

The Sprog - How it All Began

by H. H. Mc Williams - designer of the Sprog

We have had enquiries from time to time concerning the way in which the Sprog came into being, and these have been more frequent lately. It would seem, therefore, an opportune moment to record what seems almost ancient history in yachting circles, although it is only a matter of twelve years since "Stroppy", the prototype Sprog, was launched and "started something".

It all began in 1938. Like a sucker I was completely taken in by a convincing advertisement in some American yachting journal, describing the virtues of a 14 ft. sailing canoe the parts of which were supplied (dirt cheap) in knock-down kit form. I fell for it, stem, ribs and transome.

A large parcel duly arrived, beautifully packed in corrugated cardboard which - incidentally - was then as much of an innovation as the use of waterproof plywood for boatbuilding. After unpacking a litter of roughly sawn fragments and sorting out the calico packets of nuts and bolts and screws I wondered how I could have been so gullible.

Yet I eventually assembled the kit and though the boat itself was a freak, at least I discovered what enormous strength there was in thin plywood if it was cleverly used; the possibilities of waterproof glue in boatbuilding, and the enormous advantage of a light hull. Until then, a Sharpie represented the ultimate in racing yacht design and construction, and the idea of planking for hull and deck being superseded by plywood had apparently not occurred to anyone in this country.

The American canoe had aluminium channel-section ribs, a plywood deck and an outrigger with light plywood floats. It was covered with canvas which, after being treated with dope, formed a taut skin and revealed the potential uses of dope or (to give it its correct name) commercial Lacque.

The sail plan was simple, a 7 foot mast carrying a balanced lug sail of about 50 sq. ft. lashed to two spruce yards.

It did not take much imagination to see that a slightly beamier but equally light hull carrying a similar sail without the outriggers would be very much more stable and probably a good deal faster.

I discussed the idea with Helmut Stauch during the Regatta at V.L.C. in 1939, and he undertook to let me have a set of lines for a 14 ft. canvas-covered hull with a beam of about 3 ft. which would carry a sail area of 60 sq. ft. in the form of a balanced lugsail. He was as good as his word, and the sketches for this canoe arrived in time for me to build from them before leaving early in 1940 to join the Navy.

This canoe was called - appropriately enough - "Tippy", and was certainly the most cranky craft I have ever handled, literally requiring the traditional parting of the hair in the centre.

Instead of aluminium for frames I used 1/4" ply and only the deck round the cockpit was covered with ply, the rest being canvas sheathed like the hull. "Tippy" was so light that the only way I could support her while building was between two canvas deck chairs, which adapted themselves to the shape of the hull and held it steady while I was finishing it off.

"Tippy" was as fast as greased lightning and while going flat out was comparatively stable. I once enjoyed a delirious broad reach in a Westerly buster during which I dashed through the weather bow-wave of Harold Kohler's Sharpie (with spinnaker set) in a cloud of rainbow spray, and while he struggled to douse his spinnaker at the mark, nipped past and led him back to the finishing line. That satisfying moment was not enough to make up for the dozens of occasions when I capsized to weather in a let-up or rolled over on the run, or somersaulted during a gybe.

However, "Tippy" demonstrated effectively the immense strength of plywood, the usefulness of waterproof glue, and the possibilities of a light hull driven by a medium area of sail, using nothing more than the helmsman to provide the righting moment.

Then followed five years of almost complete isolation from sailing, for except for a couple of rather frightening races with the Home Fleet at Scapa Flow when I sailed a 14 ft. R.N. dinghy, I did not have a chance to get hold of a tiller until the war was over, except in my dreams.

These dreams were really constructive, and I managed to remember a lot of details from them. One, in particular, remains in my memory because it occurred in broad daylight, and provided me with the design of some of the Sprog fittings which have never been altered since the first ones were made in accordance with the particulars I noted down. This was on board H.M.S. "Shropshire" when, as an ordinary seaman I was engaged as a "surface look-out". Since dense fog rendered visibility practically nil and the ship was making about 25 knots on the fringe of the Arctic Circle I was very glad to have something with which to occupy my mind and pass away the dreary hours of my watch.

The idea of a light-weight hard-chine boat, about 14 ft. o.a., remained with me constantly and from time to time I would rough out sketches of lines and construction. Plywood was to be the material used, weight being kept to a minimum by using glue for fastening and doped canvas where possible for decking. (My first design for the Sprog had canvas fore and after decks, and plywood only on each side of the cockpit as far forward as the mast step).

There came a time in 1945 when all these thoughts seemed to culminate, and to demand some sort of recognition. Instead of being a jumble of notions seething in my head I felt the urge to sort them out on paper.

We were bound, at that time, for the invasion of Rangoon, in a convoy assembled in Calcutta. The ship in which I found myself was obliged to heave to, with several others, during the tail-end of a cyclone in the Bay of Bengal. There was little to do except to find some place into which one could firmly wedge oneself to resist the violent movement of the ship and to pass away the time in some suitable fashion.

I jammed myself into a corner with a wad of foolscap, and started there and then on sketches and specifications for "Sprog" : a plywood 14 footer incorporating all the ideas I had accumulated, and making use of the construction I had noticed in a wrecked Mosquito aircraft, which appeared to be almost entirely glued together. Years later I was to find that Aerolite glue was evolved during the war for special use in aircraft construction : the Mosquito in particular.

I made a number of drawings, and then wrote a personal letter to Maurice Wild, who was then Commodore of the Zwartkops Yacht Club, asking him to find out if the idea of such a boat appealed to the active sailing members.

I still have his reply, and I can say that it was mainly due to his support and infectious enthusiasm that on my return I followed up the idea itself by building a boat to show what I had in mind.

Not being expert in the matter of evolving lines, calculating the mysteries of centre of effort, lateral resistance, and so forth, I again turned to my old friend Helmut Stauch, asking him to examine my drawings and offer his advice.

The lines of a hull and the successful choice of a suitable sail plan are not usually matters of chance, and while the actual idea of the Sprog and the unique method of its construction (since widely copied) are entirely my own invention, I always give the fullest credit to Stauch for modifying the lines of the hull and suggesting the adoption of a sail plan identical (and interchangeable) with that of the 14 ft. sailing canoes which at that time looked like becoming popular at T.Y.C., and which were, in fact, a development of the "Tippy" design with which he was associated five years earlier.

The full size sections proposed by Stauch had to be modified still further during construction of the prototype, but with the exception of a fractional change of dimensions in setting them up which was necessary to avoid a "flat" in the keelson, the lines of the hull have never been altered since.

Although I only returned to the Union in September 1945, by the end of October I was already collecting materials for the building of my first Sprog. Brass screws were unobtainable in Port Elisabeth at the time and I remember being overjoyed at finding the sizes and quantities I wanted in a side street shop in Grahamstown.

Waterproof plywood was, I knew, to be had, but "surplus war stocks" was a racket hardly familiar by then. I learnt that a large quantity of so-called "marine" plywood was stored in a local warehouse, having been stripped from the liner "Mauritania," when her cabins were gutted for the conversion into a troopship. Before I was able to acquire some of this material a fire broke out in the store, and so the stacks of plywood bulkheads endured the double test of enduring both fire and water since the fire-brigade excelled itself in putting out the flames to an extent which subsequently entailed pumps being used to get rid of the surplus water.

After some time I managed to obtain a number of sheets of ½" ply suitable for frames and enough!" material for sheathing and decking. (Incidentally, one of the panels still retained the framed printed instructions for life-jacket drill; this at the moment remains fixed to the door of my boatshed)

Tests were made with the plywood; pieces of it dangled between wind and water from my jetty for three weeks; samples were boiled, steamed and ovenbaked. The plywood showed no signs of delaminating and, full of confidence, I went ahead. By Christmas the hull was complete, and by the end of January the boat was ready for launching. But the sails did not arrive for another month, and so it was not until March that "Stroppy" the prototype Sprog was launched.

It is interesting to recall that the original sails, supplied by Messrs. Cramfield & Carter, cost only £ 7. 16. 0. The entire boat cost only a little over £40.

The Zwartkops Yacht Club had succeeded in obtaining the honour of being the first Host Club for an Interclub Regatta after the war, and thus it was that in March, 1946 there came together many old friends to sail again in the well established 20 footer, Goodricke and Sharpie classes. Several well-remembered faces were missing, but the right spirit prevailed, and some interesting and exciting races were enjoyed by competitors and spectators alike.

Stroppy was launched a week or so before the Regatta by a charming little girl, the daughter of my neighbour, who had taken a great interest in the boat while it was being built. Since "Sprog" was naval slang for a small edition of something bigger and better it was only fitting that the first one should also have a name suggestive of the lower deck. Stroppy is the sailor's polite word for "impudent", and there was indeed a certain amount of cheek in the way that the prototype Sprog appeared to take a bow.

The first race in which Stroppy took part was a free-for-all held in a piping westerly. A brisk incoming tide against the wind had built up a typical Zwartkops sea, the short steep broken waves whipped into steaming spray by the sudden gusts. I had to call for a volunteer crew to help me sail the untried boat in these conditions, and I still don't know which of us was the greener as we crossed the line at the start.

There was only one thing to do on the mad run down to the first mark: by a miracle we succeeded in making three text-book gybes which brought us safely there while others came to grief in an attempt to sail by the lee.

I don't imagine that anyone watching this race expected that we would get very far, but any surprise that was felt was fully shared by us when we found that we had passed Colin Moag in his crack Goodricke dinghy, despite the fact that he was carrying a spinnaker.

Even after the mark was rounded and we began the stiff beat upstream we managed to keep ahead of "The Moag", who was then in the full glory of his sailing career.

I can't remember how this race ended, but what remained an established fact was the unexpected performance of an untried 14 ft. plywood boat in conditions which proved too arduous for many other larger craft handled by experienced helmsmen and crews.

After this Stroppe again showed up well by convincingly trouncing the three "Inyoni" class sailing canoes which Stauch and his brothers-in-law had brought down specially for the Regatta. These boats were not sailed in the heavy weather, and appeared to be extremely cranky, capsizing often and altogether proving a disappointment to all concerned.

Interest in the Sprog was immediate; there were dozens of requests for plans, although these had not actually been completed.

In my innocence I believed that if the eight frames or stations of the hull were accurately cut out of plywood they only had to be fixed at identical positions to enable a strictly "one-design" hull of plywood to be built over them. It took several years to reveal the fallacy of this idea, and I am not sure even now that rule cheaters and beaters have been foiled by the elaborate precautions taken to keep all Sprogs as much alike as possible.

Anyway, several sets of half plywood frames were cut out, strictly to templates, from the remaining stock of the "Mauretania's" cabin partitions. One set was bespoke by Helmut Stauch himself, another two by Syd Robinson and Albert Milde of Z.Y.C., and the next three Sprogs were very soon completed and these and a Durban-built boat, together with the prototype, took part in the first series of Sprog races ever to be held at an Interclub Regatta, at Durban in 1947.

Despite variable weather conditions they attracted attention when, in a blow, The Natal Mercury carried headlines: "YACHT CAPSIZES TWELVE TIMES IN ONE RACE", but instead of discrediting the design this only drew attention to the fact that there was a yacht now in existence which instead of having to abandon the race after a single capsize could apparently continue ad infinitum!

The series was won by Stroppe, but as I had Michael Kay of R.Y.C. as crew, I felt justified in handing the bronze trophy I had presented to him to take back to that club, in the hope that it would encourage other members to take an interest in the class. Incidentally, it was my intention to present every year a new suit of sails to the winning helmsman, but I was not given a chance to explain this at the prizegiving ceremony. I kept the sails and changed my mind about this idea, which in view of the present cost of sails, was a fortunate decision. (Sprog sails now cost nearly five times what they did then!)

With typical conservatism Durban viewed the Sprog askance, and indeed for many years avoided having anything whatever to do with it. Redhouse also adopted this parochial attitude, and so it is interesting to find that currently the Sprog fleets of both clubs exceed in numbers those elsewhere.

The 1948 Regatta at Victoria Lake, Germiston, helped to prove that Sprogs could provide keen racing in light inland conditions, despite the criticism of the "low-aspect ratio" sail plan. Again Helmut Stauch took part, and we enjoyed as keen a struggle as we had had at Durban the previous year and with the same results, which was naturally gratifying to me.

By this time there were many Sprogs under construction all over the country. Articles

published in overseas journals brought requests for plans from places as far apart as Chile and Australia, Canada and Aden, Lagos and Madras, followed by enthusiastic letters from amateur builders who had completed their boats and were enjoying sailing them. Two clubs in Queensland adopted the class, and my correspondence during 1949 was mainly taken up by the exchange of views with these eager Australians.

By this time it was discovered that despite the careful testing the "Mauretania" plywood was not waterproof. Frames in the early boats began to delaminate, and horrid smells rose in waves from their watertight compartments, where ghostly crops of mushrooms appeared to thrive. Some boats eventually lost their intermediate frames all together although they continued sailing and seemed to retain their hull shape.

Stroppy was overhauled frequently, frames were re-glued, screwed or rivetted, and numerous coats of paint helped to conceal the ravages of time and render the hull watertight. The successes of the 1951 Regatta at Knysna were followed by the disappointments at R.C.Y.C. on Table Bay the next year, when I realised that lighter and newer Sprogs were more than a match for the gallant old boat.

What better resting place could have been found than the secluded alcove in the Marine Hall of the Port Elizabeth Museum? Here Stroppy may still be seen, with a light powdering of dust replacing the salt which for so long sparkled on her plywood deck.

Tuning

The Sprog is generally considered to be one of the most difficult boats to tune. It is also supposed to be a difficult boat to sail. In both respects there is this to be said: you do at least know immediately when you have done something wrong. To know if you have done the right thing, either when sailing or tuning, requires a lot more experience than those for whom these articles are intended possess.

There are certain general rules regarding the tuning-up of a sailing boat for racing.

The basic principle lies in reducing weather-helm to a point when it exists to a useful degree when the wind is strong but does not altogether disappear when it is light. This sounds difficult, and indeed it is no easy task.

First of all, what is "weather helm" anyway?

It is the tendency of a sailing boat while close hauled to luff up, head to wind, which increases proportionately with the strength of the wind. The opposite characteristic is "lee helm", which means that the boat tends to "pay off" - in other words, as the wind becomes stronger so the bow tends to be blown to leeward; it is a most uncomfortable feeling and to be avoided at all costs.

Extreme weather helm is just as undesirable, and one must aim at just that compromise which will enable the boat to make progress to windward without being retarded by the "correction" applied by means of the rudder which, in extreme cases,

may even act as a brake.

There is one simple rule to be remembered in doing this. It all depends on the position of the mast in relation to the position of the centreplate, and-generally speaking - the further aft (of normal) the mast is stepped the greater the weather helm will be.

Moving the mast forward decreases this, but the same effect can be obtained by raking the mast to increase weather helm and setting it more upright, or even raking it forward to decrease it.

Another factor comes into effect : a forward rake improves off-the-wind performance (particularly on the dead run) while raking the mast aft improves windward performance. That is to say, the actual rake seems to be more effective than merely moving the mast fore or aft in its step.

One would imagine that a mast well raked aft would exert a "lifting" movement on the run that would cause the bow to rise and the hull to move faster before the wind - especially over broken water. But this is not the case.

It is worth noting that some Sprog owners set their rigging with the side stays so loose that the mast adopts a forward rake on the run while the downward pull of the mainsheet causes it to rake aft while sailing to windward. Theoretically, this seems sound enough, but no one has been able to find out what is lost in the translation of wind-speed into forward motion by the hull when reaching with such a loose rig. The fact that the mast must literally fall from one side to the other, according to what tack is being sailed, does not suggest that the sails of even a slightly heeled boat are deriving the maximum effect of wind currents striking them at right angles.

There is no doubt that a very small adjustment in mast rake makes a very big difference in trim. One cannot over emphasize the importance of making only very slight alterations at a time - and nothing else. It is useless to alter the set of the mast and simultaneously to move, say, the foresail leads one way or the other. These two adjustments may easily cancel out each other.

Furthermore, it is a waste of time to make adjustments and try them out except when racing, for obvious reasons.

It is a mysterious fact that two Sprogs, built by the same builder, and as nearly identical as it is possible to make them, will nevertheless require quite different mast positioning and rake, to provide the same effective results in performance. Perhaps it is something to do with the sails for we do not know to what extent these may differ, although the eye may not be able to detect the slightest discrepancy. For all we know, sails cut - or sewn - on a damp day may produce different driving forces from those made in less humid conditions. Anyway, it is accepted that every boat no matter whether a one-design or not, has to be tuned individually.

Now how much weather helm is required? This is a difficult question, because, strictly speaking, one should alter the trim to suit the strength of the wind. In other words, a boat tuned to sail perfectly in a light wind may develop acute

weather helm if it increases, while one which has just the right amount in a blow may even suffer from lee-helm if the wind drops to a gentle breeze.

This is where individual genius may be said to count for something. Often it is a case of sheer luck. It is doubtful if there is any Sprog which is tuned specially for a certain set of weather and completely re-tuned when conditions are quite different. The advantage seems to lie with the boat which is tuned for "all-round" performance, but here again, individual experience and "know-how" plays a most important part.

As a guide you can assume that in fair-to-middling breezes your boat is nicely balanced if no more than two fingers are required to steer her to weather. Here again there is more than a slight difference between the effect of "two fingers" on a tiller. What seems a featherlight touch to someone with a hand like a bunch of bananas may require brute force from those delicate piano-playing digits. Who is to know ? That is what makes it all so interesting.

Beginners should remember that real "hard-mouthed" weather helm can be immediately reduced while sailing by using less plate. There is a very delicate balance between "too much" and "not quite enough", but within the range lies the answer, and the sensitive intelligent helmsman will quickly become aware of the exact amount to be used while the callow gundlefingered "skipper" will simply not be able to tumble to it.

Tumble is practically the operative word, because a fraction too much plate on a broad reach can help to build up a situation - and rapidly at that - when a sudden broaching is the ultimate result of excessive weather helm.

For the benefit of the novice, broaching is merely the accumulated effect of weather helm, and is nothing but the irresistible tendency for the boat to luff sharply, usually spilling its occupants into the drink. This has to be checked in its early stages, and the best way is to reduce the initial weather helm caused by either too much rake or by the mast being stepped too far aft.

To sum up, then : decide to what extent your Sprog wants to luff up of its own accord in a medium breeze ; check if this is accentuated in stronger wind. Check again in light conditions, and re-set the mast to give you medium "feel" in average conditions.

Once you have decided on this (and goodness knows there'll be a lot of wise guys who will know better !) give the boat a fair testing out in several races.

By then you will be able to read (in our "next") of the further difficulties and problems besetting those who want to know how to tune a Sprog.

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