the headsails will be filled by the time they are hauled round and trimmed. The staysails are filled before this, because their sheets have been shifted, and they stand much sharper than the square-sails;@@1 and thus every thing tends to check the falling off from the wind on the other tack, and this no sooner than it should be done. The ship im­mediately gathers way, and holds on in her new course *dG.*

But it frequently happens, that in this conversion the ship loses her whole progressive motion. This sometimes hap­pens while the sails are shivering before they are taken fully aback. It is evident, that in this case there is little hope of success, for the ship now lies like a log, and neither sails nor rudder have any action. The ship drives to lee­ward like a log, and the water acting on the lee-side of the rudder checks a little the driving of the stern. The head therefore falls off again, and by and by the sails fill, and the ship continues on her former tack. This is called missing stays, and it is generally owing to the ship’s having too little velocity at the beginning of the evolution. Hence the propriety of keeping the sails well filled for some little time before. Rough weather, too, by raising a wave which beats violently on the weather-bow, frequently checks the first luffing of the ship, and beats her off again.

If the ship lose all her motion after the headsails have been fully taken aback, and before we have brought the wind right ahead, the evolution becomes uncertain, but by no means desperate ; for the action of the wind on the head­sails will presently give her stern-way. Suppose this to happen when the ship is in the position C. Bring the helm over hard to windward, so that the rudder shall have the position represented by the small dotted line *of.* It is evi­dent, that the resistance of the water to the stern-way of the rudder acts in a favourable direction, pushing the stern outward. In the mean time, the action of the wind on the headsails pushes the head in the opposite direction. These actions conspire therefore in promoting the evolution ; and if the wind is right ahead, it cannot fail, but may even be completed speedily, because the ship gathers stem-way, and the action of the rudder becomes very powerful ; and as soon as the wind comes on the formerly lee-bow, the action of the water on the now lee-quarter will greatly accelerate the conversion. When the wind therefore has once been brought nearly right ahead, there is no risk of being baffled.

But should the ship have lost all her headway consider­ably before this, the evolution is very uncertain ; for the action of the water on the rudder may not be nearly equal to its contrary action on the lee-quarter ; in which case, the action of the wind on the headsails may not be sufficient to make up the difference. When this is observed, when the ship goes astern without changing her position, we must immediately throw the headsails completely aback, and put the helm down again, which will pay off the ship’s head from the wind enough to enable us to fill the sails again on the same tack, to try our fortune again ; or we must box- haul the ship in the manner to be described by and by.

Such is the ordinary process of tacking ship; a process in which all the different modes of action of the rudder and sails are employed. To execute this evolution in the most expeditious manner, and so as to gain as much on the wind as possible, is considered as the test of an expert seaman. We have described the process which is best calculated for *ensuring* the movement. But if the ship be sailing very briskly in smooth water, so that there is no danger of miss­ing stays, we may gain more to windward considerably by keeping fast the fore-top bowline and the jib and stay-sail sheets till the square sails are all shivering. For these sails, continuing to draw with considerable force, and balancing each other tolerably fore and aft, keep up the ship’s velocity very much, and thus maintain the power of the rudder. If we now let all fly when the square sails are shivering, the ship may be considered as without sails, but exposed to the

action of the water on the lee-bow; from which arises a strong pressure of the bow to windward, which conspires with the action of the rudder to aid the conversion. It evi­dently leaves all that tendency of the bow to windward which arises from leeway, and even what was counteracted by the formerly unbalanced action of these head-staysails. This method lengthens the whole time of the evolution, but it advances the ship to windward. Observe, too, that keeping fast the foretop bowline till the sail shivers, and then letting it go, insures the taking aback of that sail, and thus instantly produces an action that is favourable to the evolution.

The most expert seamen, however, differ among them­selves with respect to these two methods, and the first is the most generally practised in the British navy, because the least liable to fail. The forces which oppose the con­version are sooner removed, and the production of a favour­able action by the backing of the foretop-sail is also sooner obtained, by letting go the foretop bowline at the first.

Having entered so minutely into the description and ra­tionale of this evolution, we have sufficiently turned the reader’s attention to the different actions which co-operate in producing the motions of conversion. We shall therefore be very brief in our description of the other evolutions.

*To wear Ship.*

When the seaman sees that his ship will not go about head to wind, but will miss stays, he must change his tack the other way; that is, by turning her head away from the wind, going a little way before the wind, and then hauling the wind on the other tack. This is called *wearing* or *veer­ing* ship. It is most necessary in stormy weather with little sail, or in very faint breezes, or in a disabled ship.

The process is exceedingly simple; and the mere narra­tion of the procedure is sufficient for showing the propriety of every part of it.

Watch for the moment of the ship’s falling off, and then haul up the mainsail and mizen, and shiver the mizen top­sail, and put the helm a-weather. When the ship falls off sensibly (and not before), let go the bowlines. Ease away the fore-sheet, raise the fore tack, and gather aft the wea­ther fore-sheet, as the lee-sheet is eased away. Round in the weather-braces of the fore and main-masts, and keep the yards nearly bisecting the angle of the wind and keel, so that when the ship is before the wind the yards may be square. It may even be of advantage to round in the wea­ther-braces of the main-topsail more than those of the head­sails; for the mainmast is abaft the centre of gravity. All this while the mizen-top sail must be kept shivering, by rounding in the weather-braces as the ship pays off from the wind. Then the main-topsail will be braced up for the other tack by the time that we have brought the wind on the weather-quarter. After this it will be full, and will aid the evolution. When the wind is right aft, shift the jib and stay-sail sheets. The evolution now goes on with great rapidity; therefore briskly haul on board the fore and main tacks, and haul out the mizen, and set the mizen-staysail as they will take the wind the right way. We must now check the great rapidity with which the ship comes to the wind on the other tack, by righting the helm before we bring the wind on the beam ; and all must be trimmed fore and aft by this time, that the headsails may take and check the coming- to. All being trimmed, stand on close by the wind.

We cannot help losing much ground in this movement. Therefore, though it be very simple, it requires much at­tention and rapid execution to do it with as little loss of ground as possible. One is apt to imagine at first that it would be better to keep the headsails braced up on the former tack, or at least not to round in the weather-braces so much as is here directed. When the ship is right afore the wind, we should expect assistance from the obliquity of the head-sails; but the rudder being the principal agent in

@@1 The use of stav-sails has been almost entirely discontinued in the navy fur some years. They are still supplied, however, and the fashion of using them will probably return after a time.