A fast rowboat

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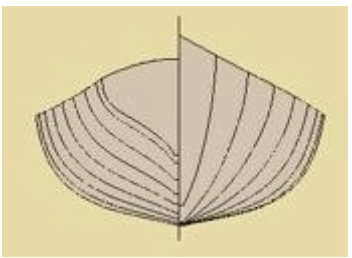
This study presents the results of the design of a new bottom for rowboats. The usual opinion is that the traditional hull shape with fine ends would be the optimal for rowboats for exercise and sport. This study shows that it is possible to create much more easily driven and seaworthy hull than the common.

In comparative tests in flat water, it appears that the new hull shape is about 20% faster than the traditional hull. In rough seas, the difference may be even greater. This means that the new boat can go nearly one knot faster with the same energy input. This can be crucial for a successful crossing of open water.

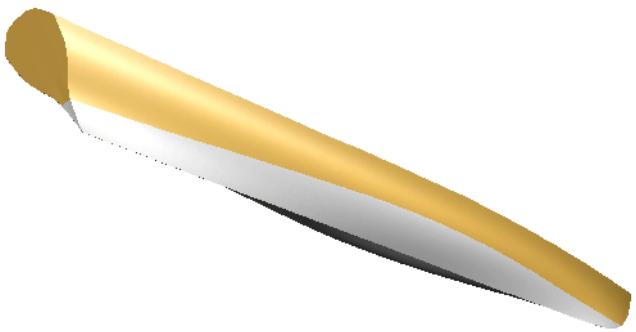
The traditional shaped boat has a long keel with narrow and high ends, and a heart-shaped transom. Often it is described as a variant of a Whitehall. These boats where originally designed as workboats to the need to take very varied load while maintaining acceptable qualities



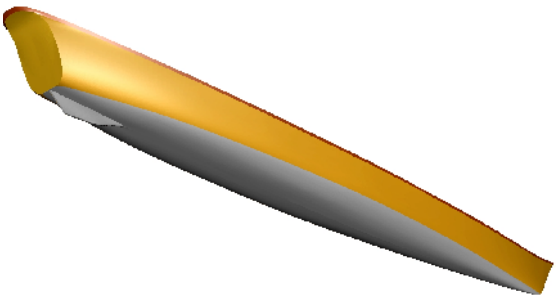
Whitehall

If the boat is equipped with a sliding seat the overall center of gravity moves very significant, especially in light boats where the crew's weight is a big part of the total weight. At each stroke the boat moves thereby with very different speeds through the water. Therefore is it not possible to make full use of conventional calculation methods for normal boats. It is necessary to make practical test to confirm the expected characteristics.

The tested boats are built with wooden ribs, glazed inside and out. They got about the same longitudinal weight distribution, and thus similar radius of gyration. This could be important for how the boats behave in seaway.



Long keeled traditional form



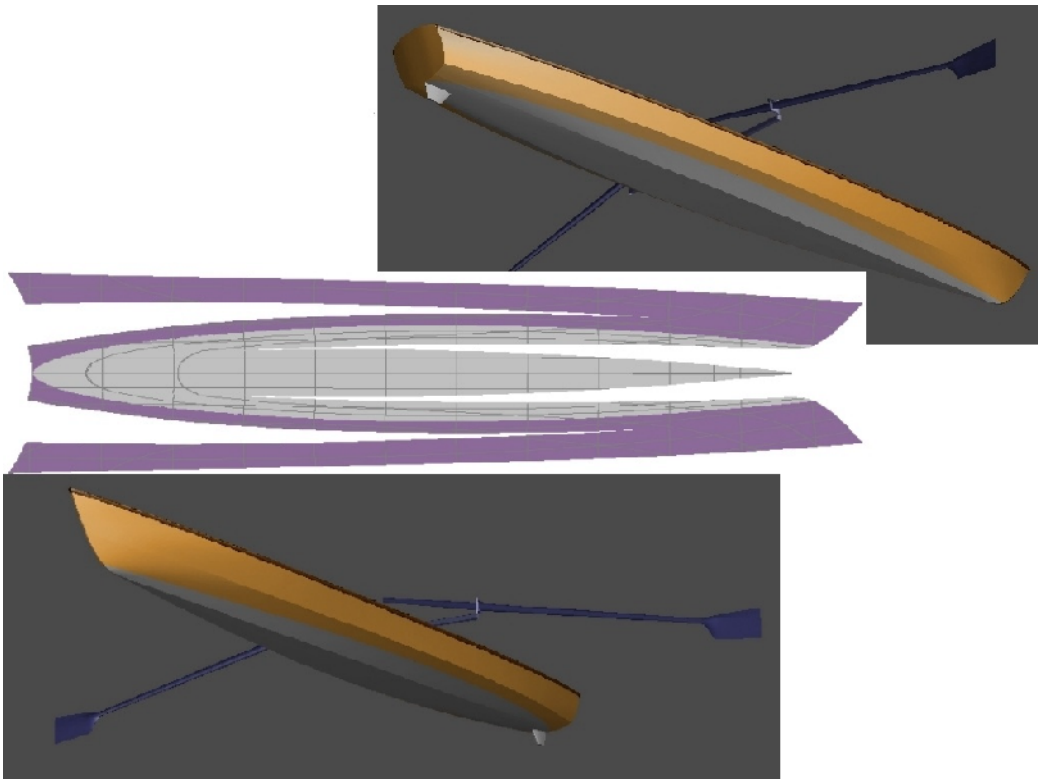
New developed form with fin

Both the compared boats have the same total weight, the same length at waterline, the same wetted surface area and the same transverse stability. The major difference lies in the displacement distribution, longitudinal stability, center of gravity location and the design just above the waterline, especially at the stern. Both boats were otherwise equally equipped with a sliding seat and carbon fiber oars. Both boats were built and equipped by the Båtbyggeriet in Tunarp, Sweden. It was also there the tests were carried out in late summer 2011.

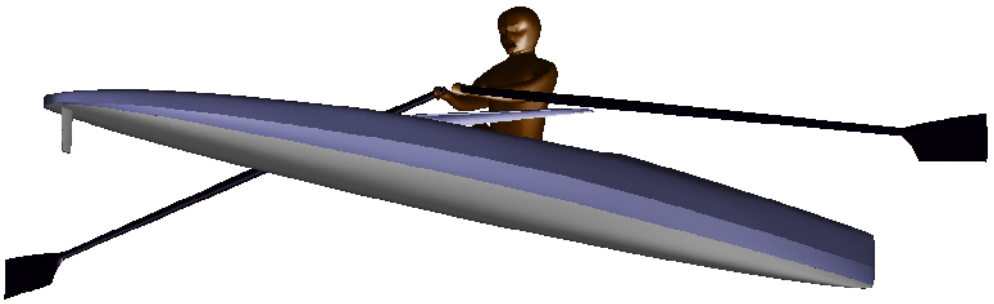
The tests were made in protected water. Test distance was about 3500 meters. To obtain an acceptable average speed, several runs were conducted under the same condition. The rower was the same and performing 20-22 strokes per minute. The results was recorded by GPS every ten seconds.

The conclusion was that boats could be rowed with an average speed of 4.5 respectively 5.4 knots. The difference was slightly larger than the preliminary estimates showed. The large difference is merely to explain that these two boats have completely different shapes.

In addition, tests were conducted to check up the seaworthiness of the boats in open water. These tests were made on Lake Vättern and open water in the archipelago outside Västervik summer of 2011. Even here, the new boat proved to have much better capabilities.



For those who want to build a boat out of plywood, it has been designed an alternative that most corresponds to the new boat's shape and characteristics. The hull has a trapezoidal midsection, a chine along the freeboard and a carefully designed transom. This longitudinal chine gives the boat a greater dynamic stability and is drier in sea. The boat can be built with only one prescarwed plywood sheet.



For racing in the class of coastal rowing a boat have been designed that is based on the above concept. It has a circular mid section for small friction area. The rounded sections of the bow lifts in the approaching waves. The flat stern creates a minimum stern wave. In addition, the above water part is designed to be so little exposed to the wind as possible. The rounded stern reduces the wetted area and verticals at the sharp chine can be made straighter and thus reduce the wave drag somewhat. Of course, these lines could be converted to a plywood version; the characteristics would not changed significantly.

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