

CRITICISM and doubt about multihulls in South Africa has come mainly from those who have never sailed in one. You might enjoy comment from a simple soul who for two years has endured the gales and calms of the Cape coast in the company of his 30-ft. Piver Nimble trimaran.

A torrent of drivel on multihulls is flooding the bilges of the world boating literature. Much of it is from violent enthusiasts, blind to their disadvantages—their clamour surpassed only by the counter-propaganda of the leaden-footed diehards with economic interests vested in monohulls.

I hope that my efforts in this article will serve only to pump the overburdened bilges, not to fill them further. I make no apology for not being an expert designer: as a layman, I am the fellow who has to live with the boat.

Also, I have nothing to sell.

Speed

Under ghosting conditions the trimaran is neither better nor worse than the monohull. The trimaran is more seriously affected than the monohull by fouling and by loading, both of which increase wetted surface. When these two factors are favourable, and given enough wind, cruising trimarans are faster than cruising monohulls.

However, they can beat the racing monohull of comparable size (e.g. Royal Cape One Design) on a triangular

TRIMARANS: AN OWNER'S APPRAISAL

BY BROOKES HEYWOOD

Three trimarans and the Protea class 21-footer Black Beauty disport themselves in False Bay where tris race regularly in offshore events. The author's t'Duifje is on the right . . . a veritable playground on deck. Dry conditions for sunseekers on the lee deck do occasionally exist in the Cape, but under pressure this side is swept by broken water, the windward deck riding high.

Photo: David Baker

course only in near gale-force conditions.

They achieve this because, heeling less, they spill less wind. No ocean-racing trimaran has yet appeared in our waters, though at least four are in construction. I will believe claims made for their performance when proof is delivered: it has been reported that they are faster even on the wind than racing monohulls, as in the first leg (to windward) of the Round Britain Race.

Windward Ability

The average cruising trimaran seems to make good about 5 degrees less to windward than the average monohull. This can be offset often by greater speed on the course sailed, but a chop seriously slows their very light hulls. Under extreme conditions, and on a lee shore when this counts for most, a sufficiently reefed trimaran can still make way to windward because she does not heel far enough to spill the wind.

I suspect that windward ability of a trimaran is affected more by fouling than that of a monohull: my trimaran crabs dreadfully when foul.

The average trimaran heels about 10 degrees to 15 degrees. In the steep seas raised by our Cape Southeaster, this angle increases as she climbs the face of the wave, then decreases sometimes with a rather sharp jerk to windward as the main hull slides down the other side and the lee sponson takes the crest. This sharp motion is annoying to those accustomed to the always-heeling posture of the monohull.

Do not be led astray by those who would tell you that you will not get sick on a trimaran! I have become accustomed to the motion—one quickly does—but a monohull sailor retched his voice away completely while rounding Cape Point with me in a 30-knot Southeaster. (His voice came back after three days, just when I had begun to hope that nobody would ever hear from him what he thought of the trip!) To this must be added the sharp pitching as the light bows rise to each wave.

This feature is shared with the modern light-displacement keelboat, the price paid for drier decks and higher speeds.

Much of this motion is due to the too full bows and too much rocker shape under the main hull causing the bows to rise unnecessarily high before dropping into the trough beyond. It is claimed that this factor has been largely eliminated in the newer round-bilge trimaran designs which have finer bow sections and less rocker. This shape is said to be relatively unaffected by chop.

Reaching

This is the fastest point of sailing in trimarans as with any other boat, and even a cruising trimaran should be able to overtake a racing monohull on this course. With enough wind, sailing is extremely comfortable because of absence of excessive heeling. However, no wind in a short



Cosa Nostra, the tri in which a Cape Town girl Miss Praetorius sailed to the Spanish Main, takes the ground in the Caribbean. Actually, no slip is necessary, given a sheltered beach and a tide of 3ft., or more. Draft of Piver's Nimble is 2ft., that of newer, round-bilged designs is less.

beam sea is uncomfortable in a trimaran because she slops sharply from one sponson to the other.

A beamy monohull in these unpleasant conditions will roll more gently, but through a greater angle.

Running

Running before the wind cannot cause the usual rolling and yawing encountered in round-bilged keelboats. The amount of each roll is a fraction of that of the keelboat. The tendency to broach depends, as with any boat, on the underwater configuration rather than the number of hulls: the Piver range of trimarans familiar in South African waters has little tendency to broach. The "tracking" effect of two or three long slender hulls inherently cuts down the broaching tendency on multihulls.

However, if an accidental broach should occur, a huge strain is brought to bear on the rudder—and more than one Piver trimaran rudder has been lost from this accident.

This is because there is no deep keel to offer lateral resistance to the water pressure: the sideways velocity of the boat is greater and the whole strain is taken by the rudder. Ultra-light construction must not be employed in the rudder and its attachments! Once this has been sorted out there is no problem.

The accidental broach is no hazard to the tri. itself: like a cork, she sidesteps with the water in an awkward jerk—but the deck stays dry and there is no strain except on the rudder.

Extreme Conditions at Sea

The trimaran configuration has proved itself in scores of ocean crossings in all weathers. New Zealand and Tasmania, in the Roaring Forties, have rapidly expanding trimaran fleets. The Nimble Tiger trimaran which left Durban in a gale during 1964 and was assumed missing, finally has been reported to have reached Australia safely.

But small trimarans can overturn, as can motor-cars, with no return once this has happened. Both need reasonable care under extreme conditions to prevent this happening: in no sailing boat should one carry full canvas tightly sheeted broadside-on to a gale.

A month after the little day-sailer Nugget trimaran overturned a mile from the Table Bay breakwater, a monohull, Nkwazi, sank a mile off Beira, leaving its two occupants to swim ashore. (Cape Argus: November 3, 1966.) We hope

that absence of editorial comment on this accident does not indicate that it is accepted as a routine event.

The wooden unballasted multihull is incapable of sinking, even if fully flooded. The dangers of yachting in general are still further increased by the fact that the keel of a monohull could spring its bolts or its garboard: or the float of a multihull could come adrift. *Neither is safe.*

And I suspect that is why we forsake the safety of the armchair to sail them.

Lightness of construction reduces inertia. Inertia is further reduced by having no deep keel to "trip" over and impede lateral motion when a violent force is applied, such as a large wave striking abeam. To illustrate the principle, imagine yourself kicking a fly in flight, then kicking a dog. The fly, like a lightweight trimaran, will be pushed sideways to escape damage. A big wave, therefore, cannot hit the hull hard enough to damage or overturn it.

The light, narrow hulls do not make waves as does a displacement hull. There is no build-up of water astern to poop the boat, so when running before a gale in a trimaran there is no need to trail warps. Under these conditions the boat surfs for long periods on a single wave; and only then does she attain the fantastic speeds claimed.

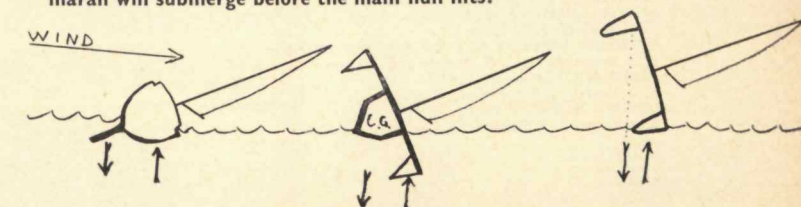
No disasters have overtaken trimarans during this exhilarating performance on the open sea, though the Australian racing Vagabond was holed, dismasted and overturned on Breaksea Spit during a cyclone; and a little 24-ft. Nugget suffered a similar fate on the bar at the entrance to Salcombe.

No ship can stand up to such treatment.

The seaworthiness of trimarans under gale conditions has been acknowledged by none less than Colonel "Blon-

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Three boats trying to right themselves. When it is most needed, the keelboat's righting moment is approaching maximum; that of the catamaran is about to disappear; the trimaran is intermediate, its righting moment will go only when heeling has exceeded 90°. Note that the lee sponson of a properly-designed trimaran will submerge before the main hull lifts.



TRIMARANS

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die" Hasler who sailed a monohull in the recent Round Britain Race. He still has reservations about their performance in the legendary "freak wave".

Theoretically waves will not be able to get sufficient grip on a multihull to punish it, and this has been the experience to date.

The Righting Moment

Under the impact of wind, resistance to capsize increases progressively as capsize is approached in a keelboat. In a catamaran there is great initial resistance which falls away rapidly after 45 degrees of heel. In a trimaran the righting moment continues strongly, though diminishing progressively, even after the lee hull has been immersed. (See figure 1.)

It has been proved that, given windless conditions in a capsize produced by mechanical means, the boat will right itself even after the mast has been horizontal. This is upset by wind pressure under the wings which, in gale conditions, might tip a trimaran heeled 75 degrees.

Toria, Round Britain winner 1966, was not decked between her hulls, so this factor can be eliminated if one is prepared to give up the luxury of large decks.

To achieve a flip in a trimaran in extreme conditions, the boat must be: (1) Heavily over-canvassed. (2) Tight-sheeted on a nearly beam wind. (3) Have an extremely light-weight main hull. (4) Have fully-decked wings.

These latter, if suitably shaped, are said by some designers to impart an aerofoil lifting effect when going hard to windward, thus increasing speed. I wonder whether this in fact does play a significant part: light as they are, I think an aero designer would be able to prove that a far greater wing surface would be required to lift the weight of a boat in the relatively low air-speeds prevailing, even in a gale.

An unexpected beam sea has no tendency to capsize an over-pressed trimaran: it has the effect of spilling the wind from the sail, readily felt by slackening of tension in the mainsheet. The boat dances sideways out of trouble, like the fly from your boot.

Family Boat

The immense space available (6-8 berths in my 30-footer) is a temptation to overload. A multihull loses performance when overloaded. But make half the complement children and you have no load problem, with undreamed-of spacious accommodation below and a veritable playground on deck. Space for some to stretch their legs and sunbathe while others catch fish for dinner.

As a family, we have spent many hours exploring the shoals and channels in the Langebaan lagoon improving our shaky navigation. A mistake that lands us on a sandbank present no problem: if an oar in the mud fails, merely jump overboard and push her off—no heeling, even when hard aground!

Manoeuvrability

Given plenty of water, the trimaran can clear any mark within inches and pick up the buoy every time in "man overboard" drill. But put her in an overcrowded anchorage under reduced canvas in a high wind, and she becomes hard to control at low speeds. This is because of the high above-water windage proportionate to the low underwater sections. Of course, much of the trouble has been due to inexperience and failure to allow for the light weight hulls coming to a stop almost the moment the sails begin to luff. My own goofy early handling is still improving.

But the fact remains: the trimaran does need extra water at moorings, even with improved handling.

Coming about with full sail in moderate to fresh wind conditions presents no problem. With genoa up, I merely



Dave Abbott's Piver Nugget trimaran Ruby has been sailed with great consistency and success in False Bay waters since her launching about four years ago. Here, well-reefed, she clears her lee sponson deck in typical brisk weather.

have to let go of the helm and she comes about on her own. Extra wind, extra chop, less canvas, foul hulls and loading: each of these factors whittles away her ability to come about, so that it is sometimes necessary to gybe under extreme conditions.

The gybe, by the way, is achieved with amazing comfort due to the great lateral stability.

The Monohull-Multihull Split

Really, what is it all about? The basic frailty lies not in either type of boat but in human nature. Excessive claims were made for trimarans when they first appeared, slighting the conventional boat-owners. To the joy of the latter, some of the claims proved unfounded so trimarans were wide open to counter-attack, which roared to a crescendo as one or two adventurous trimarans came to grief.

Now with the Round Britain victory in their pockets, the multihullers rally their forces and scream back to the attack with editorial cries of "obsolescence" levelled at the "keelers".

They point to the 50 years it took for the deep-keel to establish its superiority over internal ballast during the past century; they point to the 30 years it took the Bermudan rig to usurp the gaff in this century.

Already they are numbering the days of the monohull. Why?

The explanation is to be found not in the boat design but in man's spirit which resents any insult to his religion, his wife or his boat.

Race committees would do well to note the sporting attitude of Bill Smith, Leslie Wright and others at the False Bay Yacht club, where great trouble has been taken to work out a reasonable formula for including multihulls in the races. And writers would do well to take a leaf from the book of our Editor (*S.A. Yachting*) for having covered the successes and setbacks of multihulls during their toddling years in our waters.

Multihulls are attracting to sailing many people who would otherwise be lost to our brotherhood. Our Editor still advises caution: it is his job to do so, and multihullers will not resent it if they really have faith in their boats. The proof of the pudding is in the eating.

Remember that the same Editor advises caution in all other forms of boating activity from dinghies to tunny boats. Long may he continue to do so!