

Arthur Piver's NIMBLE

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II. FINALE

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EDITORIAL

January, 1961.

This is the first of our quarterly publications and its price is now \$1.00 or 5/- which is more realistic in view of our subscription rates.

F. Benyon-Tinker has most kindly offered to help with the addressing of publications and other publishing work which will save me a couple of days work for each publication. This offer is highly appreciated by me.

INTRODUCTION

OCEAN TRIMARANS has been a fascinating publication to compile. In it, one can see the results of all the A.Y.R.S. studies during the last five years being put into a practical form by Arthur Piver, T. C. Burnham, Dan Campau, Jack Fulton, Leon Cook and Francis Prout. Not only have the trimarans been seaworthy but the accounts of the Ocean passages in the two Piver craft add just the piece of relism and needs for the design and seamanship which the designers of the future want.

This publication I feel will be most welcome to all our readers. Despite the proven usefulness of the catamaran for day sailing and even cruising, there must be many people, like myself, who fail to find in it the prototype of their ideal boats. To me, at any rate, the trimaran keeps just near enough in its shape and design to the boats I was brought up with to make me feel at home with it. Yet it has the speed and advantages of the catamaran, if not more of both.

One would think that all boat development would start with small craft of a new type and, when this had been made to work, larger sizes would then be made. However, this was not so of the catamaran where the first successful modern catamaran was MANU KAI which was 40 feet L.O.A. Perhaps a similar feature is now occurring with the trimaran because, though Arthur Piver's and Victor Tchetchet's small trimarans have been fast, none of them have been as fast as similar sized catamarans. However, both of the Prout brothers think that Dan Campau's GEM trimaran is faster

than SNOW GOOSE, Don Robertson's catamaran using the same 36 foot moulded hull, despite the rather inefficient schooner rig. We may now see small racing trimarans and outriggers built which will be faster than existing day racing catamarans. We showed quite clearly that they had this potential way back in publication No. 6 OUTRIGGED CRAFT but it takes most people some time to get around to things.

I think that we all look forward to a future publication which will be called OCEAN HYDROFOILS. At the present rate of progress, this will come out in 1965. At present, for such craft, I favour an inverted T foil which is given positive or negative incidence by the leeway angle rocking the connective on a horizontal axle set at an angle of about 45° to the fore and aft axis of the boat. A model of this will be on our stand at the next London Boat Show.

We are indebted to the Slocum Society for the text used for Jim Brown's cruise in the Pacific, and for Arthur Piver's addendum.

A French trimaran *Ananda* did the Trade Wind crossing of the Atlantic in 17 days just before the war. We have no details of this other than those of Humphrey Barton's book ATLANTIC ADVENTURES. The trip appeared to have been very bumpy however, which could be expected from the speed — a fault which Arthur Piver is now trying to correct.



NIMBLE

L.O.A.	30 feet	Weight	2,000 lbs.	
Beam O.A.	18 feet	Sail Area	350 sq. ft.	
Beam, main hull 6 feet		Draught (board		
		up)	22 inches	

Designer, builder and owner : Arthur Piver, 344 Sacramento St., San Francisco, California.

The boat is an enlarged version of the designer's 24 foot trimaran *Nugget*, described in A.Y.R.S. No. 27 CRUISING CATAMARANS and later in this publication. The floats, however, have a much deeper V in section which is 60° as compared to 90° in the earlier boat.

Nimble has surprising manoeuverability. Although proportionately lighter than her smaller predecessors, she has apparently sufficient mass so that she carries her way like a displacement boat, putting about swiftly without effort even in severe conditions of wind and choppy sea. When the rudder is moved in still water, the bow moves in the opposite direction, as if the two were directly geared.

Performance under sail has been gratifying, notwithstanding the modest sail area. In light winds, she reaches apparently as fast as the



Birds-eye view of Nimble shows tremendous deck area. Distance from edge of coach roof to rail is 4 ft.

wind itself. *Nimble* has achieved a speed of 24 knots in a 30 knot wind in ideal conditions of smooth water. No wake or fuss was noted and it is felt that this craft will easily reach a speed of 30 knots.

The floats are proportionately larger than in previous designs and the boat never seems to heel more than a few degrees, regardless of the wind force. Because of this great stability, it is felt that an automatic sheet-release cleat is mandatory to prevent the carrying away of gear. This mechanism is described later in this publication and also the designer's remote-reefing jib.

Some further observations on the floats. My original idea was to move the floats upwards by letting the cross arms into their decks if they were too low. I did want to experiment with this matter and plan in larger boats than Nimble to have the side decks and floats integral so one could crawl right into the floats from the central hull. The floats of Nimble are immersed $9\frac{3}{4}$ inches which is apparently too much and, as we are at present sailing her unloaded, they are at present several inches less than this figure. From our current experience, the floats should not be immersed at rest to any great extent, unless of even finer section than we use.

TRANS-ATLANTIC TRIMARAN

BY

ARTHUR PIVER

The story of *Nimble's* 1960 trans-Atlantic voyage is largely an exercise in Nature's complete indifference to man's plans and aspirations.

Although we voyaged 3,800 miles without one bit of weather favourable to a hoped-for quick passage, we at least had ample opportunity to evaluate our new boat in rigorous going, which was, after all, a primary purpose of the trip.



Nimble is a trimaran (double outrigger), 30 ft. x 18 x 2, and is a modern adaptation of an ancient boating principle in which we had gained confidence after several years of experimentation and a half-dozen prototypes.

She is an expanded version of our first cruising trimaran, the twenty-four footer which we called *Nugget*. This boat had proven so satisfactory that it seemed logical to build a larger versel of the same type.

This resolve turned from dreaming to action with the announcement by the Slocum Society* of its 1960 Single-Handed trans-Atlantic Race.

Surely here was a challenge which could not be ignored by any self-confident boat designer !

This is, of course, a joke, as cruising sailboats have been little improved in safety, comfort and speed over the past one-hundred years, although materials to build and equip them are far better.

Construction is started

Because of previous commitments, actual construction on the new boat could not begin until September (1959), and thus six months

Bow view of new Nimble shows how coach roof extends over side decks, providing bunk space outboard of central hull.

were allotted in which to built it. This would give two months in which to test-sail it, and an equal amount of time in which to transport it to Plymouth, England, where the race was to begin on June 11, 1960.

*The Slocum Society is located at West River, Shady Side, Maryland.

Because the boat was designed primarily for the amateur builder, it was to be constructed of sheet plywood, fibreglass-covered. All possible economy would be exercised, not only because of the slimness of our purse, but also in order that any low-cost discoveries might be passed on to future builders.

Although we had a half-year in which to build, it was to be a part-time project, so there was not much actual leeway here.

Our simplified building system was followed. This eliminates the need of all traditional boat-building skills, and anyone with average ability to handle tools is eligible — if he has the required initiative.

Our use of this building system is merely a part of our approach to the design and construction of sailboats — we are just unprejudiced, and will use any factor which we consider superior, regardless of whether it is traditional or otherwise.

Of course, one of the most important items is cost, and we have found that the high cost of yachting simply does not exist for those with the initiative and resourcefulness to build their own boats.

For instance, our 24 ft. *Nugget* may be home-built for as little as \$600 complete. This \$600 is for a sailboat which can do 20 knots, and apparently is sufficiently sea-worthy for a round-the-world voyage.

Our new 30-footer was to cost approximately three times as much.

The entire boat was to be planked with $\frac{3}{8}$ inch plywood, with the exception of the floats — to be of $\frac{1}{4}$ inch ply.

For low cost, exterior grade plywood was used, with the exception of the cross-arms linking all components together. Because of the great stresses in these members, marine grade (at twice the cost of exterior) was used here.

Framing was kiln-dried, vertical grain Douglas Fir (Oregon Pine), which is not only satisfactory as a light-weight boat-building wood, but is the only such material obtainable locally which is reasonable in price. We also use it for spars. Total cost of all wood came to \$750.

The Design is changed

Because this boat was to be entered in the Single-Handed Race, some changes from the original design were made. In the standard model, cabin space is obtained by extending the coach roof over the side decks, providing bunk space outboard of the central hull. This



Nimble looks more airplane than boat as she heads for launching.

furnishes adequate accommodation and still retains the narrow hull form, which is the secret of this type's ultra-high performance. And so, to make this particular boat trailable, the cabin was made just the width (6 feet) of the central hull. Also, the cross-arms were made demountable, and the floats as well.

The boat was built at the designer's home, several miles from the water. There it was temporarily fitted together. Later the components were trailed to the edge of San Francisco Bay, where the parts were assembled by bolting.

Launching Day arrives

And so, on March 3, launching day arrived. Down the ramp she went, floating so lightly as to appear almost suspended above the water, with the designer acting as if he had really been certain all along that she would float several inches above the water line, just where expected. She did !

Next thrill came when the boat was pushed along the dock. With the slightest effort, she not only moved swiftly through the water, but kept right on going — we knew we had a speed-burner on our hands !

It was even more exciting when the rudder was mounted and given the first tentative movements. When it was moved, the bow of the boat would move in the opposite direction, as if the rudder were geared directly to the water.

Only the lightest and handiest of dinghys have such a reaction, and we knew that this boat would have manoeuverability which would be outstanding.

Right then the name of the boat was changed ; from the tentative Mirage (because "people won't believe it even after they see it") to *Nimble*, as the former name was too insubstantial and now not sufficiently descriptive. Besides, what other multi-hull designer



Nimble's first contact with her native element

would have the nerve to call his creation Nimble? After all, one of the traditional shortcomings of this type is poor manoeuverability, but that no longer applies.

Tests under sail were most gratifying, and the manoeuverability more than lived up to earlier expectations.

Proportionately lighter

Although proportionately lighter than her smaller counterparts, *Nimble* apparently has sufficient mass (one ton) to carry her way when coming about, and so for the first time with a multihull, only average skill is necessary to manoeuvre successfully. Just put the helm down, and around she swiftly swings, in difficult conditions as well as in favourable.

We were particularly interested in the behaviour of the boat in rugged going, and did encounter winds up to 50 knots, which gave us some good testing conditions. The reefing was especially intriguing, and we had ample opportunity to try our home-made roller reefing for the mainsail and the remote reefing for the jib.

This latter arrangement is one of our developments, made in

conjunction with Simpson & Fisher, veteran San Francisco sailmakers. It later proved to be an absolutely essential part of our equipment.

Remote jib reefing is necessary because of our control arrangements, whereby one man at the pilot's station in the cabin can handle every element necessary for successful sailing.

This craft is steered from inside by a wheel, mounted in front of a comfortably-upholstered pilot's chair. This chair was supposed to be the reclining type, but as we already had an ordinary aluminiumframed armchair, which made the price right, we used that, instead.

From a hatch next to the pilot's station the gooseneck of the main boom can be reached. Here are located controls — halliards, reefing and sheeting.

With the above arrangements, it is possible for a crew to cross an ocean without even getting wet ! We had a ship's rule that no one was allowed on deck in dark or stormy weather, as it is difficult to fall overboard when you are below.

From the hatch on the foredeck, the forestay may be reached. Jib changing or furling and the handling of ground tackle can be done from this point.

At the mast is our automatic sheet release, which lets go the sails in squalls and gales at a pre-determined pressure. A trip-line to this device runs through the cabin and after bunk, so the crew when below can release the sheets if something is amiss on deck. It also trails astern, and if a man falls overboard he can, by grasping the line, release the sails. He then has a good chance to regain the deck unaided, via the transom steps.

We were, of course, anxious to make some speed runs, but in the testing period encountered smooth water only once when the wind was favourable, although in this instance it was blowing only thirty knots. *Nimble* sailed easily at 24 knots, without wake nor fuss, with only a few bubbles to mark her passage. We realised that we had a boat which would easily do 30 knots under proper conditions.

Besides her hull form, the reason for the great speed is due to her stability, for *Nimble* never heels more than a few degrees. This is another reason for the automatic-release cleat, in order to prevent the carrying away of gear in strong winds and rough water.

During this period we paid particular attention to our rotating mast, which looked into the eye of the wind when close-hauled. It worked fine, but we decided that it was out of place on a cruising

boat, and on the basis of "what you don't have can't give trouble," eliminated this particular gear.

We decided to trail

All this time our agents had been scurrying around, trying to find ship space on which to transport our boat to England. This proved so prohibitively expensive that we determined to trail her to the East Coat, and then sail across the Atlantic. It was certainly simpler to find the three weeks we expected to take on that trip than it was to find \$3,000 for shipping costs.

Finding a crew for the trip was easy, for this boat seems to attract imaginative and resourceful men who contribute so much to the pleasure of sailing this type.

George Benello, 33, was a college instructor who was building one of our 24 ft. Nuggets. He had formerly lived in the Orient, and now wanted to return to Japan aboard his own boat. He volunteered to act as navigator. He had never navigated, but that did not bother him, as he obtained a few books and quickly taught himself the art.

The second crew member was easy to find, as we could not have kept him away at gun-point. He is Bill Goodman, 28, who is manager of our European division, with headquarters at Humblebaek, Denmark.

Bill had already once crossed the Atlantic, on a 60 ft. ketch. After sailing on *Nimble* he became so enthusiastic that there was no stopping him. This was refreshing, for normally it is easier to change a man's religion than it is to change his ideas about boats. We usually are little concerned with established sailors, being more interested in beginners who have no prejudices to overcome, and who are not conditioned by the limitations of conventional boats.

Time to be off

And so the first of May arrived—time to put the boat on her trailer, and away to Swansea, Mass., where we had made arrangements to assemble the boat and depart for Merrie England.

Nimble did not take kindly to the large trailer we had borrowed. She did not seem to fit, and besides, we had discovered that the new trailer was 8 ft. 8 in.—over the legal width.

So we took two other trailers. One of them carried the two floats, with central hull, cross arms, and spars on a larger one.

Bill towed the small trailer with his eleven-year-old automobile, for which he had paid \$65. It ran like a top all the way.

The other trailer was towed by our pick-up truck, but was so short that we had to remove the tail-gate of the truck, and the bow of the central hull was almost touching the back of the cab.

Away we went, soon discovering that the trailer carrying *Nimble* had little stability, and the boat would sway all over the road, limiting our speed to about 45 m.p.h.

We drove straight through, with two men in each vehicle. We had been joined by a non-sailor headed East, who not only helped with the driving, but became so interested in the project that he stayed on, working like a beaver, until we finally sailed away. We left him on the beach, vowing that it would be only a short while before he had his own similar vessel.

We drove East on Highway 66, as there was still snow on the passes on the favoured Route 40 to the North. It took four and one-half days to go 3,500 miles — not to mention six new tyres and two new trailer wheels.

Besides other incentives, we had our own slogan — "Beat The Bottle !" This was a result of our having read that a bottle drifted across the North Atlantic in four months. We also used the same theme when asked how we could communicate without a radio transmitter. "Why," we would reply, "we'll just send a message ahead — by bottle."

We arrive in New England.

The caravan rolled into Swansea, where we were to use the facilities of Al and Wally Sunderland of Sunderland Marine, who handle our boats in their area.

New England was charming, and the hospitality so embracing that it was difficult to remember that we had a boat to put together, plus countless details connected with our passage.

Assembling of the boat was well under way when a telephone call was received from Bruce Robinson, who was in charge of the Western arrangements for the Slocum Society Race.

"Listen," he said, "we have great news! We have found ship space in which to transport your boat and crew — and it's free!"

"That's fine," replied the Skipper, "except that I have two fellows here who have been promised a sail to England, and if I try to back out — they'll KILL me."



Mid-ocean test of life line dragging astern which lets go sails when pulled

—it worked !

Later Robinson and John Pflieger, who is commodore of the Slocum Society Sailing Club, drove up from New York for a pleasant day's visit. They were most helpful.

All went on schedule, and on May 8 Nimble was again in her native element, appearing to be quite happy with the Atlantic brand of salt water.

We had three days of testing, with apparently everyone in town

deeply interested in the project. The local newspaper and radio station kept people informed as to our progress.

The Radio fails to arrive

We had ordered a short-wave receiver from New York with which to take time ticks, but this failed to arrive. We figured that proper time was not too essential until we neared England, as we could run down our latitude. In England the civil broadcasting includes Greenwich time every hour. We planned to receive these broadcasts on our little radio-direction finder. Of course, we had not counted on the fact that it would become inoperative right after our departure. This left us with only our emergency "Gibson Girl" transmitter, which had been obtained surplus for \$7.50.

Departure was set for May 11, and accompanied by a continuous rain, our stores arrived.

We ferried them out to where *Nimble* was anchored, and in order to keep them from getting wet, tumbled them through the hatches, filling the main cabin.

This looked alarming, but we went below, storing things right and left, clearing the area.

Next came personal gear — sleeping bags, etc. This too was thrown below to escape the rain, and this time the cabin was so full it was obvious that we were going to make this voyage from the outside — looking in.

However, this too stowed with little difficulty. We had been contemplating using space in the floats for storage, but did not actually need any, after all. We were beginning to appreciate the fact that stowage in this type craft was no problem, after all.

Our water was carried in sixty one-gallon plastic bottles. On discussing this subject, Yachtsman Dave Buschman of Richmond, Calif., suggested using these containers, which are manufactured by his firm.

We were fortunate we did use bottles, as on the two occasions when we needed water, no hoses were available.

Ours were made of high-density polyethelene, which is tremendously tough, but has the unique property of absorbing odours and tastes. For this reason, they should be kept out of bilge water and away from fuels.

Because of the strong tides in the area, a noon deadline for departure had been selected, and as this time approached, *Nimble* was awaiting on shortened anchor, ready to go. We weren't entirely ready, for our craft swung in the narrow channel and lodged on a nearby sand bar — this could be embarrassing under the eyes of the many people seeing us depart.

We heard them gasp as Bill jumped overboard to push us off. People expected him to almost disappear from sight, but the advantage of a two-foot-draft became evident as he easily shoved the bow around, and away we went. He was wet only to the knees.

It took four hours to beat the 20 miles to the ocean against the light head wind, with rain and fog hampering navigation efforts.

Two hours were spent swinging the compass in Narragansett Bay, and then, bucking the incoming tide to reach the ocean, we ghosted by the Brenton Lightship at twilight.

The Weather is checked

Before leaving we had checked with the Weather Bureau, and had been advised to abandon our original idea of a great circle path to England, because of NW gales. We were told to follow the steamer track one thousand miles E, and thence great circle.

We intended to follow this advice, and depart from Nantucket Lightship, but spent that night and the next day just drifting in the fog, becalmed.

On the second night we found ourselves on the Nantucket Shoals, with low, sandy shore close at hand when a gale from the SE blew up, right in our faces and on a lee shore.

For anyone who might want, for some perverse reason, to find the world's roughest water, we could recommend this area. It was just nasty, and if we had not had a lee shore immediately at hand, we would have driven the boat in a more reserved manner.

Dawn of the following day found us again in a flat calm, and the same old pea-soup fog and light rain. This was getting monotonous. Boats were hooting all around us, and the dampness was beginning to be felt below.

This state of affairs continued for still another twenty-four hours — we had been gone for over two days but had not yet departed !

It became maddening, trying to keep our bow pointed South, when our final destination lay North and East.

Finally we decided we had had all we could stand, and even though still North of the Lightship, headed East. In a few hours we were out of the fog and rain, with a light air from the SE pushing us along under a leaden sky. Our actual departure thus was taken early on May 14, 1960.

This was great — we weren't making much time, but were at least heading in a reasonable direction. We set the genoa, and then shouted in delight as some porpoises began playing about the ship. We feel a strong kinship to these creatures — happy-go-lucky by Nature — with no apparent purpose in life ! We also saw a small whale.

The Storm strikes

And so it was until midnight of the first day. The Skipper was on watch, running before a light wind from the West — when IT struck from the NW — a screaming blast which jibed the ship, carrying away the preventer which had held the boom on the opposite side.

Up the hatch went the helmsman, letting the mainsail down with a run, and quickly reefing the jib — down to its 50 feet of storm area.

The sea built up in seconds, and the boat was run off before it, with a warp trailing astern, according to current practice. We were receiving our first crucial test. You can sail around the harbour for a hundred years and still not know how your boat will act at sea we were about to find out !

There was no sleep aboard the remainder of that night. The seas would break just astern — first there would be a hiss, followed by a tremendous crash, and the boat would jump. Then came a loud rushing noise as the foam from the breaking sea would hurtle by, with the ship trembling.

One thought was in everybody's mind — "What will happen if the seas should come from the side ?" No such dire event occurred on that first night, and by the light of morning we could see our situation.

We estimated the height of the awesome waves to be between 25 and 30 feet, which by rule of thumb indicated a wind of approximately twice those figures, in knots. The top five or six feet of these giants would break forward, like surf on a beach, presenting an unnerving sight as they thundered toward us.

We were watching this performance, admiring the behaviour of the boat, which had taken no solid water aboard, but still wishing we were somewhere else.

Suddenly, the warp, which had been trailing astern in a bight, became twisted so that apparently its resistance was reduced — as the next sea steepened prior to breaking, the boat simply surfed ahead of it, and it broke well astern.

Home-made roller reefing gear appears battered after weeks at sea. Principal component, the 8-inch diameter wheel, cost 25 cents in a surplus store. Mast is sold 2 x 8 in. plank.

Delighted, we pulled in the warp and shook out the reef in the jib. After that *Nimble* surfed for hour after hour, always ahead of the break, and with no water on deck other than spray blown aboard from adjacent crashing seas.

We next discovered something truly exciting. If there was sufficient distance between trough and crest, we did not have to steer directly down wind, but could sail across the seas if our course required it.

The giant wave would well up as our tiny craft sped across its face, rising higher until the crest approached the breaking point. Away we would wheel, swooping down the wave face, headed for the safety of the trough. Every once in a while a wave would subside in a flurry of foam. *Nimble* would whisk through the disturbed white water with hardly a tremor, and as the new wave built up she would rise toward the top, and then, as danger threatened, dive again for the shelter at a lower level. We reached speeds up to 20 knots in this awesome game.

It was incredible — terrifying — wonderful — we had mastered Nature in one of her most vicious moods !

Nimble laughs at storms, for speed is safety.

Lesser gales problem

Strangely enough, in lesser gales we had greater problems. For instance, when the waves built up to the point where they were all breaking seas, and hence dangerous except to sail before them, we might reduce sail to jib alone.

The wave builds prior to breaking, and *Nimble* surfs readily, shooting ahead as though propelled by a giant slingshot.

In this instance, however, the crests are so close together that the boat has hardly started surfing when she slows down upon starting up the back of the wave just ahead. Almost immediately the break of the following sea arrives with a roar and a crash, and if the boat had not run perfectly straight, could be hit from the side instead of astern.

Secondly, sometimes the wave ahead would be smaller than the original one. *Nimble* would go up the back and down over the front, picking up speed in a bewildering manner until she had done the same on three or four successive waves — giving the effect of a berserk roller coaster ! There was apparently no danger, as we never could drive the bows under, but it was hard on the nerves.

Even more unnerving was the occasional comber which had a particularly steep face. *Nimble* would take off, apparently straight

down in the vertical plane — headed for the abyss ! This invariably scared the crew half to death, although there still was apparently no actual danger.

For these three reasons, then, we would reef down to storm jib in lesser gales. *Nimble* would still surf, but more reluctantly, with adequate rudder control. No sail at all made her more sluggish, with waves bursting right at the transom.

The gales are continuous

We experienced a period of ten days of continuous gales, and as we were apparently in a cyclonic situation, winds kept shifting all around.

This meant that seas would be coming from several directions at once, resulting in an unbelievable turbulence that none of us, regardless of our long sea-going experience, had ever encountered.

After a short while, it was inevitable not to think that it was impossible for any man-made structure to endure such an ordeal, as the boat was tossed, shaken, and jerked all at once. This continued for hour after hour, and for several days at a stretch — an interminable wrenching, accompanied by the unending shrieking of the wind — it would have been bad enough — but the noise of the wind, overpowering and pervading the entire atmosphere, seemed like the voice of doom, screaming in triumph.

Every once in a while the screaming did stop — to be replaced be replaced by an eerie brassy note — sounding like distant, muted trumpets.

"Surely," we thought, "now things are bound to get better — or worse."

It made no difference to the strength of the wind nor the height of the seas, however, and after a short interval, the old howling was back with us.

New situation encountered

One morning the skipper awoke to feel the motion worse than ever — apparently the newest gale had somehow whipped itself into an even greater frenzy. But no — something was missing — the shrieking of the wind was gone !

He leaped out of his bunk to find the answer, to be met by an incredible sight. There was no wind at all, but the seas were jumbled in the wildest confusion, dashing aimlessly in every direction, often meeting one another and exploding skyward in a burst of spray. We were in the eye of the storm.

A few hours later a new gale arrived, from the NW as usual, and away we went again, complete with shrieking wind.

We had some rough days, but the nights were far worse. Shifting winds caused breaking seas which could not be seen in the darkness — after a while in such conditions the helmsman would flinch every time he heard the hiss of an approaching wave ready to break — it often would come at an angle, so the boat received the shock of white water from the side of the floats, shoving it several feet sideways in the sea.

Roughest rides encountered

The roughest rides in the lesser gales would occur when the boat would start to surf just as the wave upon which it was riding would break. The result was a fast slide down a distressingly bumpy surface, ending with a few wild bucks. Fortunately, such a performance was relatively rare, but particularly unwelcome in periods of lessened visability.

In all this turmoil, the Skipper was anxiously searching for signs of strain, and although he appeared unconcerned to the crew, he, after all, had designed and built this boat, and had the responsibility of three lives on his hands. He had constructed everything to be as strong as possible, consistent with his light-weight theories, but still had never considered punishment as brutal as this.

He would feel the joint where the cross-arms passed through the hull, but there was never any sign of movement here. Most vulnerable was the float connective at the forward attachment of the pontoons, where the strain was most concentrated.

He would continuously but secretly study this point. Suddenly, after several days in the storms, he saw the floats moving ominously — and knew that any working here would soon result in disaster !

Out he went with a wrench, hoping against hope that the now loosened bolts would not turn inside the cross-arms when he tightened the nuts on the outside. Luckily, they did not, and so began a daily inspection which continued until the bolts could be properly reached and finally tightened — on the beach at the Azores.

Here was a completely minor problem — except that it was difficult to fix at sea, unless inspection holes were chopped in the cross-arms so the bolt heads could be reached. A note was made for this provision on future similar craft.

As for the rest of the boat, not even the squeaks and groans normally associated with wooden craft ever appeared. This is due to

the fact that glue is used on all mating surfaces, and the boat is literally one solid piece.

Driven far South

The general direction in which we had been driven was SE, and after ten days of fleeing we found ourselves 1,000 miles East and several hundred miles South of our intended track — all done under jib alone.

Then came calm, but we welcomed a respite in which we could reorganise ourselves, and perhaps even dry our equipment.

We did encounter several hours of sunshine, which was greatly welcomed after so much overcast. It did not last long, however. So there we were, waiting for the prevailing Southwesterly winds which were to waft us to England.

Bill performs daily chore of taking sights whenever weather permitted.

And we waited — then waited some more. No SW winds. As a matter of fact, we had only two days of SW winds on the entire trip, and in both cases these were accompanied by such rough seas that we jogged along at minimum speed in order to restrict the motion.

Any winds we had were from the North or NW, light and variable, and always right ahead.

It was now evident that we were not going to make a fast passage, and we wished to send messages to our families. We had no transmitter, except for emergencies.

Also, our 40-day supply of food was disappearing at an alarming rate. A wire bridle arrangement used to support the side stays showed signs of wear, and we wished for chain to replace it. We did, however, have plenty of water, as our expected consumption of one and one-half gallons per day was found to be but one gallon.

No land near

We were well off the shipping lanes, and had seen no vessels since our first day at sea. There was no land anywhere near, but we noticed on the chart a number of tiny pin pricks 800 miles to the East.

These were the Azores. We knew they belonged to Portugal but that was all. Having no local charts, we did not know which islands were even inhabited, but it looked as though we were going to have a chance to find out. We were so far South by this time that these islands were but a few hundred miles from our intended path to Plymouth.

And so we headed East with the same light and fickle winds, which we expected to become even more so, for the Azores lie in a permanent high-pressure area.

Fun with Peanut Butter

One item in our supplies was the cause of merriment. When first discussing what food to take, George had suggested peanut butter. He had not had any for some years, but thought it might be welcome. He was immediately voted down by Bill and the Skipper, who remembered it as some sticky stuff which just glues one's teeth together.

Anyway, a single jar was taken along for George. You are right — he got little of it, as the others suddenly decided it was wonderful when lubricated with jam.

"When we get to the Azores," said George, "I'm going to lay in a one-gallon supply of peanut butter, and then I'm going to hide it from you two bandits." Sad to say, the Azores had never heard of the stuff, and the same goes for the English, so assumedly George has gone on a straight peanut butter diet since his return home.

He objected to the use of marmalade on the trip. It seemed that our folding chart table was too much trouble to set up, so George did

his navigating on a little table in the galley. When our innumerable sandwiches were made, there usually were some charts already on this table, so they became well covered with the ingredients.

"Darn it, fellows, watch out with that marmalade," George warned, "any other jam is OK, but marmalade is so slippery I can't write through it when plotting our position on the chart."

Bill was the cook, and with our one burner Primus on gimbals invariably presented hot and delicious one-pot meals. Apparently the most necessary items for successful cookery are onions and tomatopaste — we ate royally for the entire passage.

Farm-fresh eggs apparently last indefinitely, as does bread, if it is the dark variety, wrapped in aluminium foil.

As we headed East the seas were smooth, which was a great relief, and we enjoyed the lazing days which passed, although the sun would have been welcome. In all the trip we practically never saw his cheerful countenance. We had not a single opportunity to take star sights, as it was invariably overcast at dawn and dusk.

Having a crew of three on board proved ideal. Watches were three hours on and six off, which interval meant that one's duty occurred at a different time each day.

With so much free time, we seemed to be always just lying around, chatting or brewing goodies; and napping whenever we felt so inclined. It was a most restful arrangement, especially as *Nimble* was often steering herself, so the helmsman had little to do.

Because of the ease of operating the boat from the pilot's post, it was practically never necessary to disturb the off-watch.

Dependant upon Wrist Watch

Not having a chronometer or any means of getting time by radio, we were dependent upon George's wrist watch, which he stoutly

maintained was highly accurate. We had a lot of jokes about this timepiece, but it eventually proved itself. George said one of the reasons for its dependability was the fact that it was self-winding, so the spring had a constant tension. However, he also said it would stop if unworn for more than five or six hours. You can be sure we checked the fact that it practically never left his wrist.

The first opportunity of checking the watch came shortly before reaching the Azores. Although we had seen several ships from a distance, the first one we spoke to was a French freighter which altered course to come just across our stern. George and Bill both speak French, so there was a spirited exchange for the few seconds when we were close together.

The time was checked, and George was jubilant with the results, but as the French ship receded in the distance, it was discovered that his watch was an hour slow !

This was a shocking revelation, shattering any complacency we might have had regarding our navigating abilities. We were certain of our latitude, which is learned by observation of the sun at noon ; but longitude, of course, is dependent upon time.

As we were discussing this distressing turn of events, someone suggested that perhaps the French used a time other than the usual Greenwich meridian. Then ensued a vigorous search through our various navigation publications, and sure enough, the time of the Paris Observatory is thus used, giving just an hour's difference !

This was, of course, a great relief, and we could expect to shortly arrive at the island of Fayal, which was the spot we had chosen, largely because it was in the midst of the group.

Our intended path took us 45 miles South of the Northernmost island, Flores, but we did not expect to be able to see the light there.

However, in the wee hours of the morning, George, who was on watch, had unbeknown to the rest been straining his eyes Northward for hours.

He was overjoyed to discover a faint loom on the horizon. He was vindicated ! George had made his first landfall, and as far as we are concerned, from then on was the world's foremost navigator.

Island is sighted

Next day the island of Pico appeared. This is easy to see, as it is 7,000 feet high, and lies just East of our goal, Fayal.

Before we actually spotted land we could see the characteristic mantle of clouds which often lie above islands.

We sailed all day with Pico in view, and next morning at dawn coasted along the shores of Fayal, where a continuous row of houses could be seen, flanking a road along the hilly shore.

We rounded a point, and there, behind a handsome breakwater, lay the city of Horta, composed of stone buildings in varied pastel colours. A pilot boat had put out to meet us, and soon we were tied to the quay, where a large and curious crowd regarded our strange craft with great interest.

Horta, with a population of 10,000 is undisturbed by travellers,

Nimble at quayside, Horta, Azores. A large and curious crowd was usually present.

and this isolation is reflected in a people so friendly that it is most refreshing. Our first taste of this attitude came when we went to a nearby quayside bath house, where showers were somewhat more than welcome. When the attendant learned we were strangers, he went to his little vegetable plot and presented each of us with a head

of lettuce. It was quite touching, even though we could not understand each others' language.

Another friendly soul offered to take us to the best hotel in town (there were only two), as we decided to spend a day or so in luxury. The boat was safe, as customs police constantly guarded her vicinity.

Walking up the narrow thoroughfare was most interesting, with many tiny shops, and so little traffic that people often walked out in the street.

The hotel did not even have a sign outside, and we rambled around looking for the manager, who had no office, in the usual sense.

It was decided that each of us would be charged the equivalent of \$2.15 per day. This did not sound too bad, but when we learned that this price also included three delicious multi-course meals, we knew we had something.

Of course, there were a few minor drawbacks. The plumbing did not always work, and it cost extra for a bath (12 cents).

Mattress is surprise

Biggest surprise came when we retired for the night. The Skipper moved in bed, and was surprised to hear a rustling noise. He investigated. Sure enough — the mattress was made of straw ! Here was something — he had never expected to actually sleep on what sailors used to call a "donkey's breakfast."

In the morning he watched the maid make the bed. The top of the mattress cover contained four long slits, through which her hands could rearrange the straw.

"Here is an improvement over the modern mattress," he thought, "custom adjustment to fit anatomical peculiarities !"

Our life at Horta could not have been more restful. There was not a bit of night life, except for a few people sitting around in coffee houses, and the cinema. Current attraction at the movies was, believe it or not — Gary Cooper in "Lives of a Bengal Lancer," which we estimated to be about 25 years old.

Street lights went out about nine o'clock, as well as in the hotel corridors. We would go through long passages and up three flights of stairs in pitch blackness. All seemed perfectly safe, however, as apparently crime is unknown here. Lone women could be seen making their way down darkened streets with no apprehension.

We had expected to stay at Horta only a day or so, but as a strong NE wind arose, which would have been right in our teeth, we waited five days, when it blew itself out.

The delay was actually welcomed, as all the Azoreans just knocked themselves out to do all they could for us, with no thought of the time involved, and with no regard for personal gain.

Actual working time on Nimble took only about an hour. The rest of the interval was spent in sightseeing and visiting with our many newly-found friends.

Whaling major industry

Fayal is the place where whaling is a major industry, and is still done in the time-honoured fashion - man to beast.

We were anxious to actually witness such an encounter, but no whales were sighted during our stay. The afternoon before we landed we had passed several sperm whales, but these apparently did not follow us to the island.

Having arrived June 1, it was evident that we would miss the start of the Slocum Race, which was to begin June 11. However, there was a grace period of two weeks, so we still had time.

On the evening of June 6 we finally cast off, waved to our wellwishers on the quay and set sail in a light breeze from the South.

This lasted until we were out of the harbour, to drift for some hours in a calm.

Light and variable winds were our fare from then on, lasting until we had almost reached England, 1,300 miles away.

The day after leaving Fayal we were inspected by a Dutch tanker, who not only went out of his course to look us over, but became so intrigued by what he saw that he made an additional 360-degree turn, and came back for another look.

Three days before reaching England, we encountered our last gale, and for 24 hours were back in the old routine, running with jib alone.

The wind in this instance came from the SW, quickly building up to continuous breaking seas, so we were under reefed jib. At midnight a screaming rain squall arrived from the NW, and in ten minutes that huge sea was flattened completely, with small waves going in various directions. It fell calm shortly after the squall.

We had become so tired of squalls at night — even after calm days — that we had developed the habit of automatically reefing down at dusk, rolling the mainsail down about eight feet. It was a wonderful, secure sensation, for the speed did not seem to diminish to a great extent, but there was no impression that the boat was feeling

even severe gusts. The mainsail would remain reefed until after breakfast, which could be as late as ten in the morning.

Enveloped in Fog

We were now enveloped in a dense fog, and for the last 450 miles of our trip could not get a sight. Of course, we also had no radio, no log to tell distance, and no fathometer. All we had was George, our navigator, to whom we cheerfully transferred all responsibility.

Nimble fog-bound in a glassy calm in the English Channel. This is the only condition in which she was reluctant to sail.

We had sailed directly North, from the Azores, in order to escape the Portuguese Trades, which sweep Southward along the coast of France. Thus it had become time (we thought) to change our course to East, and we figured that even if we missed England, we were pretty certain to hit Europe, somewhere. As both George and Bill spoke several languages, all we had to do was ask the first person we met some questions, and we would have a good chance of discovering our whereabouts.

However, it seemed certain we were close to our goal, for through the all-enveloping fog came multiudinous ships' fog-horns, and we blew our own little mouth-power device so enthusiastically that it soon stopped working.

The wooden mast had been painted with aluminium paint so as to act as a radar reflector. It apparently was effective, for no ships came close, although it was an uncomfortable feeling to know that sharp, irresistable steel bows were charging all about us.

Darkness descended on our tenth day of departure from the Azores — where was our destination — where was the Lizard — which was to be our landfall ?

Listen ! That's no ship — that's a siren — It's the Lizard ! Sure enough, our navigator had done it again — we didn't miss our landfall by ten feet !

And so, the statistical part of our voyage was over — we had sailed 3,800 miles in 28 days. Our daily average worked out to 135 miles, which is about twice as fast as any ordinary boat our length would have gone under sinilar conditions. We had not had a chance to display our boat's great speed. We had hoped to at least have had several good day's sailing. We had been aiming for at least one 400-mile day, and would have settled for several consecutive 300-mile days (24-hour days).

Our good overall time was not a tribute to the boat's potential

(top, 30 knots), but to its light weather capabilities. In ghosting and light-air conditions this craft will move as fast as the wind itself, as long as it is not from ahead.

There are few glassy calms, and a movement of air is all that is required — she will do several knots with the sails hanging limp, regardless of her modest area of 325 square feet.

This was emphasized when we put over the rubber dinghy for some fun before reaching Plymouth, and discovered we had to row like mad just to keep even, although *Nimble* was apparently becalmed.

Port is reached

Plymouth Harbour was entered at dawn, and after days of calm it was great to encounter a land breeze of about 12 knots just before we arrived. Although close-hauled, *Nimble* fairly flew through the smooth water, and George was shouting in glee.

"We must be doing eight or ten knots," said the Skipper.

"Eight or ten !" came a voice from below, "I can't miss this."

And so up came Bill, and we all sat around, enjoying our little sail, for speed in a fast sailboat is probably the most exhilarating kind there is, with overtones of skiing and surf-riding.

It might seem strange that after 3,800 miles of sailing, it was still so much fun. As a matter of fact, as soon as we entered the harbour, the crew wanted to sail around instead of berthing. It was decided to moor her in Millbay Docks, which are protected by locks, and so escape the 11-foot local tides.

As the Skipper was making these arrangements he could feel his crew glowering at him, and knew what they were thinking with locks — you can't go sailing whenever you want !

A high spot of the trip occurred when we visited Dr. John Morwood at Hythe, Kent, which is a one-and-a-half hour train ride South of London.

Dr. Morwood is the guiding light of the Amateur Yacht Research Society, and is regarded as the world's leading authority on modern boat design. We were anxious to meet him.

The AYRS was organized in 1955, the same year as the start of the Skipper's designing career, and he and Dr. Morwood had become pen pals.

All three of the crew of the Nimble had been members of the organization, which was the instrument of their meeting one another.

Crew parted friends

Crew purieu friendis

The three men parted fast friends after the voyage, and this is significant. You might think that it would be only natural — persons with shared experience should be friends.

However, it is well-known that after having been thrown together in a small vessel, people often became enemies instead of friends, and we feel this new type of boat makes a significant difference in this realm.

Basic cause of friction is fatigue, and fatigue is present even in the finest weather aboard the usual small boat, due to the endless

rolling, together with having the craft often hecled at an impossible angle.

Even in what should be the ideal conditions, running before the trades with the ship steering herself, friction still continues, for then the ballasted boat rolls madly, as there is no wind from the side to steady her.

The multi-hull does not roll, due to its great stability and the lack

The Skipper is shown at end of voyage with one-gallon plastic water bottles. Deck of flcat shows what the Atlantic Ocean did to our expensive paint. It couldn't hurt the rest of Nimble.

of a heavy keel, which gives a pendulum effect. In the trade wind situation mentioned above, *Nimble* can sail 300 miles (three times as fast as the usual boat of a similar length) per day, with not much more motion than a billiard table.

During the voyage, the Skipper would often turn and look at a can of cleanser and a tall can of detergent placed on the smooth surface of the rear cross-arm. These would remain in place through gale after gale, and were upset only three times on the voyage, when a huge sea would break directly on the beam. Glasses, cups, etc. placed on a flat surface would similarly remain where put.

Conforms to waves

Although the motion of *Nimble* is far less than conventional types, she does of course conform to the slope of the particular wave upon which she is riding.

This slope could be steep, of course, but in actual practice it is not noticeable unless the horizon is being watched.

The reason for this is that the movement felt by those on board is a product of acceleration — you feel only a lifting movement as the craft rises, and a downward thrust as it descends. There is no danger.

The crew was convinced that their craft was non-capsizeable before the passage started, although they had not yet been in actual storms. It makes no more sense to go to sea, in a capsizeable boat than it does to go to sea in one which can sink. Both situations are unwise. Also dangerous is a boat with poor manoeuverability, which may not be able to get you out of a tight situation.

An incident emphasizing the non-capsizeability of *Nimble* was encountered on the trip. On this occasion, the boat had been driven far off course by storms, and it was desired to regain the proper heading as soon as possible. Even though the waves were still mountainous, they were not all breaking. It was, however, a reckless decision.

The boat was being sailed across a particularly steep sea when

the Skipper suddenly realized that she was heeled so far the mast was almost horizontal — much farther than ever before. Just as he had a chance to become really frightened, the wave crest above the boat broke, and tons of water cascaded over the vulnerable craft ! The impact threw the helmsman out of the pilot's chair and to the floor, where he lay helplessly, eyes on the transparent hatches, which were now covered with swirling white water.

He lay waiting for the colour to change to green, signifying that the boat had turned turtle, and that the voyage, and even life itself, was coming to an end.

The appearance of the water did change, but instead of the colour green, it was the same old leaden sky, and the boat was sailing merrily along. After that experience, there was never one moment of doubt as to *Nimble's* stability.

Upon learning of the many virtues of this type of craft, it is only natural to enquire as to its drawbacks. As far as we have been able to discover, there are two; both connected with mooring. First of these is the fact that because of its generous beam — 6 ft. for every 10 ft. in length, a wider-than-usual berth is needed. Secondly, as there is so little boat under water, they tend to charge about when at anchor.

Riding can be rough

How is it at sea on an ultra-fast boat? If there is enough wind you can go rocketing across the seascape at 20 knots or so, but the truth is that it becomes rather hard on the nerves, for sufficient wind means that the water surface becomes so rough that a bumpy ride results.

Down wind is another matter entirely, for with a following sea, there appears to be no limit to the speed possible, as long as breaking seas are far apart, or large enough to ride across. This fact is of almost unbearable excitement to the imaginative and daring sailor, for on each voyage he has a chance to break speed records which were set 100 years ago by the American Clippers — records which up to now no yachtsman ever dreamed of surpassing.

Sensational speed on courses on other than down wind will have to wait until much larger trimarans are built, so that the waves are smaller in porportion to the vessel itself.

Nimble's voyage converted the Skipper, making him an enthusiastic cruising man. Before, he had only wanted to sail like mad, whooping and hollering in exhilaration, and his little day-sailers had provided all the required thrills.

Now he discovered that he could still whoop and holler, having the same sailing fun, and live in comfort, besides. Not to mention visiting interesting places, and the addition of in-the-flesh friends rather than the ones made just by correspondence, etc.

The most fun in sailing is surfing, and *Nimble* surfed clear across the ocean. She can even surf upwind — she climbs up the face of the sea, and then surfs down its back. Sometimes when sailing across the seas, she would find herself on the apex of the wave, and there would be a choice of surfing either right or left. Many times on

down-wind courses, she would exceed the speed of the wind itself, so that the sails would come aback.

This ability of sudden spurts of speed, however, has limited the application of the wind vane for self-steering boats of this type. As speed through the water increases, the apparent wind draws ahead, for instance, changing the vessel's course in relation to the vane. When the speed of the wind is exceeded by the craft, the vane is of course useless.

That is the reason the Shipper did not feel too badly when he learned he would have to fly home immediately after reaching Plymouth, and so must forego the Slocum Race. He realized that more work is necessary to find the answer to the problem of self-steering without the use of electricity. However, Nimble does have great directional stability, self-steering on almost any course in steady winds and relatively smooth seas.

This brings us to another aspect of the tremendous charm of sailing, which is so much more than a sport — furnishing a spiritual cleansing - healthfully obtained through the most beautiful and most nearly alive of all man's functional creations.

We believe this buoyancy of spirit should be matched by the buoyancy of our boats - light, vital, eager.

We have no quarrel with the ballasted boat — we just do not believe in its principle, for any vehicle must pay a penalty for excess weight.

Our point is this :

A lot of people in boating take themselves seriously. The truth of the matter is that no one really knows much about small boat design.

If a fraction of the time and money spent, in say, aviation research were applied to the problems of the sail boat, perhaps the design of such craft would become a science, rather than the art it actually is at present.

But art is more fun than science, and any individual can contribute to the sport. All he needs is some imagination, plus initiative.

Speed is impressive

Impressions of this boat's speed are magically intensified while lying in one's bunk.

With the sea but a planking thickness from one's immediate area, its whispering, rushing sounds appear overwhelmingly close.

The greatest impression is one of continuous acceleration faster, faster and ever faster !

Nimble slides across a wave which builds rapidly under her. The feeling is that of a fast elevator — up - up.

The boat starts to surf, feeling as if rocket propulsion has been added — the upward movement halts, to be immediately replaced by a headlong dash — forward and down.

The wave has broken, and *Nimble* shudders as she whisks through the foam — riding like a fast train on a strangely irregular but somehow soft roadbed.

The feeling of acceleration grows and grows — up, forward and down — up, forward and down — up, forward and down — water is rushing with incredible speed past the slicing hull with ever-increasing rapidity : overwhelming the senses — denying reality, faster — faster — faster !

It can be tolerated no longer, and the berth occupant claws his way into the cabin, expecting to see the waves going by at supersonic speed.

But no — the pilot chair is squeaking gently as the man on watch lounges, slumped back on his spine, steering with his feet on the wheel.

The sea is indeed going by rapidly, but at the normal pace — a silken, darting advance through the water.

You grope for something to say — something to mask the overwhelming unreality of the infinite acceleration you have been experiencing.

"How's it going ?"

" Fine - want some coffee ?"

"No, thanks."

And so, back to the bunk, this time to sleep, with the rushing, swifting noises fading into nothingness.

TILLOO

A Trimaran Motorsailer

L.O.A. 40 ft. L.W.L. 35 ft. Beam, hull (max.) 6 ft. 6 in. Beam OA. 14 ft. Draught 27 in.

Floats 18 in. by 30 in. by 16 ft. Displacement (fully laden) 8000 lb.

Power 22 h.p. 2 cyl. diesel. Sail area 350 sq. ft.

Designer : T. C. Burnham, 2100 N.W. N. River Drive, Miami 35, Florida.

This motorsailer was designed for travel in Florida, Gulf Stream, and Bahama waters, and for living aboard for two persons. Full comforts are provided for living in a tropical climate, including headroom throughout, inside and outside steering, and a large galley.

Tilloo

There is more room than in a comparable catamaran, and about as much as is normally found in a conventional 32 foot single hull. Masts are folding, for ease of maintenance, going under bridges, and for hurricanes.

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Manoeuverability is good under power and the small diesel

drives the vessel at 8 knots cruising, with greater economy than is obtained from the single huller.

Under sail the ship is slow in stays and does not point well. A broad reach gives the best performance. Propellor drag, 1100 lbs. of engine, fuel, accessories, and the ketch rig all combine to reduce the speed under sail to little better than that of the single hull type of comparable overall dimensions, but larger sail area. One might think that the sailing trimaran is little different from the motor-sailer trimaran. The difference becomes apparent when you furl sail, turn on power and blast into the chop. You begin to move toward your objective. Out of six crossings of the Gulf Stream and the Little Bahama Bank (200 miles), we had favourable winds — ONCE. We sail for fun ; we power or motor-sail when we want to get there.

This past summer, we used the vessel for travel to, in and from the Abaco group in the Bahamas, wherein the ship got considerable experience — and so did we.

- 1. Forepeak No. 1.
- 2. Forepeak No. 2
- 3. Mainmast Tabernacle
- 4. Clothes hanging
- 5. Washbasin
- 6. Chest of drawers
- 7. W.C.
- 8. Stove
- 9. Refrigerator
- 10. Drying area

- 11. Sink.
- 12. Galley workbench
- 13. Upper berth and lower settee
- 14. Main cabin
- 15. Dinette
- 16. Expansion table
- 17. Inside-Outside steering
- 18. Mizzen tabernacle and seats (exterior)
- 19. Engine room hatch (exterior)

JUANA'S PACIFIC CRUISE BY JAMES BROWN

It was living in the mountains that made me decide to build a boat and go back to sailing. California's Sierra Nevada Range is beautiful, but mountains have a static beauty less dramatic than the motion of the sea. I had sailed for two years aboard several fine yachts in the Caribbean, but had left there because I felt that probably I never could afford a boat of my own.

While living in the Sierras, I remembered a man I knew near San Francisco — Arthur Piver of Mill Valley — whose hobby was experimenting with outrigger-type sailing boats. Earlier I had built one of his odd little designs, and found it to offer sailing sensations I had never felt before. That was a 16 foot double-outrigger, or Trimaran. Piver called it *Frolic*, and the class was well named. It proved exceedingly stable and versatile for the rugged conditions of San Francisco Bay and it attained speeds impossible for the yachts I had known.

Now, Piver told me of a similar, but larger trimaran, the *Nugget*, he had designed for Carleton Eugene of San Francisco. It was 24 ft. long and had space for two small bunks and a large open cockpit which might be enclosed for shelter on a long sail. After one

Builder-Skipper Jim Brown shown aboard his Nugget Class Trimaran Juana.

thrilling ride with Eugene in his prototype, I decided to build one for myself and try her out in the ocean. If all went well, she would carry me back to the West Indies.

What makes a man decide to go radical in a field so traditional as sailboats? With myself, the decision was easy. It was money. I built my *Nugget* and completely outfitted her for cruising with \$1400

worth of material and gear. I went first class with lots of fibreglass, stainless rigging, and dacron sails. She could be built for much less by the owner who didn't plan to abuse her. Also, Piver has designed her so that anyone with average dexterity can put her together. I am no boat-builder — in fact, I'm not even a good carpenter — but the construction was so simple that I had no trouble. The mast and outrigger arms are solid, and the hulls are quarter inch plywood over a simple frame.

A cruising outrigger was attractive to me for several reasons other than feasibility. There was the prospect of beaching her wherever there was a suitable beach. Not only would this be a great safety factor but, if she sailed well in the open ocean, and would also creep into shallow water or run surf onto a beach, I would be able to investigate coastline and islands otherwise inaccessible.

I must admit that another important reason for choosing a craft such as *Juana* was the spectacle I knew she would create. Voyagers are a dime a dozen these days and each has his motive, though it is seldom appreciated by others. With the Trimaran, I would have at least one distinction — the vessel — and I hoped it would help me meet people while cruising who would otherwise ignore, or even resent an everyday yachtsman.

As it happened, the idea was received with widespread curiosity from the start, and I was in for more attention than I could handle. Long before the launching of *Juana*, there was a girl who became as enthralled with the project as I was. While the boat was still being built, we were married. The voyage and the craft would not have been complete without Jo Anna.

Later, just before the launching, plans for the cruise were nearly torpedoed when my wife announced that she was pregnant ! While discussing the problem we remembered that pregnant women had crossed on the *Mayflower*, and even survived plane crashes without ill effects. With this, supported by a clean bill of health from the doctor, we decided to go. But the pressure was on — we would have to hurry. In view of the circumstances, we felt that another hand on board would be very helpful. A good friend, Dick York, had planned a similar trek in a kayak the year before. He had studied the coast, and practised running surf in his sailing Folbot, but because of the advent of a business opportunity, he had never started on the adventure. A year later, now tired of business, he asked to join us.

We needed Dick, but there was the serious problem of space. Juana's main hull is 24 ft. long, but only 3 ft. wide at the waterline, and 4 at the gunwales. And what about weight? Another 200 lbs.

on board might be a disadvantage. There were only two bunks, and the cabin space was barely adequate for 2.

To test the boat, we one day loaded seven adults aboard and drove the devil out of her. That was a delightful sail and there were no drastic effects on the boat's performance. We even managed to get six of us inboard. There was room for the seventh in the after bunk, but he was having too much fun riding the outriggers to come "below." I realized that day that, although the boat was small, there was a lot of usable space on board. Even though the cabin was crammed with passengers, the bunks were not being used for seating as in a conventional 24 footer. Also, there were many small storage spaces — the bilge compartments, a sizeable locker under the cabin table, and the void between the side decks, or wings. The whole cavern inside the floats could be used for stowing light bulky articles such as clothing, and with 14 ft. of beam, there was plenty of room on deck. We decided there would be room for Dick if the three of us traded watches for the two bunks.

The last days before departing, our home, a Sausalito bayfront houseboat, played host to an endless parade of well-wishers. Among them were people with much experience of the sea. Some warned : "You'll have to swim for your lives," but they wished us well anyway. It was with these many interested people, old friends and strangers, doubters and believers, that we first felt reward for our project.

The rush of getting off was hectic. My original destination of the Caribbean became unrealistic because of time. It would be several months before we might expect our child, but only one month of safe sailing before the storm season in Mexico. Still, there was a slim chance of our passing the hurricane area in time, and we were determined to try.

On the morning of departure, August 11th, there was cause for apprehension for reasons other than time. Jo Anna had never been to sea before, and Dick's experience came mostly from troop ships. The Northern Californian coast is not so placid as the Caribbean, and we had no idea what to expect from the boat under ocean-going conditions, except that the outrigger principle had worked well for the Polynesians. With all this in mind we were prepared to halt the same day if necessary, and call the whole thing off. Our destination was just "down the coast as far as we can go," and only the boat and the ocean together could say just how far. We sailed out of the Golden Gate, turned Southeast, and didn't stop for 200 miles. The first day we passed several refuge harbours, and that night we

Stern view of Nugget Class trimaran Juana shows access holes to stowage space in side decks.

left the inviting lights of Monterey. In the foggy morning, Juana rounded Point Sur and we sailed off down the S. coast. That first lap of the trip typified the whole voyage. We spent some time in calms, but the sailing time was spent running headlong down the sea before the prevailing NW wind. There were mountains off to port, but the Pacific was everywhere else. The boat was out in real ocean and the two were getting along fine.

We made several stops on the cruise, but sailed in comparatively long laps for a coast-wise voyage. Ports varied from the smoky confusion of Los Angeles harbour, to anchorage under the lonely lee of unnamed headlands along the shores of Mexico's Baja California. After cruising for a month, we were forced down by a Chubasco or Mexican hurricane, at Cape San Lucas, 1500 miles from the Golden Gate. We sailed *Juana* onto the beach there, not for the fun of it as we had done twice earlier in the trip, but because this time we were just ahead of the storm that caused great damage in the area. The boat was disassembled and carried to a nearby fish cannery for storage until a better sailing season. There she lies for the time being, content that she has proved herself.

A detailed account of our voyage would sound much the same as accounts of other voyages for the same route, except for peculiarities caused by our peculiar vessel. Startled onlookers ashore often became acquaintances because of *Juana*, and her sailing characteristics made for unique passages between ports.

A typical day's schedule would almost find us becalmed at daybreak. By late morning the breeze would begin slowly from the northwest, and by sundown, it was often blowing hard from the W or NW, sometimes as much as 40 knots. Around midnight the wind would fall to a breeze and die before dawn. As we progressed further south we met more calms, and they became the most arduous feature of the voyage. The boat moves in a whisper of air, however, and we almost never stopped moving completely. Without the Trimaran's singular ability in light air, a conventional boat would have been under power over half the time in the weather we had. When the wind blew, as it did with considerable force many afternoons, we were often able to pack away as much coastline as the ordinary craft would have with a fair breeze the clock around. Off Point Buchon, California, we achieved our best measured speed. It was 20 knots ! That was a spectacular blast that none of us will ever forget - we were overtaking the waves. The log commonly registered 8 to 12 knots, and the one day that the wind held, though it slacked considerably, we covered 190 miles. The cruising enthusiast should notice this ability for speed. Old-timers often ask : Why do you want to go so fast ?" My feeling is that a cruising boat is a way to go places. With a fast boat you can make a longer cruise with the time allotted, and spend

more time ashore along the way. Cruising is sailing with a destination. Speed such as *Juana's* allows you to spend less time at sea for a given distance. You have less chance of meeting foul weather because you can afford to wait for good weather and make a run for it.

I heartily agree, however, with those who say "But speed isn't everything." A steady, self-tending helm is probably the most important single feature of a cruising boat, especially on downwind courses. With our Trimaran, we had no special downwind canvas, but Juana spent a great deal of time with the tiller tied, steering herself. As I understand it, the helm is steady for these reasons : first, there are long sharp running shapes underwater, giving the craft much directional stability; second, the rudder is located on the transom, as far from the daggerboard as possible. For steering, this provides a long, powerful turning lever, but when the tiller is tied, it becomes a "straightening" lever ; third, and most important, there is virtually no rolling and pitching. The boat "leans" only enough to respond to irregularities in the surface, and no more, which allows the underwater shapes to travel through the water at a constant attitude. In other words, an underwater view of Juana as she skates over ocean waves would appear much the same as if she were at rest in a quiet harbour.

A keel boat behaves very differently. Because of pitching, heeling and rolling, all joined in a disorderly combination, the blunt underwater shape of the hull is constantly changing. Naturally, the forces created by this changing cause the vessel to wander from its course.

Because our helm was steady, we were able to tie the tiller at sea under moderate conditions, but even when the wind came blistering down the coast, and the seas piled up behind us, we had no difficulty holding course by steering. I believe that with special downwind canvas, our boat would steer herself endlessly in trade-wind conditions. A well-found conventional boat will do the same thing, but I feel there are no boats the size of ours, and very few larger ones, which

possess *Juana's* very desirable characteristics of steering on all points of sailing.

The motion of the Trimaran, as she responds to irregularities in the surface of the sea, is a surprisingly gentle one compared to the motion of keel boats, and this motion is important in appraising *Juana's* comfort. Living space on board is short because the main hull is narrow, but living space is only part of comfort. Sailing motion is the other part, and here the outrigger far outshines keel boats of much larger size. Downwind, there is no merciless rolling, because of extreme beam with the pontoons. Upwind, there is no

pounding, because the hull and pontoons are so sharp and narrow. Because of very light weight (only 800 lbs. net) the boat rides more ON the water than IN it. She cannot develop the swinging, rebounding, pendulum-like motion caused by inertia that makes even the largest ships shake their contents. For a Trimaran the size of ours, this steady motion is the only luxury on board, but believe me, it is one for which we gladly sacrifice other comforts.

In spite of our month-long cruise, we have never sailed our Trimaran under true storm conditions. We did lots of rough sailing in a strong prevailing wind, but we did not have to contend with real foul weather. The sea-keeping qualities of the Trimaran, from what we have seen, compare very favourably with conventional craft, but there is the apparent danger of capsize. The concept of going out to sea in a non-self-righting sailboat requires very radical thinking. The Trimaran, with no fixed ballast, must be equipped with other design features that make it, practically speaking, non-capsizable. The outrigger idea is ancient, but in order for contemporary sailors to understand the modern Trimarans, their quality of safety must be thought of as an innovation. These qualities seem to contradict the safety factor of a keel boat, but become quite understandable if considered by themselves. With Juana, it worked like this : unladen with the inertia of ballast, and instead carrying great reserves of buoyancy, she was free to bob over the seas. When a wave comes the boat goes UP -- easily and quickly. We never once had solid water sloshing around on deck. At high speed there was spray and air-filled foam from breaking wave crests, but not green water. Even with all the running we did, there was never a sign of a wave falling over the stern !

I felt our boat would be more vulnerable to an unexpected blast of wind than to big seas. With the ability to right herself from a "knockdown" there was the possibility of her being blown over by wind pressure in the sails. We learned that this was very unlikely because of the tremendous stability afforded by the outriggers. *Juana's* beam is more than half her length, and the pontoons have almost enough buoyancy to float the weight of the entire boat. The "almost" is important, for if a gust of wind is heavy enough, it will drive the lee pontoon below the surface without lifting up the centre hull and thus flipping the boat over. If one pontoon is driven down, the main hull stays on the water, and the boat "heels" much like a keel boat. Wind pressure is relieved, and there is a good chance for the boat to right herself. *Juana* has never come this close to capsizing, but this chance for recovery is an important safety feature.

In this respect, the Trimaran appears much safer than its cousin the Caramaran, whose "point of no return" is reached soon after the weather hull is lifted from the water. Also, the structural problems of the Trimaran are less. It is apparently easier to connect pontoons to a main hull than to tie two hulls together. We had no structural failures on the trip. Manoeuverability, another safety problem with many Catamarans, is solved by the Trimaran. When coming about, *Juana* assumes a neutral attitude which raises both pontoons almost free of the water, and the single center hull then turns much more easily than the two hulls of the Cat ! *Juana* will change tacks from one beam reach to the other without tending sheets !

It still could happen however, that to avoid capsize one might wish that the sheets would tend themselves. With our Trimaran, if an unexpected blast was too much for the boat, Piver's automatic sheet release, a real innovation, would free the sails to luff automatically. This is a very simple device that lets the sheets fly when wind force exceeds the tension adjustment. As it happened we were never caught by such a blast unexpectedly, but the sheet release was a very comfortable thing to have on board, and could be used on any small boat.

Here is another radical concept — speed is safety. There comes a gust of wind; it socks into the sails and the Trimaran lurches forward. Wind pressure in the sails is absorbed by the forward motion of the boat. Neither weight or hull speed halts the acceleration. There comes a big wave; it curls up from behind. But before the crest falls, *Juana* surfs down the face out of reach of the foam. With speed, you can steer away from things, such as freighters, and if, while trying to outrun the weather, you get backed into a bad corner, there may be refuge on that beach instead of destruction. It happened to us.

Boat owners seldom say anything against their boats. As *Juana's* owner, I suffer only one regret, and it is a social thing. She is not like other boats. With fellow boatmen, I am often on the defence, and in the face of comments like "You'll have to swim for your lives !" I have had to develop a rather thick skin.

For this regret, there are two consolations. One is that multi-hull converts themselves belong to a very elite fraternity that is quite inapproachable by conventional sailors. The other comes from knowing that the ways in which our boat differs from others are more important than the ways in which she is alike. So far, these differences have made us very proud. We have a son now and, of course, we are

especially proud of him. We suspect that he is the first of a generation that will do a lot of sailing on boats with three hulls.

In the same mail which brought this article from Brown, came a letter from Arthur Piver, her designer. We take the liberty of quoting part of it dealing with *Juana* :

"Saw Jim Brown the other day, and he was all ready to mail his story concerning *Juana*. Because of space limitations, he omitted the two most dramatic moments of the trip.

"The first occurred when the crew of *Juana* slept ashore at a Mexican village. In the morning their boat had disappeared. It had been securely anchored the night before. The natives assured him nothing was ever stolen there, so it must have drifted off. The coastline was smooth, so there was no place the boat could be but out to sea.

"By this time, the entire population of the town was up on the highest hill, looking out to sea. No one saw anything, even with a pair of binoculars. Suddenly an old shark fisherman exclaimed that he could see it, hidden in the distant glare. He had no glasses. No one believed him, and Brown was trying to reconcile himself to the loss of his boat and practically everything he owned.

"In the meantime, the old fisherman put out in his outboard. Several hours later he returned, with *Juana*! The reason the boat drifted off was that an underwater knot joining two anchor lines came undone. Brown, who is an expert skin diver, later recovered his anchor in 40 feet of water.

"The second dramatic moment came at the end of the trip. In this instance, *Juana* was trapped on a lee shore at Cape San Lucas in a mounting hurricane or Chubasco. Although well out from the beach, the water was so shallow that the boat was anchored in actual breakers, which were rapidly becoming enormous. The wind at this time was blowing about 50 knots. Brown did not know what to do, so he swam ashore to a nearby settlement to seek help.

"In the meantime, his 8-months pregnant wife was braced in her bunk in the plunging boat, hanging on with all fours. Not finding satisfaction ashore, Brown fought his way back aboard. He pulled up the daggerboard, retracted the rudder blade, and headed the boat for the beach — right through huge, crashing surf.

"A gang of Mexicans were standing by, and as soon as the boat touched the sand, they picked it up bodily and carried it off the beach to safety. The boat was not even scratched. Later ten of the Mexi-

cans were paid $\pounds 8$ to carry the boat a half mile to the spot where it is stored. *Juana* weighs about 800 lbs. complete, and the spars and floats (100 lbs. each) were removed for the subsequent journey."

GEM, A CRUISING TRIMARAN

L.O.A. 36 ft. 0 ins.
Beam 22 ft. 0 ins.
Main hull beam at gunwale 2 ft. 9 ins.
Cabin beam 6 ft. 0 ins.
Cabin length 15 ft. 6 ins.
Cabin height above gunwale 3 ft. 0 ins. Float L.O.A. 29 ft. 6 ins. Float beam 2 ft. 8 ins. Float displacement 2,000 lbs. Float filled with styrafoam. Total displacement 2,500 lbs. Sail area 381 sq. ft. Sail area, Genoa 543 sq. ft.

Owner and designer : Dan Campau. Main Hull : Stock Prout 36 ft. hull.

Gem is a pleasant looking craft with full 7 ft. headroom in the main hull and lots of room inside. In fact, there is quite as much room as in a conventional deep keeled boat of the same length, though it is differently disposed.

The floats are of a right angled V triangular section throughout

and this means that both ends come to sharp points and for this reason they are slightly fragile. When we touched a quay wall with one of these points, it was injured simply by the heave of a slight swell.

Just when *Gem* had been completed, Dan was posted to Italy and he therefore put her in our charge for the winter and spring till he can collect her.

On a pleasant day with a force 3-4 east wind, Owen Dumpleton, Norman and Peter Naish, my two daughters Elizabeth and Maureen and I collected her from Canvey Island where she was built and sailed her to Margate, a distance of some 50 miles in 6 hours which is an exceptional speed to windward, though we did get periods when we could lay our course directly.

During this passage, the first fact which came to light was the smoothness of the passage of the floats through the water which proves quite conclusively that the right angled V triangle shape gives the minimum resistance. However, in the occasional force 5 gusts, the lee float was pressed underneath the water which shows that the float buoyancy should be greater than two thirds of the weight of the boat.

On a level keel, the floats are placed so that each draws about 4 inches. In the slight lop we met on this passage, this proved to be disagreeable because the weather float had to go through the waves it met and this put excessive strain on the cross beams and, of course, pushed the lee float down, meaning extra resistance. Dan now feels that the floats should be about 4 inches above the L.W.L. on an even keel and this certainly seems right from our experience.

We left Gem at Margate overnight and next morning took her out though we had been warned that things were a bit lively off the North Foreland. The wind was force 5 gusting to 6. Under jib and mainsaily only, we made good time against the easterly wind but the swell was about 4 feet high and the weather float was taking some heavy punishment. We therefore felt that it would be better to put back to Margate and wait for smoother water so we gybed her round and really started moving, with the wind and seas behind us. The length of the seas was about 40 feet from hollow to crest which meant that our stern usually stayed on the crest as we shot along about 10 knots while the bow was down in the hollow. This gave a negative angle to the decks of the floats and the lee float persisted in sailing with its bow about 6 inches below the surface and its deck awash about half way along its length. Even though this looked alarming, however, there seemed to be little chance of things becoming dangerous, though we were not at all happy about it.

Gem then had to stay at Margate for a few days and, during this time, a North West gale with very steep short seas blew up which destroyed a fine yacht which was, allegedly, on a round-the-world cruise. Because I was not quite sure of her moorings, I spent a few hours on the quayside during this gale and watched the yachts in the harbour. One 25 foot deep keeled yacht was rolling like a metronome through an arc of 90° in about a second. Gem nonchalantly pitched to the incoming waves with less motion than any other boat in the harbour.

Two days later, Norman Naish, Jim Coleman and Sandy Watson sailed her round to Dover in smooth water and a light wind, going very fast indeed for the strength of wind. We understand that there is an entry in the Coast Guard log book which reads, " Chinese Sampan 1 mile off, Course S."

Comment: Dan Campau feels that all the faults we found can be corrected by raising the floats so that they are 4 inches above the L.W.L. and increasing the angle of attack. Norman Naish and I feel that they should be raised and extra buoyancy built on the bows as far aft as the forward cross beam.

The Design of Floats. While it must be admitted that these right angled triangle sectioned floats give the least possible resistance and the flat low decks are a great convenience in boarding the craft, a sharper V at the keel has much to recommend it for ease of sea motion. On meeting a head sea, the right angled V produces a sudden jerk up whereas a sharper V will simply cut through a short sea and give a gentler heave to a longer one. In Ocean Voyaging, one will usually want to make passages down wind and the slight loss from the sharper V floats will not be appreciable while the *ability* to get to windward in short steep seas is more important than the speed at which one can do it in calmer weather. Arthur Piver now feels that the floats of his 24 foot *Nugget* though satisfactory with a 90° keel angle, would give a better ride in extreme conditions with a 60° angle.

Summary. With her present floats, Gem should make a delightful inshore cruiser when they have been adjusted as mentioned above. We do not at present feel that she should be taken offshore. She is now on the quayside at the Wellington Dock at Dover where she can be seen. We intend to launch her at the beginning of April, 1961.

Postscript. It is axiom of trimaran design that each float shall have less buoyancy than the total weight of the craft so that it will be driven under the water before the main hull will lift. In larger cruising trimarans, however, there is plenty of stability so that the rigging is more likely to blow away than any kind of capsize occur. At this stage, it would appear likely that the floats can be made as large as one likes.

Francis Prout has sent me plans of another trimaran, using the same stock hull as *Gem* but with sharper floats resembling those of *Nimble*. This should make a lovely craft and I hope to hear that she has been built soon.

Photographs for this article are by Francis Prout and Susan

Morwood.

KOLU NAIA

BY

JACK FULTON

844 Tourmaline Street, San Diego 9, California.

Kolu Naia was briefly described in A.Y.R.S. No. 26. Members will be interested to learn how this effort turned out and the photographs show the craft during sailing tests last October (in 1959).

Kolu Naia

The sails easily drove Kolu Naia near 10 miles per hour and at this speed, the main hull " appeared " to plane. The sail proved to be very powerful but the strain caused the curved mast to bend excessively and it was impractical to increase the speed until some rearrangement and adjusting was done to the standing rigging. Before this was accomplished (several weeks later) during another test, a sudden gust of wind snapped the mast so this must be repaired before a complete evaluation of this trimaran can be accomplished.

The craft performed well within our predictions and is certain to reach the potential of this type of trimaran.

Ed.—It is not apparent from the photograph, but the sails sit well without twist. It will certainly be an engineering feat if a bent mast of this kind under compression loading can be made to survive.

THE FOULTON CROSS SECTION

The delightful workmanship which went into Kolu Naia can easily be seen in the photographs. The cleverness of the hull design can be seen in the cross section shown here with that of a smaller

version Kolu Tiki. The principle used is that there is a good deal of stability in the main hull from its beam and shallow sections, with the float stability only coming into play in stronger winds. The floats need not therefore contribute to static stability and may be raised so that only the tips are in the water. In a letter, Jack Fulton says that the floats of Kolu Naia were 4 inches immersed, adding about 30 square feet of wetted surface which slowed the boat appreciably. On heeling, the wetted surface of the main hull reduces, and the length to beam ratio increases.

STABILITY CURVES

BY

JACK FULTON.

The graphs show the stability curves of a catamaran, kolumaran (trimaran) and a keel type hull. The maximum stability of the catamaran appears the moment the weather hull leaves the water (about 20° of heel). The maximum for the kolumaran (trimaran) is when the lee outrigger becomes completely submerged. Of course, the maximum for the keel hull is when it is completely knocked down. Note that both the catamaran and kolumaran reach their maximum stability at a reasonable sailing angle of heel, and the keel boat only uses about 20 per cent. of its stability at this angle. Thus, the keel hull is carrying agout 80 per cent. of its ballast just for the ride because in almost any boat corrective action should be taken when an angle

of 30° is reached. Note also that the catamaran loses stability faster than the kolumaran which indicates somewhat greater stability for the latter, though both craft are in danger if corrective action is not taken promptly when the angle of heel becomes near 30° . The dotted line indicates the percentage of wind striking the sail at the various angles.

A 40 FOOT OCEAN TRIMARAN

L.O.A. 40 ft. 0 ins.	Float L.O.A. 30 ft.
Beam O.A. 16 ft. 0 ins.	Float beam 2 ft.
Draught 14 ins.	Float draught 4 ins.
Beam, main hull, 6 ft. on deck.	Sail area 700 sq. ft.
Beam, main hull, 4 ft. on waterline.	

Designer, builder and owner : Leon Cook, 1298 Windover Way, Monterey Park, California.

I am now building this craft in my back yard. The main hull is about half finished of the above dimensions, construction being $\frac{3}{8}$ marine grade plywood, fibreglass covered. The bottom of the main hull will be 90° V. The floats will not be "boxes" but will be of a shape which I hope will complement the main hull.

Leon Cook's mainhull

It is my own humble opinion that too many trimarans with pretty good main hulls have suffered from not enough attention to the extremely important floats. Why build 20 knot main hulls and then hamper the performance with 10 knot floats? This has been the case more or less with all the recent trimarans and has been the reason why they have been slower than catamarans. Look at it this way ! Would a catamaran sail equally well on either tack if it had a short fat hull and a long slender one ? My floats will be asymmetrical

Leon Cook's trimaran

and quite deep in draft when carrying the load. This will not have the least possible wetted surface but will give lateral resistance, plus shock absorption to sudden gusts and make for an easier roll motion. The main hull will have very little rocker while conversely the floats will have slightly more than average. This rocker in the floats will further ease the roll and make for manoeuverability when tacking. In theory, trimarans can benefit from the asymmetric floats better than a catamaran because the trimaran has only one float in the water

at a time and isn't fighting against the other one as happens in a catamaran.

Also, it might be possible to mount hydrofoils on the trimaran floats for high speeds to windward.

I believe that trimarans are inherently faster to windward than catamarans providing they are of equally good design. The reasons are as follows :

1. Lower centre of gravity.

2. Less windage.

3. Better weight distribution. This is to say that the centre of gravity is always somewhere in the main hull and is therefore always on the windward side no matter which tack the boat is on. It is not thus in a catamaran which has the C.G. between the hulls.

My rig will be conventional sloop rig of about 700 sq. ft. and may use full length battens. The boat will be primarily used for cruising but will also be entered in local multihull races. It will have a galley and will sleep six in the main hull, all berths being single. Regardless of the fact that it is for cruising, it will be kept fairly light and I expect to win a lot of races with it. I have had considerable sailing experience, being the champion of the 27 ft. FEATHER CLASS in the Los Angeles Harbour 3 years, '57, '58, '59.

My observations on the local multihull boats are as follows :

1. The *Pacific Cat* is the best in its class — a terrific performer.

2. The much bigger *Patty Cat* is only a little faster and hobbyhorses too much.

3. The only trimaran with potential in the area (a 28 ft. Tchetchet) has never been driven and has not had good sails.

4. The *Dreamer* is not the fastest cat to windward despite those claims.

5. Ralph Flood's *Fleetcats* have nice hulls but have not yet been

brought into full racing trim.

THE AUTOMATIC-RELEASE CLEAT

BY

ARTHUR PIVER.

A useful and perhaps indispensible device for the offshore multihull, especially in squally conditions when good speed is desired, is the automatic-release cleat.

Crude model of automatic-release clear shown in two views. In left photograph it is seen holding sheets. In right, the tension device has released, and the cleat has tilted, allowing the sheets to pull out of cam cleats. Not shown is tripping device which goes through cabin and to stern line.

The cleat illustrated contains two cam-action cleats, as it is felt that the jib should be released as well as the mainsail. If the main only is released, the jib can turn the bow of the boat down wind so that the main boom is pressed against the stays; perhaps complicating matters. If the jib only were released, the boat might not head into the wind quickly enough in a severe squall.

As can be seen in the photographs, when a pull on the sheets exceeds the pre-set pressure of the tension adjustment, the frame capsizes in the direction of the strain, allowing the sheets to pull up and out of the cam-action cleats.

A simplified, yet effective version of the cleat was made by Jim Brown for his 24 ft. *Nugget* class trimaran. Instead of the frame, he used merely a length of $2 \ge 4$ in. timber long enough to contain the two cam-action cleats (the cleats were mounted on the flat dimension). The wood was hinged as shown in the illustration. For a tension device, he used a safety ski binding.

A simple tripping device may be added; thus a trip line can extend the entire length of the accommodation, as well as to a line trailing astern.

Arrangements are now being made to have such a cleat manufactured.

NIMBLE'S REMOTE JIB-REEFING ARRANGEMENT invented by Arthur Piver.

The drawing shows *Nimble's* jib. To reef, the halliard is slackened off, the reefing line is hauled in. Block B descends to the tack position and grommet D descends to clue position just forward of swivel block C. In actual practice, the reefing line is double with one on

each side of the sail forming lazy jacks which confine the reefed portion of the jib. The lower horizontal battens still further keep the lower part of the reefed jib from flapping.

This mechanism was in frequent use during the Trans-Atlantic crossing and gave no trouble whatever.

GYROSCOPIC SELF STEERING GEAR

The vane-operated servo-rudder self steering gear seems to be the simplest and easiest gear and was used by three of the four entrants in the Slocum Society's single handed Trans-Atlantic race which we saw start from Plymouth in June this year. Francis Chichester, the winner was the only one to use a simple vane-rudder mechanism which needed a much larger vane, of course.

To our knowledge, no one has yet used a "Mill Gear" anywhere.

It would now appear from Arthur Piver's account in the earlier pages of this publication that no present form of self steering gear, other than an electrical one is suitable for a really fast ocean-going multihulled craft which can outpace the wind when surfing down waves, though it is also possible that the sails can become becalmed under the lee of waves.

To meet this need and to make electrical steering gears unnecessary aboard such a boat, a gyroscopic self steering gear is conjectured.

The drawing shows a possible construction. The main rotational momentum is given to a heavy metal ring by four "spokes" which are aerofoil windmill "wings." The ring will continue to spin for some time when either becalmed or the wind strikes it from the wrong side and will control the servo-rudder when a wind vane will no longer work.

Such a gyroscopic "helmsman" will not, of course, steer a course to the wind direction and will also "wander," if only from the rotation of the earth. Still it may work and be of value.

FINALE

By way of finale to this most interesting publication, we show a drawing which Arthur Piver has sent to us for the encouragement of any faint-hearted sailors, if such there be in the A.Y.R.S. It shows what the sailor of a 35 foot trimaran might feel is happening should he take his craft to the Roaring Forties under one of the "Greybeards" which sweep endlessly around the Great Southern Ocean.

In fact, of course, the contour of a "Greybeard" is not quite like this but one would most certainly feel that it was.

The 35 foot *Lodestar* is now being built by Arthur with which he feels that he has not only conquered the trimaran configuration but, by the amount of room in it (the floats alone could sleep eight people), it appears that he has also solved the problem of the housing shortage. He hopes to take it to the Roaring Forties in 1962.

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Photograph by courtesy of "Lilliput" magazine

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Key to Abbreviations :--SC. Sailing Catamaran ; AB. Specially suitable for amateur building ; MP. Can be built in marine ply ; A I-2 Normally accommodates Max/min. persons I or 2 etc. ; GF. Hulls available in reinforced glass fibre ; K. Supplied as kit ; MM. Moulded mahogany shell hulls ; C. Supplied complete ; B. Sleeps I to 2 persons etc. ; D. With detachable hulls ; S. Safe.

The price of a set of plans includes royalty and International Certificate of Registration for one boat only together with official sail number where applicable. Ten patents and registered designs are embodied. Over many years most of the designs listed have been fully proved afloat and some are already well established classes. Special designs can be drawn up to order and if required Erick Manners may be available to inspect or supervise new construction.

Plans available from the Designer

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