Some Thoughts on Oars - and a little about rowing

by Peter Bick

Part 1 DCA BULLETIN EXTRACT: 149/30 (1995/4)

During this last twelve months I have had two enquiries from members about oars. Having had to research the matter fairly thoroughly it seemed to me that it would be a pity to waste this work. I have therefore collated my investigations with my own experience to produce this article. I should first of all say that inland rowing, using gear such as sliding seats et al is a different matter about which I know little and would not even feel competent to analyse. The following deals only with rowing on the sea in boats with fixed thwarts and with a pair of oars - using the nomenclature as understood along the coast.

The main query was about oar length. I must admit that I have until now adopted only a very casual approach to this problem. There have always been two or three pairs of oars of various lengths on the rafters in the roof of my garage. I generally take down a pair a bit less than twice the beam of the boat I'm using. I am assuming that beam equates to the distance between opposite rowlocks. In recent years I have not done much rowing but at the time of receiving the letters I was just completing the building of a boat which was primarily a rowing craft. This boat deserved a better approach so the enquiries came at the right time.

As soon as I started researching the reply I found out that there is some divergence of opinion among writers. Firstly however there is the simple approach of Eric Coleman. He includes a little table in his book “Dinghies for all Waters”.

Beam	5'	5' 6"	6' 0"
Oar Length	8'	8' 6"	9' 0"

Then there is John Leather. He quotes what he calls the 'old established rule'. I think he probably made it up but anyway it is that the length of the oar inboard and outboard of the rowlock should be a proportion of 7:18. Thus a boat of 4 feet beam ends up with 7' 1" oars. As this is not a standard length, he says you can choose 7' for a low sided boat in smooth water or 7' 6" for a deeper boat in sea conditions. His 'rule' would mean 9' oars for a 5' beam. Apparently he also assumes that the rower's hands never overlap.

Next we come to a proven expert where the design, building and use of recreational sea boats and oars are concerned - Pete Culler: he says that the length of the oars should be at least twice the beam of the boat, sometimes more. Our 5' beam boat has now got 10' oars! In explanation I would say that most of Pete Cullers's boat designs were what he called 'clipper' types. Slim shapely hulls of low resistance but also important is that his oar designs insist on fine looms and blades, with heftiness above the leathers to help counterbalance the extra weight outboard.

Finally we come to Eric McKee, researcher and consultant to the National Maritime Museum. In his book 'Working Boats of Britain' we have the most authoritative view based on the use of oars in fishing boats around our coast in all sea conditions. He says that the length of the oar is limited inboard by the boat's beam and outboard by what is manageable. The ratio between these dimensions he calls the gearing. Most rowers can manage a gearing of 1:3 which would accord with a length of twice the beam, but tire more quickly if this is exceeded, even when the oar is counterbalanced inboard. He considered this to be due to the effort wasted in preventing the oar working inboard. He opted for twice the beam as a general rule but found that oars are usually used to the nearest foot or half foot below this calculated amount. He thought that oars should not be completely balanced as they then lack feel. An extra 2-3 lbs should be required at the outer end. The blade can then be immersed without effort.

After all the above, what can one say? The facts are that we have to stow them somewhere on board and that they are not used much on the type of sailing dinghy which most DCA members use. Eric's figures then make sense and could be used as the recommended minimum size. If we decided to use a boat designed for

rowing with oars to suit, then Peter Culler's ideas seem right. If we are going to eschew engines but use our oars as much as the longshore fisherman with their lug rigged beach boats and use similar boats, then McKee should be followed. The physical characteristics of the rower and his technique may affect the choice of length as does the differing freeboards of various boats. There is no substitute for 'try it and see'. Those who use oars most tend to favour overlapping the grips at the centre of the boat all or some of the time. The stiffness and weight of the oar should also match the characteristics of the boat. A light easily propelled hull needs light springy oars. If you use heavy oars on such a boat it tends to get away from you and you are unable to stroke effectively to get the most out of it. Spoon bladed oars can also be worthwhile on such boats.

Extremes of boat type can affect the issue. Last summer I found myself in the West of Ireland and while there went in search of Curraghs - those lightweight rowing boats constructed of a framework of timber covered with tarred canvas. I measured half a dozen that were lying ashore at the small harbour of Dingle. The majority were 25' long, 4' 4" beam and the oars measured 11' 3" in length. Here we have a boat that had narrow beam and was very light.

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The other query that I had received about oars was where to locate the rowlocks, both fore and aft and athwartships. Most small boat designers locate the centres of the sockets 12" behind the aft edge of the rowing thwart. However I have seen anything from 10" to 14". If the dinghy has no side decks then the rowlocks can be located at the ideal position on the gunwale; this gives the most leverage. One should still aim for this when you have side decks but the oars sometimes foul the inner edges of the decks on the recovery stroke. To get over this problem raise the rowlock sockets on blocks 2" or more high. The low sides of many modern sailing dinghies make it difficult to raise the blades sufficiently on the recovery stroke to clear the wave crests when in rough water; these blocks can help in this instance also.

An important matter which seldom gets an airing is the relative heights of rowlock socket and thwart. To start with the thwart, or moveable seat if you haven't got a thwart, should not really be lower than 7" in height from the bottom of the boat; something like 10" is better. The rowlock socket should be about 7" above this. It is best to make a mock-up of your cockpit when sorting this out. An old box, trestles etc. and a couple of old broomsticks will enable you to get a good idea of how it will work out. While you are at it see if you can incorporate some cleats against which you can brace your feet when rowing. Short lengths of 1" square batten, located where you will, will suit.

Now for some general points. Most people will settle for mass produced oars but there are very few that are satisfactory. They are too heavy in the blade and wrist and too light above the lock. The grips are barrel shaped which causes blister where they should be cylindrical in shape or preferably tapered away from the inboard end. I am afraid that you will have to put up with what you can get or pay through the nose, unless you build your own - if this is your choice read Peter Culler's book or wait for an article from me or someone else. Traditionally, working oars were of ash, with the advantage that they were OK without leathers. They were heavy but tough. I haven't seen new ash oars for many years. Best quality oars were always spruce but the price of this timber now puts these off the market except at fantastic cost. I built a spoon bladed double canoe paddle two years ago of sitka spruce and the timber cost me £40!

In fact, there is a lot of rubbish written about specific timbers for different aspects of boatbuilding. Our forefathers often had to use what they could get. I am at present building a pair of oars of best quality house builders' softwood. When I start slimming them down I will be able to judge better but they seem OK in the rough. In the old days oars were leathered where they went through the rowlock horns, and the leathering was usually at least 8" long. Nowadays you get moulded short plastic collars which are horrid but I suppose better than nothing, but do move them if they don't seem to be in the right place. If you decide to leather your oars which is one way to improve today's commercial rubbish, then try for at least 10" in length. You may use the one pair of oars in different boats or from different thwarts in the same boat; you

might also like to row at times with the grips overlapping which gives you greater leverage against the wind. The longer leathers make all this possible. You will come up against two problems however - where to get the thick leather and the fantastic price when you find it.

Oars used to break where the copper tacks were inserted to hold on the leather so the present trend is to sew them on, with a touch of contact adhesive if they slip. However they used to break because the tacks were driven round the circumference of the ends of the leather which weakened the timber all round. If you only tack down the line where the edges meet it should weaken the oar hardly at all. Anyway, soak them first before fitting and have the line of tacks or stitching at 45° to the plane of the blade of the oar. If you stitch, actually it's more like lacing up a corset, use thick whipping twine which doesn't stand proud of the leather, not folksy thonging. In order to decide where the leathers should go, use your oars without the protection first. The rowlocks will mark the timber at the appropriate place.

Whatever you do don't have anything to do with plastic rowlocks and sockets, they are an abomination. Use bronze if you can afford them but there is nothing wrong with galvanised iron. Make sure that the socket plates fit the stems before you buy as most chandlers offer you any odd bits, which they expect you to accept! Try to ensure that the full length of the rowlock stem is supported; an extra block of wood a couple of inches below the plate timber can help. If the fit of the socket hole is close but without binding, rowing will be smoother and quieter. As one often uses an oar for sounding or fending off, the end of the blade could do with some reinforcement. The normal strip of sheet brass is not much good but glassfibre tape and epoxy make an excellent job.

Ideally you should carry a spare rowlock. If you do lose one however a loop of rope through the socket and round the oar will work well enough as a temporary measure. If you equip the rowlocks with lanyards you should not have to suffer this misfortune. I would advise you to totally ignore the little hole at the base of the stem when fastening the lanyard as you would have to thread the lanyard through the socket first when shipping the rowlock - an unbearable fiddle. Make sure you choose rowlocks which have a neck formed below the horns; most of them do. Then use 4 or 5 mm three strand line for the lanyard and eye splice it round the neck. Fasten a small screw-eye to the hull near the socket and pass the lanyard through that secured with a stopper knot, when you ship the rowlock. On my boats I like to store the rowlock in a hole drilled through the thwart near the side planking. I use a lanyard long enough to allow the rowlock to be moved to its socket without untying.

On inland waters you are taught to row with long strokes catching your water early; this works fine in smooth water but not rough. If there is a sea running and particularly if you are against the wind then keep your strokes short, using a quick in and out action. At one time you could imitate the men in working boats but now you will have to experiment yourself. You may also fancy yourself feathering your oars on the recovery stroke (turning the blades towards the horizontal). Although elegant to see and perhaps desirable against the wind, it should not be thought of as essential. To feather downwind is manifestly absurd. There are or were many fast working boats which have single thole pins instead of rowlocks which make feathering impossible. Irish Curraghs and St Lawrence skiffs are just two. Unless one has trained oneself to do it automatically it is also an extra strain on the wrists.

A final point is the matter of lubrication. A touch of Vaseline or tallow (dripping refined by boiling) on leather and rowlock stem makes rowing much more agreeable. If you are unfortunate enough to have plastic rowlocks such lubrication is often the only thing that will allow them to work at all! A valuable hint to those who own an inflatable with rubber rowlocks is to carry a stub of candle and rub them with that - it improves the rowing efficiency 100%, and you will also find you can do without the plastic collars.

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Small Boats by Phil Bolger
Boats, Oars and Rowing by Pete Culler
Sail and Oar by John Leather
Working Boats of Britain by Eric McKee
Oars for Pleasure Rowing by Andrew Steever

Some Notes on Oars
by John Rawson

- further to Peter Bick's useful information in the Winter issue, here is a little more, primarily related to inland oars

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I have several rowing boats on Coniston Water, and my interest was originally caught when I made a clinker built dinghy, and found the information on oars in the books quite inadequate. I measured and weighed as many oars as I could get my hands on, thus accidentally collecting a quantity of information. I knew Eric McKee quite well, because my inland knowledge complemented his seagoing knowledge, and I helped him in his work on the reconstruction of the Greek Trireme.

As I see it the situation for an inland, non-racing, boat with fixed seats is as follows. The width between rowlocks depends on the size of the human body, and about 5'1" to 5'3" seems the best. This is more than the beam of many small boats, hence the use of short steel outriggers. Oar handles don't normally overlap, about 1" gap is allowed so you don't smash your thumbs, should you put them over the end of the oar.

The ratio between the inboard length and the outboard length is the 'gearing'. You can either measure to the end of the oar, or to its centre of pressure, and the centre of the handle. It makes little difference but you should be consistent. A gearing of 1:2 is very low, and 1:3 is very high, usually you are around 1:1.5 to 1:1.75 or so. Fast boats have high gearing, but boats that need fierce acceleration need low gearing, so racing boats are geared relatively low.

The area of the oar blade is about one square foot, related to the strength of the oarsman. The shaft usually finishes to just over 2" diameter, again related to strength. The wood should be a softwood, i.e. faultless Sitka, as this is less flexible than a hardwood shaft of the same strength. Flexibility feels uncomfortable but the energy used in bending the shaft is not lost.

At rest the oar blade should be covered by the water. This needs the centre of gravity to be so placed that the oar blade will drop if released. And it means that a downwards force needs to be applied to the handle to raise the blade from the water. This force on the handle should be about 4 lbs for a normal single-handed oar (i.e. scull) and double that for a two-handed oar. 2 lbs is better for a child. 8 lbs is almost too heavy to use at all.

This fixed handle pressure combined with the inboard length of the oar will give you a position for the centre of gravity, and a maximum length and weight for the outboard part of the oar. To get a gearing as high as 1:3 you have to have extremely fine construction for the blade. So for a more knock-about oar, a lower gearing is likely to be necessary. (If you have a boat with very high freeboard and have to have unusually high gearing the handle pressure may be too high and the loom of the oar then has to be weighted with a slab of lead or something. Not desirable but it makes it workable.)

If you want to measure an existing, oar you can suspend it by a spring balance from its centre of gravity. This gives the total weight as well as the position of the CG. And you take the overall length and the rowlock position. You can then calculate the handle pressure.

I must emphasise that you start with the 4 lb handle pressure and the width between the rowlocks. Everything else follows as the night follows day. Needless to say you have to take into account things like the weather in your district, i.e. height of waves, the boat's freeboard etc., and the weight and shape of the boat. But given this ideal design, you can try and find, or alter, an oar to suit. The closer you can get to the ideal the better it will work, the easier the boat will be to row, and the faster it will go.