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Building a classic Malay junk schooner:

The NAGA PELANGI project story:

by Christoph Swoboda

I am a German, born in the countryside, and it was a twist of fate, that turned me into a junk aficionado. Having never sailed before, I was looking to hitch a ride in order to see what sailing was all about, then I met a 30' (10 m) junk-sloop of the BEDAR type in 1979 in the harbour of Benoa, Bali. The BURONG BAHRI, (Malay: *Bird of the ocean*). Jerry, her Skipper took me on a memorable two month cruise through the South China Sea. Without an engine we were at the mercy of the often slack winds, but finally we sailed into the harbour of Kuala Terengganu (*kuala* = Malay: river-mouth), the provincial capital of the state of Terengganu on the east coast of peninsular Malaysia.

There I met the great boat builders that live on the small island of Pulau Duyong, situated in the estuary of the Terengganu river. These Malay craftsmen still cultivate a rare boat building technique. Since I had fallen in love with that type of boat on the journey, I placed a contract with Che Ali, a well known boat builder, to build a 45' (LOD) Bedar for me, one of the two types of junk schooners traditionally built there.

With this boat, the NAGA PELANGI (Rainbow Dragon), launched in 1981, I sailed the waters of South East Asia for many years, getting acquainted with the intricacies of the Chinese lug sail and learning how to navigate. The rig of that boat is a copy of what the locals have used for hundreds of years.

By 1985 I felt comfortable enough with the boat and my skills to set out on a major journey: Into the Sunda Strait, a short stop at Xmas island then heading for Chagos. When we arrived there, we had developed into deep water sailors. The NAGA PELANGI sped downwind at a speed we never thought possible. On that course, being on a broad reach or running with winds blowing up to 30 knots, the beauty of the junk rig was unfolding: the sail was handling with ease, a solid board, catching all the wind there was.

The strong trades of the Southern Indian Ocean pushed us further to the Seychelles and

then to Zanzibar, on the East coast of Africa. From there we took the northern route, facing the ordeal of having to work up the Red Sea, by far the worst stretch of ocean we ever came across in our circumnavigation. Endless days of tacking against strong northerly winds, beating towards the reefs on the east coast or



the reefs on the west coast at an angle one can't really call inspiring, was nerve wrecking and made us realise the limitations of our junk sail and our traditional hull. Without the help of our good old engine I think we might have given up our attempt to reach Suez.

From the Med. it was a piece of cake, downwind to the Caribbean, through the Panama Canal in 1988 and running to Hawaii, where





The Bedar has Arab/Indian elements



The Pinis shows a French influence

**Right:
A 52' Pinis, the
Jun Bathera**



the boat stayed for many years. On the last leg, in January of 1997, just SE of Palau in the western Pacific, we finally got what we had never asked for - more wind than we wanted. We had to hove to, in order to wait for Hurricane Anna to build up and pass by. Still, it was a very encouraging experience: laying hove to, the classic Malay hull rose gracefully above every wave and the 6 panels of our junk mainsail made it possible to offer the storm the exact amount of canvas necessary to push the bow into the wind.

Now, two decades later, after having launched the boat and three years after having sold her, I am back on the island that produces these marvellous boats. The old Che Ali is no longer around, but his son Hassan is now in charge of the yard and together with his brothers and workers he is continuing a tradition that reaches way back in time.

As the centre of the spice trade, the Malay Peninsula became a melting pot of civilisations: Indians and Chinese, Arabs, Indonesians and others, they all arrived in their pursuit of nutmeg and clove, pepper and the other spices, the *Bugis people*, sailors from Celebes (Sulawesi, Indonesia) brought from the Molucca islands. When Columbus set sail, he wanted to find the place where all those riches came from and found America instead. When the Portuguese finally arrived at Malacca in the 16th century, it was the biggest and busiest port on earth, just like Singapore, a little down the coast, is today.

The Malays as great seafarers and pirates were blending the design elements of the different boats of the various civilisations that visited them to create their own vessels. The two "*perahu besar*" (Malay: big ships) of Terengganu, the PINIS and the BEDAR are the result of this cultural interchange.

The Pinis (French: *pinasse*) shows French influence, while the Bedar has Arab/Indian (dhau) elements. Jib and bowsprit of the two are of western origin. The sails of both are a modified Chinese junk rig: The rigging with the elaborate sheet system, the parrels, the snorter and the lazy jack-system, have all been documented in Chinese literature for over 2000 years!

Since the 60's, "*orang putih*" (Malay: white people), "westerners", kept coming from all corners of the globe to have their "dream boat" built by these craftsmen: Some of them chose the traditional junk design of a Pinis or a Bedar, while others brought the plans of European/American boats to have them built. When I first arrived there, some traditional sailing boats were still operating and the boat building yards were thriving. Now the Malays have stopped building sailing boats for their own use altogether and only few fish trawlers are built. Rising timber prices and diminishing

resources of fish forced one after the other yards out of business, so today there are only 5 left operating, this is where hundreds of people earned their "rice" just 20 years ago.

Like the *Chengal*, the timber used for the construction, their boat building art, though unique, is dying out: The planks are bent in open fire and then joined with ironwood dowels (Malay: *basok*) set 2" apart. Neither plan nor frames, only eye and knowledge of the master determine the shape of a ship's body: the frames are installed into the finished hull! There is no European style caulking hammered into a groove between the planks: the planks are assembled edge on edge with no groove in between them. The bark of a tree (Malay: *kulit gelam*) is pushed over the tapered dowels, sitting in the fitted plank. Then the new plank is hammered home with about a hundred dowels snugly slipping into their assigned holes! This creates a hull as if it were made in one casting, where the planks are separated by a 1-2 mm layer of the kulit gelam bark. This vegetable caulking keeps the boats dry for their lifetime.



A new project to build a 70' Pinis

But now, my friends of Pulau Duyong have a new project in the pipeline: we are going to build a 70' Pinis. In May of 2003 the 40 tons of Chengal wood, necessary for the construction were delivered to the yard and are currently waiting to season according to the tradition. Chengal, with the scientific name *Neobalenocarpus Heimii*, family of *Dipterocarpaceae* is an indigenous Malaysian wood, growing between 5th and 8th latitude of the Malay peninsula only. It reaches a height of close to 200 feet (60m) and has a breaking strength of several times that of oak, both radially and horizontally. It's high flexibility makes it an ideal boat building material for plank bending. Like Teak, it contains preservative compounds that protect the heartwood, termites cannot eat it and even under exposed conditions the timber can last about a hundred years. Fully cured, Chengal can no longer be bent. Starting a boat building project, the logs have to be milled, then the planks are placed in the bright sun to dry for one year. Then construction must begin.

Since the planned boat will not be a sailing

freighter, but a pleasure craft, we intend to modify the lateral plan. More emphasis is given to enhance the sailing ability and less to achieve a maximum loading capacity. That is why we will add a lead keel to a slimmer but deeper hull, which will hopefully give us more stability and a better windward performance. When ready, we intend to sail the old "spice route", where *Sandokan*, (Sindbad the seafarer) had his adventures many hundred years ago. The Construction will commence in spring of 2004 and we expect the boat to be launched by early 2006.

You can visit the project website at:

www.naga-pelangi.de - Where you can see the progress of the work as it is monitored in PHOTO DOCU. This is an attempt to utilise the high-tech tools of the IT-age to bring the ancient technologies still practised by some islanders to a wider public.

One of the most conspicuous features of the Terengganu boats is their junk sail. The dragon wing type shape is different from the Chinese or other traditional junk sails and is very different from the western type. The yard is extremely long and the masts have shrouds and running stays.

In the "old days", the material that the sails were made of was not cloth, but a very strong kind of mat, woven from tropical leaves, like the mats they used to sit on or the material they made baskets from. The sailors did not want this material to take the strain of the fully bamboo (or wooden) battened sails, so they built a framework of rope, the "spider web":

They hoisted the empty yard and attached a rope at three points at roughly equal intervals along the yard. The first batten (from the top) is fixed to this rope at a distance of a little less than the panels width, then the rope goes down, catching the next batten and so on. Finally the whole "sail" is up without any cloth in between the battens. They check the shape they want and when it is perfected, they attach the mats in between the battens in such a manner, that the strain of the heavy sail is supported by the "spider web-ropes" not by the "cloth". This technique allows every panel to develop a "belly" in between the battens, which is an advantage sailing on a reach or downwind.

To prevent the yard from falling clear of the mast, when reefing, they used a "snotter": About one foot aft of the halyard pulley which sits a little forward of the centre of the yard they attach a block from where a rope starts around the mast and back through the sheave and down. When the yard is in the desired position, the hauling of this snotter pulls it close to the mast. The sail can be reefed down to one or two panels and still hold some shape.

The "standing" parrels of the mainsail battens

embrace the mast rather close, just allowing hoisting without jamming, but they don't let the battens slide to the other side of the mast when reefing. The "standing" parrels of the mizzen battens allow the sail to be shifted far forward. Sailing downwind the sail is effectively a square sail, with similar amounts of canvas on either side of the mast. On other courses, the centre of effort can be altered a lot by shifting the Topan sail forward or aft, balancing the boat on any tack.

When the old Che Ali, who had been a sailor himself, designed our sail plan in 1981, he drew it in the sand. When I asked him about the laws that govern the shape, he explained, that all is based on the length of the keel, which determines the length of the mast, which determines the length of the yard... It struck me that he worked with very simple measurement ratios. And then he closed one eye and stepped back as far as he could, slightly tilted his head and said that it looked good. It was good.

Seeing the different looks of traditional junk sails of various origin I conclude that each junk sailing population shaped their sails according to their sense of aesthetics and adapting it to the local environmental conditions. Since the Malays for example built two types of junks that vary only little but in size, it does not seem overly difficult to hand down the knowledge from generation to generation by word of mouth, once it is established, without needing a written plan or elaborate mathematics.

Today there are very few people left, that could design a typical Terengganu shape sail, but if the people there see a sail on a model or on a boat, they can say if it looks "right" or wrong. I fear the knowledge of why it has to be this way or the other, is already lost, but I try to preserve it in my drawings/pictures.

Perhaps with your help we can keep the interest in the old arts and the ancient knowledge alive that helped people throughout the world to brave wind and waves and reach new horizons.



Choosing logs from the mountains of Chenggai for the project.

The construction team....

