

Feb 1988  
Graham Egarr  
50 Tahiti Street  
MAPUA

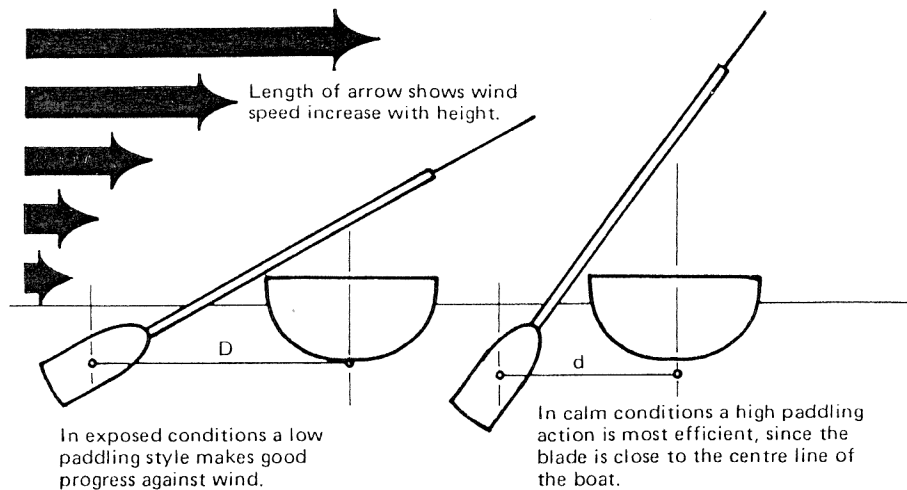
2

### PADDLES

While a great deal of attention has been given to boat design, it has only been in very recent years that any great attention has been given to paddles. Sea canoeists have for some years debated some aspects of paddle design such as whether or not blades should be feathered, and if a long narrow shape is better than what has become standard for river paddling. Possibly only the first of these two issues has been settled with any certainty. One of the best discussions on paddle design in recent years was an article written by notable U.K kayak designer and paddler, Frank Goodman. Frank is best known to New Zealand sea canoeists as the designer of the Nordkapp kayak. He came to canoeing relatively late in life and from a background as a senior lecturer in Art and therefore approached design in a rather uninhibited manner. In 1974 he equalled the world record for surfing with a four mile ride on the Severn Bore, in the same year he crossed the Irish Sea. In 1977 he was part of the expedition using his kayaks to round Cape Horn and in 1979 went to Baffin Island to introduce the Inuit (Eskimo) to glassfibre kayak building and returned in the summer (northern summer) to paddle from Frobisher Bay to Allen Island in Baffin. So Frank is no arm-chair expert and his thinking on matters of kayak and paddle design are well worth paying attention to. Using mostly Frank's thoughts on paddle design and bringing it up-to-date with more recent development I have constructed the following notes which will run over the next few issues of the newsletter.

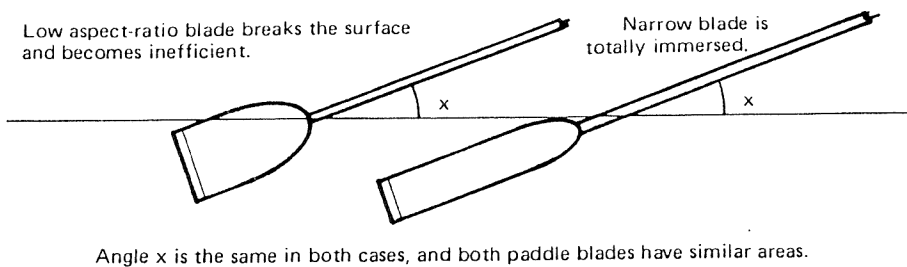
Over the years paddling styles have changed with the most marked changes being brought about by the trend for less beamy kayaks and some attention to the need for racing kayak paddlers to become more efficient once the development of the racing kayak had pretty well reached its optimum shape. In the past canoe design offered the greatest potential increase in speed, today athlete fitness/efficiency has been critical. Advice given in old canoeing manuals reflect the trend towards shorter paddles - from 'Height of paddler with arm outstretched' to 'Height of paddler with arm outstretched and fingers curled over tip of blade', and today there is a tendency for whitewater paddlers to use 2000mm paddles and flatwater paddlers to use 2100mm to 2300mm length paddles irrespective of paddler height. Up until the very recent introduction of the 'winged paddle' (which I will discuss later) the paddle was seen as ideally sitting stationary in the water with the paddler hauling himself and kayak past the blade. For the most efficient propulsion the blade of the paddle should be kept as near to the centre-line of the kayak as possible, that is, right alongside the side of the kayak. This produces the so called 'high paddling style' of the racing kayak paddler, using arm action more than other body actions. The sea canoeist has other problems to attend to rather than simply making his kayak go fast, but going fast and an efficient paddling stroke are pretty much one and the same thing. However, windage and stability must also enter into the sea canoeist's thinking.

To reduce windage two factors are important: feathered paddles help, but perhaps less so than some people might think, and a low paddling style, often this is a trade-off against efficiency and will only be used by the sea canoeist in very windy or gusty conditions. I myself will switch from a high paddling style to a low paddling style to ease my arm muscles. The low paddling style can be used with a wide paddle grip, straight arms and swinging from the waist, using mostly back and body muscles. Interestingly, the winged paddle blade uses more body muscles than the traditional high paddling style. Another important consideration here is the shape of the kayak - a river boat with much rocker really needs a high paddling style to make tracking easier - a low style can swing the kayak off-course and a skegg is helpful to resist this. Novice paddlers really do need more time spent in instruction on paddling style than is usually given.



The diagram above demonstrates the effect that wind will have on paddling style; the stronger the wind the greater the need to drop the paddle height which will in turn reduce paddling efficiency. This is particularly important with a beam wind - less so with a head wind or tail wind, when paddle feather will reduce the effects to a marked degree.

Also relevant to any choice in paddling style is the aspect ratio of the paddle blade, aspect ratio is the ratio of the blade width to the blade length - a wide short blade is said to have a low aspect ratio while a long narrow blade has a high aspect ratio. The diagram below demonstrates that if you use a low paddling style then a high aspect ratio paddle blade will be fully immersed and provide more power under windy conditions than would a paddle blade designed for river paddling. If the blade is not fully immersed it is not merely a matter of less surface area of the blade being used but there are other factors that will affect the efficiency of the blade under these conditions: blade balance, blade flutter, and cavitation all come into play. Sea canoeists likely to be paddling in windy conditions, often with a chop on the water are consequently more likely to have a need for a high aspect blade although if paddling on sheltered water such as estuaries or close inshore under the shelter of a coastline, the need will be obviously reduced.



Over the years the olympic kayak paddlers have settled upon a range of paddle lengths and blade sizes that have proven to be the most efficient for the conditions on which they paddle, namely flat sheltered water using a high paddling style. The dimensions are given below:

Class	Paddle length (cm)	Blade width (cm)	Blade length (cm)
<b>Women</b>			
K-1	215-222	15-18	45-48
K-2, K-4	218-224	16-19	45-48
<b>Men</b>			
K-1	217-224	17-20	47-50
K-2, K-4	220-226	18-22	46-52

Present paddling style dictates that paddles should be feathered. There is evidence that windage is reduced when paddling forward, but a feathered paddle may be more severely affected by cross winds. With a strong following wind and sea a gust of wind on an unfeathered paddle blade can create sufficient force to swing a kayak into a broach. Paddlers prone to tino synovitis in the wrist have found that unfeathered paddles can give relief, however if you build up to long distances gradually and avoid those long epic trips until you have built up muscle strength then a great deal of the problems subscribed to feathered paddles and tino synovitis can be avoided. Lastly, there are the traditionalists who will tell you that many of the traditional Eskimo paddles were not feathered. For my own part, like most New Zealand paddlers, I came to flat water paddling after many years of river and whitewater paddling where a feathered paddle has such clear advantages that you do not contemplate using unfeathered paddles, and now I have become so accustomed to using feathered paddles that to go back to unfeathered would be to risk a capsize and failed support strokes under those conditions when you desperately need them to work. I know of at least two kayak paddlers who have tried high aspect unfeathered paddles of the original eskimo style but both have kept their feathered paddles for most use.

Once paddles are feathered, then the set of the blades for either left or right hand control become a factor. Flat blades avoid this issue and the convenience factor offered by flat blades when a mixed group of paddlers share a set of paddles is considerable. This fact, together with the lower cost of a flat blade are the only points in their favour. The idea that flat blades catch the wind less or are more efficient at a low angle is unfounded. These issues I will look at next time.

The diagrams below provide a range of terms with which to discuss other aspects of paddles.

