before the last war, fish was carried to the capital, Kuching, by rowing. The journey, with the tide, took about four hours in a light boat; just twice as long as a motor launch.

The oarsman stands and pushes in Mediterranean fashion. The oars are long, with long, thin, straight blades: the hand hold is a fitted T-piece. The oars are slung by soft twisted cord to the forward side of a thole pin: this is set in a block of wood inside the top strake. Oars are "feathered" through the water and not above it. The method has several advantages: you can see where you are going; you can go in choppy water and keep up the movement almost indefinitely. Shoulder and wrist muscles are used most: for the rest, it is a matter of using your own weight to rock on one foot and shift the other back and forth at each stroke.

Yet this way of rowing only came into use in the latter half of last century. Before then, boats were paddled, as they still were further East, at Bintulu, twenty years ago. It is only the Chinese who scull ^(yuloh) with a pliable, or bent, sweep slung over the stern.

This brief account would not be complete without some mention of other boats in use on the coast of Sarawak.

The Henghua Chinese fishermen naturally use boats derived from patterns to be found in China. They are known as kotak and are chiefly used for drift-net fishing. They are built upon a true keel with a broad raking transom and an apron bow; so that they are prams. They are usually 30' or so in length but have a much greater beam than the Malay boats.

The kotak is carvel built, but the strakes are joined by edge nailing through notches cut in the upper strake. Floors and timbers grown to shape are used and construction is heavy. The hull is decked on a double hogsback: the two beams of this are three or four feet apart and the hatches are built between them. The side decks are very steep and two heavy bulkheads are built amidships to serve as a fish well, so that the hull is immensely strong. The forward part is used for stowage of nets and the after part for crew accommodation. Nowadays, the after part also houses a Japanese diesel engine and the sails have gone.

Sailing kotak are not often seen now, but it used to be very usual to see a fleet of thirty or more sail putting to sea together. Then, the rudders were of the lifting variety and perforated; the bows had large bulbous eyes and leaping fishes carved on them; the sails were of the familiar "junk" pattern with bamboo battens. I believe dagger-boards were used occasionally, but I have not seen them: many had a hard chine aft, and they were all much better to windward than the Malay boats.

Only the flimsiest palm-leaf shelter is erected on the deck because, as they say, the whole thing blows clear away in a storm so that the boat and the two crew are the safer for it's loss.

Now that sail has almost entirely given way to diesel, the hull form is changing and becoming more rounded. Under water the hulls look much more like Malay boats in section. The keel extends aft under the rake of the transom to protect the screw and receive the foot of the rudder post. The hulls were always different from those used on the China coast, being adapted for local conditions to have a shallower draft and a much flatter sheer.

Further East, from the Sadong River to the Rejang, the boats have spritsails. The bow and stern are different in style, being finished with a ~~flat~~ short level board instead of a sharp point. The sails are very long in the foot and have an almost square aspect.

A notched bamboo boom is used: the thin outer end is set in a loop at the clew and slid outboard; the butt end is set by its notch into a cane grommet provided for the purpose on one of the ^{floors in the waist.} ~~midship timbers.~~

The boats are known as prau pengerei from their use in prawn fishing, prau being the common Malay word for boat and pengerei one of the fishing methods used.

The Melanau boats of the Rejang delta are fitted with two masts for the main fishing season and seem to be a cross between the spritsail boats just described and the barong panau of the coast further east still. The barong are prams, with two masts carrying deep square sails on yards and booms, the sail on each mast being set as a dipping lug. They are used for a method of fishing known as panau, where fish are driven under artificial shade and caught in a dipnet which is worked by rolling the boat. The boats are fast and can ride breakers over a shallow bar, which is the only kind of harbour entrance they have on that part of the coast.

The sago schooners which formerly came from the Melanau coast were sometimes large, perhaps up to 100 tons burthen, but the only one I have seen in use under sail was small, with a length of only forty feet. They were built on European lines of 150 years ago, with clipper bows and very long bowsprits, straight keels and counter sterns. They were distinguished from other schooners by having masts of equal height, wooden slats instead of ratlines on the shrouds, and a curious

manner of reefing.

The sails were laced to the booms in the usual way but were bent to traveller bands on the gaffs; the gaffs were standing spars and not readily lowered. For reefing and furling, the peak of the sail was hauled in to the throat, just like a window curtain, leaving only the lower triangle of the sail set. To set the sail again, the out-haul on the gaff was used to spread the curtain again. For furling, the sail would be reefed in this way first; then the clew and lacing cast off and the sail all furled to the mast.

A study of the Sarawak Malays has been undertaken and part of the report has been published in the Sarawak Museum Journal by the Curator, (Vol. XI, 23-24, 1964). This describes in detail the history, society and economics of the people themselves. Among other things it shows how great a local knowledge they have, and how deep, almost instinctive, ^{an} understanding of tides and seasons. It also makes clear the equal status enjoyed by the women, even though they are Muslim.

Until recently, the Malays placed offerings at the mouth of a river at the beginning of each season. In the same way, Henghua fishermen visit the seaside Temple of the Three Buddhas where, I imagine, they look chiefly to the blue clad Goddess of the Sea who has an honoured place there; and the Melanaus go down in crowds to bathe ceremonially in the sea as soon as the winter storms are over.

The Dayaks upriver still call the Malays Orang Laut, People of the Sea; but the Malays do not like the name, perhaps because they may equate it with the name of a primitive and piratical folk who once lived on Singapore Island. But they are people of the sea still and the name simply recognizes their great skill, knowledge and energy in which they can rightly take pride.