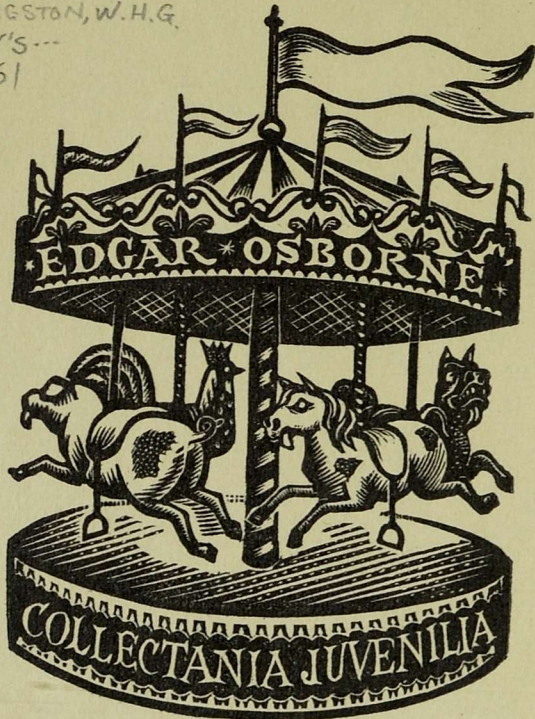


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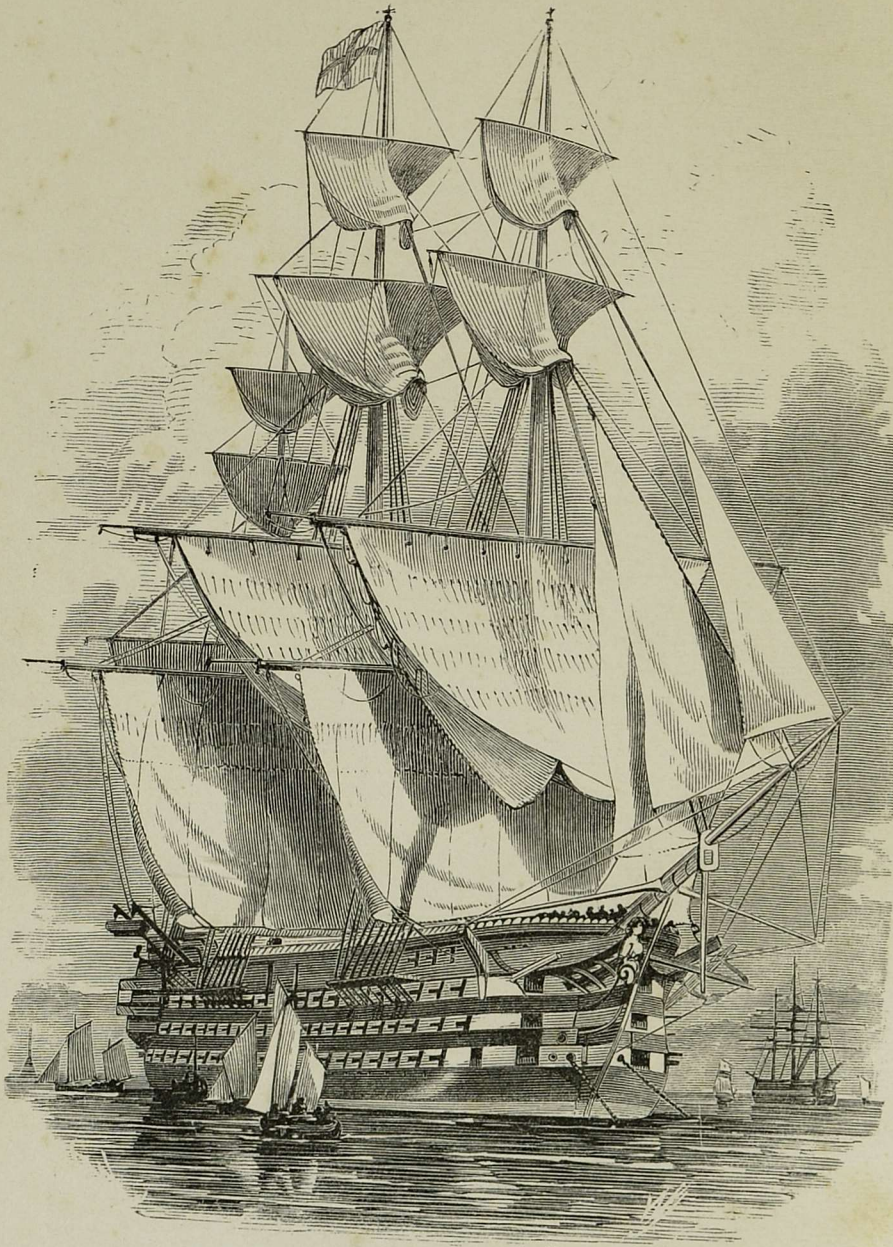
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THE "MARLBOROUGH," THREE-DECKER.

THE BOY'S OWN  
BOOK OF BOATS.

INCLUDING VESSELS OF EVERY RIG AND SIZE  
TO BE FOUND FLOATING ON THE WATERS IN ALL PARTS  
OF THE WORLD.

BY  
W. H. G. KINGSTON,  
AUTHOR OF "ERNEST BRACEBRIDGE," &c.

WITH NUMEROUS ILLUSTRATIONS, DRAWN BY EDWIN WEEDON,  
ENGRAVED BY W. J. LINTON.

LONDON:  
SAMPSON LOW, SON & CO. 47, LUDGATE HILL.

MDCCLXI.

LONDON ;  
R. CLAY, PRINTER, BREAD STREET HILL.



## P R E F A C E.

MY endeavour in the following pages has been to give my young friends an account of the vessels and boats, of every rig and size, to be found floating on the waters in all parts of the world. I hope that I may have in most points succeeded; but the subject is a very extensive one, and I dare say that there are many craft in various directions differing from those I have described, though not, I believe, in any material respect. I have written for those who wish really to gain useful information about vessels. For the general reader I might have made the work far more interesting by introducing anecdotes and stories; but I should have thus not carried out my object in giving the book which is wanted.

Every English boy, indeed, should be well informed on nautical affairs, and will, I therefore hope, find in the following pages the information he requires.

I should like to have had space to give a full account

of some of the wonderful inventions of late years. First there were paddle-wheels moved by steam; then came the screw, worked astern of the vessel, invented by Mr. F. P. Smith, a young farmer in Kent. He described to me, a few years ago, his delight when his first model screwed across a horse-pond on his farm. Scientific men told him that the principle was very well for a toy, but could not be applied to a real vessel. He felt sure it could, persevered—and now vast fleets of the most powerful ships are moved by it. The *Mersey*, of which a very exact drawing is given at page 91, is one of these ships.

Mr. Smith's first screw had numerous turns or fans, as has a corkscrew; but first one fan broke off, and then another, and it was discovered that the vessel went faster with two than with four.

Another very important invention is a mode of reefing topsails without sending people aloft. It was invented by H. D. P. Cunningham, Esq. R.N., and is called "The Self-reefing Topsail." The yard descending, turns round and round, and rolls the sail up on it. The lives of many gallant seamen have been preserved by this means.

I must not omit the following description of H.M.S. *Mersey*:—

She was designed by Sir Baldwin Walker, the Controller of the Navy, and built at Chatham Dockyard under the superintendence of Mr. F. Laine, the master shipwright of that yard. She is the first of the class, and was avowedly built as an experiment, which, from present appearances, is likely to be most successful. The keel was laid on 26th December, 1856, and she was launched on 13th August, 1858. The tonnage is 3,737, and horse-power (nominal), 1,000; but on the trial trip on 23d March, 1859, the engines worked up to a horse-power of 4,050. The machinery is from the firm of Maudsley and Field, and cost 60,000*l.* The weight of the engine is 766 tons, and the screw propeller with its frame 20 tons. The amount of coal stowed in bunkers is 950 tons, in addition to which 100 tons can be stowed in the wing passages. The consumption of coal when at full speed is 140 tons; when in fine weather and smooth water a speed of  $14\frac{1}{2}$  knots can be got. The consumption at half speed is 100 tons a day, which gives 10 knots; and at slow speed 40 tons of coal are burnt daily, which gives about 8 knots. The boilers, which are tubular, are eight in number, and are heated by thirty-two furnaces, each boiler containing 440 tubes, or in the whole,

3320. In addition to the principal engines, there are three which are auxiliary, the largest (familiarily called the mule) being used as the fire engine, and the two smaller (or the donkeys) for filling boilers. The armament is the largest ever carried by a ship, being on the main deck twenty-eight 10-inch guns of 86 cwt., throwing a shot of 84 lbs. and a shell of 90 lbs. with a charge of 12 lbs. of powder. These guns have been fitted with carriages with rear "chocks," instead of trucks, which greatly diminishes the recoil. The upper deck is armed with twelve 68-pounders, 10 feet in length and of 95 cwt. and is fired with a charge of 16 lbs.: range, 3,960 yards.

The ship's length, over all, is 345 feet, and extreme breadth 52 feet.

Up to the present time (June, 1860) she has belonged to the Channel Fleet, and has stood the test of several heavy gales in a manner which fully proves her efficiency as a man-of-war; being the only ship afloat which could steam at full speed against a gale with any chance of success.

There are several other ships of power and size equal to the *Mersey* now building, one of which is capable of contending with a whole fleet of the old line-of-battle ships which Howe, Jervis, and Nelson led to victory.

Scarcely had guns been invented to carry shots five or six miles, when the idea was started of covering vessels with plates of steel to resist such missiles ; and now naval architects are engaged in building ships sheathed in complete armour, as were our ancestors of old.

I might mention numerous other minor details, which would alone fill a volume, and would not probably be as interesting as those I have described in the following pages.

I have no wish to induce any of my young readers to turn sailors ; but if they manage to master all the subjects they will find in the book I have just written for them they will obtain that knowledge of nautical affairs which every well educated Englishman (and American) ought to possess, and my labour will not then have been in vain.

WILLIAM H. G. KINGSTON.

MIDDLEHILL, WIMBORNE,

20th November, 1860.

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THE  
BOY'S BOOK OF BOATS.



CHAPTER I.

THERE is a common saying that "the boy is the father of the man," and a very true one it is. I do not know whether, on the same principle, a boat can be exactly said

to be the father of a ship ; but I have generally found that those boys who take pleasure in making or in sailing model boats, as they grow older wish to become sailors, or to know all about ships of every rig and description ; or, if they do not enter the navy, that they get vessels of their own, and amuse themselves with the truly English and manly occupation of yachting. I speak from experience. At a very early period of my life I recollect being the owner of a little green-bottomed cutter, with which I used to sail matches against a schooner called the *Tartar*, belonging to one of my cousins who entered the navy, and whose gallant deeds on the coast of Africa I have elsewhere chronicled. I afterwards built many boats of much larger tonnage, and went on progressing till I mounted the crown-and-anchor button and gold-laced cap, as a member of one of the first yacht-clubs in England, and the owner of a good-sized yacht. I have made a number of voyages, and visited different parts of the world, where I have seen a great variety of craft ; and I have always read accounts of voyages in which vessels, and boats, and canoes have been described, so that I may write with some authority on the subject. I propose, therefore, to give, in the following pages, the result of my long experience in the matter of boats and vessels, so that my young readers may learn not only how to cut out or build and rig a boat, but may inform themselves about all sorts of vessels, from a fishing-smack to a line-of-battle ship, as



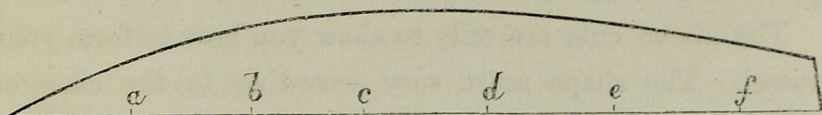
well as about the numberless curious canoes and other craft which are to be found in the Pacific Ocean, the Eastern seas, and other distant parts of the world.

At a very early age I manufactured a boat, one into which I could get, and which floated with me. I do not say that it floated very long with me however. The framework was a large long foreign basket, shaped like a boat, and I covered it over thickly with whitey-brown paper and paste. A very creditable sort of boat I thought that I had made. I put it into a tank, and with vast delight in I got. Scarcely, however, had I begun to paddle about, when to my dismay I saw the water, as might have been expected by a more experienced navigator, gradually oozing through the thick mass of paper, and very soon I had to scramble out to save myself from a ducking, while the outside covering rapidly peeled off this my first attempt at naval architecture.

There are three ways of making models of boats or vessels fit to sail; they may properly be called the Cut-out, the Clinker, and the Carvel. The Cut-out is formed from a solid log. In the Clinker style of building thin flexible planks are used, which overlap each other; the ribs are numerous and fine, and serve rather to bind the planks together than to give the shape, and a temporary framework is put up to assist in giving the desired form. Light boats and some small vessels are built in this way. In the Carvel style the ribs are very stout, and are set up

first in the intended shape of the vessel, which, till the planks are nailed on, looks like a huge skeleton. The planks are nailed on at the last. The largest ships are built in this way, and so even are many boats where lightness is not essential. I have seen very beautiful models formed both in the latter ways as well as in the first, but a considerable amount of skill as a boat-builder is requisite to make them, especially to construct a clinker-built boat. The first boat I made was formed out of a log, and I would advise any young ship-builder who wishes to construct one of a similar character to proceed much in the following way:—In the first place, look out for a very soft fine-grained piece of American pine, such as is used by joiners and toy-makers. Suppose you wish to make your vessel two feet long, the log should roughly be about eight or nine inches wide and five to six deep. Be careful that the wood is entirely free from knots or cracks—the latter especially is a fatal objection to an otherwise good piece of wood. It must also be thoroughly seasoned. The first thing to be done is to get your log squared to perfection, when you have settled the exact beam or width, and the depth of your vessel. You require for tools a couple of sharp chisels and a mallet, three or more gouges of different sizes, and a carpenter's pencil. A large vice to hold the log, or a frame, is necessary. Settle which is to be the deck and which the bottom of your boat. Draw a line down the centre of both sides, as

also down the centre of the fore part, to mark the stem. Take a piece of cardboard, or thin board, and draw on it the shape of the deck, or rather one side of the deck. Cut out the shape thus :—



MODEL FOR HALF THE DECK OF A CUTTER.

By placing the form first on one side and then on the other of the deck, you will get it of the same form on both sides. Now turn over the log, and screw on, exactly

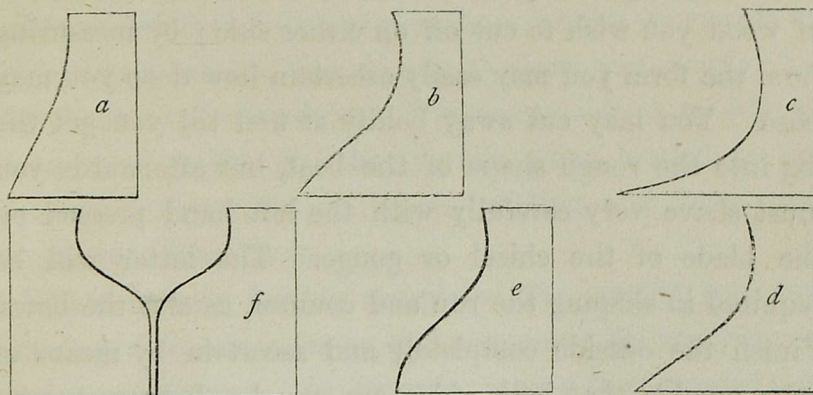


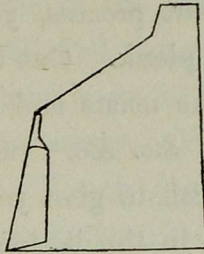
DIAGRAM OF FORMS FOR CUTTING OUT A BOAT.

- a* Form at bow.
- b* between bow and extreme breadth.
- c* at extreme breadth.
- d* between extreme breadth and stern.
- e* next stern.
- f* at stern.

down the centre, a thin piece of oak or other hard wood, to form the keel, or rather to show where the real keel will be. Another piece should be fastened on to mark the stem. You must now cut out several other shape-pieces to give the form to your vessel.

The above cuts are only to show you how to form your vessel. The shape must vary according to the class of vessel you intend to model. Mark on the deck a spot where the forms are to be placed. Thus, having got one side the shape you require, you can with your forms easily make the other side of the same shape. Draw on the after part the shape of the stern. A fine graduated gimlet will be useful, as you may bore with it so as to mark the depth of wood you wish to cut off on either side ; by measuring from the form you may easily ascertain how deep you may bore. You may cut away boldly at first till you get the log into the rough shape of the boat, but afterwards you must shave very carefully with the left hand pressed on the blade of the chisel or gouge. The latter will be required in shaping the run and counter, as also the bows. Finish the outside completely and ascertain by means of your moulds that both sides are equal. I have known some boys whose eyes were so correct that they have cut out boats trusting to them alone without any moulds. But I strongly advise the use of moulds, as you may thus draw your plans in a scientific way, and duly consider the form likely to sail well. Besides, with the same forms

you may cut out several vessels with any alterations which your experience may suggest. I used to find it difficult to give a pretty stern,—for that you can also make a mould thus—



FORM OF STERN, ETC.

Remember that I do not give these moulds as models to be followed exactly, but merely to show you clearly the plan I advise you to adopt. You must look at models of boats, or at yachts, or other vessels, when hauled up on slips, or in dry docks, or when building, and form your own moulds from them.

You may now, having completed the outside, fix your boat in a vice or in a frame, and commence the scooping or digging out process. In America, canoes thus formed out of a solid trunk are called Dugouts. You may gouge away boldly at the centre part, but as you approach the sides you must work very carefully, or you will very likely dig through and spoil your model. It is necessary to have perfect regularity in the thickness of the sides. It will

be well to mark with your pencil on the deck the proposed thickness of the sides and work down from that. The eye and the touch will best guide you. The bow and stern must be thicker than the sides. The sides, however, need not be very thin when the wood is light. Having finished the digging-out process, you must next prepare the deck of a single plank. Cut out the proper hatchways, the holes for the masts and bits, and windlass or capstern, and rudder, &c. &c. Before you screw it on settle the rake you wish to give your masts and fix the proper steps for them in the bottom, as also for the bowsprit, bits and shaft of the capstern. The bulwarks should be made separate of thin strong plank with the proper ports and scuppers cut in them, and then screwed on after the deck is fastened down. The tafrail will also be separate and formed of some hard tough wood. You have now to make and screw on the chains, and fix the chain-plates and dead eyes, and the outside of your vessel is complete. Previous to fixing on the deck it will be necessary to cut out the keel and stem and stern-post. You must remember that the after part of a cutter, and, indeed, of most vessels, is deeper than the fore part. Choose a hard wood which is not liable to split. Use screws, for nails are liable to rust and drop out, which screws do not do. Below the wooden keel one of lead is required; this you can easily cast by cutting a groove of the required thickness, depth, and length in a thick plank

to serve as a mould, and by pouring the melted lead into it. By fixing thin nails in the centre of the moulds you may save the trouble of boring holes in the lead. Now put on the first priming coating of paint, and when it is dry launch your vessel to ascertain her trim, as you may have to scrape off some of the lead, or find it necessary to add to it. You will find it useful to have little boxes below each of the hatchways, in which you may place additional ballast if necessary. You may now proceed to prepare your rigging. Tough masts and a bowsprit are important. One of my cutters had a capital mast formed out of an old umbrella stick. Ash is as good as any wood to be used. The best blocks are made of box-wood, you may buy them ready made with sheaves. However, sheaves are not necessary, and with a gimlet, a very small chisel, and two or three fine files, you may easily form them yourself. First make the dead eyes, and then the larger halliard and main-sheet blocks, and then, as you gain practice, the smaller blocks. A fine saw is very useful. My plan was to take a piece of box-wood of the required thickness of the dead eye, and to mark out and bore the holes for a number at once, then to saw them into squares and round them with a saw, knife and file; a small pair of pincers are useful to hold the blocks, or a small hand-vice. Indeed, although you may do a great deal of work with a knife and file, you will do it better and more rapidly with a few fine good tools. Finish off the blocks, as well as

masts and spars, with sand-paper. Some stout brass wire is useful for belaying pins and cleats. You must screw on some racks for the belaying pins inside the bulwarks. For a real working model, it will be better to have your cleats somewhat out of proportion, or it will be difficult to make the ropes fast to them.

We now come to the rigging. Whipcord of different sizes may serve the purpose; but there is a stuff made for trawling-lines which is not so hard as whipcord, and being intended for the water, is well suited for the running-rigging. However, use only the best well-twisted line. If you can get it of different tints from white to brown, it will enable you to know your ropes when setting your sails. Common soft twine is very unfit for the purpose; so is thread, however strong. Your ropes, for a sailing-model, must be thicker in proportion to the size of your craft than those of a real vessel.

The sails come next under consideration. They should be of new Irish linen: the upper ones may be of Cambric. They need not be made like real sails with cloths, as they are called, long strips of canvas sewn together; but they should be neatly hemmed with a very small hem, and then be fixed in bolt-ropes. The reef-points should be fixed properly, and cringles secured to the bolt-ropes. Cut out first the shape of your sails in paper, and fasten them up to the yards to see how they look. Great neatness is required to make sails look well.



The above remarks are intended merely as hints to assist you in making a working-model. The proper measurements, both of hull, masts, and spars, standing and running rigging, and sails, you must take from the following chapters, where I describe the various classes of vessels and the mode of building and rigging them. It will be well to give the last coat of paint to your vessel after you have fitted your rigging. A bright copper-colour, avoiding too red a tint, looks well for the bottom ; the upper part black, and the inside a straw or salmon-colour, with lines of red here and there. A little gilding has a pretty effect. When sailing a model-vessel, you will have to guide her entirely by her sails and the way you ballast her. I used to unship the rudder, as it is practically of no use, unless you could teach a mouse or a water-rat to stay on board and steer. Before you can sail a model properly, so as to direct her to any particular spot, you must understand the theory of sailing, and in the following pages I hope to give you some instruction on that subject. There are numerous subjects relating to a vessel, and to directing her course, which may be divided under different heads.

First, the oak, or the fir, or the teak, and other woods, have to be cut down in their native forests, and brought to the sea-side to be seasoned. This process is performed by allowing it to soak in salt water for a year or more ; it is then handed over by the timber-merchant to the practical ship-builder. The naval architect has, meantime,

drawn out his plan on paper, called the drawing or draft of a ship, which I am about to explain to you. From this the builder forms the keel, and shapes out the ribs, the stern, and numerous other parts. Sometimes all the ribs are cut out before even the keel is laid down, or any are set up. After the ribs are set up, the ship is planked, and the deck laid down; and then the caulkers come on, who stop up all the interstices between the planks with oakum. Ships' carpenters and joiners next fit her up inside. Mast and spar-makers now prepare the masts and spars, and with sheers step the masts.

Rope-makers have made the ropes, and now riggers come on board and fit and set up the standing and running rigging. Sometimes the crew do this, but often a ship is ready for sea before the crew come on board. Blacksmiths have had all this time a great deal of work to do, both in making bolts of iron and copper to fasten the ribs and other parts together, and often in making iron knees and stanchions; as also hoops for the masts, and numerous other things about the deck, and for the spars, &c. Copper-smiths make water-tanks, and coopers casks for provisions. The hold has to be stored by dockyard labourers with numberless stores. In ships of war guns have to be manufactured, and gunpowder, and shot. Sailmakers have been making the sails, by sewing with twine cloths, or what linendrapers might call breadths, of canvas together. These, last of all, are bent to their respective yards.

Officers have, in the meantime, been engaging the crew, and now the ship is ready for sea. Two separate sciences must be understood by the officers to direct the ship. One is seamanship : this is the science of managing the sails so as to make her go in any direction required ; to know what amount of sail to carry, and what manœuvres to try under all circumstances in which she may be placed. Navigation, the other science I speak of, is the art of taking observations, by means of instruments, of the sun, or moon, or stars, in conjunction with chronometers, which are clocks made to go with very great exactness, so that the real time at any particular place can be known. By navigation the precise position of the ship can be ascertained, and the proper course for her to sail on can be given. A man may be a very good seaman who knows nothing of navigation, as many able seamen are, but he is unfit to be an officer. A man who has never been to sea may be a first-rate navigator, but he also is unfit to take command of a ship. There is a third science very requisite for all officers ; that is, the science of commanding others. In the royal navy the science of gunnery is required ; and at the present day it is brought to great perfection. On board ships where steam-power is introduced, the officers should understand the steam-engine thoroughly. A new class of officers and men are required in them also. The first is called the chief engineer, and he has several mates ; there is a crew, also, of engineers

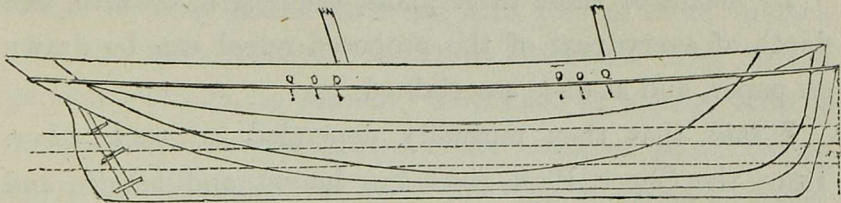
and stokers. Large ships have also pursers or paymasters, (who pay the crew, and take care of the stores,) chaplains, and surgeons. From the slight sketch I have given, it will be seen how much space the full description of even a single ship would occupy ; an idea may therefore be formed of the great variety of points to be touched on relating to the subject of boats and ships, not only of those built in England, but of the great variety to be found in different parts of the world.

## CHAPTER II.

### SHIP-BUILDING.

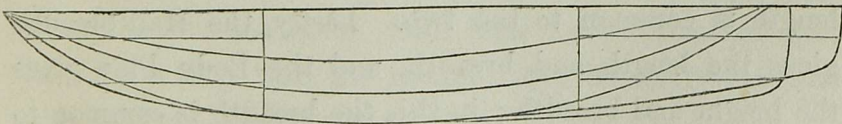
BEFORE a ship can be built, it is necessary to make a drawing. This is called the Sheer Drawing. It consists of three parts, dependent on each other. They are the Sheer Plan, the Half-Breadth Plan, and the Body Plan.

The Sheer Plan describes the longest and deepest longitudinal section of the proposed ship. On this plan the position as to height and length of any point may be ascertained.



SHEER PLAN OF SHIP.

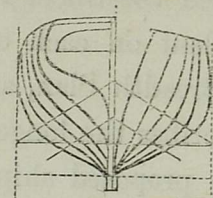
The Half-breadth Plan describes half of the widest and longest level section in the ship. On this plan the posi-



HALF-BREADTH PLAN.

tions of any point, as to width and length, may be ascertained by projection.

The Body Plan describes the largest vertical or athwartship section of the proposed vessel. All the other sections are accordingly drawn within it. In this plan the height and width of any point can be ascertained by projection.



BODY PLAN.

By means of these three plans, the length, breadth, and depth of every part of the proposed vessel can be drawn on paper, and at once ascertained.

I said that they mutually depended on each other. Thus, the Sheer Plan gives the height and length, and the Half-breadth gives the breadth and length; thus the length is common to the two.

Again, the Sheer Plan gives the length and height, and the Body Plan gives the breadth and height; here the length is common to the two. Lastly, the Half-breadth gives the length and breadth, and the Body Plan gives the height and breadth; in this the breadth is common to the two.

These three plans serve for the projection or drawings of boats or vessels of any size.

You will, after some practice and consideration, be able, by means of them, to draw the shape of any model vessel you may wish to make, and from your drawing form the different moulds you may think necessary. You will find it useful to study and clearly comprehend the plans I have given, for though you may not follow them exactly, they will assist you in drawing any you may fancy. I will give you the dimensions of various vessels, that you may cut out or build your models in the same proportions.

The plans being drawn, the ship-builder sets to work and lays down what are called blocks. These are thick lumps of wood placed in a long line, four of them in each pile, one upon another. On these blocks the keel, formed generally of elm, is placed. The keel in a large ship is composed of several pieces. The foremost piece curves up, and is joined to the stem by what is called a scarph. The groove formed in the keel to receive the lowest planks is called a rabbet. These planks are called garboard-strakes, and are generally very thick.

A FALSE KEEL is fastened on below the real keel, to which the ribs are fixed. This false keel, formed of elm, should the ship take the ground, may be easily knocked away without injuring her.

THE STEM is the foremost end of the ship; it is

composed of oak. It is, in reality, a continuation of the keel rising up to the height of the vessel. In large ships it is formed of three pieces : a groove is worked in it to receive the end of the plank.

THE STERN-POST is the continuation of the keel to the height of the deck, and has also a rabbet in it to receive the butt ends of the planks.

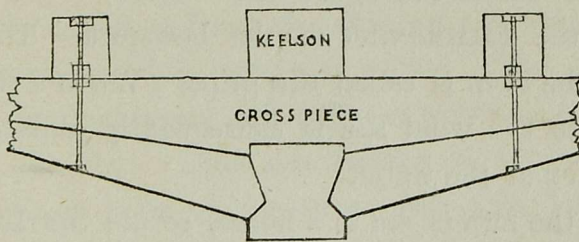
THE FRAME, OR RIBS.—The frame, as I have said, when set up, looks like a huge skeleton. It consists of a great number of pieces of timber. They are called either floors, half-floors, cross-pieces, first, second, third, fourth, and fifth futtocks, floors short and long armed, and top timbers. Then I will describe—

FLOORS.—This portion of the frame has a middle seating, on the keel. Thus, the floor-arms of the floor-timber extend to an equal distance on each side of the keel. Some extend further than others, so that all the points of union may not be on the same line. The different FUTTOCKS are the different pieces of timber which form a rib, firmly joined, one above the other. The upper piece of timber which completes a rib is called the top timber. The opposite ribs, united by the half-floors at the keel and keelson constitute a FRAME. The open spaces between the frames are called ROOM AND SPACE ; they vary from two feet six inches to three feet nine inches. At present, generally in the royal navy, the entire room and space, to a certain distance above the keel, is filled up and made water-tight,



so that should even the external planking of the bottom be stripped off, the ship may swim. The materials used, which should be well seasoned wood thoroughly caulked inside and out, are called **FILLINGS**, and sometimes extend as high as the load-line, or line of supposed deepest immersion.

**THE KEELSON** is an inner keel. The object of it is to strengthen the vessel lengthways, and to confine the floors in their proper positions. It is placed above the cross pieces and half floors, and a bolt is driven right through all into the main keel. The half floors, it must be understood, are not united in the centre, but alternately on either side. The following sketch will show the arrangement by which these important timbers are firmly united into one mass.



Sometimes long timbers are employed called **SIDE RIBBONS**. They run down on either side of the main-mast to receive the step of that mast.

The ribs being set up at the height of the under side of the beams,—an inside hoop, it may be called,—a thick

rib of wood is fixed longitudinally the whole length of the vessel for the purpose of receiving the ends of the beams which support the decks. It is called the *SHELF*, and is bolted into the timber of the frame.

The *DEAD WOOD* is the solid timber rising from the keel at the fore and after part of the ship. The ribs, it will be seen, become more and more in shape like a V, till they at the lower part close altogether. The rabbet cut in the keel rises up the dead wood, and forms the *BEARDING LINE*. The *APRON* is part of the dead wood forward. It is a thick piece of timber, and its object is to afford wood to secure the plank at the bottom and the heels of the foremost timbers. The *STEMSON* is another timber used as a further support to the stem. Beyond the stem is a mass of wood called the *KNEE OF THE HEAD*. At the upper part stands the figurehead. It also forms a base to receive the *GAMMONING* of the bowsprit. The lowest part of the stem is called the gripe. When a ship keeps well up to the wind she is consequently said to have a good *GRIPE* of the water.

What the rafters are to a house, so are the *BEAMS* to a ship to support the floors or decks. The beams are placed across the ship, and rest on the shelf. The beams, however, do not tie the sides of the ship, or prevent them from falling out; they have, when the weight of guns is placed on them, a direct contrary effect, and have a tendency to force them outwards. Above the beams

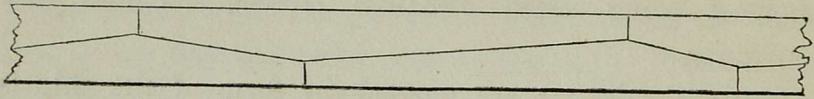
another hoop or ribband is secured longitudinally round the ship on the inside. These are known as *WATERWAYS*.

The two sides of the ship are united, when the lower timbers do not cross the keel by timbers, with arms, those foremost being called *BREADTH HOOKS*, the after ones *CRUTCHES*.

Before the beams are crossed the form of the ship is preserved by long pieces of plank called *CROSS PAULS*. They have the breadth of the ship marked on them. The keelson has also the centre of the ship marked on it, and a plummet dropped from the centre of the cross paul should reach exactly to the centre line on the keelson. If not, the shores on one side should be slackened and driven up on the other till it does so, and the proper shape of the ship is restored.

The *PLANKING* of the ship, or, as I have heard it most facetiously called, putting the skin on the skeleton, is a very important and no very easy matter. The planks are of different thicknesses and different materials in different parts of the ship. They are secured to the timbers by *TREENAILS*, or bolts of copper or iron; the latter being eight times as heavy as the wood taken out, add much to the weight, and easily draw. Wooden treenails are altogether considered by many as the best means of fastening. The outside planking is known under the heads of *Wales* or *Bends*, *Diminishing Plank*, *Plank of the Bottom*, and *Garboard Strakes*. The planks are not all even, but as the

planks partake of the form of the tree, and are narrower at one end than at the other, for economy's sake they are worked top and butt, so, however, as to make up a constant breadth in two layers.



The wales or upper planks are the thickest, and are nearly twice as thick as those below. The planking below the wales has gradually to be diminished in thickness till it reaches the plank of the bottom. This extends to within five or six strakes of the keel. These latter are termed the GARBOARD strakes. Oak, fir, and elm are used for the planking. We must next consider the inside planking. That immediately under the shelf of each deck is called the CLAMPS; that over the waterways is called the SPIRKETING. Above it the lower rim of the port is called the LOWER CILL of the port; the upper rim is called the UPPER CILL.

The beams being placed across, we come to the framing of the deck—that is, marking out the hatchways, mast-holes, &c. The framing of the MAST-HOLES are composed of FORE AND AFT PARTNERS, CROSS PARTNERS, and CORNER CHEEKS.

The HATCHWAYS are formed of four pieces; two placed fore and aft are called COAMINGS; those athwartships are denominated HEAD LEDGES, the latter rest on the beams. Coamings have pieces of wood placed under those reaching

from beam to beam, called CARLINGS. The coamings have a rabbet taken out of them to receive the gratings. The LADDER WAYS and SKYLIGHTS are fitted in the same manner.

RIDING BITTS are pieces of timber passing through two decks, placed forward, by which to secure the cable when the vessel is riding by her anchor. Two-deck and larger ships have two sets of riding bitts ; flush-deck vessels have only one set.

The sides of ships of war above water have apertures called PORTS, through which the guns are run out ; they are from seven feet to nine feet apart. They are closed by PORT-LIDS with hinges, to lift up and down ; some are of two pieces, but others are of one.

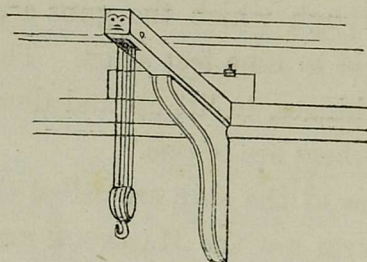
The upper sides of the ship are called the ROUGH TREE-NAILS. Above them are the HAMMOCK-NETTINGS, a framework, or box, in which the seamen's hammocks are stowed. In action, these, when full of hammocks, form a useful shelter to the crew against the enemy's musketry. Sometimes the stauncheons or sides are of iron, others of wood, or wood and iron. The hammocks are covered up by painted canvas, called HAMMOCK-CLOTHS.

The CHANNELS are blocks of wood bolted outside the ship, to serve as outriggers and supports for the lower mast shrouds. In men-of-war their breadth is governed so that they may carry the shroud six inches clear of the hammock-rail.

The CHAIN PLATES are formed of links, or bars of iron,

and their ends being fixed into the sides under the channels, they secure the shrouds to the sides.

The CATHEAD, a timber with sheaves in the extremity projects from the fore part of the ship for the purpose of raising the anchor. At the bows is also another block of wood, or iron outrigger, called a BOOMKIN, through which the fore-tack passes. Various sheaves also are placed in the side of the ship through which the different sheets are passed.



CATHEAD.

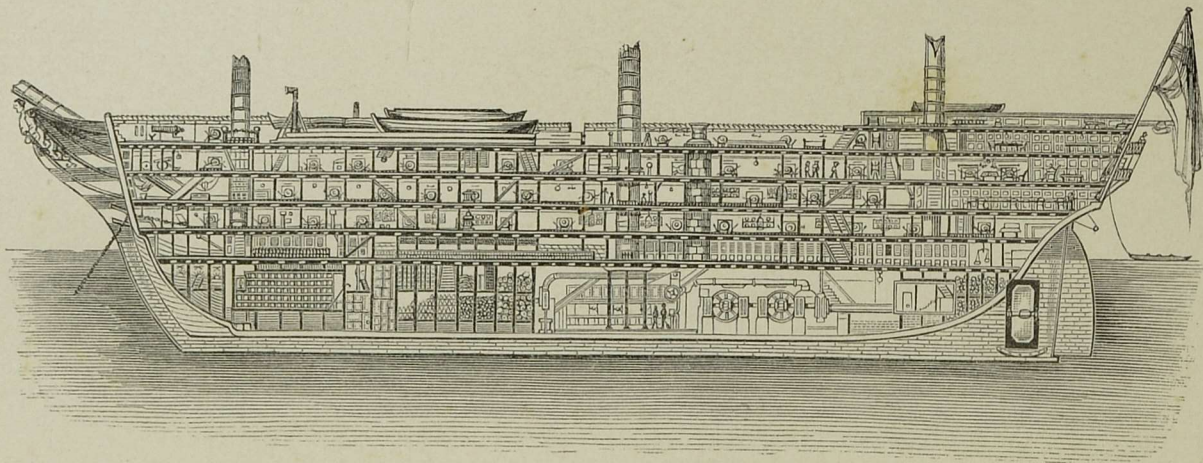
Besides the CATHEAD, which has a cathook to it, there is another outrigger, called a FISH DAVIT, in order to raise the flukes against the side of the vessel. This is called FISHING IT. When hanging up and down from the cathead, it is said to be at a COCK-BILL.

Outside the ship are long pieces of curved wood or iron, called DAVITS, for hoisting up and securing the boats.

In the waist between the fore and main-masts, are the SKID-BEAMS, on which the launch and pinnaces are secured.

The holes in the bows at the fore-castle through which the sheets pass are called FAIR-LEADERS.





SECTION OF FIRST-RATE MAN-OF-WAR.



The shelves of wood, with sheaves or pins in them, at the sides, or round the masts, by which to secure the ropes of the running-rigging, are called PIN-RACKS.

We now come to the internal fittings of a ship. These vary very much according to her size and objects. In ordinary merchantmen, or passenger vessels, there is the upper or main deck, the between-decks, or 'tween-decks, and the hold.

The UPPER DECK is so called by shipwrights because it receives the entire upper line of guns of the ship, they extending fore and aft through her entire length. Seamen call it the MAIN DECK, because formerly all the ropes led to it, and it was the *main* point where the greatest activity was displayed.

I will now give you a sectional division of a first-rate line-of-battle ship. Such a ship, carrying 120 or more guns, has four decks on which her guns are placed. The highest is open to the air, that is to say, it has no deck over it, and is called the UPPER DECK: I should have said, that it has no deck over the greater part of it. At the after part, extending a little way beyond the mizen-mast, there is a raised platform, called the POOP. It has no guns on it. On the main deck, just before the fore part of the poop, and thus under shelter, is the steering-wheel, with the binnacle in front of it. The after part of this deck between the poop and the main-mast is called the quarter deck, and is the place where the officers especially

walk. The captain takes the starboard side ; or at sea, when the ship is on a wind, the weather side. The part under the poop is divided into cabins, appropriated to the use of the captain. Here, also, is a clerk's office and a pantry. Between the main and fore-mast the large boats are stowed, and on either side are the gangways at which soldiers are stationed. The next deck under this is called the **MAIN DECK**. In the after part is the admiral's cabin. Immediately under the boats is a pen for the officers' live-stock ; and just abaft the fore-mast is the galley, or kitchen.

The third deck from the upper is called the **MIDDLE DECK**. The after part is fitted up for the lieutenants, chaplain, surgeon, paymaster, marine officers, &c., and called the **WARD-ROOM**. In the fore part of the deck is placed what is called the sick-bay, a compartment fitted up as a hospital ; about the centre of this deck is one of the capstans.

The fourth from the upper is called the **LOWER or GUN DECK**. In the after part is the **GUN-ROOM**, where the midshipmen, and other junior officers, mess. The tiller of the rudder works through the gun-room just above their heads. A second capstan is placed on this deck ; and forward are the riding-bitts for securing the cables. It is the lowest deck on which guns are carried.

The **ORLOP DECK** is the fifth deck from the upper. It has no guns or ports, though lighted up by bull's eyes or scuttles. In the after part is the purser's issue-room ; next to it is the after cockpit, where the midshipmen and other

junior officers sleep in hammocks. Before it again will be found the sail-room, where the sails are kept, and the cable-tiers, where the cables are stowed. Before it again, just abaft the fore-mast, is the fore cockpit, and the warrant officers' cabins, while right in the head of the ship are the carpenter's and boatswain's stores. Low as we have got, we have still further to go down to the HOLD, which, if it may be so called, is the sixth deck from the highest. It is often divided into two decks for the greater convenience of stowage. Here are the FORE AND AFTER MAGAZINES, WATER TANKS, WINE AND SPIRIT ROOM, CHAIN CABLE LOCKERS, SHOT LOCKERS, BREAD ROOM, SHELL ROOM, GUNNERS' STORE ROOM, DRY PROVISION, and BEEF AND PORK IN CASKS.

Since the introduction of auxiliary steam power into ships of war a large portion of the hold is devoted to the steam-engine and boilers, coal bunkers, and the shaft of the screw, while the funnel runs up through all the decks; but it is wonderful, comparatively how little space these are allowed to occupy, considering the great aid the steam-engine affords to the movements of the ship.

In speaking of the outside of the ship I might have mentioned the galleries, like balconies, which run round the stern, and afford a walk to the admiral and captain. I will now give you a slight sketch of the stern of a frigate. The upper part is the TAFFRAIL, to be found in all vessels.

The lower part is the BUTTOCK PLANKING. Above it is the COUNTER, furnished with the UPPER AND LOWER COUNTER RAILS.

The windows belong to the captain's cabin; they are fitted with sashes, like those on shore, and have shutters, which are called DEAD LIGHTS, which are closed in bad weather. A frigate has only one deck with a complete battery of guns, called the main or gun-deck, and an upper deck, without any deck above it, called the upper deck.

Over the stern of every ship is hung a life-buoy of a peculiar construction, with a port-fire fixed in it. There are two springs with lines; on pulling one the life-buoy falls, and on pulling both the port-fire is ignited, and burns at night to show its position to the seaman who has fallen overboard. This was invented by Lieutenant Cook, of the Navy.

A flush-deck vessel, such as a corvette, a sloop of war, or a brig, has only the one deck open to the sky with any guns on it. This class of vessels have, however, poops and topgallant forecastles. The latter are small raised platforms forward. Merchantmen have generally both poops and topgallant forecastles. The crew are generally berthed under the latter, while the captain and chief passengers' cabins are under the poop deck.

Having now given you a tolerably full account of the mode in which ships are built, and their hulls fitted up, I will, in the next chapter, describe their rigging and sails.

## CHAPTER III.

## RIGGING OF A SHIP.

HAVING built our ship, the next thing to be done is to rig her. We must get our masts and spars made, our blocks turned, and our rigging cut and fitted. We will begin by fitting the rigging, supposing that we know the exact length of our masts and spars, size of vessel, &c. &c. Before, however, we can fit the rigging a considerable amount of elementary knowledge is necessary. The chief of this is the art of knotting and splicing, about which I will proceed to give you some instruction. You must, however, first understand some of the terms relating to rigging. STANDING RIGGING consists of those stout ropes employed to support the masts and bowsprit ; it remains in a fixed position. The shrouds, stays, and backstays are part of the standing rigging. The rigging belonging especially to the lower mast is called the LOWER RIGGING. The stays, backstays, and shrouds attached to the topmast are called the TOPMAST RIGGING. The RUNNING RIGGING consists of the various ropes employed in hoisting and lowering, and tricing up and trimming the yards and sails. Different kinds of ropes are employed in rigging. Ropes

are a combination of several threads of hemp twisted together by means of a wheel. These threads are called rope-yarns, and the diameter of the rope will be according to the number of yarns contained in it. A certain number of yarns are first twisted together. This is called a **STRAND**. Three or more of these again twisted form a rope. According to the make of these strands in a rope it is said to be cable-laid, shroud-laid, or hawser-laid.

A shroud-laid rope is formed of four strands each of four yarns, and is laid right-handed, that is with the sun.

A hawser-laid rope consists of three single strands each, containing three yarns, and is also laid with the sun.

A cable-laid rope is formed of nine strands, each of nine yarns. These nine strands are first twisted three together, and then the three thus formed are laid left-handed or against the sun. It is so laid to exclude the water.

The most useful knots are the reef knot, stopper knot, bowline knot, running bowline, bowline on a bight, sheet bend, Carrick bend, timber hitch, Blackwall hitch, rolling hitch, studdensail bend, clove hitch, marling hitch, throat seizing, shroud knot, single wall, wall and crown, Mathew Walker, Turk's head, cat's paw, sheep shank, short splice, eye splice, cut splice.

Ropes are also wormed, parcelled, and served.

A rope is wormed to give it a round appearance. It is parcelled, or covered with tarred canvas, to preserve it from wet. Service is put on to protect it from chafing.

Ends of ropes are pointed to make them look neat, to pass through a sheave hole more easily, and to prevent them from untwisting. Whipping a rope prevents it from untwisting. All these knots and splices and bends and seizings are often done in a very rough way by old-fashioned seamen. I remember on board one of the training ships of the navy being shown a grummit turned in by a lad who had been only six weeks on board infinitely superior to one made by a man who had been sixteen years at sea. One was done on a systematic principle by the lad, who was properly taught; while the old seaman did his work in a rough way without any rule. Many of these knots and bends you will find very useful, and therefore I advise you to study them.

Certain implements are required. One known as a **FID** is made of hard wood, thick at one end and tapering to a point.

A **MARLIN-SPIKE** is an iron pin of a similar shape, with a knot at the end, or a hole through which a piece of rope-yarn can be passed to secure it round the neck.

A wooden **MALLET** is also required for putting on service to a rope. It has a handle, and on the opposite side a groove into which the rope fits.

The best book on seamanship ever written, and most in vogue in my early days, was called "The Young Sea Officer's Sheet Anchor," by Darcy Lever, Esq., who was either a purser or an officer of marines. Little change in the art of

knotting and splicing has taken place since his time ; and I observe that most descriptions of knots and hitches have been copied from his well illustrated book. As, however, great improvements in general seamanship have taken place, it has become obsolete, and it has been superseded by others at a much less price. To one of these works I refer the lad who either intends actually to go to sea, or wishes to become a thorough amateur sailor. If only the latter, let me assure him that he has plenty to learn, as the book itself will prove to him. I will, however, give a few of the splices and knots which may be found generally useful. To splice a rope is to unlay and open the strands, and then to unite the parts by interweaving them together in one of several ways.

**A SHORT SPLICE.**—Unlay the strands of the two ropes you have to join, and then, taking one in each hand, interweave them as you would your fingers. Draw them close. Having opened the opposite strands with a marlin-spike, pass the loose strands through alternately ; draw them tight. Again to strengthen them work open the strands, and alternately pass the strands in. Cut the ends off, or scrape them, and serve them over with spun yarn.

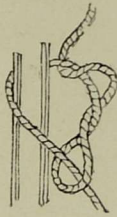
**A LONG SPLICE.**—Unlay the strands for a much longer distance than for the short splice. Unite them as before. Fill up the space left by one unlayed strand with the strand opposite and next to it. Having turned round the rope, take hold of the two next strands, which will appear



KNOTS AND SPLICES.



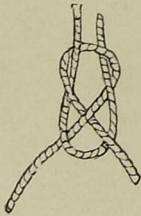
BOWLINE KNOT.



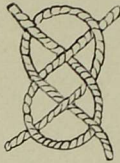
A TIMBER HITCH.



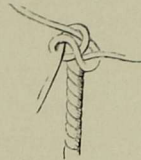
A BLACKWALL HITCH.



A SHEET BEND.



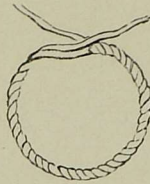
A CARRICK BEND.



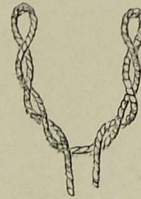
SINGLE WALL.



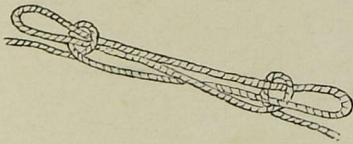
MATTHEW WALKERS.



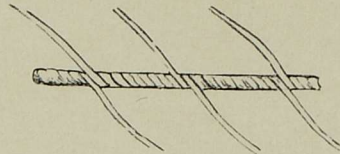
A GRUMMET.



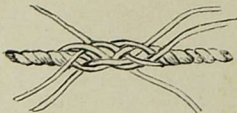
A CAT'S PAW.



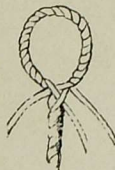
A SHEEP-SHANK.



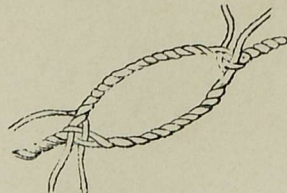
A LONG SPLICE.



A SHORT SPLICE.



AN EYE SPLICE.



A CUT SPLICE.



opposite their respective lays. Unlay one, and, as before, fill up with the others opposite to it. Next split each of the strands in two, and knot the opposite half strands together. Fill up the vacant lay with them. Stick the ends of the six half strands under two strands. Stretch the splice thoroughly before cutting off the ends. The object of a long splice is to unite the ends of a rope which have to pass through a block so as not materially to increase its size.

**AN EYE SPLICE.**—This may be called a loop. It is formed by opening the end of a rope, bending it over according to the size of the eye you wish to form, and then opening the lay of the standing part and working in the strands. Separate the strands, and put one on the top and the other below the standing part; take the middle strand, and run it under its respective strand; take the next end over the first strand and under the second; take the third and last end through the third strand on the other side.

**A CUT SPLICE.**—Take two ropes; unlay the ends, and place them according to the length of the eye in opposite directions, the one overlapping the other. As has been done in the eye splice, splice in the strands of each end; serve them over.

**A HORSE-SHOE SPLICE** is made on the principle of the former; the difference is in the shape. Unlay the two ends; make the bow with one rope and the cross bar with the other; splice them in when they meet.

## KNOTTING.

A REEF KNOT.—This is the most important of Knots. Landsmen often make what they fancy is a reef knot, but which proves to be a slip or Grannies' knot, proved by the contents of their parcels or boxes being scattered far and wide on the ground. Take the end of a rope round the standing part, under its own part, and through the bight; now bring the end next towards you over to the left, and the other to the right. Take the end on the right round that to the left, and draw them tight. The rule to go by is that the upper always keeps upper.

A BOWLINE KNOT.—Take the end of a rope in the right hand, and the standing part in the left. Lay the end over the standing part; next turn a bight of the standing part with the left hand, and lead the end round the standing part once more through the bight.

A RUNNING BOWLINE KNOT.—This is a very useful knot. Pass the end of your rope round the standing part, and then through the bight; next make a single bowline knot upon the running part, and the knot is formed.

TWO HALF HITCHES.—Pass the end of the rope round the standing part, and then pass it up through the bight you have thus formed. Thus you will have made one half hitch; now make another above it, and the knot is complete.

A TIMBER HITCH.—Pass the end of a rope round a spar or timber-head; lead it under and over the standing part; next pass the end several times round its own part.

**A COMMON MARLING HITCH.**—This is very useful for lashing up hammocks or sails. Pass the end of the lashing round the hammock. With the end take a hitch round the longer part, and pass it three times round itself. Now haul taught with the longer part, and pass it again round the hammock, hitching it round itself, and continue passing the lashing round and hitching it, till the work is done.

**WHIPPING A ROPE.**—This is done to prevent the strands unlaying. Take the yarn or twine which you are about to use, place it in the lay of the rope pointing towards the end. Pass a few turns round the rope, thus securing the end of the whipping. Lay the other end on the turns already passed, pointing downward, passing the remainder on the bight, round the rope and the last end part. Haul through on the end part and cut off.

**A SAIL-MAKER'S WHIPPING.**—Small twine is put on with a needle. Reef-points have two such whippings at their ends. First draw the twine through the point of the rope, with the needle to its end. Pass several turns; stick through the point at each end of the whipping, and pass two crossing turns. Secure with two half hitches round the upper part of the crossing-turns, and haul the twine taught.

**A GRUMMET** is a circular band formed of the strand of a rope worked into itself. Unlay a rope and take one of the strands. It must be three times with some to spare

the circumference of the grummet to be formed. Lay the right hand end over the left, and follow the lay round with each end until you have re-formed the rope. Secure the ends as in splicing, where they meet, and the grummet is formed.

I have mentioned but a few of the knots, splices, and hitches, and bends, used by seamen. I will give a list of the names of others frequently employed; but I am certain that no description would be of much use without practical experience in making them. I shall be doing much greater service to my young readers by advising them to get some old sailor to instruct them in the art of knotting and splicing. I must also advise them when they are bending on a rope to use their hands and arms freely, and to move as if they knew exactly what they were about to do. I can tell at a glance whether a man is likely or not to prove a good seaman by the way he handles a rope. Another thing—never be afraid of the tar-bucket. A first-rate officer I knew, who commanded a sloop-of-war in the Mediterranean some years ago, always had a number of midshipmen sent on board his ship to learn seamanship. He used to make them man the mizen-mast entirely, and even black down the rigging. They had, consequently, to dip their fists in the tar-bucket just as freely as the men had. They, in consequence of this training, nearly all turned out good seamen.

The following are the names of some of the knots,

hitches, and bends, &c. &c., including those I have described; but you may get any old seaman to show you how to make them. A shilling or two bestowed on him which will enable him to buy himself some tobacco, or any other comfort, will probably make him very willing to instruct you. Learn especially how to make a reef-knot, two half hitches, a fisherman's bend; how to belay a rope, without knowing which no boy ought to be allowed to step into a sailing-boat. Not knowing how to do it, you fancy that you have belayed a halliard, when down comes the sail, perhaps at a critical moment, and not being able to get out of the way, a big steamer runs you down: or you have an idea that you have made the painter of your boat fast, and you look round, and there she is floating a quarter of a mile astern, or nowhere to be seen: or you land on an island, and when you are under the impression that you have secured her to a tree, you perceive her floating calmly away, and you are left like Robinson Crusoe, Lord of all you survey, or All alone in your glory, but without the slightest prospect of obtaining anything for your dinner, till your prolonged absence induces your friends to send in search of you; and when at length, late in the evening, you, half starved, are being pulled back, you hear one of the boatmen remark, "Ah, the young gentleman is something of a greenhorn, I suspect; he did not know even how to make his boat fast. He shouldn't be allowed to go out by himself, that's certain."

## NAMES OF KNOTS, HITCHES, BENDS, &amp;c. &amp;c.

- |                           |                             |
|---------------------------|-----------------------------|
| A REEF KNOT.              | POINTING A ROPE.            |
| BOWLINE KNOT.             | GRAFTING A ROPE.            |
| RUNNING BOWLINE.          | ROSE LASHINGS.              |
| BOWLINE, OR A BIGHT.      | A NETTLE.                   |
| STOPPER KNOT.             | THUMB LINE.                 |
| AN OVERHAND KNOT.         | WHIPPING A ROPE.            |
| TWO HALF HITCHES.         | A WEST COUNTRY WHIPPING.    |
| A TIMBER HITCH.           | A SAIL-MAKER'S WHIPPING.    |
| A BLACKWALL HITCH.        | CROWNING THE END OF A ROPE. |
| ROLLING HITCH.            | A SELVAGEE STROP.           |
| CLOVE HITCH.              | A CAT'S PAW.                |
| A COMMON MARTING HITCH.   | A SHEEP-SHANK.              |
| A MARTING HITCH.          | HOW TO SLING A CASK.        |
| A SHEET BEND.             | HOW TO SLING A MAN.         |
| A CARRICK BEND.           | HOW TO BEND TWO HAWSERS     |
| A STUDDING-SAIL BEND.     | TOGETHER.                   |
| A ROUND SEIZING.          | HOW TO WORK A CRINGLE IN A  |
| A THROAT SEIZING.         | ROPE.                       |
| BACKING SEIZING.          | HOW TO BEND A HAWSER TO THE |
| A FLAT SEIZING.           | RING OF AN ANCHOR.          |
| A SHROUD KNOT.            | NET MAKING.                 |
| SINGLE WALL.              | BOATS' FENDERS.             |
| WALL AND CROWN.           | HAMMOCK CLEWS.              |
| DOUBLE WALL AND CROWN.    | SPANISH CLEWS.              |
| FRENCH SHROUD KNOT.       | HOW TO DRAW AND KNOT YARNS. |
| MATTHEW WALKERS.          | A MARLINSPIKE HITCH.        |
| TURK'S HEAD.              | COMMON SINNET.              |
| TURK'S HEAD WORKED INTO A | ROUND SINNET.               |
| ROPE.                     | SQUARE SINNET.              |
| A FOX.                    | SWORD MAT.                  |
| A GRUMMET.                | A HORSESHOE SPLICE.         |



HOW TO WORM, PARCEL, AND SERVE.	A GRECIAN SPLICE. TO SLING A CASK WITH THE HEAD KNOCKED IN.
A SHORT SPLICE.	TO SLING A CASK WITH A ROPE'S- END.
A LONG SPLICE.	SINNET FOR MATS.
AN EYE SPLICE.	
A CUT SPLICE.	

The above lists will give you some little idea of what a seaman has to learn. It is literally only the A B C of seamanship. I must particularly advise you to learn how to sling a man, how to sling a cask or bale, and how to sling a cask with the head knocked in, whether or not you are going to be a sailor, because in ordinary life you are likely to find such knowledge very useful, and possibly most important.

### BLOCKS.

We next come to blocks. They are of different shapes and sizes, according to their objects. A block consists of shell, sheave, and pin. If it has one sheave it is called a single block ; if two, a double, if three, a treble, and so on.

The shell is made of elm or ash, and of late years of iron. It has one or two scores, for the purpose of admitting a strap, which goes round the block. Treble blocks are used ordinarily as purchase blocks.

A SHOULDER BLOCK is like an ordinary block, but it has a projection at the bottom to prevent the rope which

is rove through it from jamming between the block and the yard.

A **SISTER-BLOCK** consists of two blocks made out of one piece of wood, one above another, strengthened by a band of iron.

A **SHOE-BLOCK** is something like the former, but the lower is smaller, and lies in an opposite direction to that of the one above it.

A **FIDDLE-BLOCK** is in the shape somewhat of a fiddle. It also consists of two blocks one above the other, working the same way, but the lower is much smaller than the upper.

A **DEAD-EYE** is a block of wood with three holes in it, looking something like a death's head. It has a groove cut round it for the shroud to lie in. It is employed for turning in the ends of shrouds and backstays. The three holes are for the halliards to reeve through.

A **HEART, OR COLLAR** is used for the same purpose as a dead-eye, but it has a hole in the centre, with scores at the lower part for the laniards to rest in.

A **BULL'S-EYE** is a wooden ring or thimble, with a groove round the outside for a rope to lay in.

A **MONKEY-BLOCK** is a common block, with a wooden collar made fast to the lower part.

A **NINEPIN-BLOCK** is a standing block fixed between two stancheons, with a sheave in the centre.

A **BELAYING-PIN RACK** is a ledge in the side of the

bulwarks, with a number of holes in it, in which belaying-pins are placed.

How to strap a block.—A strap is made by forming a ring by splicing the two ends of the rope together. Twist into the rope the length of once and a half round the block; worm parcel, and serve it, but leave room for splicing. Splice the ends with a short splice. Finish serving over the splice; secure it by a seizing round the end of the block.

A TAIL BLOCK.—The strap is secured by an eye-splice, and then served over with spun yarn. Its appearance shows why the name was given.

A PURCHASE-BLOCK is a large block, with double straps.

A TOP-BLOCK is single, iron-bound with a hook at the top.

A SNATCH-BLOCK is single, iron-bound, with a swivel-hook. In the shell of the upper part there is an opening. There is an iron clasp to go over the opening. It is useful for placing a rope in it without reeving it through.

A CAT-BLOCK is a large three-fold block, iron-bound, with an iron hook attached to it for catting the anchor.

#### WHIPS AND PURCHASES.

A SINGLE WHIP is the simplest purchase which can be used. It is a single rope passed through a block suspended above; it is employed generally for hoisting up light weights.

A WHIP AND RUNNER may be described as a large whip,

with the end of the fall secured round the block of another whip ; it thus consists of two whips.

A GUN-TACKLE PURCHASE.—This is made by reeving a rope through two single blocks, and making the end fast to the one through which it was first rove.

A LUFF-TACKLE PURCHASE.—This is composed of a double and a single block, each with hooks. The rope is first rove through the double block, then the single, again through the double, and secured to the single.

A TOP BURTON-TACKLE is similar to a luff-tackle, but the upper is a fiddle-block, and that of the lower or luff is double.

A RUNNER AND TACKLE.—A runner is a thick rope, and has a hook fastened to one of its ends, while the other end goes round the upper tackle-block. The tackle has generally a small double block. The hook of the lower tackle hooks on to the object to be lifted, or to the side of the vessels. In small fore and aft vessels the backstays are always set up with a runner and tackle.

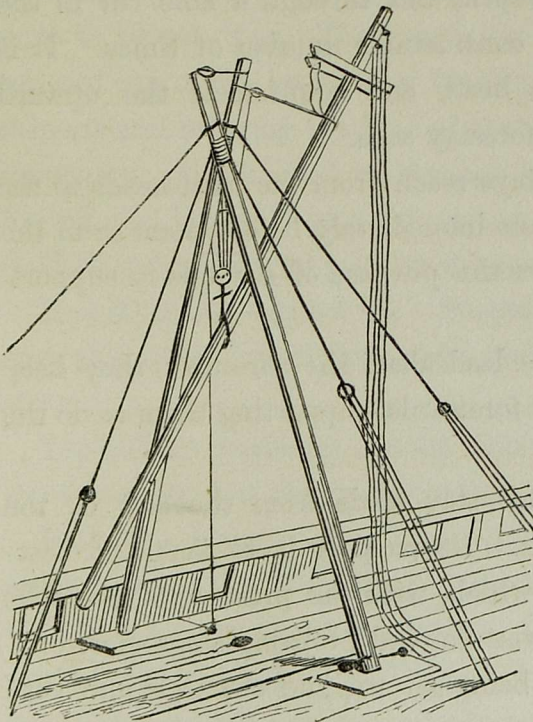
A LONG TACKLE.—This has two long tackle-blocks ; These are sister-blocks, like two blocks joined at their ends.

A TWO-FOLD PURCHASE.—This consists of two double blocks. To make it, reeve the fall through one sheave of the upper block, then through one of the two lower blocks, —next pass it through the upper, then again the lower, and make the end fast to the upper.

A THREE-FOLD PURCHASE.—This is similar to the above.

Be careful to reeve the fall first through the middle sheave of the upper block, and then through one of the sides of the lower, and this, as you will see, will give an even strain on all the sheaves. It is very useful to know how to employ these various tackles. By a proper application of them the greatest weights can be lifted or removed.

RIGGING A SHIP.



STEPPING A MAST.

Lower masts and bowsprit are got on board, and placed in their proper positions by means of sheers, which are large triangular erections of wood formed on board the ship, or sometimes on the wharf alongside which she is placed. The lower rigging has been meantime cut, fitted, served, and prepared by various operations for being placed over the mast-heads. The object of the

being placed over the mast-heads.

standing rigging is to secure the masts in their places, and to support them when the force of the wind comes to act on them by means of the sails. The shrouds are fitted with what are called eyes, which are loops, which go over the mast-heads. The lower ends are secured to the sides of the ship by means of the dead-eyes and chain-plates. The bowsprit is also secured in its place by shrouds, and by what is called a gammoning. Gammoning is rope passed over the bowsprit, and through a hole cut in the knee of the head a considerable number of times. It is thus secured to the head, and counteracts the upward strain caused by the forestay sails.

The fore and aft-stays reach from the mast-heads to the lower part of the masts immediately before them or to the bowsprit. They serve the purpose of shrouds in supporting the masts.

Back stays.—These lead abaft the shrouds ; they keep the mast from falling forewards, supporting them as do the shrouds.

The Bob-stay.—This stay leads from the end of the bowsprit to the stern. Its purpose is to keep the bowsprit from rising up, which, with the pressure of the sails on it, it would otherwise do, and probably snap short off.

The lower rigging being set up, and the tops and caps got over the mast-heads, the topmasts have next to be got up. In the end, or heel, as it is called, of a topmast, there is a hole denominated a fid-hole. Through this a

rope is passed, and the top-mast is got up and down the main-mast by means of the capstern.

Before the top-mast rigging can be set up, the *FUTTOCK SHROUDS* must be fitted. They reach from the outer edge of the top to the mast a few feet below it, where they are secured to an iron band round the masts. The upper ends of the futtock shrouds are hooked to the futtock plates, to which dead-eyes are fastened for setting up the top-mast shrouds. The top-mast crosstrees and cap have next to be got over. They serve the same purpose as the top and cap of the lower mast for setting up the top-gallant shrouds and securing the heel of the top-gallant mast. The top-mast is then hoisted up through the cap, the heel resting on the top with the fid passed through the fid-hole (fidded, it is called) to prevent it again coming down.

Backstays are then set up. Sometimes there are two on each side called breast backstays, and standing after backstays.

Top-gallant masts are got up much in the same way as the top-masts, but the operation is more easy.

Both the lower and topmast rigging have next to be rattled down ; this is forming what would be called ladders with small rope, on the shrouds. The rigging is first sparred down ; that is, any spare light spars are secured across the shrouds for the men to stand on. The end of a coil of rattlin stuff is then taken into the rigging, with an eye spliced in one end. It is seized to one shroud, and

then secured by a clove hitch to the next, but at the end it is cut off and an eye is opened in it to secure it to the last shroud.

The jibboom has next to be rigged. It is what the topmast is to the lower mast, and fits to the end of the bowsprit; it is fitted with foot-ropes for the men to stand on. It has a martingale stay which reaches from its end to the dolphin-striker. There are jibboom guys, which act the part of shrouds.

The dolphin-striker is a spar reaching perpendicularly from the end of the bowsprit towards the water; it assists in setting up the jibboom and flying jibboom rigging.

The flying jibboom fits on beyond the jibboom, just as a topgallant mast does above a topmast.

Spritsail yards are fitted to the bowsprit, and assist both in setting up the jibboom and flying jibboom rigging; also for setting a sail, which is occasionally used, hanging from it towards the water.

I have now given a brief and rapid sketch of the various masts of a ship, and of the way they are got on board and rigged. The most important operation is that of getting the yards across—that is, hoisted into their respective places. When there, their proper blocks have to be secured to them, and then they have to be rigged. Foot-ropes and stirrups have to be fitted to them. Next bowlines, buntlines, clewlines, braces, lifts, halliards, throat-halliards to spanker, peak-halliards, spanker-boom sheets,



and guys ; spanker-boom topping-lifts, reef-tackles, leech-lines, slab-lines—the tacks and sheets have to be fitted ; so have yard-tackle tricing-lines, staysail geer, storm staysail geer, studding-sail geer—indeed, it would be impossible to describe all the numerous ropes employed in working the sails of a ship unless in a regular treatise on seamanship ; still I will describe the use of a few of them.

The halliards are ropes used to hoist up the yards ; braces haul the ends of the yards about, either more or less, fore and aft, or across the deck, always horizontally.

Lifts, lift the ends up, and also tend to counteract the downward pressure of the sail, and to support the yard.

Bowlines stretch out the leech or outer edge of the sail, as the braces do the yard.

Buntlines assist in hoisting up the foot of the sail to its yard when reefing or furling sails.

Clewlines hoist up in the same way the clews or corners of the sails.

Reef-tackle pendants. These are ropes to hoist up so much of the sail as it is intended to reef.

The Bridle is the part of the bowline next to the sail, and consists of three ropes, secured to different parts of the leech of the sail.

Tacks and sheets are fitted to the lower corners of the foresail and mainsail. The tack hauls the sail down to the fore part of the ship, or to leeward, while the sheet secures the opposite corner to the other, being the weather side.

Clew Garnets hoist up the clews of the foresail and mainsail.

Slab Lines hoist up the foot of the same sails when they are to be furled or clewed up.

The objects of all these ropes is to move about the yards with the greatest possible expedition and ease, to expand the sails, or to furl or reef them—indeed, to place the sails exactly in the position which may be required.

When it is remembered the immense number of these ropes, and the great force which it is necessary to apply to them, it may not appear surprising that the largest ships in the navy require upwards of a thousand men to work them properly. This number, of course, embraces those who in action are employed in working the guns; still a large ship could not be handled sharply and well with fewer men.

## CHAPTER IV.

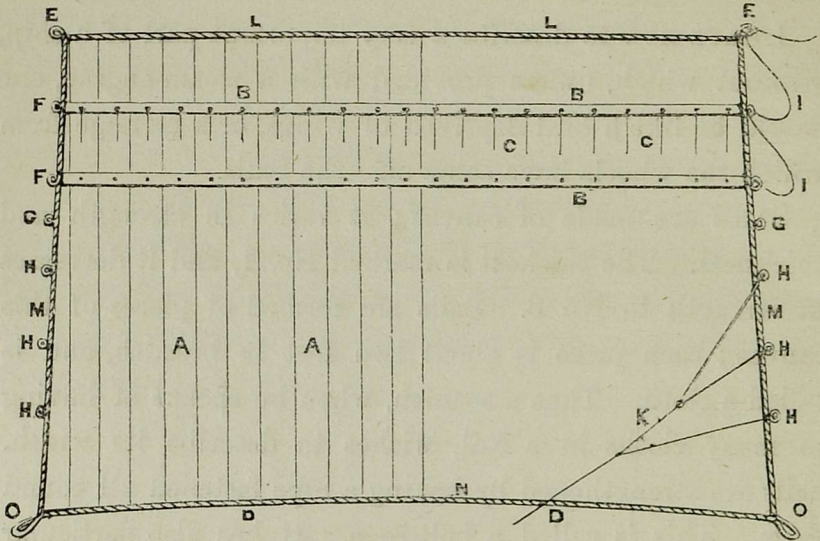
## SAILS AND MASTS.

I HAVE now to describe a very important part of a ship, without which, unless provided with a steam-engine, she would be like a bird deprived of wings, or a carriage from which the wheels have come off—the Sails.

SAILS are made of canvas ; it varies in strength and thickness. The thickest is marked No. 1, and it decreases in strength to No. 8. Sails are formed of pieces of this canvas ; each piece is about two feet in breadth, and is called a cloth. Thus a seaman, when he speaks of having so many cloths in a sail, wishes to describe its width. Sails are strengthened by having a rope fastened all round them. This is called a bolt-rope. It has also particular names, according to the part of the sail to which it is secured. That at the top is called the head-rope ; that at the side the leech-rope ; and at the bottom the foot-rope. So these edges of the sail are called respectively the head, leech, and foot of the sail. The foot-rope is the stoutest, the leech-rope the next, and the head-rope the smallest.

SQUARE SAILS are the sails which hang from the yards, and are so called especially to distinguish them from the

fore and aft sails, or stay sails, spanker, &c., which never can be set square or at right angles with the keel. Square sails have generally more cloths in them at the foot than at the head. The cloths are placed parallel to each other and perpendicular to the head. The breadth of a sail is



A SQUARE SAIL.

- |   |                                   |   |                   |
|---|-----------------------------------|---|-------------------|
| A | Cloths of the Sail.               | H | Bowline Cringles. |
| B | Reef Bands.                       | I | Earrings.         |
| C | Reef Points.                      | K | Bowline.          |
| D | Bolt Ropes..                      | L | Head Rope.        |
| E | Earing Cringles.                  | M | Leech Rope.       |
| F | Reef Cringles.                    | N | Foot Rope.        |
| G | Earing for Reef Tackle, Pendants. | O | Lower Clews.      |

diminished by being cut from the lower corners or clews diagonally towards the head. This is called goring a sail. Sails are also frequently gored more or less in the foot, some with an entire sweep or concave shape; others have only a certain number of cloths on each side of the clews gored, and the foot is then again parallel with the head.

A REEF BAND is a piece of canvas about a third of the width of the cloth, which is sewn across the sail with holes and gromets worked in it, for the reef-points to reeve through it. The band is to strengthen the sail, as there is a great stress on the canvas when it is being reefed.

At each end of the reef-band in the leech-rope a gromet is worked, called a CRINGLE. It is a piece of rope spliced on to the leech-rope.

AN EARING CRINGLE, which is made by the leech-rope being spliced into itself, is worked in the upper corner of a sail.

In the middle of the sail a cringle is worked called the LOWER BOWLINE CRINGLE; and at the foot, at equal distances, are two or more cringles called Buntline Cringles. All are worked round THIMBLES of copper.

THIMBLES are rings rounded in the inside, with a concavity or groove round the outside for the rope to fit in.

The CLEWS are similar to Cringles worked in the lower corner of the sail.

Sails are strengthened by additional cloths sewn on in

places over the others. There are some above the buntline cringles called buntline cloths.

Sails have several REEF BANDS, according to the number of reefs it may be necessary to take up in them.

REEFING A SAIL is decreasing its size by rolling up a portion, and securing it by reef-points and earings to the yard. A square sail is reefed by the head or upper part ; a fore and aft sail by the foot.

An EARING is spliced into the head cringle, or earing cringle, and serves to secure the outer corner of the sail to the yard.

When a sail is to be FURLED, the men on the yard haul up so much of it as will cover the rest, which is called the SKIN. When all the rest is gathered up, this skin is thrown up over the yard, and the gaskets are then passed round it, and it is firmly secured.

Gaskets are made of soft plaited stuff, to secure the sails to the yards without chafing them.

Each of the reef-cringles have EARINGS, which are lines spliced on to them. The end of the first reef-earring is hitched to the head-cringles ; the end of the second to the first reef-cringles ; and the end of the third to the second. Thus, when reefing, the man at the outer end of the yard-arm gets hold of the end of the earing of the reef immediately below him, and, as it is expressed, hauls it out, and hauls up so much of the sail to the yard-arm, when he secures it. If a second reef is to be taken in, he

proceeds in the same way with the next. In a gale it is always the post of honour, difficulty, and danger. When a large sail has to be furled, it requires great strength and skill to do it expeditiously and well.

Sails are sometimes reefed with the assistance of what are called REEF TACKLE PENDENTS. These are lines rove through a sheave in the yard-arm, and coming down to the lowest reef-cringle, to which a block is secured. Sometimes there is another block at the yard-arm, through which the pendent returns. The head of the sail to be reefed is thus very easily hoisted up to the yard-arm.

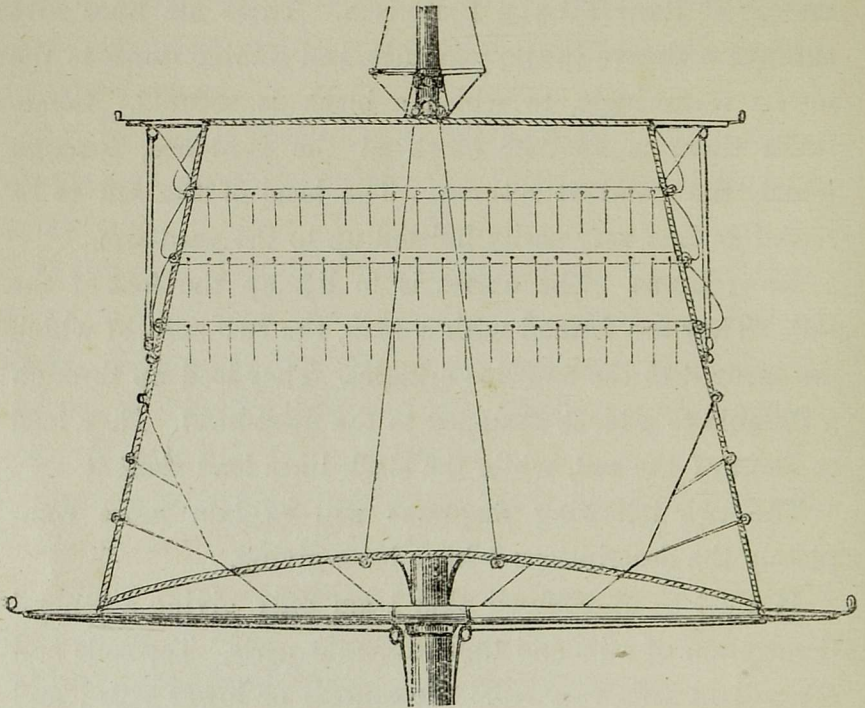
BUNT LINES. The object is to lift up the foot of the sail. They are formed with a span, the two ends of which are secured to the buntline cringles. They lead up through a thimble to a block strapped to the mast-head. They lead in front of the sail, while the slack lines lead abaft it.

The two following diagrams will explain more completely the descriptions I have been giving.

It must be understood that I am only giving a general description of sails and their different parts. Top-sails and top-gallant sails vary from the courses or lower sails; and sails in men-of-war are fitted in a different way to those in the merchant-service.

I have before described the use of BOWLINES. They extend the weatherleech of the square sails. The fore bowline leads to the fore-stay close down to the bowsprit. The fore-top bowline leads through a block on the bowsprit

cap. The fore top-gallant bowline leads through a thimble on the jib-boom end. The main bowline leads to a block lashed to the after-side of the fore-mast, the main-top



FORE-TOP-SAIL—FORE PART OF SAIL.

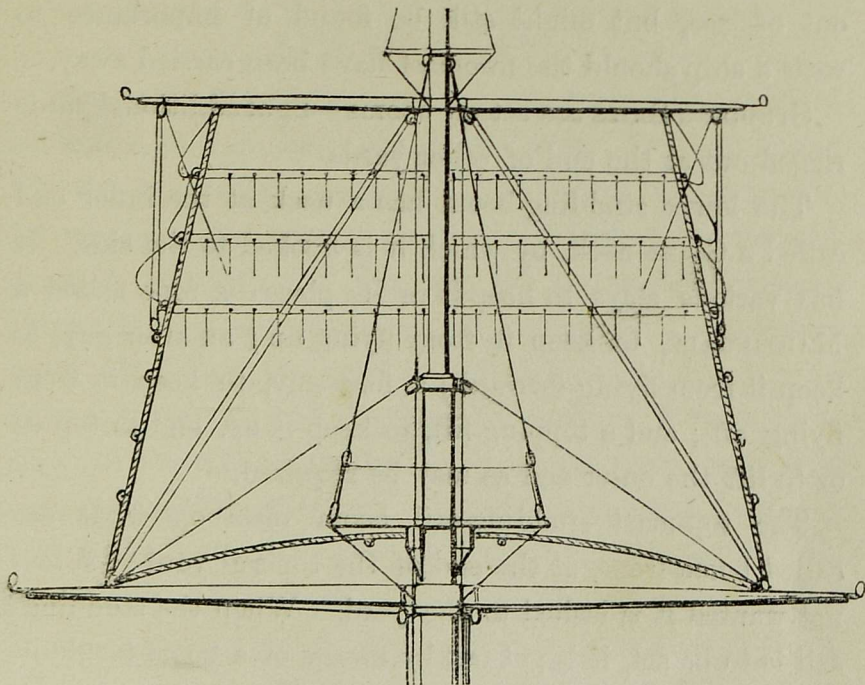
bowline to a block in the after-part of the fore-cap, and the main top-gallant bowline to one in the fore-top-mast cross-trees.

The FORE-TACK is secured to the boomkin end, the



leads through a block in the clew of the fore-sail, and then through a block on the boomkin, and so in on deck.

The fore-sheet is secured to a ring bolt in the ship's



FORE TOP SAIL—AFTER PART OF SAIL.

side, then rove through a block in the clew, and next led in board through a sheave-hole in the side.

The lighter sails of a ship are ROYALS, SPRIT-SAILS, and STUDDING-SAILS.

Royals are bent to yards, and often only sent up aloft when they are to be set. A boy is stationed aloft to cut the stops as they are hoisted up.

The SPRITSAIL is bent to the spritsail yard, and hangs down towards the water. They are, however, much gone out of use, but might still be found of importance to wear a ship should the foremast have been carried away.

STUDDING SAILS are set on booms—light additional yards rigged out at the end of other yards.

The lower studding-boom has a neck at the inner end called a Goose-neck, by which it is hooked to the side. It has various stays to keep it in its place—a rope called a MARTINGALE, to keep it from flying up; an after guy, to keep it from flying forward; a fore guy, to keep it from flying aft; and a topping-lift, to keep it up, and to top it, or to lift the outer end as may be required.

The top-mast studding-sail boom rests on what are called boom-irons, at the end of the top-sail yard. When not wanted it is lashed to the yard. When the studding-sail is to be set, it is got out by means of a boom-tackle in large ships.

The top-mast studding-sail is bent to a yard with knettles and earings. Studding-sails have sometimes a short, light spar along a part only of the head-rope. They are hoisted up from the deck, or from the tops, to a block secured at the end of the yard above them. The halliards then lead through a block at their respective mast-heads, and so down on deck or into the tops.

They are only used in light winds when going free, that is, before the wind, or almost before it. At no time does a ship appear to greater advantage than with all her studding-sails and royals set, gliding majestically over the calm blue sea.

#### FORE AND AFT SAILS.

We next come to the fore and aft sails. The chief of these in a ship is the spanker or driver. It is in shape like the mainsail of a cutter. It is, indeed, the chief sail set on the mizen mast. In a brig, which has no mizen mast, it is called the fore and aft mainsail. Formerly ships carried a sail answering its purpose on a long latine yard. It is bent to a yard or gaff, which has jaws resting against the mast; and the foot is stretched out by a boom called the spanker boom in a ship, or the main boom in a brig or schooner or cutter. The gaff is hoisted by throat and peak halliards. The throat halliards hoist up the inner end, or the jaws; the peak the outer end. The boom is worked by a sheet which passes several times through blocks. Its object is to press the after part of the ship away from the wind, so as to bring the head nearer up to it. The spanker is only set when the ship is on a wind, as before the wind the mainsail holds the wind it would receive.

STAY-SAILS are generally triangular sails, and work up and down on the fore and aft stays, whence their name.

The UPPER outer CLEW is called the PEAK, and the inner the THROAT—the foremost lower clew the TACK, the after the SHEET. Patches of additional canvas are sewn on to strengthen the sails at those points. They are hoisted by HALLIARDS, and taken in by DOWN-HAULERS.

The fore staysail is set between the bowsprit and the foremast, and is the next sail to the foresail.

The JIB is in most respects like a staysail. It is set on the jib boom, to the end of which the foot is hauled out on a traveller, or hoop running on the jib boom. It is bent on the jib stay. It has the same powerful influence on the head of the ship which the spanker has on the after part, and is used to turn the head from the wind.

The FORE-TOPMAST STAYSAIL is a small sail hoisted to the fore-topmast between the fore staysail and the jib. The tack comes down to the bowsprit end.

The FLYING JIB is set above the jib in light winds.

THE MAIN STAYSAIL.—This is a strong and triangular sail used formerly sometimes for laying-to. It is found, however, that topsails, which are not so easily becalmed by the seas, are safer for this purpose. The sails above it are the MIDDLE STAYSAIL and the MAIN-TOPMAST STAYSAIL. These sails are four-sided; the fore part, however, being of much less height than the after, which is cut to suit the angle of the stay which they traverse.

The MIZEN STAYSAILS are much of the same shape as the last described. These sails are generally first brailed up

before being taken in. Brails are ropes reaching from the outer tack of the sail, and leading up to a block near the throat.

I have now given a tolerably full sketch of the various sails used in large ships. I may describe others when I come to mention the many various craft in use both by the English and in different parts of the world.

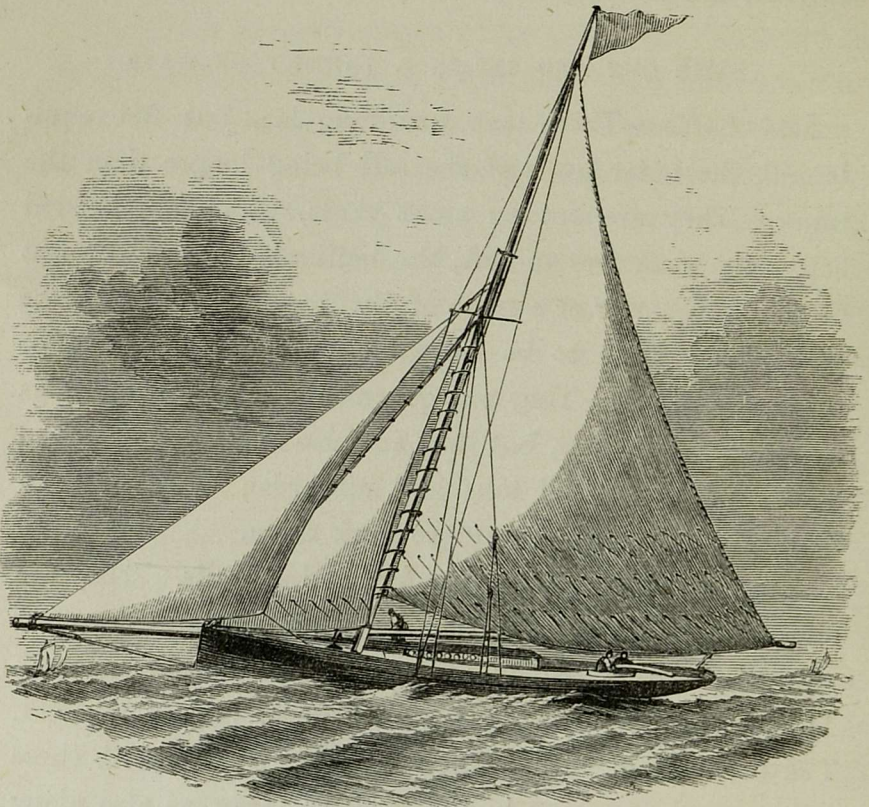
#### SAILS CUT AND SET IN A VARIETY OF WAYS.

LUG-SAILS.—These are quadrangular, but not equilateral, the outer leech of the sail being longer than the inner. They are set on stout yards, which are hoisted across the mast fore and aft, the halliards being made fast at about a quarter or a sixth of the distance from the fore end. They have to be dipped each time the vessel or boat goes about. They are generally used on board gigs and other long boats, but they are also employed on board vessels of a hundred tons and upwards; but they then require very powerful crews to work them.

LATEEN SAILS.—These are fore and aft sails. They are almost triangular. They are set on a very long tapering yard, the masts of which are very short, and rake forward. The after-leech is thus by far the longest part of the sail. The head is cut with a slight curve. Vessels with these sails are very common in the Mediterranean, as also along the west coast of Africa. They are, perhaps, the most graceful and picturesque of craft. The same rig is to be

seen on the Thames and in many inland waters, but it is not suited for heavy seas, squalls, and rough weather. The illustration here given is of a beautiful lateen boat on the Thames.

SLIDING GUNTER.—Many men-of-war boats are rigged with this style of sail. It is triangular, and is bent up



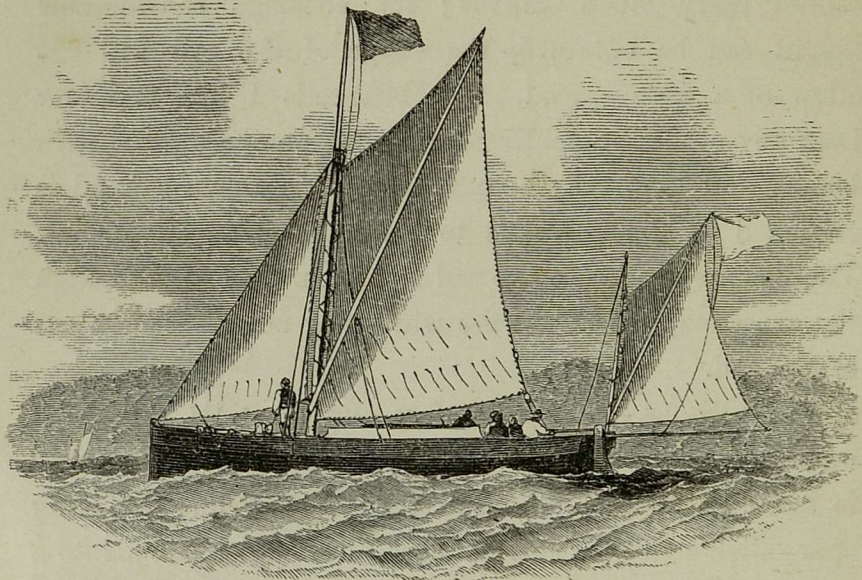
BOAT WITH SLIDING GUNTER.

and down to a mast which has two parts, the upper part

sliding down the lower. It has thus the advantage of being very quickly reefed and lowered. It is a graceful sail, and well suited for gigs and narrow boats which cannot carry much canvas; for, although considerable height can be obtained, the shape of the sail will not allow of a wide spread. For boat-sails I like it better than any other. Sometimes sliding-gunters are fitted with booms, and then they become dangerous unless a hand is stationed at the halliards to lower them in an instant. The boom spreads out the sail so much, that even though the sheet may be let go, the wind may not be shaken out of the sail.

**SPRIT SAILS.**—These are fore and aft sails, with the outer or after leech much longer than the inner. The inner is laced on to the mast, and they are set up by a long spar called a sprit or spreet, the heel of which fixes into a grommet near the foot of the mast, and the upper end into the outer clew of the sail. They are used chiefly for small boats of fourteen or twenty feet in length. Ryde wherries and Thames barges carry them; but the spreet is hoisted up and lowered down by a tackle on board large craft. Spreet-sails are used by vessels, or rather barges, which, having to pass under bridges, have their masts fitted to lower down; thus sails and masts are lowered back together. The mast is stepped in a socket with a large hinge, and is lowered and hoisted by means of a tackle and windlass.

SQUARE SAILS are sails which hang evenly from square yards, the cloths being perpendicular to the yards.



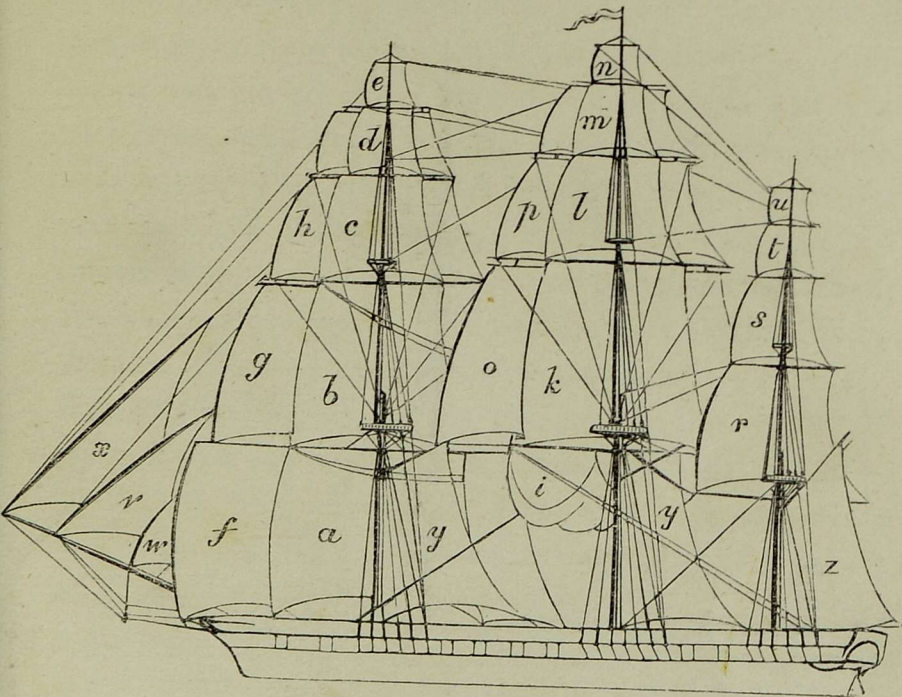
— SPRIT-SAIL BOAT.

STAY SAILS are fore and aft sails, set on fore and aft stays, and are generally triangular, or, at all events, have the after leech much longer than the fore one.

TRY SAILS.—These are also called storm sails. They are fore and aft sails; some are set in the place of ordinary stay sails, and are of the same shape. In fore and aft vessels the main try sail has a short stout gaff, and is set in place of the mainsail, but without the boom. On board a cutter it is a fine sail for laying-to under.

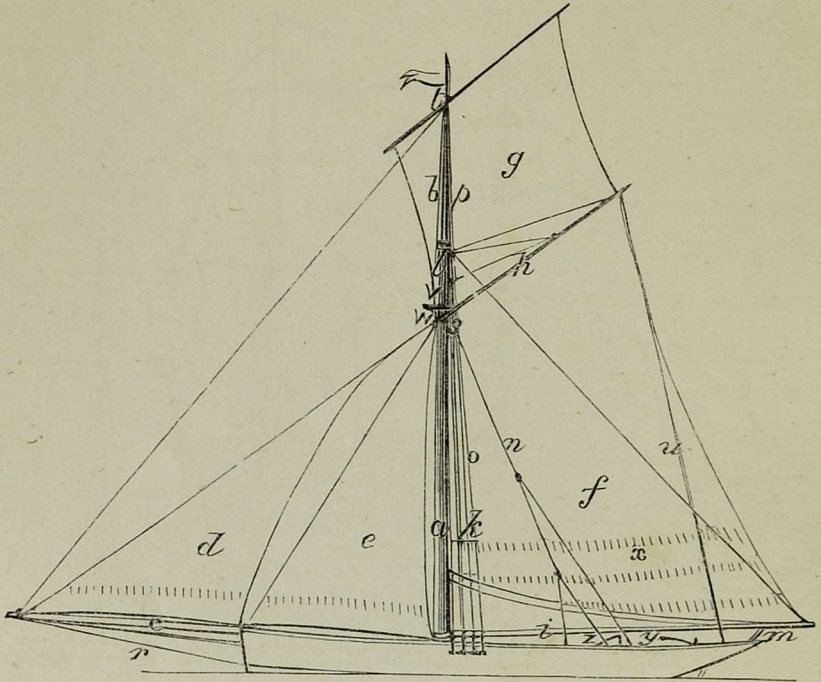


These are the various sorts and cuts of sails used on board English vessels.



SAILS OF A SHIP.

- |                                       |                                       |
|---------------------------------------|---------------------------------------|
| <i>a</i> Foresail.                    | <i>n</i> Main Skysail.                |
| <i>b</i> Fore Topsail.                | <i>o</i> Main Topmast Studdensail.    |
| <i>c</i> Fore Top-gallantsail.        | <i>p</i> Main Topgallant Studdensail. |
| <i>d</i> Fore Royal.                  | <i>r</i> Mizentopsail.                |
| <i>e</i> Fore Skysail.                | <i>s</i> Mizentopgallantsail.         |
| <i>f</i> Fore Studdensail.            | <i>t</i> Mizent Royal.                |
| <i>g</i> Fore Topmast Studdensail.    | <i>u</i> Mizent Skysail.              |
| <i>h</i> Fore Topgallant Studdensail. | <i>v</i> Jib.                         |
| <i>i</i> Mainsail.                    | <i>w</i> Fore Topmost Staysail.       |
| <i>k</i> Main Topsail.                | <i>x</i> Flying Jib.                  |
| <i>l</i> Main Topgallantsail.         | <i>y</i> Main and Mizent Staysails.   |
| <i>m</i> Main Royal.                  | <i>z</i> Driver or Spanker.           |

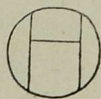


SAILS OF A CUTTER.

- |                           |                                   |
|---------------------------|-----------------------------------|
| <i>a</i> Mainmast.        | <i>n</i> Backstays.               |
| <i>b</i> Topmast.         | <i>o</i> Topmast Backstays.       |
| <i>c</i> Bowsprit.        | <i>p</i> Topmast Stays.           |
| <i>d</i> Jib.             | <i>r</i> Bobstay.                 |
| <i>e</i> Foresail.        | <i>s</i> Topping Lift.            |
| <i>f</i> Mainsail.        | <i>t</i> Ensign Halliards.        |
| <i>g</i> Gaff Topsail.    | <i>u</i> Peak Halliards.          |
| <i>h</i> Main Gaff.       | <i>v</i> Cross Trees.             |
| <i>i</i> Boom.            | <i>w</i> Jaws and Throat of Gaff. |
| <i>k</i> Shrouds.         | <i>x</i> Reef Points and Earings. |
| <i>l</i> Topmast Shrouds. | <i>y</i> Tiller.                  |
| <i>m</i> Main Sheet.      | <i>z</i> Companion.               |

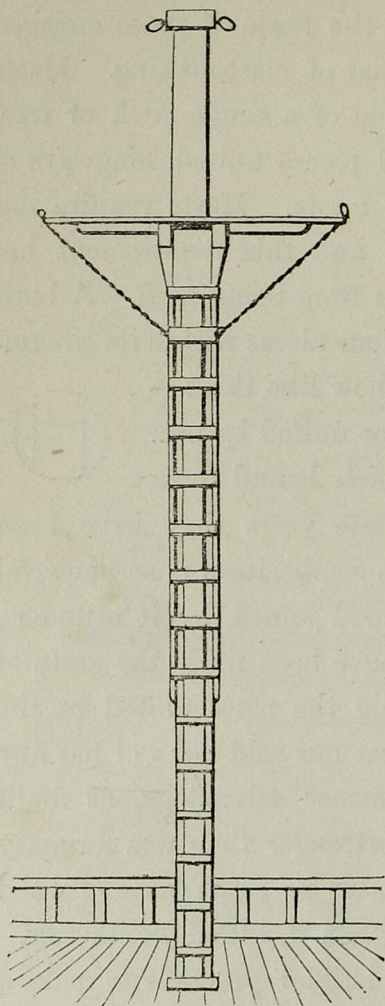
MASTS.

A very important branch of the trade of those engaged in preparing ships for sea is that of mast-making. Masts are of two kinds,—those cut out of a single stick or tree, and those composed of several pieces united, longways of course, which are called built masts. Masts require not only strength but flexibility; and this requirement has effectually prevented iron masts from being used. A built mast is composed generally of four pieces within its circumference. Thus a section will show like this:—  
Formerly these pieces used to be united by iron hoops driven on while hot, which bound them all tightly together; but of late years they have been united by MARINE GLUE. This composition is so powerful that no force will tear the wood joined by it asunder; and in all experiments which have been made the grain of the wood has given way, leaving the parts united by the gum still together. Neither heat nor cold nor wet has any effect on it. This is an immense advantage, as built masts can now be made much stronger than was formerly the case. Sometimes outer pieces or stout laths of wood are seized to the mast to strengthen it, called WOULDINGS.



The way in which the mast builder proceeds to make a single tree mast is as follows. He places the rough log or stick, after he has ascertained that it is sound, on a series of blocks or thwarts, pieces of timber piled one on another.

Here it is trimmed, and the parts to be of the greatest



LOWER MAST.

thickness measured and marked out. The mast has the greatest diameter at the PARTNERS. The lowest part of a mast is called the HEEL or STEP, which part fixes into the keelson. Towards the upper end timbers are fixed on, called CHOCKS. Chocks support horizontal pieces of wood, called TRUSSEL-TREES. These trussel-trees again form the base or support for the TOP. The top is that platform built out near the summit of the lower mast, on which the seamen stand to assist in working the upper sails. In a large ship it is of considerable size, so that a number of men can stand on it at a time. At the after part there is a sail called the top sail. The head of the

mast is squared that the cap may fit on it. The CAP is a

thick block of wood bound with iron. It has one square hole which fits on to the head of the mast, and a round hole in the fore part up which the topmast slips. Its object is to secure the topmast when it is fidded. An important object of the top is to stretch out the shrouds of the topmast, the topmast rigging, as it is called. The shrouds which lead from the outer edge of the top to the lower mast a few feet under it are called the **FUTTOCK SHROUDS**. There are traps or holes in the top immediately above where the lower rigging joins the mast. These are called lubbers' holes, because lubbers go through them instead of going up outside by the futtock shrouds, and so more quickly on to the topmast rigging. At the upper part of the lower mast there is a lighter mast, a sort of excrescence to it. This is the trysail mast, on which the jaws of the trysail gaff work, like the jaws of a cutter gaff. On the mizen there is a similar mast, on which the jaws of the spanker gaff work. The **TOPMAST** has a hole in its heel called the fid-hole, through which a fid is passed to prevent it when hoisted from slipping through the top on which it rests. Near the upper end are trussel-trees which support what are called **CROSS-TREES**. These serve the purpose of tops; they stretch out the top-gallant rigging, and the men can stand on them. They are, however, much lighter and narrower, and are formed of bars extending across the mast, the fore one being curved slightly. The top-gallant mast is much like the topmast,

but of course slighter, and has also cross-trees and a cap. The topmast shrouds have ratlines, but the top-gallant rigging has none, so that the seamen are obliged to shin up it. The lower yards of big ships are built like the masts. A visit to a naval dockyard would show their vast size, and you wonder how they can be got aloft into their places.

## CHAPTER V.

### SAILING.

WE have now seen how a ship is built, how she is launched, how her masts and spars are made and placed, how the rigging is prepared and set up, and how the sails are cut, and how hoisted and set. The next thing to be done is to get the stores and provisions and water on board, and stowed away, and the guns mounted, and shot and powder in the magazine. The crew are shipped and appointed to their different stations, and all the men on board knowing exactly their respective duties, the ship is ready for sea.

You will next wish to know how she is sailed, how her course is directed over the ocean on the exact line on which those who navigate wish her to move, how she is made to avoid rocks and islands in her way, and to enter at last, through a narrow passage, the harbour for which she has been steered. Often too she may have the wind blowing exactly against her or very nearly against her for the whole of the distance, and yet by the skilful management of her officers she has been able to make steady way, always advancing nearer and nearer the point

at which she is aiming. To comprehend this you must first understand certain qualities possessed by wind and water. The water is elastic, and though it presses it also gives way and can be separated as by a knife. The sharper the instrument the more easily it can be separated. Thus you can pass the edge of a knife far more easily through it, than the flat of the blade, and in the same way the sharp stem of a vessel cuts through it far more easily than the side. The wind also presses. The purpose of sails is to receive this pressure. Unless in very strong winds and gales the object of the seamen is to obtain as much pressure on the sails as the wind can give, in order that the vessel may the more rapidly be forced along. If vessels only floated on the top of the water as a feather does, they would only sail in one direction like a feather that is directly before the wind. Therefore it is that the rounder and shallower a vessel is, the more readily she goes along before the wind, and the less able she is to sail on a wind, that is with the wind on her side. Although vessels have frequently to sail before the wind, that is with the wind coming from a point directly behind them, yet they have oftener to sail with it coming from some other point and striking on their quarter, on their side or beam as it is called, or even before the beam on the bows. Now it is that the resistance or pressure of the water enables them to sail not only before the wind but with the wind on their side or a beam. Even thus, however, they move a



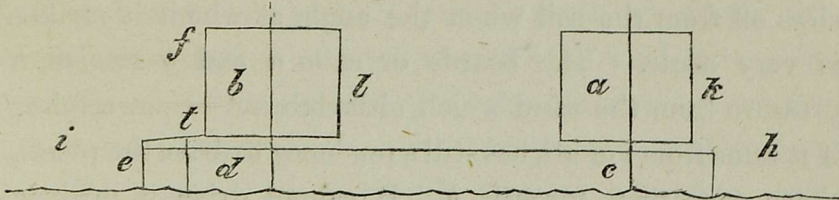
little sideways before the wind, because the water does not resist altogether ; and this side movement, which is to be prevented as much as possible, is called making LEE WAY, or *going to leeward*.

It is necessary, therefore, that vessels should be sunk some way in the water, or have a hold of it ; and it is on this account that they have keels and stems. The keel being placed below the body of the vessel, offers a resistance to the water ; it also assists to keep her steady when she is inclined to roll, or to heel over by the force of the wind. It naturally, also, moves more readily with one end first than sideways. This you will discover, if you attempt to tow a piece of timber sideways ; you can scarcely move it, but if you tow it end first, you get it along with perfect ease. The stem acts much in the same way, by preventing the bow or head of the vessel from being so readily turned round by the wind, or away from it. The stem thus gives the bow what is called a hold or gripe of the water. Some round, flat-bottomed vessels, which have, like those of Holland, to sail up shallow channels, are furnished with what are called lee-boards. These are large oval-shaped boards, which are sunk down, when the vessel is on a wind, below her bottom, and, by pressing against the water as would the palm of your hand, prevents her from going to leeward, or making lee-way.

I need scarcely again explain how a vessel sails directly before the wind. In days of yore, before the art of navi-

gation was understood, we read of vessels remaining in port for weeks and weeks, and even for months, waiting for a fair wind. Those vessels had but shallow keels, while their sails could only be set directly across them, so that they could only sail just before the wind. I have now, however, to explain how a vessel sails with the wind on one side, or abeam. I shall afterwards have to explain about the balancing or trimming of the sails. I have said nothing yet about the rudder; because a vessel can be steered, especially a square rigged ship, without a rudder, simply by properly balancing her sails. Now with regard to how a vessel sails with the wind on one side. The wind presses on one side, the water resists on the other. As she is built of a wedge shape, that is, sharper at one end than the other, she slips between the wind and the water, just as a little slippery fish would do which you might take up between your thumb and finger, and press them together. A vessel is, indeed, built like a fast swimming fish; the keel is like the snout, the bows like the head and thicker part of the body; and then a vessel, like a fish, tapers away towards the tail; for it is found that after an entrance has been made in the water, that is, a way has been cut, the less she has to drag after her the faster she will sail. A vessel has, however, something else to do than merely to sail fast; she must have stability, and buoyancy, and capacity for carrying cargo, or guns, or passengers, and be of a shape to resist the force of the

waves. Thus, formerly, vessels were built nearly of the same width all along; now, under the water especially, after carrying their width a certain distance, they are narrowed away to the greatest fineness possible till the thickness of the hull merges in the dead wood and stern post. This is called the run, and a vessel which thus near the centre commences to decrease under water is said to have a fine run. Now we have to return to the log, or rather let us take a long plank weighted so that one edge may float upwards. Fasten two sticks one at each end upright on the board, and across each of the sticks fasten a small flat board so that it may turn easily as on a pivot.



I have marked the plank *d* and *c*. One flat board I have marked *a*, the other *b*. They will answer the purposes of sails. I have shown that the plank will not move except with great force broadside away from you, but will easily move towards *h*. Suppose the wind to come from you, that is from the eye of the reader. If the sails *b* and *a* were in the same line as *d* and *c*, they would certainly receive all the force of the wind they were capable of receiving, being at right angles to it, but they would tend rather to overturn the upper edge of the

plank and to force it away from you than to send it towards *h*. Turn the sails, I mean the small square boards, diagonally across the plank so that the sides *l* and *k* are nearer to you than they were before—they, the sails, will not receive so much pressure from the wind as they did before, but what they do receive will have far greater effect in forcing the plank towards *h*. A sail always receives the wind as if it was blowing directly at it or at right angles to it, but the force is, diminished in proportion to the smallness of the angle—that is, the more acute is the angle the less force does the wind exert on the sail; indeed, it stands to reason that a great deal of the wind slips off from the sail when the angle at which it strikes is very acute. The boards or sails *a* and *b* receive a pressure from the wind which, although not so powerful as if it came from *i* or aft, has still a tendency to drive the plank, sharp edge first, towards *h*. It cannot drive it directly away from you on account of the resistance of the water; therefore, as long as the boards can be so placed as to receive the wind on their surfaces *a* and *b* with the edges *l* and *k* ever so little turned towards you, it will drive the board end first towards *h*.

We next come to the balancing of the sails. I have made *a* and *b* exactly of the same size, and one being placed at each end of the board *d* and *c*, they exactly balance it—that is to say, they exert an equal pressure on both ends. But suppose we double the size of *a*, and

leave *b* as it was ; what would be the consequence ? why, the end of the plank at *a* would be forced round, or away from you, a greater weight of wind pressing on it, while the end at *b* would be brought nearer to you, and the plank, instead of moving with its end towards *h*, would move with its end away from you, or more or less before the wind. Take away *b*, the after sail, and place *a*, the head sail, directly across the plank, and it would sail away directly before the wind. Suppose, on the other hand, that we made *b* twice as large as *a*, or the head-sail ; the greater weight would now be pressing on *b*, and this would force *b*, or the after part of the vessel, away from you, and make *a* approach you, or move up nearer the wind. The plank would move on till the wind got on the opposite side of *a*, and also of *b*, when it would drive the plank also away from you ; but this time *b* would go first. In other words, the vessel would be brought head to wind, and would have stern way on her ; that is, she would move stern first. It will be clearly understood, therefore, that in order to keep a vessel in a direct course, the sails at one end must be of such a size, and be so trimmed that they do not contain more wind than will balance the sails at the other end. For the same cause a vessel can be moved in one direction or in another by hoisting or lowering her sails at either end, or, which is equivalent to it, letting the sheets fly, so that the sails cannot hold the wind, or brailing them up. This is done in tacking, when

it is necessary to bring the head of the vessel to the wind; if the wind is shaken out of the head sails, or, rather, the sheets are let fly, and all the pressure being then on the after part of the vessel, that part is forced away from the wind, and the head is brought up pointing so much at it—that is, so close to it—that the wind strikes the other side of the sails, and then, the head sails being once more rapidly set, the head is again pressed away from the wind. This movement continues till the after sails are trimmed—that is, till the head sails are balanced by the after sails—when the vessel again continues in a steady course. Another movement, called wearing, or keeping away, is performed by bringing the pressure of the wind on the head of the vessel, and taking it off the after part by loosing or furling the after sails. In balancing the sails, however, it should be understood that it may not be necessary in practice to put the same amount of canvas exactly at one end as at the other, because the shape is so different. Vessels are deeper aft, and therefore have generally more sail aft than forward, because the deeper they are, the more hold of the water they have, or the more resistance it offers, and, therefore, the greater is the force required to overcome that resistance. Sometimes vessels have small stems, or only what is called a slight gripe of the water, and thus the head is more easily turned one way or the other. The great point to be aimed at, is to get a vessel into good trim, so that her proper sails may duly balance each other

in all positions ; when, being properly trimmed, the wind blows on them.

I have not hitherto described a very important part of the vessel, by which her course is more quickly altered than by the sails. I speak of the rudder. At the same time it must be understood that the rudder cannot entirely counteract the power of the sails, or the sails that of the rudder ; when properly managed they mutually assist each other in steering the vessel. In our diagram *d c*, I have marked off a part of the plank *e*. Bend *e* towards you, and suppose the plank to be moving on towards *h*. The water, you remember, *presses*. Now, if the plank moves towards *h*, it will be the same as if the water came from *h* and pressed against *e*, turned, we will suppose, almost at right angles to *d* and *c*. Take a bit of card ; mark it like the diagram, and bend *e* towards you. Now press your finger against *e* in the direction I tell you the water is pressing. The effect will be to drive the end *d* away from you, and to bring *c* nearer to you. Suppose *t* is a tiller placed on the top of *e*, with the end where *e* is on the same line as *d*, pointing towards *c*. When you bend *e* towards you the tiller will be pointing towards the opposite side to what you are on. You are on the starboard side ; the tiller will therefore point to the port side. To make the head of the vessel turn to the starboard or right side, you move the rudder over to that side by making the tiller point to the opposite side. It will be at all times

useful to consider the tiller as fixed on exactly above the rudder, and the rudder as a part of the vessel bent either on one side or the other. Now bend the end of the cardboard away from you, and press against it as if from *h* only on the opposite side, or port or left side. The effect will be to turn *c* away from you, and to bring *d* up towards you. The tiller will this time be pointing towards you, or to starboard. Vessels are, however, sometimes driven stern first by the wind getting ahead of them. Return to our plank, or rather to the piece of cardboard made like it; the wind is coming from *h*, and the plank is driving towards *i*. Bend the end *e* towards you, or to the starboard side, and the tiller over to port. The water pressing against the rudder *e* will of course turn the head of the vessel away from you, or to port. Now bend the end *e* to the opposite side, and the tiller will be to starboard, or pointing towards you. Continue pressing back your cardboard against your finger, which acts the part of the water; you will find the head *c* turned towards you. It follows, therefore, that, when making a stern board, or having stern way on a vessel, you must put the tiller in the direction in which you wish the head to turn. Small vessels are steered with a tiller alone, which is guided by the helmsman's hands; but large vessels cannot be thus easily moved, and either a collection of blocks and ropes are employed, or a somewhat complicated piece of iron machinery, governed by a horizontal wheel, with spokes



on the outer circle for the helmsman to turn it either to one side or the other. Generally speaking, the wheel turns in the opposite direction to the end of the tiller ; therefore, if the order given is to put the helm a-port, the wheel is turned round towards the starboard side of the ship, or *vice versâ*.

I spoke of lee-way. When a strong gale is blowing on the side of the vessel, or from any point before the beam, and she can carry very little sail to send her ahead, she drives broadside before the wind. When she is hove to also under a close reefed sail or sails, though she forges or moves ahead, she also moves broadside from the wind. It is this movement that is called lee-way, or going to leeward. The lighter a vessel is, or the less hold she has on the water, the more lee-way she makes. A deep, sharp and long vessel will make less than a shallow, short or round one. It is this tendency to move to leeward which makes it so dangerous for a vessel to be caught on a lee shore. She may be sailing with her head off the shore, and though she is actually going through the water in the direction of her head, she is making another movement broadside first towards the shore.

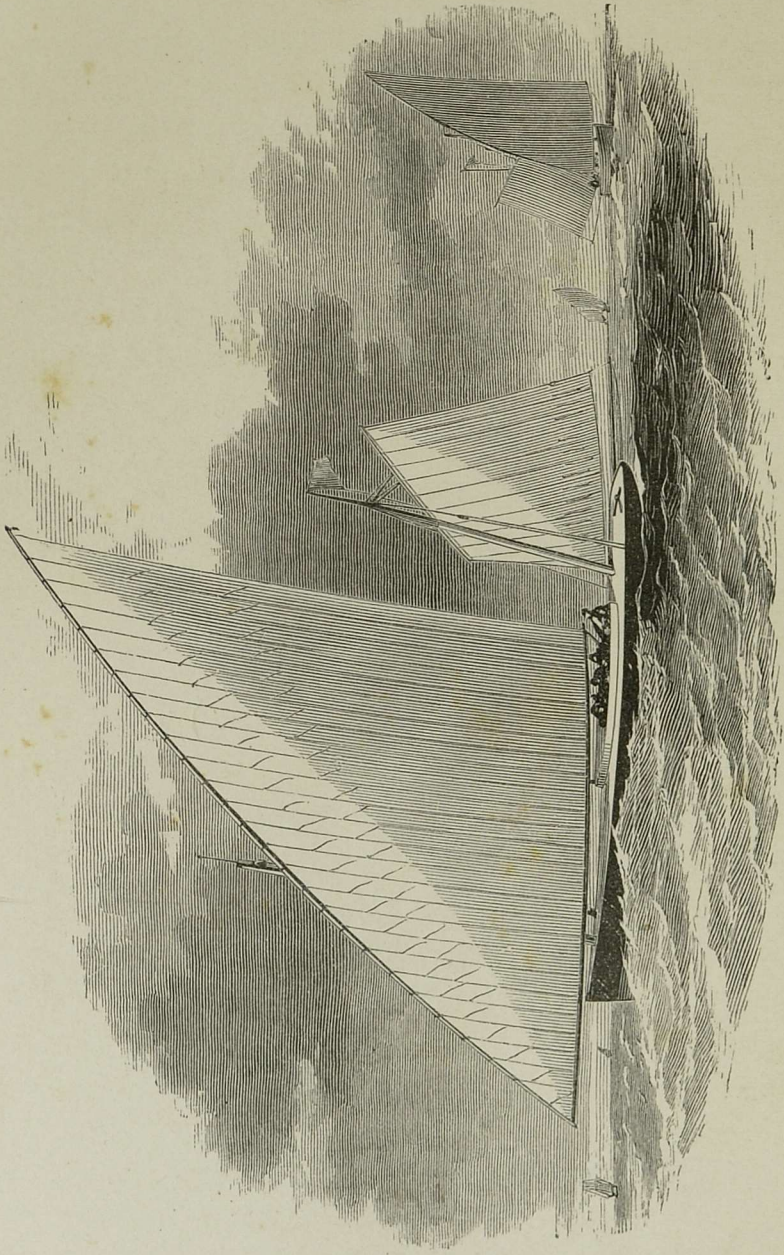
There are several qualities which vessels must have. These qualities are regulated in some degree by the way in which they are to be employed ; but others are common to all.

A vessel must have stability or, to be able to carry her sails, she must have buoyancy, or be able to rise above the

waves ; she must have roominess, or be able to carry her cargo, or guns, or passengers. It is, therefore, important to combine as much as possible all the necessary qualifications. She must have speed, and be a good sea-boat ; she must therefore have sharp bows, but they must widen pretty rapidly, so as to give her good beam, and then she must have good wide floors and a clean run, so as, once having made her way through the water, not to have too much bulk to drag after her. She requires depth both of hull and keel, to give her a good hold of the water, so that she may carry a sufficient press of canvas to drive her fast through the water.

If only one quality was sought for boats of speed, a vessel might be like a knife to cut through the water, and some steamers for smooth rivers are built almost like this ; all the part under the water is in the shape of a Thames wherry, long and narrow in the extreme, but such a vessel has no buoyancy, or stability, or roominess below. They are often built with platforms and cabins high up above the water, but they are utterly unfit to go to sea. What we are speaking of are sailing, sea-going vessels. A sharp vessel plunges into a sea instead of going over it. It stands to reason, therefore, that her bows should be sufficiently rounded to give her buoyancy to lift her over it. Beam or breadth is a very important quality. Some vessels have so much, that is, they are so wide, that they require very little ballast. Most vessels, however, require ballast. In





LATTEEN-RIGGED BOAT.

men-of-war and yachts, and even in some merchantmen, pigs of iron are used—lead, even, sometimes, but I believe rarely. It is necessary to attend to the trim of a vessel, that her head is not too deep in the water, or her stern, or that she is altogether not too deep, or too much out of it. The centre of gravity must also be ascertained, so that the heavier weights are in their proper position, for if not, the vessel will be apt to roll, and either roll her masts away or injure her hull.

What I have now told you will, I hope, enable you to understand clearly the principles on which vessels are sailed. All vessels, whether having one mast, or two, or three, are sailed on the same principles. The single mast of the cutter may be considered the point on which the sails turn. The mainmast of a ship is the point on which she works, and the foremast, of a brig or schooner. In reality, however, the exact pivot is not where the masts stand, but depends on the amount of the canvas spread on her. Boats are often fitted only with a single sail, a lug, or a latine sail, and they can be sailed as well as a ship with a dozen or more set on her. However, a mizen and jib are generally found convenient for working a boat. We have an example of this in the fine latine-rigged boat of which I give you a picture (*Plate A*). What a wide spread of canvas she has, and how beautifully her light yard tapers up towards the sky! The fore part of that latine-sail acts the part of a jib and foresail—the after-

part of a mainsail, but in consequence of the mast being stepped so far foreward, it is necessary for her to have a mizen which is extended by an outrigger or bumkin. She is sailing close hauled on the starboard tack, that is, the tack of the sails is on the starboard side, while the sheets are over on the port side. A vessel of the same rig in the distance is sailing before the wind, with her mainsail over on her port side, and her mizen rigged out on her starboard side.

It would be almost impossible to teach you how to sail a vessel by merely verbal descriptions. I have given you the principle, and you must learn the rule by practice. However, you may find a few remarks useful and interesting.

You have understood from what I have told you, that a vessel is guided by her sails and rudder, but impelled only by her sails. Those sails, according as they are trimmed, may drive her in any direction away from the wind, head first, or sides first, or stern first, and even approaching the wind as near as four and a half or five points of the compass.

We will suppose ourselves going on board a cutter at her moorings. A cutter, as you know, is a vessel with a single mast, and has only fore and aft sails, a main sail, jib, and foresail, and gaff topsail. Sometimes a flying jib is set, and she, when going before the wind, can rig out a square sail, and even a square topsail. Our cutter is but a small one—fifteen tons or so. We can manage

her. Ship the tiller. We will first set the mainsail. Here are the throat halliards. Hoist away on them. That will do. Belay! Now for the peak halliards. Hoist away on them. The peak is half up. Belay them for the present. Now bend on the jib. Haul it out to the bowsprit end. Bowse taut the bobstay and bowsprit shrouds. Hoist the jib. Bowse it well up. Get the backstays and topmast stays well taut. Hoist the fore sail. Take a turn with the bowline round the foremast shroud on the starboard side. Now I'll take the helm. Lend a hand here, and overhaul the mainsheet. Settle the throat a little, and hoist the peak of the mainsail well up, that it may stand well. Hoist the gaff topsail. See that you keep the tack to windward of the peak halliards. Before you hoist the sail taut up, haul out the slack of the sheet. That will do. Now bowse down the tack. All right! Look out now for casting. Heave the buoy overboard; see that it is clear of everything. The wind has taken the foresail the right way to cast. Let go. Heave the end of the cable overboard. I'll keep the helm up till she has got way on her. We are close hauled on the starboard tack. We'll stand on for some distance on this tack, close hauled. Now we want to go about. What would you do? Keep her full; that is, that she may be moving rapidly through the water, and answer her helm at once. Slack a little of the jib-sheet; that is, to take the pressure off the head of the vessel.

Down with the helm. As we were on the starboard tack, the helm is put to port, to make her head turn towards the starboard side. Now let fly the jib sheet. This eases the pressure on her head still more. We haul in the mainsheet to get the mainsail over to starboard, to force the stern away from the wind, and to assist, consequently, in forcing the head up towards it. Now she comes round. The wind catches the other side of the foresail, and drives her rapidly round. Haul in the jib sheet before the wind fills the jib too much. Let the mainsail come over and right the helm. Let draw the foresail, and make fast the bowline. There we are now on the port tack. Next you want to keep away. Up with the helm; that is, put it to port. Ease off the mainsheet. Overhaul the lee runner, or the boom will chafe against it. Ease off the jib sheet. Away we fly, free, with the wind on our port quarter. We may soon put her before the wind, and set our square sail. The main boom will then be right over on the starboard side. Steady with the helm. Take care you do not let it jib over; that is, come suddenly over to port in consequence of the wind catching it on the other side, which it may very easily do. A lazy guy to the boom will be useful to prevent it doing that; but if the helmsman is wide awake, and not lazy himself, he will not require it. Lower the foresail. Rig out the square sail boom. Now hoist the square sail. Away we fly before the wind. Once more we have to haul up on a wind.



Lower the square sail. *Rig in* the boom. Hoist the foresail. Now lend a hand in flattening in the mainsheet. You need not touch the helm. You see she comes up to the wind without the aid of the rudder. Flatten in the jib sheet, or you will have her up in the wind. Bowse down the maintack. There we are on a wind again. We shall be able to fetch up to our moorings. Take in the gaff topsail. Trice up the tack of the mainsail. Haul down the foresail. I can shoot her up now. Lower the jib; be smart about it. Get your boat-hook ready. Hook on to the buoy. Haul away. I'll come and help you. We have hold of the cable; slip it over the fore bit. That will do. Stow the jib and foresail. Now we'll furl the mainsail. Do it up in a neat skin. Do up the gaff topsail. That will do. Belay, and coil down the ropes. Now we've put the little craft to rights, we'll go on shore, and so ends our day's sail.

Before I conclude this branch of our subject, I must give you some important advice, to which I earnestly advise you to attend. The sort of boat in which you will probably commence your nautical career, will, I conclude, be from ten to fourteen feet long. Such was the one in which I first began to gain my experience in seamanship. She was rigged with a spreet mainsail, a foresail, and a mizen—the mizen and foresail balancing each other. The spreet is a long spar, which reaches from the mast some way above the tack to the peak of the sail, thus stretching it

out, and answering the purpose of a gaff, only thus no peak halliards are required. The butt, or lower end, fits into a grommet, which works up and down the mast, and by pressing it up, the spreet rises and stretches out the peak to the utmost. In taking in the spreet, be careful that the butt does not escape from your hand, and go through the bottom of the boat. If you understand the principles I have given you, after a little practice you will with these sails be able perfectly well to sail a boat of this description. A boat of this sort is, however, easily upset, either when on a wind by a sudden squall, before you can let fly the mainsheet, or by jibing over when running, or by being taken aback with the sheet over on what then becomes the weather side. Therefore, never belay the mainsheet. Hitch it so that you may slip it in a moment, or pass it under a cleat, and hold it in your hand.

Never skylark in a boat; either you may fall overboard, or upset the boat.

When steering, and the boat or vessel is on a wind, do not let her get into it; that is to say, do not let the wind get ahead. When you are steering with the wind directly aft, and the mainboom rigged out on one side, take care that you do not let it jibe over. You may chance, if in a boat, to upset her, or if in a vessel, to knock overboard some of the people on deck. Besides this, you may very likely spring the boom, and perhaps carry away the head of the mast, as I have more than once seen done. Indeed,

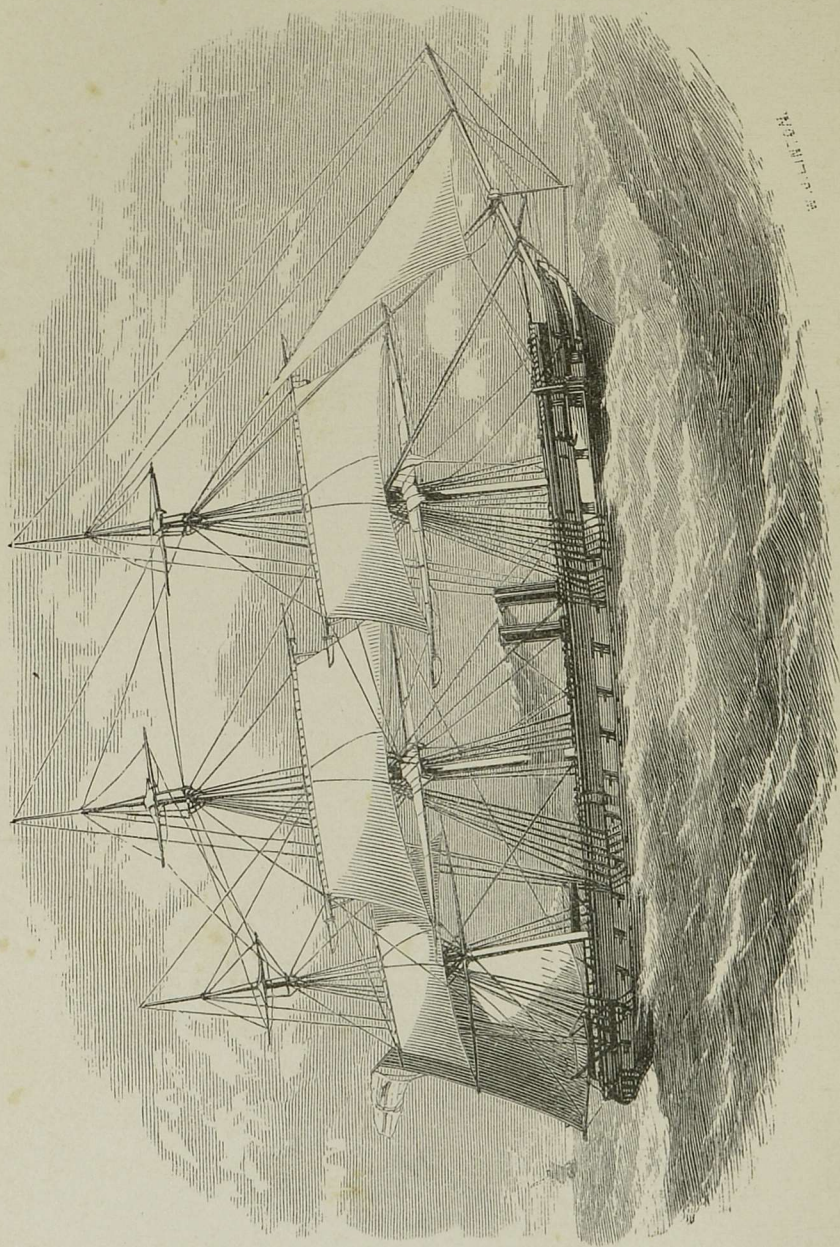
by such carelessness, a vessel may in a moment be completely crippled.

When you go on board a vessel, ascertain where every rope leads, and where the halliards of each sail are belayed, so that, if required, you may let go the right ones. Never be ashamed of asking for information, and try and understand all that is offered. Learn at once how to make a rope fast, and to bend on one rope to another, as well as knotting and splicing in all their varieties. I have often seen a boat get adrift, or a sail come down by the run, or the mainsheet fly out, or the jib get away and begin flapping furiously, or the mainboom come swinging over, to the no small risk of all on board, and damage to the vessel, when some young gentleman in a yachting suit, who pretended to know a great deal about the matter, had undertaken to tend the sails. I have before said that if you wish to become anything of a practical sailor, you must learn to knot and splice, and more especially to hitch and bend on ropes. Should you fall overboard, do not struggle, but try and float quietly on your back till the vessel can be put about, or a boat lowered to pick you up. Should anybody else tumble into the water, throw a grating, or an oar, or a life buoy to him; but take care, when throwing it, not to hit him, as it may injure him, and cause him altogether to sink. Be as calm as possible, and consider before acting what is the next best thing to be done—how you had best put the boat about to sail

back to his rescue. As you approach him, get ready a rope to heave to him. If you have no boat to lower, stop the vessel's way as much as possible, and approach him as you would the buoy, if you were going to pick up your moorings. Take great care also not to run him down.

I believe now that I have honestly given you the result of my nautical experience in sufficient measure, that were you to take it all in you would in a very short time be able to become a very good boat or small craft sailor. But, I repeat, nothing but experience will enable you to become so altogether. Thus much, however, I can assure you, that if you have intelligence, with the aid of the admirable works now written on the subject, should you be able practically to study it, being constantly at sea, you may in a year become a better sailor than many men who have been all their lives afloat. Still there is a great deal to learn, and you must be very diligent to accomplish this.





MERSEY" FRIGATE.

W. H. W. 1844.

## CHAPTER VI.

### THE ROYAL NAVY.

IN describing the very numerous English ships, vessels, and boats of all sizes, rigs, and for all purposes, under their respective heads, we will give the place of honour to the men-of-war, or Queen's ships, which constitute the ships of the Royal Navy.

The ships of the navy are divided into different rates, called respectively first, second, third, fourth, fifth, and sixth rates. Now, the first three of these rates are called line-of-battle ships. The first rate includes all ships having three decks, carrying not less than 110 guns—some of them have now 130 guns—and whose complement of men amounts to not less than 950. In the second rate are included all ships which carry not less than 80 guns, and require a complement of not less than 750 men. In this rate is included Her Majesty's yacht, the *Victoria and Albert*. All the large two-deckers come into this rate.

The third rate includes all ships of not less than 70, and under 80 guns, and are allowed a complement of from 620 to 750 men. All the other royal yachts, and all yachts bearing the pendant of an admiral, or of a captain superin-

tendent of a dock-yard, belong to this rate. All the smaller two-deckers come into this rate, such as the *Cressy*, 80 ; the *Edgar*, 91 ; the *Neptune*, 90 ; *Queen*, 90, &c.

The fourth rate embraces all vessels carrying from 30 to 50 guns, with complements of from 300 to 450 men. In this class nearly all the frigates are rated, including the screw steam frigates, many as big as the two-deckers.

The fifth rate includes all those vessels with complements varying from 300 to 450 men.

The sixth rate should properly be divided into three classes. In the first class all ships commanded by a captain, that is, a post-captain ; second class, all sloops of war and other vessels commissioned by commanders. Third class, all vessels commanded by lieutenants, and having crews of not less than sixty men. All other ships, of whatever description, when employed temporarily, are placed under one of these classes. Henceforth there can be little doubt that all vessels to be employed as men-of-war will be fitted with auxiliary screws, in consequence of the immense superiority a vessel so furnished has over one depending only on her sails. The largest line-of-battle ships of Nelson's time could now scarcely contend with the smallest frigate of the present day so fitted. In a short time it may be found that the largest ships now afloat will be unable to withstand the steel-cased vessels already building in French and British dockyards.

A THREE-DECKER is so called because she has three



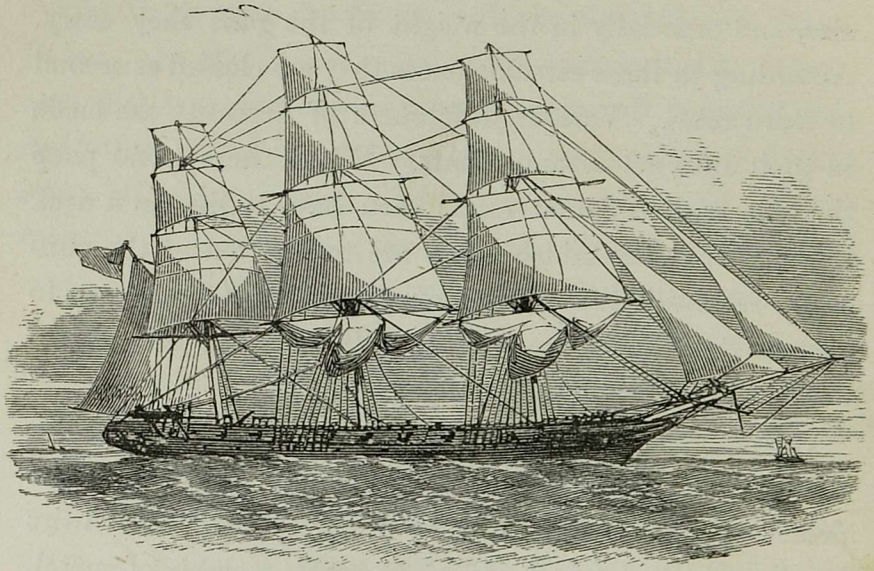
decks, on the entire length of which she carries guns. She has, besides these, an upper-deck, on part of which she has also guns, and frequently there is a poop-deck and top-gallant fore-castle besides above the after and forward end of this deck. The gun-decks are called main, middle, and lower. Below them, again, there is the orlop-deck and the hold.

A TWO-DECKER has two gun-decks, and is mostly, in other respects, like a three-decker. Two-deckers vary in size, and especially in the weight of the guns they carry. According to these circumstances they are classed as second or third rates. Various differences of necessity are made in their internal arrangements. When there is no poop the officers of different ranks each have to live on a deck lower. Thus the midshipmen are turned out of the gun-room—at least there is no gun-room—and they have to descend to a berth on the orlop-deck, where in a three-decker they sleep only.

A FRIGATE has only one deck—the main-deck under another, with guns ranged the whole length—but at the present day many frigates carry a battery along the entire length of their upper deck, of great weight of metal. These are usually called heavy frigates, not that they move slowly, but that the shot they send are heavy. Frigates have under the main or gun-deck what is called the lower deck, and is similar to the orlop-deck of a line-of-battle ship. Frigates are always commanded by post

captains; they carry from 28 to 50 guns. Formerly they seldom carried more than 48 guns, and those of light metal compared to the guns carried by frigates of the present day.

A sloop of war may be rigged as a brig or a ship. They are chiefly rigged as ships, and are then called corvettes. They carry from 16 to 24 guns, all on one gun-deck, above which there is no other deck except a poop and top-gallant fore-castle. They are called flush-decked vessels, because



CORVETTE.

the gun-deck runs evenly from one end of the ship to the other. The larger vessels are always ship-rigged, and those carrying from 20 to 24 guns are always commanded

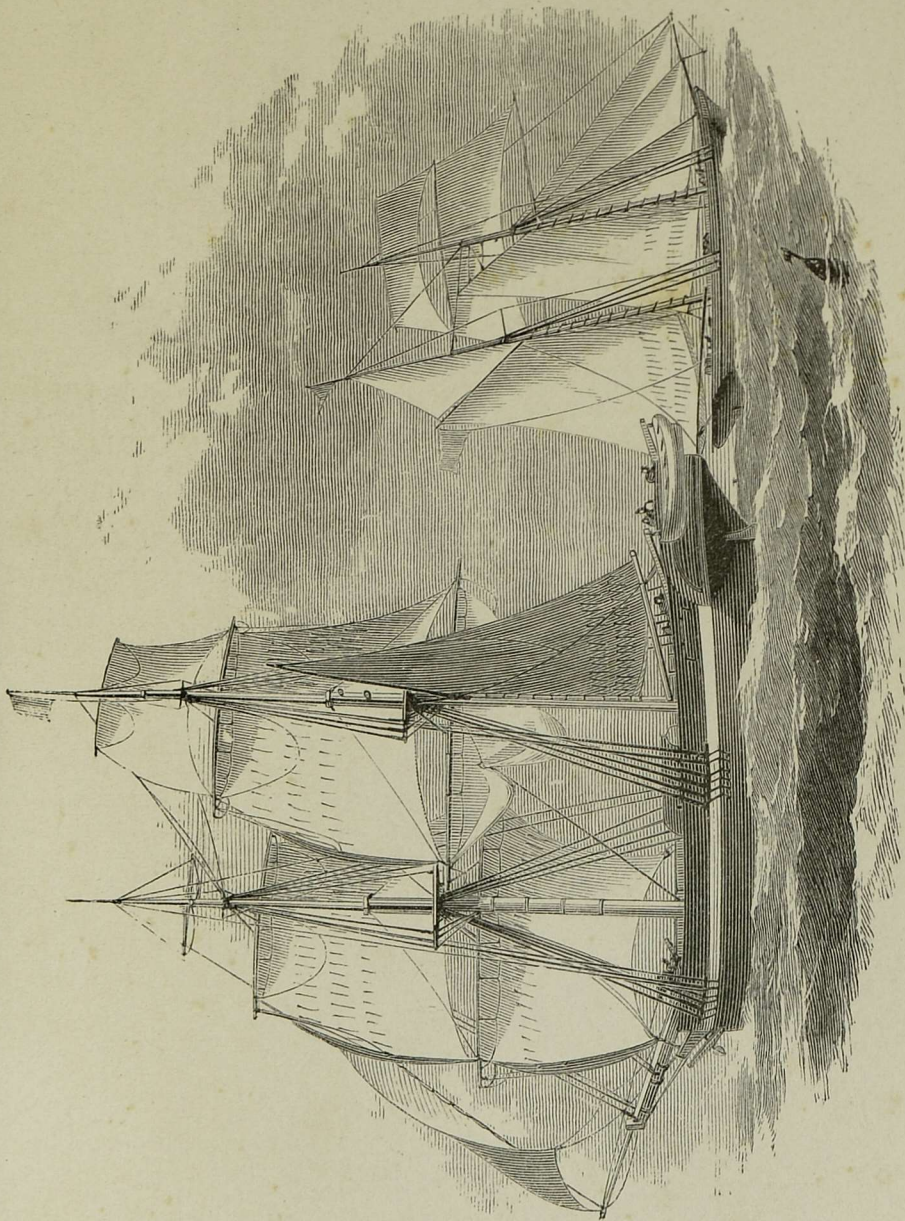
by post-captains. They are sometimes then called post-ships.

**A SHIP.** The distinctive characteristic of a ship is that she has three masts—foremast, mainmast, and mizenmast; and that on each of these three masts she carries square sails, which, as I have explained, are sails hanging to yards across the ship, placed at right angles to the masts, in other words, that all her masts carry square sails in contradistinction to fore and aft sails. A ship has, however, also fore and aft sails, such as the spanker set in the mizenmast, the jib and stay sails. A corvette and a first-rate line-of-battle ship are equally ships, and rigged exactly in the same manner. All vessels larger than those carrying eighteen guns, and generally including those of eighteen guns, are rigged as ships.

**BARQUES.**—Some few men-of-war, chiefly those employed on special service, carrying few hands, although they have three masts, are not called ships. The foremast and mainmast are square-rigged, but the mizenmast has only a large fore and aft sail, called a mizen, and shaped like the mainsail of a cutter, with another sail set above it, called the gaff topsail. The mizen is generally narrower, and has more peak than that of a cutter. Vessels thus rigged can be more easily handled than ships and brigs, because the sails are smaller, and the mizen and gaff topsail take care of themselves. Exploring and surveying vessels are often rigged in this way, but no actual men-of-war

BRIGS.—Only flush-decked vessels are rigged as brigs. A brig is a vessel with two masts, and on each of these masts square sails are spread ; she carries the same sails as a ship, with the exception of those on the ship's mizen-mast. She has, however, two mainsails, the square mainsail and the fore and aft mainsail. (*Plate B.*)

The vessel on the left in the drawing before us is a brig ; she is going free on the starboard tack, that is, the wind is on the starboard quarter ; she has her mainsail set, her square mainsail hanging in the brails, her main topsail and main top-gallant sail set, as also her foresail, fore topsail, and jib. Her fore top-gallant sail is aloft, but furled, and her fore staysail is hauled down. The vessel on her starboard quarter, or just to windward of her, is a schooner. Schooners have, like brigs, two masts, but they are rigged in a very different way. Brigs, as you will see in the plate, have tops, while schooners have only light cross-trees, sometimes little more than a cap, with two bars of iron across it. The chief sails of schooners are fore and aft ; schooners, are, however, of two descriptions ; there are square topsail schooners, which carry square topsails on both their masts, and fore and aft schooners, which either carry no square sail, or, at all events, only on the fore top-mast, like the one in the plate. Schooner's masts rake, that is, they incline towards the stern. The schooner before us I should call a fore and aft schooner, carrying a square fore topsail and top-gallant sail. In running, also, she would



BRIG AND SCHOONER.



be able to set a large square sail on her foremast ; she is now standing close hauled on the starboard tack, under her mainsail and gaff topsail on her main mast, her foresail, fore topsail, and fore top-gallant sail, and also her fore staysail, fore topmast staysail, and jib. Her foresail is the sail cut very much like her mainsail. A regular fore and aft schooner would carry over that fore-sail a gaff topsail, like her main gaff topsail, and would have no square sails ; such vessels frequently carry no topmasts, but send up light spars, called gaffs, with the gaff topsails bent to them, thus avoiding all unnecessary top hamper.

A BRIGANTINE.—While speaking of schooners, I must describe a brigantine, which is between a brig and a schooner, that is, the foremast is rigged like that of a brig, with a top, and on that mast she carries square sails and a square foresail, while her mainmast is like that of a schooner, with light cross-trees. It rakes also, and carries only a fore and aft mainsail and gaff topsail. These sails are, however, generally large in proportion to the size of the vessel, and altogether many brigantines are handsome and graceful craft. In the Royal Navy there are a few both schooners and brigantines, but all such vessels are now being rapidly superseded by steamers.

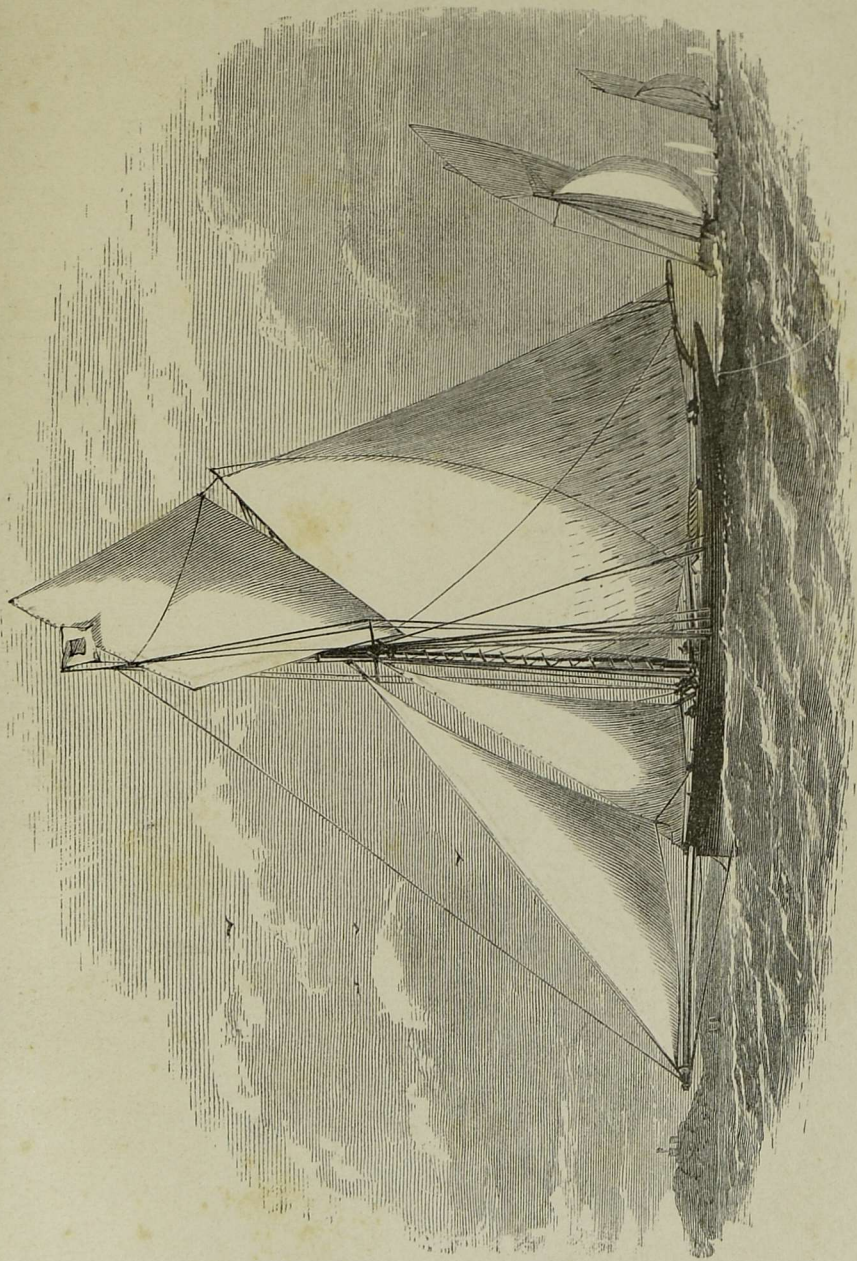
A KETCH.—A ketch-rigged vessel is to my eye the least graceful of all English craft ; she has two masts ; the foremast is low, and carries square sails, with a steeking bowsprit, that is, the bowsprit rises up. The aftermast is

stepped far aft with a short lower mast, on which a fore and after gaff sail is carried, and a gaff topsail.

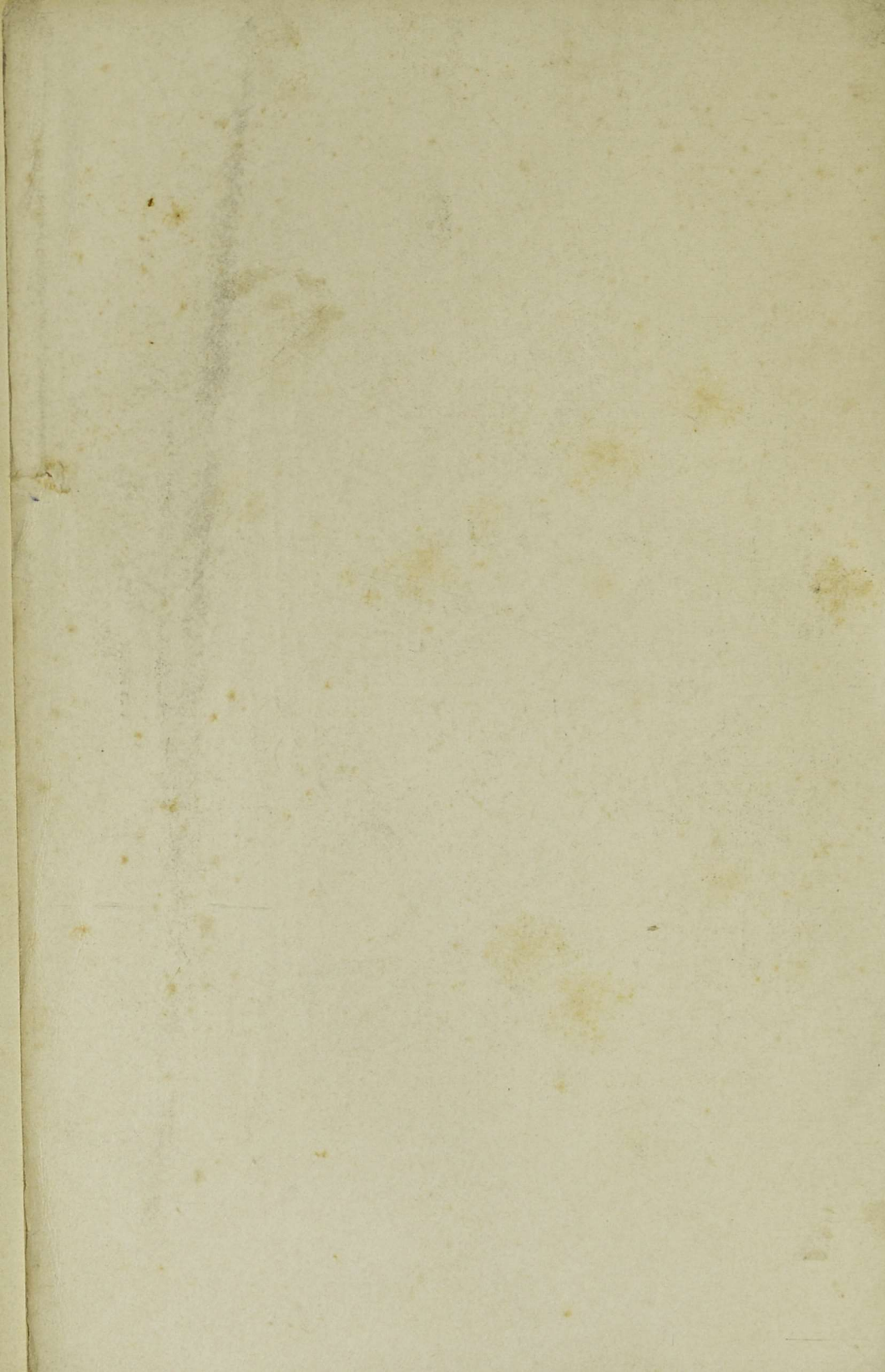
CUTTER.—The lightest and most elegant of all rigs is that of a cutter (see *Plate C*). They are generally built with sharp bows, very clean runs, and overhanging counters. They are deep in the water, and their bulwarks rise very little above it. They are rigged with one lower mast, a topmast, and a bowsprit, without any steeve or rise to it. Their ordinary sails are mainsail, gaff topsail, foresail, and jib. They can carry a flying jib, or jib topsail, a square sail, and a square topsail when running before the wind. The mast has only light cross-trees, and the topmast can be lowered or raised with perfect ease at sea. This is generally done in heavy weather. A cutter carries a heavy main boom and gaff, and consequently requires a good many men to work her. There have generally been a few cutters in the navy, and it has been the favourite rig for yachts for the last half century. The cutter in *Plate C* is standing close hauled on the starboard tack.

A YAWL.—The vessel in *Plate C*, right astern of the cutter, is a yawl. She differs from a cutter by having a small mizenmast right aft, on which a big sail is set. The mainmast, that is, the chief mast, is rigged like that of a cutter, only sometimes in small yawls the mainsail is not without a boom, and even in larger vessels the boom must always be much shorter than that of a cutter, as the mizenmast would otherwise be in the way. The object of the





CUTTERS.



rig is to avoid the long boom of the cutter, and thus to be able to work the sail with fewer hands.

STEAMERS.—Steam power is now being rapidly introduced on board all men-of-war, except the very smallest, such as corvettes, brigs, and schooners. Indeed all the corvettes lately built have the auxiliary screw. Nearly all the line-of-battle ships in the navy are now fitted with the auxiliary screw. At one time many men-of-war were built with paddle-wheels, or were so altered that paddle-wheels were fitted to them, but it has been seen that the paddles would, in action, speedily be knocked to pieces by the shot of the enemy, and now all the men-of-war building are fitted with the screw.

Some are fitted with large screws and powerful engines, and those are classed as steamers. Others are fitted with small auxiliary screws, to be used in case of necessity, and they are classed, according to the guns they carry, as line-of-battle ships, or frigates. Some, again, are fully rigged and fully manned as frigates or corvettes, and yet have powerful engines; they are usually called steam-frigates, or steam-corvettes; or screw-frigates or corvettes. The corvettes carry from twenty guns to twenty-two guns. Smaller vessels fitted with the screw, carrying seventeen guns, and under, are classed as screw-sloops. There are also still in the navy a large number of paddle-wheel steam-frigates, corvettes, sloops, and other smaller craft, tugs, tenders, &c. &c.

During the war with Russia, a large number of screw gun-boats were built, of about two hundred and forty tons; a very few were above that, and mostly under it. They carry from two to four large, heavy guns; they, when commissioned, are commanded by lieutenants. There are also a larger class of screw gun-vessels, from three hundred to eight hundred tons, carrying from three to six guns of the heaviest metal. There are also screw mortar-ships, of twelve guns each, for throwing shells. And there are floating-batteries, which measure from fifteen hundred to nearly two thousand tons, built for moving slowly about, and guarding the entrance to our harbours.

**MEN AND OFFICERS OF THE ROYAL NAVY.**—The ships and vessels I have been describing carry from fifty to one thousand men each, besides officers.

The men may be classed as able seamen, called A B, from the rating they receive being thus marked in the ship's books; ordinary seamen, landsmen, and boys.

**PETTY OFFICERS.**—Some of the able seamen are rated by the commander as captains of the tops, fore-castle, &c. &c. They are called petty officers; they are not classed among the officers, and may at once be disrated if they do not do their duty properly.

**WARRANT OFFICERS.**—Some of the seamen who can pass certain examinations are selected, if they wish it, to become warrant officers. They receive a warrant from the Admiralty, and become either boatswain, gunner, or carpenter.

They wear uniforms, and are treated as officers, have cabins of their own, but mess with each other. Many of them are very intelligent men, and frequently set to work to educate themselves.

MIDSHIPMEN.—The class of officers who enter the service, and are at once placed on the quarter-deck, with the prospect of rising to the top of the profession, are now called volunteers of the first class. After a course of instruction, they, in two years, are ranked as midshipmen, and in four years, if they can pass an examination for seamanship and navigation, they are rated as mates, or masters' mates, as they were called; they at once from this rank can receive their commission as lieutenants. After serving as lieutenants two years, they may become commanders, or master-commanders. From that rank, having served two or more years, they are posted—that is, they become post-captains. They must command a ship for a certain number of years to be eligible to become admirals, when a vacancy occurs; those who have not thus served are allowed to become retired admirals, and are not again employed. They are nick-named yellow admirals, because no such flag exists.

The admirals are divided into three classes—red, white, and blue; these are again divided into rear-admirals, vice-admirals, and full admirals, with the admiral of the fleet at the head of them.

Besides the class of officers I have mentioned, some

enter as volunteers of the second class. They are placed on the quarter-deck, and associate on perfectly equal terms with the rest. They become masters' assistants, then second masters, and then full masters. Their duty is especially to attend to the navigation of the ship. Masters have, of late years, been promoted to the rank of commanders, and retired masters have received that rank, while several have been posted. There are several civilian officers who enter as clerks, and become paymasters, and pursers, and admirals' secretaries. Others, medical men, enter as assistant surgeons, and become surgeons. Large ships also have a chaplain schoolmaster.

I must not omit a very important class, the marines. They are generally sent on board a ship to remain all the time she is in commission. A large ship has one or more companies, commanded by captains. Smaller ships have only lieutenants, with half a company; while sloops of war carry only a sergeant, or corporal, and the number they usually command.

Small vessels are commanded by lieutenants, or mates, or second masters; sloops and small corvettes by commanders; and all larger ships, fifth-rates and upwards, by post-captains, according to their standing in the service. Line-of-battle ships, besides the captain, have a commander under him, who does the duty of a first-lieutenant. There are four or five lieutenants, a master, surgeon, paymaster, chaplain, captain of marines, and two or more lieutenants,

and a chaplain. All these officers mess in the ward-room, and are therefore called the ward-room officers. In frigates and corvettes, where there is no ward-room, the lieutenants mess in what is called the gun-room, and they are therefore called the gun-room officers. In corvettes, and other flush-decked vessels, the gun-room is just before the captain's cabin, while the midshipman's berth is in the after part, generally, or the starboard side of the lower deck, just before the gun-room. The midshipmen sleep in hammocks in frigates and flush-decked vessels, just outside the berth, as their mess-cabin is called. The seamen also sleep in hammocks, slung fore and aft to the beams of the lower deck, or, in line-of-battle ships, on the orlop deck. A hammock is a long piece of stout canvas, which curls up at the sides, and narrows at each end like a canoe; it is secured at each end by a number of small lines, which are called clews; these are united at, and secured to, a ring, called a grummet, to which a lanyard is made fast; by the lanyards each end is secured to the beams, or rather to battens fastened to the beams; by this means the hammock swings from side to side as the ship rolls, and a very comfortable bed it makes. A common trick, when practical jokes were more common than at present, was for midshipmen to cut each other's hammocks down, when the poor sleeper was precipitated out, often head first. More than one poor fellow has got his skull thus fractured, or has been otherwise severely injured. In the daytime

hammocks are lashed up to look like a big sausage, and stowed in the nettings on deck. Each hammock is numbered, so every man knows his own, and can get it in a moment, either in the morning when the hammocks are piped up to be stowed in the nettings, or at night when they are piped below to be slung ready for use. It stands to reason, that while the crew require rest, it is still necessary at sea, during the night, that a number of men should be on deck; the crew are therefore divided into two watches, called the starboard and larboard watches. The term larboard, which means left in steering and speaking of the respective sides of the ship, is now abolished, and the term port substituted; starboard and larboard sounding so much alike. Each general watch lasts four hours, except the watch from four to eight, in the evening, which is divided into two, which are called the first and second dog-watches. This arrangement is made chiefly that those who have kept the middle watch, we will say one night, may not have to keep the same the following night, and thus have to turn out in the middle of the night. We will say that the watches begin at eight o'clock in the morning; suppose the starboard watch is then called—that party of men continue on duty till noon, four hours; then from noon till four the larboard watch is called. From four to six the starboard is again on duty, being the first dog watch. From six to eight, the second dog watch, the larboard watch is on deck. From eight to midnight



the starboard watch is on duty. At midnight the larboard watch is called, and they come on deck and remain till four A.M. At that hour the starboard once more comes on deck, and remains till eight A.M. at which time we supposed the watches to begin. Thus, you see, the next day the larboard watch is on duty from eight to noon. You know the meaning of the letters A.M. They mean ante meridiem—before midday. P.M. stands for post meridiem—after midday. At the end of each half-hour during a watch a loud bell is struck, so that all on board may know the hour to attend to the duties of that time. For each half-hour which has elapsed a stroke is given. Say the watch begins at eight A.M. ; at half-past eight one stroke is struck ; at nine two strokes ; at half-past nine three strokes ; at ten four strokes ; so that, at twelve o'clock, or noon, four hours having elapsed, eight strokes are struck. Each stroke is commonly spoken of as a bell, so that it is usual to say, "It has *gone* four or five, or so many *bells*." When speaking of a certain time at sea, sailors say, "It *had gone* so many bells in such a watch ;" or, "It was *near* four bells in the middle watch." On board merchantmen the bell is struck only at the end of every hour.

In speaking of the watches, I ought to have told you that the captain keeps no watch, nor does the master, who has charge of the navigation, and may have to be up at all hours to take observations. Each watch is commanded

by a lieutenant, who has under him so many mates and midshipmen. The first lieutenant in many ships always takes the first watch from four to eight A.M. that he may see the decks well washed, the rigging set up, and any slight repairs carried out—indeed, the ship made trim for the day. The boatswain is also very active at this time, as the rigging is especially under his charge, and he wishes to see all his work attended to. The carpenter measures what water there is in the hold, and the gunner sees that his guns are all in order.

I must now describe the boats of a man-of-war. They are known under a variety of names. THE LAUNCH is the largest; some launches are thirty-eight feet long, and have ten feet or more beam. On foreign stations and on exploring expeditions they are sometimes temporarily decked over and rigged as schooners. THE LONG BOAT, THE BARGE, THE YAWL, FIRST CUTTER, SECOND CUTTER, THE GIGS, JOLLY BOAT and DINGY. Smaller ships have only some of these boats. The captain has to carry him about his barge or his gig, the lieutenants one of the cutters or gigs, the midshipmen generally the jolly boat, while the dingy is used in smooth water, when only one or two people want to go on shore; the boatswain will perhaps take her to go ahead of the ship to trim sails. She is perhaps only from ten to fourteen feet long, a mere punt indeed. The larger boats are always fitted with sails, and the officers often fit the smaller ones also with them. Sometimes with lateen sails,

now and then as fore and aft schooners, but generally with lug sails.

The lighter of these boats are hoisted up out of the water by means of bars of iron bent over the sides towards the stern or quarters, and they are, therefore, called quarter-boats. These bent irons, which ship and unship, are called DAVITS. Davits were formerly made of wood, and I find that the Arabic word for a crooked piece of wood is *Davit*. Many of our sea-terms are derived from the maritime nations of old. The Phœnician Fire-worshippers had on their decks a temple dedicated to the God of Fire. It was called a CABOOSE. We give the same name to the kitchens or cooks' galleys on the decks of our merchantmen. But to return to the boats. To the end of the davits hang boat-tackles with hooks, or FALLS as they are called. To lift the boat out of the water the tackles are lowered and the ends are hooked into rings in the head and stern of the boats which are hoisted up, and bands of rope are then passed under them to secure them to the side of the ship to prevent them from swinging. There is great difficulty often in lowering a boat in a heavy sea, and many officers have devoted their attention to the means of doing this; several ingenious contrivances have been invented for this object. The crew are generally lowered in the boat, and a sort of cradle has been invented in which she is let down on an even keel and in an instant freed from the falls, and able to shove off from the

ship. Many lamentable accidents have occurred in consequence of the boats hanging to the falls. The large boats are hoisted in by tackles let down from the yard-arms so as to hang clear of the ship. The stay-tackles are employed for this purpose; their upper parts are drawn out—led out it is called—to the yard-arms by guys. These boats come on deck, and are stowed on the booms in the waist of the ship, that is on the upper deck. The booms are a variety of spare spars kept ready for any purpose which may be required. The smaller boats are always clinker built, but the larger ones are carvel built when more strength is required. The large boats are double banked, that is, two men sit on each thwart. Some are pulled by twelve or many more men. The gigs have from six to eight men to pull. Each boat has her proper crew, generally with a midshipman belonging to her, and one seaman called the coxswain of the boat. The captain's barge or gig has always a picked man as coxswain; he is generally a favourite, and his captain carries him from ship to ship which he may command. The midshipman's duty is to see that his boat is kept in perfect order, all her gear in her, and ready to lower at a moment's notice. Paddle-wheel steamers have large, flat-bottomed boats which are stowed on the top of the paddles, bottom up. They are very useful for landing troops. Some ships are also furnished with life-boats; all ought to have them. Life-boats are very strongly built with air compartments or masses of cork

round their sides, so that they can float when full of water. They have beackets or loops round their sides by which people may hold on, or haul themselves in again if they are washed out.

Ships of war have one or more life-buoys hanging over the stern. They are large floats with bars across, over which a man can throw his arms. They are fitted also with port-fires, which, on being lighted, burn brightly even under water. There are two lanyards to them ; one lets off the trigger to ignite the port-fire, the other lets the buoy fall into the water.

SIGNALS.—Ships are furnished with flags of different colours and designs by means of which they can communicate with each other at a distance apart. They are called signals ; each flag represents a numeral, and thus any number can be made. All ships are numbered—then suppose a ship is numbered 365, three flags, three, six, and five, are hoisted. There are books to serve as keys. Long sentences are written, each with a particular number. Distinguishing pendants are hoisted to show what part of the book is referred to. Thus I find in part V. of a code of signals invented by Captain Marryat, R. N., the well-known author, the number 2614, and the sentence against it “Hostilities have commenced between.” The rest of the sentence must be spelt by means of part VI. in which all the letters are numbered. It would occupy too much space to explain the system fully ; all I want you to under-

stand is the principle by which signals are made. A code of night signals, with coloured lamps to be placed in different relative positions, has been lately invented by, I believe, one of the publishers of Marryat's signals, and must be of great value. A midshipman is stationed on the poop with a telescope and the book and flags near him to attend especially to the signals when in company with other ships; he is called the signal midshipman. I should like to give you an account of all the duties of midshipmen; they are stationed in the tops where sails are reefed or the ship is put about, they are sent away in boats, they are sent aloft to look out, and they have many other duties in different parts of the ship. When speaking of the different officers, I mentioned the school-master or naval instructor; the midshipmen have to attend his class in order to perfect themselves in navigation, and in other branches of scientific knowledge.

#### GUNS.

Ships of war are armed with guns, called by landmen cannon. The shot are always called round-shot. At the close of the last great war with France, the largest guns in ordinary use did not exceed in length 9 feet 6 inches, weighing 56 cwt. They carried shot  $6\frac{1}{8}$  inches in diameter, which weighed 32lbs. These guns, being the largest, formed the lowest tier of a line-of-battle ship. One ship, the *Glatton*, a 50-gun ship, was armed with heavier guns.

They were carronades—68 pounders on the lower, and 32 on the upper deck. She beat off a French squadron of seven ships ; allowing them to get near her, she opened on them with her terrific broadsides, and so pounded them, that some of them were almost in a sinking state when they got back into port.

At the present day, however, the guns with which many of our ships are armed weigh 100 cwt. and are 10 feet 6 inches long, while they carry a shot 10 inches in diameter, which weighs 84 lbs. Guns throw solid shot and also hollow shot, or shells filled with combustibles, which burst on striking the object at which they are aimed.

The muzzle of guns, when about to be fired, are run through square holes in the ship's side, called ports. The lower part of a port is called the port cill. Strong eye-bolts are secured in the ship's side, to which tackles are hooked to work the guns—that is, that the crew may haul them about in the direction required. They also serve to secure the gun to the side when the gun is run in, and the ports are closed. A gun is mounted on a carriage of solid wood strengthened by iron. It runs on wooden wheels, called TRUCKS, and distinguished as the fore and hinder trucks. The axle of the gun, by which it works up and down on the carriage, is called the TRUNNION.

The mouth is called the MUZZLE, and the inner part into which the powder is rammed is called the CHAMBER.

The BREECH is the inner and thick end. The ropes

which pass through a ring at the end of it, and secure it to the side by means of one of the eye-bolts I have described, is called the breeching. Its object is to restrain the recoil.

Guns have now percussion-locks fitted to them, similar to those of rifles, or other small arms.

Carronades are much shorter and thicker than long guns. They are elevated and depressed by means of a screw. They take their name from having been first cast at the iron foundry at Carron in Scotland. The men employed in working each gun are called the crew of the gun. One of the best men is appointed captain of the gun. They are taught a regular exercise, so that each man knows exactly what to do, and how best to exert his strength. Great improvements are taking place in guns in the present day. They are now being scored in the inside—a sort of fluting in the slightest possible corkscrew shape, as are the barrels of rifles; they are thus called rifled cannons. They can, by these means, send their shot to a distance of three or four miles.

I must now conclude this chapter. I hope that you may have gained from it some idea of what a man-of-war is like, as also of her internal economy.



## CHAPTER VII.

### ENGLISH MERCHANTMEN AND FISHING VESSELS.

No nation in the world possesses so fine a fleet of merchantmen as the English, although among them there are certainly many ugly, slow-sailing, ill-formed craft.

THE HONOURABLE EAST INDIA COMPANY'S SHIPS.—The largest ships were those of the old East India Company, the profits from a few voyages of which falling to the share of the captain alone, made his fortune. They were generally commanded by gentlemen whose families had interest with the Company, and who entered the service with that object in view. They were of 1,000 tons and upwards, and carried several guns. One, of which I have spoken, the *Glatton*, when bought into the navy, mounted fifty very heavy guns. This will give a notion of their size. They fought several actions with the ships of the enemy; and a fleet of them made so warlike an appearance on one occasion, that they kept at bay a large French squadron.

FIRST-CLASS MERCHANT SHIPS.—However, these Company's ships, as they were called, no longer exist, and their place is supplied by others sent to sea by wealthy

ship-owners, such as the Messrs. Greens, the Wigrams, Dunbars, and others. These ships vary in size from 500 to 1,000 tons; some even are of 1,500 tons burden. I believe, however, that the greater number do not exceed 1,000 tons, as moderate-sized merchantmen answer best. They are ship-rigged; have a deep hold; a lower deck, where are cabins for passengers, officers, and sometimes the crew, and where the lighter articles of cargo are stowed. They have all poops, under which are the cabins for the chief passengers, the captain's cabin, and the saloon. In large passenger or emigrant ships, the whole of the between decks is devoted to passengers. Generally speaking, they have topgallant forecastles, or a deck forward, raised above the deck, under which there are berths for the crew. The greater number sleep in standing bed-places, or berths, arranged round the forecastle. Properly speaking, the commander of a merchantman is called the master, but in courtesy he is called captain. He has three or more mates, called first officer, second officer, third officer, and so on. Large ships have also midshipmen, who are, properly speaking, first-class apprentices, and who pay a premium on going on board, under the understanding that they are to be taught their profession. They carry a surgeon, and sometimes a purser, or supercargo; but generally the duty he would perform is attended to by the captain. These ships carry a few guns on the upper deck—those especially trading to China do so; but under

ordinary circumstances, they are used only for firing signals. They are rigged in most respects as I have described men-of-war; but their masts are lower and their yards are not so square—that is to say, not so long. Indeed, their sails are generally smaller, in proportion to their size, than those of men-of-war. Merchantmen are often fitted out by a person who is called the ship's husband. He buys all her stores, sees that she is in good sea-worthy order, superintends her fitting out, and indeed manages all her affairs with the affectionate care of a husband, till she is ready to receive her cargo. Ship-brokers collect that from different mercantile firms who may have goods to ship, and arrange about her passengers. Sometimes one mercantile house engages her entirely—charters her is the term. They pay all the freight. The term freight stands here for the sum to be paid for carrying the cargo. They ship all the goods themselves, or get other houses to do so. Ships are consigned to a mercantile house at each of the ports where they are to go. The duty of that mercantile firm is to sell the cargo, or to hand it over to the merchants for whom it is intended. They also are expected in every way to attend to the interests of the ship, and to obtain, if possible, a return freight, or to advise the master where to go to obtain one. Very often the master is part owner of the ship, or owns her entirely, and perhaps the cargo also. He then goes to the port where he expects to sell the cargo to the best advantage. Formerly, when

English mercantile houses were not so generally established in all the ports of the world, a supercargo was sent out in each ship, often one of the partners of the firm which shipped the cargo. He went where he thought best, sold the cargo when and to whom he judged advisable, and bought a cargo in return. Now, however, supercargoes are seldom required.

INSURANCE OF SHIPS.—Merchantmen and their cargoes are insured by the owners and the shippers of the goods ; that is to say, they pay a small premium to a certain number of wealthy people, who agree to pay them the value of the ship and cargo, should she be lost, or part of it should she or it only be damaged, so that they may not suffer loss. The chief insurance-office is over the Royal Exchange, called Lloyd's, after the name of the person who first established it. Here the insurers or underwriters sit in a long room, and those who wish to insure go to their desks, and name the ship and the sum for which they wish to insure. These gentlemen write their names for part of the sum under the name of the ship ; hence they are called underwriters.

All ships are classed according to their age and general condition, A 1 meaning that they are in the best order, A 2, A 3, and so on ; B means that though seaworthy, they are not fit to make a long voyage.

EMIGRANT SHIPS.—Of late years many ships have been employed exclusively in carrying emigrants from England ;

though they have, when they could obtain them, returned with cargoes. They sail chiefly from London, Liverpool, and Glasgow, though a few go from Bristol, Dublin, Hull, and a few other ports. They vary from 400 to 1,000 tons, some are 1,500 tons. They have a good height between decks, or what may be called the lower deck. The fore-part of this is fitted up for single men, the centre part for married people with children, and the after part for the single women, who have in the best-regulated ships, a matron placed over them. Among the married men two or more are selected as constables to keep order. These ships have all a high poop deck, under which are the cabins of all the first-class passengers, and the saloon, with the captain's cabin. In many ships the after part of the lower deck is fitted up with cabins and a saloon for the intermediate class passengers. All ships carrying above a certain number of passengers are compelled by law to have a surgeon on board if crossing the line. The ships I speak of go to Australia, New Zealand, and the Cape of Good Hope. Commissioners have been appointed by Government to superintend emigration; they are called Her Majesty's Emigration Commissioners; they have done much to mitigate the evils which formerly existed in consequence of a number of people being crowded together on long voyages; no vessel with emigrants can leave an English port without being visited by one of their officers; they also charter vessels, and send out emigrants to the colonies

I have mentioned ; the emigrants are placed under the entire command of a surgeon, styled the surgeon-superintendent. Many of these officers go backwards and forwards, as do the matrons in charge of the single women. Many ships fitted as I have described sail also to the British North American provinces, and to the United States. Merchant ships carry their larger boats stowed on deck between the booms, as also quarter-boats, and a stern boat hanging by davits over the stern. They are ordinarily called the long boat, launch, cutter, and gig. They also often carry a whale-boat, which is a boat suitable for heavy seas, and, both ends being alike, is lowered with less risk in a hurry. The cooking-house is on deck, and is called the caboose.

BARQUES.—I have described barques as having their fore and main mast square rigged, and the mizenmast like that of a schooner, with fore and aft sails. They seldom much exceed 300 tons. They are more easily managed than ships, or even than brigs, as their sails are generally smaller ; a large number of merchantmen are of this rig.

BRIGS.—More moderate-sized merchantmen are of this rig than of any other ; vessels of 120 to 250 tons are generally thus rigged ; they are all flush-decked vessels. Many trade to foreign countries, especially those which have to go up narrow rivers, or enter narrow harbours, as they can work more rapidly than ships. Many are very beautiful vessels ; a large number of coasters, colliers, and

others are thus rigged ; but their yards are short, and they are far from graceful looking craft. Coasters are so called, because they sail from port to port along the coast, and do not cross the Channel or go to any foreign ports. Their masters, though they are good seamen, are often perfectly ignorant of navigation, that is to say, they cannot take an observation with a quadrant. They sail by dead reckoning—that is, they find how fast they go with the log, while the compass shows them the direction in which they have gone. Thus, when they lose sight of land, they can easily get hold of it again.

**SCHOONERS.**—There are a good many vessels bound to foreign ports, especially up the Mediterranean, and some few to the coast of Africa, rigged as schooners, and very fine looking craft they are. A considerable number of small coasters are rigged as schooners or brigantines. I have described a brigantine as having the foremast like that of a brig, and the mainmast like that of a schooner. They are, on account of the mainmast being schooner-rigged, more easily handled than a brig ; often vessels of 100 tons go to sea with only a master and three men. One of them sails as mate, and is able to keep a watch.

**SLOOPS or SMACKS.**—They are among the smallest class of coasting vessels. Sloops have one mast, and a short topmast, with a bowsprit which steeves, that is to say, rises, and a jib boom. They have a large fore and aft mainsail and gaff topsail, but also a square topsail, and sometimes a

topgallant sail and a lower yard rigged across. Smacks have running bowsprits, that is to say, their bowsprits can be rigged in ; but they also carry square topsails. Some are rigged as yawls, with mizens, either lugs or gaffs. All these smaller vessels are steered simply by the tiller, without the assistance of a wheel. Tiller ropes are, however, fastened to each side, by which the helmsman more easily moves the tiller. They carry their boats on deck, or hanging over the stern from davits.

KETCHES.—I have already described their rig. Some employed in river navigation have taunt mainmasts, with a narrow fore and aft mainsail and gaff topsail. They are very easily handled.

BARGES.—Few people would suppose that the flat-bottomed craft, so low, so gaily painted with green and red and yellow and blue ; so deep in the water, without any bulwarks, and with a great hatch running fore and aft, would venture out of the smooth rivers in which they appear built solely to swim. Yet I have met them some way from land, and making coasting voyages of a hundred miles or more in length. They are rigged forward like sloops ; but sometimes their mainsail is set up with a long spreet, which is raised or lowered with a tackle, and when sail is to be taken in it is brailled up. They do not draw much water, being quite flat-bottomed, and they have little or no keel ; but they carry a large lee board, which on a wind is let down to prevent them from driving to

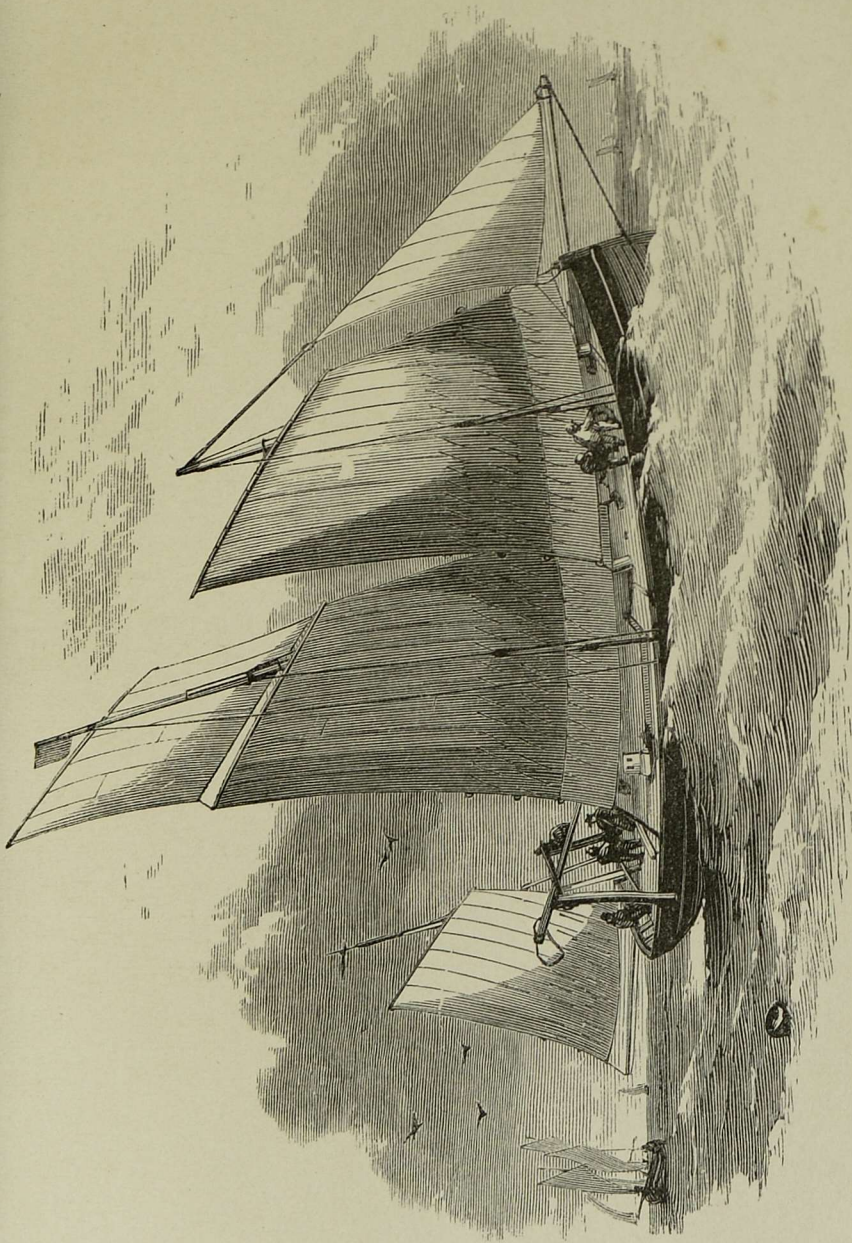


leeward. So little above the water are their gunwales, that it appears as if the sea must inevitably wash over them. They are in many respects an imitation of the Dutch galliot or dogger. The master nearly always carries his wife and family with him. His barge is their only home ; there the children are born, and there they live from one end of the year to another—perhaps not going on shore for weeks together, though close to the land, and seldom, even in their most distant voyages, out of sight of it. One of Captain Marryat's heroes, Jacob Faithful, is described as born on board a river barge ; and very faithful descriptions of the style of life led by bargemen are introduced into that most amusing work. Most of these vessels have tanned sails, and are very picturesque looking craft.

CUTTERS and YAWLS.—A few trading vessels are rigged as cutters and yawls.

FISHING VESSELS.—A very large number of vessels are employed in this occupation. The finest are the Yarmouth trawlers. They are cutters of from forty to seventy or eighty tons, and each carry from eight to ten men. Two or three persons or firms own each as many as 100 and even 150 of these vessels. They belong, however, chiefly to ports in the Thames, though they are stationed at Great Yarmouth. They go out together in fleets of 100 to 150 vessels ; and some fish off the Texel, and others 100 and 200 miles off the land in different parts of the North Sea. They are provided with large trawls, which are nets

attached to beams. These are let down by strong ropes to the bottom of the sea, and dragged after them, they being under easy sail. The nets have large bags or pockets, into which the fish are forced. Turbot and other flat fish are caught in this manner. The vessels remain out six weeks together, without once returning into harbour. It may well be asked, how do they manage to do this? what becomes of the fish they catch? Besides the fishing vessels, there exist a fleet of tenders. There exist also on the banks of the river Yar large ice-houses, in which ice is preserved all the year round. The tenders are employed constantly going backwards and forwards between Yarmouth, the fleet, and London. They take in a cargo of ice and provisions and water at Yarmouth; this they carry out to the trawlers. The fish caught in the meantime have been kept alive in tanks in the trawlers' holds. They are now packed in baskets with ice, properly numbered, so as to be known; and the tenders, which are fast sailing cutters, carry them away to the fish salesmen in Billingsgate market, and in another day or two they are dispersed all over England. At the end of six weeks or two months the trawlers return into port, where they remain to refit, and refresh the crews, for ten days or a fortnight, and then away they go again to the fishing ground. A hard life they lead, for they fish all the year round; summer or winter makes but little difference to them. The crews of these vessels have been very much neglected, and have



LUGGERS.



been looked upon as an extremely reprobate class of men. Happily, however, the blessings of the Gospel of Peace have been carried among them. One of their own class, the mate of one of the trawlers, was the first missionary. He preached the Gospel ably; he was the means of distributing tracts and circulating some good religious books, and now, out on the stormy waters of the North Sea, a flag is hoisted; and when the vessels can communicate with each other the crews assemble on board one or other of the cutters, and Divine Service is held, prayers are offered up, hymns are sung, and sermons read by these lately rough and thoughtless men. Each fleet is under the oldest and most experienced master, who is styled the admiral. One of those early turned to a knowledge of the truth was the admiral of one of the largest fleets, and his example had a powerful influence on others. In his fleet, in a short time, the masters and crews of thirty vessels refused to fish on Sunday, although the practice of fishing as usual had hitherto been common.

FISHING LUGGERS.—A considerable number of large luggers belong to Great Yarmouth, and the places to the north and south of it. They vary in size from twenty to forty or fifty tons, and carry crews of from seven to ten men. They are engaged in the herring fishery off the Norfolk and Suffolk coast, and often much further north. They fish with seine nets or well nets, which are let down at night and hang from corks straight down, the lower

part being sunk by leads. The herrings, swimming at night in shoals just below the surface, swim against them. The nets are lifted in the morning ; the herrings are taken out ; the nets are mended, and again let down. The vessels are fitted with lockers at the sides, in which salt for curing the fish is carried. There is a well in the centre into which the fish are thrown on being taken out of the nets, other lockers in which the cured fish are packed, and a curing room. Here some of the crew are employed in cleaning and salting the fish caught during the night, while others stow it away. The crew live in small cabins aft and in the fore part. They return into port once every week, and sometimes oftener. Many have now given up fishing on a Sunday, and go into port every Saturday. A fine old fisherman remarked to me, "I've done so, sir, ever since I was a boy, and I'm certain I've never lost any thing even in this world by obeying God's law. I've always got my nets spread out and dried on the Saturday evening, and have had the whole Sabbath to rest and prepare myself for the toils of the week. How much wear and tear is saved ! At the end of the year, too, my nets are stronger and better by far than are those of men who have toiled on every day without distinction. Look at me, sir ; I am as hale and strong as many a man ten years younger ; and those young men, my sons, what fine lads they are, sir. Another thing too, in one year with another, I've caught and sold as many herrings as any one else, and am

in no way poorer. Yet, often I have had to lose the best part of two days in the week to keep to my rule." These were the exact words of one of the finest old fishermen I ever saw, whom I met not long ago on the Norfolk coast. His six sons were with him. He was part owner, and he and they manned a fine Yarmouth lugger. I give a drawing of one of these vessels (*Plate D*). They are called luggers, from the form of sails—lug sails—which they carry. They have three short, stout, lower masts; and sometimes, as the one before us, carry a main-topmast, which slides up and down, and can be easily lowered. The mizenmast is stepped very much aft, like that of a yawl, and has a bumkin or outrigger. They carry a bowsprit and jib. The framework in the after part of the lugger in the plate is for spreading the net. She is on the port tack close hauled. When going about, they have to lower or dip their sails, or the sail would be against the mast. This is the chief objection to them, as they require a good many hands to work them. As a large crew is required for hauling the nets, this in fishing vessels is of no consequence. No vessels sail closer on a wind, or are better sea boats, from having no top hamper.

HERRING BOATS.—A large number of fine open boats, with very great beam, belong to fishing villages all along the coast of Scotland and Northumberland. They carry seven or eight men, and are generally rigged as cutters or yawls. Cutters with small mizens are often called

dandy-rigged vessels. Their nets are similar to those used by the luggers. They put down their nets in the evening, and hang on to the end of them during the night. As I have been sailing along the coast I have often heard their little tinkling bells, and seen the small light of their lanterns, which are held up to give notice of their whereabouts. Still, in spite of great care, they are frequently run down by the numerous steamers and other vessels passing up and down the coast. Most of the Scotch fishermen come into harbour on the Saturday forenoon, that they may have time to dry their nets and get any repairs done before Sunday, and they do not go to sea again till Monday morning. Thus they lose two nights in the week when they might be fishing. It is only thus that they can obey the law of God to keep holy the Sabbath, and I am very certain that they are in consequence blessed in their vocation. They are a very steady, respectable class of men; and their example has had a considerable effect with the English fishermen.

**SMALL FISHING BOATS.**—A considerable number of small spreet-sail fishing boats fish off Yarmouth for herrings.

**TORBAY TRAWLERS.**—These are cutters from twenty to forty tons and upwards. Their sails are generally tanned, and they have a very picturesque appearance. They return to port every day. Large vessels with wells, into which the salt water constantly flowed, and in which the fish were kept, used to sail up and down the coast, taking



in the fish caught by the Torbay men ; but now the fish are sent off at once by railway to London.

WHALERS.—Two class of whale-ships sail from English ports.

The GREENLAND WHALERS sail chiefly from Newcastle, Hull, and other ports on the eastern coast of England and Scotland. They go in chase of the common, true, or Greenland Whale, which yields the whalebone as well as oil.

The SOUTH SEA WHALERS sail chiefly from London, Liverpool, and Bristol. They sail to the Pacific and South Atlantic, and remain out two or three years. They go to collect sperm oil, the produce of the spermaceti whale, and differ in many respects from the former class.

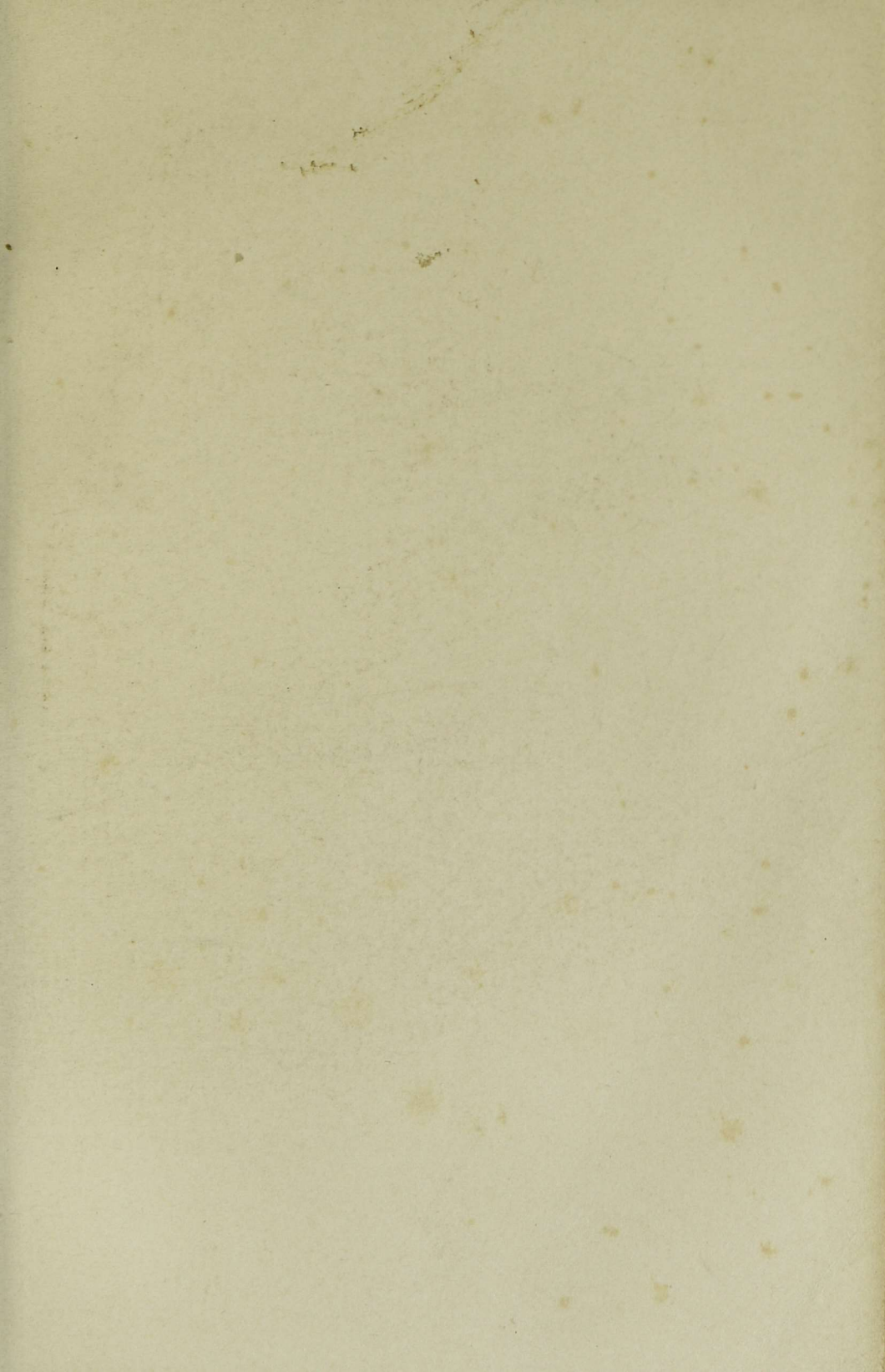
The Greenland whaler claims our first attention.

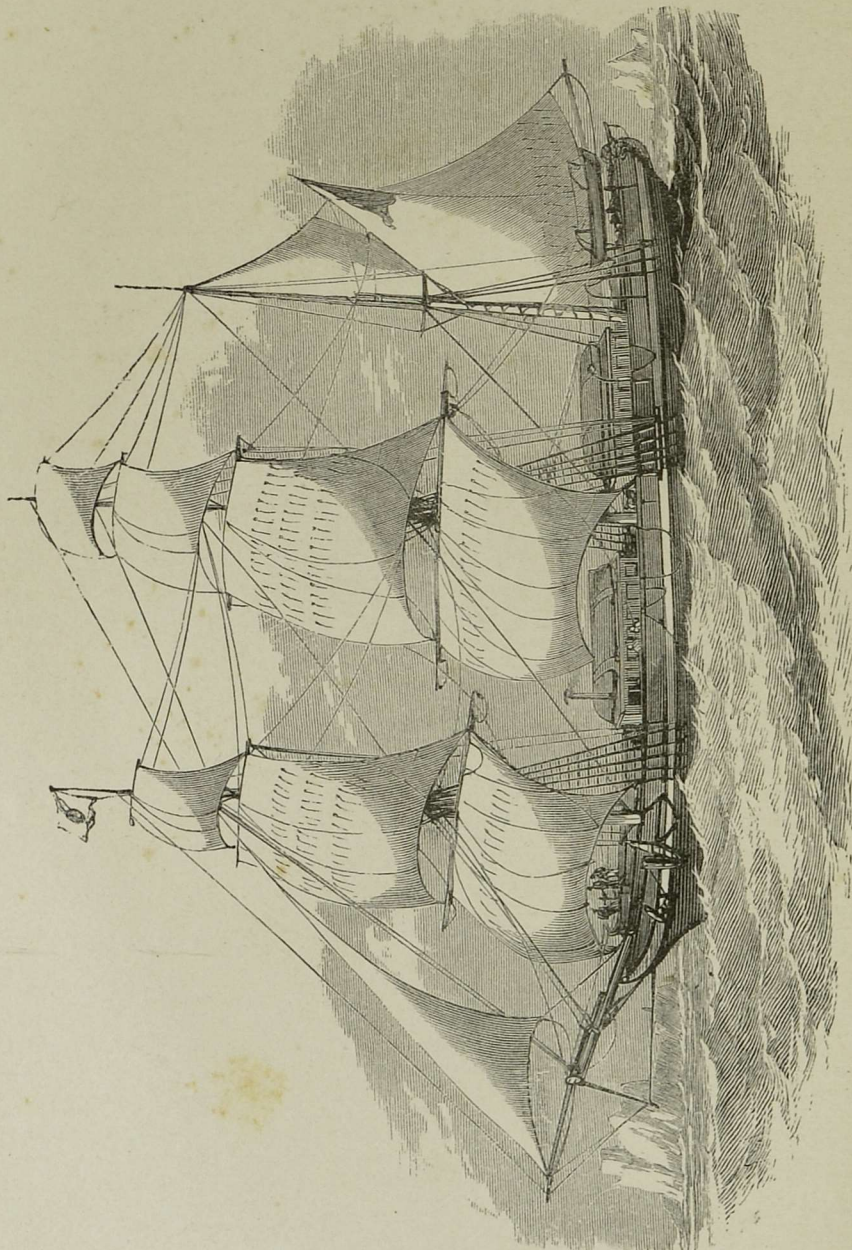
These vessels are very strongly built, to withstand the pressure of the ice to which they are often exposed up Davis' Straits ; measure from three to four hundred tons ; are fast sailors, and usually barqued-rigged. Their bows are doubled or trebled ; that is, they have one or two additional layers of planks on the bows, and are fortified in other ways with ice-stems and ice-knees of iron and oak. The ice-knees are angular blocks, filling the space formed by the stern and bow planks ; they decrease in thickness till they are incorporated with the common doubling below the fore-chains. The hold-beams are placed low, that the sides may better withstand the pressure brought against them, and thus affording also a larger

space between decks. The crew sleep in standing bed-places. They number from forty to fifty hands. A whaler carries six boats, which are hung up in a line of three boats on either side, and are always kept ready for lowering at a moment's notice. As the greater part of the crew of a whaler are frequently away together in the boats, it is important that she should work easily with few hands. Her courses are therefore cut narrowing towards the foot, and are often fitted with booms below as well as above. This boom is secured by a tackle to the deck, and as it swings with the yards, requires no tacks or sheets. In tacking, or when the sails must be backed, which it is often necessary to do suddenly when sailing among the ice, they are very useful. The crew consist of harpooners, boat-steerers, line-managers, coopers, carpenters, foremastmen, landsmen, and apprentices. All have a certain share on the profits of each whale caught. As it is important to keep a bright look-out both for whales and to avoid ice, a cylindrical screen, called a crow's nest, is fixed on the maintop-gallant masthead. It has a seat and a place for telescope, speaking-trumpet, and a flag, &c. &c. Here one of the officers takes his post, as soon as the ship enters the regions where whales are to be found. Without this shelter, no man could long endure the icy cold wind of those high latitudes. Nearly all the Greenland ships touch at the Shetland Isles to complete their crews, and leave that island about the end of March. Interesting as

an account of the whale-fishing would be, I have not space for it; my province at present is simply to describe a whaler and her boats. The bow and stern of a whale-boat are sharp and very similar; but the stern narrows more rapidly than does the bow. They are carver-built, very strong, their planking of fir, and their timbers are formed out of straight-grained oak, bent by steam into the required form. They are called according to their size—four-oared boats, six-men boats, and six-oared boats. The latter carry six men who row, one of whom is the harpooner, and the steersman. They are generally twenty-six to twenty-eight feet in length, and about five feet three inches in beam. In the two larger-sized boats the beam is about three-sevenths the length of the boat, but in the smaller it is rather less than one-third. It is necessary to have the smaller boat wider, because otherwise it might be too easily dragged under water. The five-oared boats are most used on ordinary occasions. The boats are furnished with harpoons and lances. The harpoons are now frequently discharged by means of guns, but they are difficult of management, and the old harpooners prefer the weapon to which they have been accustomed. Each of the boats carries six whale lines 120 fathoms in length, which, when spliced together, make 720 fathoms, or 4,320 feet. These six lines are all coiled away with the greatest neatness in separate compartments. All the lines have eyes spliced at each end, that they may

be the more easily united. The harpoon has a piece of rope, called a foreganger, secured to it ; it is then said to be spanned. The upper end of the first whale-line is connected with the foreganger, and the harpoon is then ready for use. Each boat is supplied with two harpoons, six or eight lances, five to seven oars, a flag called a *Jack*, to show as a signal when a whale is harpooned ; a rest called a *mik*, for supporting the stock of the harpoon when prepared for service ; an axe for cutting the line if necessary ; a bucket for baling out the boat, or wetting the lines as they run out, called "a pigging ;" two boat-hooks, a grapnel, a mallet, fid, "snow-shovel," "swale," "spare-tholes," "a snatch-block," "grommet," &c. &c. Every article must be arranged in a whale-boat for instant use ; the axe being ready to cut the line, should it foul, or should it be necessary to cut clear of the whale. A whale-boat is steered by an oar instead of a rudder, as she is thus more easily turned, or can be sculled through a narrow passage, and does not retard the progress of a boat as the rudder does. A whaler's crew are separated into divisions equal to the number of boats carried by her. Each division thus consists of an harpooner, boat-steerer, line-manager, with three, or four, or five rowers. The harpooner has command of the boat, and when in pursuit, rows the bow-oar. One of the mates, or the captain himself, acts as harpooner ; the boat-steerer ranks next to him ; and the line-manager takes the third place.





SOUTH-SEA WHALER.

The Greenland whale-ships, unless frozen up, as frequently happens, return home in the autumn, touching, as in their outward voyage, generally, at Shetland on their way. They are thus engaged but a few months in the year in the fishing, but during that time, even if the crew escape being frozen up, or having their ships crushed by the ice, the hardships and dangers to which they are exposed are very considerable. I must now go on to give a description of another class of whale-ships.

**SOUTH SEA WHALERS.**—These vessels are employed chiefly in the capture of the sperm whale, or spermaceti whale, which is known by its vast size, its huge head, and blunt flat nose. The ships are generally from three to five hundred tons, and sail chiefly from London and Liverpool. The Americans send out a far greater number of vessels than the English to prosecute this fishing; they carry from thirty to thirty-six men, and are provisioned for three years; sometimes they remain out for a still longer period than that. They always carry a surgeon. They are not so strongly built and fortified as the Greenland whalers, as they are not exposed to the pressure of the ice in the same way; indeed, they mostly prosecute their vocation in high and warm latitudes in the Pacific and Indian Oceans, though some go far south to the borders of the Antarctic Ocean. They are mostly, like the Greenland whalers, rigged as barques, with sails which may be easily handled. A whaler returned from a long voyage, battered and wea-

ther-worn, her long line of boats hoisted high up over her quarters, and her sails patched and stained, has a very antique and picturesque appearance, somewhat like the ship of the Ancient Mariner Coleridge writes about. Each ship carries six boats, at least; they are from twenty-six to thirty feet long, by four to four and a half in beam, sharp at both ends, and the bottom has a hollow, to enable them more rapidly to turn, carver-built, light and strong.

The logger-head, an upright piece of timber, is placed at the after end; and at the bow is a groove, through which the harpoon line runs out. They carry two lines of two hundred fathoms in length each, coiled up in tubs, four harpoons, three lances, a keg, in which are stowed a lantern, tinderbox, and matches; also, in the boat there are three flags, called "whifts," to be inserted in the whale when killed, and two drogues, or quadrangular pieces of board, which are attached to the whale-line, to impede the progress of the whale when running away, or sounding. Each boat carries a crew of six men, including the headsman and boat-steerer. The headsman has the command of the boat; he steers it till the whale is struck by the boat-steerer, who pulls the bow-oar. He then changes places with the boat-steerer, who comes aft, while the headsman (who is either the captain, or one of the mates) goes forward, ready to plunge his lance into the whale, as opportunities may occur. The boat is steered by an oar, which passes through a grummet at the stern. A look-out



is kept all day, when in the latitudes where whales are to be found, by men stationed at each mast-head ; while an officer is posted on the fore-top-gallant yard for the same purpose.

As the flesh of the sperm whale could not be kept till the ship makes harbour, the oil is extracted from it on board the ship ; this process is called *CUTTING IN* and *TRYING OUT*. The whale is brought alongside the ship at sea, and secured ; men then descend, with instruments called spades, on the body of the whale ; the head is first cut off and secured astern ; that alone contains a large quantity of sperm oil, which is baled out of it. The body has tackles hooked into it, and by this means it is turned round and round, while the crew with their spades proceed with the process of flaying. The sheets of blubber taken off are known as blanket-pieces. Large cauldrons are placed on deck, into which the blanket-pieces when cut up are thrown, and the odd bits serving as fuel, the fires are lighted on platforms under the pots. The oil, when extracted, is stowed away in casks ; the spermaceti oil from the head, being the most valuable, is boiled and stowed away by itself. One whale will produce as much as eighty barrels of oil, and the whole is tryed out and stowed away in three days after the capture of the whale. A South Sea whaleman has peculiar charms to those inured to hardship, and toil, and danger, on account of the great variety of countries visited, and the strange scenes often

encountered ; but, generally speaking, the crews of these ships are a peculiarly rough and untutored class of men, and often prefer leaving the ship before she returns home, to roam for years and years among the islands of the Pacific, till they almost forget their native land, and all they once cared for there.

## CHAPTER VIII.

## ENGLISH YACHTS AND BOATS.

WHO that possesses an eye for any thing nautical cannot at a glance distinguish the graceful, trim, well-found aristocratical-looking yacht from a crowd of other ordinary vessels? The English have had pleasure-vessels for many ages back, but it has been during the last half-century that they have increased so rapidly in numbers. The possession of yachts by gentlemen of fortune gave rise to the yacht clubs, and the yacht clubs have again very much tended to the increase of yachts and the encouragement of yachting generally; as also, by establishing regattas, and sailing matches, to the improvement of their build. Indeed I have no doubt that their improvement has tended in no small degree to that of ship building generally, and that it is owing to the fast sailing yachts that we have now so many fast sailing or clipper merchantmen, which were a few years ago unknown.

I will first give a passing notice of the yacht clubs of Great Britain. They consist of an assemblage of gentlemen owning yachts to whom Her Majesty has been pleased to grant peculiar privileges, and for whom she has obtained them from other countries. These clubs have mostly houses where the members meet; they have their

distinctive flags—burgees they are called. The members have a uniform, and their officers wear a crown-and-anchor button and gold lace to their caps. Their vessels have the privilege of men-of-war, and may enter any English or foreign port without paying harbour dues, and unless they take a pilot on board, without I believe paying pilotage. The oldest, most wealthy, and the members of which have on an average the finest yachts, is the Cowes Yacht Club. West Cowes Castle is their present club-house. They established the first and most popular regattas, and perhaps no more animated scene of nautical life can be witnessed than on a fine morning of the principal day of Cowes Regatta, when hundreds of vessels of all sizes and classes are collected together to take part in, or to witness the amusement. The late Lord Yarborough was one of the chief promoters of this club. It was his great pride and amusement, and he was for many years its commodore. He owned one of the largest private yachts ever built—a fully-rigged ship called the *Falcon*, of some 400 or 500 tons burden. She carried a crew of from forty to fifty men and everything on board was carried on in man-of-war fashion. He was a very good sailor himself, but his ship was generally commanded by a naval officer. He during the latter years of his life sold the *Falcon* and built a large first-rate sea boat of some 200 tons or more, rigged as a yawl or ketch and called the *Kestrel*. He went out in her to the Mediterranean in consequence of illness. At length,

while in Malta Harbour I think it was, he felt himself growing worse. He ordered that his vessel should put to sea. It might have been that he thought the sea air might revive him, but I am inclined to believe that, animated with the spirit of the old Norse sea kings, of whom he was a worthy representative, feeling his death approaching, he felt a longing to breathe out his last breath amid the wide blue ocean, which he had from his boyhood days so well and firmly loved. He was indeed the worthy representative of the true British yachtsman. Lord Wilton, the owner of a very beautiful schooner, succeeded him as commodore. Some of the yachts of the club have cruised through the Pacific even towards the North Pole, visited the shores of America and the Black Sea; and one, owned by the noblest man of all, Sir James Brooke, the *Royalist*, went out to Borneo and took part in deeds which may well immortalise her master's name. I was with him on board her just before he sailed, and though he spoke of visiting those far-off Indian islands, and I told him how delighted I should be to accompany him, little did I think at the time of the gallant exploits he was about to perform—of the wide extended benefits he was to be the means of conferring on many thousands of the human race. Among all those who have contributed to the improvement of yacht building, Mr. Weld, of Lulworth Castle, stands conspicuous. Who that knows any thing about yachting has not heard of the *Arrow*, the *Lulworth*, the *Alarm* and

other vessels built by him, each superior to the former, and nearly always beating all antagonists in the race? However, with the *Alarm* he appears to have reached the utmost extent of his powers of invention. He proved what was before doubted, that the larger vessels are, to a certain extent the more rapidly they are able to move through the water. The *Arrow* beat the *Julia*, one of the first vessels he built, the *Lulworth*, the *Arrow*, and the *Alarm*, larger than all, beat the *Lulworth*. The *Alarm*, which is upwards of 200 tons, requires as a cutter a main-sail of such extent, that she has of late years been rigged as a yawl, and is thus much more easily handled.

The Royal Victoria Yacht Club at Ryde is next in importance to that of Cowes, and as I was one of its first members, I have always taken a great interest in it. The house, which is a very excellent one, built for the purpose, is to be seen on the right of the far-outstretching Ryde pier. A very good feeling existed among the members, and a most pleasant club it was. Mr. Ackers, the owner of the magnificent three-masted schooner, or rather ship, the *Brilliant*, has been for many years the commodore. The first commodore was Thomas Willis Fleming, one of the most active founders of the club. The *Brilliant* is not inferior in size to the old *Falcon*, and a far more graceful and remarkable craft. What other nation in the world possesses a number of pleasure-vessels fit to sail round the world at a very few days' notice?

Southampton boasts of a yacht club. Many of the owners of the vessels are members of other yacht clubs. They have a very nice house near the pier.

The Western Yacht Club is one of the oldest, and numbers a good many fine vessels. No harbour on the coast is more suited for sailing, nor can exhibit more beautiful scenery than that of Plymouth.

The Thames Yacht Club.—The Harwich Yacht Club. Both these clubs have many fine and fast vessels, and several are fitted with auxiliary steam-screws.

The Kingstown Yacht Club in Ireland has long been established, and possesses many fast vessels, which have made voyages to Iceland, Norway, and other distant ports. There is a club, I believe, at Cork, and one on the Clyde, and there are, I believe, one or two others of minor size on different parts of the coast.

I have, of course, been speaking of the salt-water yacht clubs. There are numerous boat clubs in every part of England, wherever there are rivers on which boats can float. Oxford, Cambridge, and Eton may well boast of their aquatic sports on the Thames, the Isis, and the Cam; and there can be no doubt that the taste there obtained, when more developed, contributes not a little to England's naval supremacy, by the encouragement given to ship-building, to yachting, and to our glorious navy.

Yacht clubs have contributed to the establishment of regattas in nearly all the ports of Great Britain and Ire-

land. There is scarcely a harbour or roadstead in which an annual regatta does not take place. Let us take another glance at Cowes Roads on the morning of a regatta, while the preparations are making for the race. There are, perhaps, a hundred or more beautiful vessels at anchor, measuring from four hundred to twenty-five tons, or less. Some not intending to sail are gaily decked with flags. Others have their snow-white canvas fluttering in the breeze—their huge wide-headed gaff topsails and balloon jibs ready for hoisting. These are the racers. Others, with more moderate-sized canvas, are receiving their visitors on board. Yachts' boats, the men in white shirts and straw hats, and the gold lace of the officers' caps glittering in the sun, are pulling here and there with eager haste, as if some important action was to be fought. Perhaps they are only going to carry a note to another yacht, or to bring off a lady's cloak. The shore is crowded with people. Gay bands are playing; carriages are driving in; and everybody looks excited and busy. Spy-glasses are in great requisition. The blue Solent sea is covered with the white sails of small vessels, many of them full of people coming from all directions to see the race. People begin to look at their watches; the gigs pull about still more furiously; ladies and gentlemen are hurrying off to various yachts. Eight or ten splendid-looking craft are arranged in a line outside the rest, and off the club-house, with their distinguishing flags flying at



their mastheads. A gun fires. The yachtsmen are more on the alert than ever. It was the sign for the racing vessels to get ready. Another gun is heard. Up go the balloon-jibs! The vessels' heads pay round. There is a fresh breeze, but not too much. Like magic a wide sheet of canvas is now extended on their taunt-masts, and away they dart, as birds on the wing, sometimes first towards a vessel moored off Yarmouth, in sight of Hurst Castle, at other times round the Nab Light, off St. Helen's, at the other end of the Isle of Wight. Fast as they may go, what with the tide against them, and often light winds or contrary winds, it is late in the afternoon before the course is accomplished. In the meantime, fishing-boats or pilot-boats may be started, or boat-races may be taking place. The boats have either one hand in each, or they are fast gigs, each manned by four men, all of whom are dressed alike, though the uniform of the various boats may be different;—some have on white, or blue, or red, or checked, or striped shirts. Each boat is known by its distinguishing flag. The signal is made, and away they go! The men exert themselves as if the fate of nations depended on the issue. They have a long pull, but the course is so contrived that they are always in sight of the club-house, or some part of the esplanade. Not the least part of the entertainments of a regatta is the DUCK HUNT, as it is called. A man in a small punt, with a huge cocked hat, and dressed in some fanciful costume—the more bur-

lesque the better—is pursued by three, or four, or more, long four or six oared galleys or gigs. If he was to venture into the open sea, he would be caught immediately ; but he keeps, therefore, among the yachts in the most crowded part of the harbour or roadstead. In, and out, and among them, in every direction, he artfully dodges, while the long boats dart after him. They think they have caught him, but he has again sculled behind a small vessel, and they have to take a long sweep before they can reach the spot. He meantime has paddled away ; is grinning at them round the bows of another vessel ahead. The more crowded the harbour, the better chance he has of keeping up the sport, and the greater number of spectators he has. He must, however, be an expert boatman to escape the rushes and the rapid onward movement of the gigs. They depend on speed to overtake him ; he on twisting and turning : indeed, to escape altogether, he must be a perfect specimen of an “ARTFUL DODGER.” The day generally terminates with an illumination of the yachts, and a fine display of fireworks afloat. When the *Brilliant* has all her ports lighted up, and a line of blue lights burning along her bulwarks, the effect produced is very beautiful ; and then numerous other vessels follow her example, till the whole roadstead is blazing with light, till at last only the port-fires are left burning, and then it appears as if only so many phantom barques were floating on the calm waters of the Solent. There is generally a

grand club-dinner, and a ball another night at the club. The amusements of the regatta are, however, it must be understood, spread over several days. Generally one day is devoted to a schooner race, and this lasts usually longer than any other.

I must now describe the different classes of vessels which are used as yachts. Except the *Brilliant*, and I believe the old *Falcon*, which are frigate-built, that is, with a main and upper deck, the main deck being fitted up with cabins, all English yachts are flush-decked vessels.

The larger class are chiefly brigs or schooners, ranging from one hundred and fifty to two hundred and fifty tons; some are, I believe, even larger. There are a good many schooners from one hundred and fifty tons down to seventy and even fifty tons; but the greater number of yachts of one hundred and twenty tons, and downwards, are rigged as cutters or yauls. The *Alarm*, though two hundred tons or more, is yaul-rigged. There are, indeed, as many schooners of one hundred and twenty tons as cutters of that size. For going foreign, a schooner is more convenient, as being more easily handled than a cutter. The greatest number of cutters are to be found among vessels of from fifteen to fifty tons. I have known several vessels of forty tons rigged as fore and aft schooners, and very fine sea-boats they make, though they are not so fast as cutters of the same size. Neatness and efficiency is the great characteristic of English yachts at the present day.

Their bottoms are covered with bright copper ; the rest of the outside is black ; and the inner part of the bulwarks and companion-hatch skylights are generally light salmon or buff, perhaps picked out with some other colour, but generally plain. There is brass-work, kept beautifully bright, but very little carving, except perhaps the tiller head, or wheel. Now and then there is a red or a gold ribbon outside, but not often. The interior fittings are equally characteristic of good taste. Aft the companion-ladder there is, perhaps, the ladies' cabin, with two or four berths or separate cabins opening out of it. Then, before the companion-ladder, there are, if the yacht is of any size, two side sleeping-cabins ; then, perhaps, the main saloon, extending the whole width of the vessel, or with berths at the side, or cabins opening from it ; and then, perhaps, more sleeping-cabins, with a passage leading forward to the steward's pantry and the kitchen, which is, in a yacht, always below. There are now first-rate sea kitchen-ranges invented, in which dinners for a large number of people may be cooked. Before that, again, there are the cabins for the master, and mates, and steward ; and then there is in all yachts of any size a good, long, airy fore peak, in which the men's hammocks are slung. An owner with right feelings will always see that his men are properly berthed. The main cabin has generally sofas on either side, and a swing table, with racks for glasses, bottles, &c. over, a sideboard at one end. I have seen pianos on board

yachts, and, indeed, everything on a small scale which is found in a house, so that families with ladies have made long voyages in them, and lived on board throughout the year. Of course, the fittings of yachts differ so much, that it would be difficult to give a full description of them; some owners are all for plainness and neatness. They only care for what is good and strong. This is certainly the best style for small vessels, for in them paint and varnish very quickly gets rubbed off. Others, again, have their vessels fitted without sparing expense, and very handsome they are. Of one thing there can be no doubt, that mahogany and other ornamental woods are the best suited for cabin fittings, as a little oil and rubbing soon makes them look clean and handsome; the light woods are, however, the most pleasing to the eye. Glass handles to the doors are pleasanter to the touch than brass. Wooden handles are the best. I must not, however, enter into particulars. Racks for arms, speaking-trumpets, spy-glasses, charts, bookcases, &c. may be arranged round a cabin, and add much to its neatness without increasing in any way expense of fitting up. I will arrange the yachts under the following heads:—

SHIPS.—Two or three, there may be.

BRIGS.—Four or five, if so many.

SCHOONERS.—Of all sizes, perhaps one hundred.

CUTTERS.—Innumerable, taking all belonging to clubs or not.

YAULS, or DANDY-RIGGED VESSELS.—A quarter or sixth of the number of cutters. A good many of the Thames and Harwich Yacht Club vessels are thus rigged. It is a convenient rig for working on the river, though, of course, when running, a yaul cannot set so large a spread of canvas as a cutter. A dandy-rig is another name for a yaul.

THE THAMES HATCH-BOATS, a very fine class of boats, are rigged as yauls. Many of them are used as yachts. They are low in the water, have great beam, are long, and are very fine sea boats. This boat has water-ways, like a barge. A long hatch runs fore and aft, forming a good sized cabin, and in fine weather, when the hatches are off, the centre part of the boat is almost open. There is generally a place, often called a well, for the helmsman and two or three people to sit; it is only suitable for a very rough style of yachting in fine weather.

STEAMERS.—A considerable number of yachts of all sizes are now fitted as steamers; a very few have paddle-wheels. Most of them have auxiliary screws, and are in other respects fully rigged as square top-sail, or fore and aft schooners. Of late, some vessels of not more than forty or fifty tons, have been fitted with screws. At first, I could not bear the idea of having a yacht fitted as a steamer, but an auxiliary screw, especially, must often prevent a great deal of vexation when the vessel is caught in a calm, and people are on board who are anxious to get into port. At the same time, with a steamer, a great deal of the uncertainty

and excitement of yachting is lost, when a screw is ready to twist a vessel into harbour at any moment. From yachts I will pass on to a description of the various boats used along the coast of England, of these none surpass

THE RYDE WHERRIES. They are boats entirely open, thirty feet long, or more ; eight, or even nine feet in width ; sharp at both ends, and with high weather-boards. They have a little part forward covered in, and have thwarts, or seats, placed across for nearly two-thirds of the distance from forward. There are seats fore and aft in the body of the boat for passengers. They are steered by yoke-lines instead of a tiller. A yoke is a long or rather semicircular piece of flat board fitted to the top of the rudder, with ropes fastened to either end, called yoke-lines ; thus, by pulling one line or the other, the rudder is turned as by a tiller. If you wish the vessel's head to go to starboard, you pull the starboard line, and *vice versa*. A back-board divides the passengers from the after part of the boat, where the waterman sits or stands. These wherries are rigged with a spreet mainsail and large spreet mizen, and a jib. I have seen very large ones with a gaff mainsail and jib, as well as foresail, and some even have been decked over, but their superior qualities as sea-boats have thereby been considerably damaged. Their numbers have considerably decreased in consequence of the steamers, by which everybody now goes backwards and forwards to the Isle of Wight.

PORTSMOUTH WHERRIES. These differ very much from the Ryde wherries. They are very much smaller, and are exceedingly low in the water, but are higher and broader than the Thames wherries. They are rigged with main and mizen spreesails and foresail. They are well suited for pulling, and sail well also on a wind. They are extremely light, and dance gaily over the seas, but they are easily upset; and scarcely a year passes but what one or more are upset, and the people in them drowned, going to or returning from the ships at Spithead.

WHITE'S LIFE BOATS. Mr. White at Cowes, has built some very beautiful life boats, and rigged them with large lateen sails. They have great beam, are covered in, surrounded by water-tight compartments. They sail excessively fast, and will live in any ordinary heavy sea, when a common boat would founder; but I am not aware that they are so well suited for the usual objects of life boats, which are to be hauled up on a beach, launched through a surf, and pulled off amid breakers and cross seas to a ship on the rocks or on a sand bank, over which the sea is washing furiously.

GALLEYS AND GIGS. Galleys are boats not belonging to vessels, built like gigs, clinker fashion, rather higher than gigs perhaps. They are used by the Revenue service, when they are painted white, not to be seen at a distance on the water when there is a fog, indeed, a white object on the water is not seen either by night or day at so great a



distance as a dark one. Smugglers used to employ galleys of the same description, sometimes pulling eight or ten oars, The best OARS are made of ash, but as they are expensive sometimes they are made of pine. For sculls, pine serves well enough, but they are apt to warp.

DEAL BOATS. The boatmen at Deal have long been known as the most hardy and bravest of their class along the coast of England, while their boats are among the finest anywhere to be found. Numberless have been the crews they have rescued from the dangerous Goodwin sands.

LIFE BOATS. South Shields claims the honour of being the place where the first life boat was invented and employed. A Mr. Wouldhave and a Mr. Greathead were the inventors. This was about the end of the last century. However, neither that boat, nor many others built on a great variety of principles, answered the purpose intended. Numerous life boats were lost, and their crews trusting to the qualities they were supposed to possess were drowned. At length, in 1849, a crew of twenty brave fellows were lost in a life boat, attempting to save the people from a wreck off the river Tyne in Northumberland. This, and many similar catastrophes, induced the philanthropic Duke of Northumberland, who, a seaman himself, has done so much for the welfare of seamen, both temporal and spiritual, to offer a prize of a hundred guineas to the inventor of a life boat, which, after due examination by a competent committee, should be considered the best. Nearly three

hundred persons sent in models and plans. Mr. Beeching, of Great Yarmouth, obtained the prize, as the model he submitted was considered superior to all others, and I believe that it has not yet been surpassed. I saw one built after this model three years ago at Great Yarmouth, and a magnificent boat it is. In shape it is something like a gigantic whale boat, but higher in proportion to its length. It is 36 feet in length,  $9\frac{1}{2}$  in beam,  $3\frac{1}{2}$  in depth, and pulls twelve oars double banked. A cork fender, about eight inches square, runs round the outside a few inches below the gunwale. Air cases placed in all the vacant spaces give it additional buoyancy, and both forward, and aft where the boat rises somewhat, there are short decks with air cases under them. This gives a buoyancy or floating upward tendency of upwards of eight tons, counteracting to the same extent the weight or downward pressure of the boat and her crew. The boat has a heavy iron keel which serves as ballast, and besides there is an assemblage of separate water tanks, which can be filled or emptied easily by means of pipes made to contain any quantity of water up to two tons. If the boat is capsized, the light air cases at the gunwale have of course a strong tendency to rise, while the iron keel and cases filled with water have a tendency the other way, viz. to sink. Thus, without any effort of the crew, the boat rights herself. She has indeed very little chance of going over. The crew either lash themselves to

the thwarts, or there are becketts, that is to say loops, fastened all the way round the boat, by which they may haul themselves in. This boat was rigged with a lug mainsail and mizen, and could set a foresail. With thirty persons on board, she draws two feet of water. One of the peculiarities is that the water is let out of the bottom of the boat by valves, so that she speedily not only rights herself, but frees herself from water. She weighs with her fittings about three and a half tons, and each boat costs about 250*l*. She is capable of carrying fully seventy persons. Captain Charlwood, of the Navy, made the first experimental trip, in the first boat built after Mr. Beeching's plan, with a crew of sixteen picked hands, and pulled in a variety of directions through a terrific surf, breaking at the time on the Goodwin sands; since then she has been tried on numerous occasions, and found to answer in every respect. I have also seen some other life-boats constructed to right themselves, but their bows and sterns rise very high out of the water, and hold so much wind that they must very materially impede the progress of the boat when pulled head to wind, and make it at all times difficult to steer her.

On the beach at Great Yarmouth, in Norfolk, a number of very fine boats are to be seen. The finest are what are known as Yarmouth Yauls. They measure from fifteen to twenty tons. They have very sharp bows, but draw very little water forward; their extreme beam is some

way aft, and they narrow away aft with a remarkably sharp run. They carry a mainsail, foresail and mizen, and are supposed to be the fastest boats on the coast.

THE COBBLE, OR COBLE. Off the coast of Northumberland, I have frequently seen pilots put on board the vessels from the most curious style of boat, which they called a cobble. She is very deep forward, with a deep, broad stem, but she narrows and rises aft, her keel at the same time diminishing till she has no keel at all, and very little depth. She would thus have no hold of the water, and would be utterly helpless in a sea, had she not a very deep rudder, which goes a long way down below her bottom, and has thus a powerful hold of the water. She carries one large lug sail, which is hoisted and lowered in an instant. No better sea-boats exist, or more capable of standing the rough weather of the German Ocean. Floating, as the stern does, just on the surface of the water, it rises immediately when a sea strikes it, at the same time that the rudder, from its length, retains its hold on the water, and the boat continues to be steered properly. Also, when it is necessary to beach the boat, the sail is lowered, the rudder unshipped, and she is pulled in stern first. Having so deep a stem, she has a great grip of the water, and thus sails very close to the wind. Her ballast is, of course, chiefly forward, but she requires very little. As the fore part has little to drag after it when once it has divided the water, she sails very fast, both on

a wind and before it. Indeed, probably no boat for the purpose possesses so many good qualities as a sea-boat, or a beach-boat. She has not capacity, however, and cannot carry many people, or much cargo; in smooth water other boats might beat her. I do not fancy that she can be a good boat for pulling; yet, for what she is wanted, she is admirable, viz. for beaching, for sailing fast and close hauled, for living in a heavy cross sea, and for going along-side a vessel; yet she requires delicate handling, and only those accustomed to her are fit to go in her.

**THE CORACLE.** You may be surprised to find the coracle mentioned among the boats of the present day, yet I have myself seen it on the river Wye, in South Wales, and I have heard of it on some of the rivers on the east coast of England. It consists of a large wicker basket, with a hide stretched over it, or rather, I should say, that the frame-work of the boat is made of wicker, and that hides, neatly sown together, are stretched over it to serve instead of planking. It is the identical craft which was used by the Ancient Britons, when our snug little island was first invaded by the Romans. They probably had them of a much larger size than those at present in use. They are so light that a man can easily carry one on his back. They have a thwart across in the middle, and one aft; in the after one a strap is passed, which, when a man is carrying it, fits over his head. They are paddled like canoes, with single paddles.

THE THAMES WHERRY. Long has the Thames wherry been celebrated as the boat pulled by the smart young waterman. She is long, low, and somewhat crank; her upper works fall out considerably. She is a very fast boat, and well suited for smooth water. She is generally pulled by two hands, with oars.

THE FUNNY is built like the wherry, but is smaller, and is pulled by one man, with a pair of sculls.

PORTABLE BOATS. I must not omit to mention a boat invented by Lieutenant Halkett, now Captain, I believe, R.N. It is made of India rubber cloth. The sides are like a huge bladder, which can be filled with wind by a pair of bellows. Wooden seats fit into straps so as to secure them, as does also a step for the mast, or, rather, for the triangle on which the sail is set, for they can carry sail. They are moved best, however, by a paddle. When inflated, the larger ones carry three men. A man can easily carry one on his back. The same officer invented a boat of this description, which, when not inflated, he could wear as a cloak, while his paddle served him as a walking-stick, and the sail as an umbrella. To the astonishment of some old shipmates, he once paid them a visit on board a man-of-war, and sent away his boat. When wishing them good-by, he was asked if he did not want a boat. "No," he answered, "I shall just go on shore in my cloak." To the surprise of all, he filled his cloak with air, and fitting it up, he begged to be lowered down in it,

when away he paddled, and reached the shore in safety. Such a boat is invaluable in exploring expeditions, and as a fishing-punt is often very convenient.

Life-buoys are made on the same principle, but they are not such as I should like to trust to. The best description of life-buoy is that which consists of a number of small water-tight tubes ; these tubes are kept inflated by a small quantity of stiff horse-hair, just sufficient to prevent them from collapsing. I have frequently tried this sort of life-buoy, and have found great buoyancy in it. I have a belt and breastplate made of it, which fits into the breast of a great coat. I have also a deck-seat, or cushion, made in the same way. I believe the patent is taken out by Messrs. Silver, of Cornhill ; at all events, I got my cushions there.

I have not yet described the parts of a boat. The bottom boards are the loose boards for the feet to rest on. The THWARDS are the cross seats. The STERN-SHEETS is the after part of the boat, where the seats are placed against the sides fore and aft. In the after part there is one seat across for the steerer to sit on. THOLES are the pegs which fit into holes in the gunwale, between which the oars work when being pulled. RULLOCKS are square indentations, which allow the oar to slip into them. The part of an oar which works in the rullocks or between the tholes, should be covered with leather, or copper, or served round with line, or it quickly wears out. The upper edge

of the sides is called the GUNWALE, but a wash-strake is sometimes put on above this to keep out the seas. The PAINTER is the rope fastened in the bows, by which a boat is towed. The TILLER fits into a hole in the rudder, and is shipped or unshipped. The YOKE is a flat board which fits over the head of the rudder, and lines being rove through the ends, the boat is steered by them. A SHOE OR BAILER is used to bail out water. A BOAT-HOOK is a spar with a hook and spike at the end of it.

I believe that I have now fully described the various sorts of boats to be found on the English coast. There are, undoubtedly, many different names given to boats, but they have no striking peculiarity to distinguish them from those I have mentioned. The Irish hooker is a little rough craft, a cutter, generally known more by her tattered sails, make-shift rigging, than by any other peculiarity; and the same may be said of the craft to be found on the west coast of Scotland, running between the different islands scattered about there. In case my lists should not be complete, I shall be glad to have descriptions sent me of any vessels which I may have omitted to mention.



## CHAPTER IX.

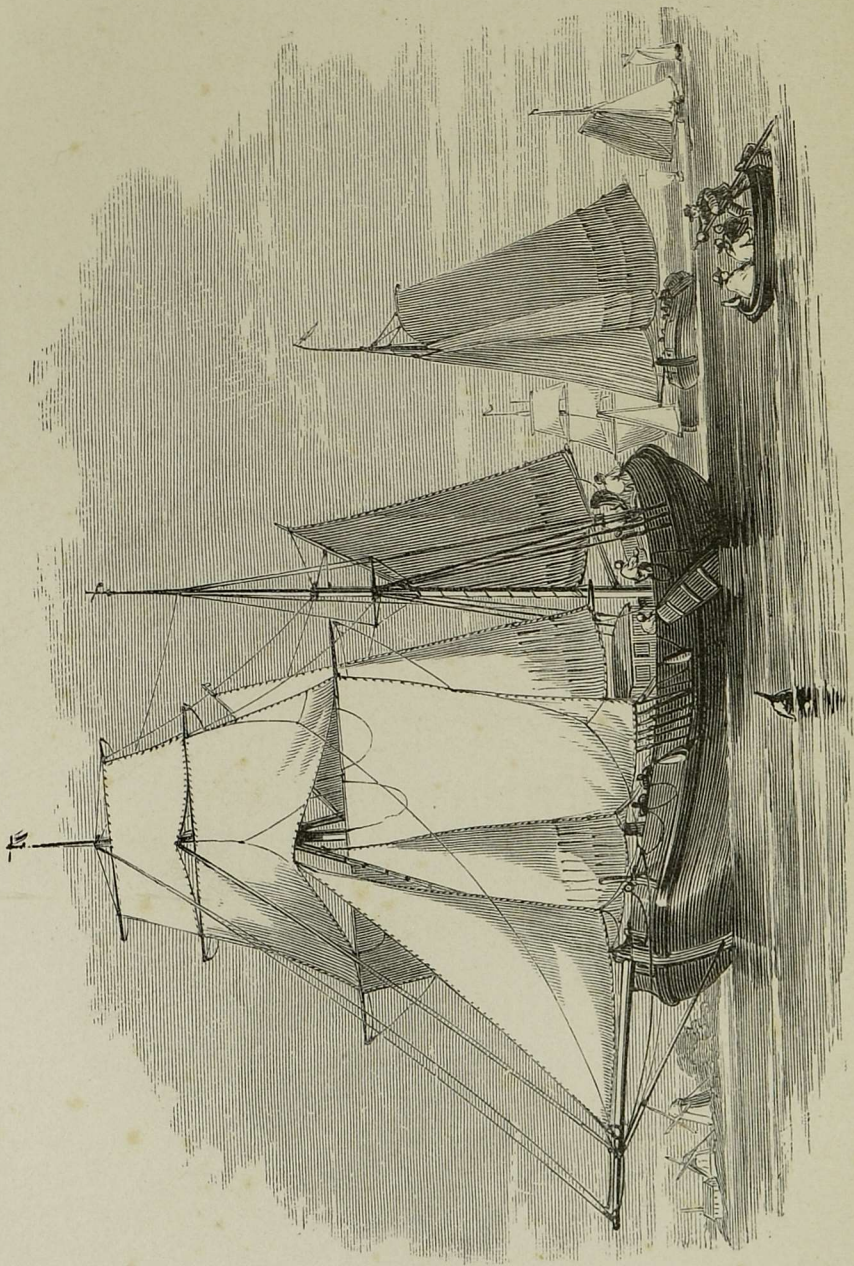
## VESSELS AND BOATS OF EUROPE.

I PROPOSE going round the coasts of Europe, and taking notice of the various craft to be met with on the voyage. We will begin at the north. Russia, as is well known, has copied all her vessels from English models since the time Peter the Great came over to England to study naval architecture in a shipwright's yard. A boat he built with his own hands, and navigated himself, is still shown at his marine villa near St. Petersburg, and called the Father of the Russian Fleet. The only vessels I have seen peculiar to the Baltic are little Finnish schooners, which cruise along the coast and bring up provisions to the capital. They appear to have no paint and no iron-work about them. They have sails of thin white canvas, and very few ropes; and those are white and free from tar. Altogether they have a most frail and unseaworthy look about them. The Finns, however, are a very hardy race, and the best seamen of all the people under the dominion of Russia. The Russian navy, which began with the one boat built by the czar, now numbers no less than 158 men-of-war, many of them ships of the line and heavy frigates;

besides which there are numerous screw and row gun boats. The Russians have an ingenious way of raising their largest ships out of the water to repair them. As there is no rise and fall of the tide in the Baltic, they cannot place them on shore to examine them. They therefore place on each side of them what may be described as huge boxes, as long as the ship, and of considerable depth. They are called "camels." These are floated up alongside, and being filled with water they sink under her. They are then secured, and a framework of timber is built up and fastened to her. Numerous pumps are now set to work; and as the water is pumped out of the camels the huge ship is thus lifted bodily out of the water, so that she can be replanked even, if necessary. Their very largest first-rates are thus treated.

It is not till we arrive in Holland that we meet with any very peculiar vessels. Galliot, Dogger, Scuyht, are names given to different sorts of Dutch vessels. I will describe the galliot, which may serve as a type of the rest. She is very strongly built with stout timbers and thick fir plank; she has flat floors, and but little keel. There is not much difference in the shape of her head and stern, which are both well rounded, or, rather, the bow may be called very bluff. She has little or no keel, but a deepish, thick stem; and her rudder is very wide, and is hung outside all. On each side is hung up a huge lee-board to prevent her going to leeward. Her planking is not painted; but after she is caulked it is covered over with a very thick





DUTCH GALLIOT, ETC.

coat of a yellow and peculiarly bright varnish, which shines in the sunbeams. Her hold is very capacious, and the whole of it is devoted to cargo. She has high bulwarks; and the after part of the deck being sunk slightly, a wooden house with arched roof is raised over it, intended for the accommodation of the master and his family. It is remarkable for its peculiarly gay and fresh paint. The windows have Venetian blinds, the doors are of mahogany or other fine grained wood, and the interior is fitted up with a sitting cabin and a number of neat sleeping berths. There is a wide, low, but capacious caboose, and another house forward for the men to live in. The hatchways are long, strongly secured, and the hatches are highly varnished or painted; indeed, varnish and paint are everywhere prevalent. She is rigged something in ketch fashion; she carries squaresails on her mainmast, and a fore and aft mainsail, and a gaff mizen with mizen gaff topsail, and a high steeking bowsprit. Her masts are well scraped and polished, and her crosstrees and mastheads are painted. Her sails are beautifully white or brightly tanned. Altogether, though she looks not entirely unlike a huge Brogdignagian wash tub, which some boy of that giant race has fitted up with sails, she is really a very fine sea boat. The well known enterprising blind traveller, Lieutenant Holman, R. N. told me that he, in one of his many voyages, crossed from Rio de Janeiro to the Cape of Good Hope, in a Dutch Galliot, when she encountered a very heavy gale

of wind, but that she was hove to, and rose like a wild fowl on the waves, and that he never was in a more comfortable sea boat. Before the wind, considering these bluff bows, they are very fast, in consequence of their drawing very little water; and on a wind, with their lee-boards down, they sail remarkably well. In describing them I ought to say that their upper works fall in, that is, bend in all round very much, just as the upper part of an egg does. Thus the deck is much narrower and shorter than the part just above the water. At the bows and stern they fall in very much more than do any other build of vessel. Thus, the upper works offering little resistance to the seas, they scarcely ever break on board, or carry the bulwarks away, as is often the case with other vessels. An immensely stout wale or girde runs round the vessel, and binds all the upper timbers together, very much adding to her strength. The great object of the Dutch builders is to give the vessels a capacious hold, and this they do by putting many of the strengthening timbers outside instead of inside them. They vary in size from sixty to eighty, and even a hundred and fifty tons. Dutch vessels, when larger than that, are built like other ordinary merchantmen of Europe, and very fine ships many of them are. Their men-of-war are likewise large and well-built ships, and in the wars in which Holland has foolishly engaged in with England, they have fairly competed with ours, though ultimately beaten. The Dutch Navy at present consists of

twenty-one ships of the line, and frigates, of upwards of fifty vessels, carrying from four to twenty guns each, and of about sixty gun-boats, and other government vessels. The Dogger is in many respects like the galliot, but smaller and not so much ornamented. Scuyht is Dutch for a boat ; and all sorts of small craft are called by that name. The Scuyht met with at sea, is a sloop rigged decked vessel, built in most respects like the galliot. It is pronounced Schifts—and thus a steam-boat is called Damp Schifts. On the Rhine a number of curious vessels are to be seen. The Rhine barge is not unlike those to be seen on English rivers, but is larger, and is remarkable for her huge rudder, and great thick beam serving as a tiller. She carries a very large cargo, and is always well painted and polished.

The most remarkable objects afloat on the Rhine are the timber rafts, which appear like islands, with whole villages on them, taking a cruise. They consist of logs lightly bound together, and must cover not much less than a quarter of an acre. They have short masts and square sails stuck about them, not only to assist their progress, but to help steer them, while several long rudders are fixed astern for that purpose. There are cottages built about them of rough planks, in which the crew and their families live during the voyage. At its termination the raft is broken up, and the logs are either shipped on board vessels for exportation, or sent to saw-mills for home consumption.

From Holland and Belgium we pass along to the coast of France. Here luggers of all sizes are prevalent, from open boats to vessels of one hundred and fifty tons and upwards. Some are coasters, carrying on a petty commerce from port to port. A large number are fishing-vessels, and are strongly manned craft. In shape they are long and narrow, with bows bluff above water, though sharp below and flat sterns. This was the favourite vessel used by smugglers, because, as they were able to lower down their lugs while their masts had scarcely any standing rigging, they were often able to escape the observation of the revenue cruisers. In the war time the French had a number of large privateers rigged as luggers, which, from their low masts and light rigging, were often able to lie hid till they could pounce out on their prey. They are also fine sea-boats, and are noted for their fast sailing qualities. It is a great advantage in a heavy sea for a vessel to have no tophammer, which is the case with luggers. They are suitable, however, only for those classes of vessels in which a number of men can be carried. The French coast-guard vessels, called *Chasse Marès*, are rigged as luggers. They are generally gaily-painted craft, with a considerable sheer, that is, the after part and bows rise in a curve higher than the waist or centre part. The rudders are wide, and hang outside. Many quite large craft are almost or entirely open, with only a fore-castle, under which the



crew sleep. Some way back you will find a print of a lugger, which gives a very correct idea of the sort of craft I have been describing. On the north coast of Spain I can remember no vessels which have any peculiarities. The boats I have seen at St. Sebastian, Passagos, Corunna, and Vigo, are large, with stem and stern alike sharp, and manned by strong crews. The oars work on single tholes, which pass through a piece of wood secured to them.

On the coast of Portugal, however, there are a great variety of craft worthy of description. The ships and large vessels do not differ much in appearance from the English. The Portuguese build very fine, long, low, raking schooners, which too often find their way into the hands of slave-dealers, and are employed in the slave-trade. They frequently, for their lighter sails, use cotton-cloth.

The *HIATE*. The Portuguese trading schooners are, however, unlike any other craft. They have good beam with very short counters; some have round, and others nearly flat, sterns. They are either contracted, or fall out in their upper works, which makes their hulls look ugly. They are all decked, and vary in size from forty to a hundred and fifty tons. Many of them trade to England, or cross to South America. Their chief peculiarity consists in their rigging. They have only lower masts, which rake at different angles, while the gaffs of the foresail and mainsail hoist to different heights; one being almost hori-

zontal, and the others much more peaked up. They carry fore staysail, jib, and flying jib, or jib topsail, with gaff topsails, and a large square sail and square topsails. Under plain sail, I have never seen a more ungraceful, ugly-looking craft. They are, at the same time, said to be fine sea-boats, and they frequently perform long voyages.

The RASCA is generally only used as a coasting vessel. I have met with some government revenue vessels, or men-of-war, with this rig. She is long and low, with considerable sheer, low bulwarks, with stem and stern much alike, both being sharp, rising also at each end. She has two or three short stumpy masts raking forward, and on these are set, beautifully cut, lateen sails, with long tapering yards, so that, when under weigh, she has a peculiarly picturesque appearance. Her upper works fall in very much, and her deck is rounded, so that she appears as if she would prove a very fine sea-boat. Her entire outside is painted black, and generally green or some dark colour inside. When before the wind, lateen sails can be set so that the yards cross each other, which has a very picturesque effect.

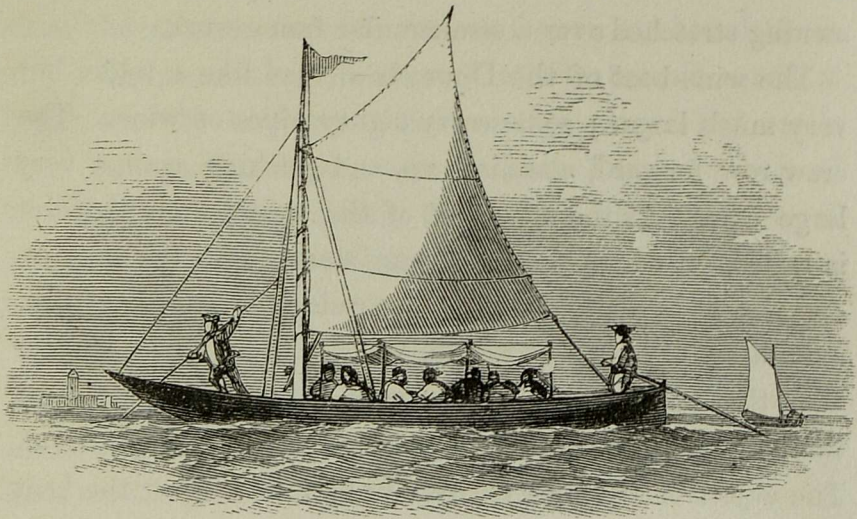
The Lisbon Beanpod is the most curious of European craft. I do not know by what name the Portuguese call her. That of Beanpod exactly describes her shape. Take a well-grown beanpod and put it on its convex edge, and then put two little sticks, one in the centre and one at the bows, raking forward, for masts, and another in the bows, steaving up, for the bowsprit, and another astern for a

bumkin or outrigger, and you have before you the boat in question. The mainsail is a large lateen sail, but it has very little peak, as the upper end extends right aft over the stern of the boat. From the point to the end of the bumkin two triangular sails are set, while from the mast forward a four-sided sail is set; the opposite angles reaching perpendicularly from the foremast head to the heel of the bowsprit, and horizontally from the mainmast head to the end of the bowsprit. Two little square sails are set on the bowsprit, but perpendicular to the water, to act as fore and aft sails. The object of the rig appears to be to keep all the sail as low as possible. The hull is equally curious. She curves, or rather curls up, at the bow and stern, where the deck—if so it may be called—is completely rounded in, just like the end of a bean; and even in the waist, where there is a deck, it is very narrow. They sail very fast, and close on a wind, and they are employed as fishing-boats, chiefly as trawlers, and are to be seen in numbers off the Tagus, where they have a curious, if not a picturesque appearance.

The CATRIA, employed by the pilots and fishermen off the Douro, is one of the finest sea-boats I have ever met. She is about thirty feet in length, bows and stern sharp, and the bows like those of a cutter. She is a deep boat—three feet or more, with considerable sheer—completely open, with thwarts for her entire length, pulls twelve or sixteen oars, double banked, has a wide and deep rudder,

the head of which rises high above the gunwale, so that the helmsman stands up to steer, or sits in calm weather on the gunwale. On ordinary occasions the crew dress in red caps and sashes and white shirts; are noisy enough, but when blowing hard, they all are silent, listening to the commands of their chief. They have visited a ship in the offing, and are pulling in towards the shore, on which a heavy surf is now breaking. There is a bar across the river, which has to be passed. They reach the spot where the huge Atlantic rollers begin to break. Several break one after the other just ahead of them. Now they pull ahead; now they back to avoid the breakers. At length the largest breaks, and the pilot gives the word. They are to pull for their lives! On they dart; the seas come rolling up astern, but they keep ahead of the breakers. Now the boat rises to the summit of a roller; now she sinks down into the trough of the sea. Advancing or pulling back at the right moment, at length she reaches smooth water in safety. A man-of-war's boat, manned by a fine crew, and many a merchantman's, has attempted to do the same; the boats have been hurled over and over, and all hands have met with a watery grave. The sail of the catria is very picturesque. It is a wide lug, with a very high peak. The tack is hooked forward, and the after clew reaches right aft, so that on a wind the whole body of the sail is within the boat.

TOLDO BOAT of the Douro.—This boat is perfectly flat-bottomed ; the sides slope out, and the after end is round and low, but it rises at the bow into a sharp point, wide, however, above, where there is a little deck, on which one of the rowers stands. It is covered with a wooden or



TOLDO BOAT OF THE DOURO.

canvas awning, supported on stanchions, something after the fashion of a Venetian gondola. The oars used are long with very broad blades. The rowers stand up and push against the oars. One stands aft and steers the boat ; sometimes shifting his oar right aft for steering, and sometimes rowing. One or two men row in the bow ; when there are two they cross oars—that is, the man who rows the starboard oar stands on the port side, and the

man who rows the port oar on the starboard side. A long, thin, rough pole is used as a mast, on which a spreet-sail is set. The toldo behaves very well under sail. The passengers sit along the sides, as do those in a gondola. The roof is flat, and painted green: it is used by all classes. The commoner sort of toldo has merely a white canvas awning stretched over a semicircular frame-work.

The wine-boat of the Douro is shaped like a toldo, but very much larger; some carry eighty pipes of wine. The crew row forward, standing up, and pushing against very large oars. At the after part of the boat a high platform is raised, on which the helmsman stands with the captain, and one or two other men. The rudder is a great beam, extending a long way astern, with a wide blade, shorter than that of an oar. It works on a pivot at the end of the stern post, while the inner part rises to the platform. The object of the long oar-like rudder is to steer the boat while she passes down the rapids, which are to be found in the upper parts of the river Douro; the blade is thus beyond the eddy, which would otherwise twist round the boat.

The AVEIRO CANOE.—Some way to the south of the Douro there is a village called Aveiro, inhabited entirely by fishermen and their families. They are said to be descended from Moors, and this account their appearance, dress, habits, and even dialect, corroborates. They are tall, thin, dark men; they dress in a red cap, a white shirt, and

very large white trousers, scarcely reaching to the knee, a blue cloth vest and red sash. Their canoes have a completely eastern look ; they are very long and narrow, sharp at both ends, which rise above the water, and are completely covered in, leaving only a small space open in the centre of the boat. They come a considerable distance along the coast in these canoes, and sleep on board them under the covered part, each end of which looks as if it could scarcely hold more than one person. They catch their fish on the beach,—chiefly sardinhas, a species of herring,—by means of very long seines, or rather several seines joined together, the property of several families of the community.

I had forgotten the farm-produce carrying boats of the Tagus. Sometimes may be seen what looks like a haystack afloat, but is in reality a boat of hay piled up on a platform on a large boat rigged with a lateen sail.

The variety of vessels in the Mediterranean is very great, at the same time they mostly bear a strong resemblance to each other. Lateen sails predominate. On the south coast of Spain we find the ZEBEC ; she is square-rigged foreward, with a steering bowsprit, a huge jib, and a lateen mainsail and mizen.

The SCAMPAVIA of the Mediterranean is a graceful-looking craft, of a very mixed order of rigging. Her mainmast is square-rigged, while her foremast rakes foreward, and carries a large lateen sail, with a steering bow-

sprit, and a little jib. On her mizenmast, which rakes aft, she also carries a small lateen sail.

The BOMBARDA is something like a brigantine or a ketch ; that is to say, the foremast is square-rigged and the mainmast has a mainsail and gaff topsail ; the foremast has, however, no tops or crosstrees, but is made polacca-fashion, that is, the mast is all in one.

POLACCA BRIG.—This is a very common rig among the Greeks ; the masts being all in one, have a peculiarly light and graceful appearance, that is to say, lowermast, topmast, and top-gallant mast ; the topsails and top-gallant yards can thus slide down to the lower yards, where the sails are furled, and there is no top weight except that of the masts themselves. The objection to the fashion is, that if a topmast is carried away another one cannot be so rapidly fitted as in the ordinary style ; ships, as well as brigs, are rigged in this style.

The GREEK MYSTICO.—Although many of the Greek vessels are very graceful crafts, as much cannot be said for the mystico ; she has but one mast, with square sails set on it ; it rakes forward, while the bowsprit steeves upwards. The mainsail is set with a spreet, and is very much wider at the head than it is either in height or at the foot, so that it has a peculiarly ungraceful look. The hull is in some respects like that of the catria I have described.

The FELUCCA of the Mediterranean is generally a long, sharp, gracefully-built boat, with two lateen sails and a jib.



The *BALANZA* of Sicily is something of the felucca. Her mizen, however, is small, and not always lateen, being more of the lug cut. She has also a jib set on a steeving bowsprit.

The *SETTEE* has two masts pretty close together, with high peaked lateen sails. When running, they are set wing-a-wing—that is, one over on each side; and, under these circumstances, a triangular sail is set between the two points, which, when she is bow on, gives her a very peculiar appearance.

The vessels of the Adriatic are peculiar.

The *TRABACOLO* is a fore and aft rigged vessel, something like a schooner, but her sails are high narrow lugs. She carries a fore staysail and jib, and square topsail and topgallant sail. Some of the smaller men-of-war of the Austrian government are thus rigged. The fishing-boats seen near Trieste are rigged with two large sails, somewhat of the lug fashion, but with long yards, and have no jib. Other boats are seen in those waters with the foresail lateen, the mainsail lug, and on the bowsprit two little square sails, which answer the purpose of a jib.

The *GONDOLA* of Venice.—No boat has been more often described than the gondola. “Didst ever see a gondola? If not, I will describe it to you.” Gondolas are of two sizes. The largest, rowed by two men, are thirty feet in length and five in breadth. They are flat-bottomed and very narrow, but gradually widen towards the gunwale.

They bear in shape a similarity to the war-canoes of the New Zealanders, and some other savage people. They narrow away towards the bow and stern. The bow is ornamented with a high iron beak, such as the galleys of olden days used to carry. This is generally highly polished, so as to shine in the sunbeams. The stern also rises into a point, and is so narrow, that it is lifted completely out of the water by anybody stepping forward. There is a platform at this end, on which one of the rowers stand. The boatmen are called gondoliers. They stand up and impel the gondola by pressing their oars against a long crooked thole, as do the crew of the toldo boats on the Douro. In the centre part of the gondola there is a framework with a circular top, covered entirely with black cloth, ornamented with tufts of the same colour, which give it somewhat of a funereal appearance. There is a window at each side and a door at the fore end. The passengers sit fore and aft, with their backs to the side. About six people can sit with ease under the awning. The benches are covered with velvet, and the floor is richly carpeted.

The larger gondolas I have described are rowed by two men, the chief gondolier standing in the bow of the boat. The smaller ones are impelled by one man. Once upon a time the wealthy inhabitants of Venice vied with each other in the magnificence of their gondolas, spending immense sums upon them ; and to so great a height did

this fashion run, that many even injured their fortunes by their foolish extravagance. At length the Doge took the matter up, and a sumptuary law was passed, regulating the form and colour, as well as the size of the gondola, and this law remains still in force. Every establishment has its gondola, and people of fashion, instead of ordering their carriages to take a drive, order their gondola, to enjoy a row through the numberless canals which pass through most of the streets of the city, or out on the calm waters of the Adriatic. As there are private carriages and hackney cabs, so are there private gondolas, fitted up with the greatest luxury, and public or hack gondolas, for the use of anybody who may call them. In days gone by the gondoliers delighted in singing as they rowed, keeping time with their oars, both for their own amusement and for the sake of giving notice of their approach to the other gondolas moving in other directions; but a cloud has long hung over fair Venice, and the voice of merriment is now silent on her waters.

There are undoubtedly many other boats under different names, and with slight variations from those I have described; but I believe that I have omitted none to be found on the coasts of Europe likely to prove interesting to my readers.

## CHAPTER X.

## VESSELS AND BOATS OF AFRICA AND ASIA.

THE numerous large and powerfully armed vessels fitted out by the Barbary States, and which at one time held the merchantmen of Europe in terror, have now disappeared. The Saicque is one of the few crafts which remain. She is a vessel with a broad beam, decked over with large hatches, and a low house aft, in which the crew live. She carries two stumpy masts, with large lateen sails and no jib, and is generally a fast vessel.

The Riff Pirates possess some large swift pulling row-boats, with which they still attack any small merchantmen drifting near their coasts; but the punishment they have of late years received in consequence of their conduct have taught them the danger of their mode of proceeding.

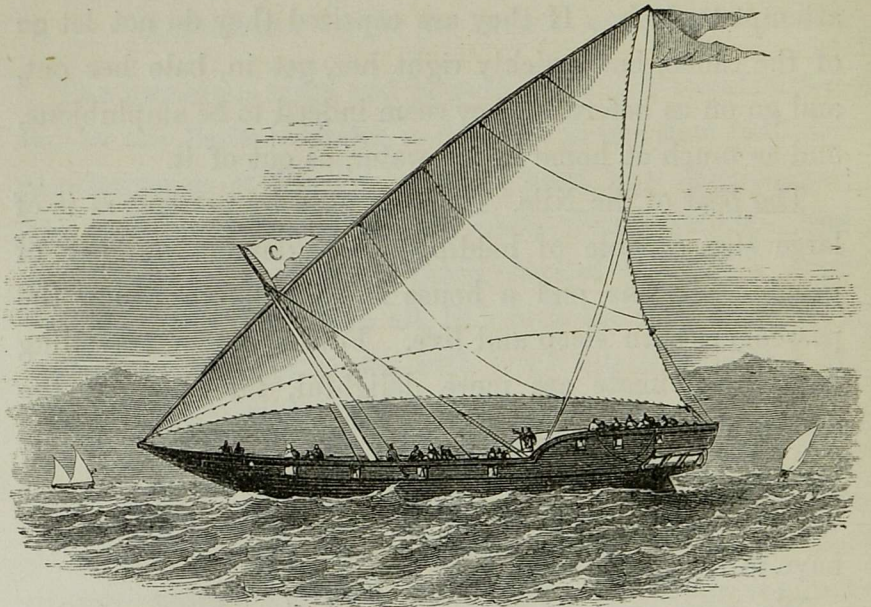
The Canoe of the Coast of Guinea is what is commonly called a Dug-out; that is, it is formed of a single tree, which having been cut into the shape of a canoe, the interior is scooped or dug out. It is very long, thirty feet sometimes, but so narrow that there is only just room for one man to sit in the space between the two sides, though one will carry

eight or ten people. They sit on round bits of wood placed at the bottom of the canoe, which is so deep in the water, that it is constantly washing in. Some of the crew are therefore always employed in baling it out. They paddle with very short paddles, and go along at a great rate. There is a heavy surf on the shore, through which they frequently attempt to dash. If they are capsized they do not let go of the canoe, but quickly right her, get in, bale her out, and go on as before. They seem indeed to be amphibious, and as much at home in the water, as out of it.

The boat of the Nile. The boat used by passengers is of large size, capable of holding a considerable number of people. At one end a house is built up, in which the passengers both sleep and live. Few modes of travelling in a hot climate are more delightful, for although the scenery on the banks of the far-famed river may be monotonous, the interesting ruins to be visited during the voyage, make ample amends for all inconveniences which have to be undergone.

We now come to Asia. Along the shores of that wonderful quarter of the Globe there exists a very great variety of boats and vessels. No people in the world surpass the natives of our Indian possessions in the art of ship building, especially in the way in which they join the planking of their vessels so as most effectually to keep out the water, without any additional caulking. Where the planks join, there is, I believe, at the time put in a

very slight amount of cotton, to fill up any unevenness in the wood. Several fine line of battle ships have been built in India of teak, and they have been in every respect found to be equal to those constructed by our own shipwrights at home. Both the naval architect and the builders



THE ARAB DOW.

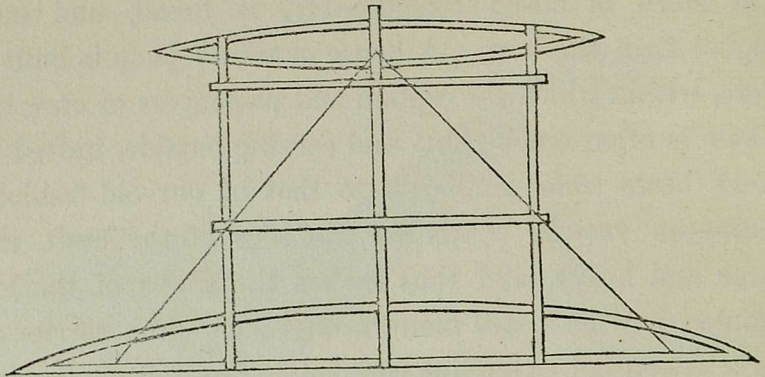
have been natives. Having gone round the African coast without meeting with many craft to afford us much interest, we will cross the Straits of Bab-el-Mandel, when we shall find ourselves off the coast of Arabia. Among all the craft which navigate the Indian seas the most commonly met with is

The ARAB DOW.—She is a vessel of from sixty

to eighty tons, often more, and yet for the most part completely open. Her hull is of an odd shape, and has a most unseaworthy look. The bow, especially, rises high out of the water, gradually narrowing and projecting a long way beyond the hull, till it becomes a mere point. The stern is raised considerably, is broad, and much higher than the bow. A house or raised poop is built up here, within which the captain and passengers or crew live. There is often much paint and carving outside, indeed the stern bears some similarity to that of our old-fashioned European vessels. Only for the size of the craft, it is large and heavy, and thus makes the shape of the long pointed bow look still more incongruous. She carries one large lateen sail, extending completely fore and aft, the tack being hooked on to the bow, the mast rakes forward, and is set up with a runner and tackle. They have of late been found employed in carrying off slaves from the east coast of Africa, to supply the larger slave vessels, who meet them at a small island to the north of Madagascar.

**THE BOAT OF THE INDIAN SEAS.**—The great principle of this strange craft is the outrigger, which projects a long way out on the weather side, with a small canoe attached to it; the lee side is perfectly flat, but the weather side is rounded to throw off the seas; the stem and stern are exactly alike, so that the boat is never put about, the sail alone being shifted. The object of the outrigger is to balance the boat, which would otherwise instantly go over

on the flat or lee side. The lee side being flat, no resistance whatever is offered to the water. When necessary, the crew can run out to the end of the outrigger, and thus increase the weight on the weather side. The following diagram will serve to explain the principle of these curious craft.



OUTRIGGER CANOE.

These craft are of different sizes, and are rigged in a great variety of ways. One of the largest is a decked vessel, with one mast, on which, in a very ingenious way, two square sails are set. The mast is stepped in the middle of the vessel, and on that a large square sail is set, with a shifting bowsprit and jib set on it. There is a long swinging boom stayed up at an angle of  $45^\circ$  to the mast, so that the end hangs out towards the stern; to the end of this another smaller square sail is hoisted, and the sheet brought right aft; thus the jib and bowsprit and this boom and square-sail are very easily made to change places.



The CANOE of TRINCOMALEE is a dug-out, and carries three or four people ; the sail is set between two bamboos, which fork upwards from the centre.

THE CEYLON DOW.—This craft is very unlike the Arab Dow in build, having a much more sea-worthy appearance ; she is in shape not altogether unlike a Dutch Dogger ; indeed, in consequence of the Dutch having been long masters of the principal parts of the island, it is very probable that she was formed after the models of the smaller vessels which came from Holland. Sir Emmerson Tennant, in his admirable work on Ceylon, describes another craft used by the Singhalese. After mentioning the dows, the dhoneyes, and the patamars of the coast of India, he says, “But the most remarkable of all are the double canoes of the Singhalese, which dart with surprising velocity among the shipping, managed by half-clad natives, who offer for sale beautiful but unfamiliar fruits and fishes of extraordinary colours and fantastic forms. These canoes are dissimilar in build ; some consisting of two trees lashed together, but the most common, and by far the most graceful, are hollowed out of a single stem from eighteen to thirty feet long, and about two feet in depth, exclusive of the wash board, which adds about a foot to the height. This is sewed to the gunwale by coil yarn, so that no iron or any other metal enters into the construction of a canoe. But their characteristic peculiarity is the balance log, of very buoyant wood, upwards of

twenty feet in length, carried at the extremity of two elastic outriggers, each eighteen feet long. By these arrangements not only is the boat steadied, but mast, yard, and sail are bound securely together. The outriggers must, of necessity, be always kept to windward; and, as it would not be possible to remove it from side to side, the canoe is so constructed as to proceed with either end foremost, thus elucidating an observation made by Pliny eighteen hundred years ago, that the ships which navigated the seas to the west of Taprobane *had prows at either end*, to avoid the necessity of tacking. These peculiar craft venture twenty miles to sea in the strongest wind, and they sail upwards of ten miles an hour. It is remarkable that this form of canoe is found only where the Malays have extended themselves throughout Polynesia and the coral islands of the Pacific; and it seems so peculiar to that race, that it is to be traced in Madagascar and the Comoros, where a Malayan colony was settled at some remote period of antiquity. The outrigger is unknown amongst the Arabs, and is little seen on the coast of India."

The PATTAMAR or PATTAMACH of the Malabar coast is not unlike an Arab dhow in build; she has the same long bow and high stern, with a curving sheer; she has a counter, but not very deep, and a high taffrail; she carries a large lateen mainsail, and a small mizen; these sails have a high peak, and are between the lateen and lug in shape.

The CATAMARAN, or SURF-BOAT of MADRAS.—There is no harbour at Madras, so that ships have to remain at anchor in the open roadstead. Persons going on shore have therefore to land on the open beach. Often, however, a heavy surf sets on the shore, through which no ordinary boat could pass with safety; the natives have, in consequence, invented a sort of raft, called a Catamaran, seated on which, and perfectly naked, they will force their way in the most blowing weather out to sea, and carry messages to the ships in the offing. They wear high conical caps, secured by the folds of their turbans, and into this cap they put any letters intrusted to them. The catamaran consists of three logs, pointed at the bows, and slightly narrowing astern. They are fastened together by two cross-bars; the rower sits on the after one, and presses his feet against the one forward, which is exactly at the part where the three points separate. He uses a longish paddle. Being an excellent swimmer, if washed off he speedily regains his raft, and rarely or never are any of them lost.

The MASSULAH BOAT of MADRAS.—This boat is a widish dug-out canoe, very destitute of grace or elegance. It is, however, from its form, well adapted for passing through the surf on the Madras coast in moderate weather. The crew, who sing as they paddle, are very nearly naked. Passengers from the ships generally land in these boats.

DOUBLE CANOE of MADRAS.—For crossing rivers in the

Madras Presidency a double canoe is used. It is formed of two logs of the Palmyra palm, which is excessively light. The trunks are dug out; the bow being rounded, and gradually narrowing towards the stern. They are placed about six feet apart, and connected by a bar at the head. When a palanquin has to be conveyed over a river, it is placed across the two canoes towards the after part.

The INDIAN BUDGEROW and DINGAY.—The Indian rivers are crowded with craft of all sizes, but they do not differ very much in shape. The budgerow is employed by travellers proceeding up or down the rivers. It is a somewhat shapeless and ungraceful mass. The stem and stern rise high out of the water, and are extremely bluff. They are flat bottomed, and thus draw very little water. In the after part a cabin or house is formed with bamboos; the roof and sides being closed in with strong jungle grass. It is from thirteen to fourteen feet long to eight or nine wide. There is another cabin for servants forward. The head and stern are generally much carved and painted. They carry one large sail, which is set to stem the current when the wind is favourable. If there is no wind, or it is against them, the crew track the boat along shore. Two oars are used, each rowed by two men. The pilot or helmsman stands on a platform aft, whence he can command a view of everything around. They frequently at their mastheads carry little bells, which, tinkling as they progress, serve to give notice when two boats are approaching

each other. They also carry a white flag. No anchors are employed; the boat, when they bring up, being always made fast to the bank of the river by means of a short stout pole, which is stuck into it, and to which the painter is secured. The rudder is triangular, and of great size. There is but one mast, on which three very thin though large sails are set. They very soon, from their fragile texture, get into holes; but they must be in a very tattered condition indeed before they are considered too bad to use; indeed, sudden squalls are of constant occurrence, and the sails being thus easily blown away prevents the boat from being upset. A small boat, called a dingy, fitted up as a kitchen, is towed astern of the lofty budgerow. Another boat, with the luggage of the passengers, also accompanies her; indeed, in India, there are almost as many people required to be in attendance on a party travelling by water as by land. When the wind is contrary, the boat is tracked or towed along against the stream by the crew. A tow rope is made fast to the masthead, and the crew, attaching themselves to it, work away from sunrise to sunset, frequently having to wade through nullahs or creeks up to their middles in mud and water. On all the rivers of India boats are found little more than canoes, hollowed out and decked over with bamboo, and partly covered in with mats. One man steers and two others paddle. When they wish to sail, they take off the scarfs they wear over their shoulders, and setting them on some slender bamboos,

a sail is procured of sufficient size to drive on their light barks. With so much skill do they manage their frail canoes, that an accident rarely occurs.

BURMESE WAR BOAT from Rangoon. This magnificent canoe is formed out of a single giant teak-tree. The trunk is first shaped into the desired form, and it is then hollowed out with fire. When this operation is completed, a wash-strake, about a foot high, is secured round the gunwale. The stem and stern both gradually narrow, but the stern curves up several feet above the water, and is richly ornamented with carved work and gilding. The bow rises but slightly. On it is mounted a gun, sometimes an eight or nine pounder. The larger boats are propelled by oars, worked by as many as a hundred men, who sit two and two, or double-banked. Paddles are used in the smaller boats, which carry crews of only twenty men. They pull very fast, and no European boat can come up with them.

We shall now have reached a land, whose people claim the patriarch Noah as their first emperor, and who, undoubtedly having once attained a considerable amount of civilisation, have since made the slowest advance of any nation in the world.

Probably but little alteration has taken place in their junks for many hundred years, except, perhaps, that as they found population and commerce increasing, they have enlarged the size of their merchant junks, that they may carry the greater amount of cargo required. There are a

great variety of craft in China, from the handsome junk of eight hundred tons to the insignificant-looking sampan. The sails of all Chinese vessels are made of matting of a brownish-yellow colour. They are set on a yard, and parallel with the yard, entirely down the sail, are strips of bamboo, which serve to strengthen the sail when set, and to reef it easily when it is lowered, as it is somewhat in the fashion of a Venetian blind. Their boats are all of varnished wood. The men-of-war and mandarin boats are generally painted black with red railings; at times, however, their hulls and topsides are white or green. The size varies according to the mode in which they are employed. They have all a very strange, rough, and barbarous look. The larger rise to a great height out of the water, especially at the poop, where there are two or more decks above the maindeck, with much carving and painting,—the cabins often being richly furnished according to Chinese notions. The sides are not rounded, but flat, sloping in gradually to the floor or bottom, which is also flat. The stern is flat, but extends beyond the stern-post. A deep groove or recess is made in it, reaching to the stern-post, and in this groove the rudder is hung. The groove is made that the rudder may be protected from the force of the seas. The rudder itself is very broad in shape, something like that of a Thames barge. A great part of the rudder-head is exposed to view; but in some vessels, which have an overhanging counter, it is partly hid by it.

I will now give a slight sketch of some of the various sorts of craft to be found on the rivers or off the coast of China :—

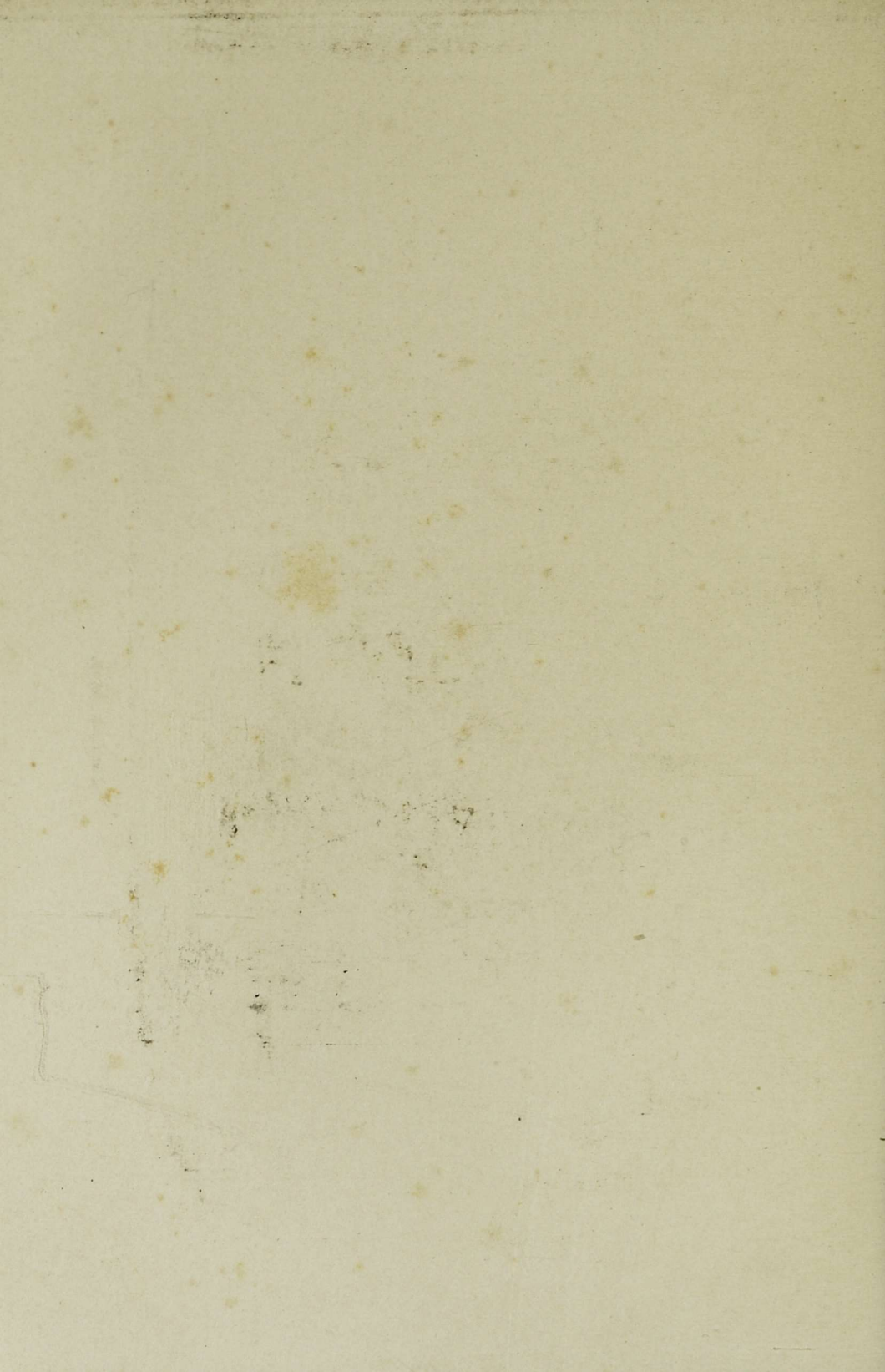
1st. There is the large CHOP, or CARGO BOAT. She is flat-bottomed generally, and draws from six to eight feet of water. The lower part of her hull is painted entirely black. A rail, about two feet wide, extends entirely round her side, above the gunwale. On this her crew walk backwards and forwards; and in calm weather, in shallow water, shove her onwards with long poles. There are many varieties of this style of boat, but all go by the same name of "chop boat." They vary in size—generally from two hundred to three hundred tons; but some are much smaller. The entire of the vessel is covered in, fore and aft, with slight bamboo work, over which is spread a strong elastic sort of matting, formed of the long leaves of the Palmyra palm. This covering is easily removed when the cargo is to be discharged. They have but one mast, on which a large square sail of matting is set. It is extraordinary how easily they work under this single sail. They stay very rapidly, and never lose way. In light winds or calms, they are propelled by two sculls aft, and oars worked in the fore parts of the vessel, or by poles shoved along against the ground.

2d. A GENTLEMAN'S PLEASURE or TRAVELLING BOAT.—We most of us may remember to have seen gingerbread coaches at fairs. The boat used for the conveyance of





CHINESE JUNK.



officials, or gentlemen of consideration, is of this description. The solid part of the stern is raised several feet above the water, and the after part of the vessel is covered in with a framework of bamboo and matting; and all the wood work is highly varnished. All the part before this, occupying more than half the boat, is covered in with a flat roof, while the sides are fitted with windows of lattice-work and glass. Sometimes, instead of glass, talc, or the interior lamina of the oyster-shell, is used. In some, gauze, or transparent coloured oil-paper is employed, to keep out the air. Generally, birds, flowers, and other curious devices, in the Chinese fashion, are painted on these blinds. All the bulkheads, or the divisions which form the cabins, are ornamented in the same way. Square traps lift up in the floors of the cabins, in order that the luggage may be lowered down into the hold.

There is a great deal of carving about the boat, and it is generally painted of a bright green picked out with vermillion. The roof of this pavilion forms a sort of deck, on which there is a little joss-house or temple. The crew, who sometimes have their families with them, live in the after-part—here also is the kitchen. There are two flag-staffs aft, on one of which is hoisted the official flag of the occupant, on the other is merely a vane to show how the wind blows. This boat carries one sail like the chop boat, but smaller; she is propelled exactly in the same way. The cooking in these boats,

as also in the chop boats and most other Chinese crafts, is carried on in the after-part. In these boats great distances are traversed along the rivers and canals of China; and as they are fitted up with every attention to luxury and convenience, according to Chinese notions, they must afford a very pleasant means of travelling through the country.

3d. **THE DWELLING BOAT.**—A large proportion of the population of China live on the water; even many people who gain their livelihood on shore have their habitations afloat. The boats they live in are of different sizes; they are covered over fore and aft with palm-leaf matting and bamboo. The covering can be slid off in the day, and drawn over again at night: whole families live in these boats. When employment cannot be found in one place they move on to another; at night they make fast to stakes in the mud, one alongside the other, and thus form large tiers, which have the appearance of an island on the river. These boats also go by the name of the egg-house boats, from their peculiar shape, which is not unlike the longitudinal section of an egg. Many of them, in which a whole family will stow themselves away, are very small, not being more than fourteen feet long and about six broad; this covering is not unlike that of the tilt of a wagon. These people are looked on as a distinct race of the population; they are under different regulations to those living on shore, with whom

they are not even allowed to intermarry. The females of the family usually manage these boats, indeed, boats in China are constantly navigated by women. They seem to be a very contented happy part of the population, and quarrels or disputes of any sort rarely take place among them.

4th. The MANDARIN BOAT.—This is a very different looking craft to those I have described, but still is thoroughly Chinese from one end to the other ; she pulls sometimes twenty oars of a side, and there is a round shield with a hideous face painted on it, hung over the side, near each man's arm. Besides the men pulling, they have a numerous crew, with a large supply of pikes, gingals, and other weapons ; they also carry swivel-guns. They are painted green and red, and sometimes the lower part of the sides are white. They are long and low in the water, adapted for pulling, and besides this they have three masts, on which large sails are set, surmounted with coloured flags ; the after part, as well as the entire railing of these boats, is formed of bamboo.

5th. The COMMON SAMPAN.—This is a roughly built broad boat, generally used to get up the junks' anchors, or to do other work for vessels ; they are propelled by a skull and a pair of oars, and as they draw very little water they are made to skim along over the surface at a great rate—large chops and junks employ them just as European ships do their boats.

6th. The EEL BOAT.—This is a mere canoe or punt ; the greater part is covered over with a low arched roof, which does not reach quite to the edge. It is painted of a light sky blue ; one man sits aft with a pole or paddle and shoves it along among the reeds or against the banks of the river ; when the sky is clear and the sun is shining, the eels, which have got up on the banks, mistaking the blue covering for water, leap on to it and slide down into the bottom of the boat.

DUCK BOAT.—Among the aquatic population of China, the duck-keeper and his boat must not be forgotten. He and his wife and children live on board from one end of the year to the other, under a raised deck in the after part of his vessel, while his feathered charges occupy the hold. He moves from place to place, as food is there to be found in greatest abundance for his ducks. The rice-fields, after the rice has been gathered in, afford the most abundant feeding for his charges. The boat is fitted with a sort of bridge at the side, which is let down, much as is the fashion in horse ferry boats, to allow the cattle to walk on shore. Over this bridge, or platform, at a given signal, the ducks all waddle on shore, one after the other, in proper order, and set to work to pick up all the grain they can find. Once upon a time, it was the most abominable custom of some Tartar captains of men-of-war to flog the last man in off the yard, when reefing topsails, in order to teach the crew to be smart about the work. I do not

know whether those enlightened captains had heard of the custom I am about to describe of the Chinese duck-keepers, or whether the duck-keepers took the notion from them. In order to make the ducks hurry on board the instant the signal of recall is given, their keepers—more kind, however, than the captains—give the first duck who arrives an additional supply of food, and they whip the last one for his dilatoriness. It is very amusing to see the birds flying and scuttling over each other's backs, in order to be on board in time, and to avoid the punishment to be expected. The poor seamen used to do the same, but it was a much more serious matter; and many a gallant fellow lost his life by falling from aloft, in his endeavour to be in before his shipmates. Such an accident was the cause of one of the most terrible mutinies which ever took place on board a British man-of-war, the crew having risen, and murdered nearly all their officers. Happily, such an event is now rendered impossible, as, although the due authority of the captain is as great as ever for all good ends, the power of tyrannizing over his men is completely taken out of his hands. To return to the Chinese ducks. I am not quite certain whether the hope of reward or the fear of punishment induces them to make the greatest speed; but I am very much inclined to believe that the hope of receiving a dish of paddy has the greatest influence over their minds.

The JUNK.—The junks, intended either for war or

commerce, differ but little in shape or mode of construction. Some are of very great size, measuring nearly a thousand tons. They are built of an extremely light wood, so that they draw very little water. The bottoms are flat, and so are the sides, which extend gradually outward, to give them the required beam. The stern is flat, and the bows are completely blunt, without any stem, nor do they even carry a bowsprit. The sterns and forecastles rise in a succession of decks, gradually decreasing in size as they near the top; the upper one being very small, and only allowing a few people to stand on it, or, indeed, sometimes being merely a roof. On either side of the bows of all Chinese vessels are painted huge eyes, for the purpose, as the Chinaman observes, of seeing their way. Frequently, also, the heads of dragons, and other monsters, are painted or carved on them, to answer the purpose of our figure-heads. The anchors are huge, clumsy-looking contrivances of hard wood, the flukes being tipped or plated with iron. Chunam, or lime putty, is used instead of pitch for caulking, and bamboo shavings answer the purpose of oakum. On the deck is the joss-house or temple, before which incense, sticks, and gilt paper are constantly burnt as offerings. When there is a calm, and a breeze is wished for, instead of whistling, the seamen form junks out of gilt paper, and set them adrift on the water, in order to propitiate their divinity the "Goddess of Heaven," who is supposed especially to watch over seamen. A curious



contrivance is sometimes employed outside the bows to serve the purpose of a windlass for getting up the anchor.

When it is necessary to reef or lower the sails, the seamen climb up by the laths placed across them, and then stand on the upper part of the yards to tread them down—down-hauls not being in use. They employ bowlines, however, to stretch them out.

The rudder of a junk is hung by ropes or hawsers, and can very easily be lifted out of its place and slung along side. The timber of which junks are built is called Saaomock. The captain and officers maintain very little authority over the crew, and there is a constant noise and disturbance going forward. Altogether, one of the largest Chinese junks is the most curious floating object of human contrivance to be seen in the world of waters, and about as unlike a first-rate British man-of-war as it is well possible to conceive.

All vessels and boats employed for a like purpose in China have the same characteristics; and thus, in order to distinguish one from the other, they have a slight variation in paint, or a black patch of a peculiar shape on the sails, so that it may be known at once where the craft is from.

The law compels the boats on the rivers to adopt a similar practice, in order that the revenue officers may know in what occupations they are employed. The clothes worn by Chinamen in summer are generally made of blue or brown nankeen, or cotton cloth; and in wet or cold

weather they put over them jackets of a rough woollen cloth, or cloaks of matting.

In describing the mode of propelling boats, I ought to have explained that the sculls spoken of are short, thick-bladed paddles, hanging down close to the side of the vessel. They are not lifted out of the water, but by the peculiar movement which is called sculling—that is, twisting the paddle backwards and forwards, so that the blade is constantly pressed against the water—the craft is urged onward. This is the principle of the screw propeller invented by Mr. F. P. Smith, only instead of being worked at the side, it is placed in the stern of the vessel. In narrow creeks, or among crowds of vessels, this mode of sculling on a boat is very useful.

VESSELS OF JAPAN.—Japanese vessels are built of either fir or cedar, both of which woods grow in abundance on their islands. The merchant junks vary according to the purpose for which they are intended. The pleasure boats are numerous, and of different sizes. They are generally impelled by oars. The larger pleasure boats have two decks. The cabins in the lowest are low, but above them is another, lofty, of large size, and handsomely ornamented, like those of the Chinese. It has open windows, and can be divided into separate compartments by means of screens and bulkheads.

The merchant vessels are generally one hundred and twenty feet in length, and twenty in breadth. They are

fitted with sails as well as with oars. They taper to a point from the midship board to the bow, and the two ends of the keel rise considerably out of the water. The body of the vessel is not convex, as in all European vessels, but the part which is below the water mark runs almost in a straight line towards the keel. The stern is broad and flat. A very curious peculiarity of it is that it has a large hole or port in the centre, quite low down, through which the whole interior of the vessel may be seen. This port was originally a rude contrivance either for working the rudder, or for unshipping it and bringing it on board, but the government now compel all vessels above a certain size to have it, that they may be thus less sea-worthy, and that their crews may not be tempted to go to a distance from the tombs of their ancestors, and introduce among them the manners and customs of the surrounding barbarous nations of the world. The deck of the junk rises towards the stern, and is widest along the sides. It is formed of loose planks of fir which are not fixed or fastened together, and, when she is fully laden, are but little above the surface of the water. A cabin or rather upper deck covers the whole vessel, a small space only being left open at her stern, for the stowage of anchors, cables, &c. This house projects nearly two feet beyond each side of the vessel, and the sides are full of windows, which are glazed, and can be opened at pleasure. It is divided into separate cabins by screens, and ornamented like those of the Chinese. The

upper deck is flat, and formed of planks well joined together. These vessels carry but one mast, which can be lowered by a tackle much in the fashion of a Thames barge. It lowers down on a rest on this upper deck, and over it at night the sails being spread, with an additional covering of straw, a shelter is formed, under which the seamen sleep. The anchors are of iron, and the cables of a sort of straw, twisted so that it is of very considerable strength. These junks carry only one sail, which is made of canvas, and is of great size. When it is calm, thirty or forty oars are used. The rowers sit on benches, placed in the after part of the vessel. They row in time, to a tune sung by the whole crew. They sit high above the water, and lift the oars up and down without any sweep forward. The oars are curved, and have a flexible joint in the centre, which enables them to be lifted quickly out of the water. Copper bolts and bands are used in building the vessel. The bow is ornamented with a tassel of long black strings; and, when persons of rank are on board, their cabins are ornamented with hangings, on which their arms are embroidered. As soon as the anchor is let go, or the vessel is moored, in those of smaller size, the rudder is unshipped, and made to serve as a bridge, by which the passengers and crew may pass through the after part to the shore. Sir George Staunton describes the beautiful effect produced at night by the crews of hundreds of vessels

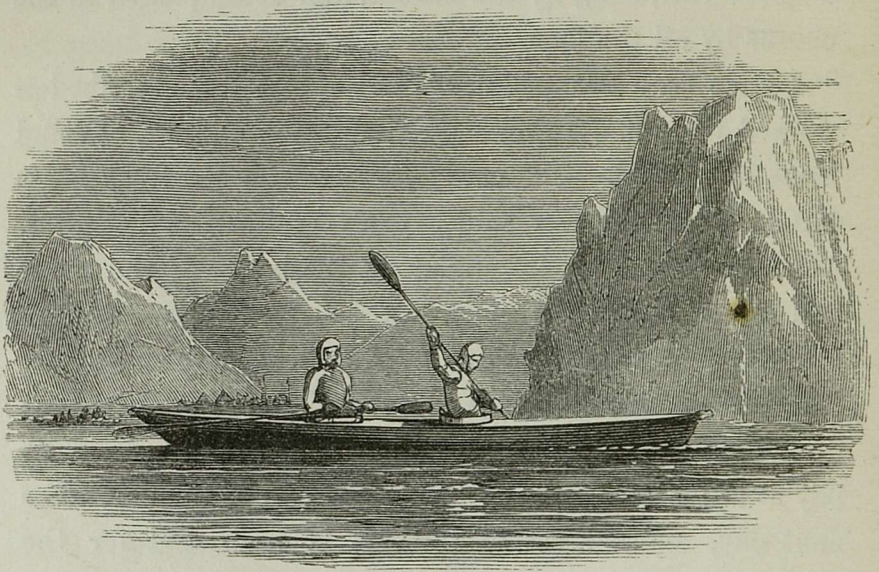
singing as they row on the waters of China. He says that some vessels have their two sculls forward and some aft, and that some have one forward on one side, and one aft on the other. Several men are employed to move each of them. They are never taken out of the water, but are made to perform, beneath its surface, a kind of vibratory motion, displacing the water first with one edge, and afterwards with the other. This labour the men seem to undergo with pleasure, keeping time with their strokes to a spirited air, sung by the master, and accompanied in the chorus by all the men.

I have seen two paddles: very like those described—worked by steam, however—one on each quarter, of canal boats in Canada. The poor fellows towing the track-boats in China are, however, subject to a very different discipline. Wading, swimming, leaping along the banks of the rivers and canals, hour after hour, in the hot burning sun, they are urged on to their work by a police-officer or soldier, with whip in hand. If they faint and stop, he beats them up: often they sink and die. The most scanty pay, or no pay at all, is their sole reward at the end of the day. The next day, another set of trackers is impressed for the service; nor dare the miserable peasants refuse to obey the stern command. With this slight sketch, which may serve as an example of the mode in which Chinese peasants are ruled by their paternal Government, I will conclude this account of the ships and boats of Asia.

## CHAPTER XI.

## VESSELS AND BOATS OF AMERICA AND THE PACIFIC.

IN my description of the boats of America, I will begin with an account of those found in the most northern part of the continent. Had the Esquimaux wandered the



ESQUIMAUX CANOE.

world round, he could not have found a boat better suited to his mode of life than the one he has contrived for himself. He requires a boat with great buoyancy and strength

when afloat, and at the same time so light that he may carry it on his shoulders, or drag it up over the ice, or away from the influence of the waves, while, should he be upset, he can again right it without much difficulty. The materials he uses are whale-bone and seal-skins. The whale-bone is not employed instead of ribs ; but he takes the longest pieces he can find and joins the ends together at the stem and stern by sewing them with strong sinews, and bowing them out at the broadest part to form the hull. These canoes are from ten to twenty feet long, and about two broad ; in shape like a weaver's shuttle ; sharp at both ends, so that they can be paddled either way. In the centre part stouter bits of whale-bone are put on to keep the canoe of the required width. Over the whole of this framework seal-skins are stretched, and neatly sewn both over the upper part as well as the lower, leaving only one opening in the centre, sufficiently large to admit a man's body. The canoe thus formed is flat-bottomed, sharp at both ends, and decked over, with the exception of the above-mentioned hatchway. In this hole the Esquimaux sits, with his feet stretched out forward, completely filling up the space with his seal-skin coat ; indeed, in some instances, a seal-skin bag, as it were, is sewn round the hole, and when he is seated in it, the upper part is fastened round his waist, so that he can neither tumble out, nor can any water by any possibility get in. His dress is tightly fastened also at the wrists and round his

neck, so that the sea and spray break over him without injuring him, and though apparently overwhelmed, he rapidly again rises to the top of the waves. His paddle consists of a pole six feet long, with a blade six inches broad at each end. This serves him to balance his canoe, as at the same time he strikes the water alternately right and left with it. It is said that with such rapidity can he urge on his light canoe, that without difficulty he can distance an eight or ten-oared boat. Such admirable sea-boats are these canoes that they can go out in the roughest weather, and vie with the wild sea-fowl in breasting the billows of the ocean. Similar canoes are used by the inhabitants of the Fox or Schumagen Islands. A few years ago I was shown, at the museum of the Aberdeen University, a canoe of the exact character of the one I have described. It contained, when discovered off the coast, one occupant, who was still alive, but in the last stage of exhaustion, and scarcely had he cast his dim eyes on the white man who came to his rescue, than he breathed his last. I thought, as I examined the ingenious and curious contrivance, of the long and solitary voyage that poor Esquimaux must have performed, driven off probably by some gale from his native shores; and how much he must have suffered as he drifted away before it, for the long distance he had come.

The BIRCH-BARK CANOE.—The canoe of the North American Indians is made of the bark of the white birch,



the framework being of cedar splints, which are exceedingly thin and tough. I made an excursion in one of these canoes on Lake Huron, during a visit I paid to Canada some years ago. While crossing the lake in a steamer we put in for shelter, during a heavy gale, under the lee of an island, on which we found encamped a large



BIRCH CANOE AND PADDLES.

body of Indians. Hearing of the ruins of an old Jesuit fort some way along the shore, we engaged some of the Indians to carry us to it. Several canoes, each from fourteen to eighteen feet in length, were drawn up on the beach. They were about three feet wide, pointed at both

ends, where they curled up, and turned somewhat inward. The bottoms and sides were rounded and curled in, so as to make the boat narrower at the gunwale than it was a little lower down. The canoe was kept from falling inward by narrow strips of the cedar placed at intervals across it. The ribs were made of broad thin strips of cedar, while narrower pieces ran fore and aft, the whole sewed with the greatest neatness together. The bark is peeled off the birch trees in such large sheets that very few of them serve to cover a canoe ; where they join they are neatly sewed together. The seams are then covered over with either tamarask gum or with the pitch of the yellow pine. As soon as the Indians understood what we wanted, they lighted some torches, and turning the canoes upside down, held them over them for the purpose of melting the tamarask gum, that it might run down the seams. Having ascertained that the canoes were in a sea-worthy condition, two Indians gently lifted them into the water, when they were brought alongside our boat. Great as is the weight their canoes are capable of carrying, it is necessary to step very carefully into the exact centre, to avoid a capsize. One of our companions tumbled in, and very nearly rolled out on the other side, as I have seen a man do when he has first attempted to get into a hammock on board ship. Escaping such a catastrophe, my wife and I, and two other gentlemen, embarked in our canoe ; two Indians sitting on thwarts, level with the gunwale, paddled in the

bows, while a third sat in the stern to steer the canoe. We were thus seven people, in all, embarked in this frail, papery-looking bark. A low box was placed for my wife to sit on, but we gentlemen had to squat down in a posture neither graceful nor comfortable. Away we went right merrily, cutting rapidly through the bright blue waters, along the tree-fringed shore, our jovial crew singing, laughing, and talking to each other, delighted, doubtless, with the unexpected harvest of wealth they were about to reap.

We proceeded on our voyage to the extreme borders of Canada and the most northern point of the United States, to a place called the South St. Marie. Here we remained some days, and I had frequent opportunities of paddling in canoes.

The river which here rushes out of Lake Superior forms some strong rapids, which, however, the canoes of the Indians are perfectly able to surmount. It was curious to see them out catching white fish in the evening, with what is called a scoop net. Two men go in each canoe, one sits aft to paddle and steer, the other stands in the bow furnished with a long pole and a net, something like a landing net, three and a half feet in circumference and six feet deep. He knows exactly the holes under the rocks where the fish are wont to lie, and so urging his light canoe up the rapid with his long pole, as soon as he reaches the desired spot he lays it down, and seizing his

net, with a rapid whirl over his head, he scoops out the hole, as it were, and seldom fails to bring a fish to the surface. The Indians also spear the fish in the usual way on the rapids. I will now give a description of the Hudson Bay Company's largest canoes, from a work on Canada, by Mr. Schoolcraft. "They are thirty-five feet in length, and six in width at the widest part, tapering gradually towards the bow and stern, which are brought to a wedge-like point and turned over from the extremities towards the centre, so as to resemble in some degree the head of a violin. They are constructed of the bark of the white birch tree (*betula papyracea*), which is peeled from the tree in large sheets, and bent over a slender frame of cedar ribs confined by gunwales, which are kept apart by slender bars of the same wood. Around these the bark is sewed, by the slender and flexible roots of the young spruce tree, called *wattap*, and also where the pieces of bark join, so that the gunwales resemble the rim of an Indian basket. The joinings are afterwards luted and rendered water-tight by a coat of fine pitch, which after it has been thickened by boiling, is used under the name of gum. In the third cross bar from the bow, an aperture is cut for a mast, so that a sail can be employed when the wind proves favourable. Seats for those who paddle are made by suspending a strip of board with cords from the gunwales, in such a manner that they do not press against the sides of the canoes. The Fur Company's

people have introduced the use of oars, but the natives still employ the paddle, with a light and slender blade. In either case they are steered with a larger paddle, having a long handle and a broad blade. A canoe of this size, when employed in the fur trade, is calculated to carry sixty packages of skins, weighing ninety pounds each, and provisions to the amount of one thousand pounds. This is exclusive of the weight of eight men, each of whom are allowed to put on board, a bag or knapsack, of the weight of forty pounds. In addition to this, every canoe has a quantity of bark, wattap, gum, a pan for heating the gum, an oven, and some smaller articles necessary for repairs. The aggregate weight of all this may be estimated at about four tons. Such a canoe thus loaded is paddled by eight men, at the rate of four miles per hour in a perfect calm ; is carried across portages by four men ; is easily repaired at any time and at any place, and is altogether one of the most eligible modes of conveyance that can be employed on the lakes, while in the interior of the north west—for river navigation, where there are many rapids and portages—nothing that has been contrived to float upon water offers an adequate substitute. Every night the canoe is unloaded, and, with the baggage, carried ashore ; and if during the day a storm should arise, such is the activity of the Canadian *voyageurs*, that ten minutes' time is sufficient to effect a landing and secure both vessel and cargo."

The DUG-OUT.—On some of the rivers and lakes of Canada, canoes are used, formed of trunks of trees hollowed out. Many of them are very light, and well formed. They are only used when it is not necessary to transport them across portages, as—though, of course, more durable and far stronger than the birch bark canoe—they are not nearly so light and easily carried.

The ICE BOAT.—During the winter in Canada, when the smaller lakes, and inlets of the larger ones, are frozen over, ice boats are employed, which sail over the ice at very great speed. A long narrow boat is placed on a sort of cradle, which has three large skates fixed to it—one forward and two aft—forming an acute angled triangle. Fore and aft ordinary boat sails are set. The rudder is a long oar, fixed securely to the stern of the boat, on a pivot; and the blade is of iron, which can dig deeply into the ice, and thus, as is obvious, easily turns the boat. These boats sail at a great speed, and keep very close to the wind. They can also easily go about.

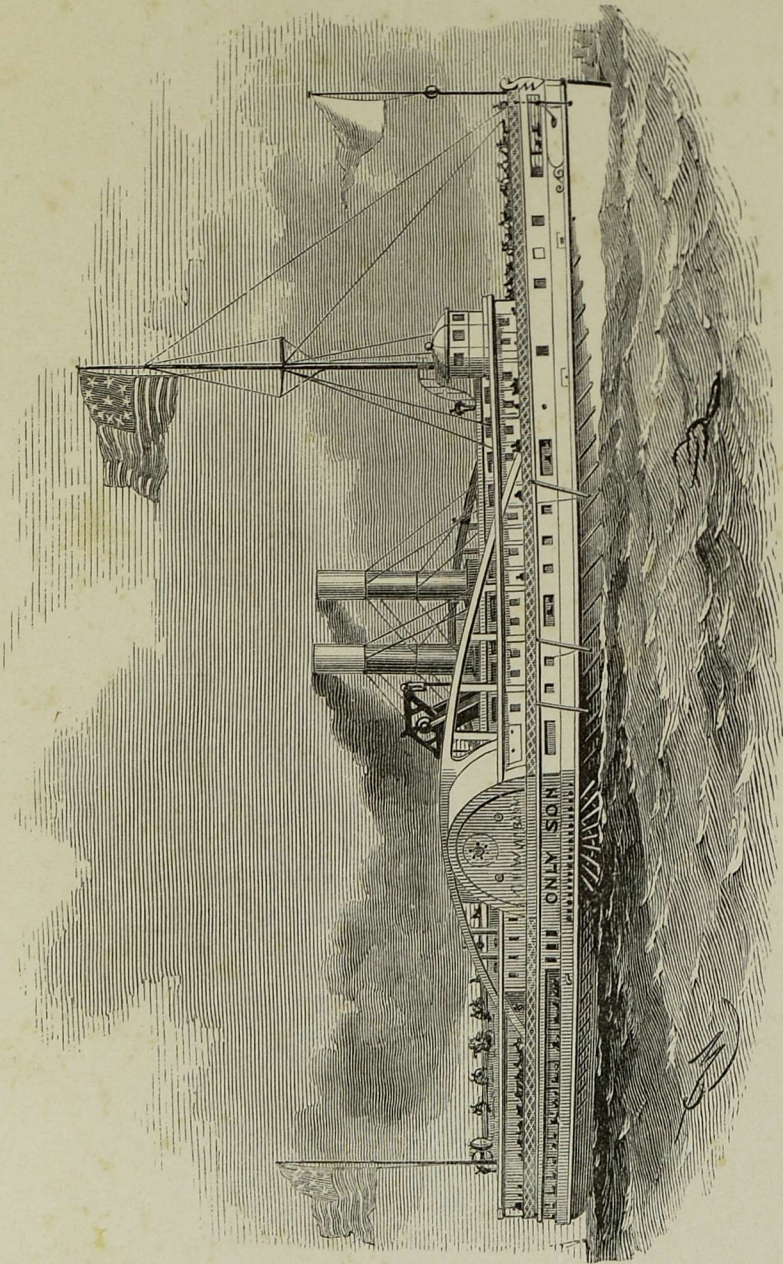
CANADIAN TIMBER RAFTS.—Huge rafts, formed of logs of timber roughly squared, are frequently seen descending the Ottawa and St. Lawrence rivers. The logs are securely lashed together, and often cover from a quarter to nearly half an acre of space. Wigwams, or huts, are built on them, to serve as the habitation of the crew; and numerous masts are stepped, on which square sails are hoisted when the wind is fair. They drop down, however, with the

current, their course being guided by men, with oars, working at the sides, or, in shallow water, poling them along. Large parties of men go up in the autumn, or "fall," as the Canadians say, and fix themselves near the banks of some of the long streams which feed the Ottawa and St. Lawrence, several hundred miles above their mouths. Here they cut down trees and square them out; and when the rivers are frozen, and the snow covers the ground, they drag the logs over the snow, and leave them on the ice. When the ice melts, the logs are thus, without difficulty, afloat. They are now lashed together; and each raft, under the guidance of a couple of *voyageurs*, floats down the stream till the width allows of more being joined together. In this way, they advance till they arrive at the rapids, or falls, which occur in most of the Canadian rivers. Here, in the unsettled districts, they are taken completely apart, and each log is allowed to find its way down into still water as best it can, when they are collected, and again lashed together. They suffer, however, very much in this process, by knocking against the rocks. In many of the settled districts, a contrivance has been invented to obviate this. I first saw it at the Chaudière Falls, on the Ottawa river, near Bytown, or, as it is now called, Ottawa City. This contrivance is called a "slide." It may be described as a canal on a slope, down which only a sufficient quantity of water is allowed to run, to carry along the timber. When a raft reaches these rapids,

which extend right across the river, it is taken to pieces, and the logs are placed on cribs, which are frames to fit the slides. A couple of men stand on each to guide their course when they get through ; and away they shoot, at a furious rate, down the inclined plane, without any injury. When all the logs are shot through the slide, they are again united, and the raft proceeds as before. The largest rafts are, however, not put together till after they get below Montreal, where there are no rapids to impede navigation. They then float down to Quebec, where they are stored, at the mouth of the Charles river, in readiness to be shipped on board the timber ships. They take many months to perform the voyage, for such a distance in the interior do they come ; and sometimes do not get to their destination before the winter sets in, and stops their progress.

THE STEAM-BOAT OF THE AMERICAN RIVERS.—These are the most curious structures, and, at first sight, I was induced to say that they were very like Chinese junks. On further inspection, however, I soon discovered that, except in size and in drawing little water, they are totally different. I heard of an American shipwright boasting that he could build a boat which would not draw more than half a foot of water. Another laughed at him. “Pooh !” he remarked, “I guess now that I can build one which will go along right over the fields, provided the dew is pretty thick on the grass in the morning.” The hull or floating part of the structure is of great length, and narrow,





AMERICAN RIVER STEAMER.



and could by no possibility bear the superstructure raised on it, were it not for a vast arch, or, rather, two vast arches, which extend on either side of the vessel fore and aft, high above the paddle-boxes, and serve to bind her together—in other words, the hull is suspended to these arches. The paddle-wheels are very broad and large, and assist to keep the vessel on an even keel. On the hull and real gunwale of the boat is placed a platform or deck, which may properly be called the middle deck. Above this, supported by pillars, is another wide platform or deck, which may be called the main-deck. It is fitted up fore and aft as a magnificent saloon. There is a roof over the whole of it. I cannot call it a deck, for the after part is arched with an iron frame-work, covered in with glass, like the Crystal Palace. This saloon is highly ornamented, generally, with white and gold, and the pillars which support the roof are wreathed with flowers. It is thickly carpeted, and there are ottomans, and sofas, and chairs, and seats of all sorts, and work-tables, scattered about. Generally there is a piano at the after end, and one or more stoves. Over the stern there is an open platform or broad gallery, where chairs are placed. There are other platforms over or just abaft each of the paddle-wheels. On both sides of the saloon are sleeping-cabins, each containing two berths. They have windows, and are very airy, and prettily fitted up. Above the saloon there is a deck, or rather, it may be called a platform, about the centre of

the vessel, before the funnel. Here the wheel is placed, and here the captain and officers take their stand. No passengers are allowed to go to this exalted spot—indeed, I never could find my way to it. There is some secret passage to it from the engine-room below, I have no doubt. On the main or saloon-deck there is generally another platform forward, with glass doors opening on to it, so that the saloon can be closed. I have as yet only described one deck, this main or saloon-deck. Under it is the deck where the entrance is, and which I have described as the middle-deck. In the after part is a saloon and sleeping-berths, generally devoted to the accommodation of the single lady passengers, who, to the honour of the United States, always receive the greatest attention whenever they travel. In the centre part the cargo is piled up—piles and piles of boxes—between which it is not always easy to find one's way. The passenger vessels do not carry heavy goods. Forward there is the barber's shop, various offices, and the kitchen. The machinery occupies a considerable portion of the centre of the vessel. Near the entrance port is the agent's office, where the fares are paid and cabins taken. Every steamer has a barber on board, that the gentlemen passengers may be shaved during their passage, even though it may last but a few hours. Time is valuable, and it is important to economize it. But where, it will be asked, are the dining-saloons? A bell rings, or a gong sounds, and everybody rushes

downwards from the upper saloon. Down they go, down through the middle deck, and stop not till a third or lower deck is reached, and here, extending from the engine-room to the extreme after-part of the vessel, there is another large saloon, with tables arranged along it and berths on either side; it is well lighted, and the tables are covered with a variety of eatables, while waiters are running backwards and forwards helping the guests. The provisions disappear somewhat more rapidly than in Europe, though the fare is not certainly equal to that furnished at the hotels on shore. Perhaps the passengers have to go on shore at the next stopping place, or being generally in a hurry, they have got into the habit of bolting their food; many of them look as if they habitually bolted it, and that it did not do them the good it ought to do. Perhaps on returning to the saloon a negro, or a gentleman of colour, with an enormous shirt frill and cuffs, and dressed in nankeens with a blue coat and brass buttons, appears violin in hand and exclaims, "Gentlemen and ladies who like to dance, come forward, please." Soon numerous damsels in low dresses, and youths not in quite such elaborate evening costume, step out from the cabins and are seen footing it merrily to the sound of the dancing-master's violin, he playing and dancing with the greatest ardour, and endeavouring to set every body right who goes wrong in the quadrille, of whom

there are not few among the rougher sex. Such was the vessel in which I steamed up the Hudson; the dancing, however, took place on board a steamer on Lake Erie. The most uncomfortable feeling I experienced on board these vessels was the complete separation of the passengers from those who managed them. The tinkle or two of a bell was heard and the vessel stopped, and another tinkle sounded and on she went again. There were stewards and stewardess, and a clerk who took tickets, but as to who was guiding the vessel or where she was going it seemed impossible to discover. The captain must thus be saved a great deal of annoyance, for he can never be troubled by having questions asked him. With regard to sea-going vessels, those of the United States do not differ much from the English. The New York sloop, however, is unlike any now found in British waters; her bow is sharp, and she carries her beam right aft, where her stern rises to a height considerably above the bows; she carries a narrow mainsail with a great hoist, a big foresail, and a small jib on her high steeking bowsprit; her hull is generally light green, with various devices on her stern, and she has altogether a very antique look about her, in spite of her bright paint and white sails. She is employed to trade about and in the neighbourhood of New York and Long Island. The merchant vessels of the United States have generally more beam than

the English—they have a straight sheer, and differ much from them in their paint. The upper works are frequently white, and a broad ribbon is left where the wood is simply varnished. The American schooners have long been celebrated for their size and swiftness; they have great beam and carry a heavy press of canvas; they are, generally well formed, and in many instances are owned by the captains. Many men in the States have not gone to sea till they have grown up, and have become expert seamen.

'MUDIAN RIG.—The boats of Bermuda have for years been known for their speed and sea-worthy qualities; at one time it was believed that nothing could come up with them. They carry no bowsprit, or only a very short stump of one; the sail is set on one yard like a lug with a high peak, and is split down at the mast so that the fore part acts as a foresail, and when going about it is not necessary to lower the sail. They have generally great beam, and rounded decks, when they are decked.

Leaving North America we will run down the east coast and round Cape Horn; first, however, touching off one or two places in the Brazils. Many of the boats of that country partake very naturally of the character of those of Portugal. The *Catria*, which I have described, seems to be the model of most of them. Off Bahia we met some fine boats; they are longer than the *catria*,

and rise more in the bows. The common market boat has a curious variety of sails; her bowsprit steeves almost up and down; on her foremast she carries a square sail; the mainmast is stepped close to the foremast, but is so long and rakes so much that the top almost overhangs the stern; on this a fore and aft mainsail, with a short gaff, is set with a wide foot. On the mizen mast a lateen sail is set, so that each mast presents a different rig. Some boats carry only the square sail and fore and aft mainsail. The Bahia fishing boat is very long, with a single stout mast, on which a large square lug is set without any peak. These boats go in pursuit of small whales, which the fishermen strike with harpoons.

The harbour of Rio de Janeiro is full of boats. The ordinary passage-boat is built like a catria, and carries two high-peaked lugs, cut almost like lateen sails. Over the after part there is an awning like that of a Douro Toldo boat, under which the passengers sit.

The Brazilian Cattamaran, or Gonguada, is a curious contrivance. The floating part is composed of numerous inflated skins of hogs, or some other animal, all fastened together. On these a platform is placed, and above it is another, which, resting on the deck forward, rises gradually astern. At the after end there is another small platform, on which the helmsman stands. The after part is covered over with a roof, or rather a tilt, the interior of



which serves for a cabin. It has one sail set on a single mast, of a triangular shape. The head is hoisted to the upper end of the mast, and it is extended by a yard, the jaws or heel of which is not at the foot, but some little way up the mast, so that the foot and tack of the sail is much below it. It is steered by a long oar, and propelled by two oars forward. It is a craft of very curious construction. I will not stop to describe the dug-out canoes of the savages of Patagonia and Terra del Fuego, but we will get round quickly to the west coast of South America. Here, on the coast of Peru, another curious craft is used for passing through the heavy surf which sets on the shore. Captain Basil Hall describes it very well:—"The balsa is made of two entire seal-skins inflated, placed side by side, and connected by cross pieces of wood and strong lashings of thongs. Over all a platform of cane mats forms a sort of deck, about four feet wide and six or eight feet long. At one end the person who manages the balsa kneels down, and, by means of a double-bladed paddle, which he holds by the middle and strikes alternately on each side, moves it swiftly along, the passengers or goods being placed on the platform behind him. The buoyancy of these balsas enables them to cross the surf in safety, and without wetting the passengers, at times when an ordinary boat would inevitably be swamped. All the goods which go to the interior, at this part of the coast, are landed in this manner. The great bars of silver, and

the bags of dollars also, which are shipped in return for merchandise landed, pass through the surf on these tender though secure conveyances.

Near Huanchaco, on the coast of Peru, the sea constantly breaks on the beach with great fury. On that



PERUVIAN BALSA.

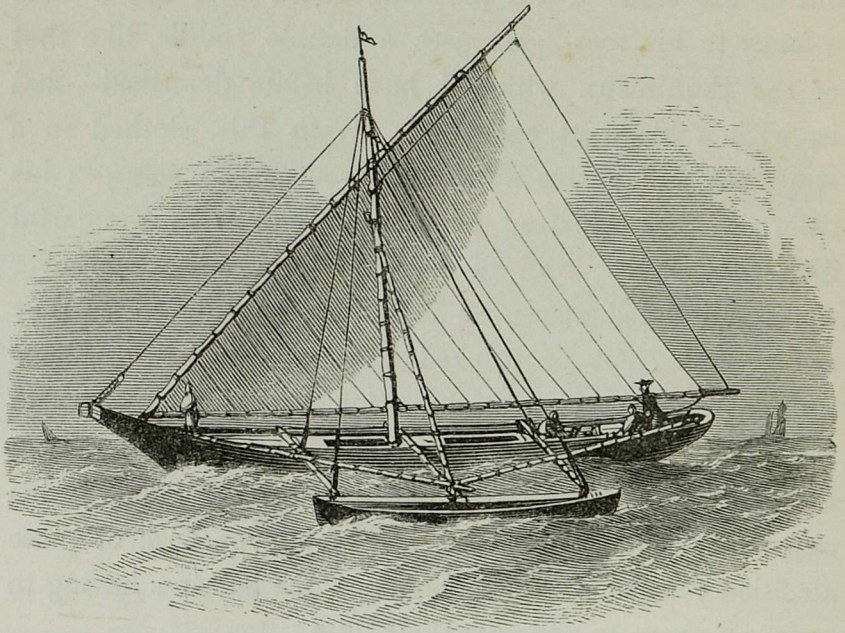
coast a peculiar kind of balsa is used, made of straw, which the fishermen call a "caballito" (a little horse), from the mode in which they bestride it as they paddle through the breakers. It consists of two large bundles of straw or rushes, formed in a conical shape and bound close together, leaving a small hole in the large end, in which small parcels are sometimes carried. The apex of

the cone is turned up in a slender point, like the shoe of a Chinese. The balséro sits astride on his little horse for greater security while he is paddling through the surf; but as soon as he gains the open sea and is in comparatively smooth water, he tucks up his legs and places himself in the hole I have described, clear of the water, and out of the sight of any prowling shark who might take a fancy to his toes. He uses a double paddle, like that of the Esquimaux which I have before described—that is, with a blade at each end. With this, clothed in a straw hat and coarse shirt and trousers, he manages his little sea-horse, instead of with a rein, with wonderful dexterity. This kind of balsa has an advantage over those of inflated skins, as it cannot be injured, as they are by being cut or pricked by anybody who may have a quarrel with their owners. Sometimes the owners of the skin-balsas have disputes, and when out on the ocean they will attack each other, one trying to cut a hole in his opponent's balsa, when the loss of one or both of these air-filled vessels is the consequence, the balséros having to swim on shore to preserve their lives.

We must now leave the coast of America, and wander about among the almost numberless islands scattered throughout the Pacific, where we shall find canoes of every variety of form, size, and principle of construction.

The FLYING PROA of the LADRONE ISLANDS.—This is supposed to have been the original of all the craft with

outriggers in the Indian Seas and Pacific, and I shall therefore describe it first. It fully deserves its name, for no other boat or canoe of any description can compete with it in speed. The principle is what I described at page 176. The sail is almost triangular, but the yard is straight, and



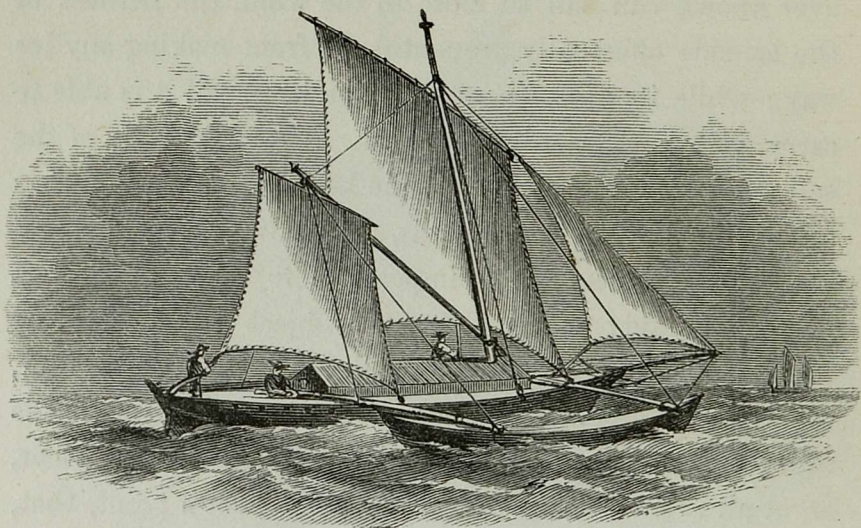
FLYING PROA OF THE LADRONES.

the outer leech does not extend far astern of the mast. The foot is stretched on a boom, the full length of the canoe. The mast, boom, yard, and outrigger are of bamboo. The sail is made of strong matting, which is stretched, by the mode I have described, as flat as a board. When

going about, they have merely to shift over the sail, so that what was before the head at once becomes the stern. When the sail is reefed, it is rolled round the boom. These proas carry six to seven people. One sits in the stern to steer, and another in the bow, ready to steer when the craft is put on the opposite tack; the rest are employed in baling out the water or in trimming the sail. No craft ever known can sail so close to the wind, the flatness of the lee side effectually preventing it from making any lee way; while its narrowness, and the large sail it is able to carry, give it extraordinary speed. The great body of the sail is also completely within the boat. It is also quickly reefed, by lowering the haliards, and rolling the foot round the boom; indeed, it is impossible to conceive a craft more admirably adapted for the object required. The Ladrone Islands, lying chiefly north and south of each other, within the limits of the trade winds, have always what is called a "soldier's wind" either on one side or the other, or, at all events, the wind blows from such a point, that, sailing as close as they do to it, coming from the most leeward island, they can nearly always fetch the weathermost.

CANOES of the FEEJEE ISLANDERS.—Captain Wilkes, commanding a United States exploring expedition, visited the Feejee Islands, and describes their canoes as superior to those of the other groups. They are generally built double, and some are one hundred feet in length. The two parts of the double canoe are of different sizes, and

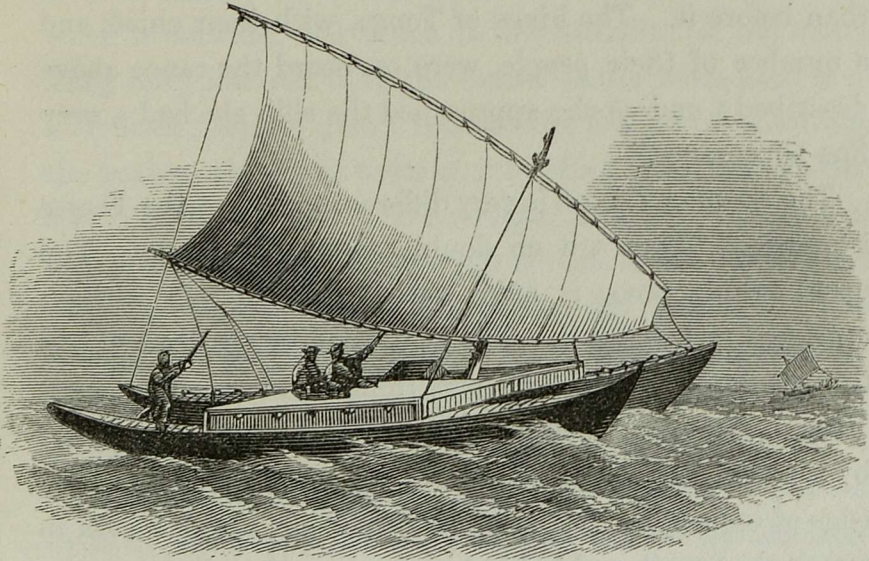
united by beams, on which a platform is laid. The platform is fifteen feet wide, and extends beyond the sides. The smaller canoe serves the purpose of an outrigger. The bottom of the canoe is a single plank, and the sides are fitted to it by dovetailing, and closely united by lashings, while the joints are made tight by gum. They have gene-



OUTRIGGER CANOE OF FEEJEE ISLANDERS.

rally a depth of hold of seven feet. Captain Wilkes particularly describes another canoe of Feejee origin, which visited his ship when off the Tonga Islands. "She was one hundred feet in length, and of the double kind, which consists of two canoes of different sizes, joined together by a deck thrown across them both. On this deck a small

house is constructed, which serves for a cabin. Above the house was a small platform, eight feet square, with a railing on each side; the mast, which is thirty feet long, is supported by guys, having a long yard attached to it, with its neat sail, of huge dimensions, furled. In all canoes, both single and double, small hatchways are left at both



DOUBLE CANOE OF FEEJEE ISLANDERS.

ends, with high combings; and when they are under way, a man is always seen in each, baling out the water. The mode of propelling the canoe by sculling is peculiar to the Tongans and Feejees. The sculler, instead of using the oar as we do, stands behind it, and holds it perpendicularly. The oar has a broad blade, and is ten feet in length;

the sculler has thus the whole weight of his body to assist his arms in using it. It is confined in a hole in the platform. There is generally one of these oars at each end, and the crew are enabled to propel one of these large canoes between two and three miles an hour by means of them. The Tongans are great adepts in managing their canoes when under sail. They sail much more swiftly on a wind than before it. The kings of Tonga, with their chiefs and a number of their people, were on board the canoe above described ; and as she approached the ship she had a very fine appearance."

The SAMOAN CANOE is very different to that of the Feejee islanders. There are no double canoes in Samoa. The usual fishing canoe is made out of a single tree, with an outrigger to balance it. The larger canoes are from thirty to sixty feet in length, and carry from ten to twelve persons. They are formed of several pieces of plank, joined together by sennits. These pieces are of no regular shape. On the edge of each plank is a ledge or projection, which serves to attach the sennit, and to bind it closely to the adjoining one. The gum from the bark of the bread-fruit tree is used to cement the pieces, and to prevent leakage. They are long, narrow, and of elegant shape, and have a deck foreward and aft. The natives who paddle them sit two abreast, while another steers. The seat of honour is on the deck foreward, in the centre of which is a row of pegs, to which, by way of ornament, the large white ovula shell is attached.



The natives sit with perfect ease on this place ; but a stranger has the greatest difficulty in occupying it, and feels that he may any instant be toppled over into the water. Having both a bow and stern, these canoes cannot be manœuvred without tacking ; consequently, the outrigger, on which their safety depends, is, in using their sail, alternately to leeward and windward, and does not, when to leeward, add much to the stability of the canoe. They carry less sail than the canoes of the other natives of Polynesia ; and to guard against the danger of upsetting, the natives rig a sprit or boom projecting from the opposite side to that on which the outrigger is fitted. This boom is secured with guys to the top of the mast. When the wind blows fresh some of the men go out upon it, and thus balance or counteract the force of the wind. Those on the other side of the canoe are kept ready to go out on the outrigger when that becomes necessary. The sail is made of a mat of a triangular shape, with its apex below. Some of them are ten feet high. None of these canoes are calculated to perform long voyages.

DOUBLE CANOE of NEW GUINEA.—Savage as are the natives of New Guinea, they manage to build canoes of great size. H.M.S. *Bramble*, while engaged in a survey of that coast, fell in with one of them, which is described as sixty feet in length. The two canoes were kept apart, and at the same time united by a platform fifteen feet broad, extending nearly their entire length. The after end was

left clear, and on it stood three helmsmen, each provided with a long paddle for guiding the craft. The rest of the stage was covered by a house about six feet high ; and the roof, being flat, made as it were a second or upper deck. The craft had two large sails of matting, each spread between two bamboo masts, with diagonal poles on either side supporting them. The masts were about twenty feet apart. There was a squaresail forward on a mast of its own, and other small sails were set on the two principal masts. Flags and pennants flew from the mastheads, and there were from forty to fifty people on the upper deck, armed with bows and arrows, and spears. It was not ascertained where this curious craft came from, or to what place she was bound.

CANOES of NEW ZEALAND.—But a few years ago, the New Zealanders possessed no other vessels than those I am about to describe ; but at the present day many own cutters, schooners, and brigs, built after the English fashion, and manned entirely by their own people. They have two sorts of canoes, single and double. The single canoes are built of the largest sized pine-trees, which grow to the height of forty or fifty feet. The logs are hollowed out, and lengthened eight feet at each end, and raised about two on each side. They are built with a figure-head ; the stern-post extending about ten feet above the stern of the canoe, which is handsomely carved, as well as the figure-head, and the whole body of the canoe. The sides are

ornamented with pearl-shell, which is let into the carved work ; and above that is a row of feathers. On both sides, fore and aft, there are seats in the inside, so that two men can sit abreast. They pull about fifty paddles on each side, and many of them will carry two hundred people. When paddling, a chief stands up and cheers the crew with a song, which they all join in chorus. They pull at the rate of seven knots an hour, but roll heavily. Their sails are composed of straw matting in the shape of a lateen-sail. The crew cook in their canoes, but always go on shore to eat. They are known to go frequently three or four hundred miles along the coast. They have no outrigger ; their paddles have spoon-shaped blades. Captain Wilkes speaks of their being propelled with great swiftness. They are cut out of the Kaurie and Kaikotia pines, which are also now much used for the masts and spars of large ships.

DOUBLE CANOES of NEW ZEALAND.—In some parts of New Zealand double canoes are used. They are joined by platforms like those of other tribes, and are carved in the most elaborate manner. At the after end there is a raised deck with an awning of mat-work, a sort of hut, over it. Here the chief sits and issues his orders to the crew. Some rise ten feet and upwards at the stem and stern, while others of a more ordinary description only rise at the bows, and appear to be very much less carved. In some there is a raised seat like an arm-chair, which forms

the stern of the canoe. This is elaborately carved and ornamented with shells and feathers, and has the head of some monster worked on it.

Probably, throughout the wide extending waters of the Pacific other contrivances for carrying people over their surface may be found, but I believe that I have given the characteristic features of all the various sorts of canoes which have been met with by voyagers in those regions. My aim has been, under the title of a "Boy's Book of Boats and Vessels," to give a sketch of the existing state of naval architecture throughout the world, and if I have succeeded in so doing, I may hope that many may derive both amusement and instruction from it on a very important subject.

THE END.

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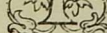
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