SEA SCOUTING

AND

SEAMANSHIP for BOYS

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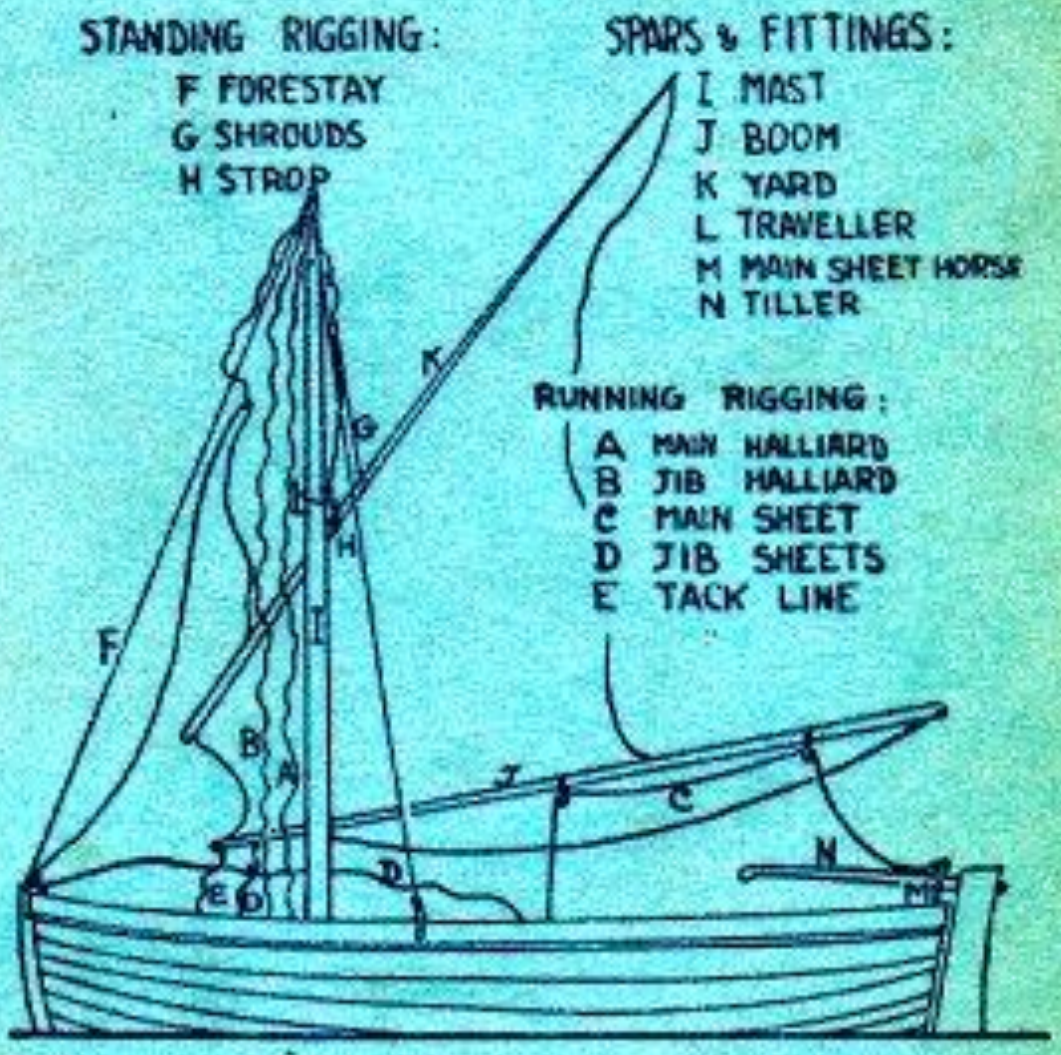

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FOREWORD.

THIS book — *Sea Scouting for Boys* — was written by my brother Warington.
It was under his guidance that I, when a youngster, began my Scouting as a Sea Scout.

He was himself both a sailor and a boy at heart and so his teaching told. I have never forgotten those breezy times and the things that I learned under him have had their lifelong value for me.

Since the first edition of this book its author has passed to Higher Service, but to the end he remained as he had lived — a sailor and a boy.

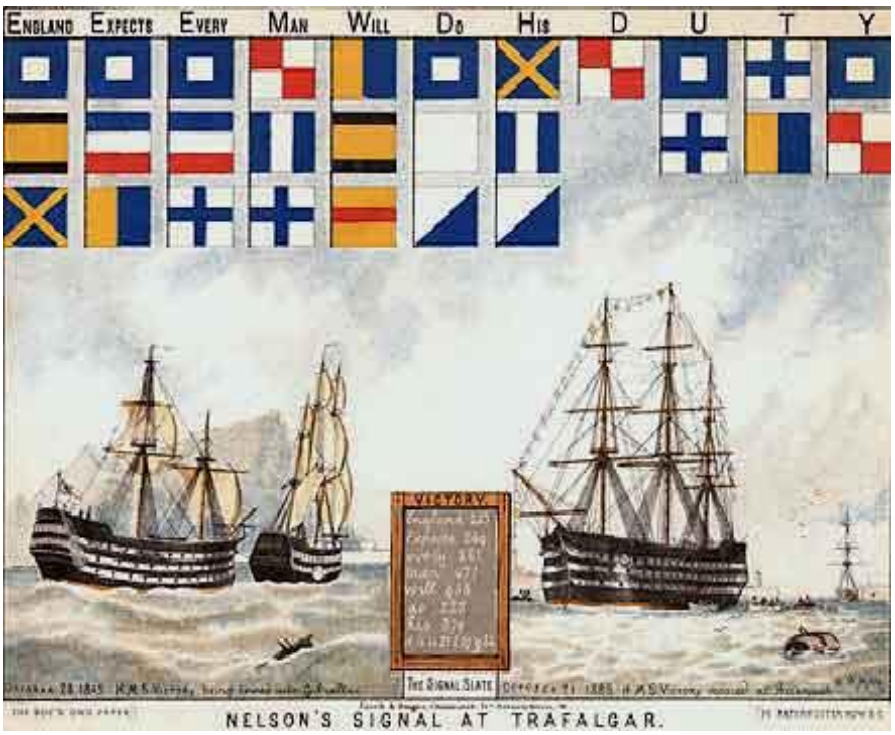
It was, largely thanks to his interest in boys and in seamanship that Sea Scouting became popular in the early days of our movement, so that when the Great War came suddenly upon the nation the Sea Scouts proved able at once to take over the duties of the Coastguards when these were called away to man the fleet. Thus the Scouts watched our Coasts from John O'Groats to the Land's End during the whole period of the War. Also they provided a considerable contingent of signallers, cooks and bridge boys to man the auxiliary fleet.

They so acquitted themselves that at the end of the war they received the public thanks of the Admiralty and of His Majesty the King himself.

This book by helping more boys in their turn to become handymen for their country will stand as
a fitting memorial to the life and character of its author.

R. B.-P.

PREFACE



"ENGLAND expects that every man will do his duty." So signalled Admiral Lord Nelson on October 21, 1805, on going into action off Cape Trafalgar.

The reason of this book is to help boys to be prepared to do their duty.

The safety of the whole British Empire depends—Mother Country, Overseas State and Colony—on every man being more or less a sailor. "More," that he may be prepared if called upon to do his duty afloat; "less," that he may have sufficient knowledge of the sea and ships as a landsman to do his duty in preventing his country from relinquishing the command of the sea.

The boy who imbibes the elements of Seamanship and the sailor-touch by making the water, sea, river, or lake, his playground will grow into the man prepared to do his duty to his country, whether in Old England or her Colonies.
I have difficulty in writing on such wide and technical subjects as pertain to the sea and ships, in a manner of sufficiently elementary treatment and condensed form as is necessary for young boys and a small book. What the older boys "don't like they can lump," and what any boy does not understand he can ask of his Scoutmaster, and what the Scoutmaster wants better explanation or further information upon he can find detailed, in the *Admiralty Manual of Seamanship* or *Tait's New Seamanship.*

This book is intended to be merely a chat with boys upon aquatic matters. It is not intended as a work of instruction for the sea profession, nor for the education of shore going men into Sea Scout matters. I have had many kindly meant suggestions made to me to add new and deeper matter; in short, advanced seamanship and navigation. I would do it, but that I consider it would go beyond the useful limit for boys.

Warington Baden-Powell

TO PARENTS AND GUARDIANS

The boy scout movement is, as the merchants say, "a going concern," and sea scouting is merely a branch of the same organisation taking up nautical matters in further development of boy scout training, *and it does not necessarily mean the boys taking to the sea as a profession afterwards.* Sea scout training, by bringing the boys into intelligent contact with all pertaining to the sea in the attractive manner common to scouting, will give the boy some of the handiness, resourcefulness, pluck, and discipline of the seaman. The handiness which the boy picks up in this way is a form of character education which is certain to be of great value to him in after life, whatever profession he may take up.

The sea scout training will interest the boy and attract him to the study of seamanship, watermanship, and coastguard work. The free open air life of sea coast scouting, boating, and camping, added to his previous shore scout training, will furnish all the manly and charactermaking qualities that a parent could wish a son to develop.

Sea scout training differs from what is known as training ship education; there the boy is intended for the sea profession, all else gives place to a life of drills and routine, a day and night, month and year, training with one object only in view, the sea. Should the boy find at the end of his ship schooling, as many do, that the sea life has become distasteful, too difficult, or, perhaps, uncertain, he may also find himself then unfitted for taking up any other line of employment.

With the sea scout, on the other hand, the training is merely his pastime and outing; he learns the sailor's touch and sea-going ways, he learns it as a game or sport, instead of having it drilled into him with irksome and often unintelligible, routine of the "Training Ship."

The sea profession is, with our growing fleets both of Royal Navy and Mercantile Marine, being now more carefully nurtured, and the career of the sea will undoubtedly improve in condition and in the security of service the two cardinal faults of two-thirds of the Mercantile Marine service for many years past. The steadily growing demand, even in peace, for men and boys to man the Fleet is pointing out the absolute necessity of a large reserve in the Mercantile Marine to possibly draw from, and unless the conditions of living and security of employment in the Mercantile Marine are sufficiently attractive the quality of, the *personnel* of that service will not be up to the requirements of Naval reserve.

In our oversea Dominions the "call of the sea" is of even greater moment at the present time than it is in the Mother Country, for the Dominions have new navies being built, and the *personnel* wherewith to man the ships as they come afloat has, to a large extent, yet to be organised and trained, and a reserve formed.

There is no need to sound the "call of the sea" in the ear of the boy scout, his training as a sea scout will put him in touch with the sea and ships, and gradually show him what the sea life is, and that he is soundly qualifying towards a very high foundation of sailor construction, while in no way relinquishing or unfitting himself for other branches or professions of life on shore.

The work of sea scouting will grow with the boy, beyond mere individual knowledge and outing pastime, into collective duties for the public good. The work of coast guarding, life saving, salvage, and so on will be undertaken by boat's crews and companies trained and equipped for the work under the boy scout organization.

TO BOY SCOUTS.

Such a lot of Scouts want to become Sea Scouts that it has become necessary to write a book specially designed to help them. Of course you know all that there is in the book *Scouting for Boys.* Well all that lot goes with this, for all the rules and laws of Scouting apply to Sea Scouts. Then there are titles, qualifications, badges, and duties which have nothing to do with Shore Scouts, but everything to do with Sea Scouting.

Of course sailors know something about the sea and ships, but Scouts ought to know all about everything, not only what is going on to-day, but of the old times, the ways and deeds of early voyages, such as of Drake and Raleigh, the ships of Elizabeth's time, Nelson's time, and then our time. There are the stories of pirates, slavers, and privateer, very often drawn a long way off the truth, usually so as to fit the needs of the story of the book; here you will only read the true character of such men, no matter how they appear as heroes in fiction. Though they were Sea Scouts of the finest quality in fighting, or escaping, the pirates never held a single other quality that you know all good Scouts should hold. Take the ten points of Scout Law in your book, the pirate's acts were the exact opposite. He had no such thing as *honour.* He had no *king or country* to be loyal to. He never was *useful to others* nor *helped* anyone; he only *helped* himself out of others. He was the enemy of all, not the friend. However you can read about him later on.

To some extent you may be puzzled by nautical words, but you will soon get to know them, and then you will see that if shore-going words had been written instead of sailors' language you never would learn the language of the sea, and the book would have to be chock-full of explanations; so I shall stick as far as possible to "Jack's" simple lingo, and if you get hung up over a phrase it will be easy and useful to get it explained by your Scoutmaster.

This little book is not a complete work on seamanship and navigation, nor a history of the world, but, just as far as I can imagine your wants, a collection of the main points a Sea Scout ought to know. Other books going into greater detail will be mentioned, and your headquarters will no doubt get such books in time, and your Scoutmasters will read them, and so be able to instruct you on points you do not understand. But this book is intended to assist the Scoutmaster as well as the coxswain and crew, and also the inland boys; so, you harbour and sea coast boys, who know a lot about ships and boats already, do not go "shaking up in wind," saying, "rot, anyone knows all that," when you read a simple thing explained, remember there are lots of Scouts younger than you, and many inland boys who have scarcely ever seen a boat or a ship.

I am not going to tell you all you should know to be fit to command a battleship, but just enough for you to be able to handle a boat safely and to assist in harbour and coast work and to enable you to give useful and reliable information about your district waters, and about things you see happening, and above all to enable you to be useful in saving life or in preventing casualties occurring.

A Sea Scout must be a Boy Scout; therefore I may take it you have read the official hand-book called *Scouting for Boys* and also, therefore, you know the Scout Law and Regulations, and have qualified in Morse and semaphore signalling and all the other many requisitions. Sea Scouting is simply a branch of Boy Scouting, but all your work as a Sea Scout is on or about the water, mostly in boats. It matters little whether your "ship" is a vessel afloat or a building on shore, provided you can have your boat or boats at the headquarters, and are at the water's edge. You will see in the official regulations for the "Organisation" all the ratings and qualifications now arranged for Sea Scout, and you must keep an eye on the *Scouter* (monthly) for any changes. Uniform and badges also are matters of official settlement.

By far the greater part of your instruction can be done at home, especially if several Scouts meet together, and one who knows helps the others on in all the simple things at once, so as to clear the way and have only difficult things to tackle at the troop or patrol musters.

The training can be done on any kind of water large enough for boating. It would be well for inland companies to be in friendly touch with a seaside company so as to have an occasional outing on the sea coast to get instruction in sea-going work and life saving, etc.

The headquarters or boat-house, with her boats, can be made up by degrees into a jolly waterside camp; of course there must be some money for material, but all the work can be done by the Scouts, and there may be kind friends who will give the company a boat.

A great advantage of a creek for headquarters is that boating and all work can be done even in bad weather; and usually a bit of foreshore would be easily granted for landing stage and for hauling the boats upon, and in such quarters the property can, in most parts of this country, be left unguarded without much risk of loss.

Cruising in boats, perhaps coupled with camping out, is a great feature in Sea Scouting, it gives a splendid healthy outing, and teaches more watermanship in a day than you could learn from books in a month; however, before any cruising is attempted in boats it is of the utmost importance that the whole crew, and especially the person in command, should be thoroughly capable of handling the boat under oars. The crew must be able to row as a crew together, and to do all the work with the oars and boat hooks, head fasts, tow-lines, etc., smartly, quietly, without fault and immediately as may be wanted. Mere rowing, in however good style, is not enough; safety demands expert handling in getting alongside vessels, piers, and landing places, being taken in tow, and many other happenings to boats.

No sails should ever be on board until the crew has for some time been perfect at ordinary handling. Nor should sail be hoisted while there is anyone in the boat who cannot swim, and never unless an expert at sailing is in charge of the boat.

Get some knowledge of the ways of the tides, how to rig and unrig the sails, the making a fire and cooking your food, setting a tent or extemporising a tent from sails, how to act in a squall; in short, a hundred and one things, all of which are mere everyday nature to the real waterman. They are quite easy to learn, but you need at first an expert coxswain to guide the boat's crew, and his word must be unquestionable law; each Scout must have his own duty of detail, and also his place in the general or combined work, there can be no "passengers." What one can do two will muddle.

In the matter of boats, it is likely than most cases the first formation of a Sea Scout branch will be only a boat's crew or patrol, even if more only with a boat or two. But do not get large boats if you can help; a small boat that can be ably handled by boys is much safer and pleasanter to use than a large heavy boat - which is so cumbersome that she masters the crew.

A large boat can be quite as easily wrecked as a small one, and only boats that have become unmanageable are wrecked. A large boat undermanned—i.e., by boys—will probably become unmanageable long before a small boat would, in which the boys are amply able to man her.

Of course there is the ridiculous extreme of putting an inland river skiff to do open sea beach work; she is too shallow, too lightly built, and too crank to do any such work. But you can usually reverse this order of things. An old ship's life-boat, or a "service cutter," which sometimes can be bought for a few shillings, or would, no doubt, be given to Boy Scouts, would make first-class camping boats for river or lake for inland companies of Sea Scouts.

Joining the Sea Scouts does not mean that you are going to take up the sea profession, it means that you are going to make boating, sailing, camping, fishing, sailoring, and watermanship your pastime for your spare time and holiday. As you go on you will see how useful Sea Scouts may be as Scouts, and also how useful the training is for life after you are no longer a Boy Scout; you may then so like the sea as to take up that profession absolutely, or you may join the Naval Volunteer Reserve, but in any event, after the Sea Scout as a boy, you will know, and every one will know, that as a man you are a more useful citizen to your country than one who knows nothing beyond his own trade or business.

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ILLUSTRATIONS.

CHAPTER I
SEA SCOUTS OF OLDEN TIMES.

In stirring tales of adventure of the old-time navigators you have often read, no doubt; you have heard about their fights and shipwrecks, their discoveries and their treasure prizes, but rarely in those stories do you read anything definite about the ships they used, what little things they were, how badly stored and poorly watered, and why so many were lost. Such matters are considered uninteresting in novels and too technical for boys. Well, if you think so, skip all this, but a good Scout should know the old ways as well as the new. The old pioneer sailors were always scouting unknown regions among wild people and enemies, feeling their way; and the more a Scout knows the less trouble he has.

When talking of old-time Sea Scouts it would be wrong to class them all together; there were two distinct divisions, those who voyaged solely for plunder, and those who adventured for the discovery and acquisition of new countries and the supremacy or advance of their nation. The former were pirates, a term including buccaneers, freebooters, corsairs, and such gentry; they were simply lawless robbers on the seas; they acknowledged no king or country, respected no laws, and flew no nation's flag; their sole object was plunder, and to obtain it with or without murder as resistance might be offered or not.

A Filibuster and a Rover are titles that have been so twisted in stories of the sea that they are commonly set as a class of pirates; even some dictionaries put them down as "lawless adventurers in quest of plunder." It is probably sufficient to say that in Queen Elizabeth's time the filibuster was an officer of rank who was commissioned by his sovereign for an adventure to annex a particular place or country; sometimes he was commissioned for a voyage uncertain of destination, and then it was called a "Roving Commission"; in each case he was to fight the Queen's enemies where they might be come across, and to discover and, in the roving case, to annex new lands. Thus, it was the voyage rather than the ship or commander to which the title applied, and often the adventure applied to a number of ships in squadron; but such adventures were always made by Royal commissioned ships of the country, and sailing under its Royal flag.

The filibuster and the rover expeditions were much older than pirates exploits, because the former were mostly discovery or colonising voyages at a time when very few other ships were on the far oceans, at least none but well-armed craft equivalent to men-of-war, a class that no pirate wanted to tackle. The pirate's harvest was a hundred years later when richly laden merchant ships, indifferently armed and slow at sailing, were to be frequently met at well-known points on the oceans, for there were trade routes of wind convenient then as there are steam routes now, and most of the looting harvest was picked up near watering ports of call.

The great English navigators of early times were filibusters and rovers; in the strict sense above stated, Raleigh, Drake, Hawkins, Hudson, John Smith, and others, engaged mainly in discovery and annexation; but also on occasion they singly or in fleets sailed to attack the fleets of the enemy, and in those days England had many enemies and the chief of them was Spain. The several histories of these sea captains have frequently been published, their main story being furnished by State papers and the dashing details being filled in by the sagacity of the chronicler. By spine writers we are warned not to believe in those histories because subsequent surveys proved the maps made by the early navigators to be wrong in important detail, but it must be remembered that their navigating instruments were of the crudest kind. One of the most important factors in obtaining positions by nautical astronomy is correct

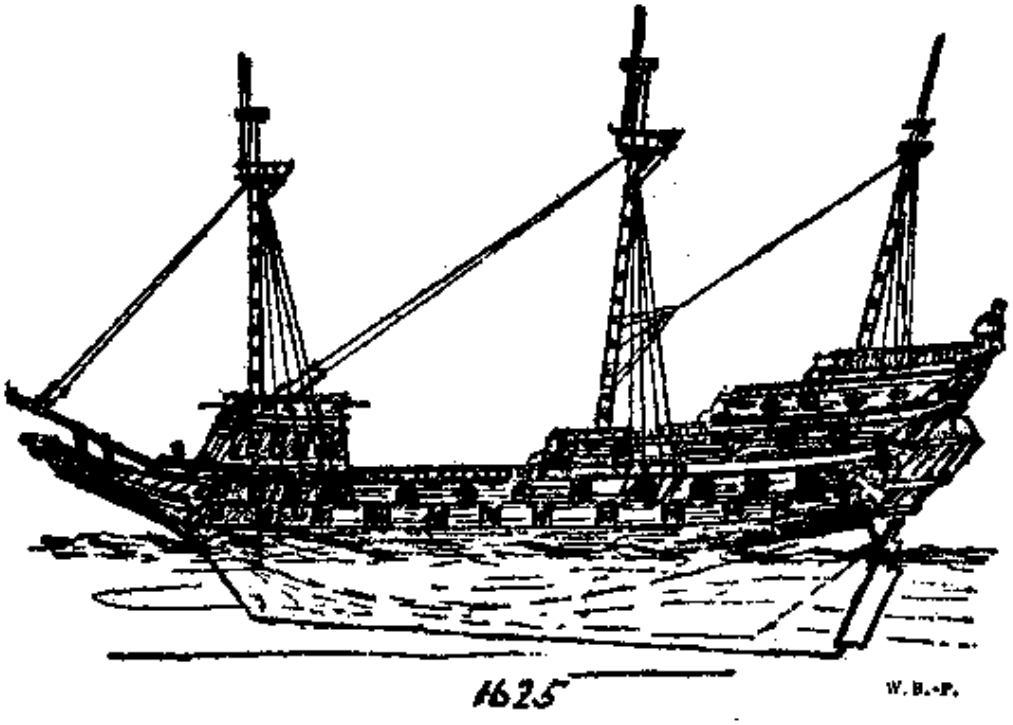
time; the watch or chronometer was not known in England until seventeen years after Sir Francis Drake had sailed round the world, nor until thirteen years after Sir Walter Raleigh had discovered Virginia. The lands were discovered, and the charts, which were made by those early navigators, gave the positions of the harbours they had used with such sufficient accuracy that they were revisited by subsequent navigators and the plans amended as better instruments and knowledge enabled men to be more accurate.

There is not space in a little book like this to go into yarns about the bold adventures of the old "sea dogs," but many of their known sayings, though three hundred years old, are applicable today. They would make good mottoes for Sea Scout guard-ships. Here are some—Hawkins, in 1562, addressed his ship's company on sailing from Plymouth, "Serve God only, love one another, preserve your victuals, beware of fire, and keep good company"; better advice couldn't be given on any ship to-day. Sir Humphrey Gilbert, of the same period, in going into action with a Spanish ship twice the size of his ship, addressed his officers and men, "He is not worthy to live at all who for fear of danger of death shunneth his country's service or his own honour." Isn't that real Scout Law to-day? You, of course, know the story of Sir Francis Drake playing a game at bowls on the green at Plymouth, in 1588, when the Spanish Armada hove in sight off the mouth of Plymouth Harbour, approaching with the intent of invading England. Alarm and panic were rapidly rising among the people and all eyes turned on Drake, the great admiral, he calmed the excitement by continuing playing, saying, "We have time to finish the game and to beat the Spaniards afterwards." Then you can find in the life of Captain John Smith, the founder of the colony of Virginia and also of Princess Pocohontas fame, that he held quite a good Scout motto, "We were not born for ourselves, but to do good unto others." When you read the histories of these old-time sea fighters you will note one remarkable feature of their gallantry which has been steadily maintained by our sailors down through Nelson's time and is with us to-day—the "odds" were never counted or allowed to weigh before going into fight. There was the enemy and we'd got to take her. The faith in every man standing at quarters around the guns, or up aloft shifting or setting sails, was, "She's sartin for to strike the flag." It was that bold confidence, the daring of that little English frigate to sail in and attack the big two-decker, that drove panic into the hearts of the enemy; it made their aim bad, their firing wild, and paralysed their arms when it came to the rush of boarding.

International law for sea use, in the days of Drake and Raleigh, was made by those who were strongest, who held command of the sea; and even at that time the bluewater-made-law, almost entirely emanating from English sailors' brains, was accepted by other countries as the just law to rule the waves (straight); and the "lawyer sharks on land" grabbed it, and the universities wove it into their old "principles," and so it came on as "international law." But no sailor ever saw how international law could be enforced except by longest gun at sea, and that is where the vital question always has been settled, and will be yet. The law of the sea goes with the command of the sea; it is ours today, open and just. If we lose the command of the sea tomorrow the sea law will be piratical, no matter universities, conventions, and declarations; the Declaration of London (1911 when this little book was in writing) had it floated, would just about have shifted the command of the sea. It did not float—so we may sing with the crew in the play of H.M.S. Pinafore slightly altered,

"In spite of all temptations to give in to other nations
And await procrastinations, the longest guns still win"

To know something about the ships is useful when you are being told stories about the old-time sailors. Most of the fighting was done hand to hand; the guns were poor in range and few in number of the larger size, and nobody waited to be sunk by a shot, but dashed alongside to "board," that is for the crew to jump aboard and fight the enemy down hand to hand. But as cannon improved, the high structures of "castles" at each end had to be reduced as too large a target on unhandy ships, and thereby the sailing ability and stability were immensely improved . The Spaniards and the Dutchmen, however, stuck obstinately to the old style of top hamper, to their cost, for many years.



Just a sketch here will give you an idea of how large a proportion of the hull was above water, making "topweight" and "windage." Then think of all those guns—cannon or pieces they called them—all their weight and the spars and sails plus the pressure of wind, all high above water, the wonder is they ever floated bottom down. Just to have the names of parts in your mind, see the sketch. Forward under the bowsprit is the prow and "head," forming a sort of bridge platform mainly used for "boarding" the enemy, supporting also the bowsprit, and it supporting, by stays, the foremast. Then we come to the "forecastle," a citadel of strength affording protection to the fighting sailor till they rushed out through the front doors to swarm on board the enemy when the two ships were locked together for that purpose. Abaft the forecastle the upper deck to the mainmast is called the "waist." In the earlier ships it was not planked over, merely the narrow cross beams and a small gangway of plank fore-and-aft amidships. In small craft this waist was open to the hold and formed a pit-fall for the boarders to tumble down into, as they had nothing but the beams to stand on, they being heavily clad in armour with unwieldy pikes and long swords, the ship rolling, arrows and small balls flying about, and nothing to catch hold of, and all the time between two fires from forecastle and poops. The next step up toward aft was the half deck, then the quarter deck, then the poop with the mizen mast just at the "break" of the poop. Below the quarter deck and the half deck, varying in different sizes of ships, were what may be termed the ship's vitals, the helm, the water, the stores and the ammunition, so when these were captured and the ship's crew driven forward they must starve and thirst and fail in powder, and the ship could not be handled by them.

A curious term is frequently met with in the old chronicles describing new ships launched in the times from Henry VIII to the end of James I's reign. Small swivel guns firing iron bullets were mounted across the after part of the forecastle and the fore part of the quarter deck, that is facing into the ship, in describing the Sovereign of the Seas we find it put "thirteen cannon on the after part of the forecastle for murdering fire, and a great many murdering pieces firing out of loopholes out of the cabins (that is firing from aft along the deck) for musket shots." Evidently these were for shooting boarders, or to crush mutiny on their own ship. These were the large "first-rates" or battleships.

The ocean-going ships such as used by Drake, Raleigh, Hudson, and others, were small craft, but all very much on the same principle. Their size would be, in tonnage, not much larger than the coasting schooners you see today in any harbour around the kingdom. They had the high poops, several levels of decks and the forecastle, fearful top hamper for so small a bottom, so no wonder they were slow and unhandy at sea. They had no headsails, i.e., jibs, at first, and all depended on smart "backing or filling" of the fore topsail which was nearly plumb over the "head" and thus beyond the fore foot.

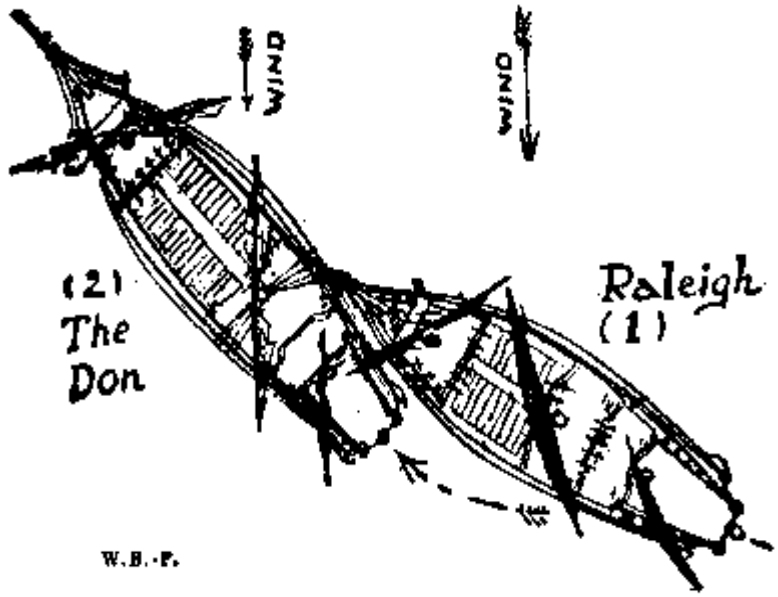
Aft they had according to size of ship, one, two or more masts fitted with lateen fore-and-aft sails; these could be quickly set and brailed in, so were useful in twisting the ship around. The driving ahead was mainly done by the square sails on the mainmast with an enormous mainsail, which by brailing to its yard could be quickly handled, set, or taken in, and so the balance of pressure of sails could be used for turning the ship quite independently of rudder action.

In those early days of foreign voyages there were no charts to warn the mariner of rocks and shoals in newly-discovered bays and inlets; that is to say, that the several companies of adventurers, though they surveyed, in a rough way, the places they visited, kept the knowledge to themselves in defence against any competition in their new-found trading. But they constantly poached in other places where they sailed at risk as if the place had not been yet discovered. This was why they one and all preferred small vessels of very shallow draught. Mostly they were between 8 and 10 feet in under-water depth, and as in all seas and estuaries, except in muddy river mouths, you can well see bottom at 8 or 10 feet depth, and as all navigation was done in daylight, they had mainly to rely on the masthead lookout man for warning of shoals. The only other way was to send two boats ahead into the harbour, each sounding with the lead, and follow in, keeping the boats in line, and also the boats would draw the fire off and so expose the presence of lurking enemies. This sort of work was all a high order of Sea Scouting.

The crews of these little vessels were very large compared to the actual work to be done, but with fighting men such as Drake and Raleigh or the more dangerous Arctic voyages such as Hudson made, the wastage of life by fighting and sickness and losses on the frequent boat expeditions had to be anticipated, as on such voyages no more men were to be picked up after leaving England. The crew, in number, went a man to every 2 feet of the ship's length, and in the smaller craft they were so many that only half the crew could be below feeding or sleeping at any time. They were in two "watches" or divisions, larboard and starboard, one of which, in turn, was on deck at work or ready for work. Now these men were mostly riff-raff fighting adventurers, attracted by the hope of plunder and gold. There were always wild stories flying about our seaports of new lands paved with gold and precious stones, hence a great ready supply of sailors. Such quality always contained all the ingredients of mutiny; when the expedition failed to find treasure the mutiny was made to stop going on with the

voyage and to get home. When the expedition filled the ship with treasure the object of the mutiny was to loot the ship and divide the spoil.

The risks of mutiny, failure of fresh water, and sickness from scurvy were far greater than those of the seas. The little ships were splendidly handled and rode the seas' easily. To guard against these dangers the old navigators were wily, they knew a mutinous crew must get thirsty, must want powder, and must want lights to fire their guns, there were no matches in these days, so these governing items of equipment, water, powder, and fire were kept under decks beneath the officers' quarters right aft, and they saw to it that there was a good bulkhead of heavy cargo or stores between these vitals and the crew, in case the crew tried to force a way aft through the hold. Only one day's water and rations were served out at a time, so a mutiny, unless it extended to the officers, could only have a short run. The steering gear of the ship was also below deck right aft, so as long as the quarter deck and poop were held by the officers the crew could not handle the ship.



Drake and Raleigh were crafty men in sea fighting, for this is not only a combat to arms and brave men, but of very deep science as to how the ships will act or can be made to act in certain circumstances. They brought in the lessons that stood us in good stead till steam superseded wind. It was to "board" after locking their lee bows on to the weather quarter of the enemy. First get the windward station, and that was the tussle which took hours, perhaps a day; once obtained you could play with the enemy. See the "bird's eye" view plan; (i) is Raleigh having got to windward of Don Quixote, he tires at the Don's fore rigging, the object being that if his foremast sails collapse the Don will broach-to, that is' come up towards the wind even against desire, and stop helplessly. In any case Raleigh intends as soon as possible to jam his (in this case) port or lee bow, the wind being on his starboard against the weather (right hand here) quarter of the Don, and his bowsprit close along the main shrouds. The bird's eye sketch here shows Raleigh's game has come off. The Don's headsails and braces have been crippled so she couldn't be kept away from pointing near to the wind, then Raleigh comes on, pushing her up. Raleigh's "forecastle," his fighting end, is now commanding all the after-decks of the Don and his cannon and "murdering pieces" soon clear everybody away to forward, so also below decks aft. The Don's little quarter deck and poop guns being no use against the stout forecastle and the murdering pieces on the bulwarks these soon clear the gun' crews away.

All this time Raleigh's men have been under cover within his forecastle. Now the head-doors are flung open and all the bow cannon fired to create a sensation and a lot of smoke. Before this has cleared Raleigh's men, with blood-curdling shouts, have "boarded" and swarmed the poops, half and quarter decks and swept all below into the hold. They have captured the

"business end" of the ship, all the fresh water, powder, shot, valuables, wine, etc., and the helm. The difficulty of feeding and watering so many prisoners so far away as the West Indies or mid-Atlantic usually advised the looting of valuables and powder; pitching all cannon overboard that could be moved, and all shot and powder not useful to the captor. Then cutting topsail halliards and all braces, the prize could be left to mend her ways. Of course, with much sea on (i.e., waves), "boarding" was dangerous to the gear and hulls, but, from history, it seems they nearly always did "board."

You should read Raleigh's history in Maunder's Biographical Treasury. You will read his life story and the action which ended his career; but even then it is impossible to sift out the truth, as court conspiracies worked and recorded in every direction to their own ends.

Shortly put, Sir Walter Raleigh towards the end of Elizabeth's reign commanded an expedition to Cadiz and gave the Spaniards a heavy beating; this restored him to favour and was, no doubt, a Victory in actual war. James I came to the throne and was by the court prejudiced against Raleigh, and on the charges of aiding the King of Spain (he had shortly before beaten him) and of placing Arabella Stuart on the throne, Raleigh was condemned of high treason, but he was reprieved and in 1616 he was released but not pardoned. He obtained a patent under the great seal to make an English Settlement, in Guiana; having come to Orinoco he attacked the Spanish at St. Thomas and captured the place but failed to get his mutinous ships to attack further Spanish Settlements, and so he returned. It would appear that charges were made against him that the St. Thomas fight was wholesale murder. He was again tried and condemned to death in 1618 It does not appear clearly whether he was beheaded for the St. Thomas affair or for the previous high treason which bad never been pardoned, but his head went off. Raleigh was not a discoverer; he was a great commander of armed expeditions to secure and perfect the work of discoverers.

Hudson's voyages in the year 1606 and onwards, were true voyages of discovery; and our vast Dominion of Canada owes practically its earliest settled state to Hudson. Much misconception had been cast about Hudson, that he was a Dutchman, Heyndrk Hoitsen, but it evidently arose from the fact that some of his expeditions were made in vessels belonging to Holland, that is to the Dutch East India Company. However, all questions were looked up and settled from the archives of the Hague for the great American celebration of the 300th anniversary of Hudson in 1909.

The Half Moon, Hudson's ship, was reproduced by building from the drawings of the old ship, and she was sailed into the waters of the Hudson River at New York in 1909, and thus were seen in the present day side by side, as it were, the little ship of 300 years ago and the latest modern - ironclad, motor launches, electric lights and wireless telegraphing apparatus. The little pop guns of the Hudson, firing an 18 lbs. iron ball at the utmost range of about half a mile, while the modern 13.5 inch to-day gun of the ironclad fires a shell of over half a ton over a sighted range of 21 miles and carrying to about 20 miles. But we are not comparing ships here.

That Hudson was English is made plain by the contract, dated 8th January, 1609 "between the directors of the East India Company of the Chamber of Amsterdam . . - and Mr. Henry Hudson, Englishman, assisted by," etc. The Times of September 25, 1909, gave a very clear account of Hudson's career as far as it can be found from records, and shows from many other points that England may claim Hudson as her son, and therefore Canada has equal right to relationship. One strong point, no matter how names be spelt, for spelling in those days did

not exist, that Hudson was not a Dutchman is found in the recorded fact that he couldn't speak a word of Dutch and that when he visited Holland, his first and only time, 1608, to complete his contract for his coming voyage, he had to be assisted by an interpreter. Later he was, as an Englishman, forbidden by the English Government to give his services any more to the Dutch. He made four voyages 1607 to 1611, in which year in June, The Times says, somewhere in Hudson's Bay, a mutiny on his ship the Discovery turned him out with eight others in a shallop (small boat), and he was never heard of again.

Hudson's ambition was to discover a North-West Passage to India through or around the north of New England (America). The Dutch East India Company ordered him to find a North-East Passage by the north of Nova Zemba. It was believed from reports of Weymouth and of Captain John Smith that there was a passage or strait through America, somewhere north of Virginia, leading to the "South Seas" (that is what we know as the Pacific Ocean in these days), but Hudson found it was only a big river now known as the Hudson. The Nova Zemba passage search ended by finding too much ice; and the head of the Half Moon was turned from the east to the west with the final result of pushing up the Hudson. The actual North-West Passage has been found and actually navigated in recent years.

Hudson's ship was a curious little vessel; her size appears from old records to have been about 63 feet long by some 17 feet wide and of about 80 tons burthen, "able to carry 80 tons," says one document, but "tonnage" may have been anything then as now. She was no doubt, in a general way, as I said before, about the size of the coasting schooners you see in small seaports, but with vastly more superstructure in high poops and forecastle and enormous spars. One must take the measurements given in the accounts of this vessel, and indeed of most ships of those days, with the mind that foreign feet and inches were not English sizes, but have been loosely passed on by writers as if they were English.

Of many articles in periodicals dealing with the Hudson festival in America in 1909, the most interesting was in the American magazine, The Rudder, of September, 1909, which also gave photographs of the Half Moon, the reproduction of the old ship from her actual building plans, and with crew on board . Curiously, in regard to the plans, from which this vessel was built, the measurements are given as in "Amsterdam feet." But the interest is not in the actual dimensions, but the quaint type of ship and the mode of sailing and fighting of those early days.

We may sum up the old Sea Scouts in saying that it was by a fine use of scouting lore or instinct that they made their discoveries of new lands, and navigated uncharted seas, all the dangers of which had to be found out by cute observation, or often unhappily, by accidents; they had crude instruments of navigation, the sand-glass for time instead of watches, chronometers or clocks, and only a dawning knowledge of astronomy. Then all these shortcomings were found on board vessels of parallel crudeness in themselves, these ships could not "work to windward," with their high above-water structures they blew side-way almost as easily as ahead (called making leeway), they were entirely dependent on the wind being abeam or aft, i.e., a fair wind; otherwise they anchored if they could find bottom or were helplessly driven out of their intended course. With such dependence on the luck of a fair wind voyages were always long, and often were entirely frustrated by the water supply being exhausted and food going bad.

It was only by being always on the alert, on lookout from the masthead, that strange lands, indeed any unknown sea, could be approached. There were, of course, no charts, and a great

portion of the already-visited places were mapped with a great deal of imagination. The "lookout" was always a trustworthy old sailor, from aloft he looked around at the water, and the slightest variation in its colour or any uncommon commotion or eddy swirl would catch his eye, then soundings with the lead line over side followed - and perhaps boats were sent out to further inspect and take soundings.

To distinguish the outline of distant land and not be taken in by mere cloud outlines required oldhand expert sight, landsmen often make such a mistake, but in these days we also know whether land ought to be, or even can be, in sight in a particular direction, but in Hudson's day they knew not and might expect to find land anywhere. So it was mainly sharp lookout and the use of the lead in sounding (that is finding bottom) that pulled them safely through the unknown dangers.

Very few actual wrecks (except the hunted Spanish Armada, where they were driven ashore being unable in the hostile country to take harbour shelter) are reported of these early navigators,
losses did occur, but from other causes. The most common was that of wood worms eating holes
through the bottom planking; then there were helpless ships where the whole crew had died off
by scurvy and bad water, and also a great number cast away by mutineers who plundered and then landed to set up their own kingdom and usually ended by starvation or in battle with the wild natives.

Those were the discoverers. There was also an immense use of sea scouting in the fighting line, all through the time from Columbus and Vasco de Gama in about 1490, down to this day. Certainly the electric telegraph and the "wireless" now take up a great part of sea scouting work, but with them there has come in the immense increase of the speed of vessels and that under steam the wind, which in old times governed action of ships on the water is now almost a neglectable item, so though the news comes in with lightning speed, ships and fleets move faster by three-fourths than in old days and with almost absolute certainty.

None the less, scouting is as important as ever; see how, in the sea fighting of the 20th century and the Great War ships and even fleets have been out of ken for days and weeks, though being the while duly searched for.

CHAPTER II
SEA SCOUTING TO DAY.

A seaman's knowledge is as essential to good Sea Scouting to-day as ever it was. The ships have changed, no doubt, and the telegraph conveys an almost instant knowledge of many things out of sight and which could not be known of in old days. But the sea, the winds, the tides, and the difficulties of pilotage are yet with us, and the fighting machine, or the ship of to-day, still needs sailors to handle her. Modern guns, torpedoes, engines, electrical and hydraulic gear need mechanicians to handle them, and no seaman's knowledge (except sea-legs and absence of seasickness) is wanted at that work; but the command of the ship and the handling of her gear are as they were of yore—seaman's work—and plus three times the speed, and therefore one-third the time to think.

Though a Sea Scout may usefully know something about everything, it by no means follows that an expert in any, or several branches of mechanics will be of the slightest use as a Sea Scout, unless he be also a seaman; and it is pretty certain that to be a high-class man in any or several of the scientific branches leaves insufficient time to become also a true sailor. So Boy Scouts should become sailors first and experts when they find time.

Let me here make it clear once for all. By the word "sailor" I don't mean dressed as a sailor, nor drilled with rifle and cutlass, exercised at scrubbing decks, lashing up hammocks, or marching in "fours" astern of a brass band. I mean holding a sound knowledge of all you can learn about ships and seamanship, boats and watermanship, seas, tides, charts, pilotage, lookout work on the coast, saving life, flag signalling and Morse semaphore. You get the foundation of these as a boy, and you'll be surprised as you grow how easily the higher knowledge will tumble into its proper place.

Your line is simply that of Boy Scouts who take up the work connected with the sea and rivers, and you add to such seamanship and watermanship all the varied Scout knowledge and backwoodsman's craft you have learned as a Boy Scout, and will still improve in learning. You work on well thought-out principles, sound high principles of honour, chivalry, unquestioned instant obedience to all above you, self-command, and then unflinching command of all below you. Those are the principles necessary to the safe being of every craft afloat from a sailing boat up to a battleship. If you are sailing in a boat and the cox'n orders you to "let go the halliards," you hesitate and say, "What for, that squall won't come to us"; she's hit by the squall, you all tumble to leeward, somebody on top of you, you can't let go the halliard and the coil is now all foul, the boat fills, and . . . well it's all your fault for not obeying instantly your superior's order. That one moment of neglect may have drowned half the boat's crew, and even if no accident
happens you've set a bad example. Always obey first and argue after, if you dare.

Another point, under those governing principles, in order to be able to instantly obey you must learn all you can in seamanship and in watermanship, for one order often covers several minor acts, and there is no time for thinking out or asking. A sailor doesn't think, he acts at once, because he knows, otherwise he wouldn't be a sailor, he'd be only a lubber or a foreigner. Then, to command, you must go on learning all you can, for when you are promoted to "coxswain" of
the boat it should be your aim and pride that you never give an order that you couldn't carry out yourself.

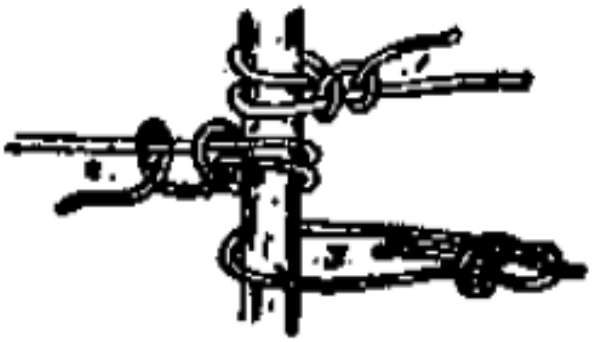
Though the work of the Sea Scout today is merely his peaceful pastime and outing he is certainly useful in lifesaving and many other ways. War may be on in a very short time when least expected, and then indeed the Sea Scouts *would* be useful all around the coast as coastguards, or in patrol boats, and many other ways. Sea Scouts would be the "eyes of the coast' to report the appearance of suspicious-looking craft or of enemy's vessels.

So while you are Sea Scouting, whether ashore or afloat, take notice of all around you, and what you don't understand ask your coxswain or other superior about it and look it up afterwards.

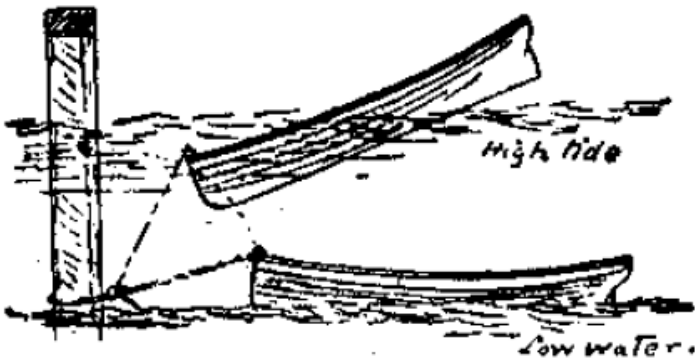
Many acts that a seaman performs are the result of a combination of several branches of your training, and a fault in one may spoil the whole. Let us take an instance; you are away for an afternoon boat cruise, you are cox'n in charge, you go well up the creek with a flood tide and

land to have a tea camp in a wood that comes down to high-water mark. You ram the boat ashore and make the painter fast to a post, all hands land, the tea camp goes grandly, yarns and songs have gone around and your orders for packing the gear and putting out the fire are obeyed; the sun is getting low and you have a long row back to the guard-ship. Well, what's the matter? Why, the boat is found left high and dry by the tide with a quarter of a mile of soft mud between her and the water. The crew can't walk on the mud, it is too deep to drag the boat; you are done for the night as to the boat, and perhaps are on the wrong side of the creek for getting aboard your guardship, when you try to walk home some miles below.

Now where is the fault? Simply several small things left undone or not noticed, any one of which would have saved the situation. You didn't look out the time of high water in the tide table before starting. This fault would have been corrected had you noticed as you stepped on shore that the beach was wet for some feet above the line of water, for you know the height of water of a tide in many places actually begins to fall while the flood stream in direction is yet running up in the fairway. Also you didn't notice that schooner at anchor off the camp, swinging to the ebb tide, it was while the kettle was boiling and the sea was the all-absorbing thing of life. Any of these would have told you to get the boat off the bank and keep her afloat, but you had not even left a boat keeper in the boat. All these are unseamanlike neglects, and combined, they stranded your boat on the mud bank.



Then there is a very common fault, viz., full knowledge of a branch of work without knowledge of its application. Your bowman has learnt to make every knot or bend that any rope was ever twisted into, and landing at low water you order him to make the boat fast to the pile at the low water end of the causeway or "hard." He does with great security. He fastens the end of the boat's painter (the bow rope) securely to the post at low water with the "bend," known as a "round turn and two half hitches," or perhaps a stun'sail halliard bend, fig. 2. Consequently, with a dry rope and a well-tied bend, when the tide rises the fastening becomes wet and very tight on the post. Up floats the boat with the rise of tide; and when you come down on the beach after your shore going and hail for the boat, the slumbering boat keeper wakes to find his rope grandly fast to the post some 6 to 10 feet below water. The seaman would have known almost instinctively that as tide rose it would lift the boat. A "bowline," fig.' 3, would be the proper bend to make, for it would travel up the post as the boat floated higher, and so could be cast off any time. Of course, you order the bowman to strip and dive and cast it off the rope, if he can.



Sea Scouting includes such a lot of distinct branches, Working one with the other, that it would fill a book to attempt to describe the combinations required for particular acts. But as you go on in training and practice you will soon see how to use the detail knowledge from different branches to carry out a particular object. Such, for instance, as the rescue by your boat from the beach of a small coaster's crew, whose vessel has dragged on to outlying rocks and is in danger of breaking up. The "detail" you bring into use is:—Launching the boat safely, knowledge of the set of the tide to make sure of reaching the wreck, ability in handling the boat under sail or oars, watermanship of how to get alongside with least danger, then also pilotage as to where to take the rescued crew for a safe landing, probably flag signalling to the shore that a tug might salve the vessel, and many more bits of special knowledge all put together act in the success of the object—the rescue of the schooner's crew.

So you see it need not be all one Scout's knowledge. You have a boat's crew, and someone may know one branch, some another, and between you you make a useful unit.

CHAPTER III
PIRATES

Whatever may be said of the quality of the morals and virtues of pirates, they were essentially fine Sea Scouts. They had to be, for their gains depended on scouting to find the property to be robbed; their life safety, to avoid being caught and hanged, depended on scouting to locate the position of men-of-war, and they had also to be constantly scouting to avoid each other.

The "bold buccaneer" of the stage and the novel is always interesting to boys; he is set out as a hero, and I well remember in the night watches when I was a young midshipman, and the ship was lazily rolling in the light airs near a tropical coast, I longed to meet a buccaneer, even to be friends with him, but the true, murdering, lawless blackguard side of such gentry of the seas was not told to boys, it was lightly glossed over and swamped in brave deeds and glorious escapes from justice or capture.

The buccaneer and the pirate were one and the same animal, freebooters or robbers; they belonged to no country, flew no country's flag except for deception, and they annexed any man's property, wherever they came across it. Their motto was "loot, sink, burn or destroy, gone ships and dead men tell no tales."

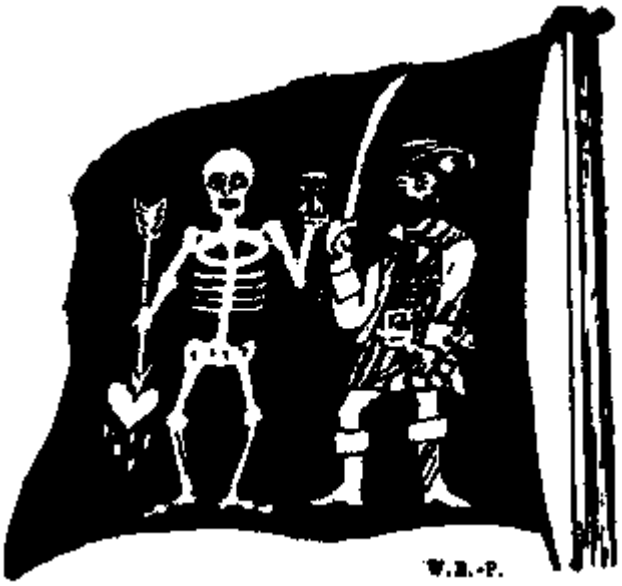
Many writers of olden times sought to make a distinction between pirate and buccaneer—but never acknowledged by law—that the buccaneer was a gentlemanly sea-rover who sought only to annex other men's goods and valuables, and to refit his ship and replenish his stores from another ship, or even perhaps to exchange ships if the other was better. He would only show fight and hurt other men if his kind wishes were refused. But as felony in those days was punished with death, it didn't matter much whether he stole a dollar or a life, nor how many of them; so the buccaneer was in fact a pirate.

Old histories are so twisted with mixed fact and fiction that it would be difficult even for a lawyer to prove that there was any real difference between Pirate, Buccaneer, Corsair, and Piccaroon. It mainly originated by sailors picking the titles up from foreigners, as an old shellback would say —

They mixed up their lingoes
As we mix our grog
And lost all true reck'ning
Just like in a fog.

There has been, from the same cause, much mistake in books, novels, pictures and plays as to the pirate flag. Old records, ships' logs, and trials for piracy, are, I take it, better than fiction and the stage, though you may think it rude to upset the great idea of the "skull and cross bones," but lately some writers have taken the trouble to dig out the truth. The pirate class, that is searobbers, had no right to any country's flag, they were disowned by all countries, being outlawed robbers. They had, however, a code of flags recognised among themselves, and also, of course, they used any country's ensign as a trap to mislead their prey.

The pirate, on nearing a ship, hoisted some country's flag to draw the usual "compliments of the sea," i.e., showing colours and dipping. Then having got near enough to gauge his chances of capturing, and, as a friend asking for news or offering to take letters, and so on, having got into a commanding position to windward, he would suddenly "throw out his house flag," say the old chronicles, and take any mean advantage.



The house flag, the true pirate flag, was "black with a white device of a skeleton holding an hour glass in one hand and a dart in the other, striking a heart, standing beside a captain holding a sword up in one hand, and a pistol down in the other hand, long-booted and cockhatted." This flag was sistered by an all red flag. These had great meaning, but even the reports of old trials of pirates vary in describing the name and meaning. I think the most reliable comes to this. The black with white figures was called the "jolly Roger" and meant that "no quarter would be given," as the prey was fighting. The "all-red" meant "looting only, if no resistance is offered." But just think why the reports are so conflicting; who among the writers ever saw a pirate flag, very few, only those lucky ones, where the pirate was beaten off, the crew or passengers of the captured vessel becoming dead men as a rule.

Johnson's History of Pirates will furnish you with many interesting details and stories, but I think he puts the signal the other way, that "all-red" meant "no quarter." This history gives also a peculiarly definite statement about flags, describing the actions of the pirate Bart Roberts. This man appears to have done the business in a very large way; his best ship was the Royal Fortune of forty guns and 150 men and his second, or consort ship, the Ranger, had thirty-two guns and 113 men. Both were eventually captured within two days, by H.M.S.

Swallow, off the Gabon Coast. The flags they flew on going into action were, Johnson says, the St. George's ensign aft, that- is the red cross on white ground. At the peak of the mizen was "the black flag with a skeleton with an hour glass in one hand and cross bones in the other, and beneath it a heart dropping blood." Also there was a "jack" whereon was a "man's figure holding a flaming sword and standing on two skulls." Also a pennant was flown. The interesting feature here, so far as such a matter can be of any interest in these days, is that the devices seem to have been the commonly accepted arms of pirates, but were made up in different combinations by some men. In this case of Roberts we have two flags, the sword-bearing man on a separate flag from the skeleton; the minor details of cross bones instead of a dart and flaming sword instead of sword dripping blood are of no matter. Now this looks as if the man or captain was "Jolly Roger," and that when he was flown with the skeleton no murder was intended, but if there was resistance "Roger" could be hauled down, and then "no quarter" given. However, the matter now rests on mere speculation. Whether they be read about in novel, penny-dreadful, or even in authentic records, the deeds of pirates can only be classed as robbery and murder. Their clever ways of doing business are no useful study for Scouts, as they always embodied trickery and treachery; honour and chivalry were unknown or forgotten by pirates and the deeds of the fraternity, like those of highwaymen, would have long ago been forgotten were it not that writers of fiction find such stories useful as blood curdlers when they introduce the "walking the plank," "marooning," and so on.

Of course there were pirates other than the sea or ship pirates, those attached to certain coasts or the sea close by; such were the Malaya, Barbary, Riffs, Chinese, mostly now extinct.

Disguise of all kinds was in great favour with pirates; anything to allay suspicion on the prey, or to enable the pirate to get sufficient inspection of her strength for fighting, was utilised however low the trick and dishonourable. One case will amply show how it worked: —The pirate was off the coast of Sierra Leone when he sighted a large East Indiaman, that is a large sailing ship laden with a valuable cargo, a crowd of passengers, a big crew and well armed with cannon, rifles and ammunition. In short, for Mr. Pirate here was a floating store-house from which to re-fit, arm, store, and ammunition his vessel. He well guessed that the commander and all on board would fight hard with far superior power and sink him in no time, so fighting or boarding was no use, trickery was the only game, and he rightly guessed that all aboard would hold high humane principles.

The wind was light and the sea smooth; the pirate, lying with no sails set so as not to be seen at a distance, had sighted the Indiaman in the evening, and had during the night worked into a position to windward of her. Next morning he sailed boldly towards the big ship with the English flag flying and signals hoisted asking for "news for his passengers" and for "a doctor to be sent to see a dying lady." He carried, as most pirates did, a lot of ladies' and gents' shore clothes, and in these his crew were disguised as passengers and were standing upon the bulwarks and rails showing the usual interest of passengers on nearing a ship. Mr. Pirate kept his little ship well up to windward and out of gun range (in those days about half to three quarters of a mile only) lest her identity might be discovered and the Indiaman sink him.

All of a sudden out of his side ports and deck hatchways came great volumes of black smoke; his fire-bell rang violently and down jumped all the passengers as if in panic, up went a signal, "Ship on fire, send boats." Water from pump hoses and buckets flashed about, and blazing tarred hemp tow was thrown out of the ports as if by the fire in the ship. The lumbering old Indiaman, of course, could not sail to windward in time to be of assistance to "the poor little passenger ship," so the humane captain did just what Mr. Pirate wanted and

expected. He hove-to and lowered all his boats—for it needed a lot to save so many "passengers, and, of course, there would be crew also—so nearly all the Indiaman's crew and officers went away in her boats to save life. The boats positively raced under a blazing sun to be first in saving the ladies.

Mr. Pirate kept edging his vessel more to windward away from the Indiaman as if his ship was unmanageable; he outpaced the boats yet cried to them to come on. Seeing presently that the boats were some 5 miles from their ship, he suddenly squared his yards and ran off before the wind right for the Indiaman and hailed the boats on passing them that his steering gear was burnt and ship unmanageable. So he ran towards her, at the same time keeping up the fire show and bell ringing. The boat's crews, now hopelessly dead beat by the tropical racing of 5 miles, were left resting and panting some miles away, and somehow the poor little passenger ship was so lubberly handled as to tumble alongside on the quarter of the Indiaman.

In a moment the smoke ceased, and the cut-throat crew, no longer dressed as ladies and gents, armed to the teeth, swarmed aboard the crewless, defenceless Indiaman and, of course, captured her. When at last the tired boats got back (of course,. they were not armed going on life-saving work) they saw the black "jolly Roger" flag hoisted on both vessels, enough warning for unarmed men to keep from attempting to board, and some of the warnings from the ship—as men killed or made to walk the plank—were enough to curdle their blood.

Having looted all the valuables and specie and half filled his little ship with stores, arms, ammunition, spare sails and gear, wine and water, Mr. Pirate took steps to draw the teeth of the monster rather than kill her—as he was now thankful and kind hearted. He "spiked" all the guns; he cut the main and after braces to prevent working ship, and also the hide wheel ropes and the davit tackles. Then, to be sure of no trouble with the boat's crews, he set a firing party to be ready to the last moment on the boats. With a spring from his quarter next the ship to the Indiaman as she payed off, her after yards swinging helpless, he canted around on to port tack, cut the warp, and sailed away;

Now there is a true story, and it exhibits the fact that the art of Sea Scouting was wanting on the Indiaman.

With such a low trick played on him, what could the good-natured commander of the Indiaman have done other than he did? Chivalry, humanity, and honourable action were all on his side. Lying, deceit, treachery, murder and robbery were on the side of the pirate, hidden in a pretty little brig sailing under false colours. Lying may be done equally by action as by word. Here it was done by signals and by actions, but it was not detected. Would a Sea Scout have been so completely taken in? One of the first principles of Scouting is to be suspicious, and to act with caution where instant dash is not absolutely necessary.

What would Commander Sherlock Holmes and his Boy Scout midshipmen have seen, and what deductions would they have made therefrom?

First sight, passengers enough to fill the little brig; no crew visible, yet if crew and stewards, cooks, etc., were there, the ship couldn't hold them or their stores and water. Not the type of craft for so many passengers in those days, nor were there many passengers, especially not ladies, carried in those waters from the West Coast of Africa, and brigs were not long-voyage passenger ships. Deduction, sham passengers, crew disguised for a purpose, and treble the number for a merchant brig.

Second sight, smoke bell and signal of fire, yet the brig is kept sailing, not hove to, and is drawing away from certain rescue. Her courses (lower sails), which would be first sails to catch fire, are not dewed up out of danger. Not a single boat is being got out. Deduction, a sham fire.

Thereupon Sherlock Holmes would smell trickery, and that the object evidently was to get the crew out of the Indiaman and far enough away from her to be helpless to prevent boarding. He would "go to quarters," that is, man his guns, keep the ship moving under good command, and then, "being prepared," he'd "wait and see." So a little real Sea Scouting, that is, points of seaman's knowledge usefully put together and deduction worked out, would have saved those lives and the valuable property.

VIKINGS

While talking of pirates one cannot pass over the "Vikings." Poetry, song and legend have so glorified their sea fights and captures of towns and castles that in many quarters it would be judged rank heresy to attack their status as heroes or to doubt their rank. However, from recent research published, it appears that Vikings were nothing more than north country "bay pirates" with no claim whatever to the title of "king."

The most valorous deeds attributed to the Viking ships were but armed raids for plunder; and these raids were made in far-off wild places where legend and song made the only history of the time and handed it down. That the raids were bold and daring, and displayed wonderful handling of boats on stormy seas and wild coasts, no one will deny; but a cold blast has been shot upon the poetic ideal of the Vikings very recently. The Society for Northern Research has, by Mr. Karl Blind, set out in The Times that "Vikings have their name from the word 'Vik' which means a bay or creek or inlet from the sea; and 'Ings' signifies a 'class,' a band of men; 'Vik-ings,' are baymen. They lie in the bay or creek with their ships until they rush forth for adventure."

So, with such authority before us, we must doubt the correctness of the legends and poetry which make them kings in actual title by virtue of the word Viking. It is, of course, not improbable that in some of the large raids, to sack a Scotch or a Danish town by means of a large fleet of craft, some chieftains took part.

The so called Viking ships, of which one or two specimens have been found and are now exhibited, are not ships in the ordinary sense, they are simply large open boats, of canoe type in model; they were propelled by many oars except in a fair wind, when they set a large square-sail. However, there is so little fact known about them they are not much use to you.

SLAVERS.

Slavers, like the pirates, are great stock for those who want to write thrilling stories of the sea, but they were nasty people and filthy ships. Fiction writers, quite allowably for them, have glorified slavers, both men and ships, far beyond the truth, or perhaps have avoided the naked truth as taking off the gloss of the story. The slave ship of fiction is the finest and fastest model of the world, a beautiful long, low, rakish craft with lofty tapering spars; as a matter of fact, with rare exceptions, they were a scratch lot of small traders on to which extra sail was

crowded, no matter the risk, to make them drive fast enough to elude the lumbering type of man-of-war which was sent out to hunt them down and kill the trade.

The slaver himself was possibly a more atrocious blackguard than even a pirate. In running a cargo of slaves he was guilty of gross cruelty and barbarism in the mode of stowage, the filth, the absence of fresh air on the slave deck, and in the hold and the shortness and vileness of the food and water. The crowd of slaves were packed together ironed, as tight a fit as sardines in a tin; and this in the heat of the tropics and disease rampant all round. The marvel is that any of the cargo turned out alive on reaching the West Indies or American coast, but profit was enormous on a successful run, so a capture or a great mortality on other voyages was softened over.

Slave running is interesting in one way. It finished just as steam was becoming common on the ocean. What would have been the change by steam in slave running and slaver chasing? Probably craft of the torpedo destroyer type, the fastest speed, the lightest build, you would say. But the expense of such craft, and of running them and the small space for "cargo" would be quite prohibitive; as the "catchers" could be such craft no cheaper or more roomy "runner" could escape capture. So steam would have ended the slave trade.

No Boy Scout will care to read much of the details of slaving stories, when he has heard the truth and sees thereby what low brutes men can be for the sole sake of making money. The romance of a man-of-war chasing a slaver is all blown to the winds by contrasting the two performers. The man-of-war, under orders of her enlightened Christian country, is cruising for months off the sickly tropical coast of Africa for the purpose of putting an end to the trade of selling and buying human creatures of the lowest types and of fetish religions. A humane service only, for a prize taken was of no value; she was condemned to be cut in half so as not to be used again, and the slaves rescued had to be carried back, usually a mass of diseased and dying bodies, filthy dirty things, yet human.

When after a weary wait the watching ship sighted a slaver all sail was crammed on the man-of war "in chase." Spars and gear, and sometimes the ships, were risked in the manly endeavour to capture the blackguards and release the slaves. But on nearing the prize and almost within gun range to cripple her spars and stop her, the slaver's diabolical trick came in. He knew the humanity of those who were chasing him; he knew they would stop to save life and that African niggers are good swimmers. So up from the hold they bring half a dozen slaves, knock off their chains so they may swim well, and, keeping their ship dead ahead of the man-of-war, they drop them overboard one or two at a time at intervals, so that the man-of-war will have to keep on stopping and towing her boats to pick them up. They put upon the humane English officer the fearful choice, "Shall I leave these men to the sharks and certainly rescue the majority and hang the murderers, or shall I stop and save these and take the off chance of again coming up with the slaver?" Well, nobody can say one way or the other unless he has been there and knows all the circumstances. In those days, under sail only, all depended on the wind; with a light breeze they might be picked up by ropes thrown to them, for they would all be, in one track; but with a good breeze that would be impossible and to heave-to would certainly let the slaver get away, especially if near night time.

The slave ship was any "old crock" that was fast; the less her value the less the loss on capture. They were supposed to carry about, at the rate of, 1½ slave per ton of the ship, thus the Maria, which was only 30 tons register, would usually carry forty-five slaves; but it is recorded that when captured she was found to have on board 237. Her gross tonnage would

not be much over 70 tons, and her crew would be probably twenty-three officers and men at least. Then with stores and water for 260 people for two months, a mass of spare sails and ship's stores, there cannot have been much room even for the cockroaches.

The rules of slave-ship capture were frequently changed. At one period "there must be slaves on board," or it was not a lawful prize. So to save the ship and their own necks, if there was a right chance, all slaves were thrown overboard when a warship had been sighted in chase. Mere slave running was only "smuggling," carrying contraband, but the sure temptation to hinder or stop the chase by casting a few overboard at once changed it to murder.

The rules as to "must be slaves on board" was changed about 1837, but by that date a successful run was so highly paid that the slavers had taken to fighting their way; larger vessels were employed and heavily armed. However, the guns of the warships, together with the hangings on shore, brought slaving to an end about 1863. I remember seeing what were said to be the last of the slaver prizes in St. Helena Roads in 1864.

The slaver was in truth no Sea Scout; that is, he was of no higher order than the ordinary criminal who keeps a sharp lookout for the police before he starts in to commit a crime. The slaver watched, arid "when the coast was clear" (an old phrase you've often heard), he quickly packed his living cargo and slipped out to sea at night. His only Scout trick was that in daytime if a sail was sighted over the horizon he immediately furled all sail so as not to be seen over the horizon; then he watched to see if the other vessel changed her course towards him that is, had he been sighted by her? If so, he would immediately set all sail, and clear out, judging her to be a man-ofwar, for no other ship would have a lookout aloft out at sea, nor would alter course towards him out of mere curiosity. But if he got first sight his trick, of taking sail off and rendering his ship inconspicuous was likely to pay as his hull would be invisible, or "below the horizon," owing to the "round of the world."

Much depends on light (see sketch). If there is a dark sky background you see the white sails conspicuously; on the right hand you see the spars against light sky, but not much to sight unless using a powerful glass, and with dark clouds behind not at all. At night, of course, all lights were extinguished.

A dirty inhuman trick was commonly played against the known humanity of our officers. When the chaser had come up to gun-range and put a shot inconveniently near, the slaves would be mustered aft, such of them as were too diseased to be likely to sell well, put up on the taffrail and in the rigging and lashed there. Then the captain of the warship chasing knew that his shot, even at her rigging, must kill many helpless black men. And yet all this time the slaver would be firing his long gun aft to cripple the chaser. Was not "hanging too good" for such brutes? Hunting pirates was sport compared to slaver chasing, and often the prize, the pirate ship, was valuable, both the ship and her cargo of loot.

In the foregoing I have only touched upon "Slaving" in its old-time nature in the Atlantic, as examples to you boys of the proper and improper uses of ships on the seas. Both piracy and slaving were to be found in all parts of the world, and it would require no end of pages to write all about what was done on the Indian Ocean, Red Sea, Borneo, China, and many other places. Slave running on the East Coast of Africa was carried on until quite recently. The slavers were dhows, very quaint looking boats of considerable size, as large as a 200-ton schooner but of quite distinct shape, in fact greatly resembling the old Elizabethan small craft with high poops and long overhanging bows. They were sailed under huge lateen sails and

with a fair wind were very fast sailers. Our Navy stationed on the coast for the suppression of that slave trade cruised on the look-out, and sent armed boats to do the work of chasing and capturing the dhows. The game of the dhow was to stick as long as possible to shallow waters among reefs and banks where no man-of-war could get near her; and, if pressed, to run ashore and abandon; so the armed boat was the only way to tackle them.

It is very certain that even today the tribes which used to act openly in those southern seas as pirates can still furnish armed bands and boats whenever there is a chance of looting, such as a stranded ship, though with steam cruisers about it is certainly too risky to continue actual piracy at a distance from land.

Chinese pirates exist in out of the way creeks and river mouths in the China Seas, but rarely now attack any but native craft coasting vessels. A not uncommon trick is for a band of pirates to simply join a river boat or a small coasting steamer as mere passengers, quite strangers, and then at a convenient time and place, near quite innocent "looking" fishing junks, to rise and cut throat any of the officers and crew who resist, loot the ship and load into the junks; then open the seacocks and sink the ship.

Such quiet work gives no alarm and at night time it can be done even though other ships be passing near-by.

CHAPTER IV
PRIVATEERS

Privateering has had a glorious past; it is at present sleeping, and it may, and probably will, come up again in the next great naval war.

The English privateer differed from a man-of-war in that she was privately owned, ordered, kept up, and manned. But she was recognised and commissioned by the State, under Letters of Marque, for certain purposes; she was in law a "licensed" man-of-war. Her profits were derived, and her cost and expenses covered, by prize money duly awarded by the prize court of the High Court of Admiralty on the sale of such vessels and cargoes as she was pronounced to have captured and brought in as lawful prizes. The privateer could be officered and manned as her owner liked; she sailed under her owner's orders, or according to his orders, and was not under any naval command, though frequently privateers volunteered their services to a squadron or fleet, and sometimes assisted single ships in attacking the enemy. It was certainly a slack way of letting loose hornets on the sea, but it had a powerful effect upon the enemy. English privateering kept within bounds, and formed an inexpensive and excellent police of the seas, and a useful intelligence-reporting force. But trouble arose when other countries—all allies, but really neutral to the war, and even governors of small colonies—began to grant *(i.e.,* sell) Letters of Marque to almost anybody. Such a loose use of a deadly weapon with great prospects of money to be captured soon developed into nothing less than actual certificated piracy. Some countries maintained more or less honourable prize courts, but in far out of the way places the legality of the capture was not closely looked into, and consequently British commerce, especially that of our colonies, suffered heavily.

The object in war is to cripple the enemy, not only his fighting power, but his commerce; you make it hot for him all round, you stop his supplies, and, incidentally, his money. But it's not playing the game to allow other countries, or even your enemy, to give free passes to outsiders to come and throw stones at you. Treaties and declarations sound grand in a lecture,

but the longest gun at sea will have a greater say in war, so we ought to be prepared in time of peace for what may probably come in war.

Old privateering should interest you, as all the work, outside the actual capture of the prize, was a high order of Sea Scouting. The vessels used were small, but as well constructed as any man of-war of their size, and were far superior in speed. They usually sailed on their own, or perhaps in couples, it depended on the ownership, and consequent sharing in the prize money. But being small they had to be ever on the lookout and alert to keep clear of enemies of superior force, and of being hemmed in by several vessels with no opening for escape; and yet they could not permit personal safety to interfere with the taking of prizes. So there was often a fine display of real bold dash, and the art of disguising ship was carried to a fine point. They also had to scout to find the enemy's privateers, and work clear of them; or sometimes to keep near enough to recapture the Frenchman's prize, and so obtain salvage on the English ship. But the privateer's business was prize capture; and her fighting, except to effect the capture of a resisting vessel, was for defence, not attack as in a man-of-war. None the less there were many gallant fights put up by privateers against one another, and, sometimes, against warships of much larger size when they attacked privateers.

In the manning, the officers and seamen were just about the same class as in the king's ships; sailoring was all alike in those days, and so also the gun working. Even the rules of discipline in the privateer, and which formed part of the "articles of agreement," signed by every member of the crew, were a close copy of the Navy regulations. The only distinction was that the Navy man was paid, fight or no fight, whereas the privateersman had to fight to be paid. The former drew his pay from the country, with perhaps, also prize money, the latter got no pay if no prize. The prize money gained by the owner of the privateer was large; but the expenditure in gear, spars, stores and ammunition was heavy; and the risk of loss was great, and not insurable except at a prohibitive price.

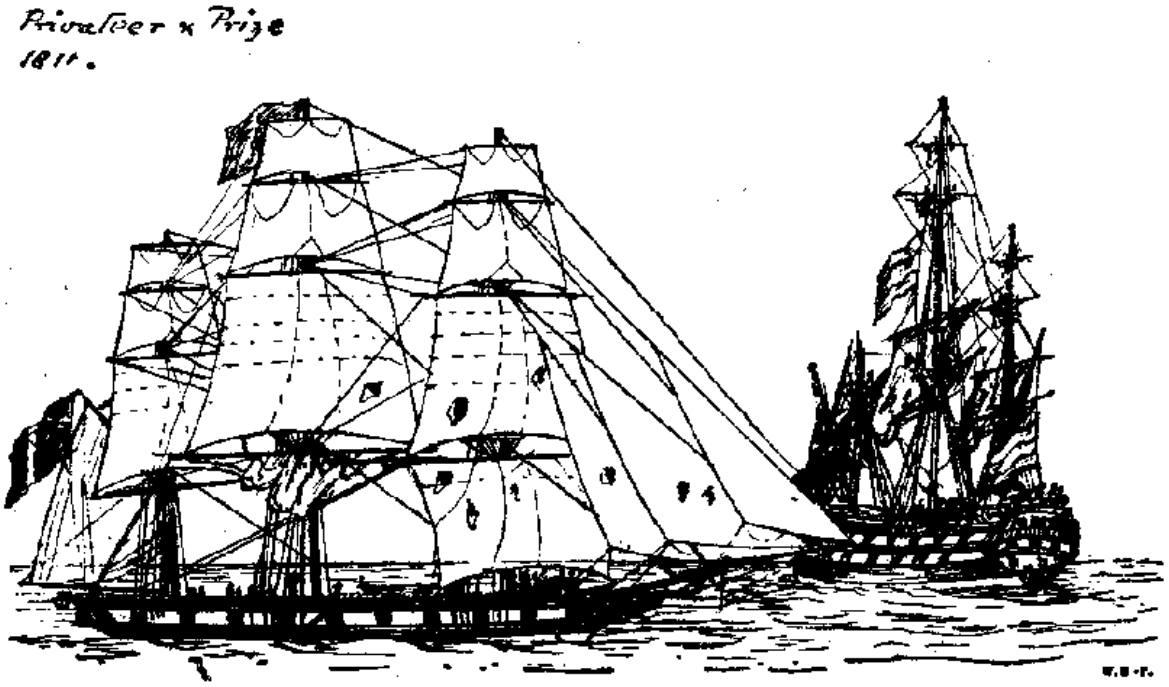
The old "commissions of adventure," which you have seen in the account of Scouting in Olden Times, were very much the same thing or of the same effect as Letters of Marque. The difference was war or no war, and that they extended to land capture; whereas the Letters of Marque were against a particular enemy and his ships and cargoes. Also in the adventure commissions the sovereign retained a considerable share in the profits of the voyage, and the question of "lawful prize" was rarely inquired into.

Round about *1800* was the harvest time of organised privateering, English, French and American; and the ships produced for this class of work were the smartest and fastest afloat. Speed under sail was everything for the chase, and to get away for safety. The crews had to be far in excess, both in officers and men, of the needs of the ship, because they had to be able to man and officer their prizes to send the captures into port. The handling, with such large crews, was, of course, some of the finest, especially in the game of hide-and-seek, alluded to before in relation to slavers, of furling all sail and sending down upper yards to lie invisible, then immediately setting all sail for chase or escape. This would have suited the bargee at Chatham, who, having seen some work done on a man-of-war, contemptuously said, "Well, they puts four men on to do a one boy's job." So also the over-masted privateer could be snugged down in a few minutes for bad weather.

From The Times of 1811, Tuesday, November 5 - The privateers fitted out in the French channel ports of St. Maloes, Dieppe, Boulogne, Calais, and Dunkirk, generally sail with the wind from north-west to north-east, and scarcely ever put to sea with the wind from the south.

During five months of the last autumn, it will be recollected that the French privateers were chiefly successful in capturing (for the greater part, between Fécamp and Calais) our armed merchant vessels, which were not sufficiently manned for effectual resistance; and were consequently, in most instances, carried by boarding. From some information received, there is good reason to believe that the same plan will still be pursued; the enemy being pretty well informed of the equipment of running ships. The St. Maloes privateers are, we understand, of the largest class. The other ports send out light small luggers, with from 50 to 100 men each."

One of the most interesting true histories of this class of vessel is that of the *America,* which was published with drawings in the *Rudder* (New York), March 1900; and therein is set out the "ship's articles," the laws which the crew signed to obey. The sharing of prize money, the expenses, indeed, all about the business of privateering is carefully recorded. The *America* was just a cross between a small man-of-war and a big yacht; 473 tons, twenty guns, and a crew of 150. There were ten "commissioned" officers; six prize masters; twenty-seven lot gunners, bosun, carpenters, and petty officers; and there is mention of "marines."



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respected and untouched by the captors," so also up to 300 dollars for male prisoners. A good conduct prize was reserved in six shares "to the most deserving man among the ship's company at the captain's order."

One point of interest which will be found to crop out in nearly every record or "log" (the diary of a ship) of these privateers is the way in which they managed time after time to escape being caught by the fine frigates sent after them by the enemy. It was just the game of the hare and the greyhound. The frigate was larger, longer and faster; but the little privateer could turn like a top, and with his large crew the captain could keep just two crews, one at work on deck and aloft, the other resting and refreshing below. The greyhound has the pace and can overhaul the hare; but the hare suddenly "doubles," *i.e.*, turns sharp back, and the greyhound overshoots, and, being longer and slower at turning, makes a wide sweep round; if the hare could also have the double crew, that is, and new wind and energy as the privateer has, would she ever be caught? Well, the privateer with a cloud of sail and all her studding sails starts running away. The frigate "makesall-sail" after her, going two feet to her one. All of a sudden in come all the light sails on the privateer, and she is off at right angle "close-hauled" going to windward. By the time the frigate has got her stun' sails in and has "braced up" and has come close-hauled, the privateer brig is leading her a dance; then suddenly the brig puts her helm up and "wears" like a top, and either comes right round on the other tack, or runs her stun' sails out again on a feint to go before the wind, just to get the frigate to do the same; and so it goes on till the frigate's crew, and perhaps much of her gear, is worn out, and at every turn the frigate has lost ground, and from sheer playout she gives up the chase.

Game.—Try this game, frigate and privateer. You get two boats; one is the shortest little dinghy you can obtain, say 8 or 10 feet long; man her with two smart Scouts and a pair of sculls; only one Scout to work at a time—this boat is the privateer. The other boat is a "gig" or "whaler" with four oars and a coxswain; or, better still, if your guardship has it, a "service cutter" with eight oars and a cox'n—this boat is the frigate. The frigate has to capture the privateer by making a rope fast to her or pulling one of her crew out on board the frigate.

The start is given at ten boats', frigates', length apart, and at ten lengths from the guardship. A prize is settled, and a time limit, say 30 minutes, is set. The privateer wins if not caught within time, and if she reaches guardship within time the prize is doubled. The chances depend very much on the nature of the boats used, and times or conditions may have to be altered accordingly. Anyway the game is most exciting and brings out very cute boat-handling, and fairly pumps the rowers; the dinghy boys relieve each other as suits them, but always one is to be off work a mere passenger, he may only use his tongue. Just when the cutter dashes in to grab the dinghy the little boat is suddenly turned and is off in the other direction, while the long cutter shoots by and has laboriously to stop and turn. There are ways of dodging round vessels at anchor, supposed to be islands, and so on. To make the game really exciting depends much on boats and nature of place, and the master will soon know what conditions to put on.

I have pointed out that it was not our privateers who brought a bad name with the merchants upon the service. Of course not, they were our merchants, they were hit by foreign privateers and spurious Letters of Marque ships and their grossly improper acts, detentions, and seizures, probably such craft now would simply be sunk as pirates; but who shall say, with the present inflictions of inland international law for high seas use.

Don't forget when you are thinking out the meeting or passing of the little privateer with the

swift frigate, that the firing range of those days was very small, and the balls very harmless at long range. The frigate's aimed or damaging broadside fire would not have a range much over half a mile, and her two or three long guns not over a mile, and very much chance shooting at that. So that many of the turns and twists, though bringing the privateer within range, would be at such quick alteration of passing bearing that the old truck-guns, which they had, could not have been hand spiked round quick enough for the training required.

SMUGGLERS.

There never was any man more gifted, able, and dependent on Sea Scouting than the smuggler. He was essentially a boatman. In most cases the lugger, her skipper, and crew were carriers; they rarely owned the cargo they "ran," but they got heavy pay for the risk of running it and of being sunk or imprisoned, for they were breaking the law.

In those days many kinds of goods, only procurable abroad, were charged a heavy duty at the custom house on being brought into England, and smuggling was the act of getting such things into this country clear of the custom house, and, therefore, without paying the duty. The owner of the cargo had the benefit, and the smugglers were paid for successfully evading customs officers on shore, called "preventive men," and the revenue cutters at sea, called "channel gropers."

We will not here go into any of the deep questions as to whether smuggling was a crime, a felony, or a misdemeanor, in those days; but it had, like the poet says of every cloud, a silver lining which was of great use to the country. It was so attractive and lucrative that it created and
maintained all round our southern and eastern coasts a large number of the smartest boat-sailing
seamen, who, on the one hand, furnished a fine ready-made reserve for manning the fleet; and,
on the other, from their constant visiting of the continental shores, a band of Scouts who time after time furnished most important information to the naval authorities.

There are many truths to be found as to smugglers, in looking up their trials when captured by the excisemen, and prosecuted in the courts. The smuggler quite naturally put forward his complaint that, for giving most valuable Scout information of vital importance to the fleet and the Admiralty, his act of "running a cargo" was often winked at by the Navy; while, perhaps, on the next "run" they were fired on, sunk, or captured, and put in prison by another Government department.

On another point also they had a grievance—there was no regular coastguard in those days and the smugglers and fishermen were the "eyes of the country" for channel scouting and for bringing in valuable information—it was that the "press-gang" from the fleet frequently hunted them and spoiled their companies. Accurate information is difficult to find; smugglers were naturally very secret societies, and when captured they let out no more than they could help. But many records of them speak to the fact that the press gangs rarely attempted to attack a gang, there was too much certainty of a deadly fight; but they laid out for stragglers.

The smuggler's boat, in most cases, was a very long light built "lugger," with an immense amount of sail. The crew, being large so as to be able to handle the cargo without assistance

could well manage the huge lugs, and consequently the boats were very fast and much too good for the clumsy heavy man-o'-war craft, the "king's cutter", set to catch them. The king's cutter was bluff-bowed with fine lines aft called the "cod's head and mackerel tail" build, generally over-rigged, and with square sail yards, for "hard driving" was the only way to get them along with any hope of cutting off the smuggler.

Of course, it must not be forgotten that the king's cutter, from say about 1800 to 1830 and indeed many years earlier, had to perform other duties than mere smuggler chasing; they were men-of war, they had to carry cannon, and also their crew had to live on board, and they had to be able to "keep the sea," that is, stay out at sea no matter the weather. Whereas the smuggler's lugger was a passage boat making comparatively short quick runs from one side of the channel to the other. And, then, again the handling of huge lug-sails was, and is to-day, an art by no means commonly known to seamen of the big ship type; but in proper and plenty of hands the lug is a most powerful and handy rig.

Small luggers used to play the "hare and greyhound" game, mentioned in relation to privateers. They would lie with all sail down - on sighting a cutter over the horizon in hope of being unseen; or, when in danger of capture, when a king's cutter had managed to come within range, the lugger would "down all sail" and under her long sweeps "double backed," *i.e.*, two men to an oar, row dead to windward well out of range, and then up sail and reach away at a pace impossible to the cutter which had to be pinched in hope of getting that bit to windward.

THE PRESS GANG.

The press gang! you ask what was it? Well a sea-dog ought to know a bit of everything. The law of impressment to serve the king in his ships is a service or duty, probably properly demandable as a prerogative of the Crown, and still exists. The press gang was a band of officers and seamen sent armed into a town, where they had information of seamen being housed, to compel into the Navy any sailors they could find.

The seamen of those days were off and on in their service, at one time in Navy then, again merchant ship, and so in these raids were found all sorts—fishermen, bargemen, and longshoremen all Lodging together. The press gang having surrounded the lodging-house or inn, the officer called upon the men in the house to come out and volunteer for the king's service. The best men generally came out at once and were well received and given a "bounty" for joining; but the rest resisted and often fought dangerously. When the haul had been made and the boats in waiting had carried the "catch" off to the frigate, the "catch" was mustered on deck, volunteers on one side and "pressed men" on the other. Among the resisters were often prime seamen who had objected to their holiday being stopped before all their prize money had been spent, but when they got into the boat and saw the game was up they turned over to the volunteer side. The "pressed men" were usually the scum of the port, deserters, ex-jail birds and long-shore lubbers.

The trouble was that the fleet had to be manned, so all kinds had to be taken till better could be found; therefore, such men were stationed in the "waist" of the ship to haul on ropes, they being fit for nothing else; they were called "waisters" and were about useless except as "beef on a rope," or for scrubbing and polishing (quite likely the term "waster" on shore, common to-day, is merely the word "waister" come down to us from the old sea term and does not necessarily mean wasters of time or money or opportunities, but generally useless persons).

“Idlers” is a term of quite another, meaning; these were simply such men of the lower ranks as had no particular duty at the gear or the guns and were not in the “watches.” They included cooks, stewards, servants, and such people, and could be called up at any time for pully-hauly work, such as assisting to tack ship with the “watch on deck” to save calling up the other watch also (all hands) when that “watch below” was getting much needed rest in bad weather or in the shifty light airs of the “doldrums.” The call of the bos’un then was “Watch and idlers about ship.”

“ Doldrums” is a term descriptive of the weather over the seas near about the equator where there is no regular or continuous breeze; streaks of wind, patches of calm, squalls and heavy rain, chase each other about in uncertain direction and varied quantity and a sailing ship, especially at night, may be badly caught aback if a good lookout is not kept and the crew ready near thebraces (the ropes which cant the yards around when a change of wind comes).

Book To Read

Two Years Before the Mast. By R. H. Dana 3s**.** 6d.

CHAPTER V.
SHIPS.

The word “ship,” according to Act of Parliament, means every kind of vessel, used in navigating water, which is not propelled by oars. Vessels propelled usually by oars are “boats”; and those usually sailed but sometimes using oars are sailing boats. Then, again, there is a use of the word “ship” which applies only to the rig—that is, a vessel having three or more masts, on all of which are “square sails. A “steam ship” means every vessel propelled by mechanical power. Some steamers have sails also; and some sailing vessels have an engine and screw to use in calms or for harbour work; these are auxiliary power, and the vessel using one or the other at times changes her nature as far as the “rule of the road” is to affect her—that is, a steam ship using her *sails only* becomes a sailing vessel—and, as you will see later, the rules of the road require all steamers to keep clear of sailing vessels; so also the auxiliary sailing vessel when using her engine, even though also using sail, becomes a steamer, and must keep clear of vessels which are under sail only.

A sailing boat when under sail is a sailing vessel, but when she uses oars she has to keep clear of sailing vessels. You see when boat meets boat or ship meets ship or sailing vessel meets steamer somebody must give way, and as they cannot arrange such matters out on the sea, and among several, and at night, the country makes certain rules which all must obey; these are called the Rules of the Road at Sea; and they are agreed to by all countries, and apply wherever vessels navigate, with only some very slight modifications allowed by special Acts of Parliament in one or two harbours.

We will go more into the Rules later, but here it will be well to give the main idea. Steamers (using mechanical propulsion) must keep clear of all sailing vessels; and both steamers and sailing vessels must keep clear of any kind of vessel which is at anchor. Steamers have duties to perform to each other when meeting with risk of collision, and so also have sailing vessels; and the only time when a sailing vessel has to keep clear of a steamer is if she be overtaking the steamer. If any vessel becomes by accident unmanageable, she must hoist a warning signal, and all others then have to keep out of her way.

Sailors' definitions of ships have nothing to do with Acts of Parliament. There are an immense variety of "ships" afloat, each with distinctive features, which it is most important that the Sea Scout should know if his report is to be of any value, say as to suspicious ships seen off a harbour in time of war, or to correctly describe the nature of a vessel he reports as "in distress."

"Square rig" means that the vessel has yards across her mast or masts, permanently there, and used for all branches of sailing she is put to. Many a vessel has yards which are hoisted up and sails set to them for running before the wind, but she does not use them when sailing to windward, so she is not called square-rigged; she is of "fore and aft" rig. An old sea definition of square rig was that the "courses" —lower square sails— were kept bent to, set from, and furled on, the lower yards (a coasting schooner, for instance, hauled her square foresail up to her fore yard, "set it flying," so she was not square-rigged though she set a foresail and topsail).

In the matter of rig, some outline sketches will show you the chief characteristics of each of the divisions; and the "mixtures" are modern puzzles as to correct name. Probably the true naming would be found thus—once a "ship" always a ship. A ship has three masts carrying square rig, so if you add a fourth mast aft with only fore and aft sail she is still a "ship." A "Barque" has three masts, the fore and the main carry square rig, and the mizzen has only fore and aft sails on it. You add another mast aft she is still a Barque, and properly called "a four masted Barque." All you want for useful reporting is to note leading features, number of masts, nature of rig, distinct paint, and any unusual point. But to give in your report merely a name of rig may be misleading unless you are quite sure of what you are talking about.

In the outline sketches here you see just the leading different rigs, they are merely sail plans. No. 1 is a "ship" of the sailing Frigate type; she is sailing close hauled on the port tack; you are looking at her left or "port" side, and as you can see her masts the wind is coming from your back, and to "keep the sails full" (of wind) the yards have been "braced sharp up." You see she has the older type of sails, she has "single topsails," whereas the Barque below has modern "double topsails" shaded to show. Looking at the sails and spars of No. 1, counting from the left, we have flying jib-boom and the flying jib (sail); next, the jib-boom and the jib (sail, 2); the bowsprit, and to it the fore topmast stay and staysail, 3 (these three are called the "head-sails"). Then we go up the foremast and foresail, 1; top mast and top sail, 2; top gallant mast and top gallant sail, 3; royal mast and royal sail, 4; same up the main mast; the mainsail is often called the main course. The same up the mizzen mast, except that the lower yard (and its sail when there is one) is called the cross-jack (pronounced "crojick"). Staysails, when carried, would be on the stays between the masts in the fashion of the head-sails, and called by the name of the stay. On the mizzen, aft, is a gaff and boom spread sail called the spanker, sometimes "driver"; and in barques, yawls, and ketches it is called the "mizzen." In brigantines and schooners it is the "mainsail."

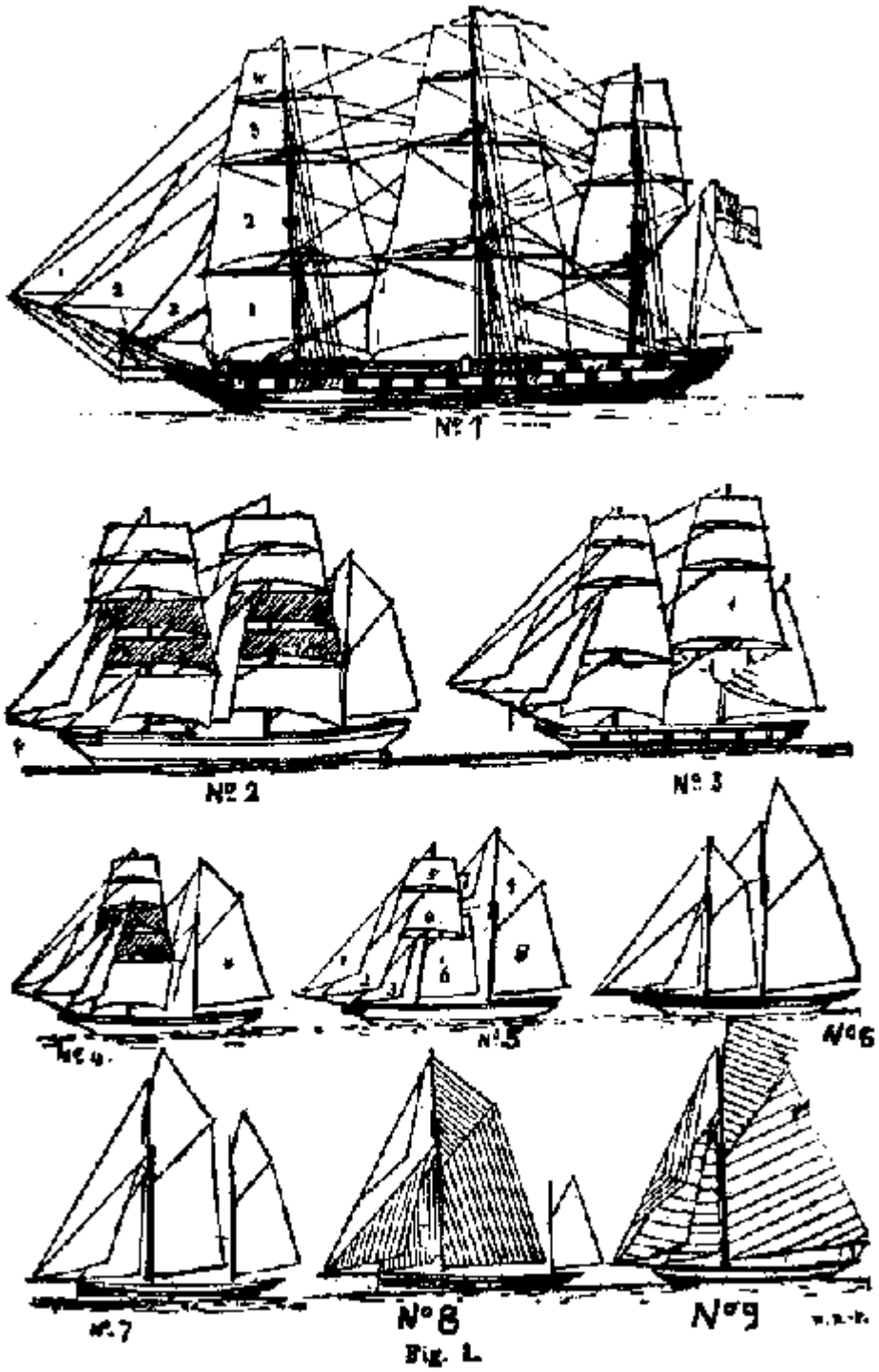


Fig. 1.

No. 2 is a barque with double topsails, shaded, to show you; and has the modern merchant fashion of long yards and shallow depth sails, short bowsprit and jib-boom, usually all one spar. She is sailing close-hauled—that is, as nearly as her sails will allow her to point towards where the wind is blowing from. Most square rigged ships can be sailed between 6 and 7 points off the wind; say the wind is N., this barque would be heading about W. by N. or W.N.W.; the. wind, you see, is blowing on to her right or starboard side, so she is "close-hauled on the starboard tack." She is "under all plain sail."

No. 3 is a “brig,” the most compact and handy square rig ever put on a vessel—for those capable of handling it, but a trap to lubbers. You may note her mainsail is “hauled up,” and her spanker (aft) is “triced up” at the tack, done for handy working into or out of harbour. Brigs were the craft in which all the best seamen were trained, but they have now been done away with, most unfortunately.

No. 4 is a “brigantine,” half a brig and half a schooner; none the less a very handy rig for a small crew, and the best rig for an ocean-going yacht. Her after sails are mainsail and gaff-topsail, with main and topmast staysails.

No. 5 is a “topsail schooner,” a rig used by coasting traders; The sails are, beginning at forward on No. 5, the “outer” or “flying” jib, 1; the “inner jib.” 2; the “fore staysails,” 3; the “fore topsail,” 4; and “topgallant sail,” 5; the “gaff foresail,” 6; “top mast staysail,” 7; “mainsail,” 8; and “gaff topsail,” 9. When the wind is fair, from aft, they set a “square foresail,” it is hauled up to the foreyard from on deck. The fore topmast and topgallant mast are in one spar usually. The bowsprit varies according to the trade in which the craft is working; sometimes all one spar, at others a standing bowsprit and a running jib-boom.

No. 6 is a “schooner,” sometimes called a “fore and after,” as she carries no square sails; this rig is mostly seen in large yachts; the sails are—jib, staysail, foresail, mainsail, and top-sails.

No. 7 is a “ketch,” her mizzen mast is forward of her rudder head; that distinguishes the ketch rig from the yawl. The ketch rig is—jib, staysail or foresail, mainsail and topsail, mizzen and topsail. This rig is commonly used by coasters, and in harbour craft; also it is a favourite rig for cruising yachts.

No. 8 is the “yawl,” usually a yacht rig; in this rig the “mizzen” or “dandy” or “jigger” mast is stepped always aft of the rudder head. The mizzen of the yawl is usually a single sail, no topsail, and is a lug or a gaff sail. The sketch shows her with a “jib-headed topsail” set, but they use
yard-headed topsails also. The small head-sail is a “baby-jib topsail.”

No. 9 is a “cutter” of modern yacht type. Old type cutters you have read about, under smuggling in a previous chapter. The sketch shows her with a large jib topsail set, sort of high flying jib, and a “jackyard topsail” used in racing. A “sloop” yacht is distinguished from a cutter in that she has only one regular head sail, her “foresail”; but sometimes in large sloops a jib topsail is set on the topmast stay.

Nos. 6, 7, 8, and 9 when running before a fair wind set a sail called a “spinnaker,” a triangular sail; the head corner going up to topmast head; the “tack” corner hauled out to the spinnaker boom end; and the “clew” corner, by a “sheet,” rope, to a cleat on deck. It is made of very light stuff, and is merely for running work.

It is hoped that these sketches of rigs are sufficient, as it is difficult to find space in so small a book for drawings of all rigs. There are any number of fishing boat rigs, barges, and so on, all of different types belonging to various districts; but I take it that Scouts can easily learn to know all that belong to their own place. The point here is to give a general knowledge of seagoing craft, so that Scout reports may be accurate as to what has been seen. As an nstance, a report from one

place says “a Brigantine with distress signal seen drifting westward when fog lifted for a short time “—a more westerly coast lookout reports an hour later, “a schooner with distress signals seen off the head, evidently been in collision “—Is this two vessels in distress, or one and the same?

The common mistake of longshoremen (not sailors) is confounding a topsail schooner with a Brigantine (see 5 and 4). The distinction is easily seen. Foresail bent on to the foreyard, and the fore top gallant mast a separate spar from the topmast, a “fidded top gallant mast,” settle she is a Brigantine. Many equal mistakes of other rigs may be very misleading to tugs or lifeboats sent to rescue.

“Square rig” service, when I passed for that certificate years ago, was held to be “in ships of which two masts at least were square rigged, and the questions included handling ship when different masts or topmasts, including mizzen, were carried away. In these days sailing takes a back seat to steam. But it is a moot point whether training of sailors is really efficient without the old sea knowledge gained in handling ships under sail without the aid of steam. I still think it is an essential training for officers, and probably also for the men.

In the Rig sketches you will see that in 8 and 9 the make of sail is shown. In the older form all sails of fore-and-aft nature had the canvas cloths running in line of the leech (the after edge of the sail), Fig. 8. In modern sails the cloths run across the sail at right angle to the leech, Fig. 9. These are called “cross-cut” sails. They certainly stand better, stretch less, and. are less apt to tear by wind; experiences may differ, but mine is that they last longer in good shape than the old type did.

RIG DISTINCTION IN SCOUTING.

A Coast Lookout Scout should always note as much detail of rig as he can make out. Also shape of hull, and its paint; colour of yards, boats, funnels, etc.; patches on sails; and other smaller details. These afterwards may be most important in identifying a particular ship, a suspicious character seen along the coast in war time, for instance. A troop of Scouts out at scouting practice all “noting up” what they saw from different point of land or boats, would have a very instructive evening if the Scoutmaster called in all reports and then read out to the Troop as to the same vessel described by half a dozen different Scout reports; say, the “reports were of a ‘ship’ seeking a pilot near the land, or perhaps the craft is a coasting vessel in distress”. To merely report “vessel in distress with N.C. flags flying,” though useful, is not enough when you might have telegraphed “three masted Brigantine, green hull, white bottom, black boats, flying N.C. and Danish ensign.” This would inform agents or owners or underwriters to send help at once. N.C. = in distress.

Practice.—When Sea Scout boats’ crews or companies are out for practice, the Commander should, at some time, give order for all Scouts then and there to note a particular vessel, and write a report thereon, *without any communication to each other.*

Then in the evening, say on board the guard ship, he should read out each report, and lecture on the omissions of important detail, based on his own report, or any better one. Flags of nations may be difficult to remember at the moment; if so, make a sketch of the flag on the report paper, add the correct name later from the sheet of coloured flags hanging in your ship’s cabin or boathouse.

Some small detail, that may seem useless, may be the very means of identification. Frequently small yachts are stolen from their moorings.

In more than one case, I remember, where the yacht was eventually recovered, it turned out that the thieves had sailed her away to a quiet creek, and there had painted her a different colour in the night, and altered her rig. Take a typical case, a yawl-rigged yacht, 16 tons, painted white, with red bottom, pole mast, tanned foresail, name 'Lutine' in gold on stern," such is the notice telegraphed by the owner to the police of all waterside places near the port of S—. The eyes of the force are looking for a *white yawl named Lutine*, but these can be changed. The eyes of the local Sea Scouts are looking for the details *which cannot be readily changed*, the red bottom, the tanned foresail, the pole mast, taken together with about the l6 ton size. They find a *black cutter* with red bottom, pole mast, tanned foresail; and by the shortness of boom and position of main sheet far inboard they know she has been a yawl, and the mizzen has been unshipped and the hull above water painted black in the night, perhaps the paint is still wet, and a scrape, accidental of course, with an oar as their boat passes discloses white paint under the black. The bottom red could not be painted over afloat, Her dinghy is towing astern; therefore, the thieves are on board; cut the boat's painter (rope), warn the police, and when the prisoners have been taken ashore, the Scouts hold the yacht for salvage reward.

STEAM SHIP.

In regard to Scout knowledge, the steam ship is a hard nut to crack. There is no "type," in hull, funnel, or masting that tells you what the ship is that you are looking at, beyond one general division—man-of-war or merchant ship. Even, in some cases, at a distance that distinction is not certain. So, as it would take a whole book of pictures and description to put all the varieties before you, you would have to be content with the advice to "go and see." There are plenty of museums in the large towns where ship models are exhibited, both war and merchant ships. But far the best is to see the ships afloat, and ask questions of everybody. Shapes cannot be much changed to disguise a ship in war time, except in magazine article or novel, where the "tramp" steamer is by canvas scenery and paint transformed into a man-of-war cruiser that does wonderful frightening work on the Ocean; whereas, in fact, at sea the make-up could not last a day. Though "shape" about the hull, the general style, and so on, may be a good indicator for kinds of ships, paint tells nothing, it can be so quickly changed, whether on hull or funnels.

Warships were at one time easily distinguished; now you can only make a guess, unless your ship's company has its guard-ship at some naval port, where you see the different ships so often as to get to know points of recognition about them.

During the Great War the following classes of war vessel were in use in the Navy, battleships, battle cruisers, cruisers, light cruisers, sloops, mine-sweepers, mine layers, destroyers and submarines. In addition to these a large number of small vessels, trawlers, yachts, etc., were used as a protection against submarines. There were also small ships sometimes called mystery or Qboats. These were apparently harmless small merchant vessels, but in reality they were manned by the Royal Navy, the Reserve or Volunteers and had guns hidden which were only shown and used when an enemy submarine got quite close.

Of the above the battleship has merged into the battle cruiser or *vice versa*, and our latest battle cruisers are faster than any battle cruiser in commission during the war and more

powerful than any battleship. It is therefore now quite easy to distinguish between the various principal classes which are battleships, light cruisers, destroyers and submarines. The smaller craft, sloop, minelayers and mine-sweepers can only be known by actually seeing them and noting differences.

There is one more class of warship to which I have not yet referred, this is the aircraft carrier. These can always be easily distinguished as they have a flush upper deck for the aeroplanes to fly off from and land on. Some of them are very odd looking as they have their funnel right over on one side of the ship.

Steam propulsion found its way into the Navy in 1832, in paddle form—that is, paddle wheels outside the sides of the ship, covered by paddle boxes and supported by sponson galleries of course, these were lumbersome, ungainly fittings, especially in a heavy sea, and though the engines were powerful, the propulsion was very slow. The screw propeller, down below water, in the dead wood aft, came into use in the Royal Navy about 1845, and in a few other ships for some ten years before being generally adopted.

At the time of our great war with Russia, the Crimean War, 1854 to 1856, many line of battleships, frigates, and corvettes were fitted with engines and propellers; and there was a swarm of small paddle-wheel vessels. But all had sail as the real motive power, using steam power only as auxiliary. In about 1860 steam had so advanced that it was trusted, like a growing child, to "walk alone," and though sails, and full square rig, were stuck to, they were less often used, and in time were stripped off till square rig on the foremast and fore and aft sails on main and mizzen was the last "scene." Now to-day, as you know, the mast is mainly used for signalling and discharging cargo.

Another great change that came in with steam was the introduction of iron, and then steel, for hulls, and the coating of hulls with armour. Such vessels were called "Ironclads," and the early birds were "Warrior," "Black Prince," "Defence," "Resistance," and many more, as it was seen that the old line of battleship was played out. However, this is not a book of history. To-day the word Ironclad has little if any meaning; protection against shot wounds takes so many lines, sides, decks, bulkheads, gun shields, turrets, barbettes are all ironclad.

THE LAST SHIP UP-TO-DATE.

Without going through the fleet of ever moving-on ships we may take one of the ships completed in 1920. The "Hood" had a displacement of 41,200 tons. She was 810 feet long and had a beam of 104 feet and drew 28½ feet. Her designed horse power was 114,000 giving her a speed of 31 knots.

She had an armoured belt varying from 6 to 12 inches in thickness, with turrets between 11 and 15 inches thick. She had 8 15 inch guns, 12 5.5 inch guns and two 4 inch anti aircraft guns. In addition to this she had four above water torpedo tubes and two submerged tubes.

This ship had a complement of 1433 men and cost £5,823,000.

Submarine.—A type of fighting ship you will have frequently near you in harbour and estuaries is the submarine—that is, a torpedo boat which, though she can move about partly out of water like any other boat, is so constructed that she can be made to dive under and navigate under water, out of sight.

The submarines are growing larger vessels as new ones come on, and so are capable of wider range of action, or of making voyages of considerable length. They are very much of hedgehog nature—that is, they make passages from port to port or to the fighting place with all their upper body and turret out of water and hatches open; but as soon as danger is anticipated they coil up—*i.e.*, they close all the hatches and go under till only the turret is out of water; and then finally close that and dive either to attack or to get away.

The larger boats now carry a gun or guns which can be opened out for action when the boat is on the surface near an unarmed vessel; but a very few hits from a small gun on a merchant ship in defence would end the career of the submarine; but they carry torpedoes, any one of which is capable of rendering helpless, if not of actually sinking, a battleship.

The idea of the submarine attack is not liked by sailors, but we must have them because other countries have them; and the mere fact that England has them, and in large numbers, is enough to make any foreign country think twice about invading our country, or coming in near to any naval harbour; just as you don't like to go for a swim in water suspected of being infested with sharks.

All under water fighting is uncanny; it is "hitting below the belt," as they say in boxing; and it seeks to destroy utterly instead of merely to disable. To sink a battleship means probably to drown a thousand men, whereas to disable her from fighting further, which gun fire does, is to capture with only the sacrifice of a few killed and some wounded, and to add a valuable ship as a prize for victory. What title to "victory" can be claimed for a battleship sunk with all hands by a contact mine, a can of explosives moored below water in a fairway?

MERCHANT STEAMERS.

Steam in sea-going merchant ships came in much in the same way as it did into the Navy. Early attempts were made about 1820, but nothing very successful was done till about 1840. The "Atlantic liners" started about that time with little paddle vessels of some 600 tons, or one fortieth the size of the present-day passenger palaces, and a speed of one-third of to-day's. All these had sails, and were paddle ships. Screws came in, but the paddle ships retained a considerable favour until about 1873, and also it was during the 1860's and well into the seventies that square rig on steamers gradually gave way to only show forward, and then pole masts entirely superseded square rig. And now to-day many "tramp" (cargo) steamers have onlylow derrick masts for lifting cargo.

To try to classify the steamers of the mercantile marine of this country alone, and to describe them so as to enable you to report individual vessels is too large a work for this book, and might be misleading, for it would be mainly as to paint, both of hulls and funnels; paints can be changed, and would be in war time, especially easy is it to change the funnel colour; and, again, though English liners have distinct colours for their funnels, foreign liners have similar paintings, and so by mere paint distinction it would be easy to mistake ships.

"Liners" are passenger steamers, and usually of immense size, with tier upon tier of decks; all the hulls are very much alike in the far distance. "But the funnels," some would say, "have the Company's registered colours." Well, yes, but a lot of them are the same. Take yellow, plain, and yellow with narrow black top; how can you distinguish? The plain yellow will have a black top smoked on after a few days' steaming. We have yellow five and yellow and black top band three—that is eight lines of English and two great German lines with yellow

funnels. In plain black funnels we have, not counting other than lines, ten English lines and four large foreign lines. (These are only European countries.) So funnel colour is not much help to Coastguard Scouts

The "tramp" steamer is purely a cargo boat; it has no claims to good looks, speed, or handiness; it aims at carrying the greatest possible cargo with the least possible crew at the lowest pinch able cost. Don't undervalue them because they are ugly and unhandy; they do immense sea trading; and the seamanship and pluck required to bring them through is of finer and finer quality the worse the ship and the smaller the crew.

Tugs are the craft that you Sea Scouts should know as much as possible about—that is, as to those within your district. They are the aids you may want to call to the assistance of vessels in distress, and for that work you need to know just where to plant the "call" with fair certainty of immediate attention. Get to know all the tugs of your port; size, power, draught of water, usual home berth, owner's address or skipper's; and know one tug from another on sight.

It is commonly the case that you have in a port different classes of tugs—screw and paddle—the former of deep draught and the latter shallow. Your Coastguard look-out reports by signal or telephone, "Trawler ashore on bar, sea breaking all around her." Your first call should be to the paddle tug, because you know the water must be shallow on the bar, and light draught is necessary to get near enough to have a line and pass a towing hawser to pull her off. If the signal is "vessel outside drifting with N.C. signal flying," send for screw tug, powerful and deep draught, but no question of depth of water here comes in, unless yours is a shallow bar harbour and the tide is out, and there only a paddle tug could get over the bar to go to assist the vessel in distress.

Tug owners will soon learn the use to them of Scouts. Both tug and prize will have signal flags of the code on board, but no one to signal therewith, no time to use the signal book, even if it can be found. The Sea Scout will know how to use the alphabet signals, and the Scouts ashore can read them, and so the work of salvage can be greatly assisted by even a boy—if he be a trained Sea Scout.

Salvage.—In such work, apart or together with the humane acts of saving life, there is the act of salvage. The award for salvage of ship and cargo, and perhaps freight, given by a Court of Admiralty is not a charitable payment nor a present; it is not begging to ask it; it is a legally recognised reward for saving property from loss, or probable loss, and all who can show that they contributed to that salvage can claim and may share in the award. The division of the lump sum awarded among the several salvors may be arrived at by agreement, or be subject to the apportionment of the Court. It may be the case that the Scouts who discovered the vessel, say ashore and deserted, could not of themselves have put her into safety, but they call in the aid of the tug; the tug is a stranger, and does not know the way into the harbour. The boys do, and they give the information; the gale increases, and if the tug and prize had to remain outside probably both would have been lost, anyway the prize and her crew. The apportionment of salvage to the Scouts would then be almost as much as to the tug; it is tit for tat, neither party could have completed the saving of the ship and lives without the other. So there would be a nobby sum of £. s. d. nobly won in salvage, which will go to the funds of your ship's company to augment the fitting out of your "guard-ship."

Small boats, either steam or motor, will at first puzzle you. Man-of war boats, such as pinnaces, picket boats, and so on, you can hardly mistake; anyway, you soon get to know them in your own harbour; and it is, if not your duty, at least advisable that your boat's cox'n salute on passing such boat if he sees an officer in her. But your trouble comes, especially with motor boats ofprivate ownership; they sometimes fly the white (man-of-war) ensign, or the blue (naval reserve) ensign, and dress their men as naval bluejackets, and steam yacht officers may be seen with R.N. cuff stripes. Look closely, and you'll probably see the officer and one or two of the men have moustaches, otherwise clean shaven, a fashion never seen in the R.N.; the men usually mount a white collar and coloured necktie on a boiled shirt, instead of the blue-edged white flannel vest of the blue-jackets.

In regard to types of steamers, whether of the Navy or the Mercantile Marine, there is a great difference in whether the craft has two screws ("twin") or one only. In the twin screw vessel there are two separate engines side by side with separate propellers and shafts, which stand out on either side of the dead wood under the stern—i.e., under the quarters of the ship, and usually in advance of the rudder. By using the twins more or less in opposition to one another, such as one stopped or going astern the other going ahead, the action of the rudder can almost be disregarded; but, of course, in conjunction with the rudder the turning power thus set up is immense. So to speak, you can "play a tune" with a twin screw ship in places where you would have a tight job to handle at all a single screw ship.

Modern liners, and all men-of-war are fitted with twin screws or more. The smaller "turbine engined" vessels have twin shafts, with sometimes two or more propellers on each shaft, for going ahead.

Some motor boats can only go ahead, and cannot reverse; avoid such ill found things; they should not be allowed afloat. A motor boat should be a thing of life, capable of aquatic acrobatic feats. The "single screw" boat offers every chance of being left in awkward places "stopped" or "broken down," or a bit of crab pot rope round the propeller, where the "twin" would have come home quite happily under the other propeller. When you get a chance with your "boats' crew" to learn handling a motor boat remember, as of first importance, to find out whether she can be "reversed" and exactly how to do it. The expert driver may have an accident, then some one of you must know how to stop the engine and to reverse it to avoid collision, or, if you are meeting a sailing vessel, as it is the duty of any vessel under power to keep out of her way, you may want suddenly to stop your movement through the water; there are no brakes like on a car on shore, merely unclutching or stopping the engine won't do; the only thing and necessary thing is to "reverse"—*i.e.* go astern with the propeller revolving the opposite way to going ahead; inability to do this may sink one or even both the vessels.

YACHTS.

Yachts are pleasure vessels, privately owned and used for no other purpose, and for this reason they are, in most parts of the world, exempt from many of the dues, restrictions and taxes, registration, carrying of numbers, and name of port applied to merchant ships.

Many of the yacht clubs have been granted the title Royal by the Crown; and by the Admiralty granted permission to use the ensigns of the Fleet and the Royal Naval Reserve—that is, the white and the blue ensigns, and some have the blue or the red ensign with a device in the fly.

These flags are to be flown on yachts of the club only in conjunction with the approved "burgee" of the club, and subject to an Admiralty warrant personally granted to the owner.

There are at present 139 yacht and sailing clubs; of these 51 hold the title Royal; 35 clubs hold the warrant for blue ensign, and 14 clubs for special red ensign—i.e., with device thereon— one, the Royal Yacht Squadron, holds the white ensign, and the Royal Canoe Club holds only the title Royal. Then there are also 88 yacht and sailing clubs "without warrant," which simply fly the red ensign of the Mercantile Marine.

Colours.—The whole of these club flags are printed in colours in Hunt's Yacht List, yearly, on one side of paper, so you can get a past year copy from any yacht owner and make up a sheet of flags to hang up in your guard-ship. To fly the warranted flags, each yacht must obtain the Admiralty warrant; otherwise they may only fly the red ensign.

The yacht of to-day varies immensely in size. Steamers from 2000 tons, down to little steam kettles of 10 tons; and shoals of steam and motor launches. In sailing yachts size is kept down, there being now a preference for cruising under steam. Even in the smaller, and down to the smallest, cruisers motor power is rapidly being adopted as an auxiliary. The main reason probably is that large sailing yachts, if of sufficient sail, require such large crews that the owner's accommodation is badly pinched compared to the tonnage of the vessel.

Small yachts will be your likely line for sailing, and the smaller the better for learning in. You saw the picture of rigs in the chapter on Sailing Ships; for yachts they are schooner, cutter, yawl, ketch, and sloop. In the smaller boats we find occasionally the lug rig—that is, two masts or more, setting lug sails. The usual mistake is to confound a type of sail with a "rig"; for instance, we hear of a "sloop" being termed a "cutter" simply because she has a gaff mainsail; they call it a cutter's mainsail, whereas the sloop has only one head sail (foresail), while the cutter always has two (fore staysail and jib); or the sloop may have, in small boats, a "gunter lug" mainsail, and is frequently written down as a "lugger" or of "lugger rig." It is not; the "lugger" proper has two or more masts on which lug sails are set—that is the luggers' standing rig; occasionally, especially in foreign boats, they rig out a flying jib, and often a mizzen topsail. In the lugger, proper, the larger sail is set forward, and called the main lug; the after lug is the mizzen. Whereas in a schooner yacht the after-sail is the larger, and called "main-sail"; the next forward is the "foresail" and forward of that are the staysail and jib; topsails don't count in "rig."

Many an inexpensive "yacht" is formed out of an old ship's lifeboat, built up a bit higher and decked over. But except on the excuse of the impossibility of laying out a larger sum of money, the converted ship's boat is a poor thing; she is unhandy, and perhaps even dangerous (that is, if not judiciously ballasted and heavily keeled). None the less for a cheap craft for just messing about in creeks and estuaries, and for leaving on the mudbanks when not wanted for use, this class of "yacht" is good enough.

Some old yachts, no longer fit for real sea-going, may be bought at wonderfully low prices; they are quite fit for sheltered water sailing, and their only expense of working is crew's wages. Therefore, if such a craft were got by a Sea Scout Troop, whether as or in addition to their "guard-ship," the crew treble over would be there, and very little other expense to meet.

Good-natured owners will no doubt take Sea Scouts out for a sail now and then, so you should learn the names of all parts of a yacht and her rigging.

Here is an outline sketch of a "yacht," and though they all differ in size, design, and mode of fitting, the several parts go under the same names. Yachts, like any other vessels, are built from drawings, which are drawn to any convenient scale, such - as 1 inch representing 1 foot of real size. Generally for building the scale drawing is "laid off" on a floor at full size, so that the workmen can measure off any item for actual building, at actual size. For that you would measure the part of the drawing wanted—say breadth on Fig. 2 you find 10 eights; therefore, 10 feet. You use a scale of 12 inches divided into 96 divisions of 1/8 inch, and each division cut into six parts—of course, 1/8 is a very small scale, but does for a sketch.

The plans are called I., sheer plan, giving the vertical side view of hull and accommodation; II., the body plan, giving the cross-sections at so many feet apart; and III., the deck plan. The "design" plans would be from the same points of view, but would show form of model by section lines, vertical, transverse, and horizontal.

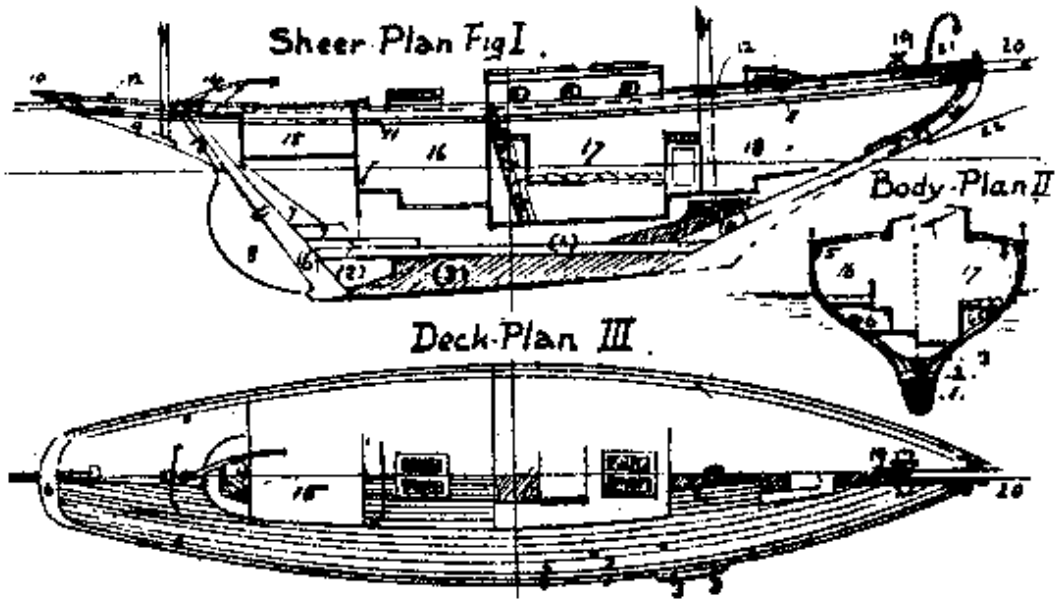


Fig. 2.

In I. you see a yawl yacht of 43 feet length "overall"; the section is as if she were sawn in half fore and aft vertically at the middle line; so you see the internals of the vessel, heights and lengths of cabins, and general nature of the structure. In II. you see the shape of the mid-section with the section of seats, bunks, floors, etc.; and in III. you look down "bird's eye" upon the deck, and see the hatchways, skylights, cockpit, and so on.

The design drawings are merely lines of shape, but you are not building, all you want here is to know the names of parts you will see when you go for a sail; and these are better hoisted in from a drawing than by reading.

No. I., the sheer plan, (1) the wooden keel, (2) false keel, (3) lead or iron keel, (4) forefoot, (5) stern piece, (6) stern post, (7) dead woods, (8) rudder, (9) the counter, (10) the taffrail, (11) the covering board (or deck edge), (12) bulwark rail. Inside the joint of 4 to 1, 5 to 4, 6 to 2, and so on are called "scarfs." Then there are internal strengtheners—viz., knees, chocks (shaded), keelson, and floors, below; and the shelf or inwall stringers, knees, aprons, and so on to hold the frame altogether. The cock-up of the bow and stern along the line 11, or covering board, is called "sheer"; when it is well proportioned the vessel is said to have a

nice “sheer,” and *vice versa.* The parts of hull at stem 5 and counter 9 are called “overhangs.” The rudder, 8, is slanted, called 11, “raked,” to give quickness in turning; also when the rudder is put over to one side when moving ahead the water hits against and runs up it, and the rudder has, area for area, thus a more powerful turning effect. The stern post, 6, goes right up to the deck, and inside the counter it is boxed so as to form on its after side the rudder-trunk 13, in which the rudder “neck” turns; the neck ending on deck as the “rudder-head,” to which the tiller, 14, is cap and tongue fastened, or a steering wheel connected by worm-screw gear. 15 is the “cockpit” or “well” for crew to sit into to steer and handle the vessel; it is formed by bulkheads and sides and floor, in many different ways; sometimes it is fitted as a watertight box self-draining, at others with openable lockers, and with seats. 16 is the after or “ladies” cabin, with bulkheads across ship and floor, with skylight above, bunks and seats in the sides, and door to main cabin is into main bulkhead. No 17 is the saloon, covered by a raised cabin top, called sometimes a “booby hatch” or a “coach roof”; this has at its aft end a slide hatch called the “companion,” and a ladder to come down. Round windows in its sides are “scuttles,” and perhaps also a skylight, on top at fore end. No. 18 is the “forecastle” for the crew, if they can get into it, with a hatchway over, also having a sliding cover.

Along the deck on No. III. beginning aft you see the “boom-kin,” a spar sticking out under the taffrail, 10, to which the mizzen sheet attaches by block and other gear. Then comes the mizzen mast stepped through the deck abaft the rudder; if it were in front of the rudder she would be a “ketch”.

The main sheet, the rope tackle, and blocks which trim the mainsail, fasten to the deck between the mizzen mast and the rudder-head either to eyebolts or to a buffer horse, 1 in III., different in vessels. Near about the main cabin companion are, at the side, the runner backstays, 2-2, slackable back-shrouds to support the mast. Going forward, you come to the main rigging, 3, at the rail or side; this is one, two, or three wire shrouds, coming from the mast “hounds” down to the “channels” or shroud plates, and set up by lanyards of rope or wire, or maybe screws. These support the main mast; all such fixed supports and stays are called “standing rigging”; tackles, sheets, braces, tacks, outhauls, halliards, downhauls; in short, anything that does any movement is “running gear.” You will, no doubt, hear sometimes of a craft that her standing rigging was all right, but her running gear was rotten; well, not much harm or expense, a little expenditure in new rope and splicing.

It’s difficult to try to tell you in a book what things are on a vessel. It would he an easy job to walk round the dock and tell you, and answer a thousand questions as to the rigging and why it is there, and how to make and put it there, but to write it all down means many pages beyond what can be put into this chapter. Well, finish off forward; look at both plans; there is 19 the “bowsprit bitts”; the place where the heel of the bowsprite houses, and also, by modern ingenuity the “bitts” are part of the winch for heaving in the anchor chain, and for belaying any rope to, such as hawsers for towing or for mooring in dock. Then you see, 20, - the bowsprite. (Don’t have it “bowsprit,” that is modern town expression.) This spar is rigged out over the stem-head, through. an iron collar, called the “cranse iron,” and the “hawse pipes” for anchor chains to lead through are on each side of the cranse. The wire rope or metal rod staying the bowsprite down to the stem is called the “bob-stay,” 22, and usually there are two bowsprite shrouds tackle-fitted to the main channels, at fore side of the main rigging, and leading to the bowsprite end, as side stays; they are tackled to take up slack, and also to allow the bowsprite to be reefed-in, and the three shortened shrouds, without shifting, to be firmly set up. 21 is the anchor “cat,” or cathead, for lifting the anchor on board with a tackle when too heavy for handling.

The body plan II. gives you a section of the yacht at her greatest size. You see the metal keel is, 1, shaded at the bottom; above it is the "keel" 2, of wood; then the keelson, 3; at the sides are the heels of the frames, and on them and across the keelson are metal floor frames.

The frames or timbers, 4, go right up around the sides to the shelf, 5, and have the planking fastened on outside; planking is laid edge to edge flush and caulked, called carvel building; in small boats it is often laid on, each plank just overlapping the one below, and fastened through both planks in the overlap, this is called "clench" build, by some "clinker" build; but clench is correct. (See "Boating," Chap. VI.)

Sometimes a thick batten is laid along inside over the frames in about the bilge, and fastened through each frame or timber, and carried right forward and aft; this is called a "stringer." and makes a very strong construction. The "shelf," 5, is like a stringer, 6, and supports the deck beams, and holds all the timber heads in place. The right hand half of the sketch II. shows the deck and cabin-head section, at other places the beams go right across under the deck from shelf to shelf. The left side of the dotted mid-line shows a section in the after cabin, with bunk and seat locker.

The deck plan III. gives a birds'-eye view of vessel. You see there are side decks to get along fore and aft; and the cabin head, skylights, cockpit, and sail-room hatch at its after end. Between the rudder-head and mizzen mast you see the main sheet horse, an iron bar for the sheet block to travel on; and the dots are the sheet-lead blocks on the deck, in some yachts. The dots on the rail near mizzen and main mast are, as before said, where the shrouds and backstays fasten; and the dots forward are fore sheet leads on deck and jib sheet leads in the bulwarks. Of course, a little sketch like this can't show you all the rigging and cleats, pinracks, and so on, but enough just to find your way about.

The yacht of modern days nearly always has a heavy metal keel,' and the great distinction from all other sailing vessels is that she cannot be capsized. She may be knocked down on her "beamends"— *i.e.*, laid over nearly flat by a squall, but will come upright again as soon as the wind lightens, or when she is turned towards the wind. Boats and canoes are often keel ballasted, and are equally safe. But in each and every case it is essential that the side decks are nowhere less than one-quarter the width of the vessel in a full-bodied vessel; even wider side deck may be necessary in V-sectioned craft or boats with short sharp ends.

Turning once more to plan I. This is not drawn as a careful design to build from. I merely put on paper for you a modern cruising form, roughly to the dimensions of a 12-ton yacht. Such a boat would "house" four in the cabins, and (possibly) two in the forecastle. But the main thing is she would "keep the sea" ably; so far as the hull is concerned. Gear and spars no one can be sure of, as you will read in the "Bos'un's Locker," - Chap. XII., a faulty splice in the eye of a wire shroud, carelessly put in, may "draw" and dismast the vessel in a few seconds in a jump of the sea. To "heave to" is to so trim the sails, and, if necessary, the helm, that the vessel should lie with her bow to wind and wave, and almost stationary in the water, and so lie till the worst of the gale has blown over. That is sailor's work, but it is absolutely useless if the vessel herself will not "heave to"; most modern yachts, built for speed as the main idea, will not lie-to, and they are not safe to run before a heavy sea; they are then too wild. The only thing to do, if caught by a gale in such craft, is to make port at once; or if that be too far off, go out to sea away from land, and out of the common track of steamers, and there ride to a sea-anchor and keep your lights handy.

In Plate I., the form below water, I put into a yacht that I designed and built for my summer cruising, and she proved to be an excellent sea boat, but I always had in any rough weather a remorseful feeling haunting me that I ought to have given her more fore-foot (see dotted line under (4).) She did "lie-to" nicely, but I had my doubts, and there should be no doubt; fault may be in the man, but should never be in the boat.

This part of the chapter on yachts may be thought, by some of you Scouts, to be too detailed or even technical, but remember I am writing also for Scoutmasters, and they in a very short time may be taking the Sea Scouts cruising in yachts such as here described, and though many of them will have learnt nothing new from me, they will be able to explain matters to you, and as all Scoutmasters are not, as yet, seamen, no doubt there will be some who will find the book, like the curate's egg, useful in parts.

Finally, on yachts: in anything about the size of a sailing boat, when going out for a sail, no matter for how short a time, always take the dinghy. Reason—You may be run-down; you may get stuck on the mud; you may have to anchor for calm or fog, and want to land to get food. But, above all, you may have man overboard; then the dinghy may be absolutely necessary.

BOOK TO READ

Sailing Ship Rigs and Rigging. By Harold A. Underhill.

CHAPTER VI.

BOATS.

Boat Model—Names of Parts—Fittings—Rowing

—Sculling Precautions.

All around England, and in every country which has a sea coast, the boats differ in all their parts both as to model and fittings, Generally, the marked difference is called in because of the nature of the shore or place where the boat is used. If all the work is from a deep water harbour and out to open sea you find the boats of that place with deep keels, and sails are more used than oars; on the other hand, when the usual work is from a beach, and for short journeys to sea, the boats are shallow and flat, and oars are more used than sails. Another thing you will notice about boats is that, in fishing boats, the mode of build and decking depends on the nature of work to be done, such as for net work, or line fishing, or for trawling. At sea the more the boat is decked, especially along the sides, the safer she is against being swamped. So also the deeper and more ballasted she is the less liable to be capsized.

The beach-boat, which has to be pulled up or down the beach, to land or launch, cannot be ballasted because of the weight. Many such boats, however, are fitted with centre-plates for sailing, and use tanks or breakers (small casks) of water for ballast. These are comparatively safe boats if they get filled or capsized, because the water in the breaker, though of good weight in the boat, is of no weight- when in the water. That is a rough statement. Let us think it out, say the wooden breaker weighs 6 lbs. and holds. a cubic foot of water, which is 64 lbs.. so that gives 70 lbs. of ballast. Throw that breaker full of water into the sea; it will float

because the wood is more than sufficient to carry the iron bands of the cask, and the 64 lbs. of water is now part of the water in which the wooden cask is floating; but if there was 64 lbs. of iron in the cask and it was, over that, full of water the wood would not support the weight of the iron, and the iron would sink the cask. A boat without ballast will not sink, because the wood of the hull is sufficiently buoyant to float the metal fastenings.

Air-tight cases are fitted into some boats, especially life-boats, and they will, if of sufficient size, float the ballast and prevent the boat from sinking.

Ship's boats are open-boats, that is they are not decked: they are intended for rowing and have sails only as a help. In a general way they are poor models for beach work; but as they may often be obtained second hand at a very cheap rate they are likely to come into the hands of Sea Scouts; so you should study that class of boat.

The best class of ship's boat for scout work is the "whaleboat." She has bow and stern alike, a form called by sailors "sharp at each end," and if she has also what is called a flat floor and good sheer, *i.e.*, high at the ends, she will be a good sea-boat and comparatively safe "to beach" in a breaking sea. A "square-sterned" cutter, or a jolly-boat, are nothing near so handy. The "cutter," as a rule, is too large a boat, too heavy, for boys to handle except in fine weather and smooth water. And heavy boats are difficult to pull out of the water on to the bank, or to hoist on the davits of the guard ship.

To procure boats. There are generally a number of old ship's or yacht's boat at the docks and shipyards in every port. The ship's boat is usually discarded for having become unsound, chiefly from non-use, inattention, and exposure to heat., The Government Surveyors then decline to pass her, and she goes on to the scrap heap; and is replaced by a new boat. That's the time to get her, perhaps as a gift. So also with yachts' boats, when they lose their "smart youth" the poor things have to go, though quite efficient for your work. Ships' managers and yacht owners only need a hint from headquarters, and no doubt boats will be forthcoming for scouts to use.

Build.—There are three kinds of building for boats. Clinch, carvel, and diagonal double skin. The first is often called "clinker." The plank edges are lapped one over the other, and the two planks at the overlap are "cinched" or fastened together: the nail is driven through from outside and clinched on the inside over a metal washer (see fig. 1).

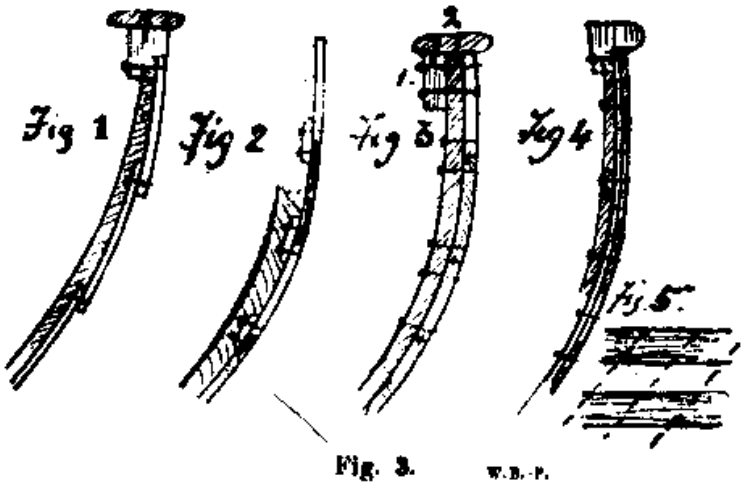


Fig. 3. W.B.-P.

The carvel build has the plank laid edge to edge flush, and the edge of each plank is rivet nailed from outside through the frame or timber (shaded, see' fig. 3) between the plank edges there is usually "caulking" that is cotton driven in, or may be a cotton string sunk into a groove in the plank edge, put in while building. Another form is ribbon-carvel (fig. 2) where the planks meet flush, edge to edge, and a ribbon

inside overlaps the joint, fore and aft, and takes the plank rivets; it forms the best water-tight building, and is the lightest and strongest form of building.

The diagonal (see fig. 4) is two thin skins: these are laid thus— the outside planks horizontal and the inside diagonally crossing (see fig. 5), and are rivetted together, and also to and through the frame or timber. Water is apt to get between the skins and then they soon go rotten: but it is a strong build, and stands a lot of hard bumps. The planks are shown in alternate shading to distinguish them.

Fig. 1 shows a solid gunwale, and a covering board, at top of the planking. The timber is sawn to fit the lap of the planking. In fig. 2 the frame would be sawn to fit over the ribbons and to lie against the plank. In fig. 3 the frame may be "steam bent" and lie against the inside of the plank. Planking is commonly called skin. Fig. 3 shows an "inwale" (1) for gunwale fastening, and there would be a "cap" on top (2).

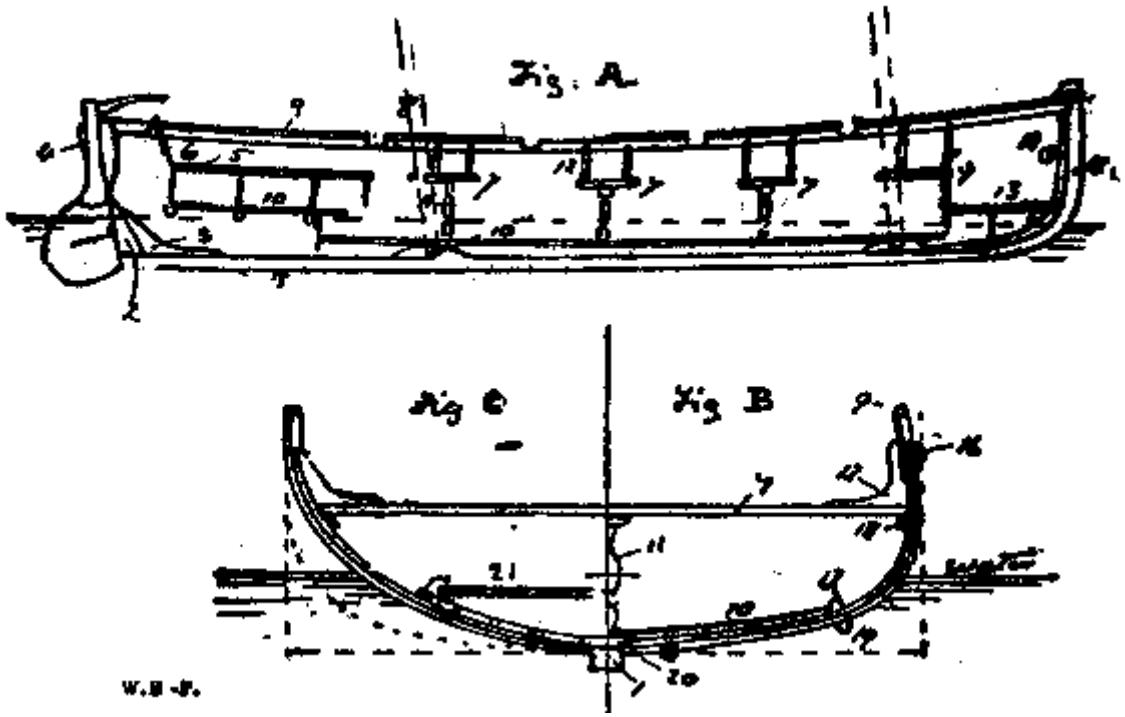
The wood used in sea-boats is generally English elm or teak planking and oak for framework, American elm for keel and gunwale. In river boats the planking is usually of pine or cedar; these are not nearly so strong or lasting as the sea-boats but are much lighter, in that a cubic foot of teak or oak is 52 lbs., whereas a cubic foot of spruce or pine is 30 lbs. But if the boat is a present or a bargain you must take what you can get.

Size of Boat.—Size of boat is a matter of money. But remember that you can do more general work with the smaller class of boat. A 32-foot "pinnace," bought at a dockyard sale may make a fine cruising yacht by being built-up, decked, and ballasted; but as a rowing boat she will be cumbersome and too heavy for boys in rough weather: her weight would be about 56 cwts. (2 tons 16 cwts.), whereas a 23-foot whale-boat won't be over about 8 cwts., and ample in size for a Scout 'Boat's Crew" of eight. A 20-foot "service-cutter"' would be a good boat for estuary work, where much sailing is done, and for camping work; but is heavy for boys to row. Collapsible "Berthon" boats are carried by all troop and passenger ships, and often come into second-hand sale list. They are extremely handy for stowage on shore, as when collapsed the two sides fold down by the keel and the width is less than one-third the full beam of the boat. A ship's Berthon boat would be 18 feet by 6 feet open, 2 feet 6 inches in depth, and weigh 8 cwts. She will carry 20 men. Now these boats have double skins of canvas with air space between. Such boat has 45 cubic feet of air between the skins; so even if filled by a wave she would support 25 boys in her.

I have used these boats for years in rough' work, and have never had a smash of the canvas or any trouble. The smaller sizes are easily carried, when collapsed, by lashing the oars across stem and stern of the boat at their middles, and the crew, standing at each side of the boat's ends, lift and carry by the oars; the doing of this depends upon the depth and weight of the boat for ability to keep her clear of the ground. 'Yachts' boats are much lighter in build than are ships' boats; and they are freely cast away by owners when they get to look shabby: as a rule, however, their size is too small for a "Boat's crew " of Sea Scouts : yachts' dinghies are very useful in harbour for two or, at most, three boys; but they are too short to go far in where the water may be rough, and here let me advise you to bear in mind that where ocean going steamers and passenger steamers navigate at high speed there is extreme danger to small boats from the breaking wave of their "swell": when you are out on the water of such a place there is no getting away from the swell: it comes rolling up short and

steep. The only thing to do is to row head at it with plenty of way on the boat, otherwise it will throw you back very likely end-over. Dinghies, those short 8 to 10 feet things, would have a bad time.

Form or Model of Boat—If you have any choice get a boat with a flat-looking floor, or bottom. A V-shaped boat is crank; and, weight for weight, she draws more water than the U-sectioned boat. The former under sail is not nearly so stiff as the latter, as you will see by the sketch, fig. D. The difference in actual shapes shown in figs. B and C. The former is the U section, and is compared to the V by a dotted line in fig. C. The. difference in bulk makes the C a poor shape for carrying a quantity of kit and stores compared to the boat B. As a general rule, sea-coast boats are of the B type; whereas river boats are too commonly of the V type, and, therefore, dangerous.



A boat's crew sit high above the water-line, and as a rowing boat has no ballasted keel to balance top-weight or wind force, she depends for stability on the form of her bottom, the flatter it is the stiffer she is. A perfectly round or circular sectional log of wood or a barrel, fig. E, will float with any part up; give it a touch and it will roll round. A flat plank, fig. D, will float only on its flat; stick it up edgeways in the water, and directly your hand is off it will capsize and float on its flat. The reason is - in fig. E, which is a section view of the round log floating in water, the centre of 'weight is and remains at 1, and the centre of the body in the water is and remains at 2 no matter how you roll the log round; because always the same shape is in the water, therefore the buoyancy centre remains the same and right under the centre of weight. Buoyancy of water, 0, presses a body in the water up. Weight of whole body,* presses straight down.

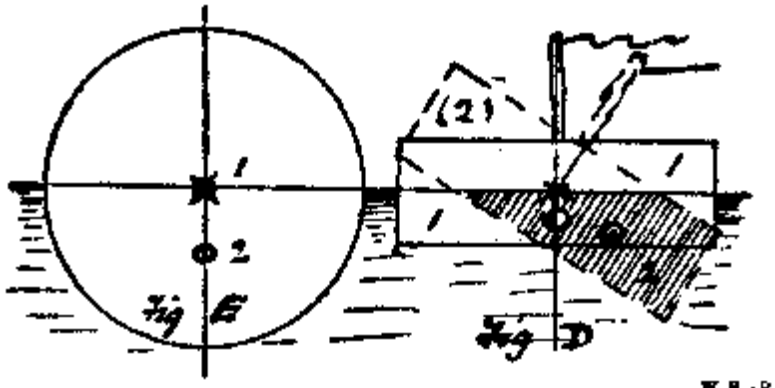


Fig. 5.

In fig. D, you see the plank 1, 1 floating flat (the sketch is a section across the plank), the whole weight centre is , the centre of the buoyant part in the water is 0. If you tip the plank over, say by a string on the little mast, one side goes down into the water, 2, and the other comes out of the water, (2); therefore the buoyancy part, shaded vertically, has altered in sectional shape and its centre has shifted out to the right, but the centre of the whole weight of the plank remains as it must do in the centre of the block. Now, as I said above, the buoyancy is pressing up, while the weight, *, is always pressing *down*, so directly you let go the pull on the string the buoyant water-borne side comes up, and the plank floats again on its flat.

The *pull* of the string on the mast is just the same effect as would be the *pressure* of wind on the sail. Hence, you see a round sectioned boat must be ballasted to carry sail; whereas a flat *(i.e.*,
comparatively) floored boat gains in her stability as she leans over: and if the crew "sit-up to windward" at (2) she has their weight also acting downwards, so gets immense stability.

Probably this explanation is enough in a general way as to the habits of boat models; this is not a book on naval architecture, nor even on boat designing and building, it merely warns you of what to expect from obvious difference of form. The boat, fig. A, gives a general idea of a rowing cutter; it is to tell you the names of the different parts of a boat :—l, is the keel; 2, the stern post; 3, the dead-wood; 4, the transom; 5, the stern sheets-....-that is, space for officers or passengers. with seats around; 6, the back board; 7, the thwarts for rowers to sit on; 8, the rowlocks in which the oars work; here they are shown as pockets in the gunwale, other boats have metal crutches shipping into sockets in the gunwale or cap-piece; some have two wooden pins called thowle-pins stuck into the wale; 9, is the capping; in some boats a finish, to inwale and top-streak; 10, floor boards or gratings, often called burdens; 11, thwart supports or staunchions; 12, thwart knees; 13, head-sheets, for bowman to stand on to use boat hook; 14, bow-ring for the boat's painter, the head rope, to make fast to; 15, the stem, with "apron" piece inside for strength.

Figs. B and C are sections, as said before, to show, C, a light-bilged, so-called V-sectioned boat; and B a flat-floored hard-bilged boat of good stability; they also show the above set out boat parts in cross-section instead of in the fore and aft given in fig. A—. numbers being the same. The additions are :—16, a rubbing streak, put on outside to take the chafe when alongside any craft or pier; 17, is a stringer, a kind of internal bilge-keel which gives great strength as it goes right forward and aft; 18 is a lodging shelf similar to a stringer, it is to lodge the ends of the thwarts on; 19 is an outside bilge-keel, a great saving of rub where much hauling on shore takes place ; 20 is the keelson, a flat keel on top of the real keel, a great strengthener. The "rabbet" is where the garboard plank of the skin joins, and is fastened into the keel. In most boats the frames, or timbers, go across the keelson, and are bolted down to it; the floor burdens, 10, then are set on top, and higher than in the sketch. Sometimes the

frames go across on the keel and the keelson (then called "flying ") goes on top of these. In all kinds of building the frames have a waterway cut in their lower side close to the keel, over the garboard, called limber holes, to allow the water, which may get into the boat, to be baled out by draining aft.

"Sheer" means curve upwards of either or both ends from the level of the gunwale at midships or where the freeboard is lowest. Freeboard is the height of side, anywhere, from water to top of gunwale, or covering board. Ships, as a rule, look better with little or no sheer; the old frigates were nearly dead straight in line of rail and deck, to the eye, and were a little heightened at the ends by the form of the bulwarks and rails. They were considered the most beautiful craft afloat. A yacht without sheer would look ugly; and a boat should have sheer to look well, and must have sheer if to be used in rough water.

"Rocker" is a term applied to the keel same as sheer; it depends on the work intended whether a boat have a rockered or a straight keel; for sailing, rocker is best. "Hogged" is the reverse to rocker; when the middle of the keel is higher than the ends, arched, it is hogged. When a wreck has a broken back it is generally then hogged in the keel, perhaps the whoIe body. "Camber" is transverse hogging. It is given to the beam supporting the deck, both for strength and to run the water off.

"Amidships" generally means at mid-length: also at middle line fore and aft; all weights, such as stores, kits, water breakers, and so on should be stowed amidships, both as to length of boat and as to middle line, as weight in the ends causes a boat to behave badly in rough water; also such stowage leaves the ends of the boat clear for working. As to side stowage it depends how she is rowed.

The rudder (see fig. A) is hung on the transom and sternpost by gudgeons (eyes) on the boat, and pintles (long downward 'spikes) on the rudder fore edge, which engage in and revolve in the gudgeons; the long spike pintle enables the rudder to be lifted a bit without coming unshipped: useful in passing over submerged hawsers or moorings or shallows.

The "plug," sometimes a mere cork in a hole in the garboard streak, or a turn valve, is for letting the water run or drain out of the boat when ashore or hoisted. But it is essential to see that the plug is in the hole or the valve shut before you launch the boat. And when the boat ships a heavy wave don't do as the Irish strokeman did. "What are you doing Fat," said the officer when she'd shipped a sea. "Shure I've just pulled the plug out to let the water out again yer honour."

Stretchers (fig. C, 21) are the wooden bars that ship across the boat near the floor for the rowers' feet to press against, for power in rowing. They ship freely into sockets; they have often proved handy and effective weapons to a boat's crew when another boat's crew or natives have attempted to "board."

A BOAT'S GEAR

A complete fit-out may not always be necessary; but let us set it all out, and then mark * such fittings as are necessary anywhere.

* Oars, one for each rower the boat is intended to have.

* Boat-hook, and coxswain's staff and flag.

* Bow-painter, a good rope about 5 fathoms long, for towing, anchoring, and making fast, it is fastened with running-eye to the bow-ring.

* Bailer, preferably a canvas bucket with wooden bottom; have a lanyard to it made fast in the boat.

* Spare plug for the hole in the bottom planking.

* Rudder, and yoke or tiller.

* Crutches for oars, fastened with lanyards at their stations— one spare in case of loss.

* Water breaker, or can, always fresh filled when going out on salt water, you never know where you may be stuck, for hours it may be on mud.

Lamp, trimmed, either oil or candle, and a bottle of matches, ready to show a light in danger of collision after sundown.

A small boat's compass: liquid type preferred.

Mast and, sail, with sheet, halliard, tack, etc.

Life buoy, and maybe life belts for crew.

Tin of biscuits for emergency only.

Anchor and warp, or use painter, may be very useful waiting tide in an estuary.

Fenders, canvas stuffed with cork or shredded rope, or rope made, say four a side, to fend off when alongside any craft or dock wall.

Camping fittings for boats are a matter of hand-making, and much depends on the size of the boat and the nature of the place where the camping will be done. A tent to cover the whole boat, and the necessary spars and ropes to set it is rather expensive. "Roughing it" can be done, using the sail as tent; the mast laid heel forward slanting up from the bows and resting in the crutch, made by two oars lashed at their blade necks and opened out at their handles across the stern sheets, as a pair of sheers; a lazy-painter (a short, spare painter), with the eye end used as a running eye around the lashing on the oars, and pulled tight, is set up as a back stay to the transom ring: then the mainsail is spread over the mast, which forms a ridge, and makes an inverted A tent. An oar in each side rolled up in the side of canvas which may be to spare and lashed around at the ends may enable the temporary tent sides to be kept outside the boat's sides, and so on a wet night shoot the worst of the rain clear— else you soon have a bath in the cabin.
A complete boat tent would be expensive unless home made.

Book.—Probably the most instructive book your guardship library can hold is Smyth's *Mast and Sail*, published by John Murray, London. It describes, with sketches, pretty well all the types of boats of the world.

FOR COAST SCOUTS.

Dinghy handling in sheltered water is the best beginning, because the boat is small enough for you to handle alone, and also any fault you make comes on you alone, whereas in a big boat as one of a crew you are nursed by those who know more about it. When you go out in a dinghy in a harbour you will get a sharp lesson in lookout, for the least inattention you will find yourself crashed into by a tug or steam launch, or foul of a buoy or mooring, or your neck scored by a ship's warp or mooring you hadn't noticed. But you will quickly pick up the situation and gain the seaman's eye, which at a glance takes in from time to time all that is going on and all obstructions. But you must be able to handle your boat before you venture among traffic.

Sculling over the stern with a single oar is better for harbour work than rowing. In sculling you stand up and look in every direction all around and 'see where you are going, and others coming at you. In sitting rowing, unless you half twist your neck off every few seconds, you see nothing ahead; but you can stand facing forward and row by pressing the oar handles. Fishermen and watermen are fond of that method, and in fact it gives better command of boat than sculling over the stern; but much depends on your own size and strength. The dinghy's sculls should be short and light; sea oars are usually of American elm, very strong, but far too heavy for boys. Get spruce oars nicely leathered where they play in the crutch.
Sculling over the stern needs a rowlock, or a semi-circular pocket cut in the transom, *i.e.*, the stern board. The expert, with a long bending American elm oar, can scull at considerable speed, single- or double-handed, standing to the oar in almost any position; but to begin and learn to scull neatly you should stand facing aft, feet wide apart. Hold the oar in both hands, thumbs towards your face as if you were about to suck the handle. The oar is dipped in at an angle of about 45° (see sketch 1) with blade flat across the line of boat. Then it is moved edgeways outward towards one side of the boat's line, a, fig. 2, and then twisted a little, the inner edge of the blade more towards the boat than the outer edge is. Then putting the handle to your left, the pivot being the stern board or transom crutch, the blade cuts across to your right, as you face aft, then you twist it the reverse, *b*, fig. 2, push the handle to your right and the blade cuts across to your left. If it went simply straight on edge through the water the oar blade would try to come nearer to the boat getting more upright, but your hand hold won't let it, so there is *pressure* of water on the aft side of the blade, therefore the boat has to move away, that is ahead. When you have got the action across and across and the twist-turn, you add a little circular sweep to the direction and find you can put on much more power, till a good hand will quite bend the oar with his power; then he gets speed (see fig. 3), the long arrow in the direction of the

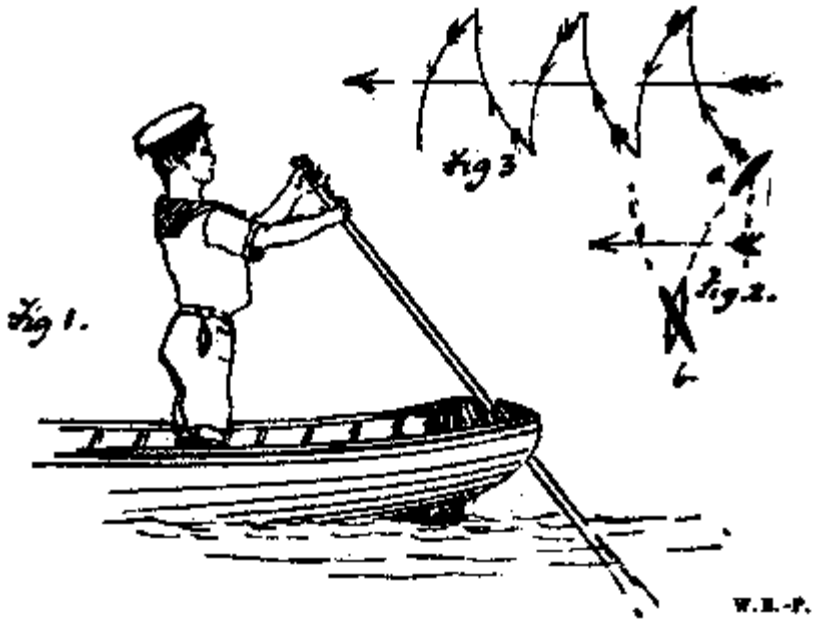


Fig. 6.

boat's travel ahead, while the small arrows show the travel of the oar blade across and across the track.

Needless to say, except going ahead, you have no command over the boat, such as stopping or backing: but sculling had many uses, such as when one oar of the two you have is broken or dropped overboard. Some boys, and men also, on rivers get into the habit of "dingy dawdling," sitting on one end of the boat paddling with a Canadian canoe paddle: it is simply loafing bad form, it is more sailor-like to scull or to push-row for difficult or crowded places, and to sitrow for open work. "Dawdlers" are constantly getting foul of other boats. Feathering the oar when pulling, or when push-rowing, is this: you put the oar blade into the water when it is as far forward as you can conveniently reach, sitting with your upper body bent aft and arms stretched out at full length: the blade is dipped in perpendicular to the surface, see sketch (1) shaded oar, the blade is pulled aft, a little deeper in water (2) and (3), and then with your body thrown right forward by the act of pulling the handle forward, and with your elbows at sides and hands close up to your chest (4) the oar blade is as far aft

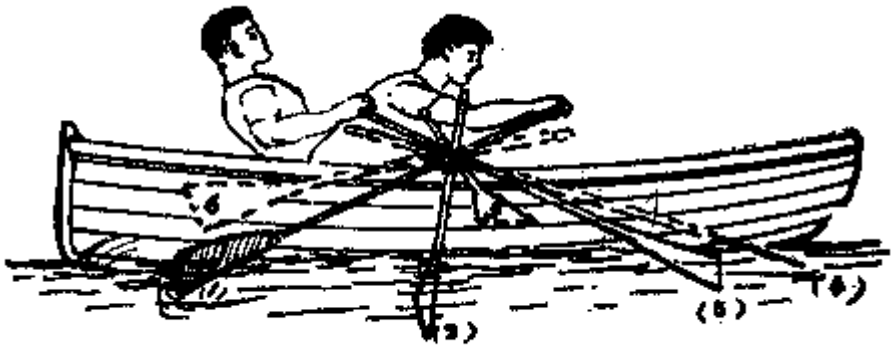


Fig. 7.

as it will go, or is useful, you drop your hands smartly and turn your wrist so that the back of the hand which, up to that moment, has been in a straight line with your arm, now becomes almost upright to the arm, consequently the blade is twisted upper edge forward from perpendicular to horizontal or flat, see (4), then pushing out your hands aft and following them with your body, the blade of the oar comes along forward clear out above water (5), still held flat, that is "feathered," by your turned wrists till it gets to (6), as far forward as you can push it by putting the handles aft. There you pause "half a mo," straighten the wrists, lift the hands, and drop the blade into the water again square at 1 and at 2 and 3 (in sketch) the blade is moving aft as the boat travels ahead, at 4, 5, and 6 the blade is being swung forward again.

If you did not "feather" the blade would be struck square on by a wave and likely be knocked out of your hand, or broken in the rowlock. Lift the blade well up in rough water. The sketch shows solid line while pulling, and dotted line when feathering.

Standing aft of the oars and facing forward, to *push-rote,* you bend your wrists just the opposite way. To push row you push the handle of the oar forward with the blade perpendicular in the water, the back of the hand bent slightly upward. Then at the end of the stroke, and you are reaching forward, you turn the knuckles and back of the hand downward, which feathers the blade, and pull the handle aft; at each movement you swing your body to assist the reach and to put power in the push.

Cautions.---One can't, in a little book like this, give all the instruction for "style" in rowing, nor all the boat drills, salutes, and so on. Your main object is to get "there and back" without accident caused by doing wrong. In narrow crank river boats it is wrong to change places afloat, by trying to walk or crawl past one another; run the boat aground and do it. Except in sheltered places and close to the shore always keep seated in such boats; in large ship's boats you can do otherwise, in reason, but crawling is better than dancing about in a boat, unless you are in a very big boat: expert boatmen can jump about as they like, but you have yet to become a boatman.

There is no better advice to be given to a boy in the beginning of boating than be cautious; smartness and brave deeds will follow later. Consider the weather, the tide, and the strength of your crew *before* you start: with a wind *blowing off shore* don't go further out to sea than is absolutely necessary, because it may blow stronger, and you may not be able to row in against it, and so may be swept further and further to sea into rougher water, and perhaps night. If so caught, it's no use tiring yourself out trying to do the impossible; if you have an anchor and sufficient rope and are in anchorable water, anchor at once. If not start in at once to make a seaanchor, that is a raft of oars, spars, loose sail, securely though not closely lashed together with the lazy-painters and any spare stuff; then bend on to the middle of this bundle the end of your boat's long painter; launch the bundle overboard, and "ride" to it. She won't drift much as she has to pull all that lump along through the water. Then would come in your precaution, mentioned earlier herein; the water, the biscuits, the lamp, and bottle of dry matches.

With the wind blowing *on to the shore,* and freshening, you have the reverse chance, that you will be blown on to the beach or rocks. So do not hesitate to land at the first suitable place you can get to, no matter how far it be from your home; you've got to beach the boat before the waves get too dangerous. You know where the coastguard stations are, so you row in towards the nearest. Before you come to the outer line of breakers turn the boat head to sea, and then back her in, sitting ready to pull ahead to meet a breaking wave; you turn the boat because if you don't meet the wave with good motion on the boat against the run of the wave the boat will almost inevitably be caught on the face of the wave and either be capsized or filled by the breaking wave crest. While you are meeting the waves and backing nearer in between times, the coast guard will have made out your trouble and got down with ropes and cradles or other gear. A rudder is useless for this work, so you unship it and have instead a long steering oar, working in a rope grommet or a crutch on the stern transom. With this the cox'n can sweep her stern round in a moment just as if he was rowing. When close to the beach look out for a big wave, meet it by pulling ahead at it; as the *wave crest passes the middle of the boat* back in for all you're worth on its back, throw a rope to the men on the beach, or get one from them, to your stern ring and hang on to it, otherwise the wave-suck would 'draw the boat back to meet and go under the next breaker.

All "boats' crews" belonging to the coast divisions should practice this kind of beaching in moderate weather; the wave action will be the same as in a gale or fresh breeze, but much milder, and with no danger. The crews not afloat in boats should take the shore coastguard's part and practice securing the boat on the beach. Another useful drill is that of making and riding to a sea anchor; but don't do that drill right in the track of steamers, because while your boat is fast to the sea-anchor you can't move, and your oars are not in the boat, so a steamer with a bad lookout might run over you. In making the sea-anchor always keep one oar in the boat, and use it over the stern to keep her head on to the waves.

Every year hundreds of lives are lost of men who, when their vessel is stranded, manage all right to get into her boats; but they know nothing about beaching. They row bang in for the beach head first; a breaker thunders against her flat "square" stem, half fills her and broaches-her-to, and the next wave rolls her over. That is where the whale-boat shape, bow and stern alike, comes in so well, you can " back her" to meet a sea (of coursç there must be no rudder shipped, it would get across and stop her), but it is easier to "back" her into the beach than to back to windward against an on-coming breaking sea.

Another caution is that everything in the boat, not actually in use, should be safely lashed to her, especially bailers and buckets.

The points which should always be in mind in a boat in open rough water or under sail are—

1. Never stand up, crawl to do your work if possible.
2. Never sky-lark in a boat.
3. Sails are not to be set without permission of your senior officer, nor unless the coxwain is a qualified boatman.
4. Never *belay* a "sheet" when sail is set.
5. There must always be one life-buoy or life-jacket in the boat, and no boys should be in the boat who cannot swim if the boat is going on to open water or among steamers.
6. Where the boat is used on a dangerous coast or for rescue service there should, if possible, be a life-jacket for each boy on board the boat.

For single hand work a few words more.

In coming alongside of vessel or landing place single handed you must be able to toss your sculls into the boat neatly and quietly, learn to toss one at a time, and then, later, both together. When you see that you have speed enough on the boat to bring her to the landing spot or gangway ladder you take the feather stroke forward up to its half way, you then drop your hands smartly some inches, with momentary leverage on the rowlock; this jerks the oar out of the rowlock. As you drop the hands the wrists must be turned strongly outward then upward and backwards; causing the blade to describe a semicircle through the air and land inside the bow and the rest of the oar between you and the boat's side. If you are using metal crutch rowlocks see that their lanyards are properly fast before you attempt *jumping* the oar out of the rowlock; a bad jump will likely unship the rowlock.

When going to board a craft at anchor with a strong tide or a hard wind be sure you have way enough— that is speed— to get to the spot. Get a bit beyond it and catch it on the drift is better than to miss it. So acting, in boat the oar first next the vessel. The other oar outside is held ready in the rowlock to take a maybe wanted stroke ahead or back, and then is in-boated in time for you to use the boat hook or get the painter or bow rope fast.

OFFICIAL RULES.

(1) No boat shall be taken over for use until the "Boat Certificate" issued for this purpose has been completed.Boat Certificates must be renewed each year.

(2) No boat shall be used for training unless properly manned and in charge of a person possessing the "Charge Certificate" issued for the purpose or otherwise authorized by the Sea Scout Committee of the L.A. Charge Certificate forms can be obtained from I.H.Q.

Examiners for "Charge Certificates" must be nominated, by the Sea Scout Committee and approved by the L.A. and D.C.

(3) No Sea Scout or Rover Sea Scout shall form part of the crew of any rowing boat until he can swim 50 yards with clothes on (shirt, shorts, and stockings, as a minimum), or form part of the crew of a sailing boat untilhe has also passed for the Oarsman badge.

CHAPTER VII.
BOATING ON INLAND WATERS.

Boating Inland—Boat Rigs—Boat Sailing—Boat Handling.

On inland waters of all kinds boating can be done by boys with very small risk, provided precautions are taken. A rule which must never be broken is there must be one, the most experienced, in command. All his orders must be obeyed instantly, there must not be any argument; obey, and then ask questions if you wish. In a Sea Scout boat of course the coxswainis in command; and in his absence the bowman goes aft and takes command. It would be a good rule that sail should not be used in the absence of the coxswain, because even in the lightest breeze a sudden squall may strike, and then only a prompt and correct action will save the boat.

The class of boats used in river work is very much smaller and lighter than those used in harbours or on the coast, and consequently, they are more easily overturned or smashed. But with Boy Scouts, who can swim in clothes, who obey orders, and are always on the lookout the chances of an accident are remote.

Where, on an inland river, lake, or canal, there is a scout guardship the officers are, or soon will be, good watermen, and consequently, they can teach the boat's crews not only just how to row and sail, how to clean and mend a boat and her gear, but the reasons why things are done. For instance, when under sail all the crew, except the coxswain, sit on the floor; and if the wind is on the side, or beam, of the boat all should sit across with head and shoulders against the windward side, and have no legs or bodies under the thwarts. Reason is always be ready for a squall and possible capsize, and the crew makes better ballast below than sitting up on the thwarts.

Sheets, that is the ropes which hold the after lower corners of the sails, the "clews," should never be made fast, but be held in hand with a pass round something, such as a thwart, or half pin, or one end of a cleat, to take the strain. Reason: you can then let go instantly to a bad puff or squall.

All spare gear and kit to be lashed down so as not to float out if the boat gets swamped; oars and spare spars laid along amid ships and lashed at one place to a thwart with a pull hitch—i.e., a "hitch on the bight" —so that one pull releases them; otherwise they are secure; they may be wanted in a hurry.

Ballast has been dealt with in describing boats, it is not wanted on inland waters as a rule, and on a lake, water in breakers is ample, you are not in for match sailing, and the crew close up to the windward side gives good balance against sail; water gives a lot of ballast, quite safely, in tin cans or "breakers" (little casks), all to be well fastened.

Nearly all navigable rivers have locks at intervals; these and the necessary "weirs" or dams enable the water to be kept in a series of "deeps" for navigation; whereas, without them the

current would be very strong and there would be long shallow rapids. The Thames has locks and weirs. The Wye has none. Consequently, if you boat on the Wye it must be down with the stream; and to get up again to where you started from, you would have a heavy struggle "poling" up long, shallow, swift rapids and always against stream; so you had better return with the boat by cart or train. On navigable rivers there is always a towing path, so with a good long tow rope, say 30 yards long, turns can be taken by the crew, two at a time, to tow, others rest, and one steers. The rule of the road is if you are towing *up stream* and meet a boat towing *down stream* she has to give way to you; she must shear outside of you and drop her rope into the water for your boat to ride over it. Mind it doesn't get caught in your rudder.

"Danger": on most navigable rivers where there are weirs you will see a big notice board with the word "danger"; but never a word as to which side to keep to. But you will soon be waterman enough to see by the flow of water where the weir must be, and where the quiet canal to the lock is. Never take the boat down the "weir suck" above the weir: a handy fisherman may do it and get back all right, but boats differ and states of "weir suck" vary according to volume of water and the number of weir paddles pulled up. Below the weir, in the pool, there may be danger of being under towed or sucked right under the falling water. Keep away from it, and certainly don't bathe in the weir pool, there are under currents.

In sailing down stream and approaching a bridge, if there is any doubt about the mast going safely under, down sail and unship the mast, as you can't do it after striking, the stream will twist the boat round and likely capsize her. Also it is better in any case to lower the sail and row through as wind flies about in strange puffs under the arches of a bridge, and a shear to one side may cause a mast collision, whereas it would have passed amply clear under the arch centre on a straight course.

For inland river or lake work, out and away the best craft for scouting purposes is the Canadian canoe of large size. In England they are rarely built larger than for four people; but in Canada they are often met with large enough for six or eight. Nearly every canoe club in Canada has its own "war canoe," large long open canoes to hold 10 or 12 paddlers. Now, such a canoe manned by six or eight boys would carry tent and camp kit for a week's cruise: and the crew would find little difficulty in portaging the canoe and kit over land or around locks or weirs, and could cruise wherever there is 6 inches of water. The difficulty of canoes is that, being all open, they require very expert handling in rough water, but their capability for inland navigation, and their inexpensive nature, puts them far above any type of boat for scouting purposes. A Canadian canoe of 16 feet by 33 inches wide, would carry four scouts; but if there is to be camp kit then three would be a full complement. Occasionally a canoe of 18 feet by 36 inches is to be got; a very useful size for lake work. A canoe of 16 feet by 33 inches usually weighs about 70 lbs., but it depends on the nature of the wood and the mode of building.

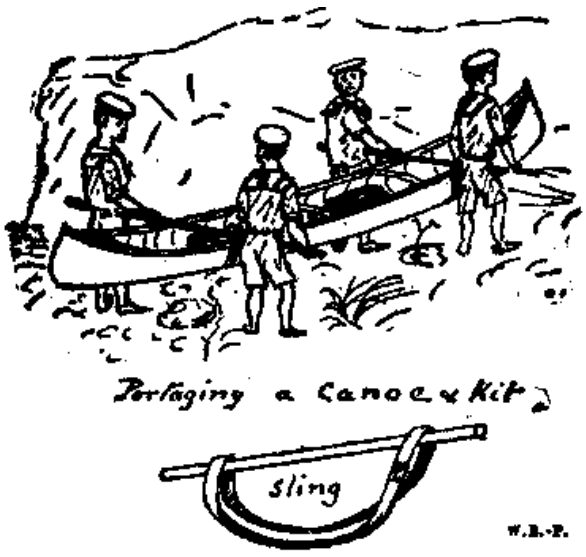


Fig. 8.

The canoe can be carried long distances over land by having in her kit two poles, bamboo

will do for light canoes. Then sling her as in the sketch, either with rope or preferably with strong web band, stitched as a ring band of suitable length to go double over pole and under the canoe as in the sketch. Tent poles can be used for carrying.

BOAT RIGS.

What will suit you best in sail? It actually depends on the type of boat you have got. Speaking generally for a river the "balance lug," described in the chapter on Ship's Rigs, would be the more suitable, and for up river you don't want any jib, or even a mizzen; they have a lot of extra gear. Give the boat one mast and a large balance lug, or if much sailing is likely, such as for Sea Scouts on the Norfolk Broads, have a "main and mizzen" rig, fig. 1. The main placed well forward, is a balance lug; the mizzen a spreet* sail: this mizzen is very handy in that when the "spreet" is unshipped the sail can be furled on the little mast and left standing in nobody's way. There is a halyard on the mast, fig. 1, *a*, with a ring traveller so as to lower the sail a bit for reefing; and the spreet heel strop on the mast can be shifted down to the extent of the reef, fig. 1, *b*. The sheet is on the transom (see boat drawing A, 4), a single block (pulley) on the boom through which the sheet runs; the sheet has one end fast by clip hook or knot to an eye bolt on, say, port side, and also runs through a block shackled to the other side, both inboard and close up to the transom. So you pull in or let out on one part of rope and the sail works on two, that is on the "bight." The main sheet may be fitted in the same way. The main halyard pulls the yard up the mast, and keeps it in close into the mast by a travelling ring. To this ring the halyard is fastened after passing through a thimble stropped to the yard, and through the mast head block (fig. 1, *c)*. The fore end of the boom is held to the mast by a "parrel" made of "sennet" flat platted rope, formed with an eye to go on the boom and a small eye to take the "toggle" which is stropped to the boom on fore side of mast (see fig. 1, *d)*, and the "tack" is made of a block stropped to the boom, and a rope with one end fast to an eyebolt in keelson, and rove though the boom block and through another block shackled to an eyebolt in keelson *(d)*.

These are all material parts of rigging. Then you may, for wide waters, want a topping lift; it is a long light rope, one end fast to mast head by an eye spliced end around the small part of mast above the halyard block. From there it goes down one side of sail and under the boom, through a ring lashed to boom, and up to the mast head block, which will, for such rigging, be a two sheave block, or have a thimble seized to the block strop for the lift, and thence down to hand and a cleat. To keep it at the after end of boom it may pass through a thimble, and this thimble be strop toggled to the boom so it can be taken off when the sail is to be disconnected from the mast.

Reefing is performed along the lines shown across the sail, and which are "tabling," or tapes sewn on to the sail, there are brass, or sewn, eyelet holes. To reef you lower sail well down, roll up the reef and pass a light line through the eyelets and round the rolled part through and through, and strop toggle (fig. 1, *e)* at each end of reef round boom.

The second sketch, fig. 2 is the "standing lug" rig, which is, to my mind, preferable for sea or open water; all the rigging is the same, only that the boom takes the mast with jaws or a gooseneck (fig. 2, a). The "raking," or leaning, mast is supposed to give a lifting effect to the sails. I have found it useful to have a "parrel" on the yard reaching from the halliard strop *(b* in fig. 2) to the yard's throat end. It keeps the yard in close to mast in the act of hoisting or lowering, a vital point.

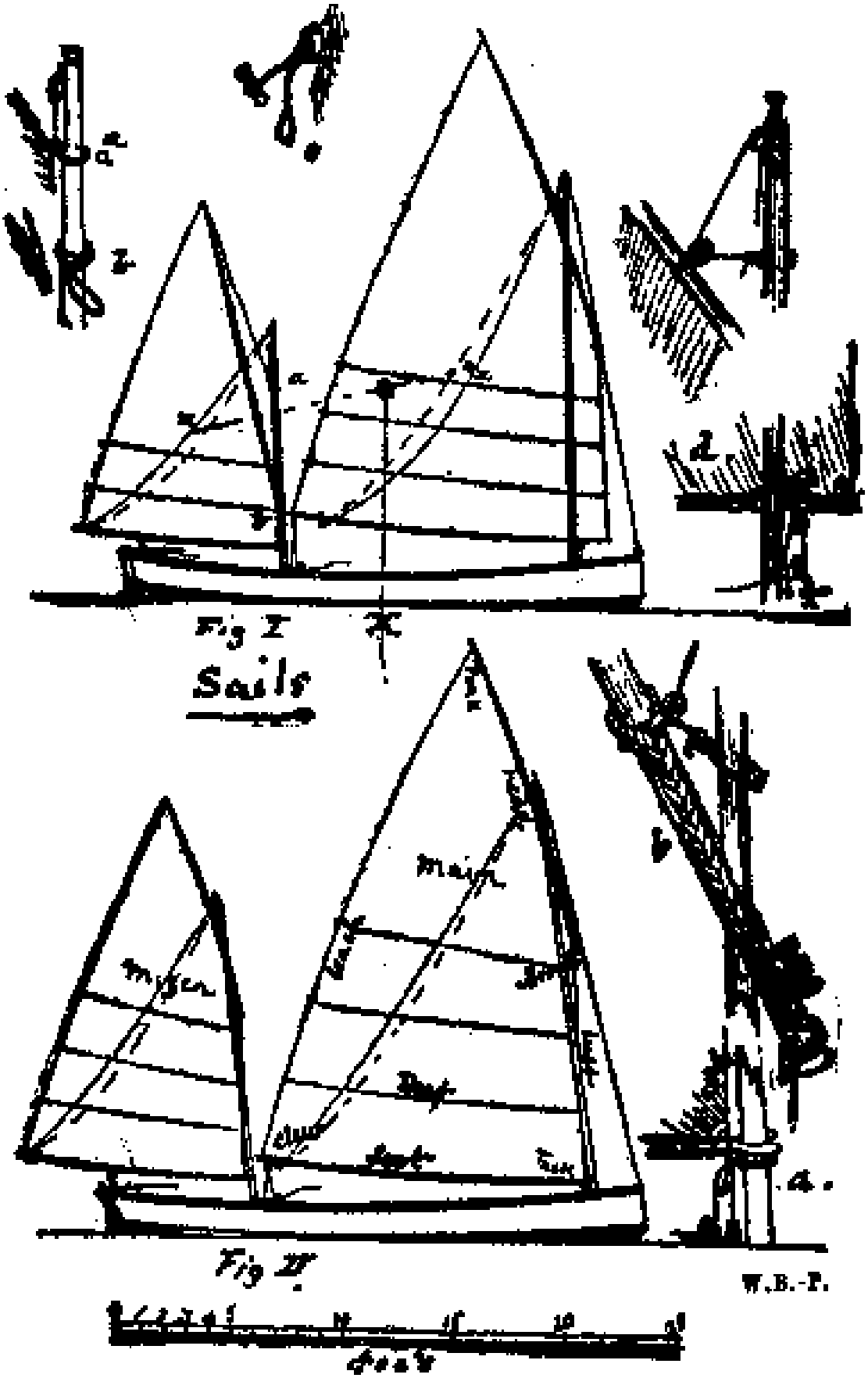


Fig. 9.

Rigs which you should avoid as poison are latteen, gaff rig, and dipping lug. They have their uses with smart crews, but should never be seen in boys' boats. The elementary sail, of course, was a square sail, hoisted only to a fair wind; and so long as the course to be made allowed the wind to be abaft the cross line of the boat, i.e., called "abaft the beam," the boat couldn't come to much harm with a small sail. Such type of sail might well be the beginning sail with new "boat's crews"; and, no doubt, it would make a useful tent or rain shelter.

BOAT SAILING.

Why a boat turns one way or another under sails only— without using the rudder —is the first thing to know before you go out sailing. Each sail has its "centre"; though the wind acts all over the sail's surface its centre is the pressure point acting on the boat. In the plan of sails just given you see in fig. 1 the centre of each sail x and then *o* the common centre of the two sails, nearer to the main, z, because that sail is the larger area. Suppose that centre is in the same position, vertical, as the turning centre of the boat at X, each sail with a side wind presses with equal proportional force to push the sail away from the wind, but, as they balance one another at the boat's balance or turning point, neither can turn away, so their combined force drives her ahead only.

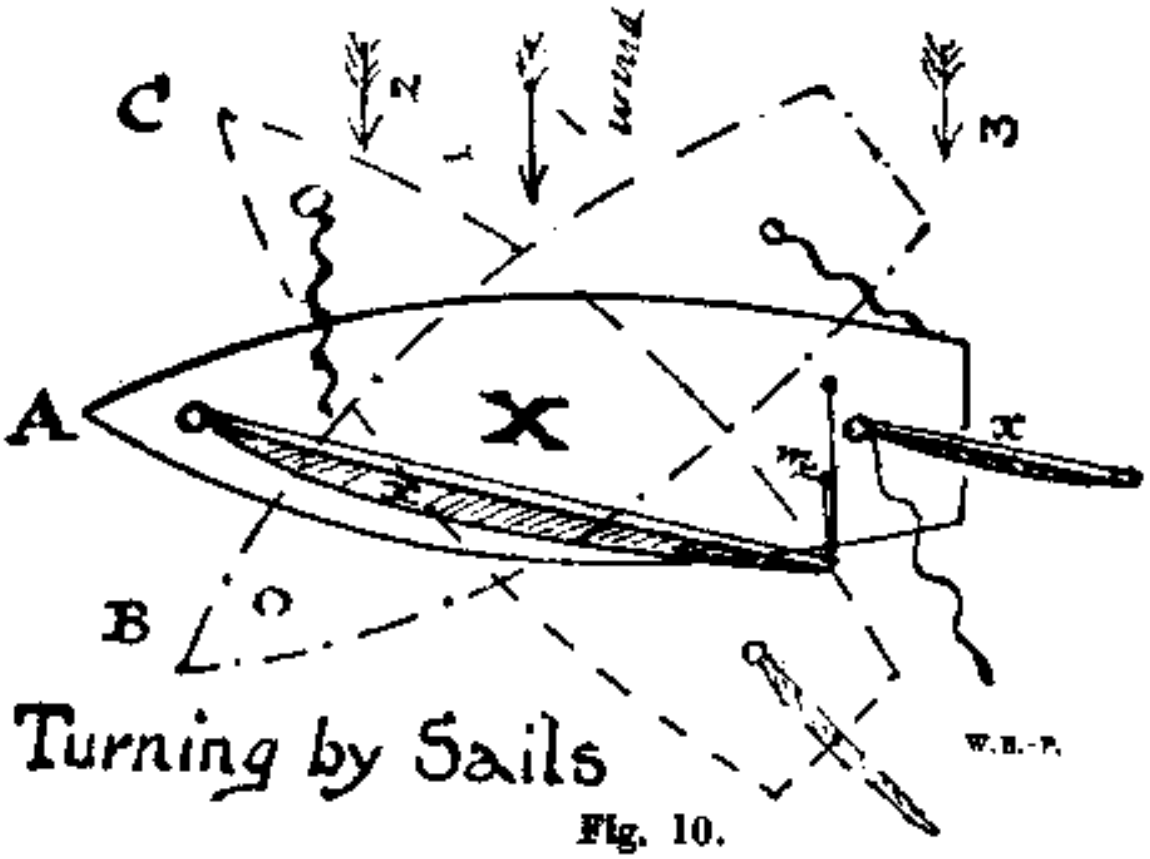


Fig. 10.

Now if you let go the mizzen sheet (see waved line in fig. A, bird's eye view of boat) the sail's force is gone, and all the wind pressure being now in the main sail, x, forward (wind arrow 2) the boat will turn away from the wind (see dotted lines, B): just as if the model in cardboard was pinned so as to revolve on s table through X, and you push with another pin point at x on the sail forward; try it. If again a squall (arrow 1) struck the boat; you let go main sheet *m* in sketch A, and keep the mizzen fast. The pressure then goes out of the main sail, and the mizzen turns the boat's head up towards the wind and the stern away from the wind, C. That is the safe thing to do if the wind is on the side of the boat, blowing on to the beam or forward of the beam; if the wind is aft of the beam let fly the mizzen and lower it—that is if there is room on the water to run before the squall. But if there is not room to run—that is land too near—you *must* luff, that is bring her head round up to the wind.

In luffing, from a position having *wind aft,* there is great danger because you turn across the hollow of the waves, called the "trough of the sea"; on inland waters there is not so much danger from this, but you, in any case, also meet the full weight of the squall. Keep the mizzen set flat; stand by to lower the main in case the squall is really bad, and take to the oars. Light rowing boats won't "hold to windward" under sail in a real squall, and the oars will, at least, prevent her getting stern way. What happens in luffing to a heavy squall is: you put the tiller over to leeward, keep the mizzen set flat and ease off the forward sail or sails; she comes round quickly head to wind. Then, if she is a light boat, she loses her way, and the force of the wind, on the shaking sails, the hull, and the gear, drives her helplessly astern (called "making a stern board "). Therefore lower the head sails and use the oars or anchor at once.

Running before the wind is quite safe if there is plenty of room, and the sea does not get too high and vicious in breaking. But these points must be watched before it is too late to act. The danger is, as before said, that you have to round to, as she can only ride to her anchor or a floating sea anchor (mentioned above) with her head to the wind. If the worst comes to the worst and you have to beach her, drive her in under plenty of sails, run her high up. It is fatal to try to round to under sail close to a lee shore (lee shore is wind blowing on to the shore), she will probably be thrown broadside on to the beach and rolled over and over.

These are extremes not likely to happen in good management: but it is advisable to tell you what to avoid. Of course if the coxswain is a good boatman he will, in fine weather, practice you in all these manoeuvres and explain why such and such things are done. You will quickly pick up all about it, for you can't hold a book in hand and work the boat at the same time.

A sail always comes down better head to wind than any other way, and for beginners the sail should be lowered right down to be reefed; later on you will be able no doubt to reef while the sail is up—but its tricky work in a light boat and very dangerous among breaking waves. The mizzen helps when set flat to keep her head to wind.

When you are sailing "close hauled," that is with sheets tight in, and. wind is coming at you from forward of abeam, the boat should balance nicely, almost steer herself; but the direction from which the wind *comes* may be your course, so you have to "tack." that is to sail as far as is convenient with the wind on one side, and then turn her round head to wind, and sail with the wind on the other side of the boat, and so by a zig zag course you actually, in the end, get to the place dead to windward.

To tack you put the tiller "down"— *i.e.,* away from the wind — and so turn her head into the

wind; keep the mizzen close hauled and ease the head or forward sail a little. When she gets nearly head to wind mind she don't fall back again; if she stops turning push the forward sail's boom out a bit to *back* that sail a little, to push her head more around; but as soon as the wind has come, undoubtedly, on the new tack, or side, let the boom swing over and haul the sheet in for the new tack. It is "lubberly" to use oars, for it shows up that the boat is a duffer or has been badly handled.

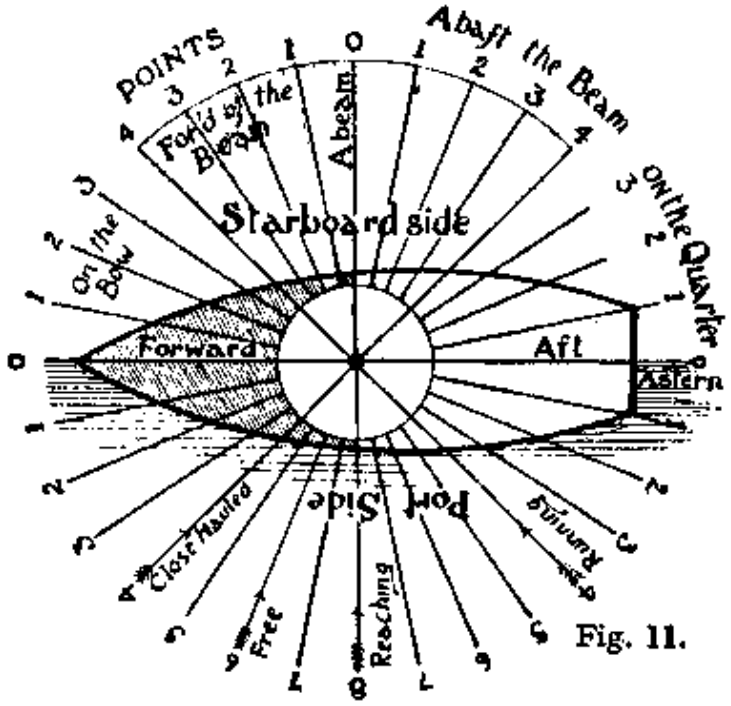


Fig. 11.

If there is plenty of water to work in and she refuses and is inclined or beginning to fall back to her old tack, let her do so (that is called "missing stays," as tacking is called "going in stays"); then sail to get good way through the water, and try again without any bungling. Sometimes a jutting point of the river bank may just be weathered, without tacking, by making a "Blackwall hitch." You can't quite sail past, so you put the helm down slowly and not hard over, let her shoot up to the wind, and as soon as she begins to go slow, reverse the helm and let her fall off again on to the old tack, fill the sails and get good way on. The "shoot to windward" has probably given you sufficient offing to clear the point.

Of course you remember "port side" is left hand facing ahead or forward, and "starboard" is right; then there is "on the bow," each side to four points from ahead; then "forward of the beam," from that "abeam" (see diagram starboard side), or at right angle, amidship; then "abaft the beam" is from abeam to four points from line to keel aft, Then "on the quarter," from right aft to four points to the keel line. Then there is "astern." "Close hauled," in fore and aft rig, is usually wind at four points on the bow (see port side of diagram). "Free" is with wind from four points on bow to anywhere on quarter. Reaching is wind abeam. The term "free" is really for any direction except close hauled. "Running" is with wind between four points on quarter to right aft. "Running free" is a lubber's term. "Running by the lee" is when the course required the wind to be on one quarter while the booms and sheets are yet on that side and a change over cannot at once be made; and so, if wind is heavy and waves high, you may be caught with a dangerous "jybe"— *i.e.,* a sudden forceable flop over of sails from one side to the other, caused by shearing or bad steering; or may be a sudden shift of wind.

"Working to windward" is close hauled sailing to get to a spot to windward. "Wearing" is "tacking" by turning the ship's head round away from the wind instead of to the wind, and then turning until she is again close hauled. "Clawing out," or weathering out, is sailing better than another to windward. "Griping to windward" is a boat trying to turn to the wind against her helm

— i.e., faulty balance — she would be carrying "weather helm"— i.e., the tiller must be kept up to windward. The reverse is "carrying lee helm," or "running off her helm." "Sagging" is making leeway; suppose her head points for a light ship two miles off a point of land, and to windward of it, and the boat sails on and hits the point, she has made two miles of leeway, for had she made none she would have passed two miles outside the point. "Sternway," or a "stern board," from some cause or fault she has lost her headway and get to moving astern through the water.

The orders to "Starboard" or "Port" refer to the rudder and boat's head. Hence, when you want the ship to turn to the right, as you face forward, you push the tiller over to the left, or port, side. The rudder blade is thus turned across the stern towards the right hand side, and the flow of water along the keel and the sides of the dead wood (2 and 3, Fig. A, the boat sketch) press against the face of the rudder and turn the vessel's stern to left and head to right; that is the action of "starboard," or "putting the helm (tiller) a starboard". So the short word "starboard" means putting the tiller, if there was one, over to the port side, or "ware something" on starboard side; that is "go to starboard"—and *vice versa* as to the order "port." "Larboard" was the old time word instead of "port," but it was so confusing, it was so like starboard, it was discarded.

Another helm order you should know always, without hesitation, it is common to all sailing vessels, ship down to dinghy, viz.: — .

"Put the helm up" or, ditto, "down." Now think it out: the wind blows on one side or the other until it is dead aft. (You can't sail with wind from ahead.) The side on which the wind blows is "windward," the other "leeward." All ships and boat lean over ("list") a little by the wind pressure, to windward side up and leeward down. The boom and sheet are, course, to leeward. So when you get the order "put the helm up" you push the tiller up to windward. The same alteration of the heading may be ordered as "hard up" or "keep her away" or "bear up." The reverse is "hard down," "luff," "bring her to." It is most essential to get these orders quite clearly in mind. A wrong helm may bring grave trouble, especially when the order is given to avoid a collision; of course they are sailing vessel orders. "Steady" means stop any more turning of ship — "steady at that" — or may be steady back to your course. "Steady" means helm amidships, that is rudder acting no longer and keep boat heading in that direction. In relation to the foregoing among your boat's crew or ship's company the handy carpenter should make several wooden models like this drawing.

Cut them out of about inch pine board. Cut with a pair of scissors out of biscuit tin or card the little shapes to represent sails and rudder, it is in "bird's eye view," as if you were looking down upon the vessel from a flying machine. Seeing that they are clear of each other to be twisted across, pin them by the round end to the centre line, as dotted; the sails are here shown in shaded lines; the rudder is shaded, the tiller white.

The sketch has more on it than you need put on the model; it explains some of the things told above. You see "on bow" means from mid line to four points of compass on bow to starboard or to port; "on the beam" or so many points, up to four, forward of aft of the cross ship line; aft of this, any bearing, is so many points on the quarter. The side lights show "right ahead to two points abaft the beam"; you can cut a nitch on each side and paint it red port, and green on starboard.

The sketch here shows the wind four points on the starboard bow, the foresail and mainsails

"close hauled" on starboard tack. The mizzen has been eased off to shaking, edge to wind, and the tiller is "hard up," "a port"; so the pressure being on the forward sails only the vessel will "pay off"— *i.e.*, turn away from the wind.

With such models, several on the table at a time, they can be moved as if sailing in accordance with the "rule of the road"; the master, mate, or coxswain, placing them and explaining the rule and necessary manoeuvres, and later leaving the boys to each manoeuvre his model and then be told if he has done wrong, and why.

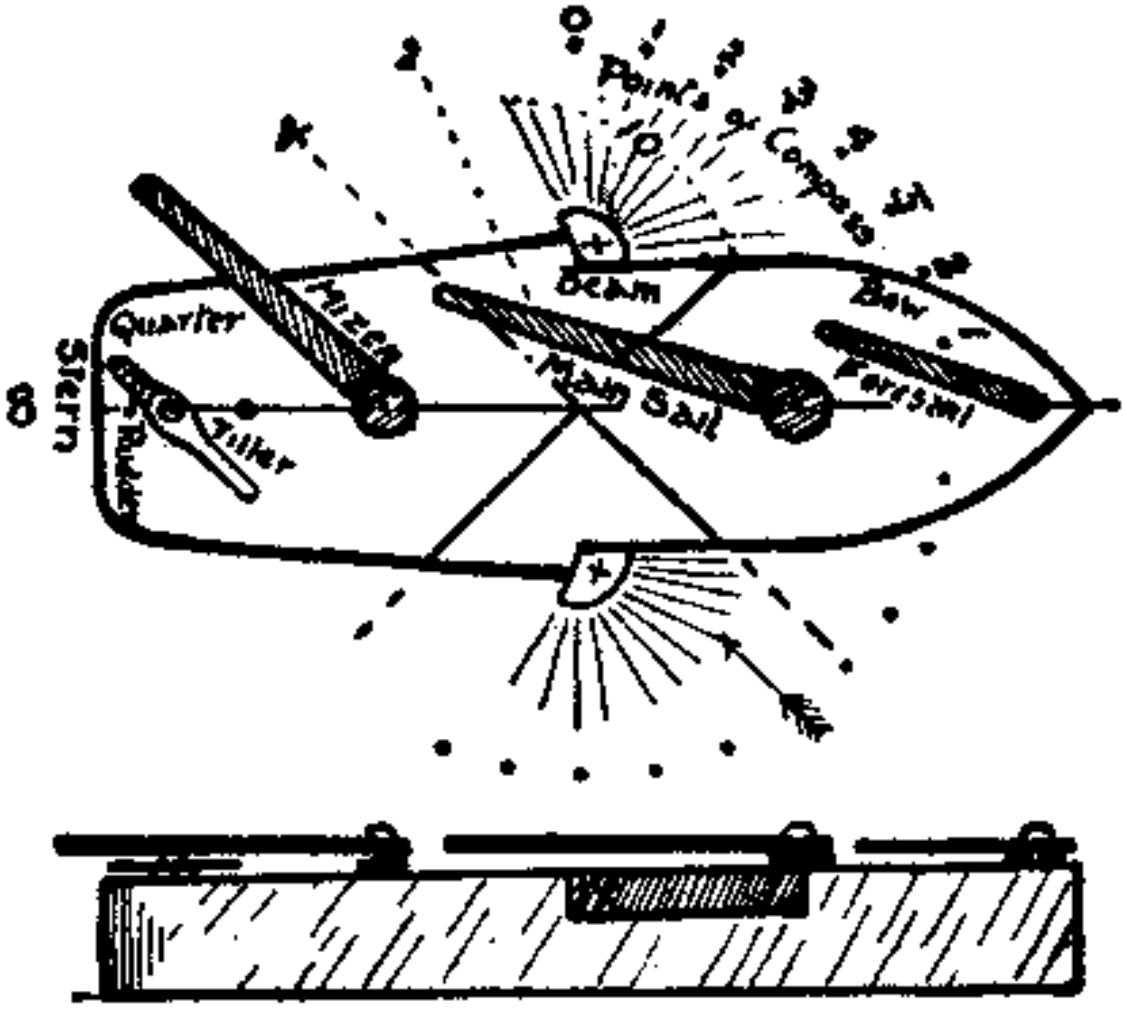


Fig. 12.

We have, perhaps, now given boat sailing enough consideration on paper; and you will be ready to get afloat, where you will pick up wrinkles every minute; but I would give a parting warning that trouble in sailing is more often found, for the beginners when the wind is right aft. A sail without a boom is more apt to "jybe," that is to get violently thrown back across the boat by the wind catching on the lee, the wrong side of the sail than is the case with a boom on the sail. Therefore, when "running" before the wind be always on sharp lookout for this: it may be saved by a quick use of the helm, putting the tiller over toward the side on which the sails are hanging out. It is better, for a beginner, never to run dead before the wind; keep it on the "quarter." If, for the course you want to sail, you must jybe and bring the wind on to the other quarter, lower the sail, then turn her head by the helm, and hoist again.

BOAT HANDLING.

Anchoring.—The anchoring you will do, other than for leaving the boat at anchor as a several day mooring, will be for short times; so you should take the precaution not to get your anchor foul of something on the bottom so that it can't be lifted when you want to get away.

The most common fouling is hooking another vessel's cable or an old lost mooring chain or rocks. It is common sense that where the anchor has gone in by a pull ahead, it will come out by a pull back. So the dodge is this, make your anchor rope fast to the "Crown" of the anchor, A, by a clove hitch and half hitch and stop the end, then let the rope lie along the anchor and "stop" with yarn, B, to the "ring." If the anchor gets foul and heavy perpendicular strain is put upon the warp, C, it will burst the "stop"; slack away a bit to let the anchor settle flat, then pull up crown first, D. If done neatly it usually comes off.

Fig. 13. W.B.-P.

River Anchoring. —For small boats or canoes there is an excellent plan. I don't claim to be the inventor, but I thought of it for myself and I have used it with success for over 30, years. An anchor is a trouble and weight to carry in a small boat or canoe and very apt to get foul and be lost. The dodge is to have a few bags of calico, about 1 foot to 18 inches or even 2 feet square, according to size of boat; fill one or two with ordinary river shingle when you start on the cruise, tie the neck with its own tape; slip a strop becket of rope or sennet on to the neck, so as to form a loop; to this loop bend on the painter by a sheet bend. The bag of shingle will hold in almost any river current better than an anchor. If it gets foul of rock or tree snag a jerk or two will tear the bag and let the stones out, and away it comes. You only lose a bag. Of course in canoe travelling it's a great saving of weight to only carry a roll of calico bags instead of a 7 lb. anchor.

Remember in tidal water when making fast to any fixed object, piles or piers, etc., that you must leave range enough of rope for the boat to rise or lower with the tide; also that you must be able to undo that fastening, it may be too high out of reach, at low water, or under water at high water. I remember a good example of this for you. At Teddington weir on the Thames, which is there tidal, a young fellow had moored his fishing punt close up to the weir at low water by hitching his short bow chain (punts usually have chains instead of rope painter and it is riveted to the stem under deck) to an old iron rivet in the weir woodwork with a clove hitch and one or two half hitches. The tide rose, the rivet was covered, presently the youth noticed his punt was tipping bow down. Release was impossible. A waterman came up to his assistance, jumped aboard, forgot to make his boat fast; she went adrift, and there were two in the chained punt.

The weir roaring and the vast swirling under currents made things look very blue. No force that they could muster would break that chain, and there was the certainty that in a few minutes the tide would be over the punt. Well, a seaman saw at a glance what was happening

and made record time in rowing to the rescue of the men; but the punt was doomed for that tide, and under she went. I warned that young gent about mooring with chain, and he had an expensive lesson and a near call for life if nobody had noticed him.

Steering a Boat—A first point to bear in mind is never to put the helm (tiller or yoke) over beyond 45 degrees, that is half across; any more simply stops the boat and has little steerage effect. A good helmsman in a boat hardly ever uses more than 20 degrees of helm; and in sailing it is often the overdoing of helm that causes the boat to fail to tack, or, again, to run wild, jybe, and do other silly things.

To come neatly alongside a vessel when rowing, in any case keep well out from the gangway ladder, with room for the oars next the ship to keep rowing—there may be tide running—till you see you can sheer neatly alongside without oar assistance.

At a reasonable distance or space of anticipated time, give the order "in bow." The bow man then tosses his oar, lays it in the boat, gets his boat hook up and stands in the boat's bows ready to hook hold. You must give him time enough. Then, when you see she will shoot in give order "way enough "—the rowers give one stroke more, and "boat their oars." You steer alongside. If you have misjudged the strength of tide or way on the boat you may ignominiously drift astern, have to out oars and try again.

To come alongside coming down with the tide; that is from ahead of the vessel, row down quite three boats' lengths from the side of the ship, judge the tide strength (usually this will be about it), when abreast of the ladder commence to turn inwards towards the ship. A neat circular sweep is made, all oars rowing, then "in bow," and "way enough." She glides with last ounce of way alongside the landing, with the ladder grating just abreast the stern sheets. You may have to back the oars on inside of turn and pull all again to "catch" the gangway, but that's bad handling. The coxswain who brings his boat "nose on" into the vessel or her gangway should be disrated, so also the bowman who fails to hook and hold.

Towing.—You may be offered a tow up against tide to get home, by a friendly power launch or even a tug, but you must be very careful; if she goes too fast your boat may be towed under or yaw and capsize; in either case you must be ready to instantly slip your tow rope. The bare end of the tow rope must be in your boat so that you can cast off and slip in a moment: So never tow by your rope spliced to the bow ring. Give the tow boat all the spare rope. Take your bare end, of rope through your bow ring, lead it under the thwarts to the after thwart, there you may hitch it with a round turn and two half hitches, not tight but ready to let go. Some people tow from under the bow thwart, but if the steering is bad—she can sheer badly by the rope shifting across— seat the crew well aft to lift the bow, sit still, no larking. A boat tows best with a short scope of tow rope.

Books To Read

Boatsailing for Beginners. By G. P. Ranken.

Dinghy Sailing Simply Explained. By G Prout.

The Book of Canoeing. By Alex. R. Ellis.

CHAPTER VIII.

WATERMANSHIP IS A FIRST CALL.

Tides—Currents.

A Scout should be a good "waterman," whether his work is on inland waters or in coast harbours. He should know all he can get hold of about tides and currents, rapids, and weirs, locks, bridges, and shoals, in fact everything that comes in touch with using the water in boats or other craft. With this he must also practise and make perfect his knowledge and ability to handle boats in every kind of circumstance met with on rivers, estuaries, and lakes. That is watermanship.

A waterman's knowledge on the water is like the backwoodsman's knowledge of woodcraft in the forest; and as the backwoodsman is to a great extent also a waterman, so a waterman may be to some extent a sailor. In like manner, a sailor may usefully be also a waterman, but not necessarily; the ship can go to sea without watermen, and the canoe or boat can navigate a wild river or lake without a seaman in her crew. Yet a mixed knowledge of watermanship and seamanship is of the greatest use to scouts.

There is another point which will affect you boys in the early stages of sea scouting. Seamanship, except the elementary work of knotting and splicing, signalling, and reading up such things as working the rocket life gear, using the compass and chart, and learning the rule of the road, etc., has to be done afloat on a ship, and with other ships moving about and showing off what they do; whereas the whole of watermanship is, learnt on rivers and waters, ponds, lakes, and canals, and you can get at it in almost any kind of boat. So as the "ship" wont come to you until some time after you have made up your boats' crews and ship's company, watermanship will be your first call.

You know that some waters connected with the sea have tides; that is a rise of water, with a current running up towards inland, and there is high tide, then soon after the water begins to get lower, and the ebb tide or current runs off down towards the sea. Well, the waterman knows that if he wants to get his boat to some place up stream he had better let the flood tide help him by carrying her up, even if it be only floating without any speed or rowing or sailing; such is a "dumb barge" which you see on the Thames, she only drifts and the oar used is to "set her" fair for passing through the bridges and keeping her in the best run of the stream; also the waterman knows that if he wants, that is has to row up against the ebb tide, he must keep close along the bank so as to get advantage of the little slacks and favourable eddy currents caused by jutting out points. Working boats on tidal waters you soon learn that each tide runs for about six hours, it differs in some places, but take that as an average, so the good waterman works all he can to advance on his favourable tide; and then when it is done he anchors or makes fast, knowing he has about six hours for cooking, feeding, and sleeping before he can get on again; and this is the art of working tides" at which the "bargee" (the skipper of a barge) becomes so proficient from his local knowledge that the most expert seaman, unless also a waterman, could not come near him in this practical knowledge.

In inland navigable rivers the water is held up at certain places by barriers or dams to keep sufficient depth for navigation; and the craft are passed through locks, which have water tight gates at each end, from higher to the lower grade of water, or, going up stream, totherway on.

The lock is filled by sluice gates, shut able doors in the upper gate. When the lock is full those doors are shut and the lower gate doors down stream are opened; this lets the water out of the lock till it is level with the river or canal surface below the dam. Then the gates are opened and the boat is pushed out of the lock. Always have a boat hook, if not two, in the boat when going through locks.

The waterman's ways of utilising tides and current are very numerous, and, of course, in the higher branches very deep. For instance, "shooting" an 80 ton sailing barge through Rochester Bridge, sailing to the last moment and lowering all mast and gear on deck is a mixture of high watermanship and seamanship; the one in touch with all the vagaries of the tide, the height of the bridge arches, the local gusts of wind, and the quaint ways of others in such river traffic, the other, seamanship, giving calm judgment of how to sail her boldly to the last moment, then lower away every stick, and "shoot" her through. The slightest hitch in the gear, half a spoke in the wheel fault in steering, or a moment's hesitation in acting, there would be either a dismasting and capsizing or a smashing collision and sinking.

Simple watermanship applies to all boat work. In nearly every river or estuary where tide flows and ebbs the stream slacks in towards the shores, even sometimes runs counter to the main tidal stream in all little bays and backwaters along shore. So the waterman working up against tide, if he must do so, will hug the shore and work all the eddy water. On inland rivers, even on rough, rocky, swift rivers with rapids, canoemen will "pole" the canoe up in a few inches depth of water, a few inches off the rocks and banks, where no oars could find clear spread for use and no paddle would give the powerful hold against intermittent, extra hard, rushes of water; the pole is most powerful, but it calls for skill rarely attained by other than the most expert canoe men, yet it is fine watermanship. Another form of working up against the current of a river is by line tracking when the bank nature permits a man to walk or even to scramble along. The tow rope is long and light, each end is made fast to the canoe, at each of her ends; then the towman coiling up the rope "on the bight *"—i.e.*, the double or loop part starts with short scope; pulling on the rear part shoots her out, pulling on the bow part shoots her in to your bank, so you take a middling place till you have found the exact inches of cant she wants. This can be done close in or she can be let out to the full extent of the bight. This power is got just the same as in the kite, only that the kite shows a horizontal (or nearly) surface with the wind pressing against its under side; whereas the boat or canoe presents a vertical surface (the keel for instance) held by the two tow lines at a slight angle across the current of water, or with similar effect when the towman walks and pulls the boat against the still water, as in a canal.

When you come to a difficulty, a rock or bank for instance, and there is danger of the boat running on to it, slack away the bowline a bit and she will shoot out off the shore you are towing on, when out enough you readjust the length of each line till she tows steadily again, and when the obstruction is passed you shorten in on both tow lines till she is in the slacker water near your bank, and thus have easier towing.

That is the way a waterman "tracks" his canoe up miles of difficult river, but he also uses the other ways at some places, where tracking becomes impossible. "Towing" from a tow path on a navigable river or on a canal is usually done, as better progress is made with less fatigue than by rowing. You can plod on on foot for mile after mile with a boat or canoe on a tow line with little more exertion than the mere walking, especially if one person is left in the boat to steer, then the double line is not needed to towing because she is being steered

In time of floods the true waterman will get miles up river by the flood slacks, while the main stream or true river is a roaring torrent. So also in "running" down a flood stream he will safely fly down the main current where a duffer would be swept aside by the swirls and dashed under tree branches and capsized. It is knowledge gained by taking particular notice of drifting things, and almost natural anticipation of the way the streams will run by a glance at the bends and banks of the river. A man who only feasts his eyes on pretty scenery is likely to be drowned in the prettiest place—it is there the banks are high, the river twisty, and the waters mad when in flood.

TIDES AND CURRENTS.

Tide is distinct from current; current at sea is simply a mass of water moving in a particular direction from some, and different causes. It runs for a season, or perhaps is continuous in one direction, and with no alternating difference in depth of water above the bottom. Example, the Gulf stream as much as 250 miles wide. There are also drift streams, set up by continuous winds; for instance, in the line of the Trade winds of the North and South Atlantic Seas. These are merely large areas of surface water set into slow motion by the friction of the wind. The various ocean currents of the world and their actual causes and seasons is interesting matter you can take up later. What you have to know as a waterman is the effect of current and how to utilise it or avoid it.

A river current is caused by gravity, the upper portions of rivers being higher above the sea level than their mouths. The rapidity of the river current depends on its fall of level and the amount of feed water put into the river from its source downward by rain and springs flowing by tributary streams and water courses into the main river, and therefore, a river is constantly varying in the speed of its current and the depth of its channels.

Lakes and some seas have no tides. Enormous lakes such as those in Canada and Russia, five times as broad as the sea between England and France and hundreds of miles in length, have no tide. The only rise and fall of water, noticeable in the smaller lakes, is caused by rain or melted snow, or the absence thereof, and the only currents met with, except near the mouth of a river, are drifts set up by wind.

Tide, its rise and fall, and direction, force, and duration of tidal stream, is a complex subject, which if exhaustively treated, would fill a large book to itself. The Scout must be content with the general principles and cute local knowledge of the tide's ways. The tide commonly is the rise and fall of the sea caused by the sun and moon's attractions. When they pull together the rise and fall is greatest and these greatest tides, called "spring tides," are at their best about the equinoxes—that is March 21st, and September 22nd, when day and night are of equal duration.

The "spring tides" occur at new and full moon, that is twice a month, and the middle date of the interval is "neap tide," or least rise and fall. As a matter of fact, the actual highest water is at the tides, varying with place, one to two days after full or new moon. So if you have got a boat Canadian housed or berthed on the mud for the winter, and want to get her afloat, you prepare for spring tide and especially the day after.

The peculiarities of tides are numerous in different places, and utterly uncertain. So it is better for you to learn your own port or river only and thoroughly.

The "range of tide" is the height that the high water shows above low water. It varies immensely with place. For instance, at Bournemouth the spring range is about four feet, whereas at the
mouth of the Wye in the Bristol Channel there is a range of 47 feet. The "range of neap tide," which is given on the chart and in most tide tables, gives the amount of water in a channel or over a bank at low water, a very useful bit of knowledge when working a small boat into a harbour. The chart shows the depth of water in figures for low water springs (in fathoms of six feet each, or feet, as stated under the name of the chart). Suppose the channel you want to bring the scout ship through has places marked only "one foot," and the ship's draught is 3 feet; the date is neap tide—i.e., first or last quarter moon, and time you approach the place is about low water or six hours after high. The chart tells you "spring rise 15 feet, neap rise 10 feet, neap range 7 feet." Well you know the 10 feet rise is above L.W. spring, and as the range is 7 feet the neap low water is 3 feet above the spring low water sounding, so you have 4 feet of water and can go through at once.

Each place round the coast has its tide times different from others; the reasons are too long to give here, but the difference of time is called the tidal constant of the port, and a table of these times will be found in most pocket book almanacs, and in the month pages will be found for each day the time a.m. and p.m. of high water at Dover. So you look up the constant of the place you want—say Wivenhoe is "plus l h. 07m"; the Dover time for that day H.W., 12 noon+1:07 is lh. 7m. p.m. at Wivenhoe. Low water will be a little over six hours after high anywhere, both tides may be affected in actual turn and in height by wind. But for all scout purposes a pocket book with daily tide column and a table of "constants" will be near enough for useful work; of course you will note, as a waterman, that as there is a fresh gale blowing on the back of the tide the high water will last hail an hour later than the stated time and the rise will be some 2 feet higher; for instance, on the north east coast the flood tide runs to the southward, so a northerly wind is on the back of the tide and sets it up; so in the channel, as the sea is called right along from between the Start and the Casquets to between Dover and Calais, the flood tide sets to the eastward, so any westerly to south westerly wind backs the flood, and *vice versa.* But they are not exactly definable as ebb or flood, but better as west or east streams; for instance, off Brighton you have the east going stream running for two hours after the west stream has made along the shore.

Such are the generalities, but more detailed inspection is rather a matter for Scoutmasters, it will be enough for the boys to learn all about their own district, both as to the sea and the harbour tides.

An intimate knowledge of the tide time, and the amount of its rise and fall, the nature of the bottom, and the compass direction which the stream will take at different hours and places, may prove of the utmost importance to Scouts on the lookout finding a vessel in a dangerous place.She may be at the time safely at anchor, yet the local boy Sea Scout, knowing the tides and well up in watermanship, sees at a glance from his lookout place that soon after the change of the tide she will ground on rocks and be bumped to pieces. Then warn her, assuming there are no coastguards stationed near, and to know and advise which way to cast and sail her out of the danger and into a safe berth are services quite within the scope and ability of the Sea Scout; and in some cases such service would amount to good salvage, and bring in an award which would enable the district troop to buy and fit up a very fine guardship. Here would arise watermanship assisting seamanship; the Sea Scout having discovered the pilotage danger to which the vessel was ignorantly exposed, manages, by perfect boatmanship of himself and brother Scouts to board the vessel, to point out her danger

and the way out of it and also the safe place to go to, leaving to the captain and the crew the seamanship business of moving the vessel.

Good watermanship in a river where the tide or current is running strong will take you with easy rowing to a vessel you want to get to, say on the other side; whereas, ignorance will give you a heavy pull, a miss, and a row back without a chance till the tide has finished. You should row up along your bank till well up stream of the vessel. Then come out across the tide and you will drop neatly alongside. The other has gone direct across—and found the tide swept him down faster than he could row and so he missed her.

The banks of every river are right and left banks as you look down stream. The bends in a river are called the "bights" and the jutting out bank opposite and above the bight is the "point." The tide nearly always shoots off from the point into the bight, and so on down. Therefore, to work against tide or current you must hug the bank under the point, then cross the stream, and work up to the next point, avoiding going along the bight.

If you want to get hold of a mooring for your boat in a strong tide, get up stream on one side of the buoy before you take in sail or cease to row, so you have some speed on and can then sheer the boat's bow close to the buoy for the bowman to grab the buoy up with his boat hook. Never attempt to touch the buoy from the after part of the boat, she would swing bang around and drag anybody out who has hold of the mooring.

Coming down with the tide, "round to" before you get abreast of the buoy, so she will have yet some way (speed) through the water, say equal to the tide for a time and you can then lay her bow gently against the buoy to pick it up. If you are single-handed you must do these waterman's tricks else you'll never get to moorings for hours.

In sailing to windward with tide you have to cross the lie of many vessels at anchor. The tide is ripping past them and you are, though sailing ahead through the water, actually also going sideways with the tide. So suppose the tide were not running and that you would sail across the bows of the vessel at anchor by a clear hundred yards, but as the tide is running you will be set bodily towards her that hundred yards, so you will hit her. Then the thing to remember at once is—take a hand bearing of her, look at her along your forefinger pointing at her, hold your hand steady on the aim and as regards your boat, and sail the boat steadily. Then if the bearing remains the same you are going to hit her; if it only widens a little there is danger in crossing her bow; if the bearing gets smaller you will pass her stern. In any case pass her stern and make sure, wind may drop or change.

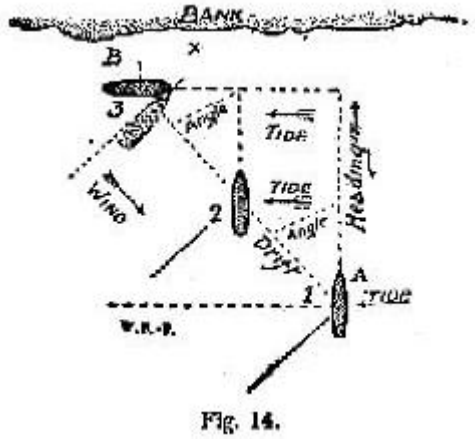


Fig. 14.

In the sketch A is your boat, with wind on port bow and B is vessel at anchor. Tide, you see by the plain arrow, is setting broadside on to you; from position 1 to 2 you have pointed your finger at him. You see the, bearing has not altered. The tide has set you bodily up to windward. If you do nothing you will hit the vessel at position 3. So you must do something quickly. Well, with the wind as drawn, by the luff arrow, you must tack; it is not safe to try to cross his bow, for if the wind failed you would drift on to him.

Then comes in a point of mixed seamanship and watermanship. Even if you got across his bow you know as a waterman that the tide would be slack at the bank at x, and as a seaman you know you must tack at x and wouldn't clear B on the starboard tack. Any way the risks all round make it good judgment to tack at position 2.

A good waterman never makes a boat fast to a pier or stage in tidal water in such a way that she can drift in under a beam, and be floated up by the rising tide against it, and at least swamped if not broken up; or on the ebb tide, for contrary, be left balancing and lodged upon a beam high above the fallen tide, with the risk of sliding off and falling across the next beam below, etc., etc. However, the tide is there for study every day, and the waterman makes it a careful study. (See Chapter III.)

One other point of watermanship, that of how to navigate a boat through a bridge, is of use to Sea Scouts on inland rivers. Whether the river is tidal or has a current great caution is always necessary in going through the arch of a bridge under sail and with mast up. Flaws of wind and swirls of current twist the boat about very suddenly, and may jam the mast head against the lower parts of the arch on one side or the other. It is safe watermanship, unless you are very expert and have a boat of perfect abilities, to only attempt sailing through with a fair wind, even then you must lookout for sudden contrary puff heavy jybing of sail, and anticipate sudden twists of boat by swirls.

It is wise in any circumstances, other than a fair wind, to down sail and mast and to row through the bridge. Even a fair wind becomes twisty and uncertain, on the lee side of the bridge, and once at the bridge there may be no time for getting sail and mast down and getting oars out. So take the safe course early enough. There is no glory in a foolhardy deed; sailors always use caution and only do the dashing deed when it is the one and only way to victory.

Remember that in sailing past another vessel on her lee side, whether on opposite course or overtaking her, go a good wide berth off her; she may be and is probably drifting to leeward a lot, called "making leeway," and will settle down upon you just when you are becalmed under her lee—that is her sails and hull passing between you and the wind she "takes the wind out of your sails."

CHAPTER IX.
SEAMANSHIP.

Seaman—The Flag—Flag Signals—Lights—Sounds—Distress—Semaphore—Morse Flag—Rule of Road—The Compass—The Chart—The Lead—The Log.

A "Seaman" ought to be able to do anything on board a ship, except to be sea sick. A seaman handles the ship and her gear. In the upper branches he also navigates her from one part of the world to any other part of the world where he can find water enough to float her. The "ordinary seaman," a move above a "boy," cannot perhaps navigate the ship; but, on the other hand, the captain cannot move the ship if the ordinary and other seamen are not there and able to do their duties in the lesser branches of seamanship.

Size of ship has little to do with the quality of seamanship. In large ships everyone, from the captain to the boy, has greater comfort, less risk, and more advice and assistance, than in small craft and the elements have less harsh effect upon the large ship and her crew.

The skipper of the small coaster, or smack, even of a small yacht, caught out in a gale, has at one and the same time to work like a nigger at his ropes and sails, navigate, steer, carry out the "rule of the road" to avoid collisions, and all this has to be done while he and his little crew are wet to the skin, overworked, half starved, and utterly played out by exposure and want of sleep. The latter is certainly as grand a seaman as the former.

Now what is wanted in a Sea Scout in seamanship is that he should try to learn just as much in all branches as he can hoist in; that is, get hold of the foundation of it. With that knowledge and a fair idea of watermanship every day's outing you get on the water or round about it on the shore will pile up the knowledge of detail till you'll begin to wonder what more there can be for you to learn.

You are to be both a seaman and a waterman. The one knows all about sea going ships and the work to be done aboard ship, the other knows all about boats and river craft and of the waters, tides, and places they work in.

The best seamen begin their work as boys; a boy grows to the sea life and becomes a sailor, with the sailor touch and handiness, the sailor instinct, valour, and intuitive acceptance of discipline. A landsman taken to sea at grown age, well, he may be dressed as a sailor. And in this lies the present trouble of every large maritime country, the supply of seamen.

The boy who begins in boats or canoes, or makes and navigates a raft, will most likely turn into a first rate seaman. The boy who can handle a boat under sail in bad weather, alone, or with a companion or two, will rapidly learn resolution, pluck, resource, and confidence; and confidence in himself is the most important, otherwise he will hesitate to do brave acts. Old saying true:

"The man who hesitates is lost."

• Sea Sickness.—You must not be sea sick, that is to say, if you must, get over it as soon as you can. You should take every chance to get trips out to sea in the harbour tug or on a coaster or smack, "get it off your chest," it's a bad habit. A sea sick boat's crew can't work the boat, and might come to grief; besides it puts you off your dinner. I have never known the pleasant sensation of sea sickness, but well remember the longshoreman's song—or some of it—

"There's a nasty up and down motion,
That comes from the bed of the ocean
That gives me a kind of a notion
I never was made for the sea."

Well, if all else fails, if you keep a piece of lemon peel between your teeth—you can't be sea sick. Go and try.

On examining the qualifications for badges (see Organisation) you will see that the subjects run very much into one another, that is seamanship and watermanship. Well, better not try to separate, have a try at all of them, get a good general knowledge, and then perfect up as you get the chances.

There is one badge you should try to be "top dog" of—that is "signalling"; it puts you above all the crowd on the beach at a wreck, as you will read, and all of it can be learnt from the

book and practised with a chum at home. Several others of the subjects can be learnt on shore as to their early stages, and then perfected afloat when you have cruises in boats and other vessels. Thus inland crews of Sea Scouts can, in their river boathouse, work up all the elements and then get the practice when they go to the seaside for their outing.

THE FLAG.

When you are cruising about, whether afloat or on your legs, in sight of ships you are pretty sure to see many flags, and, of course the scout should know what they are and what they mean, even in a general way; of course you can't read flag signals without the signal book, except a few.

First, there are the national flags called ensigns. There are a great number of them, and it will be well for your guard ship to buy a coloured "sheet" of national flags and have it hanging up in the cabin. Nearly all the countries which have Royal Navies have one ensign for their mercantile and a different one for their warships. The British flags, however, are several and may lead to much confusion in case of war. None the less, as they are at present allowed you had better know them. Then there are several meanings denoted by the way the same flags are used, which we will go into; and then there are the "code flags" which can "speak like a book." There are so many ways of using the code that you must read a book devoted to signals. (Brown's Signaling, published by Brown, Son & Ferguson, Ltd. Glasgow, 3s. 6d., gives the signals very fully).

The ensigns of England are White Blue, and Red. Each has the Union Jack in the upper fore quarter. The "White" has a red St. George's cross across the flag, and is the flag of the Royal Navy. This ensign is also allowed to be flown on yachts belonging to the Royal Yacht Squadron, but only when they also fly the "burgee" of the club. "Burgee" is a triangular flag with a device in the centre and of pattern approved by the Admiralty. The R. Y. S. burgee is white ground with red cross and crown in centre. The "Blue" is the flag of the Royal Naval Reserve. The "red" is the flag of the mercantile marine and of any English subject.

The Blue ensign has been allowed to some Royal yacht clubs, and the members can obtain an Admiralty warrant to fly such flag "together with the burgee of the club." In most cases the warrant stipulates for a device to be upon the "fly" (the blue body) of the flag. Officers in the Royal Naval Reserve who command certain mercantile ships are given a warrant to fly the Blue ensign. So when you see a vessel flying the White ensign or the plain Blue ensign, look at the main masthead, and if you see there a "burgee" you know the craft is a yacht. Otherwise she is a man of war or R.N.R. (but she may be, especially in small craft, wrongfully or ignorantly flying the flag without right to do so). Most of the yacht clubs, have a device in the fly of the ensign, such as a yellow anchor, crown, lion, shield, etc., in each case repeated in the burgee of the club.

Our colonies also fly the Blue and the Red ensign with device thereon. For instance, Australia, a large white star under the Union Jack and five white stars in the fly; New Zealand likewise, but four white stars and no large star under the Jack. The Blue ensign in each case belonging, at present, to the colony's warships, and go, with a blue pendant (pennant, a very long narrow flag like a ribbon, flown from the main truck).

Transports (hired ships) wear the Blue ensign with a yellow anchor in the fly. Then also there are many small craft in Government employ which carry the Blue with "badge of office" in the fly.

The Union Jack, plain, is hoisted on the flag pole on the stem or bowsprit of all men of war of and above the size of destroyers. The Jack for all other ships, merchant or yacht, must have a white border all round.

The admiral's flag is a square white flag with red St. George's cross (horizontal and vertical). The vice admiral's the same with one red ball in upper fore corner and rear admiral's two balls. The admiral's flag is carried at the main masthead (if there is such a thing), and the vice and rear admirals' flags show on the foremast head.

The Royal Standard is the personal flag of the Sovereign, and is only hoisted when the Sovereign in present on board the particular vessel; also, with difference in device, a Member of the Royal Family, or representing the Sovereign. It is not an ensign but purely a masthead flag.

(For history of the Union Jack, see Scouting for Boys.)

There are a large number of ensigns flown, such as Trinity House, War Department, Customs, Port Authorities, and so on, mostly with some device, but misleading at a distance owing to smallness of the distinctions. A revision of the flag warrants should take place so that the ensign shall have a definite national meaning of class of ship. Foreign ensigns, of course, you should know and their distinctions of war and private ships (they are all set out in All about Ships, published by Alexander Moring, London).

Advice.—Here I will put in a bit of advice to you boys. You can't expect a little book like this to go and give you pages of coloured flags, and pretty well half the "signal book" to tell you how to use and read the signals. Now when you have "acquired" (nice word for built, begged, borrowed, or —— acquired) your guard ship, you should start a library on board of the books I occasionally mention herein, and then find among the ship's company the handy boy who will paint all the flags in small size to paste on to linen for you to fold up like a touring map and carry in your kit. Or you may find a sheet of coloured flags sold at the flag maker's shop, or chart seller's, in a seaport town, and treat it the same way, or hang it up in the cabin.

The countries which make no distinction between warship and merchant in flag, are—Belgium, Egypt, France, Holland, Greece, Portugal, Turkey, United States, Brazil; and Chili.

Flagtime.—In the Navy, on home stations, the ensign and Jack are hoisted at 8 a.m. in summer, and 9 a.m. in winter, and saluted, and are hauled down at sunset, and all respectable ships act the same. So your guardship should follow the same practice when the crew or any boat's crew are on board, Remember she wears the red ensign and the sea scout flag.

Signals.—The international commercial code flags run from A to Z 10 pennants, 1 to 0 and 3 "substitute" triangular flags and an answering or code pennant. Get or copy a coloured sheet for your pocket. You will see by the books that each class of signal is made in certain numbers of flags with certain top flag. For instance, "Urgent signals," as they are called, are all of them two flag signals. Of course with a code of 40 flags and pennants, and a whole

heap of combinations, such as two, three, and four flag hoists, then certain flags at top, and so on, each having a special meaning, in addition to mere reading of letters and the need of the fat signal book to work out the signal, you boys can't be expected to take up flag signalling in all its departments; but you can very easily learn the important side of distress signals, and as a coastguard you are more useful if you know them.

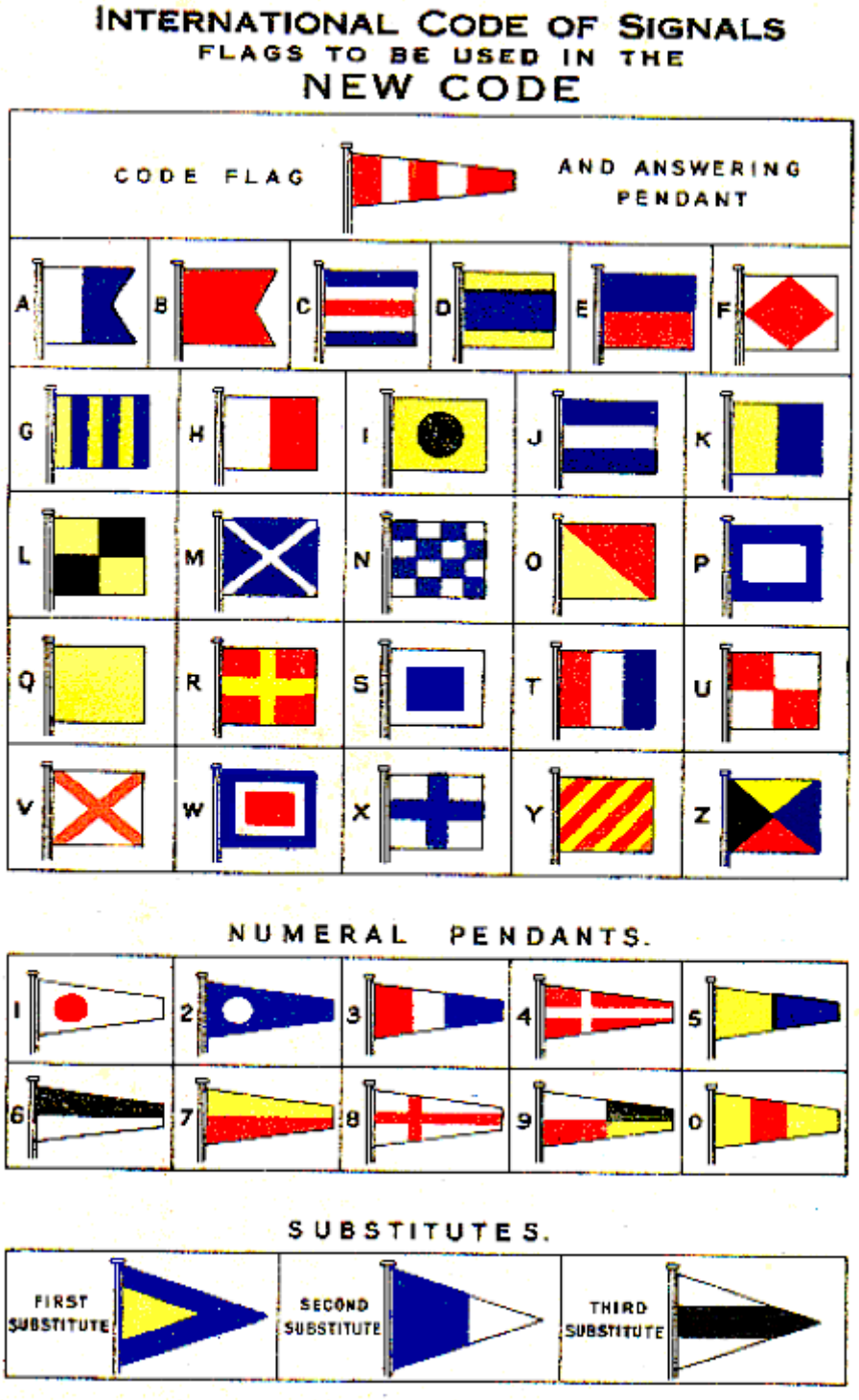
Suppose you are on the "lookout," and see a steamer drifting along the coast with the tide, no smoke coming out, only two little flags flying NO, you, a Sea Scout, know that it is an urgent signal and perhaps you have copied into your pocket book a few of the most important signals, together with their answers. You find NO is "ship sinking, send boats, save life." You double off to coastguard station, hoist F L—"have sent for life boat"—telephone life boat station, telegraph nearest harbourmaster to send tugs. Then do as place and circumstances permit. But you by knowing the signal of distress have acted promptly, whereas the holiday people and longshoremen only thought her a steamer taking it easy.

An excellent little book is Brown's Signalling (published by Browns Son & Ferguson, Ltd., Glasgow, 3s. 6d.) In it are pages of pretty well all the urgent signals, and if this book is in the library of your guard ship you can copy the most important of these, for about half of them are unimportant changes of statement of same subject. For instance, signal that boiler has burst, A T, A U, A V, A W, A X, A Y, A Z, the only difference in these is as to "men killed," "wounded," or "not hurt," these details don't affect the ship's safety; the point is the ship needs immediate assistance; of course it is otherwise very perfect signalling.

Then there is alphabetical (spelling) signalling, now this you can do without any book so long as you can have the use of the flags, and all you need is card of flags in your pocket to make sure your memory doesn't let you down.

All you have to do is to show that you are going to spell what you want to say, and they are to answer in the same way by spelling.

Answering:—Hoist the code pennant to half mast. When you have made out the signal's meaning, hoist pennant right up, keep it there till the other ship hauls down her signal. There are "distant signal"—i.e., stiff shapes—with numerous changes, all in the Brown book. Then there are single flag hoists which denote things:—Blue Peter—i.e., P hoisted at the foremast head means leaving port. Red—B—at masthead means "Am loading," discharging, or carrying powder, or other explosives. G at masthead means "want a pilot" The pilot's flag in square white horizontal over red when seen on a yessel means pilot is on board. C flag means yes. N flag means no. L means "Stop I wish to communicate." Q, yellow, means "Healthy: request pratique." White bordered Union Jack at masthead also means "Want a pilot."



Memorandum on Flag Sketching.—Men of war may be using different code and pattern of flag to those of our commercial code. You may not know them correctly, so better sketch the flags seen with the different shading according to the colours seen.

Before I leave signalling with flags let me tell you an easy way to get very quick at using the alphabet flags. The scoutmaster in command of your headquarters will find an excellent game can be played with two sets of painted tin flags with a hole in each to hand up as “hoists” on two blackboards by opposing “boats’ crews.” All that is needed is some biscuit tins, blue, red,

white, black, and yellow enamel paint, pair of old scissors, some paint brushes, and a handful of French nails.

Any wet afternoon or winter evening the boats' crews form "sides" and set up signal boards. The commanding officer, pro tem, writes the signal, the intended meaning only, and gives it to one crew; they have to remember to hoist the code notices and stops as well as the spelling words, they pick out their tin flags to make words which will convey the meaning in the smallest number of hoists, that is in quickest time. Several vertical rows of French nails on the board enable next hoist to be hung up while the previous one is being handed down, so the smart signalman forms his words preferably to use other flags than on the hoist exhibited at the moment. Also there should be no objection to incorrectness of the spelling so long as it is clear to read, it is signalling, conveying idea, not a school lesson; for instance, "clock" needs two hoists, CLO, CK, whereas CLOK is one, a signal "time by clok" couldn't be misunderstood.

Time taken in making the signal, ditto of other crew in answering, would be judged by the officer, and then crews change round, the others making signals, etc. Of course, also, at first the game would be instruction not competition, the officer or any smart scout showing how a signal could be bettered, shortened, or altered.

Now, among the crew of the guard ship you should be able to make a set of Code flags in bunting, of course you know how or should learn to sew, and have got the gear. Settle the size of the flag, say, 16 inches in depth for all, 22 inches long for squares, and 33 inches long for pennants. The material is called "bunting," and the colours wanted are blue, red, white, yellow, and black. There are eight flags of blue and white, seven flags red and white, three of red, white, and blue, two of yellow and blue, four of yellow and red, two of yellow and black, and one of blue, red, yellow, and black. So you should divide these among the homes in your neighbourhood which are dying to do the scouts a nice turn in a useful line. Your part will come in doing the sewing under their teaching.

Each flag, when the coloured pieces have been sewn together, has a tape doubled over and sewn on the front edge, called the "hoist". The "hoist" is where the flag letters are shown on the sketch of the flags: The roping is a piece of line, say stout cod line, with a little wooden toggle (get them at ship chandler's shop), eye spliced in, and rope is about 22 inches long; this is passed down inside the tape, leaving the toggle out at top, and is firmly sewn at top and bottom end of tape (mind it is the "top," look at flags L, 0, U, Y, Z, and mind it is the foreside, see flags H, K, L, 0, T, U, Y, Z). The bottom end of the rope has an eye, spliced in. Thus, in making a signal you tie the halyard to the toggle of the top flag, and the toggle of the second flag is passed through the eye in the rope end of first, and so on, and the haul down end of the halyard is hitched to the last flag's rope eye.

Code Signal Flags and How to Make Them.—There are 40 flags in the code set. Division of labour is advisable. Make the flags as nearly as possible in groups taking the same colours.

Five colours are used, and the Table below should help in laying out the materials and arranging the hands. the flags are arranged in groups using 1, 2, 3, or 4 different colours, and the letter is against each colour that its flag requires.

Material	FLAGS				PENDANTS		
	1	2	3	4	2	3	4
	Colour	Colours	Colours	Colours	Colours	Colours	Colours
Red	B	EFHORUVY	CTW	Z	14780	3	9
White		AFHJMNPSUVX Sub. 2, Sub 3	CTW	12468	12468	3	9
Blue		ADEGJKMNPSX Sub. 1, Sub. 2	CTW	Z	25	3	
Yellow		DGIKLORY, Sub.1		Z	570		9
Black		IL, Sub. 3		Z	6		9

Parcelling out the work with some consideration of difficulty of structure, and advisability of grouping material in colours, you see I suggest 20 makers doing about two flags each.

Some makers will have such simple flags as will find them finished long before the others; well, a few blue and white "wagging" flags would be very nice, you see blue and white colours come in the majority of flags, blue in 20, white in 23 flags, red in 19 flags, yellow in 14, and black in 6 flags.

SIGNALLING BY SEMAPHORE.

To know the Morse code and be able to signal by semaphore is one of the most, certainly, useful abilities of a Sea Scout. You have learnt the sign for each letter of the alphabet when you qualified for second class boy scout, but it is most desirable to keep it up and get higher. Signalling in connection with a wreck on the coast may be of vital importance; out of the crowd on the beach probably 50 per 100 could splice broken rocket gear, man boats, heave lines, and do all work common to boatmen and fishermen, but signal by arms or flash light, or read signals seen, no, not one of them; then in come the scouts.

Morse, as you know, being longs and shorts, can be conveyed on anything that comes to hand. Suppose the coast guard scouts' crew get information from their lookout man on a dark night:

"Schooner ashore on cockleshell sand." They turn out, man their boat with six; and two remain ashore, one of them to signal and the other ready to bike off and telegraph for assistance. Well, they board the schooner, find all the crew have left her, she's derelict, no water in the pump well, an anchor on the bow ready to let go, and they know its dead low water. Now, the the coxswain wants to signal, he has left orders with Billy to blow his bugle occasionally and he hears it. Can't find a lamp or a match, galley fire is out, but he comes upon the fog horn. At once the Morse signals can be made, though it is pitch dark and raining, long and shorts with fog horn are answered by blast and toot on bugle ashore, and in a short time the harbour tug, ten miles sway, has been telegraphed for, comes and tows the prize into harbour with the scout crew in possession. Even further example of the use of signalling in this supposed case would be that when making the tug's tow rope fast, a signalling scout from the boat's crew is put aboard the tug. The coxswain uses the foghorn on the schooner, and the scout on the tug answers by tug's whistle, or a lamp dipped into and out

of bucket, and so on. But you see here you want three capable signallers out of one boat's crew. Constant practice is the only way to keep well up at signalling. (Note—for smart signalling the arms must be held perfectly straight, especially overhead.)

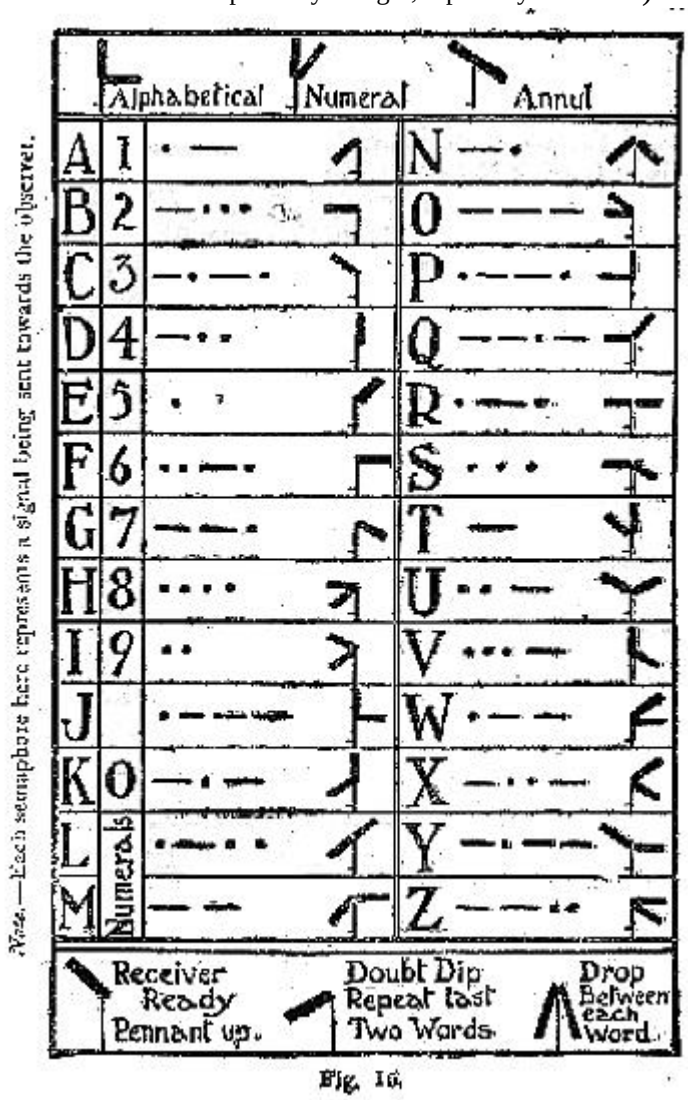


Fig. 16.

Semaphoring by waving your arms is easily learnt, but go slow at first so as to make such angle of arm decided, not half way to another signal. One arm only for letters A to G. The alphabetical signal to start with J, right arm up, and left straight out level, then drop both down.

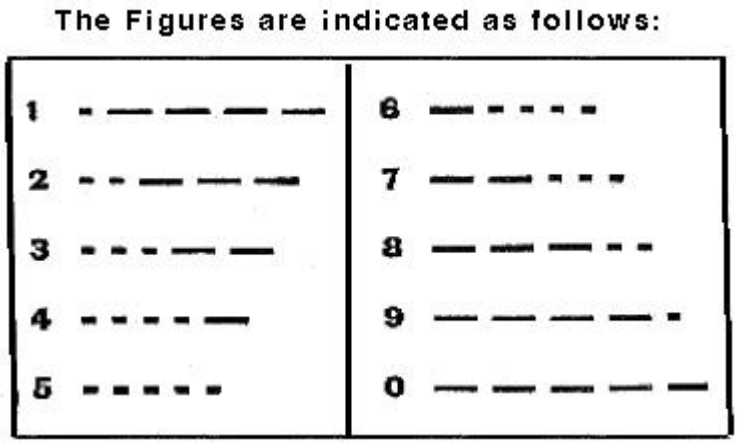
When numbers are to be given, stop by dropping both arms and then make the "numerical" right arm perpendicular, left arm at up angle 45°, drop arms and go on numerals as A to I = 1 to 9 and K=0.

If any mistake is made signal "annul" = right up arm up angle 45°, left arm down angle 45°, these two "numeral" and "annul" are not letters. When numbers are done you drop both arms and then signal J alphabetical, and go on with letters. Between—i.e., after—each word drop both arms.

When ready to take the signal and while the signalling is being made the receiver makes and keeps letter C = right arm up angle 45°. When the receiver mistakes or is doubtful he "dips" by making A, right arm down angle 45°. The giver thereupon repeats the last two words. Remember the giver of the signal always faces the receiver.

Flag Wagging.—This is the way to use the Morse code in some circumstances; the flags may be anything that can be seen against the background—i.e., land, building , skyline, and so on. The preferred flags are blue or white with white or blue respectively, bar across the centre. The white shows best when the sun is in front of the signal, and blue when behind. Size of flag convenient is 2 feet square.

Numerals in Morse code for flagging are separate from alphabet, so they can be put in without stopping to say so as in semaphore. The alphabet is never more than four marks, dashes and dots, and often less. The numerical is always five marks.



In learning the numerals remember there are no dots between dashes. 5 is five dots, and 5 and smaller can be counted by their dots or by subtracting their dashes from five— viz., 3 is two dashes from five.

Over 5 they commence with dash, add five to the dashes and you have then the number—e.g., five and three dashes is number 8. and as there are only five marks 8 must be finished with two dots. Number 0 is five plus five dashes.

Distant Signals.—In a more advanced stage of signalling you will find it useful to be able to read what are called "distant signals." They are shown by shapes—cones, balls and drums—these in various combination above one another and cones point up or down indicate letters of the alphabet. I mentioned before, that little book called Brown's Signalling (Brown, Son & Ferguson, Ltd., 3s. 6d.) gives pretty well all about signalling, and has several pages of useful signals forming as it were a "signal book"; 85 pages are given to signalling and about 80 on instruction thereon; It is just the book for the guard ship master to have.

Storm Signals.—You will see at signal stations, port flagstaff, dock heads, and so on a cone hoisted. It is a storm signal; if point down it means gale probable from southward, if point up, gale probable from northward. This warning is given by the Meteorological Office. At night three lanterns, shown in triangle, represent the cone, point up or down.

Distress Signals.—A vessel in distress and requiring assistance is authorised to make the following signals under the International Rules:— In daytime.—

1. A gun or explosive fired at intervals of about a minute.

2. The code signal, urgent signal, N C.

3. The distant signal—square flag and a ball.

4. Continuous sounding of fog horn.

At night.—

1. A gun or explosive at about one minute intervals.

2. Flames, such as burning tar barrel.

3. Rockets, one at a time, throwing stars.

4. Continuous sounding of fog signal.

Sound Signals.—So far as you scouts are concerned probably may be well, while talking of

signals, to mention navigation signals. You may be out in your boats, day or night, and hear certain signals, then it is necessary to know what they mean as they may be meant for your boat.

Sound.—A steamer altering her course, in respect of navigating to pass another vessel, is bound to make her action known by a whistle signal. *One blast* means she is altering her heading to the right.

Two blasts means she is turning left and will come to port.

Three blasts means her engines are going full speed astern. *Four blasts* on the Thames means she is unable to manoeuvre, and you must keep clear of her.

In fog, mist, falling snow, or heavy rain, a steamer under way (that is not at anchor) must sound on her whistle a long blast at intervals of not more than two minutes. If she is actually stopped, no way on, two long blasts with interval of about one second given every two minutes. These are in addition to any helm signal.

A sailing vessel sounds a fog horn at intervals of one minute, giving one blast when on the starboard tack (wind coming at her on right hand side). Two blasts when on the port tack (other side), and three blasts when the wind is abaft the beam (fair wind).

Any vessel at anchor shall ring a bell rapidly for five seconds at intervals of not more than one minute (this keeps the boy busy). (A gong is allowed on small craft which have no beIl, commonly the fry pan is used, tinkled by a belaying pin.)

A vessel towing, or laying a telegraph cable, or a vessel not under command, instead of the above signals shall sound a three blast signal of one long and two short. A vessel being towed may give this signal, but no other. Small craft under 20 tons shall make some efficient signal every minute.

As to your scout boat being caught in a fog, your best game is to once get into shallow water where none of dangerous size can come. Probably you have a whistle among the crew, or a tin bailer to strike as a gong; anyway for your own safety you must make an efficient sound on hearing a steamer coming towards you.

I may tell you here, as a convenient place in the book, that nearly every large port or river has "rules" of its own; these are known as local rules and under special acts of Parliament. Where there are no local rules the universal rule of the road, both as to lights, signals, and handling, holds good. So it comes to this that you must get a copy of the rules of your port, if there are any—price about one penny. The harbour master will know how to get the rules for you. Here are places that I know have local rules :—Avon River, Belfast, Grangemouth, Clyde, Cork, Dublin, Humber, Manchester Canal, Mersey, Solent, Waterford, Tees River, Thames, Trent, Tyne. Also there are rules for the naval harbour..

As all these rules would fill a book, and only one set, your own district, is of any real use to you, you had better get your rules, and also know the general rules for outside of your port. This really is more truly scout masters interest than boys in the early stage of scout training, but when the actual rule of the road and the sea signals have been mastered, it will not be difficult to grasp the working of the local rules where they add some item.

In another branch of rule of road I may also here say that the rules of meeting fishing boats at work as to their lights, signals, and customs relate to matters far out at sea, away from the district of the Sea Scouts. Perhaps later, as the movement develops and the boys go further afloat, it may be well to add all about every kind of light and signal for the instruction of senior scouts.

THE CHART.

You know how useful a map is on shore when you walk or bicycle in a country you don't know about. Well, a chart is a map of the sea and coast, and to some extent of the bottom of the sea. Never call a chart a map, it's bad form.

You don't need to know how to make a chart, but you do need to know how to "read" it, that is to get information from it that enables you to navigate a vessel along the coast or into a port; also, knowing the chart of a place may help you to reason out why a vessel is doing certain things you see her doing, such as anchoring in an exposed place near the harbour bar; you don't at once conclude she is in distress and summon the life boat or tugs, you don't man your boat and dash off to ask if she wants assistance; you know the tide time and the chart, and, therefore, that probably she has only anchored to wait tide enough to get in over the shallow bar.

Charts are always drawn with top at north true —i.e., to the pole of the world, not to the magnetic north. This needn't trouble you, as all charts have the compass card printed on them with the north point (and all others consequently) set to magnetic points. On the east and west edges of the chart the latitude is marked in degrees and minutes; minutes are sea miles and there are 60 miles to a degree. So you can measure distances from place to place, or ship, on known spot, to shore or to harbour. By taking off such distance with "dividers," or by marking it on the edge of a slip of paper and applying that distance measurement the minutes of latitude on the side of the chart; do this reading off at a position on the chart edge as near as may be abreast—
i.e., east or west of the place the distances is wanted for.

Compass on Chart.—Some chart., but very few, have the compass printed on pointing "true north," then you have to ascertain the "variation at that place, that is the difference between N true and N magnetic, and draw another picture compass twisted to the magnetic north. The simplest way to set things right and avoid having to be always "adding corrections" to your compass bearing, is to cut out one of the spare compasses, there are usually several, and paste it on over the "true" one, canting the north point to left or right of N true the amount of variation. Say you read that "variation is two points westerly" paste the card on with its N.N.E. pointing to true north—i.e., up and down the chart.

Soundings.—Charts are marked more or less with useful information, some charts a good deal more than others. Figures on the sea or where there is water denote the depth of water at low water of spring tide. It is feet or fathoms as stated at the bottom of the title page, as it may be called.

Together with the name of the chart this "title pane" gives a lot of information to help you in reading the chart, and states always whether the soundings are in feet or fathoms (fathom is 6 feet), and whether bearings printed as such and such are magnetic. You will find, usually, at each place of importance, say a harbour or lighthouse, a statement of the tides, thus, for

instance, "XI^{h}, 30m., Sp. 14, Np. 11," this means "high water, spring tide, or full and change of moon, 11.30 o'clock; spring tide rises 14 feet, neap tide 11 feet." So you read in a few figures, and knowing by your pocket almanac that it is new moon today, the water will be high tide at 11.30, and as the chart shows 6 feet on the bar for LW. there will be 20 feet of water (see about tides, Chap. vii.).To find H.W. of days between the moon's dates, called "full and change," add 49 minutes per day to the F. and C. amount. The quarter moon gives neap tide.

Depths of water on drying banks are underlined, and mean the depth over the bank at high water of spring tides. Gravel, mud, sand, rock, and so on are marked by one or more letters, these are all set out on the " title page" of the chart—g, gravel; m, mud; a, ah, sand and shells, etc. The nature of lights and colours of buoys are there also explained. Arrows on the chart mean currents, and tidal current direction. Ebb is shown on the chart by a plain shafted arrow, a feathered arrow for flood.

Navigation hardly comes into your work; and it's a deep subject for beginners, needing a lot of explanation as you go on. We are dealing here with harbour and along shore work, not with the navigation of large, vessels needing astronomical observations and carefully settled compass courses and finely fixed positions. But you should know how to fix your boat's position if you are in a vessel of some size cruising to sea and back for you may be caught by fog coming on, or darkness, and yet some miles to go to get into port.

Of course I assume you have a compass and the chart of the place, never go without them to sea; perhaps your harbour is a mere inlet with no lighthouse, or in fog you won't see the light, but you can see your compass.

Take a cross bearing. You see two recognisable objects, wide apart, take the compass bearing of each from your craft, and of a third if there is one. Mark these in pencil lines on the chart, reversed from the object (say one is bearing W. by N., draw the line E by 8, getting the direction from the nearest compass point on the chart). These three pencil lines will cross each other at one spot. That is your position. From that position spot draw a pencil line to the harbour mouth, bar, buoy, pier, or whatever you can go straight to, and then by the chart printed compass find what the line is as a compass course, then you steer on that course through the fog or darkness, using the lead line and lead to warn you of approach of shore or mistakes. Of course knowing time and tide you make some allowance for being "set" by the cross tide if any.

Sounding may here come in as it is intimately connected with the chart.

In thick weather, even in an estuary, it may be that the only way to find your way is by using the lead so as to get along the banks, instead of getting on top of them. In your case, and going slow, quite a light lead and line will do, say lead of 3 or 4 lbs. and line, say 10 fathoms long, about inch in circumference. A ship's "hand lead" would be 9 .lbs. and line 25 fathoms long. The shape of the lead should be "sugar loaf," the top, small, end pinched in so as to put a hole through to splice the line into; it is best to have a raw hide becket actually in the lead, otherwise the line would chafe in the metal and you'd lose your lead.

The marking of the line is an important matter, like signals, all lines are marked same, in fathoms.

At 2 fathoms above lead bottom, two strips leather hang out from the line.
,, 3 ,, three strips of leather.
,, 5 ,, a piece of white bunting.
,, 7 ,, a piece of red buntin6.
,, 10 ,, a piece of leather with a hole in it.
,, 13 ,, a piece of blue bunting.
,, 15 ,, a piece of white bunting.
,, 17 ,, a piece of red bunting.
,, 20 ,, two knots hang out.

The intermediate fathoms 1, 4, 6, 8, 9, 11, 12, 14, 16, 18, and 19 are called deeps, and are not marked. You have to guess or estimate them. That's all, very well for a ship and fairly deep water; but you want to take boat soundings. Still you should know what you've got hold of when you may be assisting a distressed coaster into port; her lead line will be marked "regulation."

Now, for your boat's lead stick to regulation marks but add more. Say your lead is seven or eight inches long, measure from the bottom up, with the, line wet, as it will be when in use, mark one fathom (six feet) with, say, white bunting (because at night bunting will feel different to leather, which is two fathoms, then ¼, ½, and ¾ fathoms may usefully be marked as one, two, and three small knots on the end of a bit of small line tucked into the strands of the lead line. This can be repeated in your case up to three fathoms as you want to know creeks and landing places.

In use, always see the end of the line is secured to the boat before making a cast. Throw the lead, after a swing or two of lead hanging by line from hand; throw it forward, parallel to the side; let the line run freely through the hand which is outboard, the coil being held in the other hand you will instinctively (soon) know when the lead touches bottom, clutch the line with the working hand, lift the hand up to feel the lead, perhaps to plump it to make sure; and if you can see, if not feel, read off the depth and sing it out to your officer. Then coil up ready for another cast.

The Log.—In all navigation, making passages anywhere, the speed of the vessel is important; it can be very nearly estimated by experts, but safety demands something better than guesswork.

The old log was called the "log chip," because it originally was actually a chip from a log. Thus, the carpenter cut a chip from the log kept for that purpose on the forecastle, and when they were ready aft on the poop with two or more sand glasses, as they had no watches then, he dropped chip overboard and called "watch"; then at a certain time by glass they, aft, called "stop" and the men being stationed at intervals along the lee side looking at the chip, the man opposite the chip at the call of "stop" called out "stop here," or "stop it is." Now the distance in feet or fathoms along the ship's side from carpenter to "stop here" man, and the time known that it had taken the ship to sail that length past the floating chip, *q.e.d.* = the speed of the ship.

The log of today is usually a "patent log" which, by the revolving of fans towing through the water, registers the distance gone on a dial on the ship, and this can be read of at any time, and can be reset at zero for a new distance run. All large ships use this "patent log." Small craft usually don't trouble about navigation, they go by the look of the land and cute guessing of speed from seeing how fast the water passes the side. Yet the old log for heaving is often carried and occasionally used.

The log chip is (in these days) a piece of flat wood in the shape of a quadrant; the angle when in work stands out of the water and the circumference section, which is leaded, stands down into the water, the plane being held vertical in the water by slight towing pressure of line in water ending in a three span of line, two of which go through holes in the board and are knotted at the back side, the third held, and releasable, by a plug on its end into the wood. This is used when the distance is done by jerking the plug out, the board floats flat on the surface and is easily hauled in on to the vessel.

The Line.—The first piece about 80 to 90 feet spare, merely to let the log float away into clear water before measurement begins. Then comes a mark, white rag, after that, at 47 feet 12 inches, comes a knot mark, and the line is thus marked in these lengths up to any desired speed. 47 feet 12 inches being the same fraction of a nautical mile as 25 seconds is to one hour.

The log chip is dropped over the lee quarter of the ship, with its plug in, and the stray line is payed out without check. The 25 second sand glass (28 and 14 second glasses are used with some logs' divisions) is held ready, and as the white mark goes over the rail the glass it is turned; when the sand is just out of the glass the call is "stop," and the line is at once stopped, and the nearest knot mark is read off as the speed of the ship.

"Lead log and lookout" were the old time idea of the main adjuncts to safety at sea, and, so they are still, but now often neglected.

SHIPS' LIGHTS.

Fixed lights are a class of signals for they, to a large extent, tell you what the ship is doing in regard to her heading, and change of heading. So I think a word thereon should follow signalling. To know "what she's up to" is one of the things a Sea Scout should be found useful upon, and there can be no doubt that lights tell a tale.

Some of you Sea Scouts, in short a great majority, are harbour or coast boys and know all about vessels, lights and tugs' whistles, and really don't need to be told half what I am putting down; but just remember there are many youngsters coming into sea scouting from inland places who have never seen a green or a red light, except in a doctor's shop, and they have to be told, and want to know, the use and meaning of the lights used on vessels.

Vessels at anchor, no matter of what size, are all required to exhibit a white light forward. This is called the "riding light" or "anchor light"; and if the vessel is over 150 feet long she must also show a white light aft. The risk of not having a light up is that if run down by another vessel, the vessel without a light is to blame, even if the other is also in fault. Vessels underway, that is not at anchor or tied to the shore or quay, are required to exhibit a red light on the port side (left side) and a green light on the starboard side; this applies to all steam or sailing vessels. Steamers have in addition to carry a white masthead light in some cases two,

and any vessel may carry also a stern light. Tugs towing carry two mast lights, one above the other on the same mast.

The actual rules made by Act of Parliament and orders in council are very precise and lengthy, they are set out in Brown's Siqnalling.

The interest to you is to know how to read such lights as indications of danger or safety. So we will look at a sketch, bird's eye view, of the way the lights show.

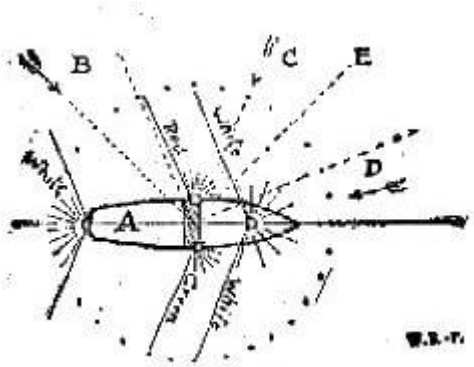


Fig. 16.

You see the spot in middle, call that the compass on the bridge. The coloured side lights are fixed at each side of the bridge:
red on port, green on starboard side. These lights have to show from right ahead, each on its own side, to two compass points abaft the beam, that is to an angle of two points abaft a right angle to the middle fore and aft line of the ship. The masthead white light forward is also to show from ahead to two points abaft the beam. The stern light, when carried, is to show from astern to six points on each quarter (" quarter" being the angle of meeting of side and stern).

Thus, a vessel coming towards ship A, like the arrow B, only of course at a greater distance away, would only see the white stern light, because she is behind the range of the other lights. A vessel coming towards ship A on the line C sees the masthead and red light, with the mast light well to the left of red. If she was approaching on the line D she would see mast light and red, but the masthead light, white, would be nearly in line with red. Say D is a mile off and steaming on that line, she has A right ahead. Then if she were to see A's green come into view she know at once that A is starboarding—i.e., turning to port, and there is immediate danger of collision. D would stop his engines, for by seeing both of A's coloured lights D knows he is ahead of A, and that A must see both his coloured lights. The next change of lights—i.e., of colour—shows what A is up to, if the green is shut in A is porting back and D had better port. If red is shut in then A is still starboarding, and D had better go full speed astern. Of course all depends on distance the ships are apart for avoiding collision; here we are only showing how the change of lights seen tells what is being done.

If B was going on a course about same as A instead of arrow course and faster, she would run past the angle allowed to the stern light of A, and would then pick up view of A's red light, and know she had overtaken A and she must keep clear of her. A on her part would see B's green light, and knows that by the rule she, A, must keep on her course and speed, as B has to keep clear, being "an overtaking vessel" (rule of road). Suppose A— sights only a green light at some distance off in the direction of, line E, and the wind is blowing from right—ahead of A, she sees by the green with no mast light that E must be a sailing vessel heading somewhere across A's course and that she must be on the "port tack," wind on her left side, because the wind is coming from ahead of A. Thereupon the light having shown this; A being a steamer must get out of the way, "keep clear" of E; so as E must be moving across to the right, A must turn to the left and pass safely under the stern of the sailing ship. Here you see A has to act by the rule of the road.

But, again, in same position, suppose B showed a green and a high white (mast light), A has not to act, but to keep her course. The lights tell her that E is, in this case, a steamer, and that B is crossing A's course with A on her, B's, starboard side. So by the rule E has to keep out of the way of A.

So you see the different lights tell a lot between ship and ship at a glance, when there would be no time for signalling.

So long as red is open to red or green to green it is a position of safety, provided the course is being made good, that is no sideway drift (called leeway) which sometimes happens under sail, and the verse on this is—

> Green to green or red to red,
> Perfect safety, go ahead.

A change of colour tells you that either your ship has crossed the course of the other, or that she has turned from her original course. So in the case of steamer B, showing green on your, A's, port bow, she has ported to get out of your way (her duty to do so), and she means to pass by your left side and across astern of you, you know this by her red coming into view and her green disappearing, or it may be she is very slow or stopped and you have crossed her course; it matters not which it is to you, you have got red to red. B is then what is called a "passed ship," and there can't be a Collision unless B turns and chases you. But some men do silly things sometimes.

Models.—To learn the lesson of lights, and also to play the game of the rule of the road, it would be very useful to have on your guard ship a set of flat wooden models of the type of A, only larger, say four inches long and some small ones, cut out of wood about 1 inch thick, with vertical sides and round stern. Paint the side from mid ship of length to stem, red on left side and green on right side, deck paint black with angle of masthead light, white, or you can pin coloured and white glass beads on for lamps, with a bit of sheet tin out with tabs to stick into the wood of the deck to represent screens to the bead lamps, showing the angle sketched in figure A (Fig.16) . The mast bead, white, may be on a pin, say one inch or so above deck. There should be, at least, two steamers, one sailing ship, and some small craft in your table fleet.

Games of Lights and Rule of Road.—With these models, and a table with a compass face painted on it, most instructive evenings can be passed by any number of scouts, the scoutmaster or the coxswain with the book of the rule of the road giving out a set of positions and placing the models. Then those in charge of each model start to navigate on the line of "course" given them by the umpire (say chalk lines on a black table), some will find they are coming into danger of collision and they have to manoeuvre, the scoutmaster explaining the rule and correcting faults. Later on, games on the rule and lights can be played of quite interesting nature and of great value in perfecting the knowledge of night and day navigation.

Finally, a word which might have come first. Your guard ship boats should each have a white light lamp. You never can tell when you may be delayed out till after dark. Then you may at any moment meet a steamer coming upon you. The only light you ought to exhibit is a white globe light; for want of a better at least have a bicycle lamp in the boat and some dry matches.

THE COMPASS.

Description.—The compass on a ship is the instrument by which the ship or boat is directed in any desired direction upon open water, especially, where no land is in sight, such as when far out at sea or anywhere in fog or thick weather and at night. The compass is formed of a magnetised needle or bar of steel which always points north (magnetic). This "needle" is balanced upon a vertical pointed pin fixed in the bottom of the compass bowl, and the bowl is fixed to the ship in the binnacle. The bowl is suspended in "gimbals" (a ring around outside the upper edge of the bowl, the bowl engages with the ring by two opposite trunnions, the ring itself having two opposite trunnions at right angle to those on the bowl, which engage to the inside of the binnacle or compass box. This gimballing is to allow the compass bowl to keep a horizontal position while the ship rolls or pitches to the motion of the waves or force of the wind.)

The needle of the compass, as said, always points to the north, that is by the magnetic attraction of the world, so if the ship, turns her head right round, the needle remains still pointing north.

A ship's compass differs from a landman's compass in that it has the compass card fastened to the "needle," whereas in the landman's the needle is bare and the card is at the bottom of the box. On the inside rim of the bowl is a mark, usually a black vertical line on the white paint of the bowl, called the "lubber's point," this is in the direct line of the keel, looking forward. Then the "points of the compass" marked on the compass card show by the one or portion of a point that is seen at the "1ubber's point " how the ship is heading, and, therefore, when you want to steer a course, say west, you turn the ship's head by steering until the W. on the compass card is exactly at the "lubber's point" or mark on the compass bowl.

There is such a thing as "deviation," that is a drawing of the needle point to one side or the other of the real magnetic north, caused by, say, iron in the ship; it is in some compass instalments "corrected," or it is ascertained by experiment and the corrections allowed in the working out of navigation, but it is only for fine navigation and not necessary for you to trouble about.

The compass card is divided into 32 points, the opposite are north and south, then east and west across. The simplest way to learn the compass is to paint a compass card on the floor of your boathouse or the deck of your guard ship, say four feet in diameter, with every two points named in painted letters, and the intermediate points in spot or bar of paint. Thus, N. N N E NE, there you have four points of compass to right of N. The beginner then stands in the centre of the "card" and reads off the points. When the beginner knows the compass pretty well, the instructor will point to or put his foot on some spot, Saying "how's her head?" Answer is the name of the point of the compass at which the instructor points.
To "box the compass" is to be able to say off all the points beginning at north and going round by east and south and west up to north or the reverse way round. There are many who know the compass but don't use the correct words; for instance, suppose the instructor puts his foot on point to north of E.N.E., a lubber would answer E.N.E. a half N. A sailor would correctly say N.E. by E. a half E.; or another question, "N. 3½ points E" is marked as spot. The lubber says north east by north a half east; the sailor says north east a half north; it's the shortest way of "getting at it."
To "box" you go North, N. by E., N.N.E., N E. by N.,

N.E ., N.E. by E., E.N.E., E. by N., East, E. by S., E.S.E.,

S.E. by E., S.E., S.E. by S., S.S.E., S. by E., South, S. by W.,

S.S.W., S.W. by S., S.W., S.W. by W., W.S.W., W. by S.,

West, W. by N., W.N.W., N.W. by W., N.W., N.W. by N.,

N.N.W., N. by W., North.

The printing or writing will remind you that all block letters are north of east and north of west;all round letters to the south of east and west. Of course this is only for the very beginner.

A point of the compass is 11¼ degrees, and big ships usually steer by degrees instead of points, but for ordinary navigation and your work,—such as taking bearings, working by points, half points and quarter points is near enough.

The diagram here given is what you should paint on the floor or on a school "black board "; lines and letters in white, or may be white for northern half and red for southern. Remember some of your pals are young boys not knowing as much as you do and the thing is to get them to have, as it were, a picture compass in their heads.

East is always to right of north and west to left when you face north. N., S., E., and W. are called the "cardinal points."

To "read" the compass correctly remember that there are eight points that begin and end with the same letter, two of them in each quadrant, marked o in diagram. Thus, N.E. by N. and E.N.E., E.S.E. and S.E. by S., S.W. by S., and W.S.W., W.N.W. and N. W. by N. These, though they may be read off as "points," are not to be read onwards with subdivisions added, as I said above of the lubbers; for instance, the instructor says "steer a course by compass N. 3½ points E." this read properly N.E. ½N., not N.E. by N. ½ E." or say the course is given as N. 6½ points E., it is read as E. by N. ½ N., not as E.N.E. ½ E
.
The cardinals are N., S., E, and W.; the half cardinals are N.E., N.W.; you read your points and sub division to right and left of these cardinals and half cardinals to half way i.e the next.

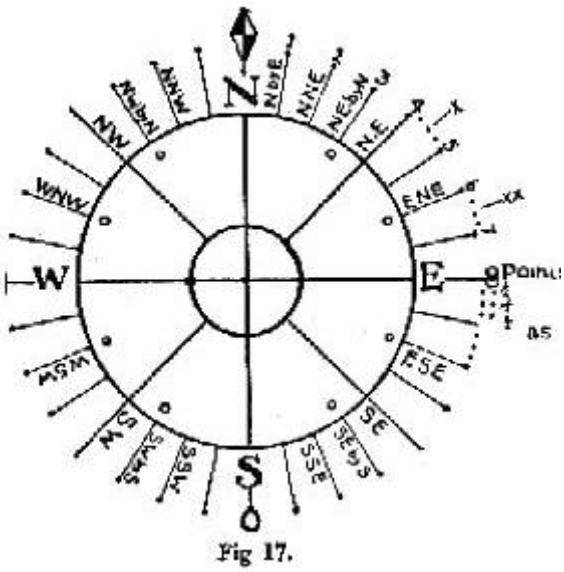


Fig 17.

Learn the name and, point out correctly the cardinal and half cardinal points, then you can fill inthe other points as you go on learning.

The Sea Scouts will find it very useful, if he has not a pocket compass, to carry on his walks or cruises a compass card, about three inches in diameter; this can be made of white card wíth black lines and letters, or as fancy wills it, but it shouid be well varnished all over both sides and edges, then a little wet won‘t hurt.

A **Watch as a Compass.—**If you have no compass in the boat or wherever you are, and want to get a near idea of bearings of certain objects, or the general direction that your track should take, you can do so if you have a watch among you and the position of the Sun can be seen. Hold your watch flat, face up, point the hour hand at the sun—you can make the image of the Sun on the glass travel across on the line of the hour hand by canting the watch a bit this shows you have got a good bearing of the sun. Say the hour hand is pointing to 4 o‘clock p.m. Then south point must be *to your left* of sun and as the south point is half way between the sun *i.e.* the pointing hour hand, and 12 o‘clock on the watch face, the 2 o‘clock mark is south. The position of south can be found at any time of day. Before noon the south point will be to your right of the sun as you face it, and your watch face will show it half way between 12 noon and the hour hand point at the moment. For instance, if hour time is 6 a.m., hour hand is pointed to sun, the compass south point will be half way to 12 figure, *i.e.*, on line from centre of watch through the figure 9 o‘clock.

The sun “rises“ and “sets“ on the horizon at sea, taken as a “mark of time,“ and lifts over from one to the other on an arc of a circle, and the highest point it reaches is always 12 o‘clock noon. Therefore the *shortest* shadows will be got from any perpendicular object at noon. If you were cast on an island and have no watch in working order, you can make a fairly near time given by preparing a flat face of clean ground on which to mark off shadows for a sun dock. Plant a pole with a string and weight so pinned to top as to hang just clear when perpendicular, as the pole must be. Then with a string from the base at earth surface watch and line and mark the complete shadow, and when the shortest shadow is found drive a peg mark for its end, and the string tied thereto gives the line; the peg and line is north from the stick, the sun being south to make the shadow. So you can then set out on your table ground an approximate compass and Sun clock.

Having found the line of north and south, whether by noon shadow or by watch, you can apply your compass card mentioned above, and thus be able to take bearings of flxed objects.

Spirit or liquid compasses are the most useful in boat work because the card does not “fly about“ or keep shifting around owing to the lively motion of the boat or the jerk of rowíng. These compasses have the bowl filled with liquid, usually a mixture of one part alcohol and two parts water, over which there is a water-tight top or rim and glass. These compasses are now made in the smaller sizes as well as large, even down to pocket size.

Never let any iron be in the boat near the compass, as it attracts the needle sideways.
A lamp is necessary at night to see the compass by, but need only be a fixture in vessel that have to steer a compass course. But when a lamp is used it must be all brass or copper, lest it attract the needle. Electric torches are liable to disturb the compass.

RULE OF THE ROAD AT SEA

The only reason for a rule of the road at sea is to avoid collision, and then it becomes necessary, as it takes two ships to make a collision, that each ship shall have a known duty to

perform, and that duty may be to act in a certain way, or to do nothing, that is to keep on as she is going.

There are many rules and provisos and footnotes thereto, which for the officer who may have charge of steamer or other vessel of size are all important, they would if fully set out in this book require it to be cut in half and re-built to twice its tonnage, so for scouts I think it will be enough to give the rules in a more general way sufficient for small craft.

Risk of collision, as said above, is the sole call-in for use of any rule. You can alwaye assume there is risk of collision if a veesel approaches you and you see that *her angle bearing from you does not alter.* Take three scouts on to a grass field, station one, let the other two scouts march away in diferent directions, say one straight away to front of the point scout; the other to an angle of four points = 45° to right of point scout; march to a short distance, marching on two distant objects kept in one to get a correct line; both halt when man in front of "point" is say, 60 yards away; turn and face "point." Now front man aligns side man with his staff, and at signal whistle both start to march slowly direct for the point man. If "side man" remains on the same bearing to the "front man," that is remains aligned along his staff held steady as they march in there will be a collision at point man, same will be seen by the side man; that is where their courses cross. It matters not what the pace of each may be in walking, there will be collision if *the angle of bearing does not change.* If the side man gets ahead of the staff bearing he will cross ahead of front man, and if he comes behind the staff the front man will cross ahead of him.

The next point for you to hoist in, and have no doubt about, else you'll confuse yourself, is the sea terms which the rules hold, to learn a rule you must understand the words "close hauled." A ship (any sailing vessel) is "close hauled" when sailing to windward, heading as near to the wind as she reasonably can do. Her *changes* of heading then are "luffing *"—i.e.,* turning her head towards the wind; "bearing away" is turning away from the wind. Yachts and boats fore and aft rigged sail about four points on one or the other side of the direction the wind blows from—i.e., wind north, yacht sails N.W. on starboard tack (wind on right-side), or N.E. on port tack (wind on left side). A square-rigged ship, smartly trimmed, will sail at about six points from the wind, when close hauled—i.e., W.N.W. or E.N.E. to a N. wind.

"**Free.**"—When the wind is easy, so that in fore and aft rig sheets are eased, or in square rig the yards are squared in a bit— *i.e.,* not hauled as far forward as for close haul, the wind is said to be "free" or the ship "going free." "Running free" is a term met with in novels and even in the rules, but is nonsense, of course a ship "running" is "free." "Reaching" is with wind abeam or abaft beam to two points; all directions of wind more than two points abaft beam cause the vessel to be "running." The "rule" uses the words "running free," and there is often in collision cases a law fight as to whether a vessel is really "close hauled" when she is a point or more "free"; but we are here only going to give the general rule, not to fight a case.

The "tack" is the side the wind is *on—e.g.,* port tack means the wind is on 'the port side (left); starboard tack, wind on starboard side (right). "Luffing" is steering towards or closer to the direction the wind is blowing from. Bearing away is the reverse.

Rules.—A steamer must keep clear of a sailing vessel and steam or sailing vessels keep clear of anchored vessels.

(A) A vessel "close hauled" to the wind has the right of way—i.e., holds her course; any vessel sailing "free" has to keep out of her *way—i.e.,* keep clear of close-hauled vessels. Of two vessels each "close hauled" but on different "tacks," the one on the starboard tack holds her course, the one on the port tack keeps clear. If two vessels are "close hauled" (in their own fashion of sailing) and their courses converge with risk of collision, the vessel to windward keeps clear.

(B) When two vessels are running with wind on different sides, the one with wind on her port side keeps out of the way of the other.

(C) When two vessels are running with wind on the same side the vessel to windward must keep clear of the vessel to leeward.

(D) A vessel *overtaking* any other vessel (steam or sail) shall keep out of the way of such vessel.

Steamers End-on (E).—Two steamers meeting end-on, both are to turn to starboard and pass port side to port side. (End-on is each seeing the masts and funnels of the other in line ahead or nearly ahead of herself, and at night they would see each other's red and green lights ahead. It does not apply to seeing one side light only ahead.)

crossing (F) .—When the courses of two steamers cross and there is risk of collision, the one that has the other on her own starboard side shall keep out of the way.

Steam and sail.—A steamer and a sailing vessel meeting or crossing with risk of collision, the steamer is to keep out of the way.

Hold on.—Where one vessel has to give way, the other shall keep her course and speed (this is to prevent her hampering the movements of the giving-way vessel). But the one to give way must avoid crossing ahead of the other.

Stop.—The giving-way steamer shall, if necessary, slacken her speed, or -stop, or reverse.

Sound Signals.—When a steamer alters her course in obeying one of these rules she shall give a signal on her whistle. One short blast, that she is starboarding her helm. Two short blasts, that she is porting. Three short blasts, that her engines are going full speed astern.

These are the rules of the road at sea and in all waters navigated by sea-going vessels. You should work them out in every kind of position you can place your models in on the table (mentioned before for the game of lights). You may, in your scouting trips, be called on in a moment to use the rules, or to interpret them as to the doings of others, in your own boats or perhaps in salvage work. You may not understand them for some time, but get them into your mind and work at "playing the rule " and you will soon have it all in you.

A sheet of leading positions may help you. Sketch A shows two sailing vessels, 1 and 2, both of them close hauled, and on opposite tacks. If they sail on they will collide at the spot. A little more or less speed on either still running it close. So 1 has to give way because she is on port tack, and the safest way is to bear away. In A, 3, we have 2 close hauled and 3 sailing free with wind abeam, their courses meet at spot. So 3 having the wind free has to give way, bearing away being the surest way.

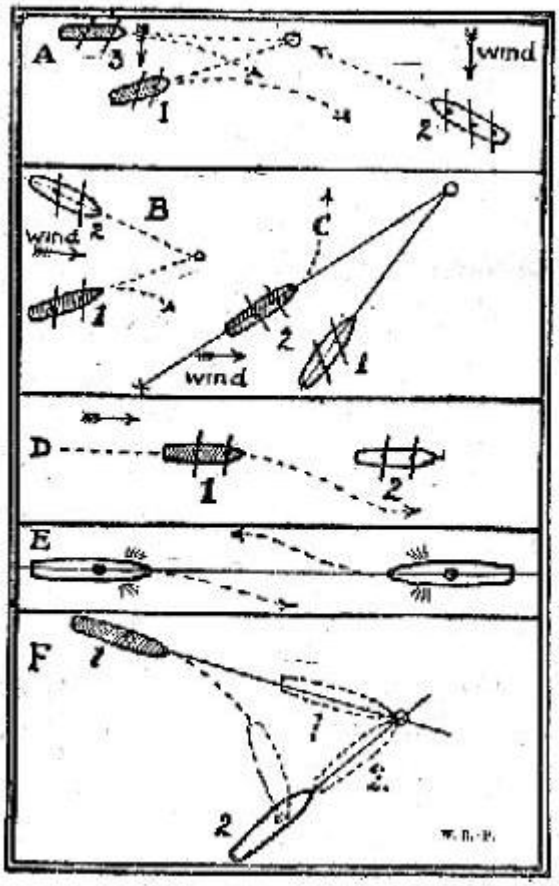


Fig. 18.

Fig. B shows two running, 1 and 2, and as 1 has the wind port side (see rule) he must get out of the way; bearing away is probably the best; but all these giving ways as to method must suit circumstances.

Fig. C shows two vessels running with the wind on the same side of each, so the rule requires 2 to keep out of the way; she can only do so in the position given by "luffing." She should have acted before, say at x, when she might have borne away under the stern of 1.

Fig. D. —The shaded vessel is overtaking 2, so by the rule she has to keep clear, any way she chooses. Steamers, fig. E.—Here they are meeting end on and both must starboard (per rule) and pass port to port.

Fig. F. is the "crossing rule," and in order to show another rule we will say that 1 is steaming twice as fast as 2. Their courses meet at spot and so should the ships as dotted, for 1 travels two of her lengths while 2 is only going one length. The rule requires 1 to keep clear, so she starboards to pass astern, and would do so. The rules further require 2 to "keep her course and speed."

These are just examples of how you can play the game on your table with deck plan models. The full text of the rules has some provisos for special circumstances, such as "dangers of navigation" shoals, and so on, preventing compliance, then good seamanship and the ordinary practices of seamen must step in.

It may be that Scouts in their boats will not often be out in the navigation channels after dark, yet a late return or misjudged tide may cause it to happen, and tugs and launches will be found very dangerous, they dash about at high speed with poor lookout; your safety depends in rightly interpreting the lights seen, and in showing a bright light in good time.

BOOKS TO READ

Elementary Seamanship. By P. Clissold.
Brown's Signalling: How to learn the Code.
Brown's Rule of the Road Manual.

CHAPTER X.
SWIMMING

Swimming—Rescue of Drowning People and Reviving

An overladen ship makes a bad passage, so I want to avoid cramming into this little book a lot of things that are fully set out, and you have read in Scouting for Boys. So as we go on I shall only touch lightly upon the things which have been dealt with in that book, or where Sea Scouting differs from land scouting. First aid, health, and many other things you have gone in for to obtain the second-class pass for boy scout need no notice.

Swimming.—Before you go afloat you must be able to swim, and you should be able to swim with clothes on, because in boat work you may tumble in at any time; also it's not fair to be a burden on your comrades in the boat if an accident happens. Then again, at any moment it may be in your power to save the life of a person, if you can play with the water with your clothes on.

Never bathe out of a boat unless somebody is left in it, or the bank is so near that you don't depend upon the boat. The boat drifts away with a breeze much faster than you can swim. The thing looks easy enough and the plucky boy starts to swim after the boat. If no other boat is near by it may easily end fatally, simply that by the time the chase is given up as hopeless the swimmer may be too far from the shore to get there in his now exhausted state; or even if he reach the boat he may be too far done to be able to climb into her.

So also when you have landed on an island, don't forget to make the boat securely fast. If she drifts away it is useless to attempt to swim to her, especially in clothes, and there is no time to undress, she will have got too much start. She will be found and rescue party will find you.

For bathing from boat, when the crew bathe, it is advisable to have a life buoy always ready; if funds won't go to a cork life buoy, a couple of one-gallon varnish cans (those with handles) will make an excellent and very cheap life buoy. Of course there are many things, such as corks in bags, but not so buoyant as cork-stoppered cans.

Get a mop handle, about 30 inches long; score a notch around near each end to lash the handles of the varnish cans to, one at each end of the spar, with a little play so as to prevent wrenching off. A bit of rope spliced on the spar and long enough to go over the shoulders and hitch with a clove hitch to the spar is useful in the way of bringing to boat or shore one of the bathing crew who may get cramp, or feel dizzy, or is otherwise disabled (see the sketch.

These cans would hold up several if an oar or staff is lashed across; but those who are holding on must be content with having no more than head above water.

Swimming in clothes is too seldom practised; when you fall overboard or jump in to save another you are not usually naked, and if you delay in order to strip for a drowning person you will probably lose the chance of saving him.

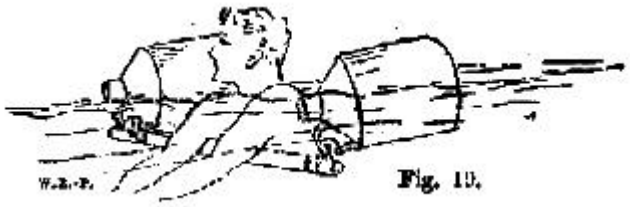


Fig. 19.

A summertime game, well worthy of a boat's crew's attention, is to swim in company in clothes with the boats' oars lashed in a bundle as a hand-raft, the crew being arranged on each side. Boats as a rule, unless metal or stone ballasted, do not sink when capsized; but there may be circumstances in which the boat must be abandoned and the crew must swim. Stick together, and collect all floatable articles, and, if time allows, cut a fathom off the painter (rope at bow), unlay it and use strands to lash all in a long raft to hold to. Very little wood, merely hand held, will support many heads above water, the bodies are nearly naturally floated, as you know when you lie on your back and float.

As a matter of fact you should stick to the boat if she floats. If turned bottom up you should remember that all the crew getting up on the bottom will make her bottom inclined to turn over, so all hold to keel, all on same side of bottom; throw body weight outward, and probably the boat will be pulled over and float water logged. All hold to the gunwale, shift some round to man both sides of the boat, which is now gunwale up.


Fig. 20.

Now comes the value of "being prepared." Of course there is in the boat, secured by lanyards, a canvas bucket and one or more bailers? One boy then climbs in over the stern and starts bailing, then as soon as the water is reduced so that no more runs in over the gunwale, another boy gets in and helps to bail; soon two or three more get in. Use hats, boots, or even hand-splashing. She will soon be up under the united work.

When a boat is capsized or swamped don't leave it, unless close to shore you know you can land on. In most estuaries the banks are all soft mud and unfit to land upon. Rescue men will surely come, probably sooner than you could swim ashore, even if landing were possible.

As the regulations of the Sea-scout qualification require previous boy-scout training, and that training includes swimming, I need only make remarks on the absolute necessity of practising swimming in clothes.

If you are not sure how you will come off, try first in shallow water. You will at once find that boots and trousers are your trouble; shorts will be no trouble. Boots laced up and heavy are not wanted by Sea Scouts, and they are almost impossible to get rid of while swimming unsupported. Shoes can be thrown off if you are a fairly good swimmer.

There are many ways of learning to swim, or of being "tort," as the Durham miner said when he chucked his two-year old kid into the pond and gave it advice on swimming; the curate coming by remonstrated and dashed in to save the kid, 'but the father only remarked, "av tort the pup that way." Well if boys learnt first to swim as pups and dogs do, they would be better ever after at all kinds of fancy swimming strokes. One way, by no means bad, is to get the boys, while ashore and ready to go into the water, to lie across a plank some two feet off the ground, balanced so they can strike out with legs and arms in imitation of the instructor who lies across a stool in front of them and broadside to his pupils. They see the stroke and imitate it. Then one by one repeat it without the show, then all together, etc. When this has gone on some time the same can be done in shallow water, two boys holding a rope or spar under one or several of the beginners, and when the instructor sees the action attained the support can be lowered a bit (by signal from behind the learners), the boys will, in ignorance that the support, is less or gone, swim for a bit; then up support again for a time to give confidence. Swimming will follow quickly.

What stroke should be first taught depends much on the tutor; but the best is to swim as a dog or otter, one leg and arm forward and downward at a time, while the other hand and foot are being brought forward, crawling as it were; do this in shallow water where you can just touch with hand and foot as you crawl, having of course practised the action, as said, on shore. The hands, of course, must be spread flat open. Confidence is the important thing; hence the confidence given by the support of the rope or spar leads you to actually swim when you don't know that the support has been taken away.

Another good way is to get leg action perfect, whether in dog or frog fashion, one at a time or striking out together. Do this by holding to the end of a spar floating free, and push it along in front, end on. Then later using legs and one hand, and then let go and use all, but do it in shallow water.

Take in plenty of breath every chance, keep your mouth shut, and head well up and back; don't shout. Keep your hands open flat in the water, skimming them from side to side in front of you this will keep you up, even if it does not drive you ahead.

Treatment of Nearly Drowned Person.—As soon as you have lifted him from the water, if breathing has ceased place him face down on the ground or deck; never mind the clothing, but get on at once to give artificial respiration. If you are several, say a boat's crew, the leader will at once send a messenger for a doctor.

The mode of working artificial respiration on the Schafer system has, of course, been one of your drills. The "honorary surgeon" of your guard ship has, no doubt, good naturedly, come down occasionally and given you a few practical instructions of exactly how to do it, and wise words as to what to avoid doing. They used to lift a man's heels up "to let the water run out," don't do it; ask the doctor why?

Kneel over the man's body, which is lying face down, abreast of his thighs; the idea is to squeeze all the air out of him, and then on easing up the pressure the air will be drawn in to

him again, just as in real breathing. Keep on doing this. If you squeeze the air out of an india rubber ball with a hole in it, and then ease your hand pressure, the air immediately refills the ball, because the elastic ball has sprung back to it original shape, and the body of the ball will not remain a vacuum when there is a hole (the mouth) to let the air in. So with the man, only you must keep on till the organs of the body return to their natural duty, aided at first by you, and then acting once more for themselves.

You kneel astride of his thighs, place your hands flat on the small of his back, fingers outwards and thumbs nearly touching over his backbone, just about at the lowest rib. Lean forward, allowing your weight to fall on your hands giving a downward pressure. Then bend back smartly, releasing the pressure, but keeping your hands in position.

Keep on repeating this forward and backward swing of your body, with its downward pressure and the relief—every four seconds about. Thus the exchange of air in the lungs becomes similar to natural breathing. Even if you notice actual breathing recommence continue your work for some time; then a careful watch, keeping in position to resume pressure, etc., if the slightest failure takes place.

Of course it may be that in most circumstances by this time the doctor would be on hand. But I am not sure that it is safe to attempt some of the "book" recommendations of applying snuff to the nose, tickling the nostrils, pepper, smelling salts, etc. Anyway these things are not usually at hand on a sea beach or in a boat, but ask your surgeon about them, and by all means read about them.

While the hand pumping is going on, others of the crew may be getting clothes off, trousers, etc., and fetching hot flannels to rub the limbs and body, and hot water bottles to put to the feet, but the clothing under the hands of the operator should not be touched, nor any restorative given by the mouth till natural breathing has undoubtedly been restored. Then you may turn him face up and promote warmth and circulation. Friction over the whole body by flannels propels the blood along the veins to the heart; friction to be all inwards along the limbs towards the heart. Then wrap in blankets. Restorative: first a teaspoonful of warm water, and if swallowing power has returned give small quantities of warm brandy and water, wine, beef tea. Still watch the breathing and have hot flannels ready to apply to stomach, armpits, and between thighs, and possibly, if breathing difficult, a hot linseed poultice to the chest.

Lastly, and all through, don't crowd the man.

Rescue of Drowning Man.—Practise among yourselves, whenever you go bathing in parties, the admittedly proper ways of getting hold of a drowning person; there should not be, at any rate at first, any rough play of clutching and so on; but get the positions right and let each scout practise until he is able to swim ashore bringing a scout in who simply lies intentionally helpless in the water. This should be done with, at least, a shirt on each; something to hold on to and also to somewhat impede progress.

You must keep clear of the "patient" and get behind him. If he can swim he won't drown; if he can't swim he can't turn in the water and swim at you, so what you bear in mind is to get hold of him behind the neck. If his hand clutches your wrist, twist against his thumb; that usually causes release, or a push under likely makes him let go and dash his arms out to clutch something in front. If he's quite sensible tell him to "keep quiet and you'll save him";

make him answer. If he does answer you can take him, from behind, under his arms and swim on your back. But beware of the clutch. If you have an oar or log of wood within reach let him clutch at it and you get behind to his collar at arm's length.

In mad cases it may be his saving that he gets insensible, as you may easily get him ashore or hold up till a boat comes; whereas with constant fighting and pulling under both may be drowned. If the rescue is at sea and a life buoy is near, as is often the case for a "man overboard," better take it to him at once as you may not be able to get him to the buoy.

In the case of a woman, remember her skirt is a great danger; however calm she may be your legs must be kept clear of her skirt. If she is in her senses, tell her she's to lie quietly on her back and you will tow her at arm's length.

But again it's that loss of mind clutch that is the standing danger in every drowning rescue.

Every Scout will be keen to go to the rescue of anyone drowning, but he should have reasonable belief in his own ability that he will at least be able to look after himself. A Scout friend puts the point to me thus, "If a Scout knows that 25 yards in clothes it his limit of distance he has no right to attempt to swim out in clothes to someone say 200 yards away. He can do no possible good, but much harm, because the next man to the rescue, who can swim 200 yards and back, has to rescue both if he is able." Another note sent me is, "In case of a good swimmer going to the rescue it is only commonsense for him to throw off his coat and shoes, it only takes a few seconds and he will thus arrive at the drowning person far quicker and fresher and more able to do his job".

On this, however, I can give you warning from my personal experience last September that a "few seconds" delay may be fatal. I dived after a lady sinking in a full Thames lock, and by the time I brought her to the surface she was insensible. I had dived in immediately with full tweed suit and laced shoes on. Had I waited to take off coat and shoes - well - she would not be sitting by me now. I have on more than one occasion been overboard myself and got my coat and boots off in the water, but I had only myself then to think about.

If you fall out of a boat when alone, and succeed in getting hold of the boat, certainly get your coat off and any other garment you can manage and throw them into the boat before trying to lift yourself in. Clothes in the water will weigh 6 to 8 ounces, but many pounds when you try to get out.

OFFICIAL.

Bathing will only be permitted under strict supervision to prevent non-swimmers getting into dangerous water. A picquet of two good swimmers should be on duty (undressed) with great coats on, in a boat or on shore as the circumstances may demand, ready to help any boy in distress. The picquet itself may not bathe until the others have left the water.

CHAPTER XI.

Wrecks — Life Saving by Rocket Gear — Life Boats — Beaching

and Sea Work — Man-slinging.

THE ROCKET LIFE SAVING.

When a ship strands on the coast of the mainland, that is to say not on an outlying shoal, and is close to the beach or rocks, the crew may be saved by being pulled, from ship to shore by means known as the rocket apparatus.

Generally a ship only strands by being driven ashore by an onshore wind, or by a mistake in her course and position in fog. When stranded it is frequently found to be impossible to get to the ship by boat, because in the shallow water the waves break too dangerously for a boat to attempt to go alongside. Then the coast guards come down on the beach with the rocket apparatus and usually succeed in getting a hawser fast between the ship and shore, and by a travelling suspended seat hauled to and fro they get the crew ashore, and often themselves get on to the ship to render further assistance.

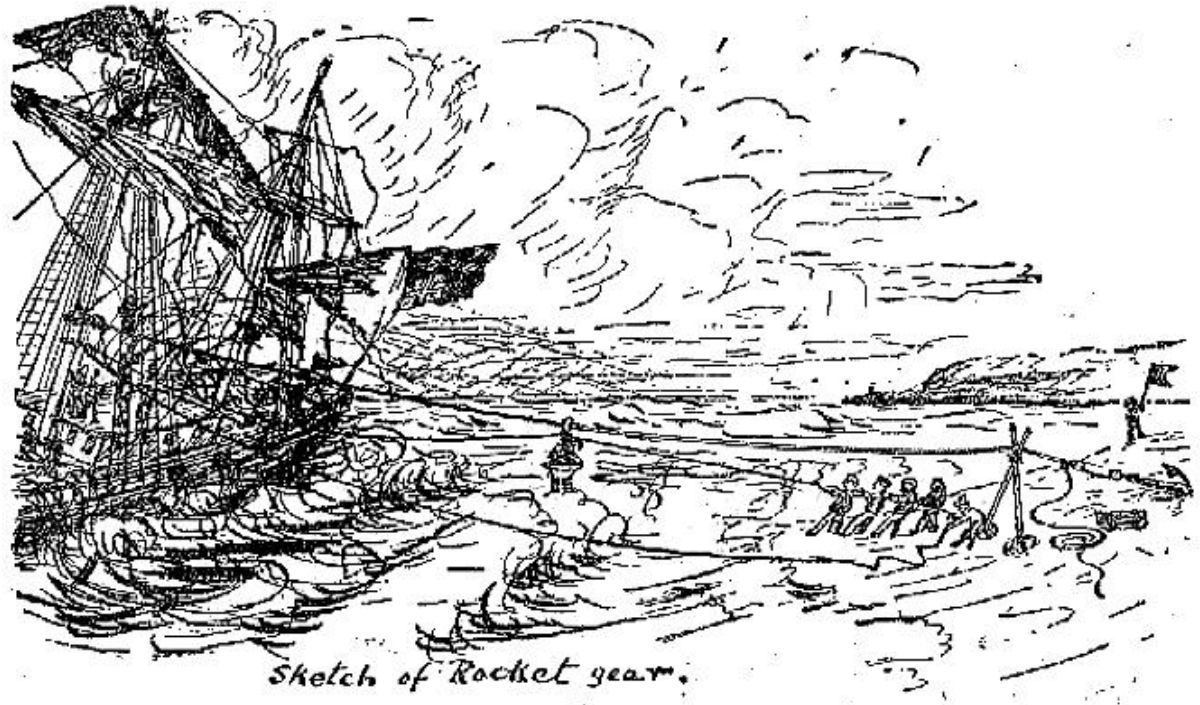


Fig. 21.

The rocket carries from its tail a light line which is shot across and drops upon the ship. The crews of all ships, especially the officers, have instructions as to what to do. The wrecked crew get hold of the line. Then one of them goes to a part of the wreck away from the crowd so as to be distinct, and waves his hat or flag or handkerchief to the shore party as a signal that they have got the line. At night he would display a lamp over the ship's side and then conceal it, or a flare, or rocket, or a blue light.

Then one of the shore party separates from their crowd, probably one of you scouts; he waves a red flag, or at night shows a red light for a few moments and conceals it. The ship's crew

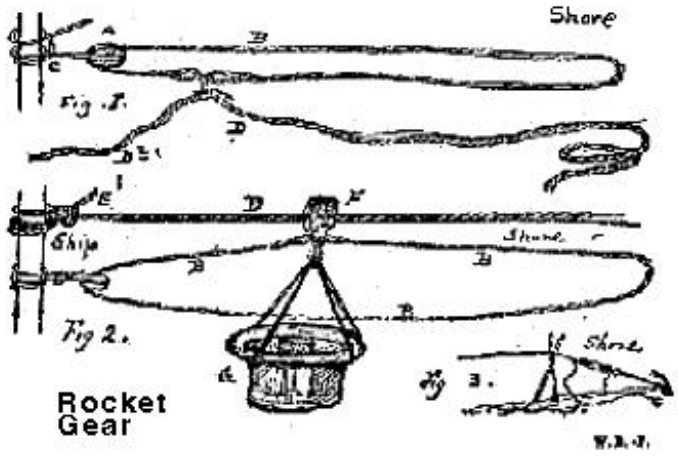
then haul upon the rocket line and thus get hold of a tail-block, A in fig. 1 (a pulley with a long tail for making fast), and this has an endless line rove in it, the whip B.

The wrecked crew make fast the block-tail to the vessel's mast, C, well above the deck, or if the masts are gone then to some convenient and substantial high part of the structure so that the endless line don't get rubbed or chafed in working, and this block must be placed so that the hawser to come, D, may be secured directly above the block When the block is fast the separate signalman on the ship makes his signal again.

Next, the shore party, having seen the ship's signal, haul off the end of the hawser to the ship, D and D^2.

The crew on the ship make fast their end of the hawser above the tail-block at E, fig. 2, some 18 inches higher because the travelling block hauled by the endless line has to always be beneath the hawser, and also see that in making fast there is no foul turn of the whip round the hawser. The whip line is then unbent from the hawser.

The hawser D, a large stout rope, is now fast on the ship. The separated signal man now makes his signal again, and the shore party, having seen thereby that the hawser is fast on the wreck, set the hawser taut on its shore end by an anchor, post, rock, or other convenient undoubtable fixture, fig. 3. Then they haul in to shore on the whip line till they get the joint-eye part, this is made fast on shore to the travelling block, F, which has been by them snapped on over the hawser and carries the "breeches buoy" hanging down from it, G. Thus, now the shore party can by the endless, or all round line pull off to the ship and back to the shore the travelling breeches buoy, and consequently any man sitting in the buoy, and also when the man is landed the empty buoy is hauled back and the same work is done again. Each time the man is in the buoy ready, the signal is again made by the separated signalman on the ship.



The necessity, or at least the preference, of the separate signal is that lamps may be in use among the crew at the loading station on the ship and something definite must be known ashore lest they pull the buoy away before the man is securely in place.

Where the wreck is such that the hawser can't be safely used the whip may be used as the only chance to pull the men ashore more or less wet, if not half drowned—but saved.

Here it may be remarked that if possible, I say it merely from experience, it would be advisable for some bold volunteer of the shore party to go off to the ship on the first haul of the buoy to instruct them how to come ashore and to see that all is properly made fast and the correct signals given.

General remarks on the above, which apply strongly to Sea Scouts, are these:

Without touching a rope you can be most useful, and the commanding officers should see to it, in keeping the ground round about the rocket apparatus clear of good-natured loafers. They don't mean to be any trouble, but are not in the drill, and they trample over the coils of line, pull on ropes when not wanted to, and may easily thereby cause actual loss of life. You can be most useful as reliable signalmen, and many of you will soon be A 1 at coiling and clearing ropes and to attending for first-aid the ship's people as they come ashore. The average "beachman" is a well-meaning individual with a great idea of taking command — well, keep him back.

The Sea Scouts in each district on the coast will, of course, be known to the coast guard and lifesaving stations. Also the scouts will know the correct places to which to send messages for life boat or tug, at least this will be so when the scouts have settled into place, and then the authorities will welcome the aid which the scouts can bring. Intelligent lookout and ability to signal are main factors in saving life off the coast. A boy's lookout may be as intelligent and sharp and his signalling ability as good as any man's though he may not be able to pull as many pounds on a rope.

The rocket apparatus sketches, above given, are meant merely to be diagrams to explain the parts and a sketch to show the whole in working order. You can make a model, or even go to sufficient size to carry a boy in the buoy. Then instead of a rocket you can use the "heaving cane" carrying light line. This cane is loaded at one end with about 1 to 2 lbs. of lead and at the other is a becket (loop) to which, the light heaving line is made fast. To heave the cane, coil or fake the line—loop over loop—from the shore end, and take the upper end and make it fast to the cane becket. There are many ways of throwing viz. :—Side swing, overhead cast; and swinging round, holding line in hand and cane and lead hanging down as pendulum, swing round and round vertically and let go when lead rises about level with your shoulder, or as found best in practice. As much depends on thickness of line and the strength of the thrower; 40 yards is a good cast.

The danger of the heaving cane must not be forgotten. Two lbs. of lead slung at you will break bones and may kill outright, even half a lb. may be dangerous; so in practising great. care must be taken for the receivers to keep out of the way. Do not heave to a boat, if the lead fell in on to a plank from a high heave it would probably go clean through the boat's bottom.

A kite may be used to carry out the line, but can only be with wind from behind the rescuers.

A full description of "How to make a Rocket Apparatus" can be obtained at headquarters, this apparatus is large enough to take a Scout across a pond.

LIFE BOAT.

Life-boat work may be taken in two classes, the coast life boats of the Royal National Institution and the harbour life boats of the institution, now commonly fitted with motor or steam engines.

These latter we need scarcely touch upon, as scouts are not likely to be called in as crew, though I would point out for whom it may interest that a Sea-scout signaller with his wag-flag taken out in the boat to the wreck might be of first-rate importance to communicate, via his co-signallers in the patrol on shore, the requirements of the case found on getting to the ship.

Probably not one in a hundred life-boat men can signal by flag-wag or arm semaphore. Often and often the life boat has to anchor and wait near the stranded vessel, then to - signal to and get answers from those ashore is highly important. Scouts can do it.

Life-boat work, both in the launching, the sea handling, and the beaching and hauling up, is man's work, and is beyond boy's powers, but scouts in organised and disciplined bodies can render great assistance in several ways at the launch, the return, and in aid to the injured or nearly drowned crew rescued by the boat and brought ashore.

Whenever life-boat practice is on or the boat is called away the scouts, if able, should be there, and for that purpose the institution will be wise to order the local secretaries, where Sea Scouts are established, to extend the life-boat "call" to the local headquarters of the scouts, and also to utilise their services in keeping the ground clear around the boat and in bringing up gear, signalling, and taking messages.

The way of launching a life boat from its carriage is scarcely scout work in any way, but scouts may well take interest in all that takes place so as to know what to expect on a launch, what may happen, what to keep clear of, and keep inquisitive idlers away from. The whole thing, from taking out of the boathouse to re-housing, is expert man's work.

The Sea Scouts may be most useful in knowing the name and house of every man belonging to the life-boat crew in their district, so as to aid in mustering the crew in the shortest time; also they should know where to find the doctors, and further, to get quickly in touch with tugs. Often the life boat puts off at great risk only to find, on getting to the vessel in distress, that the ship only wants tug's assistance, or shore labour to jettison or pump, and so on. Here the scouts, if used as signallers from boat to shore, would be of great value.
As to the handling of life boats, that is the big boats of the institution, it is the work of the expert only. There is plenty of theory, also rules of the sea, and of nature, which must be obeyed or disaster will come in the handling, but the main thing is long experience in actual practice. I am afraid you cannot get that from any book. In "single-handed" sailing in boats from five tonners down to canoes we do a heap of things almost by nature correctly and with hardly a thought, but it would take pages in a book to attempt to explain them; they come from experience; and so it will be with you and life-boat work, you will see things done, get them explained in spare time (not in action) by the men who do them, and you will soon know as much as the men.

Small life-boat work is often done, and you may do it with fishing boats, beach boats, and may be your boats will come in. "Life boat" is merely a term without definite meaning. Usually it is applied to ship's and yacht's boats that are fitted with air cases to prevent sinking and which have both ends alike—i.e., sharp. In these there is no provision by form to make them selfrighting if capsized, nor are there valves self-acting to let the water out if swamped, so nonsinking is their only "life" qualification, the air cases merely float the boat fully swamped. Some have an outside cork belt to prevent sinking (see sketch).

In a general way, neither ship nor beach boat can be fitted with double bottom and valves, nor with high air-cased ends, they would be too heavy and ungainly for ordinary work; but sufficient air cylinders to prevent actual sinking can be carried in any boat without more than mere fancied inconvenience.

Brave, daring boat work is constantly done on our coasts in ordinary beach boats, saving the

lives of hundreds in the year, these are boats of merely local type, open boats without any socalled “life-boat “quality about them.

Grace Darling, the brave fisher girl you have read about, saved life in the wild North Sea in an open “coble” boat.

But there you are! Those cobles constantly go out and remain out in the worst weather that the large life boats tackle. They are beached again in heavy surf, they can be equally well worked under sail or oars, but it is owing to their fine model and their not being hampered and weighted with appliances put into some boats, which actually invite the very troubles they are placed to remedy or avert. Curious! Isn’t it?

Small Life Boat.—There are some essential points for boats that may be put to life-saving service, that is boats that are not bound to certain forms by particular trade requirements.

The boat should be sharp sterned, not a transom (see Boating, Chap. VII.—picture). She will run safer in a heavy following sea, and can be beached more safely than a square-sterned boat. The coble model belongs chiefly to the east and north-east coasts of England, but would be equally effective the world over if understood by the men who are put to man them. The coble has a high bow above water and a deep forefoot, grand form for taking a heavy wave. Her after part, from midships to right aft, is flat floored or nearly so (see all about this in Chaps. VI. And VII. and in sketch), and thus she has great natural stability. There is no keel aft of midships, so she can be turned like a top, and, therefore, in able hands she can dodge the breaking waves in a way no other boat can do. This type of boat is beached stern first—the only correct way—but such way is risky for a keel boat, and keel boats are not suitable far beaching.

The nearest approach you can get, away from the east coast, of a coble is the whale boat, but the fault usually is they are built too lightly bilged (see Chap. VI.). Cut the whale boat’s keel off close up to the planking from mid length to aft, rounding up the heel, and use an oar for steering, and you have a wonderfully handy boat for heavy sea work. A rudder to a boat among breakers in beaching or putting off is not only useless but dangerous; an oar in a crutch or grommet over the quarter is a powerful controller of the boat.

In the Chapters VI. and VII. on boats, pretty well enough was said about handling; the main point which may be repeated is that, as life saving is usually done in bad weather and heavy sea, when nearing the shore to land on a shallow flat beach the boat must be turned head to sea and backed in by the oars, and from time to time rowed forward to meet a bad wave, and then. backed again as soon as the wave crest has passed her midships. If the boat is keelless and flat floored aft she will sit the beach kindly and slither up, with the next wave, but if she has a keel aft and especially a deep angular stern post and deadwood, these will cut deep into sand or shingle as the oncoming wave lifts the bow, and will pin her stern and over she must go, either right end over, or twist round on her heel - and be rolled over (see sketch thereof, fig. 3). On the back of a wave the boat approaching the shore seems to be travelling, rushing in, but really she has no way on her, it is the run of the wave; that is the time when the rudder is useless and just when she most wants keeping straight end on to the seas, and, therefore, the steering oar is necessary.

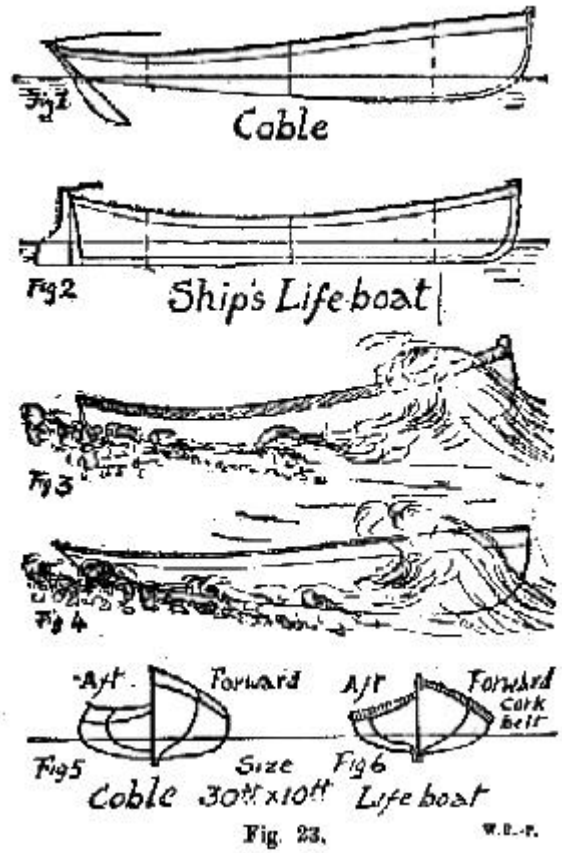
In rowing head to sea, going off, the great point is to meet each big wave with sufficient

headway on the boat not to be thrown back by the curling rushing top of the wave, you must put her head hard into it or you will be thrown back like a cork. So it is when running before the seas (waves), the wave crest has rapid rushing motion and will overtake the boat, it will up-end her stern, carry the boat along on its (the wave's) front side at tremendous pace, burying the bow deep in the solid, not moving, water in the trough or hollow of the wave; the low-bowed open boat will fill forward and be thrown over or twisted round and capsized. This is, as before said as to going out head to seas, got over by backing with the oars and holding her stern into the oncoming sea, but it can only be done with a sharp-sterned boat. And a "drogue" towed astern, spillable for going ahead and holding when wanted, is a great help in a dangerous sea.

(A drogue is like a canvas bucket only the bottom is carried out to a cone point, to this is a, tripping line coming in to hand, so the drogue is fast by its ring span to a rope and holds, point aft. The trip line pulls the point of the bag forward, then there is no hold on.)

If the beach is steep, and, therefore, there is deep water close in, it may be best to row bow first in, catching the right moment to be on the back, not front, of a wave, and row hard in and land high up.

These directions are, of course, only as to what may have to be done in extremities, but scouts should take every opportunity to practise; even in fine weather little curling waves will show you how a boat lands best or how she may be twisted about, then you will see the value of some or all the manoeuvres above mentioned.



A sketch of a north-east coast "coble" and of a steamship's "life boat" will show you two very different boats in shape though of same size, and it has been pointed out how extremely different their actions are in handling, and here you will see in figs. 3 and 4 the fatal difference between them in attempting to beach the boat, that is to land in a heavy sea on an open beach.

The upper sketch, fig. 1, is a coble. From midships to aft she has no keel and a very flat buoyant floor. Her immense bow is hollow below and powerfujly shouldered above water, hence she lifts to a wave with great ease. - Look at the sections in figs. 5 and 6, each of those lines is the shape you would see if you took a saw and cut the boat transversely where you see the perpendicular line in figs. 1 and 2. Figs. 3 and 4 show the two boats backing on to a shelving beach, of course the rudders have been unshipped. In each case the boat has come in on the back of the previous wave, the proper thing to do, and then with her stern on the beach she will be lifted by the next wave forward first, as-shown in the sketches. and then as the wave rushes along

her she will be lifted and carried bodily up the beach and dropped again. Now remember she will start moving up the beach as the wave takes her bow; in the sketch they are shown as having moved up about half the boat's length or less. Notice the
stern post or heel of the ship's life boat; it has, and always will do so, dug into the sand or shingle beach. Thus the boat has stopped, the wave won't stop, so up goes the bow and the boat is chucked over end, and probably smashed to bits. The coble's flat bottom (and no keel aft) simply sledges up the beach, and the bow is hardly lifted at all, and directly the wave drops her and recedes she sits flat and is easily run up by the men, so that the next wave never reaches her.

Numbers of lives of wrecked crews, who have safely got away in their boats, are lost every year in the attempt to land in ship's boats. These losses are about equally from two causes :—First, wrong shape of boat unhandy, crank, keeled boats, as above shown; second, as before remarked on, ignorance of handling among breakers, rowing in for the beach just as if going to land at town quay steps, instead of turning head to sea and backing in, and rowing to meet each bad breaker.

So you will soon learn when you have practised a bit in moderate weather that the sea is not hopelessly dangerous to those who know the right thing to do and use the proper boat to do it in; calm judgment comes of experience.

Boarding Wrecks.—Whether the wreck be a stranded ship or a floating ship deserted it is always best, if other circumstances permit, to board on the lee side. The main danger to you is of your boat being smashed against the ship, or may be holed by wreckage of spars floating to leeward, and where the sea is breaking over the deck of the ship there will be waterfalls over the lee side, which will swamp you if you get under them. So it all comes to doing the best the circumstances will allow. Masts not carried away have yet to fall. Heavy deck fitting or cargo is apt to be washed over the lee side. The best thing to do at first is to get hold of a long rope fast to the ship and ride to it to leeward, well clear; there get the boat in good order and bailed, puzzle out what is happening, and settle plan of action. This head rope should be rove through the boat's bow ring and held by hand with a turn round a thwart, never made fast, it may have to be slipped in an instant. Same as when being towed, the tow rope may have to be let go at a moment's notice.

When intending to board a floating vessel, whether moving or apparently stationary, great care must be taken to guard against her leeway, that is practically broadside drifting. When boarding to leeward of a vessel making a rapid drift, such as a vessel in ballast, the boat would be dangerously sucked in and held against the ship and smashed. Better go to bow or stern of such vessel, not the bow if she has sail set.

Refuse to take anything but lives into the boat. Bundles of clothes and boxes of supposed valuables are frequently attempted to be lowered into the boat. You risk all the lives by lumbering the boat. If you save the lives, and the property is afterwards saved by others, you stand in for your share of the salvage awarded.

There are cases which Sea Scouts may very easily come upon, where there has been a collision during the night and the one crew have abandoned their ship, thinking her to be sinking, and boarded the other and gone away. You sight her at daylight, and put off to her. First find what water is in her hold, or "well," and later note whether it is increasing. Inspect the wound in her hull and see if it can be packed with bedding, tarpaulin, or other things; pull down any signal that may be hung up, as you should hoist only what signal you want. Find the code flags (usually they are kept in the cabinway aft), bend ready Y.P (want a tug), and keep ready N.C urgent ("in distress—want assistance") in case anything happens. However, one cannot here go into all that a seaman would do and in the hundreds of different circumstances, but the best thing is to signal for a tug—as said—and meantime, if you can and wind and course permit, get some sail on her and make towards shelter. Do not allow, or try to prevent, any new salvors boarding her. If they

board you persist in holding command, ten to one they know less about what to do than you do. You may "accept their offer of service," but they have no legal right to supersede you.

When the tug comes take her rope, she will throw a heaving line (small line), if you have men who have come off they will soon haul the towing hawser on board, if not you hail the tug to come alongside, or to send her boat with two or three men.

Steer after the tug, and if you have spare hands go and see if an anchor is sufficiently ready to be let go, sufficient chain ranged, or windlass workable by you, if not (if any doubt) find an axe and keep it handy, and direct tug to pull her into some sheltered corner of the harbour; cast off rope, or cut it, and run her on to the mud. (Of course much depends on place and nature of vessel.) Haul down all flags, leave two of your scouts in possession, and get ashore and report to the Receiver of Wreck, and notify that you are "first salvors."

However good your intentions of doing a mere useful service, remember that in salvage you have a right to reward, and that others will sharply claim it away from you if you do not hold your own.

THE MAN-SLING.

The "bowline on the bight" is a make-up of a rope's end which you should study above any of the bends or hitches. You may at any time have to "sling" a helpless man's body, such as from a boat to the deck of a ship or up to a dock quay, or a pier. A body in wet clothes is great weight. Say the case is man overboard from a "tramp steamer"; you are there, the boat picks the man up all right, there she is alongside 30 feet below the rail, nothing but a rope ladder to get up from boat to deck, and the boat is, perhaps, in a rough sea. Now in probably 90 cases out of 100 the insensible, nearly drowned body is kept in that boat all that long precious time while the boat is being hooked on to the davit tackles and hoisted up, then there is considerable time and trouble in lifting him out of the boat on to the deck. Very commonly the opportunity for reviving him has been lost by all this delay—just think, rescued and lifted into the boat insensible, the row back to the ship, the wait alongside while hooking on, hoisting the boat, and passing the man on board.

While the boat is away you, on the ship, get a long rope on the lee side of the upper bridge, make a "bowline on the bight," and hang it over down to near the water.

When the boat comes in hail the men to put the man into the "bights" of the bowline with a folded coat, maybe, between his body and the ropes under his chest and stomach (if he is insensible), and then two or three on the bridge pull up, and others swing him in on the deck under the bridge end, and start at once to revive him.

The same may happen at a high quay or a pier, there usually is only a perpendicular iron ladder; or, again, a man may become injured up aloft, stunned, leg broken, and so on, you cannot carry him down the ratlines of the rigging, he must be lowered by a

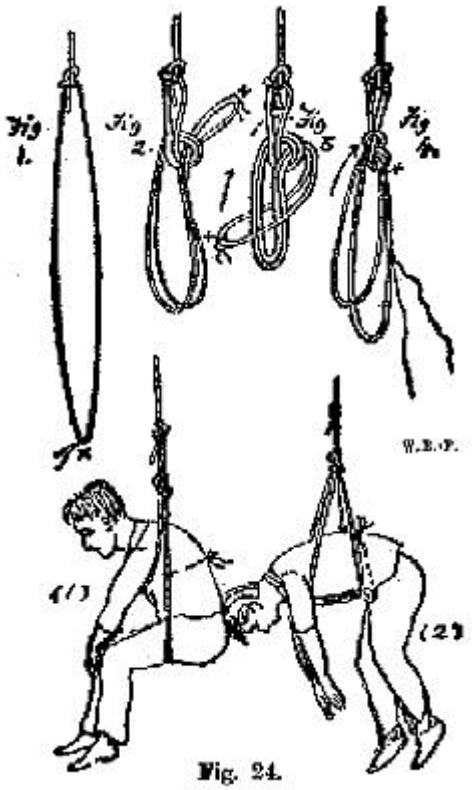


Fig. 24.

rope. (Many instances and the details too much to set out here.) How to sling him quickly is the thing.

Take a long rope of small size about as thick as your thumb. Measure off four stretches from hand to hand as wide as you can stretch across your chest, this will give about 20 feet. At that place make a "bowline" with the bare end (fig. 1). Middle the bight (x, fig. 1), it will be about 9 feet 9 inches long, and tie a bit of string on there. Make a curt near up to the single bowline (fig. 2), and pass the bight x the right way through it, so the loop z is opposite the head loop; haul the bight z well through and open this loop and dip the loop around the rest of the rope loops and upwards (as per arrows in fig. 3), so that x, the end of the bight, comes to the dots just under the single bowline bend; pull back down through the curl and you have the loop sling (fig. 4).

The loops can be made of equal lengths for an insensible man (2) or seat and arm lengths for injured man (1), by simply shifting the part with the string mark x around before tightening the knot (try it in thick string)

In the case of a helpless man it is advisable to prevent any chance of the body slipping. For this a bit of small line cloves hitched on at o will be handy for the men in the boat to make across the back lashing in (1) or hip lashing in (2) (see dotted lines). As said above, for (2) it is advisable to put a folded coat between sling and man, but not necessary; no time should be wasted. -

One point to remember is that in slinging a man the knots or bends must jam, if they slip they may tumble him out of the sling, or squeeze him to death by his own weight; the hauling up may be rough.

This sling can be used on shore at a fire to lower persons from a window. Practise the making. Also it is just the thing for teaching swimming, being made in small line attached to the end of your staff.

CHAPTER XII

THE BO'SUN'S LOCKER

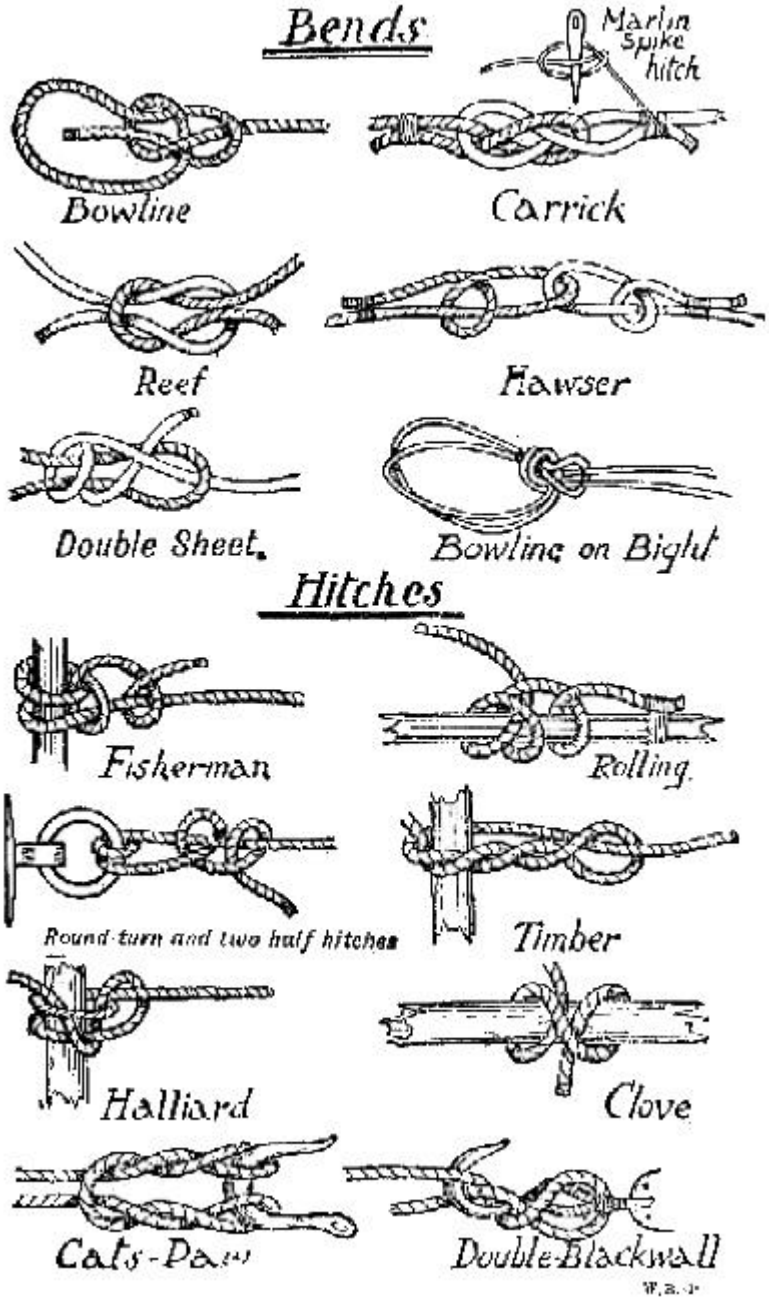
"Bends" and "hitches" are the terms used for fastening a rope to a rope or to anything. Probably the most correct definition would be that "bend" is the act and "hitch" the mode of acting. A "knot" is a stopper at the end of a rope or placed somewhere upon it, such as "Turk's head," "man rope," "wall," "crown," "Matthew Walker" "blood." A "bowline" is really a bend and hitch, and, from constant wrong writing, commonly called a "knot"; you "bend" two hawsers together to get a greater length, by making two "bowlines bends"; so also the two ends of reef points on a sail are fastened together by a "reef bend" but it is commonly called a "reef knot."

"Bend and hitch "—an example of this is—you want to get a hawser on to a vessel for towing; it is done by a heaving line; a good length of the end of the hawser must be free to make fast to the bitts or bollards; so about 5 fathoms up the hawser you "bend on" the heaving-line by a "rolling hitch."

However, though it is well to be correct in knowledge, it is better to be able to decide in a moment what is the best mode of fastening a rope no matter whether it be correctly described as knot, bend, or hitch.

Generally I would put it thus—a "knot" is permanent connection; a "bend" is an undoable connection of rope to rope; a " hitch" is an undoable make fast of rope to something else.

BENDS OF ROPE TO ROPE.



The bowline is used on the end of a warp to put over a bollard, or a mooring post, on a vessel or a quay. Bowline on to bowline is to join two ropes for heavy work to get longer rope, such as for towing, or mooring.

The carrick bend is for joining two hawsers for "warping," hauling a ship across a dock, where the "bend" may have to pass round the capstan in winding in.

The reef is the untyable "knot" used for tying the reef points in reefing sails.

The hawser is another mode of lengthening a warp or tow rope.

The sheet bend is generally useful, it jams tight by the pull, but is easily cast adrift.

The bowline on the bight is very useful as a man sling (see lifesaving, Chapter XI.).

Hitches.—Rope to spars, rings, hooks, etc. The fisherman used for making the boat warp fast to the ring of the anchor, or to the sea anchor of spars, etc.

The rolling hitch for making a rope fast on a mast or spar so that it won't slip down; it jams, but can be let go. The boat rope thus fastened to the boat hook, the hook can make a quick

catch hold of a ring bolt or rail stanchion for tow, in smooth water, also used for fastening a tail block tackle to a halliard, etc., to set it up taut, and then take the tackle off when the set up is done.

The round turn and two half hitches, a good hitch for mooring to a buoy ring or a ring on a dock wall; it can be quickly cast off, whereas if the fisherman hitch was used, it jams while there is strain on the hawser.

The timber hitch is useful in towing a spar, when drawn tight a half hitch or a "stop" (a binding) can be added near the end of the spar.

The halliard hitch is much used on lug yards, fore-and-aft topsail yards, the head of the jib, and many other things which hoist close up. It holds "till all's blue."

The clove hitch has many uses in a small way; it is the hitch for securing the "ratlines"to the shrouds, the ladder for getting aloft.

The cat's paw is formed on the "bight" (loop) of rope, usually to secure a sling to a crane hook.

The blackwall is the way to take a rope end, say, a shroud lanyard, to a tackle hook when setting the shrouds up tight, or such like work.

The marline hitch is a series of overhand knots made around something; it is used in lashing up hammocks for stowing; it acts as a seizing for holding two ropes together, or spars, or for lacing a sail to a gaff or boom, the line being then passed through the eyelet holes on the edge of the sail and round the spar an overhand hitch at each eye.

SPLICING HEMP ROPE

A rope is made of small parts, all twisted as to themselves and they are twisted together till a rope, a hawser, or a cable is formed.

Yarns are the smallest, they are twisted fibres of hemp, coir, manilla, flax, cotton and wire. Strands are the yarns laid up, and twisted together.

Making up a rope. The yarns are twisted to the right in making. Then laid together to the left to make strands. The strands are laid to the right, twisted with one another, and make a righthanded rope. Three strands are called hawser-laid. Four strands with a "heart," internal straight up strand, are called "shroud-laid," right-handed twist. Three small hawser-laid ropes twisted orlaid, left-handed, are a "cable-laid" rope, a cable if large enough.

Spunyarn is three to nine rope yarns laid right handed.

Nettles, two or three yarns left handed, twisted together right handed.

Sennit is made of several twisted yarns plaited together.

Hemp rope is measured by its circumference; coir rope is measured by its circumference; wire rope is measured by its circumference.

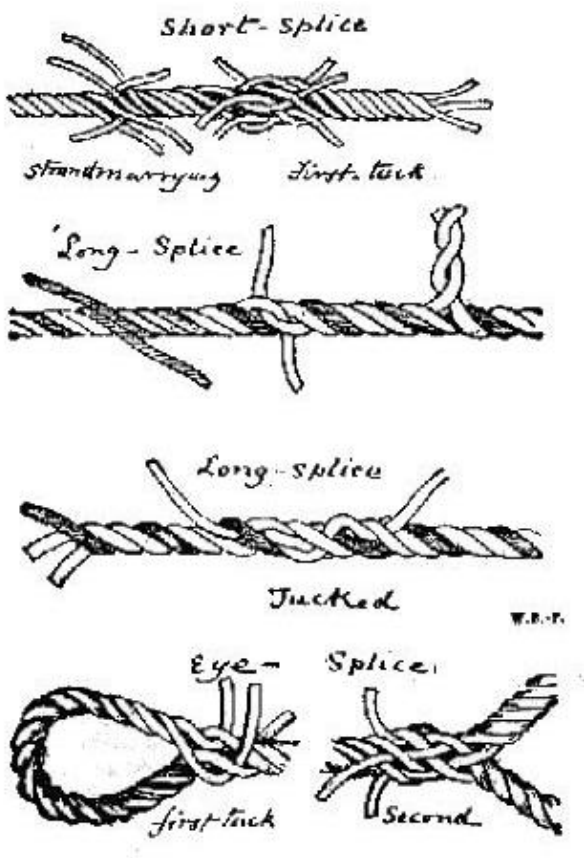
To “worm, parcel and serve” a rope means that worming is laying small line around in the hollow of the twist to fill up; parcelling is wrapping over the worming diagonally around the rope a tape of fine canvas, tarred; serving is close binding over all with spunyarn. “Worm and parcel, with the lay, but always serve the other way.”

The short splice is for joining two ends of rope which will not have to travel through a block or for making a block strop, etc.

The long splice is joining two ends of rope in such a manner that the rope can run through a block or a thimble, etc.

The eye splice has many uses, for holding a block or thimble, or thimble and hook, etc., on the end of a rope, or a tail, or the end of the tackle “fall” rope to the block.

Splicing short, unlay the two ends to be spliced (practice soon teaches you how much is wanted) to sufficient length for tucking and pulling tight. Place the strands one strand between each two of opposite end (called marrying), it may be needful to, whip the end of each strand to prevent it untwisting. Of course, you have a marlinespike or pricker, this is to push through between the strands of the solid part of the rope to make a hole to push the strand through. Dip the spike through across the lay, and withdraw it and pass the strand through, so that it takes one strand under itself and goes through under the next strand of the solid rope; pull neatly tight and follow on the same game with the next strand to left if the rope is right handed, and vice versa for left handed.



When all are thus passed turn to the other side and put those strands through down that bit of rope. Adjust all, pull neat, and a few hammerings with spike butt will soften lumps into beauty. The second “tuck” is done the same, but tougher boring for the spike; when drawn tight after second tuck, open and half the strands, leaving one-half dangling, tuck the others twice; thus each side being done, cut off the ends, not too closely, and the splice is made; it can be served over for neat appearance.

The long splice —Unlay the strands of the two rope-ends for a length of about six times the circumference of the rope. “Marry” the strands (as in short splice), suppose it’s to the right hand twist, you facing rope; take two strands, the one from left hand being over the right hand one, put a light stop round, unlay a. strand of the right rope and follow up with the strand from the other or left side that was lying above it so as to fill up where the other strand was at 6 or 8 inches out, tie these two strands with a half twist round each other and then tuck the ends and half ends and quarter

ends to make a nice taper. Then do same on opposite side to left; then a half turn knot or twist of the two middle strands and tuck them in whole, half and quarter. Hammer gently into smooth fit, pulling all ends as you do it; then cut off, and the thing is ready for use.

An eye splice.—Unlay the strands of the end, open and lay on to rope, having made sufficient bight of rope for required eye. Take the three strands to the left, middle and right, as you hold the eye bight up your left hand and left thumb on the middle strand; spike in right hand. Pierce the spike under the solid part of strand, which is underlying your middle loose strand, bring the point out over the next strand to it across, then work the spike round pointing up the rope, this gives a lift and leaves a hole through which you can point the strand, especially if its end is whipped with sail twine. Then do same with left strand. Turn a bit, and tuck the right strand under the remaining solid strand, end to left; humour and pull all taut, perhaps a touch or two of handle of spike to humour them into place. Another tuck whole, then half strands and cut ends.

WIRE ROPE SPLICING.

This is a branch of knowledge required by the regulations for King's Sea Scouts, so I think it necessary to say something upon it. You may have wire rope to fit in various ways to your guardship's gear, flag staff, gangways, boat davits, and so on. All such work will be eye-splicing, to fit the wire to thimbles, blocks, and over shoulders of spars; for any running gear you would be using rope.

The stuff of which wire rope is made differs greatly in its nature; some is quiet and quite easy to handle in splicing; while other kinds jump and fly like watch springs directly you cut the whipping to open out the strands.

To start in for splicing, nearly all flexible wire rope is now six stranded right hand laid. Down the centre runs a hemp heart of same size as one of the strands. Each strand has a hemp heart of the size of the wire of the strand. Iron rigging wire has not.

Remember that wire jumps, is springy, and very powerful; so, when splicing, keep your marlinespike through under the strand till you have tucked the strand.

Before opening the end of the rope put seizings on at the points giving the length for eye and the necessary length for strands for tucking. Unlay the strands, putting a whipping of fine twine on the end of each as you unlay it—else all the wires of several strands will fly out like hairs on a bristle paint brush. Then seize the two parts of rope, on the eye side of where the splice is to be, together for temporary holding.

The strands being all whipped at end and unlaid down to the mark seizing, cut the heart away, and lay three upper right-hand strands over the right side; the eye part against your hip for small rope or triced up on your large rope. You are working on right handed rope. Beginning with the right-most strand, tuck it down to right under two strands. Then the next strand, entered in the same layer, goes under one strand; then the third strand goes through under the next strand layer; pull all these down pretty closely. Turn the rope over a bit and tuck the fourth and fifth in turn and the sixth the last, all come out on their adjoining strands and further tucking is under one strand each and each round its own first strand, not crossing as in hemp splicing.

As the strands are laid left-handed and the tucking around is left-hand laying, the object is to get the strands opened a bit so the wire may assimilate as much as possible with the wires of the unlaid strands of the rope.

Two tucks whole and one tuck half strand is enough for most work. For heavy work it is usual to tuck three times whole and then two tucks of half strand.

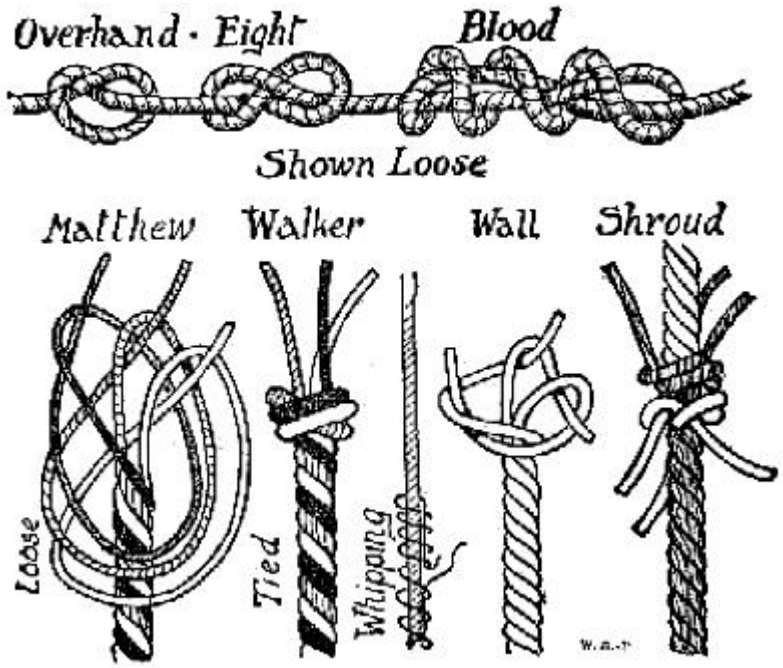
The finishing job is the work where experience comes in and makes neat work and no knuckles. I may here say that for years past I have done all the splicing about my small yachts and boats myself, because for racing the rigging splices must be above suspicion, the whole show depending on first class rigging. If a shroud eye draws, ten to one your craft will be dismasted. The cause of my taking on such a troublesome job as some twenty-five steel wire splices was that I had had a splice give out, a shroud eye, on a set of rigging made by professional riggers. I opened out another of those shroud eyes for inspection, and found it only had one whole tuck and two half strand tucks— no doubt done for "neat looks "—where it ought to have been two and two.

The way to finish is to get a luff tackle on the wire and the eye fixed, put a good strain on; then, with a block of wood as an anvil, hammer all round the splice to persuade the strands of splice and the rope to come neatly together. Next in small work serve over the splice; in large work parcel with oiled canvas or linen, and serve over it tightly.

KNOTS AND FANCY KNOTS.

"A midshipman should be useful, not ornamental," is an old saying, and so it is with knots in this book; if space permitted I should give you all the "fancy knots," round and square sennit, roving Turk's heads, double diamonds, manrope, and so on. But pages would be filled for mere fancy or show.

You may want knots on a rope as stoppers to hold on to, to prevent the rope running through beyond a certain distance, say a sail sheet through its block or a halliard, or any rope that may suddenly be let fly may need a knot in it to prevent it unreaving, so I give here, in this edition, only just those that are necessary. They are : —The overhand knot, the figure of eight, the blood knot, the Matthew Walker and the shroud knot.



The upper sketch shows the simple tie knots. Of these the blood knot makes a very efficient stopper for hand-hold, and cannot be dragged through a block. The figure of eight is what you put, only while sailing, on the end of ropes such as the sheets or any rope liable to

come unrove from its lead or block.

The Matthew Walker is made of over hand knots on each strand (see sketch) over-riding one another. It is useful for any rope-end stopper, such as the handles of a sea-chest, or a bucket, a gangway manrope, and lots of things about the decks of a ship.

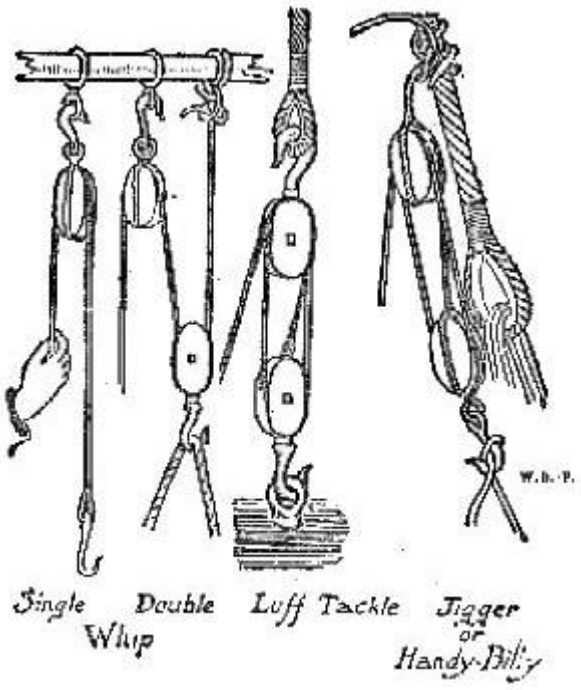
The shroud knot is very useful in joining two parts of rope for lengthening, or a breakage when such rope has not to pass through blocks or narrow leads. The sketch shows the wall knot and the shroud knot is simply two wall knots one belonging to each rope, put on after marrying the strands as if for splicing. See the white rope and dark rope married and walled in the sketch, of course it pulls tighter for finish. To make a neat job, the strand ends cut off to three or four inches are unlaid and pared off taper by a knife, and wrapped round the main rope in the lay, a light twine turn or two to hold them close, then serve over with spunyarn gives a lasting finish. Always be neat in your rigging, a lubber's boat shows bare splices and unravelling rope ends.

The central figure shows how a "whipping" for a rope end looks before being tightened on. The inner part is the commencement, lay the end of the twine along the rope, wrap tightly five or six turns of the twine around the rope and twine end, then put the other end along, pointing up the rope, and wrap round it and rope in continuation of the first wrapping, when enough is on, pull the long end through and cut off the spare ends, fray out the strands a bit, and cut them to quarter or half inch length;

TACKLES.

These are made of blocks (pulleys) and ropes for gaining power to tighten gear or to lift weight. A single whip tackle is one single sheave block, fixed, and rope through it; man pulling on one part of the rope (called the fall) can lift anything that he could lift by hand, but get it above him or to places he could not lift it to. This has no added power.

A double whip—a hook block—is rove on the rope above described and the rope end is-carried to and made fast at, or close to, the single block, then greater weight, slung to the hook' block, can be lifted by the man, power is gained double, power is called "purchase."



A luff tackle is a two-sheave upper block and single lower block, the rope end is fastened to the single block, passes through one sheave of the double, then through the single, then through second sheave of the double block, and the "fall" comes to hand. If the double block is the fixed point and the single the lifting part, the power is threefold; if the single is the fixture, and you pull the double towards you, your power is fourfold.

Such luff tackle is much used in boats, the "single" being the fixed point and the "double" on to the halliard, or the

clew of sail for sheet, or for lifting centre plate.

For hoisting boats on your guardship davits you would use a tackle of two double blocks, the end of the rope in the purchase being spliced into a metal becket on the upper or head block, and the pulling fall leads from that block on to the deck.

A handy billy is a luff tackle, the double block of which has a rope spliced round instead of a hook, and a couple of feet or so from the block this rope tail is laid up as flat sennit tapering. This tail you can clap on by a rolling hitch to any rope or halliard that needs tightening up, and many other uses. Another name is a "jigger."

There are three and four-sheaved blocks used in tackles on big ships, but beyond your present work. "Runner and tackle" is a form of purchase used mostly in fore-and-aft craft for getting a tight back stay to the mast, yet able to be let go quickly. The back stay, a wire rope, has a single block spliced in its end, say 8 feet above deck. Through this block travels a single wire rope one end hooked to an eye bolt at the rail, the other end fitted with a luff tackle also hooking to an eye bolt at the rail and the fall, leading from the upper or double block of the luff tackle, goes or sets up under a cavvel (wooden cheek usually) to a cleat. All yachts have runner backstays and they are constanly being either let go or set up as you will find when you go yacht cruising.

A block (wooden) has a shell, usually of ash, the top is the "crown," the other end is the "arse." The shell is "scored" to take the rope "strop" to which the hook or thimble is fitted and seized tight. The slot for the sheave is the "swallow"; the sheave is either wood (lignumvitæ) or metal, and is held, and revolves on the "pin," this is kept in the shell by the strop passing over outside its ends. Some sheaves have a series of rollers let into the centre, which revolve upon the pin, they lessen friction. Most yacht blocks are metal stropped within the shell, which is rivetted in parts all over the strop.

Books On Knotting

Brown's Knots and Splices. Interlacings in colour.
Knots, Splices and Fancy Work. By C. L. Spencer. –

CHAPTER XIII.

BUOYS AND BEACONS.

Buoys, generally, throughout the United Kingdom are laid under a "Universal System of Buoyage."

They are placed near the edge of shoals, and, with a knowledge of the system, the shape and colour of a buoy will give a. navigator all the necessary information as to the direction in which the danger lies.

'The principles governing the "Universal System" are as follows:—

Starboard hand buoys are conical in shape and painted one colour (red or black). They should be passed on the starboard (right hand) side when navigating with the main stream of the flood tide, i.e., when entering a harbour, etc.

Port hand buoys are can shaped and painted two colours (red and white or black and white) either in vertical stripes or chequered. They should be kept on the port (left hand) side when going with the flood stream.

Should there be a shoal in the fairway of a channel its ends are marked by spherical buoys painted in horizontal bands (red and white or black and white), the outer end buoy carrying a staff surmounted by a diamond shape, and the inner end by a staff and triangle shape. These shapes are known as topmarks.

Other topmarks are carried on channel buoys, if necessary, to attract attention, always a staff with ball or balls on conical (starboard hand) buoys; and a.staff and cage on can (port hand) buoys.

Channels are generally marked in alternate colours. That is to say, if two channels run parallel one would have black conical buoys starboard hand, black and white can buoys port hand, and would be called a black marked channel. The other channel would have red conical buoys starboard hand and red and white can buoys port hand, and is known as a red marked channel.

It will be seen that the shape of a buoy is its most important characteristic.

Lights and bells are carried by buoys of any description in any position to mark a special danger or make the channel available for navigation by night.

Special buoys are used for the following purposes:

Pillar buoys generally mark the fairway or navigable channel. Conical buoys, black and yellow chequered, mark the end of a sewer outfall or an area in which sludge may be deposited.

Conical buoys, black with word "Telegraph" in white, mark submarine cables. Conical buoys, green with word "Wreck" in white, mark sunken wrecks.

A wreck in a position dangerous to navigation is marked by a vessel painted green with the word "Wreck" on her sides. During the daytime she exhibits balls to indicate on which side she should be passed when going in the direction of flood tide. Lights take the place of balls at night. (See diagram 15).

Beacons are marks erected on shore or on sandbanks, and are of various shapes and descriptions.

Lightships carry a topmark at the masthead, such as a ball, cage, etc., which is a signal that she is at her proper station. Should the vessel, by bad weather or otherwise, be driven from her position the topmark is struck, and at night she would show a red light at each end and a red flare every 15 minutes.

The foregoing rules apply, generally speaking, throughout the coast of the United Kingdom, but there are some few exceptions of harbours, etc., where the local authorities have not worked in accordance with the "Universal System of Buoyage."

THE LOG BOOK.

This is the ship's diary of the work and navigation done, and all movements of the day, the twenty-four hours from noon to noon. It is made in columns and lines, each line is for an hour, and the columns are set out thus in general way, hour, course, speed; wind, leeway, deviation remarks. At the end of each twelve hours is a space to fill in the ship's position,. names of lookout, officers of watch, water in wells, etc., and officer's signature.

The remarks column contains all things done, seen, cross bearings taken, times of passing lights and anything of interest. The Irish mate wrote up "Dead calm with wind south; caught a porpoise but lost him."

Steamers keep logs containing other columns with connection to steam work, and also keep an engine-room log containing all about the working of engines, the coal consumed, oil used, and such things as remaining quantities of coal and oil, officers of watches and remarks.

A captain wrote in the log in the column of "remarks," of Saturday, "Weather fine and clear, wind S.E. ; first mate drunk." Next day the mate's turn came and he wrote "Sunday noon, weather fine; skipper sober." Could the skipper complain?

If your boat's crew happens to find a derelict vessel perhaps ashore, or adrift after collision, the crew having been taken off by the other ship perhaps in the night, you search for the log book in the captain's or mate's cabin, because in the log you will find all about the ship and her voyage, and can signal it to the shore.

Ship's Watches.—As a general rule the crew of a ship is divided into three parts—the starboard watch, the port watch, the "idlers," i.e., those who are not used generally in working the ship but have a host of other duties to perform, for instance, cooks, stewards, carpenter, etc., but all are paid hands and part of the crew. The two watches, in a general way, work on deck for 4 hours and then are "watch below" for 4 hours, with two 2-hour watches, called the dog watches, in the evening, which make a change round each 24 hours. The watches are called first, middle, morning, forenoon, afternoon, first dog, second dog.

Respectively these are 8 to 12 p.m., midnight to 4 a.m., 4 to 8 a.m., 8 to noon, noon to 4 p.m., 4 to 6, 6 to 8. "Anchor watch" is harbour lookout, etc.
Ship's Bells.—This is the way time is sounded, so all within hearing know about what time it is by the last "bell" they heard. A sailor's watch is usually kept in his bag or chest while he is at work. Officers, of course, carry a watch in pocket for many notations of time required in their duties. Starting with noon, which is eight hells, we go on to one bell or 12:30, every half hour day and night the bell is sounded. So the "bells" go on progressively — 1 o'clock is two bells, and 1:30 is three bells; and so on up to eight bells. The "bells" are given in couples and ones, for instance 2.30, five bells, is - - - - -; six bells would be - - - - - - in couple strokes, just a space of time between each couple of strikes, so also between a couple and a single strike.

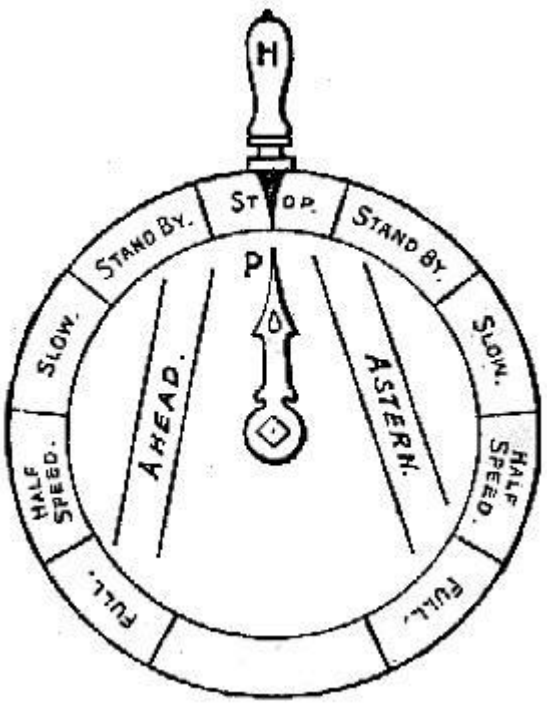
On board a vessel if asked the time you don't say "a little after half past eleven," you say "just gone seven bells."

In the dog watches, 4 to 6 and 6 to 8 evening, the bells only go up to four bells at 6 pm, then one, two, three and eight bells.

ENGINE-ROOM TELEGRAPH.

The engine-room telegraph is situated on the bridge, another of the same description being fitted in the engine-room. When the officer on the bridge moves the handle (see fig.) to stand by, or slow ahead, or astern, a bell rings in the engine-room.

The engineer attends to the warning and observes his dial, then moves the handle of his telegraph to the same as the order from the bridge. P, the pointer (see fig.), is the repeating signal, which shows the officer on the bridge that his signal is understood.



If the vessel is steaming full speed ahead. the pointer on the bridge (and in the engine room) should point at Full on the left of the figure. Before working the engines the pointer on the bridge should be compared with the pointer in the engineroom.

In the event of the engine-room telegraph getting out of order, or breaking down, it will be necessary to station men from the bridge to the engine-room, and pass the word (orders) along to the engineer on watch.

The engine telegraph should be studied by every Sea Scout whenever he gets a chance. They differ much in make-up and in figuring, so a Scout ought to get familiar with several kinds, as it may be the very one instrument he can best perform on should he take part in a salvage job. The telegraph is easily within a boy's power to work; whereas steering, if there be no steam gear, is man or two-man work, and large hawser work is out of boy's power.

The following has been extracted from the Journal of the Nautical Research Society:

The Boatswain's Call.

"THE BOATSWAIN'S CALL" or "Boatswain's Whistle" is an instrument by means of which orders may be passed round a ship in the quickest and easiest manner; firstly, by recognised "calls" or signals, differing from each other in notes, tone and shrillness—these should be understood by all hands on board without the interpretation being "piped" by the boatswain's mate, that is to say, without its being shouted verbally; secondly, by recognised "pipes" which draw the attention of all hands to an order which the boatswain's mate is about to "pipe" or "sing out"; thirdly,' by recognised "calls" which should be understood as salutes or marks of respect.

The "call" consists of the following parts :—The "buoy"; the "gun"; the "keel"; the "shackle."

The "buoy" is the whistle proper; the "gun" is the blowpipe; the "keel" is to facilitate its manipulation; the "shackle" takes the chain.

THE MANNER OF USING THE BOATSWAIN'S CALL

If the call is blown into with moderate force a certain note, dependent on the make of the call, will be obtained. If, however, it be blown into with greater force and the air which would escape is throttled by the fingers, a note of almost an octave above the former one will be sounded. By moderating the throttling, that is, by not closing the fingers completely over the side of the "buoy," any note between these may be obtained,

The hand should contain the side of the "buoy" close against the ball of the thumb. The tip of the thumb should be resting on the "shackle" or rather beyond it. The first finger should grasp the call to the ball of the thumb by resting on the middle of the side of the "keel" When throttled, the hand should be clenched, bringing the middle finger to the outer side of the "buoy," and the third and fourth fingers close against it, taking care not to touch any part of the edge of the hole in the "buoy," as this would stop the sound altogether. When open, the second, third and fourth fingers should be lifted together. When running a note up, as mentioned above, the second, third and fourth fingers are slowly closed (or opened).

The three methods of blowing the call :—(1) By blowing with an even pressure, with sufficient, but not too great power to get the clearest note at the particular state of the throttling. (2) As above, but introducing throughout a trill similar in effect to that produced in a whistle with a pea inside. This may be done, by allowing the tongue to vibrate whilst blowing, as if making the sound of a prolonged "R" without allowing any voice to escape. (3) As in (1), but blowing with a " vibrating pressure," producing an effect similar to a canary singing.

THE METHOD OF SHOWING VARIOUS PIPES AND CALLS GRAPHICALLY.
It should be understood that the "expression," if such a term may be used, gives the method or the "touch" with which many calls are carried out, e.g., in the call "walk back" (or ease a rope) the speed of the undulations indicates to the hands what speed of "walking back " - is required of them. Similarly "belay" sharply piped indicates "catch a turn," not "take your time and belay and coil down"; consequently the length of the calls shown below is only arbitrary; the actual expression being unable to be conveyed on paper. Along the top of each figure is a horizontal scale of seconds of time, which represents roughly the period of the pipe or call. Line i, or lower, represents the open note; line ii, or upper, the fully throttled note; the slope of the pen line represents the rate of rise and fall owing to throttling, which has been described.

1st method of blowing is shown by the plain line thus ————————

2nd method of blowing is shown by a hatched line, thus ////////////////////////////

3rd method of blowing is shown by a wavy line, thus ~~~~~~~~~~~

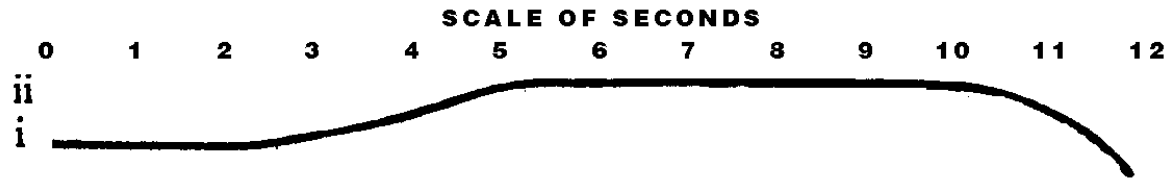
CALLS.

(1) "Call Boatswain's Mates."

etc., until they turn up. This is to call boatswain's mates before a long call such as "dinner" is piped, when the custom is for all boatswains' mates to pipe in chorus.

(2) "Pipe the Side."

Note.—There is no trill in this pipe; the scale of seconds is a little too low.



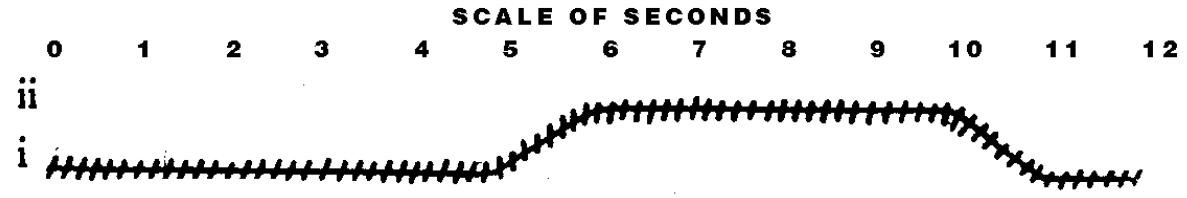
(3) "Pipe Still"

Note.—Should be started sharply and finished sharply.
Indicates stand "still" or to "attention" either as a salute to a passing ship, or to avert an accident during work.

(4) “Pipe Down.”

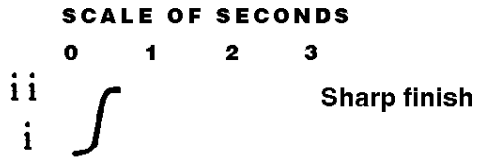
Means (1) hands to turn in; (2) hands down from aloft; (3) hands not required until further orders. The meaning should be immediately understood by the time of day and week. This is the
call for lowering washed clothes. We know of no call for “stand by to wash clothes” and have never heard of such an order being given.

(5) Reelers

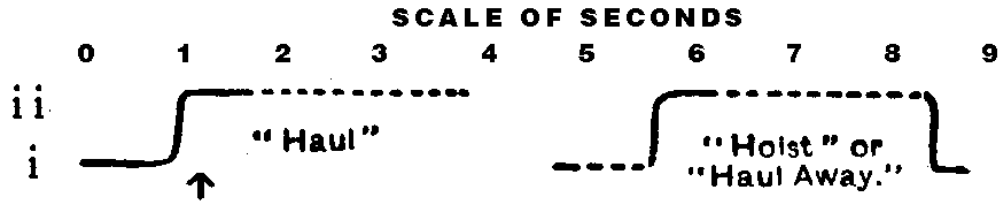


Calls the hands told off for heaving the hand log; up to recently, this when piped called the sounding party, who work the sounding machine.

(6) “Haul Taut.”

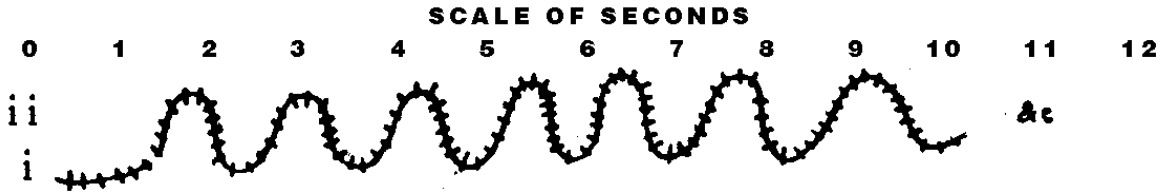


(7) “Haul,” “Hoist,” or “Haul Away” (according to how piped).



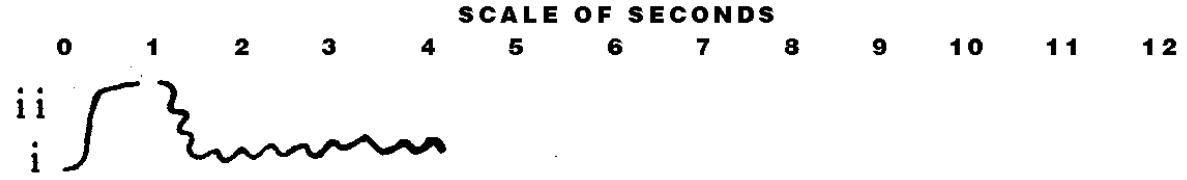
Haul is a signal for all to haul together. All fall back at the point shown by the arrow head. Hoist, or haul away, is a signal to walk or run away with it.

(8) “Walk Back.”



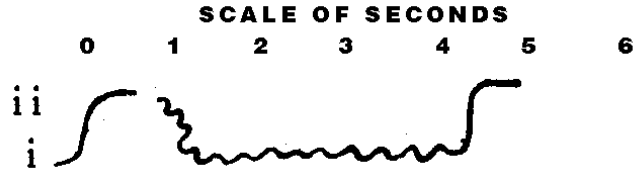
A very expressive call, meaning “ease” (a rope). The rate at which it is required to ease varies as the undulations in the call. it proceeds as long as the “walking back” continues.

(9) “Light To.”



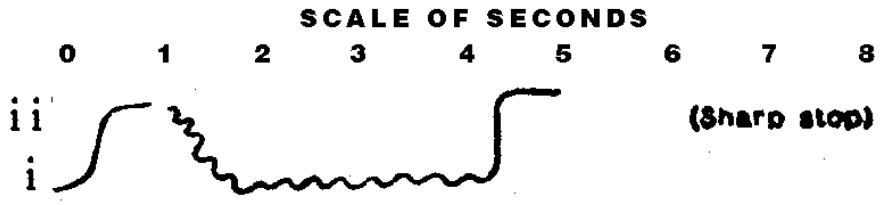
Means, “Let go.”

(10) “Belay.”



Means “Turn up,” “Catch a turn,” etc.

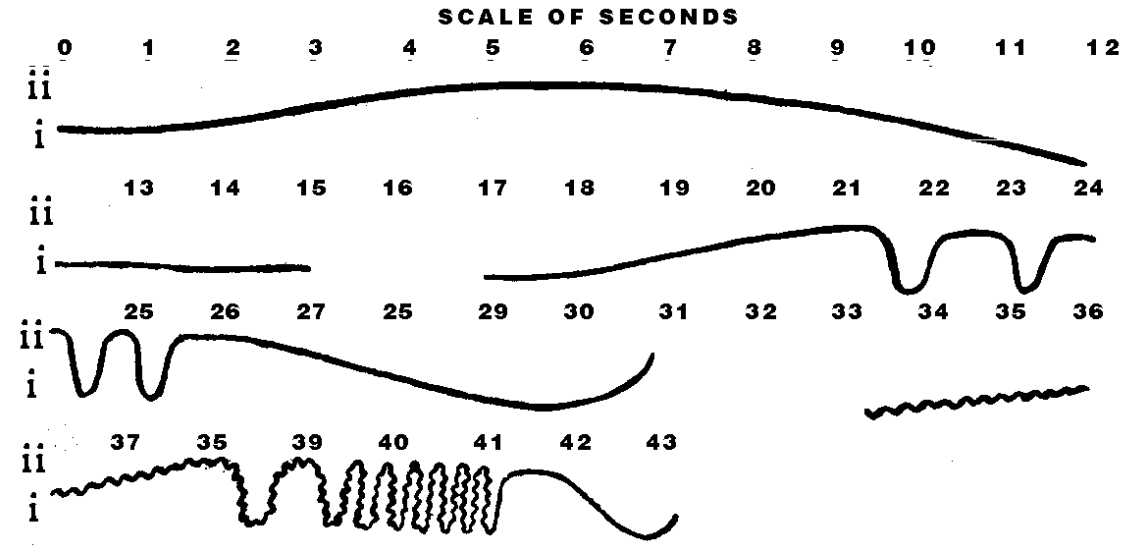
(11) “Avast !“ or “High Enough !”



(12) “Sweepers.”

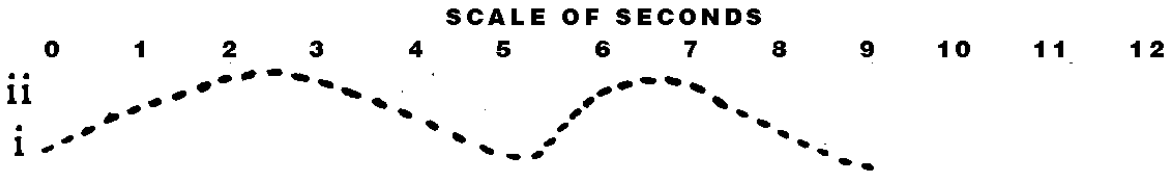
Note.—More undulations may be put in. Calls the upper deck and lower deck sweepers to their work.

(13) Dinner or Supper.



Note—Finish up with "Pipe Down."
Usually played in chorus for any meal and should be lengthened out as far as possible.

(14) "Heave Round the Capstan."



etc., for about a minute, boatswain's mates relieving each other. Very difficult without practice. It may be noted that in this call every "note" is used from that of the whistle itself to what may be termed the "throttled whistle." This, as shown, is the correct method of playing the call; but, because this method is difficult, the call is often played as shown in (14a), which is easier (14a). etc., as before.

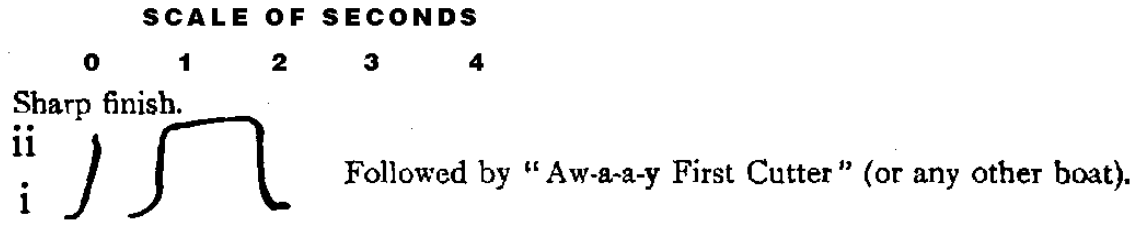
(15) "Veer and Haul," first "Veer," or "Walk back" for about five seconds, then "Heave round the Capstan" for about five seconds, and repeat as before as long as it is required, boatswain' mates taking turns. "Haul and Veer "—ditto, the opposite.

(16) If an order be given by an officer which it is desired should be obeyed "All together," the executive order will be similar to the "still" piped on the boatswain's call, but about one quarter as long.

PIPES

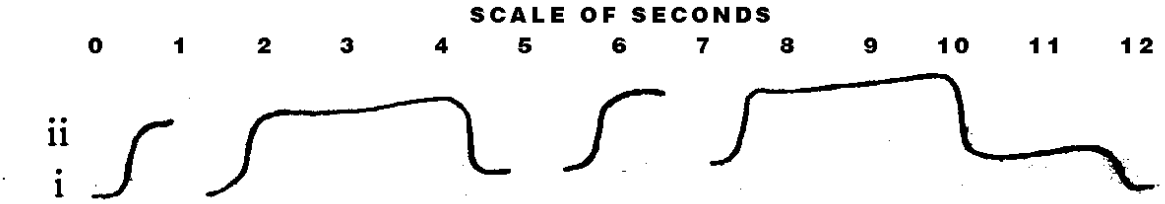
(17) "Away Galley." As for "Piping the Side," followed by a long-drawn "Aw-a-a-y Galley," the longer the better.

(18) Away any other boat, or before any other short "pipe" Sharp finish.



Sharp finish. Followed by "Aw-a-a-y First Cutter" (or any other boat).

(19) Before a long pipe such as "Call the Hands," "Call the (Starboard or Port) Watch," "Lash up and Stow Hammocks," all of which are drawn out as long as possible. Scale in seconds



Followed by "D'ye hear, there," and then. the "Pipe."

Book To Read

The Weymouth Yacht Log Book. Sail and for Steam.

PIPE-DOWN.

And now it would appear to be time to "pipe-down." This little ship is well under way; and, so far as can be judged without actual trial, appears to be in every way fully found and fitted for another cruise in Sea Scouting. No doubt defects or omissions will show up, and, if clearly reported, will be as fully as possible rectified when she comes into the dockyard to be overhauled for a third cruise.

Sailoring is here treated mainly for the boys; the Scoutmasters, and also the more expert readers holding sea knowledge, may think that many matters might have been more deeply gone into, but my object all through has been to avoid making a technical, drill, or school book—we are not educating to the sea profession, but we are drawing the young and growing mind into close yet playful touch with the call of the sea, yet essentially retaining all that belongs to the Boy Scout ideal.

This book was written in 1912 with a keen belief in the far reaching value of the Sea Scout movement in bringing boys within sound of the call of the sea. What the Sea Scout might be in war was imagined in page 25. What he did in the Great War may be found in history. The Times of February 26, 1916, said, "The Admiralty utilised the Sea Scouts when war broke out for coast watching and found their services so useful that they have enlisted nearly 2000 Scouts. They have increased the rate paid for maintenance and have just handed to the Boy Scouts' Association a cheque for nearly £57,000 in payment of subsistence allowance due up to date."