Yullah

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Why Single-oared Sculling? The Practical Boat Owner of September 98 published, in their column "Waiting for the Tide"(Witt, Rodger, "Slicker Sculling", Sept 1998, p38), a description of the stern-sculling oar I have now been using for some thirteen years in my 20' estuary cruiser Mercia Maid. While this article is not available through the PBO's website, the technical specification of the blade can be readily summarized as follows:

A standard, elongated rain-drop semi-symmetrical NASA15 section, about 13" chord width and 17"long, with the shaft centred about 25% of the chord width back from the leading edge. It was constructed from about sixteen 1" thicknesses of deal; these were individually shaped and drilled to accommodate the steel shaft before being glued together.

Conventional stern sculling is a well-established and centuries-old technique, perhaps best known in its Chinese version as "yullah".

Pro's & Cons of Yullah

Compared to conventional rowing, the disadvantages of yullah in general are

1) In its most efficient form, it requires a special oar (as practised in China, a very long one) that can't readily be used for another purpose, e.g. as a bearing-out spar.

2) It requires skillful use of the wrists, which diverts some of the oarsman's energy from propelling the boat.

3) It generally requires the oarsman to stand, making the boat less stable.

4) It also offers less directional stability,

while the relative advantages are

1) Nothing projects beyond the beam of the boat, which thus can be maneuvered into locks, narrow channels & alongside without having to "ship oars"

2) The fact that the sculler stands means he can make use of more muscles than in a conventional boat not equipped with a sliding seat.

3) It is probably more efficient. This assertion is based both on experience, and on the theoretical considerations that there is (a) no recovery stroke and (b) no lifting the blade in and out of the water, all

of which involve energy losses, and make for difficulties in heavy weather.

4) By suitable location of its centre of gravity, the unattended oar can be made to settle in a stable near-vertical position convenient for the sculler to take in hand again, so he can readily change to any other task that takes priority, e.g. attending to the ropes. Stern-sculling is thus a natural "green" alternative to an auxiliary engine when sailing (See my article "Engineless on the Waterways, R.N. Sailing Journal, Spring 2003, pp. 47-8)

4) By standing on the other side of the oar, a second crewmember can more readily lend a hand in delivering power.

5) In a twin-hull craft like a 'Bell boat', a second crewmember could also use another paddle in the "well" between the hulls.

6) By putting a lanyard from the crutch round the loom, the paddle can be use to lose way and to go astern; for the same reasons as in (2), this is probably more efficient than in conventional rowing.

7) As in conventional rowing, the sculler has to face the stern; however by using the muscles in his legs and trunk as well as in his arms, he can develop a rhythmic action where he naturally glances ahead at the end of each stroke.

The claim for my oar in particular is that it offers all the above advantages, and is probably even more efficient, both because of its specific shape and because the blade is nearer the vertical than in Chinese yullah. Further, it counters the second disadvantage, because the blade "auto-rotates" to a suitable angle of attack so I can use both hands, and devote my mental and physical energies to propelling the boat. I demonstrate the auto-rotation to newcomers by ostentatiously keeping my palms well apart as I pull the loom towards and across my body, my fingers clasped together, but in contact with only about half of the shaft's circumference; the oar rotates in my hands as naturally as a log in a hammock.

Future Developments

More by luck than judgment, I feel I have built an oar that works well for a person of my particular physique in my particular boat. But I have little theoretical basis for recommending what dimensions should be used in other circumstances. In particular, the oar's performance is very sensitive to precisely where the shaft is centred. The 25% figure quoted above is commonly quoted in the literature on e.g.

rudder design, but my own experience suggests a figure a little lower. Can anyone out there help me establish an optimum?

Several people have suggested I should patent the oar. But I doubt this would be possible, because descriptions of devices of the same principle have already been published, notably Dick Hazelwood's *Flowtiller* *. In any case my ambitions are less financial than self-fulfillment. My vision is to persuade youth groups near inland waterways that stern sculling offers a more challenging activity than sitting passively in a powered boat.

I would much appreciate hearing from individuals who could help promote this vision. The best way of reaching me is by Email: michael_bedwell@hotmail.com

*** Projects 1993, pp19-23, Amateur Yacht Research Society, c/o BCM AYRS, London WC1N 3XX**

Picture:

Author's note

Single-oared Sculling Model April 5 - An improved way of stern-sculling

Order of Magnitude calculations

200 x 300 x 20 (trial), so 1200gm 1Cover own length in 12 sec, say 1 metre in 6 secs From page 16, taking Cd as 20. R = C x beam x draft x density x (velocity)squared = 1/90 N-m So energy needed to cover 1m = 1/90 N-m ----- Metacentric height = (beam)sq/(12 X draft) = 1/6 metre. To reduce friction loss, maximise drop of driving mass and so of pulley diameters. Updated May 05<>