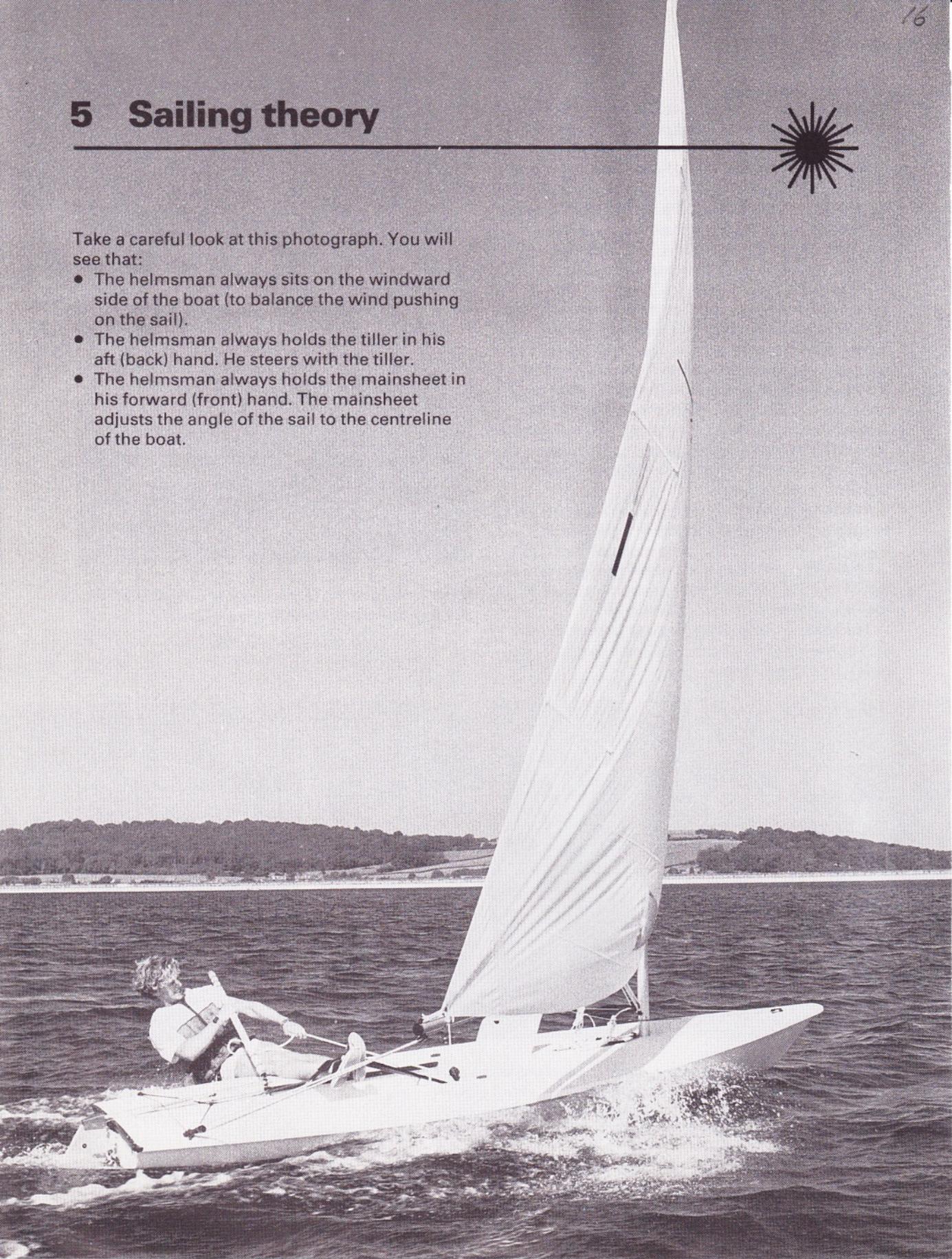


5 Sailing theory



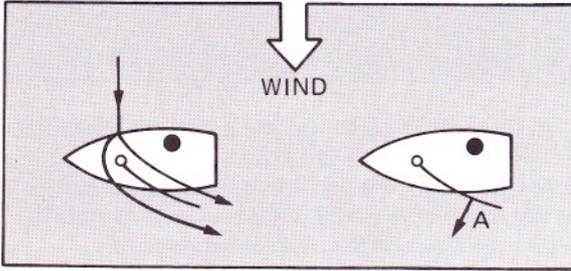
Take a careful look at this photograph. You will see that:

- The helmsman always sits on the windward side of the boat (to balance the wind pushing on the sail).
- The helmsman always holds the tiller in his aft (back) hand. He steers with the tiller.
- The helmsman always holds the mainsheet in his forward (front) hand. The mainsheet adjusts the angle of the sail to the centreline of the boat.

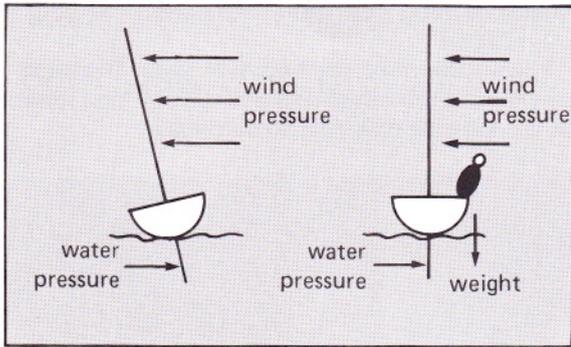


How does the boat sail?

Wind is the boat's driving force. The wind flows over the windward side of the sail (causing pressure) and round the leeward side (causing suction). The resulting force on the sail is in the direction of arrow A, at right angles to the sail.

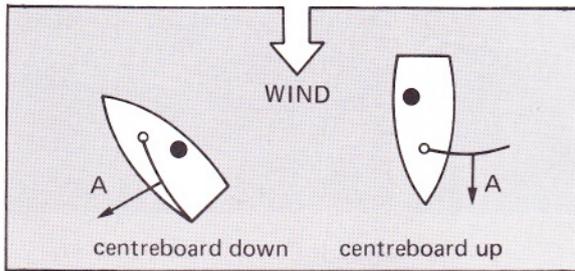


The force pushes the boat forwards and sideways. The forward push is welcome! The sideways push is counteracted by water pressure on the centreboard.



The helmsman's weight counteracts the turning (capsizing) effect. The further he leans out, the more leverage he gets.

If the sail is pulled in, force A will be almost at right angles to the boat: the sideways force is maximum, and the centreboard needs to be

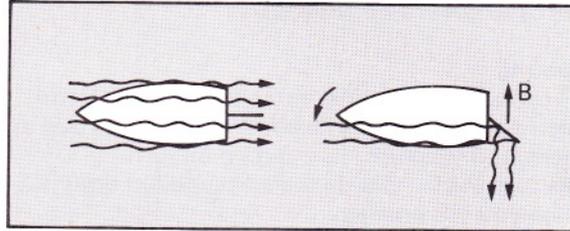


pushed right down. If the sail is let out, force A points forwards: there is no sideways force, so the centreboard can be pulled up.

How can I steer?

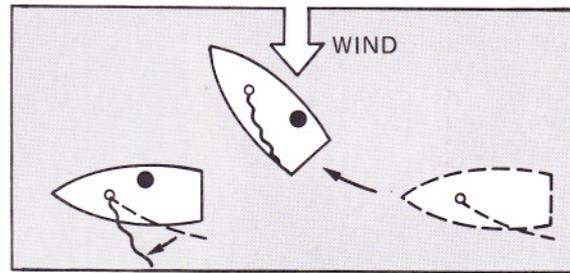
When a boat is sailing straight, the water flows past the rudder undisturbed. When the rudder is turned, the water is deflected. The water hitting the rudder pushes it, and the back of boat, in direction B. The bow turns to the left.

In short, pulling the tiller towards you turns the bow away from you, and vice versa.



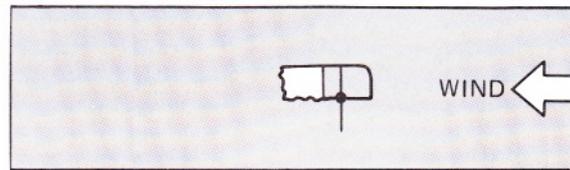
How can I stop?

It is the wind in the sail that makes a boat go forward. To stop it, take the wind out of the sail either by letting go of the mainsheet, or by altering course towards the wind.



How can I tell which way the wind is blowing?

Everything in sailing is related to the wind direction. You can tell which way it's blowing by the feel of it on your cheek, by the wave direction or by using a burgee. Remember, the burgee points to where the wind is going.



Points of sailing

Look at the diagram on the opposite page. There are three points of sailing:

- *Reaching* – the boat sails *across* the wind.
- *Beating* – the boat sails *towards* the wind.
- *Running* – the boat sails with the wind *behind* it.

Reaching

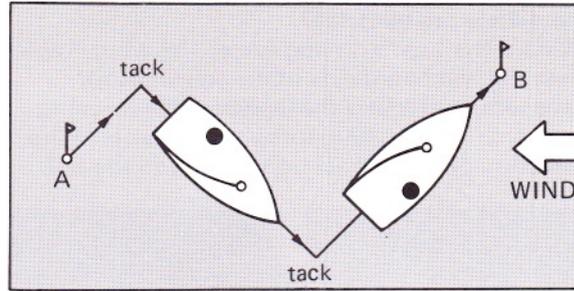
When reaching, the boat sails at right angles to the wind, which is blowing from behind your back. The sail should be about halfway out and the centreboard halfway up.

Beating

If you want to change course towards the wind, you must push the centreboard down and pull in the sail as you turn. You can go on turning towards the wind until the sail is pulled right in. Then you are *beating*.

If you try to turn further towards the wind you enter the 'no-go area'. The sail flaps and the boat stops.

If you want to reach a point that is upwind of your current position you have to *beat* zigzag fashion, as shown in the diagram.



At the end of each 'zig' the boat turns through an angle of 90°. This is called a *tack*. The boat turns 'through' the wind – the sail blows across to the other side and the helmsman must shift his weight across the boat to balance it.

Running

From a reach, you may want to change course away from the wind. Pull up the centreboard (not more than three-quarters up) and let out the sail as you turn. You can go on turning until the wind is coming from behind the boat. Then you are *running*.

If you turn more, the boat will *gybe*. The wind blows from the other side of the boat. You must shift your weight across to balance it.



Reaching.



Beating.



Running.

