



AMATEUR BOAT BUILDERS' ASSOCIATION

SEPT/OCT '03

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Contact any of these four people for clarification of association activities.

PRACTICE AND THEORY ON "THERA"

On Tuesday 29th July we were very fortunate to have as a guest speaker, John Fitzhardinge Jnr, talking about his rebuild of the famous yacht, "Thera". Thera was always a very quick boat from her original build date in 1911 until well into the '50s and even now is no slouch around the buoys. She was actually up on the RPYC Hard that night, so we all trooped out for an early look at her but more of that later.

John described in the course of his talk the early history of the yacht and he knows a lot about it, backed up by numerous old photos. She was built in Victoria in 1911 by Charles Peel and originally raced from The Royal Brighton Yacht Club on Port Phillip Bay. She was a low or unballasted centre boarder, beamy and shallow, very much in the North American mould and relied heavily on crew as ballast. This approach drew the ire of many other yachties of the day, most of whom raced English based plank on edge designs, no doubt with plenty of ballast. At 36' between perpendiculars, with a gaff rig and long overhanging boom she could beat 50 footers of the

more traditional design in races from Melbourne to Geelong, although many other competitors felt that her design approach wasn't quite cricket, old chap. (The Americans used the same ideas to retain the America's Cup through much of its history up to WWII)

In 1934 she was sold to Perth owner, Peter Plowman, who had John Fitzhardinge Snr skipper her on the Swan where she was unbeatable. The ownership changed to Bill Lucas in about 1939 but the war kept Bill busy with Catalinas at Crawley until 1945, when racing resumed. Thera continued her winning ways although Bill was a little more commercial in his approach and managed to winkle good publicity for his cycle business out of his yachting successes. Thera was Cock of the Swan from 1946 until 1954 when she was purchased by John snr, while Bill acquired Panamuna, a much bigger boat. John snr decided it was time for sailing to become more comfortable and so replaced the open cockpit with a small cabin and the centre board with a deep, ballasted keel. She was still a good yacht, but out-paced by

bigger ones such as Panamuna. Later still ownership passed to Aub Berryman and a couple of later owners, the last of whom left her unprotected in the weather for about ten years, by which time she was badly hogged and some planks were literally falling off. She was held by the Maritime Museum for a time but the Fitzhardinge family acquired her again in a very sorry state about seven or eight years ago.

John jnr set out to rebuild her at his works in Dongara and has spent about seven years on the project. At first the job must have seemed enormous because so little of the original remained, and was badly out of shape. Fortunately the main cross section was preserved in some sawn frames which were added during the deep keel refit. A piece by piece restoration might just have been possible but extremely tedious and expensive, so John elected to recreate the lines with computer and build what was really a new boat in modern strip plank, glassed inside and out. That is what we got to look at on the hard that night (fortunately the area was fairly well lit).

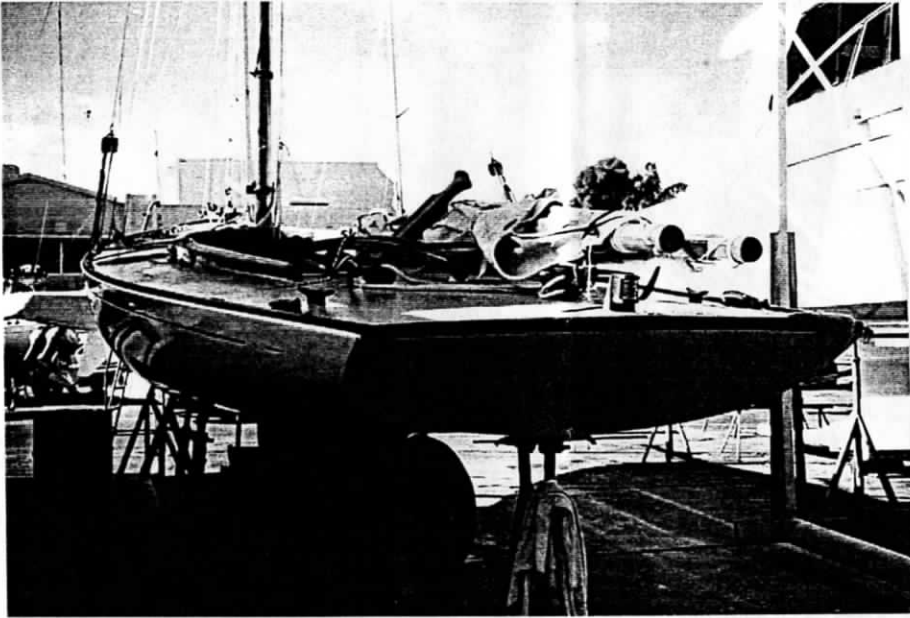
We were told that the transom, keel and a few NZ kauri planks were the only original pieces of timber still in her. The hull was strip planked, mainly in Western Red Cedar, upside down over particle board frames, lifted off and glassed inside and out with double bias cloth in epoxy. Some ribs in Airex foam were added and built up with glass, giving a hull, I should imagine, far stronger than the original. Incidentally, during the rebuild John was offered the original name board which now has pride of place in the open cockpit. She's still a wide, flat boat of course (9' beam on 36' loa), and the canoe hull probably draws about 2' so there's a foot or so of deep keel which incorporates the centre case, the pivoting centre plate (32mm aluminium) and no less than 1650kg of lead ballast - so the crew don't have to lean quite as energetically as the photos on Port Phillip suggest. All up weight is about 3600kg, meaning a healthy ballast ratio of about 45%. Draft with the plate down is 6', but the ballast is not at the bottom of that, of course.

The spars were made by Chris Bowman, a 'Couta boat restorer and builder himself, in his works in "C" Shed a couple of years ago. They're hollow in Oregon and the mast looks thicker than the original from Victoria so I guess they didn't use hollow spars in 1911. It's still gaff rigged, as you would expect, with a reasonably long bowsprit, but the main boom doesn't extend past the transom any more. The sails were made by Graham Hill in a soft Dacron that looks pretty much like the original cotton and like cotton they seem to be blowing into (or out of) shape a little. Certainly John thinks the main is fuller than it used to be. One gets the opinion that his favourite in the wardrobe is the big balloon jib, copied like most of the rig from original photos, but since they dropped it in the water twice in a race the previous Sunday, there's now a rotary furler sitting on the bowsprit to make sure it doesn't happen again.

John can only guess at the original weight but it may well have been higher than at present. Early photos show her taking a fair amount of water over the lee gunwale but apparently none comes in now which makes life much easier on board, especially for the baler boy. Most of the bronze fittings had to be cast to John's patterns in Perth, and were finished and polished in Dongara. There's a 15hp Nanni diesel driving an off-centre folding prop discretely covered by a tidy box just aft of the centrecase. The overall presentation of Thera is excellent, from the colourfully laminated tiller, past the neatly capped cockpit coaming, all the way forward.

However, John had a warning for anyone interested in following in his footsteps - first, predict a rebuild cost and then double it and secondly, expect to lose money on a resale. In other words, do it for the love of it. So once again it was a great evening, thanks to John; almost a Toolbox visit as well, thanks to being able to see the actual vessel. We are indebted to John for being able to make the time to share the operation with us.

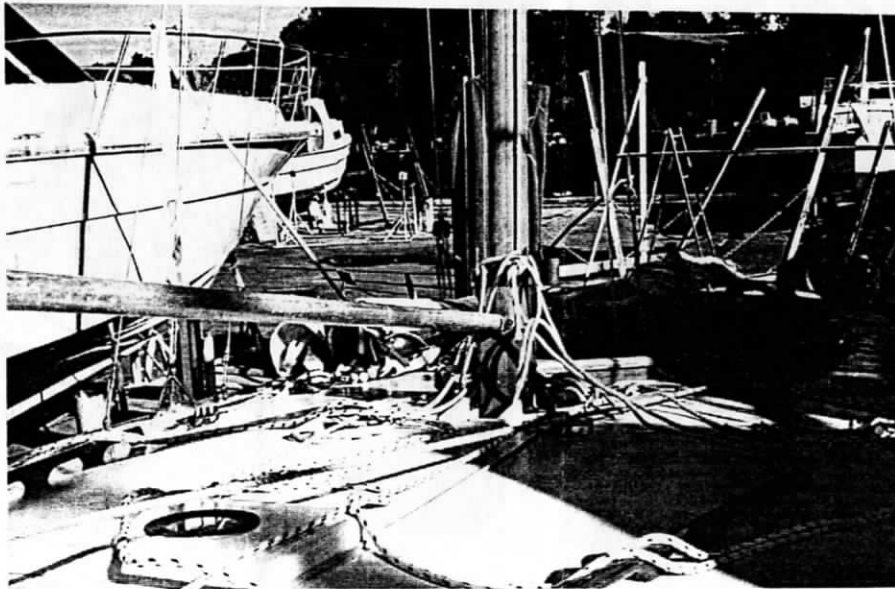
THERA, ARISEN (ALMOST) FROM THE ASHES



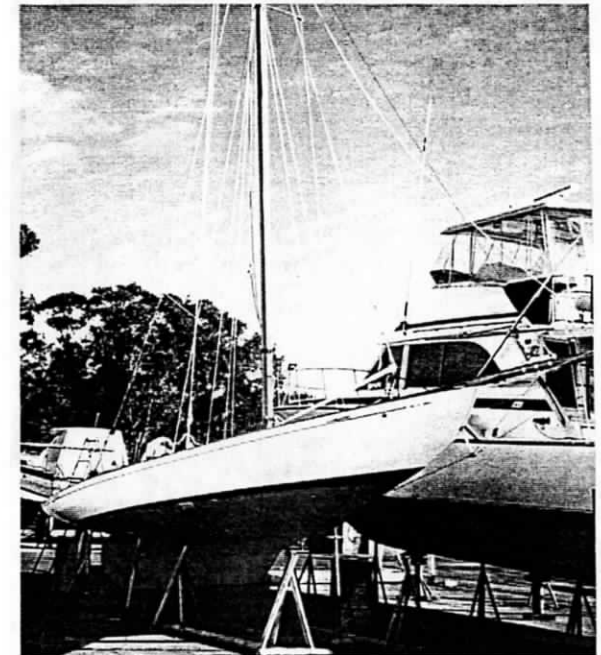
The broad stern and flat sections show up well here.



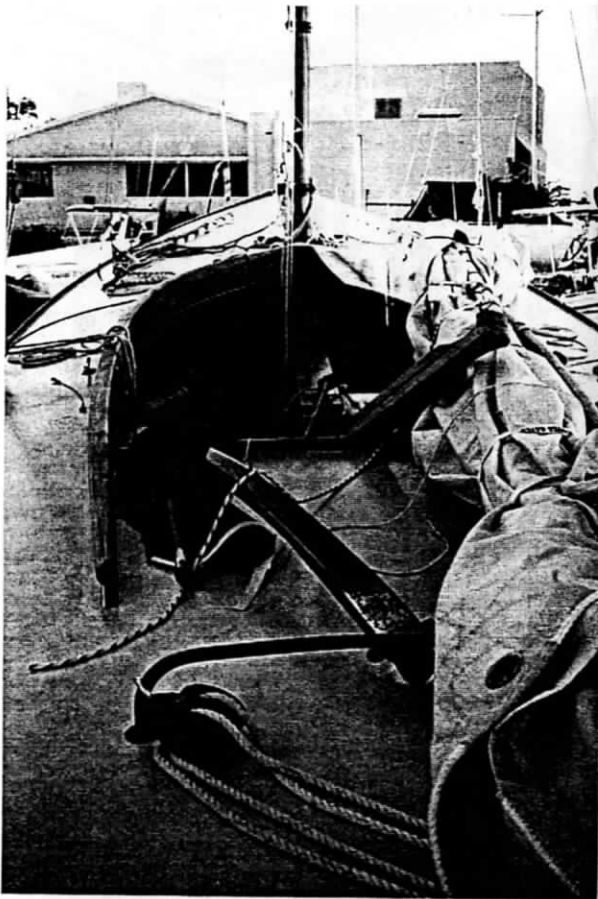
A decent bobstay and dolphin striker is essential.



The mast base with aluminium lowering prod in place.



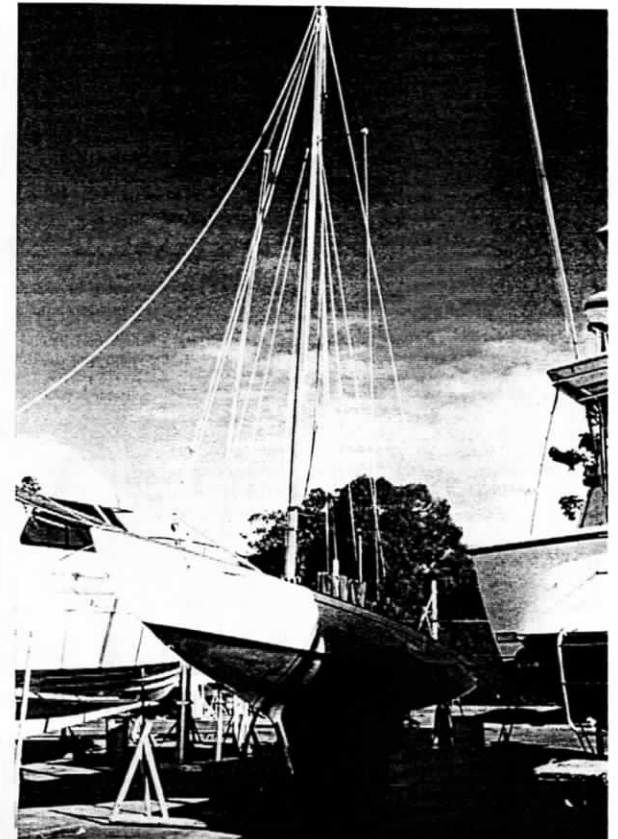
The mast is should because it's added to by a gaff main. A shallow fin, there's a centre board.



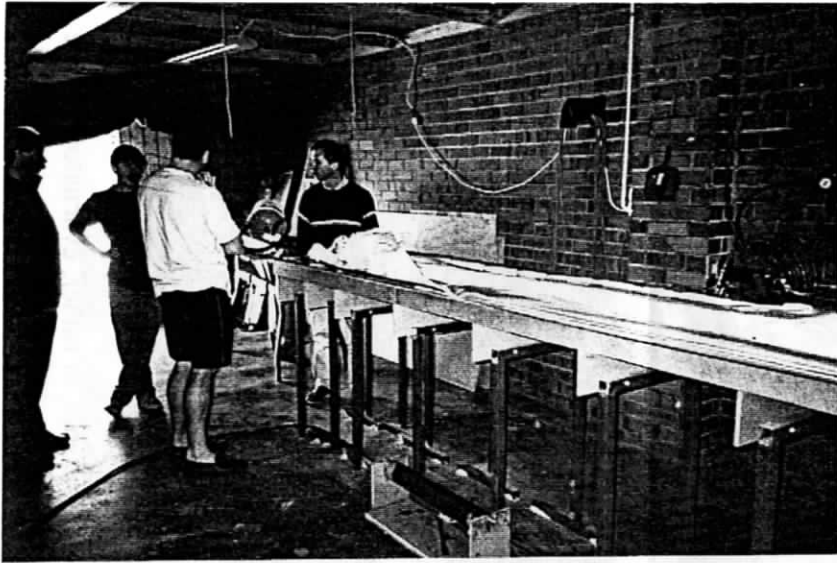
The open cockpit with centre case visible.
Look, Ma, no winches!



This exaggerates the bowsprit,
but it's still pretty long.



Note the high spreaders which go with a gaff rig.



Custom built stands hold the mast mould at waist height.

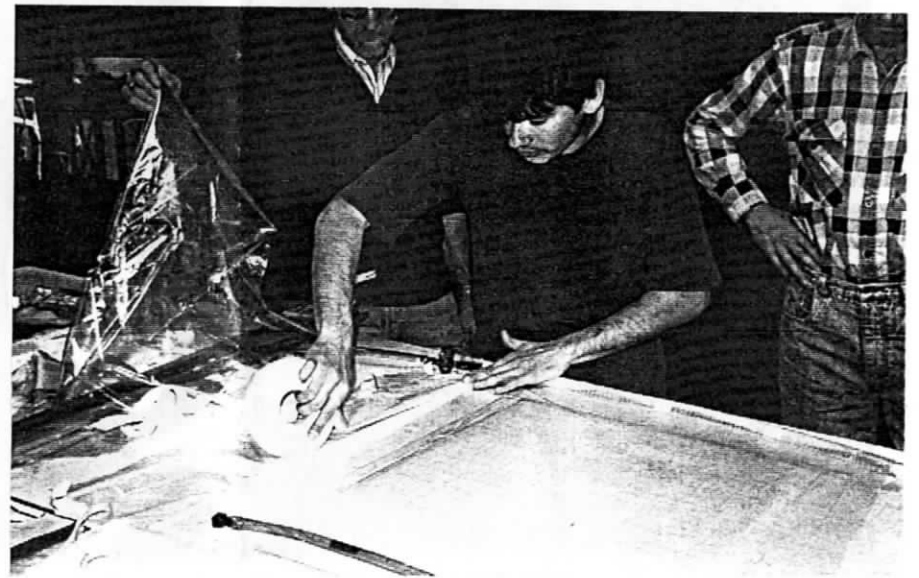
HIGH TECH IN NORTH FREO



Geoff Leggatt and Kim Klaka examine the bottom end of the very large mast half in its mould.

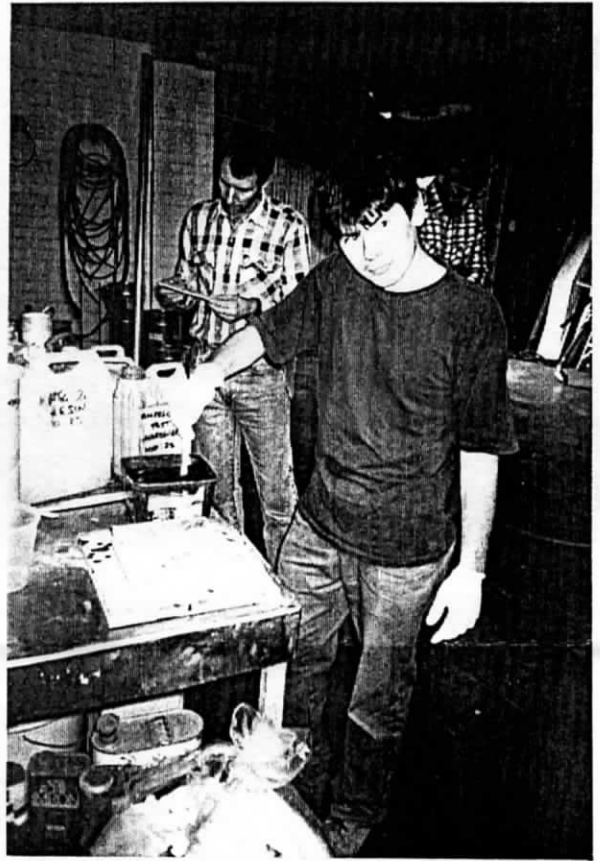
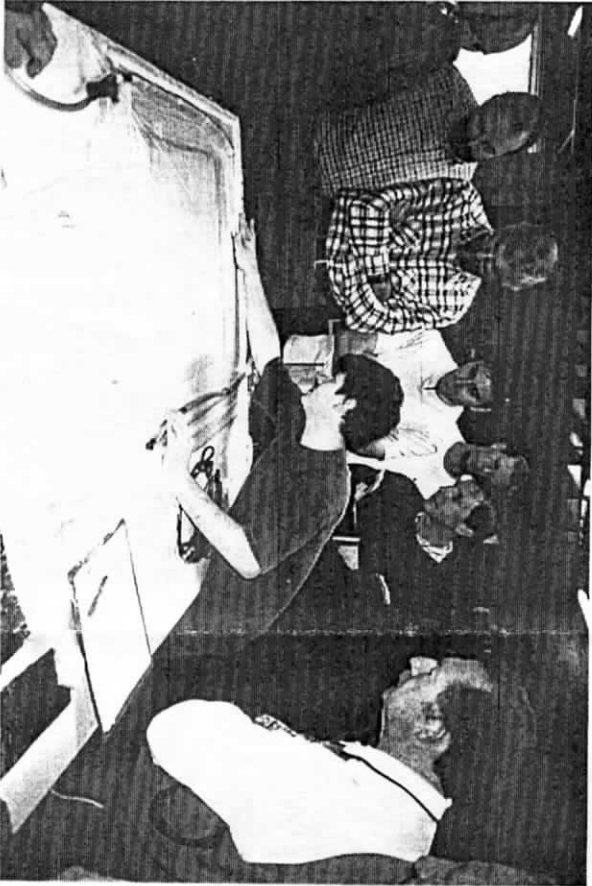


Fabrice trims the upper plastic sheet before sticking down.



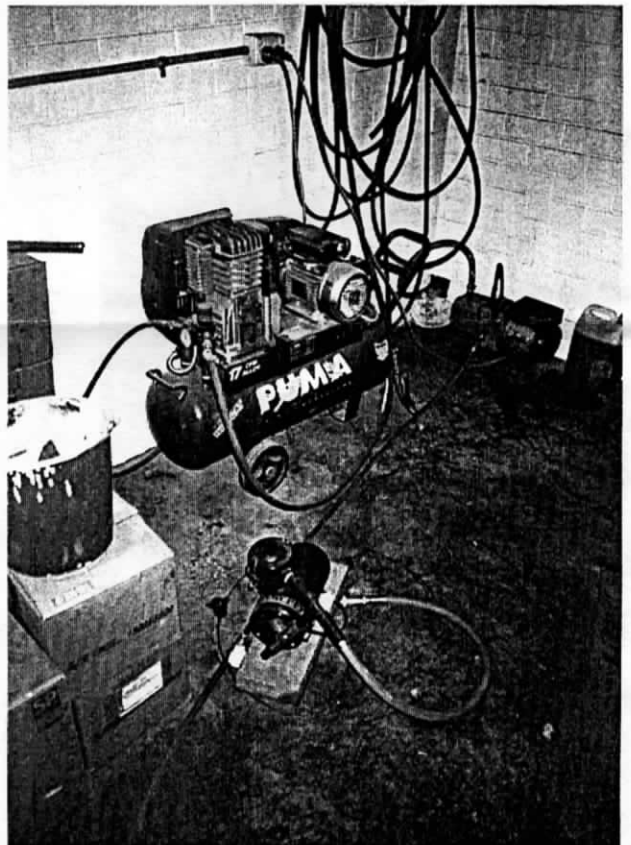
Applying a second layer of double-sided tape.

The gang looks on while Fabrice tapes down the top plastic sheet, over inlet and exhaust tubes.



Fabrice mixes his resin, planned for a 5 - 6 hour cure time.

Fabrice checks the seal under vacuum with an audible leak detector. Sensor in hand leads to earphone.



Two compressors, or rather, evacuators, in the workshop corner - both used in our demos.

COMPOSITE FABRICATION WITH FABRICE

Yes, I know the title is an awful pun, and I promise you'll get no more (this issue, anyway). On Saturday, 9th August we visited Fabrice Allez at New Challenge Fabrications to have epoxy vacuum bagging and similar procedures demonstrated.

When I reached the works a couple of members were with Fabrice, examining a large carbon mast under construction. This monster ran nearly the length of the factory at 18m long and had its starboard half laid up in a mould on stands at waist height. It was a wing mast destined for a large cat and they were going to make two at the same operation, each of them finishing at about 100kg, including aluminium sail tracks, etc. We were told that making the same thing in aluminium would be nearly as expensive but that conventional extruded masts (non-wing sections) would be about half the price in ally. The mould was fabricated out of plywood. This had been finished with four coats of mould sealer, then three of sanding sealer, four polishings with wax and then a coat of PVA release agent - so it's pretty labour-intensive.

The mast half had been laid up with peel ply both sides, followed by a layer of bleeder ply then the clear plastic stuck all along the mould edges to complete a vacuum bag. Peel ply is a porous membrane which allows surplus resin to run (or be sucked) through and when pulled off leaves a fairly smooth surface which needs no sanding before any application of extra coats. The bleeder material, in the case of the mast, was a perforated, white material like a plastic blotting paper which absorbed excess resin and also allowed the vacuum to be effective. Conventional, outdoor shade cloth can also be used, and was in the later demonstration.

For the demonstration pieces Fabrice had waxed and PVA'd the plastic top of an adjacent table. At one end there was a fairly thick assembly of layers of glass and carbon, about a metre square, already laid out and bordered by a square of

double sided tape. Shade cloth was laid over the top as bleeder material. The finished piece was going to be cut up to form reinforcing pads inside masts and so on. He then taped down two side-perforated, reinforced lengths of 0.5" plastic pipe, one at one of the square and leading to a bowl of mixed resin, via a common irrigation in-line tap, the other opposite it and leading to the vacuum line via a separating tank and vacuum gauge in case an excess of resin should be sucked right through. Over all this a layer of clear plastic was taped down to seal the vacuum. Great care and a lot of tape was needed where it crossed over the incoming and outgoing pipes. The vacuum pump appeared to be a moderate-sized, 17cfm compressor, working in reverse.

The resin was mixed in an icecream container using electronic scales. It had slow and fast hardeners which could be mixed to juggle the curing time. Fabrice mixed these in equal parts to give a cure time of 5 - 6 hours, before weighing it into the main resin. He'd earlier calculated the weight of resin needed, based on the weight of all the cloth. The inlet pipe was dipped into the resin with the tap turned off, and the vacuum pump turned on. In this instance it was pulling about 2/3 of an atmosphere vacuum after all leaks had been tested and sealed up, using a small electronic leak detector. When the tap was opened resin was sucked up the inlet pipe and out into the matrix of cloth. It moved only slowly, darkening the shade cloth as it went. It would have taken at least an hour to cross the metre or so of cloth except that it stopped completely just short of the end. This may have been due to rubbish in the tap or the partial closure of the vacuum holes by the top layer of plastic. Fabrice explained that he could open up the vacuum bag and move the feed pipe up to the stop point and continue the next day. He explained that the process as demonstrated was vacuum resin transfer rather than infusion. Infusion describes a process whereby the resin is also pumped in under pressure - probably good for bigger jobs.

While all this was going on, Fabrice also demonstrated a conventional vacuum bag at the other end of the bench. This was a slab of about 19mm foam sandwiched between top and bottom layers of carbon, the edges chamfered to aid folding. He applied resin extremely sparingly, with a small roller, to all surfaces before fitting peel ply and shade cloth and sticking down the vacuum bag - only this time there was only an exit pipe to vacuum, no inlet. The materials appeared

to be only partially wetted out but as soon as vacuum was applied wetting out was completed; he had used enough resin after all.

Whether we want to try these processes at home or not, it was a fascinating demonstration of high tech fabrication and we very much enjoyed it.

Many thanks, Fabrice.

ADMINISTRATION NOTES

GENERAL

Readers will have noticed the doubling of our photo page this issue - we felt that John's talk on the rebuilding of Thera was as good as a Toolbox visit and deserved pictures so Mike Igglesden very kindly made the (short) trip from his home to RPYC the following morning to take the delightful shots reproduced here - many thanks, Mike.

FORTHCOMING EVENTS

Tuesday, 30 September; Evening Meeting. Graham Deale, State Manager for Yanmar Marine, will talk on marine engines for small boats. Graham will talk on the range of Yanmar marine engines, the features to look for in a marine engine, installation of same and maintenance. That's at RPYC Junior Clubhouse, 7.30 for 8pm.

Saturday, 11 October, Toolbox Visit. We will see Mark Pivac's own construction of a 43' cruising yacht at his home at 11 Keane Way, Lesmurdie. We last met Mark when he addressed our evening meeting of last September - then the subject was marine hydrofoil design, you might call it his day job. At home he's building a Pivac

43 (yes, his own design). This yacht is a one-off, using balsa core, 'glass sheathed, built over a male mould. This will be a fairly conventional boat of about 6 tons, but I think, with his background, it may contain some interesting innovations. He's at the stage of fairing the upside-down hull. The address you've got, it's between 2 and 5pm.

LIBRARY

Geoff has managed to purchase both "Painting and Varnishing" (Duck Flat publication) and Schade's "The Strip-Built Sea Kayak" which includes three sets of plans, both via The Chart and Map Shop. For the next evening meeting he'll also bring along books that we have on marine engines which will complement Graham's talk nicely.

CALENDAR

Tuesday 30 Sept, Graham Dearle speaks on Yanmar engines. RPYC Junior Club, 7.30 for 8pm.

Saturday 11 Oct, Toolbox Visit to Mark Pivac's 43' cruising yacht at 11 Keane Way, Lesmurdie.

Monday 20 Oct, Committee Meeting.