SEAMANSHIP,

TO WHICH IS ANNEXED, AN ESSAY ON

NAVAL TACTICS AND SIGNALS.

AS REGULATIONS

FOR THE GOVERNMENT OF THE

NAVY OF THE UNITED STATES OF AMERICA:

WITH

OBSERVATIONS AND INSTRUCTIONS

FOR THE USE OF THE COMMISSIONED, THE JUNIOR, AND OTHER

NAVAL OFFICERS,

ON ALL THE MATERIAL POINTS OF PROFESSIONAL DUTY:

INCLUDING ALSO,

FORMS OF GENERAL AND PARTICULAR ORDERS

FOR THE BETTER GOVERNMENT AND DISCIPLINE OF ARMED SHIPS:

TOGETHER WITH A VARIETY OF NEW AND USEFUL TABLES;

AMONG WHICH ARE,

General Tables for Watching Ship's Companies in all Rates;—For showing the Stations of the different Officers at quarters;—For the general appropriation of Men at Quarters, in Ships of every Class;—For Darling Sails; Mooring and Unmooring;—Making and Shortening Sail;—Tacking Ship, &c. &c.

WITH A SYSTEM OF NAVAL DISCIPLINE,

AND THE ACTS CONCERNING

LETTERS OF MARQUE, REPRISALS,

THEIR OFFICERS AND MEN.

WITH A CARTEL FOR USAGE AND EXCHANGE OF PRISONERS.

The whole forming a useful compendium to the officer, to instruct him when young, and to remind him when old.

NEW-YORK:

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DISTRICT OF NEW-YORK, SS.

Be it remembered, that on the twenty-first day of July in the thirty-eighth year of the Independence of the United States of America, Edmund M. Blunt of the said District, hath deposited in this office the title of a book the right whereof he claims as proprietor in the words following, to wit:

"Seamanship, both in Theory and in Practice. To which is annexed, an essay on Naval Tactics and Signals. Also, regulations for the government of the Navy of the United States of America, with observations and instructions for the use of the commissioned, the junior, and other naval officers, on all the material points of professional duty: including also, forms of general and particular orders for the better government and discipline of armed ships; together with a variety of new and useful tables: among which are, general tables for watching ship's companies in all rates;—For shewing the stations of the different officers at quarters;—For the general appropriation of men at quarters, in ships of every class;—For furling sails; mooring and unmooring;—Making and shortening sail; tacking ship, &c. &c. with a system of naval discipline and the acts concerning letters of marque and reprisals, their officers and men, with a cartel for usage and exchange of prisoners. The whole forming a useful compendium to the officer to instruct him when young and to remind him when old."

In conformity to the act of the Congress of the United States, entitled "An Act for the encouragement of Learning, by securing the copies of Maps, Charts, and Books to the authors and proprietors of such copies, during the time therein mentioned." And also to an Act, entitled "an Act, supplementary to an Act, entitled an Act for the encouragement of Learning, by securing the copies of Maps, Charts, and Books to the authors and proprietors of such copies, during the times therein mentioned, and extending the benefits thereof to the arts of designing, engraving and etching historical and other prints."

PHILIP SPENCER, Jun. Clerk.
New-York District.
At the present important crisis, every man who navigates the ocean should, by theory and practice, be a sailor; the working of ships depends on principles of mathematical form and origin; but the early authors who developed it scientifically have been found too abstruse for general use. They afforded materials however, which formed the basis of that theory which was afterwards confirmed by experience. M. Bourde de Villehuet has treated the laws of motion of fluids, with regard to ships, and the effects of the different sails and rudder, in a manner correct and accessible to general comprehension. But he has, in the humble opinion of the editor, performed a more essential service to maritime nations, by shewing the exact correspondence of practice with theory, the one accompanying the other, as the rule and its example; by which, not only is the truth of this science established, but nautical students are led on to aspire from effect to cause, and to make themselves masters of that upon principle, which else they could only know from practice. In this volume will be found practical directions for the management of ships in calm or storm, in harbour or on the ocean.

Our country being now engaged in a war with a nation whose fleets nearly "bridge the main," NAVAL TACTICS become more interesting to every American Mariner.

Whoever studies the history of the late revolutionary war, will be convinced that American Seamen have never failed to exhibit instances of intrepidity and perseverance. In the present contest, additional honours have already been added to its flag, and stripes again inflicted on those who have once been deceived in our strength. The Commanders of our Navy have science, courage and humanity; they have, in their several contests, proved that prudence and heroism mark every action, and their tactical operations will convince the nation whose ill-judged policy has called them into action, they will avenge the wrongs done their country. Justice and impartiality have marked our conduct, but while we wish for peace, still we will not shrink at war.

Every Officer in the Navy should be acquainted with the Laws for regulating the same, and the duties attached to each officer; this volume comprises the whole; the Laws granting Let-
ters of Marque and reprisal, instructions to armed vessels; together with every law by which officers and men are governed; with the articles entered into between the United States and Great Britan, for the treatment and exchange of prisoners of war.

Respectfully dedicated,

to the officers of the
American Navy,

by their
obedient servant,

EDMUND M. BLUNT.

New-York, August, 1813.
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THE THEORY AND PRACTICE OF WORKING SHIPS.

The working of ships, like other sciences, consists of theory and practice. The knowledge of a theory, which is founded upon unerring principles, is surely indispensable for the correct attainment of the practice which it guides; and it cannot therefore be unuseful to shew that the theory of working ships is supported by mathematical principles, and capable of convincing demonstration.

To the theoretic part are superadded directions for the performance of many evolutions, accompanied with demonstrations of the agreement of each with the mathematical principles before laid down. The whole, we trust, will form the most extensive collection ever yet brought together; and all founded, we equally hope, upon the surest principles.

But we do not affect to give specific directions for every possible situation of a ship at sea; because, if such directions could be given, they would most likely be unserviceable from their bulk: but, in explaining the theory upon which all nautical operations ought to be founded, we impart an unfailing source of knowledge to the seaman. Those principles will be his surest safe-guard in the hour of danger, and his best assistant in the time of untried difficulty.

EXPLANATION OF THE TERMS USED IN SEAMANSHIP.

ABACK. The situation of the sails, when their surfaces are pressed aft against the mast by the force of the wind.

ABAFT. The hinder part of a ship, or towards the stern. It also signifies farther aft or nearer to the stern; as, the barricade stands abaft the main mast; that is, nearer to the stern.

ABAFT THE BEAM denotes the relative situation of any object with the ship, when the object is placed in any part of that arch of the horizon, which is contained between a line at right angles with the keel and that point of the compass which is directly opposite to the ship's course. See Bearing.

ABOARD. The inside of a ship.

ABOARD MAIN TACK! The order to draw the lower corner of the mainsail down to the chestree.

ABOUT. The situation of a ship as soon as she has tacked or changed her course.

ABOUT SHIP! The order to the ship's crew to prepare for tacking.

ABREAST. The situation of two or more ships lying with their sides parallel, and their heads equally advanced; in which case, they are abreast of each other, as are the ships A B C. But, if their sides be not parallel, then that ship, which is in a line, with the beam of the other, is said to be abreast of her, as the
ship E is abreast of D and F. With regard to objects within the ship, it implies on a line parallel with the beam, or at right angles with the ship's length. **Abreast of any place,** means off or directly opposite to it.

**ADRIFT.** The state of a ship broken from her moorings, and driving about without control.

**AFLOAT.** Buoyed up by the water from the ground.

**AFORE.** All that part of a ship which lies forward, or near the stem. It also signifies *farther forward*; as, the manger stands **AFORE** the fore-mast; that is, nearer to the stem.

**AFT.** Behind, or near the stern of the ship.

**AFTER.** A phrase applied to any object in the hinder part of the ship, as the after-hatchway, the after-sails, &c.

**A-GROUND.** The situation of a ship when her bottom or any part of it rests on the ground.

**A-HEAD.** Any thin?, which is situated on that point of the compass to which a ship's stem is directed, is said to be **A-HEAD** of her. See **BEARING.**

**A-HULL.** The situation of a ship, when all her sails are furled and her helm is lashed to the lee side; by which she lies nearly with her side to the wind and sea, her head being somewhat inclined to the direction of the wind.

**ALEE.** The position of the helm when it is pushed down to the lee side.

**ALL IN THE WIND.** The state of a ship’s sails, when they are parallel to the direction of the wind, so as to shake or shiver.

**ALL HANDS HOAY!** The call by which all the ship's company are summoned upon deck.

**ALOFT.** Up in the tops, at the mast-heads, or anywhere about the higher rigging.

**ALONG-SIDE.** Side-by-side, or joined to a ship, wharf, &c.

**ALONG-SHORE.** Along the coast; a course which is in sight of the shore, and nearly parallel to it.

**AMAIN.** At once, suddenly; as, **LET GO AMAIN!**

**AMIDSHIPS.** The middle of a ship, either with regard to her length or breadth.

**To ANCHOR.** To let the anchor fall into the ground, for the ship to ride thereby.

**ANCHORAGE.** Ground fit to hold a ship by her anchor.

The **ANCHOR** is a cock-bill. The situation of the anchor, when it drops down perpendicularly from the cat-head, ready to be sunk at a moment's warning.

**AN-END.** The position of any mast, &c. when erected perpendicularly on the deck. The top-masts are said to be **AN-END** when they are hoisted up to their usual stations.

**APEEK.** Perpendicular to the anchor; the cable having been drawn so tight as to bring the ship directly over it. The anchor is then said to be **APEEK.**

**ASHORE.** On the shore, as opposed to **ABoard.** It also means **A-GROUND.**

**ASTERN.** Any distance behind a ship, as opposed to **A-HEAD.** See **BEARING.**

**AT ANCHOR.** The situation of a ship riding by her anchor.

**ATHWART.** Across the line of a ship’s course.

**ATHWART-HAWSE.** The situation of a ship when driven by accident across the fore-part of another, whether they touch or are at a small distance from each other, the transverse position of the former being principally understood.

**ATHWART THE FORE FOOT.** When any object crosses the line of
a ship's course but a-head of her, it is said to be athwart her fore foot.

ATHWART-SHIPS. Reaching, or in a direction, across the ship from one side to the other.

ATRIP. When applied to the anchor, it means that the anchor is drawn out of the ground, and hangs, in a perpendicular direction, by the cable or buoy-rope. The topsails are said to be atrip, when they are hoisted up to the mast-head, or to their utmost extent.

AVAS! The command to stop, or cease, in any operation.

AWEIGH. The same as atrip, when applied to the anchor.

To BACK the anchor. To carry out a small anchor a-head of the large one, in order to support it in bad ground, and to prevent it from loosening or coming home.

To BACK astern, in rowing, is to impel the boat with her stern foremost, by means of the oars.

To BACK the sails. To arrange them in a situation that will occasion the ship to move a-stern.

To BAGPIPE the mizen. To lay it a-back, by bringing the sheet to the mizen shrouds.

To BALANCE. To contract a sail into a narrower compass, by folding up a part of it at one corner. Balancing is peculiar only to the mizen of a ship, and the mainsail of those vessels wherein it is extended by a boom.

BARE POLES. When a ship has no sails set, she is under bare poles.

BEARING. The situation of one place from another, with regard to the points of the compass. The situation also of any distant object, estimated from some part of the ship, according to her situation: these latter bearings are either on the beam; as A and B; before the beam, as the arcs AD and DB; abaft the beam, as the arcs AC and CB; on the lee or weather bow, as the lines EE; on the lee or weather quarter, as the lines FF; a-head, as the line D; or a-stern, as the line C.

BEAR A-HAND. Make haste, dispatch.

To BEAR IN with the land is when a ship sails towards the shore.

To BEAR OFF. To thrust or keep off from the ship's side, &c. any weight, when hoisting.

To BEAR UP, or AWAY. The act of changing a ship's course, to make her sail more before the wind. Thus the ship A bears away from a close-hauled course, when she gets into either of the courses Band C.

BEATING TO WINDWARD. The making a progress against the direction of the wind, by steering alternately close-hauled on the starboard and larboard tacks.

To BECALM. To intercept the current of the wind, in its passage to a ship, by any contiguous object, as a shore above her sails, a high sea behind &c. and thus one sail is said to becalm another.

BEFORE THE BEAM denotes an arch of the horizon comprehended between the line of the beam and that point of the compass on which the ship stems. See BEARING.
TERMS USED IN SEAMANSHIP.

To BELAY. To fasten a rope, by winding it several times round a cleat, or pin.

To BEND A SAIL is to affix it to its proper yard or stay.

BENEAPED. See Neaped.

BETWEEN-DECKS. The space contained between any two decks of a ship.

BILGE-WATER is that which, by reason of the flatness of a ship's bottom, lies on her floor, and cannot go to the well of the pump.

BIRTH. The station in which a ship rides at anchor, either alone or in a fleet; the due distance between two ships; and also a room or apartment on board for the officers of a mess.

To BITT THE CABLE is to confine the cable to the bitts, by one turn under the cross-piece and another turn round the bitt-head. In this position it may be either kept fixed or it may be veered away.

BITTER. The turn of the cable round the bitts.

BITTEREND. That part of the cable which stays within board round about the bitts when the ship is at anchor.

A BOARD is the distance run by a ship on one tack; thus they say, a good board, when a ship does not go to leeward of her course; a short board and a long board, according to the distance run.

BOARD-AND-BORDER. When two ships come so near as to touch each other, or when they lie side-by-side.

To BOARD A SHIP. To enter an enemy's ship in an engagement.

BOLD SHORE. A steep coast, permitting the close approach of shipping.

BOOT-TOPPING. Cleaning the upper part of a ship's bottom, or that part which lies immediately under the surface of the water; and daubing it over with tallow, or with a mixture of tallow, sulphur, rosin, &c.

BOTH SHEETS AFT. The situation of a ship sailing right before the wind.

BOW-GRACE. A frame of old ropes or junk, laid out at the bows, stems, and sides, of ships, to prevent them from being injured by flakes of ice.

To BOWSE. To pull upon any body with a tackle, in order to remove it.

BOXHAULING. A particular method of veering a ship, when the swell of the sea renders tacking impracticable.

BOXING. An operation somewhat similar to boxhauling. It is performed by laying the head-sails aback, to receive the greatest force of the wind in a line perpendicular to their surfaces, in order to return the ship's head into the line of her course, after she had inclined to windward of it.

To BRACE THE YARDS. To move the yards, by means of the braces, to any direction required.

To BRACE ABOUT. To brace the yards round for the contrary tack.

To BRACE SHARP. To brace the yards to a position, in which they will make the smallest possible angle with the keel, for the ship to have headway.

To BRACE-TO. To case off the lee-branches, and round in the weather-branches, to assist the motion of the ship's head in tacking.

To BRAIL UP. To haul up a sail by means of the brails, for the more readily furling it when necessary.

BRAILS. A name peculiar only to certain ropes belonging to the mizen, used to truss it up to the mast. But it is likewise applied to all the ropes which are employed in hauling up the bottoms, lower corners, and skirts, of the other great sails.

To BREAK BULK. The act of beginning to unload a ship.

To BREAK SHEER. When a ship at anchor is forced, by the wind or
current, from that position in which she keeps her anchor most free of her self and most firm in the ground, so as to endanger the tripping of her anchor, she is said to break her sheer.

BREAMING. Burning off the filth from a ship's bottom.

BREAST-FAST. A rope employed to confine a ship sideways to a wharf or to some other ship.

To BRING BY THE LEE. See TO BROACH TO.

To BRING TO. To check the course of a ship when she is advancing, by arranging the sails in such a manner as that they shall counteract each other, and prevent her from either retreating or advancing. See TO LIE TO.

To BROACH TO. To incline suddenly to windward of the ship's course, so as to present her side to the wind, and endanger her oversetting. The difference between BROACHING TO and BRINGING BY THE LEE may be thus defined: Suppose a ship under great sail is steering south, having the wind at N. N. W. then west is the weather side, and east the lee-side. If, by any accident, her head turns round to the westward, so as that her sails are all taken a-back on the weather side, she is said to BROACH TO. If, on the contrary, her head declines so far eastward as to lay her sails aback on that side which was the lee-side, it is called BRINGING BY THE LEE.

BROADSIDE. A discharge of all the guns on one side of a ship both above and below.

BROKEN BACKED. The state of a ship which is so loosened in her frame as to drop at each end.

BY THE BOARD. Over the ship's side.

BY THE HEAD. The state of a ship when she is so unequally loaded as to draw more water forward than aft.

BY THE WIND. The course of a ship as near as possible to the direction of the wind, which is generally within six points of it.

To CAREEN. To incline a ship on one side so low down, by the application of a strong purchase to her masts, as that her bottom on the other side may be cleansed by breaming.

CASTING. The motion of falling off, so as to bring the direction of the wind on either side of the ship after it had blown some time right a-head. It is particularly applied to a ship about to weigh anchor.

To CAT THE ANCHOR is to hook the cat-block to the ring of the anchor and haul it close up to the cat-head.

CAT's PAW. A light air of wind perceived at a distance in a calm, sweeping the surface of the sea very lightly, and dying away before it reaches the ship.

CENTRE. This word is applied to that squadron of a fleet, in line of battle, which occupies the middle of the line; and to that column (in the order of sailing) which is between the weather and lee columns.

CHANGE THE MIZEN. Bring the mizen-yard over to the other side of the mast.

CHAPELLING. The act of turning a ship round in a light breeze of wind when she is close-hauled, so as that she will lie the same way she did before. This is usually occasioned by negligence in steering or by a sudden change of wind.

CHASE. A vessel pursued by some other.

CHASER. The vessel pursuing.

CHEERLY. A phrase implying heartily, quickly, cheerfully.

To CLAW OFF. The act of turning to windward from a lee-shore to escape shipwreck, &c.

CLEAR is variously applied. The weather is said to be CLEAR, when it is fair and open; the sea-coast is CLEAR, when the navigation is not interrupted by rocks, &c. It is applied to cordage, cables, &c. when they are disen-
tangled, so as to be ready for immediate service. In all these senses it is opposed to foul.

To CLEAR the anchor is to get the cable off the flukes, and to disen-
cumber it of ropes ready for dropping.

CLEAR HAWSE. When the cables are directed to their anchors with-
out lying athwart the stem.

To CLEAR the hawse is to untwist the cables when they are entangled
by having either a cross, an elbow, or a round turn.

CLENCHED. Made fast, as the cable is to the ring of the anchor.

CLOSE-HAULED. That trim of the ship's sails, when she endeavors
to make a progress in the nearest direction possible towards that point of the
compass from which the wind blows.

To CLUB-HAUL. A method of tacking a ship when it is expected she
will miss stays on a lee-shore.

To CLUE UP. To haul up the clues of a sail to its yard by means of the
clue-lines.

COASTING. The act of making a progress along the sea-coast of any
country.

To COIL the cable. To lay it round in a ring one turn over another.

To COME HOME. The anchor is said to come home when it loosens
from the ground by the effort of the cable, and approaches the place where
the ship floated, at the length of her moorings.

COMING TO denotes the approach of a ship's head to the direction of the
wind.

COURSE. The point of the compass on which a ship steers.

CRANK. The quality of a ship, which, for want of sufficient ballast is
rendered incapable of carrying sail without being exposed to the danger of
oversetting.

To CROWD SAIL. To carry more sail than ordinary.

CUNNING. The art of directing the steersman to guide the ship in her
proper course.

To CUT AND RUN. To cut the cable and make sail instantly, without
waiting to weigh anchor.

To DEADEN a ship's way. To impede her progress through the water.

DEAD WATER. The eddy of water, which appears like whirl-pools,
closing in with the ship's stern as she sails on.

DISMASTED. The state of a ship that has lost her masts.

DOUBLING. The act of sailing round or passing beyond a cape or point
of land.

DOUBLING UPON. The act of inclosing any part of a hostile fleet
between two fires, or of cannonading it on both sides.

To DOWSE. To lower suddenly or slacken.

To DRAG the anchor. To trail it along the bottom, after it is loosened
from the ground.

To DRAW. When a sail is inflated by the wind, so as to advance the
vessel in her course, the sail is said to draw; and so to keep all draw-
ing is to inflate all the sails.

DRIFT. The angle which the line of a ship's motion makes with the
nearest meridian, when she drives with her side to the wind and waves,
and not governed by the power of the helm. It also implies the distance
which the ship drives on that line.

DRIVING. The state of being carried at random, as impelled by a storm
or current. It is generally expressed of a ship when accidentally broke
loose from her anchors or moorings.

DROP. Used sometimes to denote the depth of a sail; as the fore-top-
sail drops twelve yards.
TERMS USED IN SEAMANSHIP.

**To DROP anchor.** Used synonymously with **to anchor.**

**To DROP a-stern.** The retrograde motion of a ship.

**To EASE, to EASE AWAY, or to EASE OFF.** To slacken gradually; thus they say, ease the bow-line, ease the sheet.

**EASE THE SHIP!** The command given by the pilot, to the steersman, to put the helm hard alee, when the ship is expected to plunge her fore part deep in the water when close-hauled.

**To EDGE AWAY.** To decline gradually from the shore or from the line of the course which the ship formerly held, in order to go more large.

**To EDGE IN WITH.** To advance gradually towards the shore or any other object.

**ELBOW in the hawse.** A particular twist in the cables by which a ship is moored; explained at length hereafter in the practice of working ships.

**END-FOR-END.** A reversal of the position of any thing is turning it end-for-end. It is applied also to a rope that has run quite out of the block in which it was reeved, or to a cable which has all run out of the ship.

**END ON.** When a ship advances to a shore, rock, &c. without an apparent possibility of preventing her, she is said to go END ON for the shore, &c.

**EVEN KEEL.** When the keel is parallel with the horizon, a ship is said to be upon an EVEN KEEL.

**FAIR.** A general term for the disposition of the wind when favorable to a ship's course.

**FAIR-WAY.** The channel of a narrow bay, river, or haven, in which ships usually advance in their passage up and down.

**To FALL aboard of.** To strike or encounter another ship when one or both are in motion.

**To FALL a-stern.** The motion of a ship with her stern foremost.

**To FALL CALM.** To become in a state of rest by a total cessation of the wind.

**To FALL down.** To sail or be towed down a river, nearer towards its mouth.

**FALLING OFF** denotes the motion of the ship's head from the direction of the wind. It is used in opposition to COMING TO.

**FALL NOT OFF!** The command to the steersman to keep the ship near the wind.

**To FETCH WAY.** To be shaken or agitated from one side to another so as to loosen any thing which was before fixed.

**To FILL.** To brace the sails so as to receive the wind in them, and advance the ship in her course, after they had been either shivering or braced aback.

**To FISH the anchor.** To draw up the flukes of the anchor towards the top of the bow, in order to stow it, after having been catted.

**FLAT-AFT.** The situation of the sails when their surfaces are pressed against the mast by the force of the wind.

**To FLAT IN.** To draw in the aftermost lower corner or clue of a sail towards the middle of the ship, to give the sail a greater power to turn the vessel.

**To FLAT IN FORWARD.** To draw in the fore-sheet, jib-sheet, and fore-stay-sail-sheet, towards the middle of the ship.

**FLAW.** A sudden breeze or gust of wind.

**FLOATING.** The state of being buoyed up by the water from the ground.

**FLOOD-TIDE.** The state of a tide when it flows or rises.

**FLOWING SHEETS.** The position of the sheets of the principal sails when they are loosened to the wind, so as to receive it into their cavities more nearly perpendicular than when close-hauled, but more obliquely than
when the ship sails before the wind. A ship going two or three points large has **flowing sheets**.

**FORE.** That part of a ship's frame and machinery that lies near the stem.

**FORE-AND-AFT.** Throughout the whole ship's length. Lengthways of the ship.

To **fore reach upon.** To gain ground of some other ship.

To **forge over.** To force a ship violently over a shoal by a great quantity of sail.

**FORWARD.** Towards the fore part of a ship.

**FOUL.** Is used in opposition both to **clear** and **fair.** As opposed to clear, we say **foul weather,** **foul bottom,** **foul ground,** **foul anchor,** **foul hawse.** As opposed to fair, we say **foul wind.**

To **founder.** To sink at sea by filling with water.

To **free.** Pumping is said to **free** the ship when it discharges more water than leaks into her.

To **freshen.** When a gale increases it is said to **freshen.**

To **freshen the hawse.** Veering out or heaving in a little cable, to let another part of it endure the stress at the hawse-holes. It is also applied to the act of renewing the service round the cable at the hawse holes.

**Fresh way.** When a ship increases her velocity she is said to get **fresh way.**

**FULL.** The situation of the sails when they are kept distended by the wind.

**FULL-AND-BY.** The situation of a ship, with regard to the wind, when close-hauled; and sailing, so as to steer neither too high the direction nor to deviate to leeward.

To **furl.** To wrap or roll a sail close up to the yard or stay to which it belongs, and winding a chord round it to keep it fast.

To **gain the wind.** To arrive on the weather-side, or to windward of, some ship or fleet in sight when both are sailing as near the wind as possible.

To **gather.** A ship is said to gather on another as she comes nearer to her.

**Gimbleting.** The action of turning the anchor round by the stock, so that the motion of the stock appears similar to that of the handle of a gimblet, when employed to turn the wire.

To **give chase to.** To pursue a ship or fleet.

**Goose-wings of a sail.** The clues or lower corners of a ship's mainsail or foresail, when the middle part is furled or tied up to the yard.

**Griping.** The inclination of a ship to run to windward of her proper course.

**Grounding.** The laying a ship a-shore, in order to repair her. It is also applied to running a-ground accidentally.

**Ground-Tackle.** Every thing belonging to a ship's anchors, and which are necessary for anchoring or mooring; such as cables, hawsers, tow-lines, warps, buoy-ropes, &c.

**Growing.** Stretching out; applied to the direction of the cable from the ship towards the anchors; as, the cable grows on the starboard bow.

**Gybing.** The act of shifting any boom-sail from one side of the mast to the other.

To **hail.** To salute or speak to a ship at a distance.

To **hand the sails.** The same as to **furl** them.

**Hand-over-hand.** The pulling of any rope, by the men's passing their hand's alternately one before the other or one above another. A sailor is said to go aloft **hand-over-hand** when he climbs into the tops by a single rope, dexterously throwing one hand over the other.
HANDSOMELY. Gradually, as LOWER HANDBSOMELY.

HANK-FOR-HANK. When two ships tack and make a progress to windward together.

HARD A-LEE. The situation of the helm, when pushed close to the lee-side of the ship.

HARD A-WEATHER. The situation of the helm, when pushed close to the weather side of the ship.

To HAUL. To pull a single rope without the assistance of blocks.

To HAUL THE WIND. To direct the ship's course nearer to the point from which the wind blows. Thus the ship A hauls the wind, when, by the trim of her sails and the action of her rudder, she gets on either of the courses B and C.

HAWSE. The situation of the cables before the ship's stem, when she is moored with two anchors out from forward. It also denotes any small distance in front of the ship, or the space between her head and the anchors employed to ride her.

HEAD-FAST. A rope employed to confine the head of a ship to a wharf or to some other ship.

HEADMOST. The situation of any ship or ships which are the most advanced in a fleet.

HEAD-SAILS. All the sails which belong to the fore-mast and bowsprit.

HEAD-SEA. When the waves meet the head of a ship in her course, they are called HEAD-SEA. It is likewise applied to a large single wave coming in that direction.

HEAD TO WIND. The situation of a ship when her head is turned to the point from which the wind blows, as it must when tacking.

HEAD-WAY. The motion of advancing, used in opposition to STERN-WAY.

To HEAVE. To turn about a capstern, or other machine of the like kind, by means of bars, handspins, &c.

To HEAVE A-HEAD. To advance the ship by heaving-in the cable or other rope fastened to an anchor at some distance before her.

To HEAVE A-PEEK. To heave in the cable, till the anchor is a-peek.

To HEAVE A-Stern. To move a ship backwards by an operation similar to that of HEAVING A-HEAD.

To HEAVE DOWN. To CAREEN.

To HEAVE-IN THE CABLE. To draw the cable into the ship, by turning the capstern.

To HEAVE IN STAYS. To bring a ship's head to the wind, by a management of the sails and rudder, in order to get on the other tack.

To HEAVE OUT. To unfurl or loose a sail; more particularly applied to the staysails: thus we say, loose the topsails and HEAVE OUT the staysails.

To HEAVE SHORT. To draw so much of the cable into the ship, as that she will be almost perpendicularly over her anchor.

To HEAVE TIGHT OR TAUGHT. To turn the capstern round, till the rope or cable becomes straitened.

To HEAVE THE CAPSTERN. To turn it round.

To HEAVE THE LEAD. To throw the lead overboard, in order to find the depth of water.

To HEAVE THE LOG. To throw the log overboard, in order to calculate the velocity of the ship's way.

To HEEL. To stoop or incline to one side; thus they say TO HEEL TO PORT, that is to heel to the larboard side.

HELM A-LEE! A direction to put the helm over the lee side.
TERMS USED IN SEAMANSHIP.

HELM A-WEATHER! An order to put the helm over to the windward side.

HIGH-AND-DRY. The situation of a ship when so far run a-ground as to be seen dry upon the strand.

To HOIST. To draw up any body by the assistance of one or more tackles; pulling by means of a single block is never termed hoisting, except only the drawing of the sails upwards along the masts or stays.

To HOLD ITS OWN is applied to the relative situation of two ships when neither advances upon the other; each is then said to hold its own. It is likewise said of a ship which, by means of contrary winds, cannot make a progress towards her destined port, but which however keeps nearly the distance she had already run.

To HOLD ON. To pull back or retain any quantity of rope acquired by the effort of a capstern, windlass, tackle, block, &c.

HOME implies the proper situation of any object; as, to haul home the topsail-sheets is to extend the bottom of the topsail to the lower yard, by means of the sheets. In stowing a hold, a cask, &c. is said to be home, when it lies close to some other object.

To HULL A SHIP. To fire cannon-balls into her hull within the point-blank range.

HULL-TO. The situation of a ship when she lies with all her sails furled; as in trying.

IN STAYS. See to heave in stays.

KECKLED. Any part of a cable, covered with old ropes, to prevent its surface from rubbing against the ship's bow or fore foot.

To KEEP AWAY. To alter the ship's course to one rather more large; for a little time, to avoid some ship, danger, &c. Keep away is likewise said to the steersman, who is apt to go to windward of the ship's course.

To KEEP FULL. To keep the sails distended by the wind.

To KEEP HOLD OF THE LAND. To steer near to or in sight of the land.

To KEEP OFF. To sail off or keep at a distance from the shore.

To KEEP THE LAND ABOARD. The same as to keep hold of the land.

To KEEP THE LUFF. To continue close to the wind.

To KEEP THE WIND. The same as to keep the luff.

KNOT. A division of the log-line, answering, in the calculation of the ship's velocity, to one mile.

To LABOUR. To roll or pitch heavily in a turbulent sea.

LADEN IN BULK. Freighted with a cargo not packed, but lying loose, as corn, salt, &c.

LAI-D-UP. The situation of a ship when moored in a harbor, for want of employ.

LAND-FALL. The first land discovered after a sea-voyage. Thus a good land fall implies the land expected or desired; a bad land-fall the reverse.

LAND-LOCKED. The situation of a ship surrounded with land, so as to exclude the prospect of the sea, unless over some intervening land.

LARBOARD. The left side of a ship looking towards the head.

LARBOARD-TACK. The situation of a ship when sailing with the wind blowing upon her larboard side.

LAYING THE LAND. A ship which increases her distance from the coast, so as to make it appear lower and smaller, is said to lay the land.

LEADING-WIND. A fair wind for a ship's course.

LEAK. A chink or breach in the sides or bottom of a ship, through which the water enters into the hull.
Terms Used in seamanship.

To Leak. To admit water into the hull through chinks or breaches in the sides or bottom.

Lee. That part of the hemisphere to which the wind is directed, to distinguish it from the other part which is called to windward.

Lee-Gage. A ship or fleet to leeward of another is said to have the lee-gage.

Lee-Lurches. The sudden and violent rolls which a ship often takes leeward, in a high sea; particularly when a large wave strikes her on the weather side.

Lee of the shore. See under the lee or the shore.

Lee-Quarter. The quarter of the ship which is on the lee-side.

Lee-Side. That half of a ship lengthwise, which lies between a line drawn through the middle of her length and the side which is farthest from the point of wind.

To Leeward. Towards that part of the horizon to which the wind blows.

Leeeward Ship. A ship that falls much to leeward of her course, when sailing close-hauled.

Leeeward Tide. A tide that sets to leeward.

Lee-Way. The lateral movement of a ship to leeward of her course; or the angle which the line of her way makes with a line in the direction of her keel.

To Lie Along. To be pressed down sideways by a weight of sail in fresh wind.

To Lie-to. To retard a ship in her course, by arranging the sails in such a manner as to counteract each other with nearly an equal effort, and render the ship almost immovable, with respect to her progressive motion or headway. Thus the position of the yards, in the figures A and B, causes the sails to counteract each other, the wind blowing upon the after-surface of one and the fore-surface of the other.

A Long Sea. An uniform motion of long waves.

Look-Out. A watchful attention to some important object or event that is expected to arise. Thus persons on board of a ship are occasionally stationed to look out for signals, other ships, for land, &c.

To Loose. To unfurl or cast loose any sail.

To Lower. To ease down gradually.

Luff! The order to the steersman to put the helm towards the lee-side of the ship, in order to sail nearer to the wind.

To Make a Board. To run a certain distance upon one tack, in beating to windward.

To Make Foul Water. To muddy the water by running in shallow places, so that the ship's keel disturbs the mud at bottom.

To Make Sail. To increase the quantity of sail already set, either by unreefing or by setting others.

To Make Sternway. To retreat or move with the stern foremost.

To Make the Land. To discover it from afar.

To Make Water. To leak.

To Man the Yards, &c. To place men on the yards, in the tops, down the ladder, &c. to execute any necessary duties.

Masted. Having all her masts complete.

To Middle a Rope. To double it into two equal parts.

Midships. See Amidships.

To Miss Stays. A ship is said to miss stays, when her head will not fly up into the direction of the wind, in order to get her on the other tack.
TERMS USED IN SEAMANSHIP.

MOORING. Securing a ship in a particular station by chains or cables, which are either fastened to an adjacent shore or to anchors at the bottom.

MOORING SERVICE. When a ship is moored, and rides at one cable's length, the mooring service is that which is at the first splice.

NEAPED. The situation of a ship left aground on the height of a spring tide, so that she cannot be floated till the return of the next spring tide.

NEAR or NO NEAR. An order to the steersman not to keep the ship so close to the wind.

OFF-AND-ON. When a ship is beating to windward, so that by one board she approaches towards the shore; and by the other stands out to sea, she is said to stand off-and-on shore.

OFFING. Out at sea, or at a competent distance from the shore, and generally out of anchor-ground.

OFFWARD. From the shore; as when a ship lies a-ground and leans towards the sea, she is said to heel offward.

ON THE BEAM. Any distance from the ship on a line with the beams, or at right angles with the keel. See Bearing.

ON THE BOW. An arch of the horizon, comprehending about four points of the compass on each side of that point to which the ship's head is directed. Thus, they say, the ship in sight bears three points on the starboard-bow; that is three points, towards the right hand, from that part of the horizon which is right a-head. See Bearing.

ON THE QUARTER. An arch of the horizon, comprehending about four points of the compass on each side of that point to which the ship's stern is directed. See on the bow and bearing.

OPEN. The situation of a place exposed to the wind and sea. It is also expressed of any distant object to which the sight or passage is not intercepted.

OPEN HAWSE. When the cables of a ship at her moorings lead strait to their respective anchors, without crossing, she is said to ride with an open hawse.

OVER-BOARD. Out of the ship.

OVER-GROWN SEA is expressed of the ocean when the surges and billows rise extremely high.

To OVER-HAUL. To open and extend the several parts of a tackle, or other assemblage of ropes, thereby fitting them the better for running easily.

OVER-RAKE. When a ship at anchor is exposed to a head-sea, the waves of which break in upon her, the waves are said to over-rake her.

OVER-SET. A ship is over-set, when her keel turns upwards.

OUT-OF-TRIM. The state of a ship, when she is not properly balanced for the purposes of navigation.

PARLIAMENT-HEEL. The situation of a ship when she is made to stoop a little to one side, so as to clean the upper part of her bottom on the other side. See Boot-topping.

PARTING. Being driven from the anchors, by the breaking of the cable.

To PAWL the capstern. To fix the pawls, so as to prevent the capstern from recoiling, during any pause of heaving.

To PAY. To daub or cover the surface of any body with pitch, tar, &c., in order to prevent it from the injuries of the weather.

To PAY AWAY or PAY OUT. To slacken a cable or other rope, so as to let it run out for some particular purpose.

To PAY OFF. To move a ship's head to leeward.

To PEEK the mizen. To put the mizen-yard perpendicular by the mast.
 TERMS USED IN SEAMANSHIP.

PITCHING. The movement of a ship, by which she plunges her head and after-part alternately into the hollow of the sea.

To PLY to windward. To endeavor to make a progress against the direction of the wind. See BEATING TO WINDWARD.

POINT-BLANK. The direction of a gun when levelled horizontally.

POOPING. The shock of a high and heavy sea upon the stern or quarter of a ship, when she scuds before the wind in a tempest.

PORT. A name given on some occasions to the larboard side of the ship; as, the ship heels to port, top the yards to port, &c.

PORT THE HELM! The order to put the helm over to the larboard side.

PORT-LAST. The gunwale.

PORTOISE. The same as port-last; to ride a portoise is to ride with a yard struck down to the deck.

PRESS OF SAIL. All the sail a ship can set or carry.

PRIZING. The application of a lever to move any weighty body.

PURCHASE. Any sort of mechanical power employed in rising or removing heavy bodies.

QUARTERS. The several stations of a ship's crew in time of action.

QUARTERING. When a ship under sail has the wind blowing on her quarter.

To RAISE. To elevate any distant object at sea by approaching it; thus, to RAISE THE LAND is used in opposition to LAY THE LAND.

To RAKE. To cannonade a ship at the stern or head, so that the balls scour the whole length of the decks.

RANGE OF CABLE. A sufficient length of cable drawn upon deck before the anchor is cast loose, to admit of its sinking to the bottom without any check.

REACH. The distance between any two points on the banks of a river, wherein the current flows in an uninterrupted course.

READY ABOUT! A command of the boatswain to the crew, and implies that all the hands are to be attentive and at their stations for tacking.

REAR. The last division of a squadron, or the last squadron of a fleet. It is applied likewise to the last ship of a line, squadron, or division.

REEF. Part of a sail from one row of eyelet-holes to another. It is applied likewise to a chain of rocks lying near the surface of the water.

REEFING. The operation of reducing a sail by taking in one or more of the reefs.

To REEVE. To pass the end of a rope through any hole, as the channel of a block, the cavity of a thimble, &c.

RENDERING. The giving away, or yielding to the efforts of some mechanical power. It is used in opposition to jambing or sticking.

RIDING, when expressed of a ship, is the state of being retained in a particular station by an anchor and cable. Thus she is said to RIDE EASY or TO RIDE HARD, in proportion to the strain upon her cable. She is likewise said to RIDE LEeward TIDE if anchored in a place at a time when the tide sets to leeward and to RIDE WINDWARD TIDE if the tide sets to windward; to RIDE BETWEEN WIND AND TIDE, when the wind and tide are in direct opposition, causing her to ride without any strain upon her cables.

RIGHTING. Restoring a ship to an upright position, either after she has been laid on a careen, or after she has been pressed down on her side by the wind.

To RIGHT THE HELM is to bring it into midships, after it has been pushed either to starboard or larboard.

RIGGING OUT A BOOM. The running out a pole at the end of a yard to extend the foot of a sail.
TERMS USED IN SEAMANSHIP.

To RIG the capstern. To fix the bars in their respective holes.

ROLLING. The motion by which a ship rocks from side to side like a cradle.

ROUGH-TREE. A name applied to any mast, yard, or boom, placed in merchant-ships, as a rail or fence above the vessel's side, from the quarter-deck to the fore-castle.

ROUNDING-IN. The pulling upon any rope which passes through one or more blocks in a direction nearly horizontal; as, round-in the weather-braces.

ROUND-TURN. The situation of the two cables of a ship when moored, after they had been several times crossed by the swinging of the ship.

ROUNDING UP. Similar to rounding-in, except that it is applied to ropes and blocks which act in a perpendicular direction.

To ROW. To move a boat with oars.

ROWSING. Pulling upon a cable or rope without the assistance of tackles.

To RUN OUT a warp. To carry the end of a rope out from a ship in a boat, and fastening it to some distant object, so that by it the ship may be removed by pulling on it.

To SAG TO LEEWARD. To make considerable lee-way.

SAILING-TRIM is expressed of a ship when in the best state for sailing.

SCANTING. The variation of the wind, by which it becomes unfavorable to a ship's making great progress, as it deviates from being large, and obliges the vessel to steer close-hauled or nearly so.

SCUDDING. The movement by which a ship is carried precipitately before the wind in a tempest.

SCUTTLING. Cutting large holes through the bottom or sides of a ship, either to sink her or to unlade her expeditiously when stranded.

SEA. A large wave is so called. Thus they say, a heavy sea. It implies likewise the agitation of the ocean, as, a great sea. It expresses the direction of the waves, as, a head sea. A long sea means an uniform and steady motion of long and extensive waves; a short sea, on the contrary, is when they run irregularly, broken, and interrupted.

SEA-BOAT. A vessel that bears the sea firmly, without straining her masts, &c.

SEA-CLOTHES. Jackets, trousers, &c.

SEA-MARK. A point or object on shore, conspicuously seen at sea.

SEA-ROOM. A sufficient distance from the coast or any dangerous rocks, &c. so that a ship may perform all nautical operations without danger of shipwreck.

SENDING. The act of pitching precipitately into the hollow between two waves.

SETTING. The act of observing the situation of any distant object by the compass.

To SET SAIL. To unfurl and expand the sails to the wind, in order to give motion to the ship.

To SET UP. To increase the tension of the shrouds, back-stays, &c. by tackles, laniards, &c.

To SETTLE THE LAND. To lower in appearance. It is synonymous with to lay the land.

To SHAPE A COURSE. To direct or appoint the track of a ship in order to prosecute a voyage.

SHEERING. The act of deviating from the line of the course, either to the right or left.

To SHEER OFF. To remove to a greater distance.

To SHEET-HOME. To haul the sheets of a sail home to the block on the yard-arm.
TERMS USED IN SEAMANSHIP.

To SHIFT the helm. To alter its position from right to left, or from left to right.

To SHIP. To take any person, goods, or thing, on board. It also implies to fix any thing in its proper place; as, to ship the oars, to fix them in their rowlocks.

SHIVERING. The state of a sail when fluttering in the wind.

SHOAL. Shallow.

To SHOE the anchor. To cover the flukes with a piece of plank to give it firmer hold in the soft ground.

To SHOOT A HEAD. To advance forward.

SHORE. A general name for the sea-coast of any country.

To SHORTEN sail. Used in opposition to make sail.

SLACK-WATER. The interval between the flux and reflux of the tide, when no motion is perceptible in the water.

SLATCH is applied to the period of a transitory breeze.

To SLIP the cable. To let it run quite out when there is not time to weigh the anchor.

To SLUE. To turn any cylindrical piece of timber about its axis without removing it. Thus, to sluice a mast or boom is to turn it in its cap or boom-iron.

SOUNDING. Trying the depth of the water with a plummet, sunk from a ship to the bottom.

To SPELL the mizen. To let go the sheet and peek it up.

To SPILL. To discharge the wind out of the cavity or belly of a sail, when it is drawn up in the brails, in order to furl or reef it.

SPLIT. The state of a sail rent by the violence of the wind.

SPONGE-DRIFT. A sort of showery sprinkling of the sea-water, swept from the surface of the waves in a tempest, and flying like a vapor before the wind.

SPRAY. The sprinkling of a sea, driven occasionally from the top of a wave; and not continued as spoon-drift.

To SPRING A LEAK. When a leak first commences, a ship is said to spring a leak.

To SPRING the luff. A ship is said to spring her luff when she yields to the effort of the helm, by sailing nearer to the wind than before.

SQUALL. A sudden violent blast of wind.

SQUARE. This term is applied to yards that are very long, as taunt is to high masts.

To SQUARE THE YARDS. To brace the yards, so as to hang at right angles with the keel.

To STAND ON. To continue advancing.

To STAND IN. To advance towards the shore.

To STAND OFF. To recede from the shore.

STARBOARD. The right-hand side of a ship when looking forward.

STARBOARD-TACK. A ship is said to be on the starboard-tack, when sailing with the wind blowing upon her starboard side.

STARBOARD THE HELM! An order to push the helm to the starboard-side.

To STAY A SHIP. To arrange the sails and move the rudder, so as to bring the ship's head to the direction of the wind, in order to get her on the other tack.

STEADY! The order to the helmsman to keep the ship in the direction she is going at that instant.

STEERING. The art of directing the ship's way by the movement of the helm.
TERMS USED IN SEAMANSHIP.

STEERAGE-WAY. Such degree of progressive motion of a ship as will give effect to the motions of the helm.

To STEM the tide. When a ship is sailing against the tide at such a rate as to enable her to overcome its power, she is said to stem the tide.

STERNFAST. A rope confining a ship by her stern to any other ship or wharf.

STERNMOST. The farthest a-stern, opposed to head-most.

STERNWAY. The motion by which a ship falls back with her stern foremost.

STIFF. The condition of a ship when she will carry a great quantity of sail without hazard of oversetting. It is used in opposition to CRANK.

To STOW. To arrange and dispose a ship's cargo.

To STREAM the buoy. To let it fall from the ship's side into the water, previously to casting anchor.

To STRIKE. To lower or let down any thing. Used emphatically to denote the lowering of colours in token of surrendering to a victorious enemy.

To STRIKE sounding. To touch ground, when endeavoring to find the depth of water.

SURF. The swell of the sea that breaks upon shore or on any rock.

To SURGE the capstern. To slacken the rope heaved round upon it.

SWELL. The fluctuating motion of the sea either during or after a storm.

SWEEPING. The act of dragging the bight or loose part of a rope along the surface of the ground, in a harbor or road, in order to drag up something lost.

SWINGING. The act of a ship's turning round her anchor at the change of wind or tide.

To TACK. To turn a ship about from one tack to another, by bringing her head to the wind. Thus the ship A passes from the larboard to the starboard tack a.

TACKING-IN. The act of furling the sails. Used in opposition to SETTING.

TAKEN A-BACK. See A-BACK.

TAUGHT. Improperly, though very generally used for TIGHT.

TAUNT. High or tall. Particularly applied to masts of extraordinary length.

TENDING. The turning or swinging of a ship round her anchor in a tide-way at the beginning of ebb and flood.

THWART. See A-THWART.

THWART SHIPS. See A-THWART SHIPS.

THUS! An order to the helmsman to keep the ship in her present situation, when sailing with a scant wind.

TIDE-WAY. That part of a river in which the tide ebbs and flows strongly.

TIER. One range of any thing placed horizontally.

TOPPING. Pulling one of the ends of a yard higher than the other.

To TOW. To draw a ship in the water by a rope fixed to a boat or other ship which is rowing or sailing on.

TRIM. The state or disposition by which a ship is best calculated for the purposes of navigation.
TERMS USED IN SEAMANSHIP.

To TRIM THE HOLD. To arrange the cargo regularly.

To TRIM THE SAILS. To dispose the sails in the best arrangement for the course which a ship is steering.

To TRIP THE ANCHOR. To loosen the anchor from the ground either by design or accident.

TOUGH OF THE SEA. The hollow between two waves.

TRYING. The situation in which a ship, in a tempest, lies to in the trough or hollow of the sea, particularly when the wind blows contrary to her course.

TURNING TO WINDWARD. That operation in sailing, whereby a ship endeavors to advance against the wind.

VAN. The foremost division of a fleet in one line. It is likewise applied to the foremost ship of a division.

To VEER. To change a ship's course, from one tack to the other, by turning her stern to windward: thus the ship A veers, in passing from the course A to the course C. The wind is said to veer when it changes more aft.

To VEER AND HAUL. To pull a rope tight, by alternately drawing it in and slackening it.

To UNBALLAST. To discharge the ballast out of a ship.

To UNBEND. To take the sails off from their yards and stays. To cast loose the anchor from the cable. To untie two ropes.

To UNBIT. To remove the turns of a cable from off the bits.

UNDER FOOT is expressed of an anchor that is directly under the ship.

UNDER SAIL. When a ship is loosened from moorings, and is under the government of her sails and rudder.

UNDER WAY. The same as UNDER SAIL.

UNDER THE LEE OF THE SHORE is to be close under the shore which lies to windward of the ship.

To UNMOOR. To reduce a ship to the state of riding at single anchor, after she has been moored.

To UNREEVE. To draw a rope from out of a block, thimble, &c.

To UNRIG. To deprive the ship of her rigging.

WAKE. The print or track impressed upon the surface of the water by a ship in her course. A ship is said to be in the wake of another when she follows her in the same tack, or on a line supposed to be formed on a continuation of her keel. Thus the ship A is sailing in the wake of B, and the ship C is crossing in the wake of A and B.

To WARE. See TO VEER.

WARP. A small rope employed occasionally to remove a ship from one place to another.

To WARP. To remove a ship by means of a warp.

WATER-BORNE. The state of a ship, when there is barely a sufficient depth of water to float her off from the ground.

WATER-LOGGED. The state of a ship, become heavy and inactive on the sea, from the great quantity of water leaked into her.

WATER-TIGHT. The state of a ship when not leaky.

WEATHER. Synonomous with WINDWARD.

WEATHER-BEATEN. Shattered by a storm.

WEATHER-BIT. A turn of the cable about the end of the windlass.
WEATHER-GAGE. When a ship or fleet is to windward of another, she is said to have the weather-gage of her.

WEATHER-QUARTER. That quarter of the ship which is on the windward side.

WEATHER-SIDE. The side upon which the wind blows.

To WEIGH ANCHOR. To heave up an anchor from the bottom.

To WIND A SHIP. To change her position, bringing her head where her stern was.

WIND-ROAD. When a ship is at anchor, and the wind, being against the tide, is so strong as to overcome its power and keep the ship to leeward of her anchor, she is said to be wind-road.

WIND'S EYE. The point from which the wind blows.

To WINDWARD. Towards that point of the horizon from which the wind blows.

WINDWARD TIDE. A tide that sets to windward.

To WORK A SHIP. To direct the movements of a ship, by adapting the sails and managing the rudder according to the course the ship has to make.

To WORK TO WINDWARD. To make a progress against the direction of the wind.

YAWING. The motion of a ship, when she deviates from her course to the right or left.
THE THEORY OF WORKING SHIPS.

The theory of working ships is nothing but the demonstration, supported with proofs, of the effects of every sail, and of the rudder, separately or altogether considered, both with respect to the points where these machines are placed in the ship, and with respect to the different dispositions which either are given them in the changes of evolutions, or which arise from their various obliquities, when they present, more or less obliquely, their surfaces to the course of the water or the wind.

LEMMA.

1. If a body strikes a surface, it communicates to it all its perpendicular motion.

DEMONSTRATION.

Figure 1.

If the body c meets the surface A B, with a motion perpendicular to its middle, or centre of gravity D, it will do it with the strength of all its perpendicular motion, which is the produce of its weight by its velocity; and will force it in the direction D G, perpendicular to A B. If the same body meets the same surface obliquely, and with the same velocity, it will impel it in the direction D G, with the velocity only of D E, which is equal to the angle of incidence H F. For, H F expresses the perpendicular velocity of the body H, towards the surface: and this is evident, if we consider that the movement H D is composed of the two movements H F and H E; and that there is no other movement but H F only which can meet the surface A B, since the other H E is parallel to it.

But the part H F, of the motion of the body H, is perpendicular to the surface A B: whence it follows, that the body H impels in the like perpendicular manner, that surface in the direction D G, with a force equal to the product of its weight by the velocity H F.
THE THEORY OF WORKING SHIPS.

CHAPTER I.

OF THE ACTION WHICH WATER OR WIND HAVE, BY THEIR PRESSURE ON SURFACES.

2. FLUIDS are formed of an infinite number of particles, the minuteness of which is the cause why they communicate, by their shock, but very imperceptible degrees of motion, in the first instant of their action: and such is the weakness of their action, that it requires to be repeated a great many times before they can produce any sensible effect on the bodies they are to move.

It is easy to conceive, that the more specific gravity a body is possessed of, the stronger its impulse must be: therefore water, which weighs nearly eight hundred and fifty times more than air, ought to produce (the velocity being the same) an impulse eight hundred and fifty times more than air would against a surface of the same size, moved in directions perfectly similar. And when it is known that the impulse of a fluid depends on its specific gravity it will be easily understood that such an impulse must depend also on the extent of the surface which is struck. For, it is plain, that the greater the surface is, (the gravity, the velocity, and the direction, of the fluid being the same,) the stronger the impulse will be, admitting still the same proportion to be kept between the extent of that fluid's surface and that of any other surface put in comparison with it, because a surface of twelve feet square will always receive twelve times as much impulse as would a surface of only one foot square. We must observe here, at the same time, that such parts of the fluid as strike find more or less difficulty to recoil after the shock, according as the surface is more or less extensive; because, the greater the surface struck, the longer is the continuance of repulsion from their former directions impressed on the particles, which by that very act of repulsion, receive a new direction, by which they are made to lose for a while the first movement they had during their primitive ones; whence it follows, that the shock of the subsequent particles must be altered: but this deviation from the direct line of the subsequent particles may be looked upon as almost nothing, since there is very little wanting, indeed, but all impulsions should be in the reciprocal proportions which exist between them and the surfaces on which they strike, allowing always all other circumstances to be alike.

3. It must be observed, that the rapidity of the fluid contributes doubly to the force of the impulse; for every particle strikes with so much the more strength as it acts with a greater velocity, and is at the same time followed by a greater number of new particles to shock the surface. So that the greater the celerity of the particles, the greater is the number of those which share the action, and the more powerful is the resistance they oppose to their being put out of their direct motion. But, if the fluid is possessed of five or six times more rapidity, it is evident that every particle enjoys likewise five or six times more force to shock the surface which opposes the passage of them all together; as, on the side of the surface, there are five or six times as many particles to encounter in the same space of time: therefore such a surface, thus exposed to the shock of the fluid, will be struck with twenty-five or thirty-six times more force at one time than at another, since there are five or six times as many particles employed in the act of striking, and supported with five or six times as much rapidity. Whence it may be concluded, that impulsions increase as the squares of their velocities; or, rather, that they are between themselves, as the squares of their velocities, when all other circumstances are the same.

When a surface is exposed to the course of a fluid, it is indifferent whether we consider that the fluid shocks the surface, or that the surface moves the fluid: or, again, whether we consider the fluid and the surface as having
each their respective share of the velocity with which that surface receives the impulse of the fluid.

4. When the wind has little velocity, its action is observed to be but faint; but, when moving with rapidity, then it becomes capable of producing the greatest effects. This is easy to be conceived; for, if to the action of every particle of air, which is stronger by reason of its increased celerity, be added a greater number of particles striking at the same time, it is evident that its force will increase as the square of its velocity; which has already been demonstrated.

The same may be said of water, the impulse of which is almost like that of a solid when it acts, or is acted upon, with a great rapidity of motion. Whence we must conclude, that if that water meets perpendicularly a body which presents to it a great superficies, such a body must have the greatest solidity to be able to resist it.

5. Experience confirms this principle. For, a ship which drives to leeward does not divide the fluid with her side in a direct line; there is always some obliquity in the direction she pursues by her act of dividing. This obliquity proceeds from the little resistance she experiences from the fluid either at her stem or at her stern. So that, should she be driven ever so little to leeward, she glides always obliquely on the column of water which opposes her under her lee, following a line more or less close to the direction of her length, than to the perpendicular which may be conceived to be drawn as lateral to her keel.

6. We have hitherto spoken of the impulse of fluids upon surfaces only, when considered as perpendicular: but, when that impulse becomes oblique, it is clear, that it must receive a great diminution; since the motion of every particle will be discomposed, on account of its acting only by its motion perpendicular to the surface, as has been demonstrated, (fig. 1, page 27,) where the body may be considered as a particle of a fluid, the impulse of which is proportionally less as the sine of the angle of incidence is diminished: therefore, in this case, when we consider the particle as a body, its impulse will be in the proportion of the different angles of incidence, which always express their respective velocities, these being considered in a direction perpendicular to the surface.

FIGURE 2.

7. If, instead of one particle, we consider the whole surface as exposed to the course of all those which compose a fluid; it will appear evident, from what has been said, that the surface (fig. 2,) which is oblique to the course
of the fluid, presents to that fluid a less surface than it would if it were perpendicular to it like \(\text{a b}\). So that each particle produces less shock, and the particles which are at the same time contributing to the shock are less in number. Now, as these two causes of diminution follow the same proportion, it results, that the impulsions of fluids are between themselves as the squares of the sines of incidence. Therefore, as soon as the impulse of a fluid, which strikes a surface perpendicularly, is known, that impulse, when it strikes the surface obliquely, is only to be diminished in the same proportion as the sine total \(\text{I K}\) is to the square of the sine of incidence \(\text{L K}\).

The surface \(\text{a b}\) (fig. 2,) receives all the direct impulse of the fluid which strikes it perpendicularly, and which is contained between \(\text{c d}\); but the same surface, presented obliquely to the fluid in the direction \(\text{e f}\), will receive but a part of the impulse, which will be proportional to the sine of incidence \(\text{L k}\), compared with the sine total \(\text{I K}\), of the direct effort of every particle contained between the parallels \(\text{e c and f h}\), which inclose a much less space than the first \(\text{e c and b d}\). Whence it is easy to conclude, that the diminution of the impulse of the fluid has diminished on two sides, and has consequently followed the proportion of the square of the sine total \(\text{I K}\) to the square of the sine of incidence \(\text{L K}\); for there is a less number of particles employed in striking the surface, and with a smaller degree of velocity.

8. It follows, that we ought not to be surprised to see the velocity of a ship diminishing considerably, when, after having run with the wind aft or large, the vessel is hauled closer to the wind. For it is evident that all the sails, which can possibly be spread in this last direction, will receive but very little impulse, on account of their great obliquity to the wind, with which they cannot make an angle more open than 30 degrees, and sometimes much less, as will be demonstrated hereafter. So that the impulse has diminished in proportion as the square of the sine total is to the sine of incidence of 30 degrees; that is to say as \(4\) to \(1\). Therefore the sails, receiving but a very faint impulse, can communicate to the ship but a small motion; and that motion is still enfeebled by the resistance of the water on the lee-bow; which resistance increases, on one hand, by the inclination of the ship; and, on the other, by the greater surface which she presents to the water in the direction of her length; to which must be added, the decomposition of the absolute effort of the sails, the lateral part of which is now become much greater than the direct. Hence we find the rapidity of the ship's way is already diminished from three evident causes, to which another may still be added; and it is this: if the ship has an inclination to the horizon, (as this always happens in oblique courses, and as we have already hinted,) and if the wind has ever so little force, there will result again from that circumstance a cause of diminution of impulse of the wind on the sails; because, in such a case, the sails follow that particular inclination of the ship called heeling; and this diminution of impulse will follow this particular proportion, viz. that in such a direction the square of the sine of incidence will be smaller than that of the sine total.

Therefore, we see that the absolute sine of incidence diminishes in a twofold proportion, and receives that diminution from the compound ratio of the proportion which the sine total bears to the two sines of the obliquity of the yard with the wind and of the inclination of the sail with the wind.

9. The impulse of the wind, being continual, must necessarily communicate to the ship degrees of velocity, which, from instant to instant, are increasing, until there happens to be an equilibrium between the impulse of the wind on the sails and the resistance of the water on the bows, observing, that, in the courses where the ship sails with the wind abaft the beam, the first moment when the wind strikes the sails is the time when its impulse is greatest, and the resistance of the water the weakest; because, at that in-
constant the ship does not yet move in the fluid, not having yielded to the power of the wind: but, in a few moments, the velocity of the ship increasing, the resistance of the water on the bows increases also considerably: then the impulse of the wind on the sails is proportionably decreasing, because, the ship, receding, as it were, from the wind, must of course lessen its power on the sails. Thus the accelerating force is incessantly lessening from two causes; first, from the wind striking the sails with less force; and, second, from the greater part of its impulse being destroyed by the resistance of the water on the bows; a resistance which increases in proportion as the ship's way accelerates; for, this opposition of the water is as a deduction from the effort of the wind; since, by its resistance, the water renders part of that effort ineffectual. Therefore, the rate of sailing will be the greatest possible when the impulse of the wind upon the sails shall be so diminished, and the resistance of the water on the bows so increased, as that the two forces, acting in contrary directions, are in a perfect equilibrium. Hence we must conclude, that the vessel will now enjoy a constant and uniform motion; for, the ship advances as if she were not subject to the action of any exterior force, the wind no longer having power to increase her velocity, because the resistance of the water on her bows prevents it; and, on the other hand, the impulse of the wind hinders the water, by its resistance, from retarding her course.

10. If a ship runs on a line perpendicular to the direction of the wind, the impulse on the sails is always the same, because she does not recede from the point from which the wind blows; but, when she sails close-hauled, the impulse must be stronger; because she runs to windward, and draws nearer to that point. So that, if the rate of the ship's sailing be great, the apparent angle of incidence diminishes in proportion to the two velocities, viz. that of the wind and that of the ship.

The moment a surface, which is suspended or a-float, is struck by a fluid, that is the time of the greatest impulsion, (if it were not in motion before,) and of the greatest resistance of the surface.

CHAPTER II.
OF THE CENTRE OF GRAVITY.

FIGURE 3.

11. EVERY solid has a centre of gravity; that is to say, a point, on which, it being suspended, it will have a perfect equilibrium; and on that
point all the gravity of the body is united. Such, for example, is the rectangular parallelepiped $A B$, (Fig. 3,) the centre of gravity of which is exactly in the middle of the solid $G$; so that, if it be suspended from that point, as from $G$ to $D$, it will always be in equilibrium; because that solid being considered as regular, one of its halves must exactly balance the other; and, were it not regular, the finding of this centre would be much more complicated. Without engaging, therefore, in abstract difficulties, it will be sufficient for our purpose to make it appear, that the centre of gravity of a body, heavier at one extremity than at the other, lies always in the heaviest part, with respect to the point which marks the middle of the length of the body. If, to the solid $A B$, which is suspended in perfect equilibrium by its centre of gravity $G$, be added a weight $E$, in the centre of the part $A G$, the equilibrium will then be lost, as it will increase the weight of this part, which will then over-weigh the other half $B G$ by all the weight $E$, of which the part $B G$ becomes by so much the lighter. To find, then, the centre of gravity, which is changed from $G$ to $I$, we must divide reciprocally to the weight of the two bodies, $AG + E$ for the one, and $BG$ for the other, the interval $FH$; for, it may be supposed that this half $A + G$ of the parallelepiped, plus the weight $E$, is a body suspended by the centre $F$ of the part $AG$; and that this point is the extremity of a lever $FH$, infinitely light, which bears also, at the other extremity $H$, taken for the centre of the other part $BG$, all the weight of that part: so that, if the body $AG + E$ weighs four times as much as the weight $BG$, we have but to make the interval $FI$ the fourth part of the other $IH$, and the point $I$ will then be the centre of gravity required of the solid $AB + E$, and the two bodies suspended by that point will be in perfect equilibrium; for, the weight $AG + E$ is four times as heavy as the other $BG$; but it acts with an arm of a lever $FI$, which is only a fourth part of the other $IH$; therefore the two weights, suspended by the point $I$, will preserve a perfect equilibrium in whatever situation they may be placed, as they make, in fact, both but one, the heaviness of which may be supposed united in the single point $I$.

12. It follows, from what has been demonstrated, that a long lever is productive of a greater effect than a short one, when both are actuated by the same force; whence we must conclude, that the longest lever, or the greatest distance from the fulcrum, or point of support, is proportional to the greatest weight.

It is very easy to be convinced of this truth if we make one of the two following proportions; first, thus; the sum of the two weights $AG + E + BG = FH = BG + FI$; or $AG + E : IH$.

We have supposed that the weight $AG + E$ (Fig 5) weighs four times as much as the other $BG$, which I suppose to be two pounds; so that the sum total will be ten pounds. Then say, Ten, the sum of the two weights, is to the whole lever $FH$ as two pounds is to the less part $FI$ of the lever, divided into five equal parts: so that, if $FI$ is equal to two feet, $IH$ will be equal to eight feet, and $FH$ equal to ten feet. But we have also this proportion to make: viz. Ten pound, the sum of the two weights, is to ten feet, the whole length of the lever, as eight pounds are to eight feet; but, admitting the distance $FH$ to be ten feet, the distance $FI$ is found to be two feet, and of $IH$ eight feet; which demonstrates, that a power of two pounds on a lever of eight feet is equal to a power of eight pounds on a lever of two feet; for the product of the extremes, in both the one and the other proportions, is equal to that of their means.

It ought also to be observed, that the centre of gravity of a solid follows always the greatest weight with respect to the middle $G$, (Fig. 3,) since the point $I$ is four times as near the centre $F$ of the heaviest body as it is to the centre $H$ of the lightest body.
13. It follows, that the centre of gravity \( c \) of a ship (fig. 4) is always before the point \( A \), which is the middle of her absolute length; for, the fore part \( B A \), having more capacity than the after part \( A D \), must of course have also more weight; therefore it carries the centre of gravity \( c \) forward in proportion to its greater weight; (which in large ships is from fifty to eighty tons,) and to the interval there is between every centre of gravity of each particular part both forward and aft.

14. When a ship is at sea, and loaded, the centre of gravity may well be supposed not to change, unless the cargo be moved. But it must be observed, that, as experience shows it, the fore or after part of the bottom of a ship plunges and labors more and more, in proportion as the wind acts with more or less force on the sails; because ships are generally not masted according to the \textit{point velique}.* so that a ship, which has the centre of the effort of her sails ill-placed, draws always more water forward or aft, if the impulse of the wind upon her sails is very powerful, than when she is at ease under her burthen.

**THEOREM.**

15. The centre of rotation, or the point on which a body turns freely, is always on the other side of the centre of gravity of that body, with respect to the point on which the moving force acts.

* From the centre of gravity of the floating line of a ship let a perpendicular be raised, and continued till intersected by the direction of the impulse of the water on the bows, in sailing directly before the wind; and, where these two lines cut each other, there is the \textit{point velique}, and where the centre of effort of all the sails should be placed.
If the body $BD$ (fig. 5) be struck in its centre of gravity $G$, when it is perfectly at rest, it is evident (§ 1) that the two extremities $B$ and $D$ will advance equally on parallels; but, if it is struck in the point $F$, distant from the centre of gravity, by any mobile such as $A$, when the body is subject to no friction, it will then have two motions with respect to its centre of gravity $G$, on which are collected all the weight and the resistance. For, that centre, not being held by any thing, is moved in the direction $Gg$, parallel to the direction $Aa$, of the effort of the mobile $A$, which strikes the body $BD$ in the point $F$. So that the part $BG$ of that body receives the shock of the mobile $A$, which makes it pass from $F$ to $f$, according to the direction of its motion $Af$. And, as the other part $GD$ of the same body shares that motion only in proportion as its parts are less distant from the point of percussion $F$, (since the nearest parts of that point receive the greatest share of the action,) in proportion as they remove from their first situation, they all describe by the first effect of the shock, parallels $BG$, $GG$, and $DD$, to the direction $AF$ of the effort of the mobile $A$. These parallels are greater as they are more distant from the part shocked and from its extremity $B$; because the resistance, which the body $BD$ makes against receiving the motion, cannot be in equilibrium with that which the power $A$ makes to lose part of its own motion, but as much as the two resistances are equal and directly contrary: therefore, the body $BD$, yielding to the impulse of the mobile $A$, does not oppose to it a resistance equal to its shock; it must then change its place and situation, in turning on the point $F$, marked by the meeting of two lines $DR$ and $DR$, drawn from the centre of
gravity of the body $BD$ in those two situations before and after the shock; and, as the circular motion of the body $BD$, is made always round the centre of gravity, it is easy to conceive that the centre, having taken the velocity $Gg$, must continue to move equally in the same right line prolonged; and that the body, having begun to turn, it must continue to do the same round its centre of gravity, and at the same time be carried in the direction $AI$ on the parallels $BE$ and $DH$, as long as the force which puts it in motion exists. But it must be remarked, that, in proportion as it shall remove from its first situation $BD$, it will lose all the relations it had in the principle of motion with the point $R$; that is to say, that the point $G$, being transported to $g$, in the first instant of the shock, it will continue in the second and the following instants to be thus transported on the same line and in the same direction: therefore the point of rotation $R$ will change in proportion as the body $BD$ removes from the second situation $BD$ to take another $EH$; for, the line $HK$ will cut $DR$ in a point $K$, nearer the point from which the body was moved; and, although the point of rotation $R$ be continually changing during the time of motion, it remains always on the other side of the centre of gravity with respect to the point of percussion, till at last the body $BD$ be so much turned, that the effort $AI$ may pass through the centre of gravity $G$ in the direction $DB$; then the body $DB$ will cease to turn round a point situated on the part $GB$ prolonged, and will turn successively on different points of the part $GB$, which will then have passed to the opposite side.

16. If the force of the mobile $A$ (fig. 5,) employed to turn the body $BD$, be greater or less, the velocity $Gg$ of the centre of gravity will be likewise increased or diminished in proportion as the mobile shall act with more or less power. Consequently, when the body $BD$ changes its situation, the angle it will make with its first position will be proportional to the motion $Gg$, or to the force employed in the shock, since they are correspondent to one another. Therefore, all other circumstances being the same, the rapidity of a circular motion will be always in proportion to the force employed to produce it.

17. A method of increasing the rapidity of motion and the angle of rotation is to make the power $A$ (fig. 5) act on a point more distant from the centre of gravity $G$ than the given point $F$; for, it is clear, that, if the distance $GR$ be two or three times augmented, the other distance $GR$, from the centre of gravity to the point of rotation, will become two or three times less; and the sides of the angle $GRG$, becoming consequently shorter, it follows, that the angle will be more open in the same proportion. Therefore it is demonstrated that there are two sure methods of augmenting both the angle and motion of rotation of a body; the first consists of employing more force in the percussion, in order that the angle $GRG$ should be as much increased as is the side $Gg$ which subtends it.

The second is to apply that force at a greater distance from the centre of the body you wish to turn: for, in augmenting $FG$, $GR$ is diminished; and the more the sides which form an angle are shortened, (the sides which subtends it still remaining the same,) the more the angle is augmented. So that the angle of rotation is in a compound proportion both to the force employed and to the distance of that force from the centre of gravity: this angle is then as the produce of that force multiplied by $FG$. Although the body be perfectly free, and take a direct motion $Gg$, we must consider its center of gravity $G$ as the point of support, or $FG$ as the arm of a lever; and the angle of rotation $GRG$ is always proportional to the absolute force* employed in the percussion.

18. Let us consider the body $BD$ (fig. 5) exposed to the action of several forces at the same time, and it will appear that the angle of rotation will be pro-

* By the term absolute force we understand the force employed to turn the body, multiplied by the distance $FG$, from the centre of gravity.
portional to the sum or difference of the absolute forces, according as they tend to turn the body $BD$ in the same or in contrary directions.

If the acting forces directly counteract each other, it is plain that their absolute effect, with respect to the centre of gravity $G$, must be sought, and then deduct the excess of one from the other: then the angle of rotation will be proportional to that excess; instead of which, it will be proportional to the sum of the forces employed, if they act in concert and in the same manner, to augment it. But if you take no notice of the angle of rotation, and wish to consider the centre of gravity only as being transported from $G$ to $g$, it is not necessary to find the sum of the absolute forces of the acting powers, but only to consider the forces in themselves, and then $Gg$ will be found proportional to either their sum or their difference, according as they contribute to produce the same effect, or as they are opposite in their efforts.

**Figure 6.**

Suppose these forces equal between themselves but acting in contrary directions on the extremities $A$ and $B$ (fig. 6) of the body $AB$, and on arms of equal levers. Then it is evident, that the angle of rotation is double what it would be if the body were struck by only one of these forces, and turned on its centre of gravity; since the two parts, separated by the centre, are struck equally and at the same time by forces which act perpendicularly in contrary directions. To prove this, observe that the equal powers $s$ and $T$ act at the same time on the body $AB$ with equal levers, $CG$ and $GF$; so that the extremity $B$ passes to $C$ at the same time that $A$ passes to $P$; and thereby the centre of gravity $G$ remains as if it were fixed in the same point which serves as a centre of rotation; for, if one of the acting forces removes it from its first situation, the other, in opposing an equal force, will replace it.

If the power $T$ exceeds the other $s$, it is evident that the centre of gravity $G$ will be transported towards $g$, in proportion as the force $T$ exceeds the other $s$; then the body $AB$ could no longer turn on the centre of gravity $G$ (§. 15,) but on another point $E$, which would be on the other side of the centre of gravity $G$, with respect to the point of percussion.

If the body $AB$ (fig. 6) were struck at the two points $K$ and $F$ by two mobiles, $s$ and $T$ exerting equal powers with respect to the centre of gravity $G$; it is plain that the whole body $AB$ will be carried up on parallels, such as $IT$ and $SH$, and that the sum of the two powers will act on the centre of gravity $G$, since they are equal in every respect.
THE THEOREM OF WORKING SHIPS.

THEOREM.

19. A SAIL ACTS ALWAYS TWO WAYS ON A SHIP, WHEN IT IS NOT PERPENDICULAR TO HER LENGTH.

FIGURE 7.

DEMONSTRATION.

We have only to consider the sail $\text{AB}$, (fig. 7,) oblique to the ship and to the wind, and we must be convinced (§ 1, 7) that it is impelled in the direction $\text{CD}$, with a force expressed by the square of the sine of incidence of the wind upon the sail. Therefore what we are going to say here for the present case is to be understood as applicable in all others, in which the sail shall not be perpendicular to the length of the ship; for, then, she would go only in the direction of her length from $\text{C}$ to $\text{E}$, or from $\text{C}$ to $\text{F}$, according as the sail might be full or a-back.

If $\text{CD}$ be equal to the impulse of the wind upon the sail as expressed by the square of the sine of incidence $\angle \text{AV}$, we have only to form the right-angled parallelogram $\text{GH}$, to be convinced that such a direction is composed of the two effects $\text{CH}$ and $\text{CO}$, which it produces with respect to the body $\text{EF}$, upon which it acts in impelling it in the direction $\text{CD}$.

The more the yard $\text{AB}$ (fig. 7) shall make the angle $\angle \text{ACOE}$ acute, the more the effect $\text{CH}$ will augment, and the other $\text{CO}$ diminish; for, the more the angle $\angle \text{ACOE}$ becomes acute, the more its equal $\angle \text{DCH}$ or $\angle \text{CDO}$ (§ 22) will be acute also; so that $\text{CD}$, which is perpendicular to the centre of the yard, will approach more to $\text{CH}$, the other perpendicular to the length of the ship $\text{EF}$; which cannot happen without increasing the ship's tendency to fall off in the direction $\text{CB}$, and increasing likewise the cause $\text{CD}$, which follows in that increase the same proportion as the square of the sine of incidence augments. (§ 1, 6, 7.) But this increase of the impulse $\text{CD}$ is not sufficient to preserve the effect of the sail in the direction of the keel $\text{CO}$. On the contrary, it diminishes in the proportion of the decrease of the sine $\angle \text{ACOE}$ or $\angle \text{CDO}$; whence it follows, that you never can augment the impulse of the wind by shifting the situation of the sail, when it is properly trimmed, without lessening the rate of sailing, (§ 28,) when neither the ship changes her course nor the wind shifts.
20. It might, in the same manner, be demonstrated, that the more open
the angle $\angle A C E$ of the sail $A B$ is with the keel, the more its effect $c \ G$, in the
direction of the ship's length, will increase in the same proportion as the in-
crease of the sine of that angle, when the impulse of the wind upon the sail
is the same; for, the sines of the angles are in proportion to their opposite
sides in the triangle $c \ D \ G$, of which the angle $\angle C D G$ is equal to the angle
$\angle A C E$.

If the impulse augment also, ($\S.3$,) the two effects, $c \ G$ and $c \ H$, will aug-
mment proportionally.

21. If the sail $A B$ receive the impulse of the wind $E$ on its forward sur-
face, it would still act in two ways on the ship, by forcing her first a-stern in
the direction $c \ F$, and then to leeward in the direction $H \ C$; to be convinced
of this, reverse the parallelogram, by tracing it on the after part of the yard
towards $F$, and use the same reasoning.

**FIGURE 8.**

![Figure 8](image_url)

**THEOREM.**

22. THE ANGLE $A C F$, (fig. 8,) FORMED BY THE YARD $A B$, AND THE KEEL,
$F C$ OF THE SHIP, IS EQUAL TO THE ANGLE $D C H$, COMPREHENDED BE-
TWEEN THE PERPENDICULARS $D C$ TO THE YARD AND $B C$ TO THE KEEL,
IN THE LIKE MANNER AS THE ANGLE $C D G$.

**DEMONSTRATION.**

The angle $A C D$ is right, since $C D$ is perpendicular on $A B$: the other
angle $F C E$ is right also; for $C H$ is perpendicular on $F I$; therefore the arc
$A D$ is equal to the arc $F H$; and if, from these two equal arcs, be taken away
the common one $F D$, the remainders $A F$ and $H D$ will be equal: because,
when equals are taken from equals, the remainders must be equal.

Secondly, the angle $C D G$ in the parallelogram $G E$ is alternate to the an-
gle $D C E$: therefore it is equal to it; therefore it is also equal to $A C E$.

23. It follows, that the angle $B C H$ is equal to the other angle $D C F$; for,
if from the two equal arcs $A D$ and $B D$ be taken the other equal arcs $F A$ and
$D H$, the remainders $F D$ and $H B$ will be equal also.

24. The few principles of geometry here given, and which will be found
of great service in the sequel, ought not to discourage. We make use of
them now, only to establish principles as simple as they are sure, and to leave
nothing to doubt or conjecture in the following part of this theory, which is
in itself very abstruse. We shall however be obliged to use again a few
more demonstrations of this kind.
25. IN most ships the sails make with the keel an angle $\angle ADN$ (fig. 9) of 40 degrees, or thereabouts, (some more, some less,) when close hauled. We are now to undertake to make it appear that this angle is not the most favorable to run with the greatest velocity, in getting to windward. It should be much more oblique; but as it is not possible, in practice, to attain the greatest perfection, we must be contented to approach it as near as possible, in great ships, by reducing the angle $\angle ADN$ to 30 degrees only. This will be so much the more easily done, as in every ship the two foremost shrouds of each lower mast can be suppressed. For it must be observed, that, in the movement of pitching and rolling, the masts always incline forward, in the direction $DE$ of the effort of the sail; so that the shrouds which are abaft, and cat-harpened in, are sufficient to support the masts, since they act nearly opposite to the effort of the sail. Besides, should there be reason to expect bad weather, preventer-shrouds may easily be fastened to the strops which are always ready hung for that purpose. This practice is so much the better grounded, as the number of those preventers can at any time be increased as circumstances or necessity require.*

* This recommendation of M. Bourde, to suppress the two foremost shrouds of each lower mast, in order to brace up sharper, we are warranted in saying, cannot be followed in the British navy. It was lately determined, upon a consultation of the officers of the King's Yards, the question having been referred to them, that the present number and dimensions of the rigging of ships could not be advantageously altered or safely diminished. And, as to occasionally casting them off, it may be rendered by the inevitable accidents of navigation, highly dangerous; as, for instance, in case of being suddenly taken a-back, this lessening of the support of the mast might be attended with its loss.
THE THEORY OF WORKING SHIPS.

Therefore, we shall, for the future, consider the angle A D R, which is the most oblique in practice, as fixed at 30 degrees, though, in some ships, it may happen to be more acute: a circumstance to which particular attention should be paid.

26. Among the angles A D R, B D R, and H D R, (fig. 9,) which the sail A Z can make with the keel in the same course D R, it is evident there must be one more advantageous than the rest, to produce the greatest velocity possible in the most oblique course. That angle of the sail and the keel is not what we propose directly to determine, since it is impossible to render it more acute than 30 degrees, the term to which we have fixed it in practice: but it will serve us to determine the most favorable angle of incidence A D V of the wind upon the sail, and which is the most advantageous to run with the greatest rapidity on all oblique courses between close-hauled and wind abaft.

27. Before we enter upon the demonstration of the rule which must be followed in practice, the principle which serves to demonstrate its utility must be first established. It may be recollected that impulsions (§. 7) are between themselves as the squares of the sines of incidence. Therefore, to judge if it is advantageous to render the angle of incidence A D S or A D V of the wind upon the sail A Z more or less acute, we must examine if the square of the sine of incidence A F, or the total impulse D E, increases more or less than the squares of the sines of incidence B C and H I, or than their correspondent impulses D G and D K, proportionally to the diminution or increase of the sines of the angle of obliquity of the sail with the keel A T, B Y, and H L; for, if the square of the sine of incidence H I, or the impulse D K, does not increase so much proportionally, as the sine of obliquity A T diminishes in becoming equal to L H, it is evident that the position of the sail A D is more favorable than when it is situated in the direction D H; and if the square of the sine of incidence H C, or its correspondent impulsion D G, diminishes more in proportion than the sine A T augments, in becoming equal to the other sine of obliquity B Y, in the other position of the sail; it is an evident proof that its situation A D is still more favorable than if it were in the position B D, and that there is even no better situation than A D, whether the angle of incidence A D V be increased or diminished.

28. To prove it, we shall consider (fig 9.) the absolute impulses D K, D E, and D G, as correspondent with the sines of incidence H I, A F, and B C, and proportional to the squares of these same sines; then, on these diagonal lines, if we draw the rectangles X N and M O, in order to dissolve those total impulsions D E and D G, it will appear evident that the direct effort D X in the direction of the keel, is the greatest possible, when the tangent A S of the angle of incidence is double the tangent A R of the angle of obliquity of the sail with the keel; for, if the angle of incidence be opened ten degrees by placing the sail in the situation H D, it will appear that, though the total impulsion D K is augmented in the ratio of the square of the new sine of incidence H I to the first A F, the partial effort D M, in the direction of the keel, will be nearly by one-tenth less, in this situation of the sail H D, than in the first A D. The direct impulsions D M, proceeding from the total ones D K and D G, are equal, because these last have augmented or diminished in the same ratio as the sines H L and B Y have lessened or increased in proportion to the square of the sine of incidence A F; and to the sine of obliquity A T. These direct partial impulsions D M and D X are in a compounded ratio of the sines of obliquity H L, A T, B Y, equal (§. 22) to those of the angles D K, D E, and D G; for, if the total impulsion augment by a movement of the sail, the sine of obliquity diminishes: so that from the total impulsions can at any time be deduced the direct ones for every possible angle of incidence. We might very well verify by
calculation this demonstration, which proves that the tangent $as$ of the angle of incidence must always be double the tangent $ar$ of the angle formed between the sail and the keel, agreeably to the situation of the sail $az$; since if any other position be given to it with respect to the wind $v$, whether it be in the direction $hd$ ten degrees more open than $az$, or like $bd$ ten degrees more oblique, a result, as $dm$, in the direction of the keel, will ever be found less than $dx$.

As the vanes always indicate the apparent direction of the wind, on all the courses the ship can sail, the angle which the wind makes with the course, or the keel, cannot fail being easily known if there is no leeway; let that angle with the sails be parted into two others, so that the angle of obliquity of the sails with the course may have its tangent equal to half the tangent of the apparent angle of incidence of the wind upon the sails. On this foundation, it will be easy to form a table which will always shew both the apparent angle of incidence, and that of the obliquity of the sail with the keel or with the course. This table will serve for all oblique courses, provided the after sails cover those forward only in a trifling degree; for should they becalm them much, they must, for other considerations, be braced up a little more to the windward; but always leave the apparent angle of incidence of the wind upon the sail more open than that between the sail and the keel, or the course.

**ARTICLE I.**

**REMARKS ON SAILING BY THE WIND.**

**FIGURE 10.**

29. When it is desired to gain to windward as much as possible, without absolutely wishing to sail with the greatest velocity, let the direction of the coast under the lee be supposed to make with the absolute direction of the wind (which must as near as possible be known) an angle of 90 degrees; or, in the sea phrase, blowing dead on shore; let the angle $ace$, (Fig. 10,)
formed by the sail and the keel, be known to be 30 degrees, let the lee-way be also known to be 10 degrees, the angle $\alpha$ between the sail and the course will consequently be 40 degrees, which you must take from the total angle $\angle v c L$ 90 degrees; then there will remain 50 degrees, the half of which, 25 degrees, is to be taken for the absolute angle of incidence $\angle v c E$, and for its equal $\angle t c L$; so that the ship $A B$ will go 55 degrees from the wind when she is close-hauled, and will consequently recede as much as possible from the point $D$ on the coast, the direction of which makes an angle of 90 degrees with the absolute direction of the wind $v E$.

**Figure 11.**

But, if the situation $c l$, (fig. 11,) of the point $D$, from which you wish to move, made an obtuse angle $\angle v c L$, with the positive direction of the wind $v M$; then the tangent of the apparent angle of incidence $\angle v c E$ must be made double the angle of obliquity $\angle E c I$ which the sail makes with the course, at the same time that the angle $\angle I c L$ of the course and the coast shall be made equal to the angle $\angle v c E$, formed by the real direction of the wind $v K$ and of the sail $F E$: so that two considerations must at once be attended to. For example: the angle $\angle a c E$, formed by the sail and the keel, is 30 degrees; then, according to the first principle, it will be necessary that the apparent angle of incidence $\angle v c E$ should be $49^\circ 6'$; and if the difference between the apparent and real direction of the wind be $10^\circ$, there will be $59^\circ 6'$ for the angle which the sail $E F$ makes with the real direction of the wind $v M$: so that the angle $\angle L c I$, of the course and the object stood from, must be found also to be $59^\circ 6'$, and the total angle $\angle L c V$ will then be $148^\circ 12'$, adhering to the two principles of sailing with the greatest velocity, and of getting to windward of the point $D$, as much as possible, at the same time; while the angle $\angle L c V$, formed by the apparent direction of the wind and that of the coast from which the ship moves, will be only $138^\circ 12'$. The yawing and the different velocities of the ship render the angle formed by the two directions of the wind (the real and the apparent) more or less open. If the ship has more velocity at the same time, or if the course approaches more to the direction of the wind, it will appear by the vanes that the wind draws forward, and the angle of the two directions of the wind will augment. If the ship falls off, and yet still preserves the same velocity, or if her velocity decreases without altering her course, the wind will seem by the vanes to draw aft, and the angle of the two directions will diminish; so that, whenever the ship shall have velocity or run obliquely to the wind, there will always be a difference between its real and its apparent direction. If the ship run exactly before the wind, or have no motion at all, there will be then no other but the real direction of the wind shewn by the vanes: but, in oblique courses, the vanes being movable, will fix themselves in a middle direction between the absolute tendency of the wind and the course of the ship; whence we may easily conclude, as we did before, that the apparent direction of the wind, shewn by the vanes, is a medium between the respective velocities of the ship and of the wind; since that direction necessarily partakes more of the
greater velocity than of the less: so that, if the ship runs east, with the wind at south, having the fourth part of the velocity of the wind, the vanes will shew S. S. E. 4° 30′ S. for the apparent direction of the wind.

ARTICLE II.

THEOREM OF M. BOUGUER.

The velocity and real direction of the wind is $c\ M$; (fig. 11;) suppose the ship $A\ B$, of which $E\ F$ is the sail situated at pleasure, to draw the course $c\ I$, while the particles of air run in the direction $c\ M$; if from the point $I$, be drawn $I\ K$, parallel to the sail $E\ F$, till it cuts the direction of the wind $V\ K$, in the point $K$, there will be given the three points $C, I, K$, through which draw the circumference of a circle $C\ I\ K$, and that circumference will shew the extent of the forces acting on the ship, at the same time, in following the course $C\ I$, provided her sail be always trimmed in the same manner with respect to her keel.

DEMONSTRATION.

The apparent or relative velocity of the wind is represented by $I\ M$ (fig. 11) in the course $C\ I$; and as $I\ K$ is parallel to the sail $E\ F$, the angle $M\ I\ K$ is equal to the apparent angle of incidence $V\ C\ E$. But to be more explicit: the wind strikes the sail with its apparent or relative velocity $I\ M$, (and not with its absolute velocity, because of the motion of the ship,) and with an angle of incidence $M\ I\ K = V\ C\ E$: so that if the ship runs close hauled or perpendicular to the direct wind $V\ C$, $I\ M$ will become in both cases stronger than the absolute velocity; because the ship will either approach to the source of the wind, or not recede from it. But the impulse on the sail is proportional to the square of the velocity $I\ M$, multiplied by the square of the sine of the angle of incidence $M\ I\ K$ equal to the angle $V\ C\ E$ (§. 3 and 7) and the proportion $M\ K: \sin e\ K\ I\ M:: M\ I: \sin e\ M\ K\ I$, which furnishes us the triangle $K\ I\ M$, shews us that $M\ K \times \sin e\ M\ K\ I = M\ I \times \sin e\ K\ I\ M$; squaring the two products, and substituting the sine of the angle $V\ K\ I$ in the room of the sine of the angle $M\ K\ I$, which is equal to it, since they are the supplement of each other, we shall then have this other equation: $\sin e\ V\ K\ I \times M\ K = \sin e\ K\ I\ M \times M\ I$; whence it follows, that instead of expressing the actual impulse of the wind upon the sail by the square of $I\ M$, multiplied by the square of the sine of the angle $K\ I\ M$, it may be expressed by the square of $M\ K$, multiplied by the square of the sine of the angle $V\ K\ I$, or of its equal $V\ C\ E$, formed by the absolute direction of the wind $V\ M$ and the sail $E\ F$.

We must not forget to be very attentive to this; viz. that the impulse of the wind upon the sails is in equilibrium with the effort of the water on the bows, or that they are exactly equal and contrary when the ship is come to an uniformity of motion (§. 9) as here we suppose her to be. Besides, the impulse of the water on the bows is proportional or equal to the square of the velocity of sailing $C\ I$, (§. 3) so that the square of the velocity of sailing $C\ I$ is equal to the actual impulse of the wind upon the sail expressed by the square of $K\ M$, multiplied by the square of the sine of the angle $V\ C\ E$; and if $s$ be supposed equal to the sine of $V\ C\ E$, or of $V\ K\ I$, we shall always find $C\ I = s \times K\ M$. The first term in this equation represents the impulse of the water on the bows, and the second expresses the effort of the wind upon the sails; and, if the square roots of the one and of the other be taken,
THE THEORY OF WORKING SHIPS.

will be found c i = s × k m; that is to say, that the very velocity of sailing c i will be continually equal or proportional to the product of k m by the sine s of the angle v e or c k i. The proportion between these quantities depends on the density of the two fluids, and on the magnitude of the surfaces struck: but it will be the same in all the different courses.

The different velocities of sailing c i have a constant and given proportion with the products s × c k and c i × sine c i k; for the triangle c i k gives

\[ s \times c i : : \text{sine } c i k : c k, \]

which forms this equation, s × c k = sine c i k × c i; and all the angles c, i, k, are constant and known, since they are equal, being alternate to that which the sail makes with the course. But, as the velocity c i bears a continual and constant proportion with the product s × k m, and as it bears also a constant proportion with s × c k, it follows that s × k m : s × c k : : k m : k c; so that the point k always divides c m in the same proportion: the point k is then invariable when the sail, as well as the lee-way, are both the same; (which never happens, however, as will be made appear (§. 47) hereafter;) but, in admitting these two hypotheses, which never can deviate from the truth but in respect to the lee-way, which is always variable in the same ship, according to the different circumstances of wind, sea, velocity, sail, and course, it ought then to be concluded that all the points, c i &c. will be situated on the circumference of a circle; for, without that, the

\[ \text{equal to those which are formed by the course and the sail,} \]

which are supported on the same chord c k, would not be equal.

COROLLARY.

Admitting therefore (fig. 11, page 42,) that the velocities are continually proportional to the sines (whatever they be) of the angles v e, which the sail makes with the absolute direction of the wind, provided the sail be always trimmed in the same manner with respect to the keel, and that, in the triangle c i k, the side c k and the angle c i k are constant, and the velocities of sailing c i are proportional to the sine of the angle c k i, equal to the angle of incidence v e; it follows, that, all the other conditions being the same, the more the sine of the angle v e is augmented, the greater will the rate of sailing be; so that, if you want to carry it to the greatest rapidity, you have only to make a right angle of the angle v e formed by the absolute or real direction of the wind with the sail; then the velocity c i will no longer be a simple chord in the circle c k i, but a diameter. This holds good for all the ships which have but one sail set; but, whenever they shall have several, the greatest velocity will be when the apparent angle of incidence of the wind upon the sail makes a right angle with the course; because then the sails will easily make, with the apparent wind, an angle of which the tangent will be double that of the angle they make with the course, without their becoming one another; while, at the same time, the ship will receive all the absolute impulse of the wind, because she does not recede from it, and it is the time when the greatest surface of sail is exposed to its impulse. The same advantage of the greatest velocity will still be had, when the apparent direction of the wind makes an angle of a hundred degrees with the course; and, in this situation, the velocity will in some degree be increased. In a word, whenever the after-sails do not become those forward, the ship’s rapidity may always be increased, by trimming the sails as directed (n. 28): but when the sails take the wind from one another, an increase of velocity can no longer be pretended to.

We are now going to demonstrate the exactness of the rule given before. (§. 29.) When it is required to get off shore, or recede from a given right line with all possible expedition, or to keep absolutely as close to the wind as
The ship will lie; \(C\) \(M\) (fig. 11, page 42) is the absolute direction of the wind; the circle \(C\) \(K\) \(L\) \(I\) marks all the points at which the ship can arrive with the same sail, the same disposition, without alteration of lee-way, and at the same time; and \(C\) \(L\) is the right line from which she is to move. Knowing the angle that line makes with the absolute direction of the wind \(V\) \(M\), it is evident that the point \(I\) of the circumference, where the course ought to end, is in the middle of the arc \(C\) \(I\) \(L\), of which \(C\) \(L\) is the chord: and all the points from one part to the other of \(C\) \(I\), where the ship can come to at the same time, are less distant from \(C\) \(L\), since \(D\) \(I\), perpendicular to \(C\) \(L\) divides it into two equal parts, and is the longest of all the perpendiculars which can be drawn from the circumference \(C\) \(I\) \(L\); but the point \(I\) cannot be taken without rendering the angle \(L\) \(C\) \(I\) equal to the angle \(C\) \(K\) \(I\), which itself is equal to the angle \(V\) \(C\) \(E\).

**ARTICLE III.**

**A TABLE OF THE SITUATION OF THE SAILS TO RUN WITH THE GREATEST VELOCITY.**

M. BOUGUER.

<table>
<thead>
<tr>
<th>Angles of the apparent direction of the wind and course.</th>
<th>Angles of the sails with the keel.</th>
<th>Angles of apparent incidence of the wind on the sails.</th>
</tr>
</thead>
<tbody>
<tr>
<td>D. (00) (15) (37) (30) (44) (58) (10) (22) (33) (41) (48) (53) (55) (54) (59) (42) (21) (14) (53) (13) (25) (28) (23) (06) (39) (00)</td>
<td>D. (90) (87) (86) (85) (82) (80) (77) (75) (72) (70) (67) (65) (62) (60) (57) (55) (53) (52) (50) (45) (42) (40) (37) (35) (32) (30) (27) (25) (00)</td>
<td>D. (90) (88) (88) (87) (86) (84) (83) (82) (81) (79) (78) (76) (75) (73) (72) (70) (66) (67) (65) (63) (61) (59) (56) (54) (51) (49) (46) (43)</td>
</tr>
</tbody>
</table>

The foregoing table can be of no great service, except in the eight last circumstances under the line \(a, b\); because, in all the cases mentioned above that line, the sails will cover one another too much.
When a fast sailing ship (such as will, on a direct course, or right before it, take a third or a fourth part of the velocity of the wind) comes to run with the same quantity, or more sail, on a perpendicular to the apparent direction of the wind, then she acquires a greater rapidity of sailing with respect to the velocity of the wind; the angle made by the two directions, the apparent and the absolute, is at that time very considerable; it may be from 18° to 22° 30'; and if the ship hauls quite close by the wind, the angle will still be nearly the same; for, her velocity diminishes: but, as it is in sailing by the wind that it is most essential to know the greatness of the angle between the two directions of the wind, let the angle between the directions of the ship's head on the different tacks be observed, without paying any regard to the lee-way but just to the exact point on which the ship stands, before and after going about, when strictly by the wind, neither too much to leeward nor to windward; and when you have determined that angle, from two or three observations, halve it, and then you will have the angle formed by the keel and the absolute direction of the wind; by which you will know the quantity she will come to upon the different tacks, and will never be deceived with respect to the lying on after having gone about: a mistake pretty commonly made by those who pay attention only to the apparent direction of the wind, which always makes with the real one an angle more or less open in a compound ratio of the greatest velocity with the greatest obliquity of the course of the ship, with respect to the direction and the absolute velocity of the wind; things which vary in all ships, because they have not all the same advantage of sailing with the same rapidity in similar circumstances.

CHAPTER IV.

OF THE SAILS WHICH ARE BEFORE THE CENTRE OF GRAVITY OF A SHIP.

30. THE sails which are before the centre of gravity of a ship are the sprit-sail, sprit-sail top-sail, the jib, the fore-top-mast stay-sail, and the fore stay-sail.

Besides these sails there are, on the foremost, the foresail, fore-topsail, fore-topgallant-sail, and fore-topgallant-royal-sail, with their respective studding-sails. Now these four last sails may be regarded as only one large sail, wide at the foot and tapering towards the head, and which can be reduced as occasion requires, either by taking in the royal, or by reefing the fore-topsail, or even taking it quite in, if necessary, to have the foresail only set; or by hauling the foresail up, if nothing but the topsail is wanted. It must notwithstanding be observed, that the different parts of the whole sail may, in certain cases, be worked differently the one from the other; as, for example, in reefing the top-sail, or in taking in either the one or the other. But, when you want to set them to work all together, either for making a course, or performing some evolution, they must all be braced and trimmed in the same form, and with the greatest uniformity possible. Therefore, whatever we shall say concerning one of them in any operation, is to be understood to be the same with respect to all the rest.

The main-stay-sail, the main-top-mast stay-sail, the middle-stay-sail, and the main-top-gallant stay-sail, are likewise sails of the fore-part of the ship's centre of gravity.
OF THE EFFECT OF THE FORE-AND-AFT SAILS, WHICH ARE ON THE FORE PART OF THE CENTRE OF GRAVITY OF A SHIP.

31. The jib and stay-sails being of a triangular figure, their centre of gravity is easily found; and that point is to be considered as the part, in all these sails, on which the whole effort of the wind is united, when they are exposed to its impulse, in whatever way it strikes them.

The particular effort of each fore-and-aft sail being on the fore part of the centre of gravity of the ship, it follows that the total effort of all these sails must be there too; and that, if the ship was in a perfect equilibrium with respect to the wind, before her sails were set, she will loose it immediately after (§. 11) they make the fore part of the ship obey the wind, whenever it strikes them perpendicular or obliquely. For it must be observed, that almost all these sails have their tacks in the middle of the ship, and their sheets lead to the sides; so that they make with the keel a very acute angle: whence it is easy to conceive, that the perpendicular which would be raised on the exterior surface of these sails, in the direction of their efforts to leeward, from their centre of gravity, would differ but very little in the lateral direction from a perpendicular to the keel. From this we may therefore conclude, that these sails would have but very little effect to accelerate the rapidity of sailing with respect to their position, if it was not demonstrated that they are very advantageous in going by the wind. They make the ship steer well, and are particularly useful when a ship gripes much: and, when they do not take the wind out of any of the lower sails, they ought to be used, particularly when one is obliged to sail by the wind, or to run not very large. The jib and fore-top-mast stay-sail, must be preferred, because they are at all times useful when they can receive the wind; for, by their position, they cannot take the wind out of any of the other sails, and their particular effect in veering is considerable, not only on account of their great surface, but because they act before the point on which the ship turns with a very long arm of a lever. (§. 17.) Besides, all sails which raise a ship’s head, assist her progress: for the direction of their effort ascending obliquely towards the horizon, they do not make her plunge in the water, which is an advantage peculiar to these sails. Experience has confirmed their utility on all occasions when they can be employed without taking the wind out of the other sails.
ARTICLE II.

OF THE EFFECT OF THE FORE-SAIL, FORE TOP-SAIL, FORE TOP-GALLANT-SAIL, AND SPRIT-SAIL, IN THEIR DIFFERENT SITUATIONS.

32. When the sail $AB$ (fig. 12) is trimmed close to the wind which blows from the point $V$, it is impelled in the direction $CD$ (§. 7) with a force expressed by the square of the sine of incidence, and composed of the two effects $CE$ and $ED$. (§. 19.) But as the centre of effort of that sail $AB$ is on the fore part of the centre of gravity of the ship $H$, and as its power $CD$ is always decomposed between those two effects $CE$ and $ED$, it follows, that the effect of this sail is to cause the ship to bear away; while it keeps up at the same time, and even augments, the rapidity of sailing.

33. If the fore-sail $AB$ received the impulse of the wind perpendicularly, it would still produce the effects of bearing away, and augmenting the rate of sailing, for the reasons just given above, but more effectually would it do so (§. 29) on account of the increase of the impulse of the wind upon the sail.

34. It follows, from what has been said, that when the sails upon the fore-mast are full, on the same side they are tacked, being braced obliquely to the keel, there is always one part of their effort, in proportion to the obliquity, which acts to make the ship bear away; while the other part of their effort acts at the same time to accelerate or keep up the rate of her sailing.

35. When the sails $AB$ of the fore-mast (fig. 13) are situated obliquely with respect to the keel, and receive the wind in them, on the side of the sheet $B$, they act upon the ship in bringing her up to the wind, because their
THEORY OF WORKING SHIPS.

36. In general, when the yards are square or perpendicular to the keel, it is evident that they will act on the ship, only by impelling her right in the direction of the keel, from stern to head, or from head to stern, with more or less velocity, in proportion to the impulse of the fluid which strikes them.

37. When the sails A B on the fore-mast (fig. 14) receive the impulse of the wind v on their surfaces forward, they will make the ship both go a-stern and fall off; because the direction c e of their effort, being turned towards the after-part, serves as a diagonal to the parallelogram v d; which, by discomposing it, will shew us those two effects c f and c b; the first of which takes its direction with that of the keel from forward aft, while the second takes it in a lateral direction in making the ship to turn.

38. When the wind blows between the keel and the yard, the ship comes to, until the point g (fig. 14) is in the direction of the wind v. But, as soon as this is done, it is evident that she falls off; for the point g recedes farther and farther from the direction of the wind. Whence we may remark, that as soon as the weather part of the sail catches a-back, on the tack side, the angle of incidence of the wind on it goes continually increasing, till the ship has fallen off so much, that her sail becomes perpendicular to its direction; and, if the vessel continues to fall off, then the angle of incidence diminishes more and more, till the sail is parallel to the course of the wind which comes from the tack B, or as it is called, shivering.

CHAPTER V.

OF THE SAILS WHICH ARE ABAFT THE CENTRE OF GRAVITY OF A SHIP.

39. THE main-sail, main-top-sail, main-top-gallant-sail, and main-top-gallant-royal-sail, and their respective studding-sails; the mizen-stay-sail, mizen-top-mast-stay-sail, the mizen-course, mizen-top-sail, mizen-top-gallant-sail, and mizen-top-gallant-royal-sail, are all sails which are placed abaft the centre of gravity of a ship, the point round which the total effort of the sails is placed.
ARTICLE I.

OF THE EFFECT OF THE FORE AND AFT SAILS ABAFT THE CENTRE OF GRAVITY OF A SHIP.

40. The centre of effort of these sails being abaft the centre of gravity of the ship, it follows that they always force the after-part of the ship to leeward, and consequently contribute to bring her to the wind, as soon as they receive its impulse; for, that movement of the after-part of the ship cannot happen, without the head approaching to the direction of the wind.

The fore-and-aft sails being in general situated very obliquely, it follows, consistently with principles, that they are very advantageous for sailing by the wind. Therefore, we must not neglect augmenting them: observing at the same time, that they do not take the wind out of one another, nor becalm the principal sails. They are only to fill up the space between the masts fore and aft, in sailing near the wind, in order that no wind may be lost.

ARTICLE II.

OF THE EFFECT OF THE SQUARE SAILS OF THE MAIN-MAST, AND OF THE MIZEN-TOP-SAIL, IN THEIR DIFFERENT OBLIQUITIES.

41. As we have already demonstrated (§. 19) that when the sail $AB$ (fig. 15) is trimmed obliquely to the keel, it produces evidently two effects on the ship; it must therefore follow, that, in dissolving its power, $CD$, we shall find its compound effects, the one $CF$ in the direction of the keel which produces the velocity, and the other $CE$ lateral, which (in forcing the after-part of the ship to leeward, by its action on the point $C$ abaft the centre of gravity $G$ of the ship) occasions her to come to the wind; for that motion of the stern from $C$ to $E$ cannot take place, unless the fore-part $H$ acts contrarily in coming towards the point from which the wind blows, $V$.

42. If the sails $AB$ were more or less oblique to the keel, they would still have the same effects of keeping up the ship's velocity, and bringing her to the wind. And, if they receive its impulse perpendicularly, it would still be the same thing, producing those two effects, however, with greater efficacy than in any other situation with respect to the wind, because then they receive its greatest possible impulse for the time.
45. When the sails $A B$ (fig. 16,) of which the centre of effort $c$ is abaft the centre of gravity of the ship, receive the impulse of the wind $v$ on the sheet side, being placed obliquely to the keel, they will cause the ship to fall off, by forcing the after-part, from $c$ to $F$, towards $v$, the source of the wind, while they will, at the same time, keep up the velocity $c L$. For, this motion of the after-part $E$ towards $v$ cannot be executed without the fore-part $H$ going, as it moves off, in a contrary direction; and she will continue to fall off till the keel $E H$ be right in the direction of the wind $v c$, or right aft; then the ship will come to the wind, as shewn in the two preceding articles.

It may be remarked that, in this movement of the ship, the angle of incidence goes continually increasing till the wind is perpendicular to the sails.

44. When the sails $A B$ (fig. 17,) of which the centre of effort $c$ is abaft the centre of gravity $c$, shall receive the impulse of the wind $v$ on their forward surfaces, they will make the ship come to the wind and go a-stern at the same time. For the direction of their efforts $c D$ may be dissolved between the two efforts $c F$, in the direction of the keel, from forward to aft, and $c E$, lateral and perpendicular to the keel; so that the after-part $C H$ is forced to leeward from $c$ to $F$, while the fore-part $I$ approaches, by a contrary motion, the point of the wind $v$. In this case, therefore, the ship comes to, and goes a-stern.

45. When the ship is so far come to the wind, that the fore-part $I$ (fig. 17) has come into its direction, it is evident, that she will fall off more and more; for, that point $I$ will constantly move from the point of the wind $v$; therefore, it is demonstrated that, in this case, the sine of incidence is continually decreasing more and more, till it is reduced to nothing. But, if the direction of the wind had made an obtuse angle $v B c$, the sine of incidence would have augmented until the direction of the wind had been perpendicular to the sails; and it is at that moment only it would have begun to diminish, as we have shewn before.
After having demonstrated the different effects of the sails both before and abaft the centre of gravity, it is clear that if either the head or after sails only were set, in sailing by the wind, the ship would not only steer badly, but consequently sail not so fast as she could under the same quantity of surface differently disposed. For, if the ship be supposed (fig. 18) to be under her head-sails, and one half be retrenched and set on the masts abaft, it will evidently appear that the velocity of the wind produced is the same, since the direction and the velocity of the wind act always in the same manner on the same quantity of surfaces; the only difference which will be found is, that the primitive effect is divided, and acts now on the points c, c, e, before and abaft the centre of gravity of the ship. It is not the same with respect to the effect c e, which acted only on the head of the vessel in the first disposition of the sails; because, that effect being now divided on the after-masts, it is diminished one half c e forward, by reason of that force being transported aft; where, balancing the effect of falling off produced by the head-sails, it keeps the ship to the wind; by equality in the movements (§. 34 and 42) I say that it balances, because, when the weather permits, we may at any time either increase or diminish the sails, so as to preserve an equilibrium between their powers, and fix the ship on her course. When this point of equilibrium is obtained, we then possess the most advantageous disposition the sails can have for the vessel to run with the greatest celerity; provided that they have been trimmed in the most favorable manner to receive (§. 28) the greatest impulse of the wind.

This equilibrium between the powers of the sails forward and aft is likewise advantageous with respect to the rudder; because, as there is less occasion to use it to regulate the movements of the ship, its surface opposes itself but little, and less often to the shock of the water, which glides along the ship's bottom. It is then of the greatest importance, in endeavoring to increase the ship's way, to combine as much as possible, the reciprocal ef-
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47. When there is an equilibrium between the sails fore and aft, the resistance of the water from A to B (Fig. 18) on the bows is equal to the power of the sails, whether it passes through the centre of gravity H of the ship, or through another point of the axis, more or less forward or aft; then a ship, thus situated, finds no more difficulty to veer than to come to the wind, with respect to the resistance of the water under her lee; since all things are equal, viz. the resistance of the water upon the bottom to leeward, and the impulse of the wind upon the sails. But it must be considered that the power, composed of those of all the sails united, acts upon the ship according to the direction B A, perpendicular to their surfaces, the origin of which is the point H, a middle between all the effects C G of the sails fore and aft, which ought to correspond exactly with the resistance of the water from A to B: so that the ship is pushed to leeward of the course I K, which she holds into the direction B A of the effort of her sails; but the resistance which she finds from the water on the lee-side of her bottom, from A to B, sets her to rights again by its opposition, which is greater by reason of the greater facility she finds in dividing the fluid with her stem than with her side; so that she runs on the true course N B, which approaches nearer to that on which she steers than B A. Therefore the angle K H R of the lee-way is proportional to the greater or less resistance the ship finds laterally from the fluid under her lee; which resistance depends entirely on the more or less facility she finds in dividing the water with her bows; so that the lee-way can never be considerable but when close-hauled; for this reason, it is not much taken notice of when the course is less oblique than the wind on the beam. We might pursue this reasoning still farther, from an experienced fact, which will prove that the lee-way depends, not only on the form of vessels, but still more on their greater or less velocity, and seldom or never on the entire disposition of their sails more or less oblique to the keel, as some authors have advanced. For, when a fine sailing vessel is trimmed sharp, with all her sails set, in a very light breeze, with which she scarcely obeys the rudder, the lee-way is considerable, though the sea be perfectly smooth. This great lee-way is made by the ship, because the vessel being only gently impelled, and with little force, the water, not being shocked with violence, offers little resistance, and she is then carried easily by her sails in the direction of their effort B A: and, if we consider the side of the ship, in the act of sailing, as presenting a very great surface of sails above the water, it will visibly appear the lee-way will become still more perpendicular to the keel. But, let the wind begin to freshen, then the rapidity of sailing augments considerably; the ship shocks the water with a force expressed by the square of six or nine knots of velocity from B to A (Fig. 18) in the space of an hour, while the water repels her effort in a contrary direction: the water repels then in the ratio of this square to the square of her first velocity, and now no longer yields with facility (§. 4); the lee-way is suddenly diminished, and is reduced to five or six degrees, and sometimes less, if the rapidity of sailing continues to increase; if, at the very time when the ship has acquired already a very great velocity, she be kept away 12° or 15°, or even 20° 30', without altering the sails, their obliquity remaining the same, the ship should then fall off in the same proportion, according to the opinion of some who have written on the theory of the working of ships. This, notwithstanding, never happens; the velocity augments, because the sails then receive the wind with a
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greater sine of incidence, and thereby require more power, while the bows continue to be still shocked by the fluid in the same parts, and with the same sine of incidence; so that the lee-way diminishes again, because the water makes a greater resistance from the increase of velocity; and that resistance is greater on the ship's side than on her bows, which is less exposed to the shock. Whence it must be concluded that the lee-way, in the same ship, does not depend alone on the disposition of her sails, and that in different ships it is always dissimilar, from their not having the same form, or their sails not trimming equally in the same oblique courses; and because, in short they have different velocities with the same weather and under the same sails. Which proves, in a word, that the lee-way is always in a proportion compounded of the velocity of the ship; of her form, which gives her more or less resistance on her side than on the bows; and of her sails, trimmed more or less obliquely.

To return to the consideration of the action of the water on the bottom from a to b, (fig. 18,) it must be remarked, that it acts forward, and that it must consequently contribute very much to the tendency which almost all ships have to come to the wind, whenever the after-sails are in the smallest degree more powerful than those forward: for, the shock of the water is then a power which is to be added to that of the impulse of the after-sails, since this action of the fluid is so much the stronger as it acts before the centre of gravity of the ship at the point m, (fig. 18) in impelling the fore part towards the wind, which always makes ships difficult to ware, because all the effort of the water's resistance upon the bows is opposed to this movement, in forcing this part to windward with a very great effort. It is not therefore to be wondered at when ships veer with difficulty or slowly, especially such as have a large cut-water; because there are two forces acting one against the other, and the force which comes from the sail must surmount (§. 18) that which comes from the water; which will always easily happen, whenever, in suppressing some of the after-sails, those forward shall be disposed favorably enough to produce that effect; and when the rudder is used at the same time, the power of which is considerable, whether the ship goes a-head or a-stern rapidly. But if the ship, being abandoned to her own proper movements in an oblique course, had on a sudden all her sails suppressed, the vessel would come to the wind, should even the rudder never be used; because the water, acting on the fore-part of her bottom more on one side than the other, impels the head to windward against the smaller resistance, until its power is entirely destroyed by the total cessation of the ship's velocity.

When the ship runs so large that the after-sails becalm part of those forward, this is again another reason for the ship having an inclination to come to the wind; for, the sails forward receive a much less impulse from the wind than in a course more oblique; because the sails abaft, by increasing in their power, prevent those forward from having as much wind as their surfaces would take, since all the lee-parts of these sails become useless for the moment, being becalmed by the weather-part of those on the main mast; so that the power of the sails forward diminishes, while that of the after-sails increases; for the sine of incidence is greater. The ship ought then, for these reasons, to have more inclination to come to the wind; but, regard must be paid to the direction of the power of the sails in general, which now approaches nearer the direction of the keel: so that the greatest part of their effort is in that direction, while their force in the lateral one diminishes.

It should be farther observed, that when the ship has as much sail as the weather will permit her to carry, that is the moment of the greatest velocity of sailing, provided that (the sails having at the same time received the most favorable disposition) an exact equilibrium has also been placed between those afore and those afl, so that there should be little occasion for the use of the rudder.
APPLICATION.

41. One may readily discover, from what precedes, how to distinguish the degree of quickness with which different operations ought to be performed. For example, being obliged to run for a road-stead, the wind being large, and to let go an anchor as soon as come to it, it is evident this ought to be executed but under little sail, which should be all on the part before the centre of gravity; because, in the first place, a ship has always velocity enough when she sails large; secondly, because she is to overcome the effort $A B$ (fig. 18) of the water which opposes her movement. If, on the contrary, being obliged to come to the wind in anchoring, as many sails as can conveniently be managed at that moment may be set, because that movement of the ship is always very quick, and as soon as the sails are taken a-back, the rapidity of the ship’s way diminishes, and in a few moments entirely ceases, whereas it always augments when the ship falls off.

ARTICLE I.

REMARKS ON THE EFFECT OF THE MAIN-SAIL.

49. In the use of the sails, attention should be paid to the effect of the main-sail, which perhaps may not be that of bringing the ship to the wind; for, if the ship be too much loaded a-stern, the centre of gravity $H$ (fig. 18) of the ship might be abaft the main-mast, and then the direction of the effort of that sail, quitting the point $C$ before the centre of gravity, ought to make the ship fall off in lieu of keeping her up to the wind. But, for this to happen, the ship must be either very ill constructed or very badly loaded; or, in short, there must be great error in the position of her masts. Notwithstanding the main-sail may always be made to assist the ship in veering, though the centre of gravity $H$ be (as it is almost always) before the effort $C$ of the main-sail; yet, to do it, the effect of that sail need only be changed, by making it to pass before the centre of gravity of the ship: which will suddenly happen, if, when close-hauled, the main sheet be let go a-main, because the weather-part of the sail being fixed forward by the tack, its effect is likewise before the centre of gravity of the ship, though it has lost in that part much of its power, in becoming less exposed to the impulse of the wind; while the lee-part, bellying out more, can receive a great impulse of the wind, which will strike it more and more perpendicularly as the ship falls off with more and more rapidity. In this case, it may happen, that if the direction of the effort $C G$ of the mainsail do not pass before the centre of gravity $H$ of the ship, it comes so near that point, that it may be said to have no longer the effect of an after sail.
The rudder is a machine known to all the marine world; it is supported by the stern-post, to which it is affixed by braces and pintles, which operate as hinges. It acts by means of a lever called a tiller, which enters nearly horizontally into the ship, passing under the upper or middle deck transom; so that if, instead of leaving the rudder exactly in a right line with the keel, and, as it were a prolongation of it, it be turned to one side or the other, as $b\,d$ (Fig. 19,) it receives an immediate shock from the water which glides along the ship's bottom, in running aft from $a$ to $b$; and this fluid impels it towards the opposite side, while it continues in that situation, so that the stern, to which the rudder is confined, receives the same movement; and, the ship receiving an impulse sideways, her stern turns accordingly from $b$ to $d$, on any point whatever $c$, (§. 18,) while her head passes from $a$ to $a$. It must be observed, that the water strikes the rudder obliquely, and only with that part of its motion which acts according to the sine of incidence; in impelling it in the direction $n\,f$ with a force which depends not only on the rapidity of sailing, but also on the greatness of the sine of incidence: a force which is consequently in the compound ratio of the square of the greater or less velocity of the ship's motion, and of the square of the larger or smaller sine of incidence, which depends upon various circumstances. So that, if the vessel runs three or four times more swiftly, the absolute shock of the water upon the rudder will be nine or sixteen times stronger under the same angle of incidence, and will be augmented in a greater proportion if the sine of incidence be increased. This impulse, or what is the same, the power of the helm, is always very feeble, when it is compared with the whole weight of the vessel; but it acts with a very long arm of a lever, which occasions it to work very advantageously in turning the ship; for the helm is fixed at a very great distance from the centre of gravity $g$, as well as from the point $c$, upon which the ship is supposed to turn, with respect to the point of percussion $a$: and, if the direction $p\,n$ of the impression of the water upon the rudder be prolonged, it is evident that it will pass perpendicularly at the point $n$, widely distant from the centre of gravity $g$; therefore the absolute ef-
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fort of the water is very powerful. It is not therefore surprising, that this machine impresses the ship with a considerable circular movement, by forcing the stern from \( b \) to \( b' \), and the head from \( a \) to \( a' \), and even much farther, when the velocity of the ship is preserved; because the effect of the helm always keeps pace with the rapidity of the ship's way.

51. Amongst all the obliquities which may be given to the rudder, there is one situation which is more favorable than any of the others, to make it produce with more rapidity the effect of turning the ship, in order to change her course. To be convinced of this, we have only to consider that, if the obtuse angle \( \alpha \beta \delta \) (fig. 19) were to be lessened, the impulse of the water on the rudder would augment, at the same time that it would more oppose the sailing of the ship, since the angle of incidence would be more open, and would present a greater surface (§. 7) to the shock of the water, by opposing its passage more perpendicularly: but then the direction \( n p \) of the effort of the helm upon the ship would pass at a smaller distance from the centre of gravity \( g \) towards \( r \), and would less approach the perpendicular \( n l \), according to which it is absolutely necessary that the power should act with greater effect to turn the ship. Therefore, it is evident that, if the obtuse angle \( \alpha \beta \delta \) were too much lessened, the greater shock of the water could not counterbalance the loss occasioned by the distance between the direction \( n p \) and \( n l \), or by the great obliquity which would be given to the same direction \( n p \) of the absolute effort of the helm with the keel \( \alpha \beta \). If, on the other hand, the angle \( \alpha \beta \delta \) were made more obtuse, the direction \( n p \) of the effort of the rudder would become more advantageous to turn the ship, since it would approach more the perpendicular \( n l \), and since the prolongation of \( n p \) would augment \( g r \), by passing at a greater distance from the centre of gravity \( g \). But the rudder would then be struck too obliquely; for the angle of incidence would be more acute; so that it would only present a small part of its breadth to the shock of the water, and would of course receive but a faint impulsion. All this proves that the greatest distance \( g r \) from the centre of gravity \( g \) will not counterbalance the too great obliquity of the shock of the water. Whence it must be concluded, that when the water strikes the rudder too obliquely or too perpendicularly, a great deal of the impulsion, or of the effect it should produce, is lost. Therefore, between these two extremes, there is a middle position, which must be the most favorable.

52. The diagonal \( n p \) of the rectangle \( 1l \) (fig. 19) represents the absolute direction of the effort of the water upon the rudder: \( n i \) expresses the portion of this effort which opposes the ship's head-way, or which forces her a-stern in the direction of the keel. It is easy to perceive that this portion \( n i \) of the whole power of the helm contributes little to turn the vessel; for, if \( i n \) were prolonged, it would be seen that its direction passes at a very small distance \( g v \), from the centre of gravity \( g \), and that the arm of the lever \( b n = g v \), to which the force is as it were affixed, is at most equal only one-half of the breadth of the rudder. But, it is not so with respect to the relative force \( n l \), which acts perpendicularly to the keel. If the first force \( n i \) is almost useless, and even hurtful, by retarding the velocity, the second \( n l \) is capable of a very great effect, since it is applied at a great distance from the centre of gravity \( g \) of the ship, and acts on the arm of a lever \( g e \), which is very long. Thus, it appears, that, between the two effects \( n l \) and \( n i \), which result from the absolute effort \( n p \), there is one which is always opposing the ship's head-way, contributing but little therefore to the motion of her turning; whilst the other alone produces that movement of evolution without retarding her velocity.

53. Geometricians have determined the most advantageous angle made by the helm with a line prolonged from the keel, and fixed it at \( 54^\circ 44' \), on a presumption that the ship is not wider at her floating-line than at her keel. But,
as that supposition is absolutely false, since all vessels augment their breadth from the keel upwards to the extreme breadth where the floating line, or highest water-line, is terminated; it follows, that this angle is too large by a certain number of degrees. For the rudder is shocked by the water, at the height of the floating line, more perpendicularly than at the keel, since the fluid exactly follows the out-lines of the bottom: so that one could almost say, that a particular position of the helm might be required for each different sine of incidence upwards from the keel. But, as a middle position may be taken between all those points, we need only consider the angle formed by the sides of the ship and her axis at the highest water-line, in order to determine afterwards the middle point and the middle angle of incidence. It appears, from Mr. Bouguer's *Traité de la Manoeuvre*, Sect. I. Liv. II. that, in most ships, the angle of the rudder with the prolonged line of the keel should be made to be $46^\circ 40'$. Without following the calculations of that able geometer, we shall perhaps be able to explain what he has discussed in a more abstruse manner.

54. When it is required to turn the ship by means of the rudder, and at the same time, keeping the head-way as much as possible, it is evident that the angle $54^\circ 44'$, which some have determined to be the most favorable with the line of the keel prolonged, is in that case too open; because the water strikes the rudder with too great a sine of incidence, and which is equal to that of the angle which it makes with the line prolonged from the keel below. Above, the shock of the water is almost perpendicular to the rudder, on account of the width of the ship's sides, as has been shewn before. But, if the rudder opposes the fluid by making only with the line prolonged from the keel an angle of $45^\circ 1'$, the impulse by becoming weaker, will be less opposed to the ship's headway; and the direction of the absolute effort of the water on the rudder, approaching nearer to the lateral perpendicular, will be more advantageously placed; since the prolongation of the absolute effort passes at a greater distance from the centre of gravity. On the other hand, experience every day shews us that ships steer well, when they do not even make the angle $45^\circ$, as we require it, and then we should discompose the absolute effort $NP$ we have the side $NI$ equal to the other side $NL$ of the same square; so that the part of the total power which opposes the head-way is only equal, in this case, to that which produces the movement of rotation: instead of which, if $DBE$ were $54^\circ 44'$, $NI$ would become much greater than $NL$, in proportion to the sines of the angles which are opposed to them in the triangles $PIN$ or $PLN$, and the ship would consequently lose much more of her velocity than in the first situation of the rudder, to which we shall confine ourselves, as being that which is best adapted to the generality of vessels, but which nevertheless must be occasionally altered, according as they shall make an angle more or less open with their sides a-stern.*

The angle of the rudder with the keel may always be determined with sufficient precision, by observing the rule we have prescribed (§ 28) for the determination of the angle of the sails.

55. As the water often strikes the rudder with a very great force, the tiller has a certain length, in order to lessen the labor of the helmsman. But, to lighten his labor still more, there is in most ships, on the quarter-deck, directly over the extremity of the tiller, a vertical wheel (fig. 19) which has the effect of a capstern, and which is connected with the tiller by means of ropes and blocks. So that, if the wheel be turned either one way or the

*It may be taken as a general position that the most advantageous angle will always be formed between $35^\circ$ and $45^\circ$.***
other, the extremity of the tiller approaches towards one of the sides of the
ship, and exposes the rudder to the shock of the fluid.

56. The longer a lever is, the more effect it has when it acts with the same
power: therefore, the longer the spokes of the wheel are, in proportion to
the radius of the cylinder round which the tiller rope is wound, the more
advantage the helmsman will have; for, if the spokes of the wheel be three
or four times longer than the radius of the cylinder, the helmsman will act
with three or four times more force, since he works on a lever which is three
or four times longer than the radius of the cylinder, the extremity of which
is supposed to be the fulcrum of the lever on which he works. So that, if
he employs a force of 30 pounds weight, he will produce an effect of 90 or 120
pounds by the disposition of the wheel alone. On the other hand, the im-
pulse of the water is collected in the middle of the rudder’s breadth, which
is very narrow compared with the length of the tiller; therefore the effort of
the water is very little distant from the point of support upon which it
turns: whereas the tiller forms the arm of a lever 10 or 15 times longer,
which still increases the power of the helmsman in a similar proportion to
that which exists between the length of the tiller and that of the lever on
which the impulse of the water acts. This force is therefore 10 or 15 times
stronger; and the effort of 30 pounds, which before gave the helmsman a pow-
er of 90 or 120 pounds, will become one of 900 or 1800 pounds on the rudd-
der. This advantage proceeds from the water’s acting on a very short arm
of a lever, while the helmsman works on one very powerful, in comparison;
and because this lever is moved by a wheel which multiplies its force. This
demonstration ought to remove all surprise at the prodigious effect of the
rudder, when its mechanism is not attended to; for we have only to consider
the pressure of the water, which acts at a very great distance from the cen-
tre of gravity of the ship, as well as from the point upon which she is
supposed to turn, (§. 15.) and there will easily be perceived the difference
which exists between the effort of the water against the helmsman and the
effect of that same impulsion against the ship. With respect to the helms-
man, the water acts with the arm of a lever very short, of which is the
fulcrum; on the contrary, with respect to the ship, the impulse of the water
is exerted in a direction perpendicular at a very great dis-
tance from the centre of gravity, in acting on a very long lever, which
renders the action of the rudder very powerful in turning the ship: so that,
if in a large ship, the rudder receives an impulse from the water 2700 or
2800 pounds, (as very often happens, provided that the ship sail at the rate
of 9 or 12 knots, and that this power, applied at e, be 100 or 110 feet from the
centre of gravity,) it will act upon the vessel, to turn her, with a power
equal to 270,000 or 308,000 pounds, while the helmsman need not act with a
greater power than 30 pounds on the spokes of the wheel.

57. It is proper to remark, that the great length which is given to the til-
ler, in order to facilitate the work of the helmsman, is an obstacle to the play
of the rudder; since that length hinders its presenting itself sufficiently to
the shock of the water to produce all the effect which might attend it. For,
this inconvenience does not, in most ships, allow the angle D B E (fig. 19) to
be more open than 30° ; whereas it should be 45° , as we have before shewn.
But, as this most favorable determination has not yet come into use, and the
course dimensions commonly given the tiller have always been followed, we
shall endeavor to propose something better for practice.

It must be considered, that, if the tiller were shorter, the rudder would
have more play, because its extremity, in describing the arc of a smaller cir-
cle, would occasion the rudder to make an angle more open, with the keel
prolonged: and this new augmentation would be so much the more advanta-
geous, as it would approach nearer to the angle of 45° . And as, in all ships,
the length of the tiller might certainly be cut a fifth shorter, or perhaps more, it is evident that, thereby, the angle of the rudder and the keel prolonged might be rendered very near 45°, which would increase its force in a proportion of nearly 5 to 3, since the square of the sine of incidence of 45° is to the square of the sine of incidence of 30°:: 5:3, or thereabouts. This augmentation of the impulse is often of the greatest importance, especially when ships are of a large size, as their motions are but slow on account of their length.

If the tiller be shortened, the helmsman will be obliged to employ more force in proportion to the length taken from the lever on which he works: but this loss may be repaired by the facility with which the helm will be handled, if the diameter of the cylinder of the wheel be considerably lessened, augmenting at the same time the length of its axis, without diminishing that of its spokes, which ought on the contrary to be lengthened as much as possible, and two more turns of the tiller-rod should be wound round the barrel.

These forces would be still multiplied, if two sheaves were fixed in the end of the tiller, in two mortises which might be made for that purpose, and which might work on an iron pin passing through their centres, taking care to have the end of the tiller stoutly hooped with iron, in order to strengthen it; then the tiller rope might be reeved through the blocks which are for that purpose on each side of the ship, thence through the two sheaves at the end of the tiller, and the standing-part to be affixed close to the blocks on each side. By these means nothing would be lost with respect to the force; because, if the lever be shorter, the forces which cause its action are likewise multiplied in proportion.

58. After what has been said respecting the helm, it is easy to conceive, that the greater the ship's velocity is, the more powerful is the action of the rudder, since it acts against the water with a force which increases as the square of the velocity of the fluid, (§ 3,) whether the ship has head-way or stern-way; observing always, that in these two circumstances the effects are contrary; for, if the ship goes a-stern, the rudder will be struck from i to n; (fig. 19;) and, instead of being pushed from n to r, it will be so from n to r; so that, the stern being moved in the same direction, the head will take a contrary one, and move towards the same side as the tiller b f.

59. It should be observed, in the use of the rudder, that there is one part of its effort which impedes the ship's sailing when it is struck by the water which runs rapidly along the ship's bottom. If it makes an angle of 45° with the keel prolonged, it receives only half of the impulse it would if acted upon perpendicularly; because the absolute impulse diminishes from two causes: (§ 7:) The surface which opposes the shock of the water is reduced to a less extent than it was at first, and the angle of incidence diminishes likewise: so that, by this, the impulse has diminished one half. Considering next the impulse n v, which remains, (fig. 19,) it will appear that there is only one part n i which is opposed to the sailing, (§ 54,) and which is less than n v, in the proportion as the sine total is to the sine of 45°, the measure of the angle of incidence v n r equal to n p i; for the angle v n i is right, as well as the angle p n b; so that, if you take away the common angle n b, two angles p n l and v n b will remain equal between themselves; but, as the angle p n l is equal to its alternate angle p n l, it follows that p n is always equal to v n b, whether the angle made by the rudder be more or less open with the keel prolonged. So that, if the surface of the rudder which receives the shock be 80 feet square superficies, it will first be reduced, by its being exposed to the course of the fluid, to an effort of 40 feet surface, then to 28 or 29, because, in the first place, there is only one part of the velocity of the water which contributes to the shock, and that is propor-
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61. All that serves to produce motion in ships has more force in larger than in small ones; but the difficulty which large ships have to receive the motion is greater, in a greater proportion, than that which opposes the motion of small ships. For, if the dimensions and machines which compose a large vessel are twice as large as those which constitute a small one, (solidities being in ratio of their cubes,) the first will be eight times as great. Yet the obstacle which the large will oppose to its being put in motion will be two-and-thirty times as great as that of the small one. For, if both ships were considered as divided into an equal number of vertical sections, those of the large would appear to have four times as much surface as those of the small, besides that they would be twice as thick, since the dimensions are in general twice as large; consequently they will have eight times the solidity; which answers already to the relative effort of the rudder and sails.

Farther, the parts of the large ship are twice as distant from the centre of gravity as those of the small one, since those distances are proportional to the other simple dimensions of the two ships. So that if the evolution be supposed of the same number of degrees, the stern and head of the large ship will have to describe arcs twice as large as the small one; and this greater velocity being multiplied by the solidity of the parts of the large ship, which is eight times as great as that of the small one, the product will give 16 times more motion; the resistance will act consequently 16 times as much on the large as on the small; and as that resistance operates on the arm of a lever twice as long, the total resistance of the large ship will be 32 times as great. Thence it follows, that if the forces which act on the large ship be augmented only in proportion to her solidity, she will have still four times more difficulty than the small one to get into motion: and therefore the large ship, instead of making in the same time an angle of rotation as great as the small one, will only make an angle of one fourth, or three times less. Now, that the great ship should describe an angle of rotation equal to the other vessel, it will require only thrice as much time: but that angle, or the velocity with which the ship obeys the impulse of her rudder and sails, will follow the laws of acceleration, since the velocity acquired in the first instance is con-
ally augmenting in arithmetical progression; so that the time which similar vessels of different sizes take in performing the same evolution will be in proportion to their lengths. But the heavier body parts with its velocity not so readily as the lighter body, because the resistance of the mass is greater, being three times heavier than that of the small ship; which, being moved with thrice the facility, is also brought to rest with the same degree of ease. So that, if a vessel 100 feet long takes four minutes to perform an evolution, a similar vessel of 150 will take six minutes or thereabouts to perform the same circular movement. For as $100 : 150 :: 4 : 6$.

CHAPTER VII.

OF THE HEIGHT OF MASTS.

THE correct height of the masts of ships is still a problem which remains to be solved for the builders. The most skilful of them have not paid attention enough to the solutions and determinations which are contained in the works of the late Mr. Bouguer on that subject. It seems, on the contrary, as if they had endeavored to deviate as much as possible from the true principles in that respect, by raising the masts a great deal more than they were formerly, although they were already much too high, as the learned author I have just mentioned has asserted. An experience, confirmed by repeated observations, has convinced me of this truth; viz. that "as soon as a ship inclines, her velocity diminishes in proportion as her inclination increases." This principle has been verified on different vessels and at different times by several officers, and in various oblique courses. I had no share in those various experiments, and therefore cannot be suspected of partiality: but, as they have always proved, to those who have made them, that the present mode of masting is generally too high, I will not hesitate a moment longer to deliver here an epitome of my own experiments on that subject.*

Having all the sails out and being hurried on by a strong gale, I have ordered all the top-gallant-sails, the studding and stay sails, to be taken in, without the ship losing the least perceptible degree of her velocity; nay, I have seen it sometimes to increase by a twentieth, and that at a time when the ship ran already at the rate of nine or twelve knots an hour.

These trials, which I have made with care, and which were performed so quickly, that the wind should not have time to increase or diminish in strength, are sufficient to prove the necessity of lowering the centre of effort of the sails in general, and consequently all the masts. These experiments have been repeated by augmenting the number of sails, sometimes at the risk of fatiguing the masts; and it has always been found that the velocity did not increase, when the ship was more inclined; but that she labored more and more in all her parts, as her movements became stronger and the concussions of her pitching rougher, although the sea was not more swelled. At other times, when the ship inclined pretty much, though the wind was not

* We have thought it proper to give the reasoning of M. Bourde upon this subject, although the practice of high-masting prevails in the British navy. It has been very justly remarked, that high masts have the advantage of giving an option; because they enable a ship, without obliging her, to carry a greater quantity of sail than ships with shorter masts.
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quite strong enough to hurt the masts, I have lessenened the number of sails; and it happened that the ship, after that suppression of the top-sails, was easier in her movements, steering better, and was, in short, more quiet, though the swells of the sea were still the same; an attention which must not be neglected in these kinds of observations, which should be often repeated before a positive decision. However, we do not recommend any diminution in the surface of the sails, in lessening their height: but, it will often happen that we shall rather recommend to increase it upon the whole. For that which is lost in height may be regained by the width. There will even result, from that operation, another advantage: the top-sails, by this reform, being shorter, and, thereby, proportionally wider, than the lower sails, will be more easily cut to their shape; and, their sides being formed with lines exactly strait, the sail will be the more tight, by which a much greater effect on the ship will be produced. The mast being shorter and the sails wider, with less fall, the surface will be the same; but the effort of that surface will, with the same wind, act on shorter levers, the fulcrum of which will not be altered; therefore, it will operate at a shorter distance from that fulcrum; and therefore much less will be the power which makes the ship incline: and the ship, being more upright, will sail with more velocity, because her water-lines will be then more advantageous than when she heels. On the other hand, the sails being less inclined, they present a wider surface to, and receive a stronger impulsion from the wind; an advantage which must always produce an increase of swiftness and a decrease of drift. Add to this the real advantages of trimming the sails better, of working them with more ease, of rendering the masting in general more solid, and more capable of resistance in bad weather as well as in battle.

But how must we determine the height for the masts? or in other words, how much they are to be shortened? The Treatises on the perfect masting and working of ships, by Mr. Bouguer, teach us that method. It is from those Treatises I have imbined the notions of my principles on that subject. But, in order to give a previous idea of that inquiry, and to engage the builders and seamen to bring to perfection this part both of the building and working of ships, upon which, almost as much as from their bottom, their steering undoubtedly depends, I will subjoin here what M. Brue, a learned and studious officer, made me conceive on that subject.

"That masting," said he "is absolutely perfect, when the centre of effort of the sails is precisely opposite to, or at the same height as, or parallel with, the point velique. What is the point velique? It is that point in a perpendicular, (raised from the centre of gravity of the horizontal surface of the ship at the floating-line) which is intersected by the direction of the absolute impulse of the sea on the head of the vessel. This is the point velique in direct courses."

It is clear. No great effort of imagination is necessary to conceive this principle, which appears so evident, that it may be surprising why it has not yet been made use of. For, this point once known, the centre of effort of the sails will be so too; and their right height, as well as that of the masts, will be determined. A little more calculation, and an attention to the plan of the ship, will be necessary, in order to find out that absolute direction of the effort of the impulsion of the water on the bows. But that should not prevent the inquiry. On the contrary, it should be an additional inducement to those, who, building such good vessels as we are now possessed of, and which might still be of a more advantageous form, will be desirous to make them more perfect, by masting them more advantageously. This would undoubtedly be the case; for, several vessels have had their masts cut shorter, and the practice has been attended with decided success. These facts, which could be attested by many able seamen, will always speak highly in favor of this principle; although,
when that shortening was made, the sails were not widened in proportion:

"But," continues M. Brue, "in carrying this enquiry farther than it ever was, the intersection of the two above-mentioned lines (viz. that of the absolute impulse of the water on the bows, and that of the perpendicular of the centre of gravity of the surface of the floating-line of the ship) cannot take place unless in a direct course; and, as soon as the course becomes oblique, they no longer meet. The centre of gravity of a floating-line's surface of the ship passes to the leeward of the axis, on account of the inclination which always occurs in that sort of course: and the direction of the shock of the fluid, which then takes its origin a little to leeward also of the bow, passes, in its prolongation, to windward, without meeting the perpendicular at the centre of gravity of the floating-line's surface;" (which is easily conceived, if we represent to our imagination the horizontal edge of that floating-line's surface but ever so little inclined;) "whence it results, that no point velique will be found in any course but a direct one. Which is true, unless we could fancy such a ship as would neither drive nor incline in an oblique course. But that is not possible; and hence no perfect mode of masting could be discovered in the last case of the oblique course."

This is true, strictly speaking; for, in each instant of a course, a different point of the bow is struck by the water; which is owing to the pitching of the ship, the continual variations in the strength of the wind, and the greater or smaller inclination produced by the rolling motion of the ship.

"But," says again M. Brue, "the point velique, relative to these various circumstances, varies therefore in the proportion of the almost infinite variety of those circumstances, which accompany the course of a ship; that is to say, according to all the degrees of drift, all the degrees of inclination on either board, forward and abaft; as many times, in short, as there are new points of the bow either struck or no longer struck, the point velique ascends or descends.

"I pass over the minute examination I could make of each particular cause which contributes to lower that point from its utmost height, which is in the direct course, to its lowest, which takes place in the most oblique course, accompanied with the greatest lateral inclination of the ship. And there is no method to get out of that common road which is pursued in determining the dimensions of the masts, but that of attending to the following considerations; viz. Such a ship, being intended for such a latitude, the wind she is most commonly to expect there will be nearly of such a strength, and generally oblique to her course by so many degrees; so that her most common drift will be nearly so many degrees, and her lateral inclination so many, &c. To give her, therefore, the most suitable masting, making her relatively perfect, we must seek for her point velique in what situation we shall think most convenient, and there place the centre of effort of her sails."

All this reasoning tends evidently to the shortening of all the masts, and proves the necessity of doing it at the same time as it determines their height. The most difficult point in that operation is to find out the direction of the absolute impulse of the water on the bows, when the ship steers a course close-hauled and one with the wind on the beam, with such an inclination as the ship could be supposed to have in either of these two courses; when the wind would allow to have four square-sails set, together with the mizen top-sail. Considering these two suppositions of the wind on the beam, and close-hauled, it will be easy to determine the height of the masts proper for that double situation; because, if the gale blows harder, one may lessen the number of sails; if weaker, one may increase it by adding stay-sails, top-gallant sails, jib, &c. If the wind gets more aft, then the surface of the sails may be increased again by adding the studding and top-gallant-royal sails:
finally, it is very clear that top-gallant and top-gallant-royal sails will always be of service when the centre of effort of the sails should ascend.

CHAPTER VIII.

OBSERVATIONS ON THE DIFFERENT INCLINATIONS GIVEN TO THE MASTING OF SHIPS, WITH RESPECT TO THE WATER-LINE.

The masts are hardly ever stepped in the same manner in all ships. This too is one of those things which are rather regulated by custom than reason. Some will have them perpendicular, while others choose to have them rake forward and others aft. Each party brings, to support their opinion, reasons drawn from some experiments which chance has sometimes rendered specious.

In this respect, we should rely on the judgment of the builder, who ought to know the qualities of his ship, even before he puts her on the stocks. If one has not an opportunity of taking directly from him the necessary instructions, it is proper to observe, that, if the masts are made to rake forward, the direction of effort of the sails will be inclined towards the bottom, obliquely with the horizon; which will consequently make the head of the ship plunge whenever they receive a strong impulse from the wind: and this may diminish the head-way of the ship, while it increases the celerity of the pitching; the sails also will be with more difficulty trimmed, especially when close-hauled, since the bracing of the yards will be more confined. Therefore, the only advantage, which can be drawn from this oblique masting of ships, is only to render the ships more ready to fall off.

If the masts are perpendicular the direction of effort of the sails will be horizontal, always supposing the ship to be in an upright position. Therefore, this effort, not being discomposed, it will preserve a much greater action; and the ship will sail with the greatest velocity she is capable of.

If the masts rake aft, the ship will be more ready to come to the wind, because the sails will be a little more aft; these will also be more easy to trim sharp, because the braces will not be so much confined. As this position of the sails will raise obliquely above the horizon the direction of the effort on the ship, it follows, that, by their power, the ship will be eased away from the water; for, it is certain that she will not prolong her course, unless she heels too much; therefore, she will rise more lightly over the waves, pitch less, keep better the wind, and tack quicker. This is nearly all that can be said in respect to practice.
CHAPTER IX.

OF THE TENSION OF SAILS, AND THEIR TENDENCY TO FIX THEMSELVES PERPENDICULARLY TO THE DIRECTION OF THE WIND.

I. It is clear that sails are never perfectly flat. But every one is not persuaded that the more extended is the sail, the greater impulsion it receives from the wind which strikes it perpendicularly, and the more effectually, of course, the sail acts on the vessel. It is astonishing that any seamen should be of opinion that a bag must be left at the foot of the sail to lodge the wind in. A hauled-down top-sail has as much cloth displayed in it as when hoisted up and well extended. It forms, then, by its convexity, a considerable kind of bag, in which the wind may play at ease; and it is observed, that the rapidity of the sailing decreases very much; whence we must necessarily conclude, that the impulse of the wind must have greatly diminished, since the sail produces no longer the same effect upon the vessel. To know demonstratively the cause of that diminution in the impulse of the wind, we have only to pay attention to the air which acts against the foot and the head of the sail; for, that part of the wind which strikes at the head makes an effort to re-act towards the foot, against that which, having struck at the same instant at the foot, endeavors to re-act towards the head. From this shock results (though the air escapes at each side) a compression in the sail. But, after having acted inwardly, in the same manner as if it were shut up, it finds itself more and more compressed by that which succeeds to the first; and, though it escapes by the sides, it is evident that it tries to extend, and that it impels, consequently, with an equal power, all the parts of the sail perpendicularly; and this is the cause of the sail taking the form of a circle's arc. Therefore the sail will produce no greater effect than if it had no greater height than the space contained between the two yards; it may not even, strictly speaking, have that whole effect; for, that sort of whirlwind, which is made in the centre, by the re-action of the wind which strikes the upper and lower parts, cannot fail to diminish the shock of those particles, which, succeeding the former, would have struck the sail with all their primitive power; instead of which, this power is now almost entirely destroyed by this barrier which opposes for a while their passage. To which may be added, that the sail, having the form of the arc of a circle, very little wind can strike it perpendicularly; and that it must, of course, have much less effect than another sail, of the same height and width, which should be very exactly stretched out.

The sails of a ship should be cut in such a form as to present as flat a surface as possible.

II. The centre of effort of the impulse of the wind upon the sails exposed perpendicularly to the course of the wind, answers exactly to the centre of gravity of the surface, struck in that direct situation. But, as soon as it is presented obliquely to the course of the fluid, and kept so, the centre of effort of the total impulse will pass on the weather-side of its centre of gravity; because the particles of air, which at first met the surface, have been reacted, and, by that re-action, they stop part of the passage to the succeeding ones, which diminishes, of course, both the strength of the shock and the impulse they would have communicated to the sail, if their movement had not been interrupted. But this deviation of re-action in the first particles of air which have struck is repeated afterwards. For, all those which succeed them, while the surface is kept obliquely to the wind, continue to re-act to leeward; so that, from the first vertical line, (taken from the windward side,) out of all those which form together the surface, there is a continual series of ob-
obstacles which change the shock of immediate and succeeding particles, and which alters it so much the more as they ought to strike the parts of the sail most to leeward, and so much the less as they will strike those which are most to windward. Therefore, the leeward-side of sails, obliquely exposed to the wind, is always less struck than that which stands to windward. Whence it results, that the centre of effort of the absolute impulse of the wind on the sail is lodged in the weather-side of the sail, (for it is supposed to be equally divided in two,) since that is the part which receives more impulsion. Therefore, the centre of effort is also to windward of the centre of gravity of the surface; and the removal of this centre of effort towards the wind is in proportion to the impulse received on the weather-side of the sail and that received on the lee-side. The truth of this assertion is continually demonstrated by daily experience of ships at sea. The sails are carried by the yards and by the masts, which divide them perpendicularly into two equal parts from top to bottom, through their centre of gravity. When, being placed obliquely to the wind, they are left at liberty, without being confined by their braces or bowlines, they immediately range themselves perpendicularly to the course of the wind, because their weather-side receives more impulse than the lee-side: and there they remain constantly, unless their position be altered; because all their parts are struck equally, and an equilibrium is kept among them; for, the power of the wind, whether it increases or decreases, acts always the same on them all.

This proof, which shews the difference between the centre of gravity and the centre of effort in the sails, requires much attention in the use of that knowledge in practice. For example, in the middle of the yards on their after-side, there might be fixed a cleat or bolster, which, in oblique courses, pushing them to leeward, would ease them off from the shrouds, and facilitate their bracing in carrying their centre of gravity, as well as the centre of the absolute effort, a little to leeward; which operation would of course draw that centre of gravity nearer to the axis of the ship, from which it is so essential to remove it as little as possible.

CHAPTER X.

GENERAL OBSERVATIONS ON THE EFFECT OF MORE OR LESS SURFACE OF SAILS EXPOSED, IN VARIOUS WEATHERS, TO THE WIND.

I. WHEN a ship, with a certain quantity of sail, has acquired the utmost velocity with the power which then puts her in motion, it is certain, that, if the surface of the sails is either increased or diminished, the rapidity of the headway will likewise augment or lessen in a very complicated ratio. In order to find out the degree of impulsion of the wind on the sails, multiply their surface by the square of the excess of the velocity of the wind on that of the ship, or, which is the same thing, by the square of the apparent velocity of the wind. Then a second multiplication of that product is to be made by the square of the sine of the angle of absolute incidence, or, in the second case, by the square of the sine of apparent incidence. And this second product will give the degree of the absolute impulsion of the wind on the sails, in the actual state which we have supposed.

In order to find in what ratio the surface of the sails is to be augmented to make the ship acquire a certain degree of velocity above that which she possessed under a supposed particular quantity of sail, it must first be known
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by how much the velocity of the wind exceeds that of the ship; then, knowing how many degrees her head-way is wished to be accelerated, the sails must be increased in the ratio of the squares of the two velocities of the ship; viz. that which was known before the alteration of the sails, and that which she is afterwards to acquire. But, as the ship recedes so much the more from the action of the impulse of the wind as her velocity increases, it is evident the surface of the sails must be increased also in the ratio of the square of the two excesses, that is, the different excess of the wind over that of the ship both before and after the increase of the sails; then the ship will acquire the wished-for velocity; provided no other cause happens to oppose it, as we have already hinted before, and as we shall have an opportunity to shew more particularly hereafter.

Suppose the wind has 12 degrees of velocity, and the ship, under a certain set of sails, has 3; the velocity of the wind, in the direct course, will exceed that of the ship only by 9 degrees. If the velocity of the ship is intended to equal the third part of that of the wind, and to have therefore 4 degrees for head-way; then the sails are to this effect to be increased in the ratio of the squares of the two velocities 9 to 16, because the resistance of the water on the bows will increase in that very proportion. But, in the first case, the velocity of the wind exceeded that of the ship by 9 degrees, while, in the second case, it exceeds it no more than 8. Hence it results, that the impulse of the wind on the sails has diminished in the ratio of the two squares 81 to 64; and, in order to repair that loss in the impulse of the wind, the expansion of the sails is also to be increased in that last ratio of 64 to 81; then the ship will be able to run with the degree of velocity desired.

II. When the masting is perfect, that is to say, when the ship is masted according to the point velique, she will rise from the water parallel to herself by a certain quantity relative to her velocity, and she will rise always more and more in proportion as she acquires new degrees of velocity in her head-way. Because she is moved by forces which stand exactly and continually in equilibrium with the action of the water on her bows, the inclination of which forward contributes so much the more to that rising out of the water as it is more remote from the perpendicular. For, then, the vertical impulsion will have more power, since it acts more directly on a very oblique bow than it would on a vertical one. This reasoning may be as exactly applied to the direct impulsion, the absolute effort of which may be decomposed, since it acts less against the velocity of the sailing on an oblique bow than on a vertical one, while the other part of its action joins with the vertical impulsion to raise the head of the ship, which shocks the water with very great strength when she is arrived to a very great velocity, and which water opposes her so much the more as it is shocked with violence. So it is easy to conclude that, in any ship whatever, the more rapid the headway is, the more parallel to herself she rises above the water, if the centre of effort of her sails is at the same height as the point velique: for, the point of the bows, on which may be considered as united the action of the water which opposes its progress, may be taken also as the point of bearing. So that all the sails acting from abaft to forward on different points of the axis of the ship, (she being considered as a lever in the direction of her length,) they raise the after-part of that point, and place it on a level with the elevation of the bows; which never can happen, if the centre of effort of the sails is either above or below the point velique. If it is placed above, the power of the sails, acting on too long levers, will raise the after-part of the point of bearing of the bows above the level of the elevation of the ship's head. If it is placed below, the power of the sails, acting on too short levers, the after-part of the ship will remain plunged in the water, without being able to rise on a level with the bows. Therefore, in either of these two cases, when the centre of effort of the sails is either above or below the
point velique, the ship, however well built, will lose some of the qualities of sailing, either in her readiness to obey the helm, or in her steadiness to carry sail, especially if she is over-masted: for, in this last case, she will grip, incline easy, and lose much of her head-way, since her bows will plunge in the fluid, or, rather, her stern will rise too much out of it; which will diminish the action of the water on the rudder and increase it on the bows. In the last case, (an inconvenience of which ship-builders seldom, if ever, have been guilty,) the ship will be slow to obey, and her head-way will be slackened, because she will never present her most advantageous water-lines to the fluid, nor have a sufficient surface of sails, as, although their width is the same, their height is not so. The point of perfection then is this, viz. when the centre of effort of the sails is placed at the height of the point velique.

III. The next proposition will appear a paradox to many seamen. But, it is no less self-evident.

There are many cases in which the adding of a few sails, instead of increasing a ship's velocity, retards it. It is however an error into which all seamen almost continually fall, when, in a strong gale, they want either to distance or approach a ship. When their own ship is arrived to a very great velocity, (sometimes of twelve and more knots an hours,) if they have to do with an adversary the rapidity of which is nearly equal to that of their own ship, they fancy that, by adding more sails to those they have already, at the time when their ship is perhaps best disposed and arrived at its utmost degree of swiftness, they shall increase the rapidity of her head-way; and, accordingly, they hoist up some additional stay or studding sails, especially if the wind happens to be on the beam or a little more aft. But, by this their expectations are baulked; for the ship becomes more inclining, her head plunges, and the resistance of her bows increasing in the direction of the keel more than the effort of the sails in the direction of the course, the rapidity decreases in so much as the water acts more powerfully than the sail does. Besides all this, those forward and lateral inclinations of the ship, produced by the effort of the new-added sail, which have caused the centre of effort of the sails to ascend and the point velique to descend, (if the new added sail has been set above it,) cause also the ship not to rise from the water parallel to herself; she rises her stern and plunges her head; whence it results that she gripes from two causes: first, because, as her stern lies less in the water, the rudder is of course exposed to a less shock; and the stern, which always acts as a sail, is more easily mastered by the wind which strikes it then on the beam with a great deal more efficacy than it does her head; on the other hand, as the resistance of the water on the lee-bow has increased by the inclining of the head, plunging thereby that part of the ship which is the most full in its shape, and increasing also the surface on which the water acts, which has both diminished the head-way and increased at the same time the lateral impulse on the side of the bow; so that lateral impulsion forces the ship to windward more at the head, then she is impelled to fall off by the lateral part of the effort of the new added sail. Whence it follows that the ship becomes still more gripping, which is an additional cause of the decrease of her head-way; because, the helm being more a-weather, in order to hold the ship better to her course, more of the rudder itself is presented to the run of the water; and, by the great surface it offers more directly to its shock, retards the velocity of the ship. Whence we are to conclude that as soon as any more sails are added to a ship which carries already a sufficient quantity of them, she will lose her qualities of steering well and making good headway, whether those additional sails are set forward or a stern.
THE PRACTICE OF WORKING SHIPS.

THE useful part of a seaman's duty is the application of his theoretic knowledge to the various evolutions of a ship. We are now about to shew how those various evolutions should be performed, consistently with the principles upon which the science of navigation is founded.

A ship, when launched from the stocks, is furnished with one stream-anchor, and another which is termed a launching anchor, somewhat heavier than the stream-anchor, hanging by stoppers to the catheads: by one or both of these she is first brought up, and afterwards warped to what are termed HEAD AND STERN MOORINGS;

of which the following is an accurate description. Across the bottom of the harbor or river, two chains (parallel to each other, if the bed of the river will admit of it) are extended at the distance of 200 feet from each other, by means of anchors, having one fluke only, which is sunk, and secured in the ground by piles, on the opposite sides near low-water mark. To the rings of these anchors these chains are connected by a peculiar sort of link, called a shackle, which is delineated in the plate.

Each of these chains has, at about one-third of its length, a large iron ring, to which is fastened a chain, called an up-and-down span; which, lying on the ground, connects the parallel chains, and serves to keep them steadily in their places. At about 30 or 40 feet distance from each other, along each chain, chain-pendents (from 5 to 9 in number) are fastened, having, at the end which connects with the ground-work, a shackle; and, at the other end, a link called a jew's harp, through which the bridle or hawser of the ship, when moored, is passed. The centre chain-pendent is fixed to the ring of the chain; and the number of the chains must depend upon the number of tiers required, each tier occupying two chains, because the ships are moored head and stern. But every tier does not always occupy two whole chains; because, unless a passage between the tiers is requisite, the chain, to which the head chain-pendent of one tier is affixed, has likewise fastened to it the stern chain-pendent of the next-tier. A reference to the plate will elucidate this.

These moorings are calculated for and used in rivers or harbors of small extent; but in other places, where either many ships do not frequent, or the extent of which is considerable, there is another sort in use, called SWINGING MOORINGS.

These differ from the former only in this; the ground work being the same, to the ring of the chain is fixed one chain-pendent, the end of which is passed through a large buoy; and to that is connected a swivel ring by a shackle; and thus kept constantly from sinking to the ground. This is used for mooring one or two ships to. Near each end of the chain is fixed one more chain-pendent, supported likewise by a buoy, which is used only for the purpose of warping ships from the middle to any intended place.
THE PRACTICE OF WORKING SHIPS.

OF MOORING TO HEAD AND STERN MOORINGS.

To these moorings ships are thus fastened: Clench the end of a bridle to the jew's harp of the chain-pendent, and pass it into the hawse-hole; then heave it up and bit it. Take the after-bridles into the gun-room port, or in upon the quarters; and take a round turn round the beam of the after-hatch, and cross it with a throat and round seizing; or, if more convenient, round the jeer bits.

OF MOORING TO SWINGING MOORINGS.

Pass out the ends of the bridle; one on each side, through the hawse-hole next the stem; then pass them through the swivel-ring of the chain-pendent; then return them into the ship through the after hawse-holes, and bit them.

In this situation a ship is fitted for sea, by regularly stowing her ballast, and getting on board her rigging, stores, &c.

We shall therefore proceed to discuss the theory and practice of ballasting, and shall afterwards treat of the manner of getting on board and stowing the anchors and cables, before we enter upon the method of navigating a vessel in various situations.

OF THE BALLAST AND LADING.

WHEN a ship is loading, it should be considered, that her tendency to pitch or roll depends not alone on her form, but even more upon the more or less advantageous distribution of the heaviest parts of her cargo.

Particular attention is to be paid to moderate her pitching, as that is what most fatigues a ship and her masts; and it is mostly in one of these motions that masts are seen to break, particularly when the head rises after having pitched. Although the rolling be proportionably a more considerable movement than pitching, it is seldom any accident is seen to arise from it, as it is always a slow one. It is however not less proper to prevent it as much as possible. This will in general be easily obtained, without being any way detrimental to the ship's stiff carrying of sail, if, when the ballast is iron, you stow it up to the floor-heads; because it will recall the ship with less violence after her having inclined, and it will act on a point but little distant from the centre of gravity: To make this clear, let us consider by the assistance of a figure.

First, let it be understood, that the centre of gravity of a body is that point by which it may be suspended, and the parts remain in perfect equilibrium.

That the centre of gravity is the centre of that part of a ship's body which is immersed in the water; and which is also the centre of the vertical force that the water exerts to support the vessel.

That the centre of motion is the point upon which a vessel oscillates or rolls when put in motion.

That the metacentre is that point, above which the centre of gravity must by no means be placed; because, if it were, the vessel would overset.

Various methods have been recommended to find all these different points; some of them are in their nature fixed, others varying. Thus when a ship is completely loaded, the centre of gravity is fixed, howsoever the vessel may alter her position.
The centre of motion is always in a line with the water’s edge, when the centre of gravity is even with or below the surface of the water; but, whenever the centre of gravity is above the water’s surface, the centre of gravity is then the centre of motion. This must be understood of bodies not perfectly circular; for, if circular, the centre of motion will be the centre of the circle.

The centre of cavity varies with every inclination of the ship, because that depends upon the shape of the body immersed.

The metacentre (which has been likewise called the shifting centre) depends upon the situation of the centre of cavity; for it is that point, where a vertical line, drawn from the centre of cavity, cuts a line passing through the centre of gravity and being perpendicular to the keel.

Let the segment of a circle 1 2 3 represent the transverse section of a vessel’s bottom; w l, the surface of the water; m, the metacentre, as well as the centre of motion, because this is a circle; c, the centre of cavity; g, the centre of gravity; and the line 2 4, the vertical axis of the vessel which may be turned round the point m, as on a fulcrum supported by the centre of cavity. By thus simply considering the vessel as a lever in the direction of her vertical axis playing round her centre of motion, it is plain, that, if the centre of gravity was placed above the point m, being the metacentre too, the vessel would upset; therefore, that the ship may have stability, the centre of gravity must be below this point. And it may be observed, that, the farther o is removed from the metacentre, the greater must be its force, as the gravity then acts with a greater length of lever, considering the fulcrum of that lever to be at the centre of motion; or, if the weight at o be augmented, it will likewise increase the force; therefore the force of c may be expressed by multiplying the balance of weight, beneath the centre of motion, by the distance of the centre of gravity from the centre of motion.

The centres of cavity and motion (in circular bodies) will ever be in a line perpendicular to the horizon, but the centre of gravity may be either on one side or the other of this line. When such a body is at rest, the centre of gravity will be in this line; but, if in motion, it will be diverted from it. Thus the points m and c will always be perpendicular to w l; but the point g, by the body’s rolling, may be on either side; for instance, at g. While g is perpendicularly beneath the centre of motion, its action can only tend to preserve this circular body in its erect position; but, if it is removed to either side, as to g, its action is to return it to the erect position; and this action increases as the distance of g, which is the sine of the angle of roll g m g, the distance m g being considered as the radius. Thus, to gain the force of gravity with any roll, as g m g, let the balance of weight beneath the centre of motion be multiplied by the sine of the angle of roll g g.
But the tendency to roll may be also diminished by the shape of the hull. For let us suppose that the transverse section be allowed more beam and increased by the dotted lines. Now, when this vessel is rolled over, it is plain that the cavity will be augmented towards the side of course its centre must remove towards, say to $c$; and, if from $c$ be erected a perpendicular to the horizon, it will cut the vertical axis at $n$, which will, in this case, be the metacentre, above which, if the centre of gravity were placed, it would act in conjunction with the centre of cavity to overset the vessel: but, as the centre of gravity is here below it at $g$, her stability will be increased by the increased distance of $c$ from $n$, the metacentre; and the vessel will roll round the point $m$ as her centre of motion.

When sailing in smooth water, the greater the stability the better; but, if a vessel with a heavy cargo, stowed low in her bottom, be sent out into a rough tempestuous sea, where every wave will throw her from her equilibrium, she will return with such violence as to endanger her masts; and, should she be dismasted, her roll will then be with still greater force, possibly to the destruction of her hull. Was the cargo in this laborsome vessel to be removed higher up towards the centre of motion, so as to lessen her stability, she would be found considerably easier; her roll would be by such deliberate motions, as to lessen the danger to her masts and hull.

The ballast is placed round and very near the centre of gravity of the ship, because it will prevent the motion of the pitching being so hard as it would, if that weight were distant either afore or abaft that point. Whenever the sea runs a little high, the ship is never carried by a single wave; there are generally two or three always passing under at the same time, unless when the sea is extremely long, the swells coming from a great distance, and in latitudes very remote from land; for, then, it happens that the largest ships are sometimes carried by one single wave. But, in either circumstance the ballast ought not to be stretched afore or abaft the centre of gravity, as soon as the ship is in the parallel to her draught of water marked for the ballast, which it is absolutely essential to pay attention to. To prove this principle, suppose in either case a long or short surge, and that the water strikes the ship forward, that thereby she may be exposed to the greatest and hardest pitching: for, when the wave takes a ship under the stern, her motions, if she has got a little head-way, are not dangerous; because, as she flies before the wave, she recedes in some measure from its impulse; while, in the first case, she increases on the contrary that same impulse in the ratio of the square of all her velocity.

First, the ship, whose extremities are light or little loaded, being supposed to run with any velocity whatever against the wave which comes to her ahead, shocks that wave with a force expressed by the square of the sum of the two velocities: she divides it and goes through it, at the same instant that she is raised by the vertical impulse of that column of water, which opposes to her a supporting power too considerable for her weight to displace: the wave which follows produces the same effect in receiving the fall of the ship, because the first is already under the middle of the ship, whence it passes to the stern, which is supported by it, while the second takes its place in the middle, and the third is come to support the head; and this is an uninterrupted succession. This motion continuing thus as long as the sea is agitated, it follows that the ship is never at rest: no sooner has she been raised by a wave, but she falls again when that wave is gone, which falling is proportionably less sharp as her head is less heavy: the shake is then less violent, since she shocks the water with a less mass, which prevents her pitching so deep as she would if she were more heavy; consequently the masting does not suffer, and the head-way is less delayed, as the fullest part of the bows is not so much exposed to the shock of the water.
Secondly, when the ship is carried by one single wave, her fall is still less sharp, if little loaded a-head, than when she is carried only by the middle. She rises, therefore, more easily at the moment the other wave comes to strike her, and the shake is not so violent. Were she to plunge deeper into the fluid, it might happen that the column of water would become higher than her head, and, passing partly over it, would expose her to the danger of foundering.

In the stowing of the cargo, it is proper to place the heaviest part of the stowage as low as possible, taking care to preserve that draught of the ship which is most advantageous for her, whether she be in ballast or when laden. Those points are marked both at the head and stern: in a word, the great art of stowing lies, in endeavoring that each of the vertical parts, in which the extremities of a ship may be supposed to be equally divided, be lighter, when her lading is complete, than the weight of the mass of water they are to displace; observing always, that the vertical parts of the middle admit of being loaded more heavily than the weight of water they are able to displace.

**THE PRACTICE OF STOWING BALLAST, &c.**

In the royal navy, the iron ballast is first stowed fore and aft, from bulkhead to bulkhead in the main hold, next to fir cants nailed on the limber-strakes on each side the kelson, five or more inches clear of the limber boards; and is winged up 3 or more pigs above the floor-heads in the midships, or bearing part of the ship, and there are two tiers of pigs in the wake of the main hatchway and well-wings. Ships, built with a very clean run aft, seldom have any iron ballast stowed abaft the pump-well or after-hold. Ships, that have floor and futtock riders, have the iron ballast stowed, either lengthways or athwart ships, agreeably to the length of the chambers, which are the clear spaces between the riders.

The shingle ballast is next spread and levelled over the iron ballast, on which is stowed the ground tier of water; bung up and bilge free from the sides, either chine and chine, or bouge and chine, beginning at the coal-room bulkhead, that being the foremost, and making the breakage, if any, at the main hatch: the midship tiers, fore and aft, are the first laid down, and the casks are sunk about one quarter of their diameter into the shingle; the sides are filled-in with wingers of small casks, as half-hogsheads, gang-casks, or breakers; observing not to raise the wingers above the level of the tier, to cause a breakage in the next tier above, which is stowed in the cutline of the ground tier: bung up and bilge free; and so on, for as many tier as can be stowed sufficiently clear of the beams.

In the after-hold, between the after-side of the pump-well and fish room bulkhead are stowed the provisions above the ground tier; between the casks, billet or other wood, and shingle ballast.

In the fish room are stowed some of the spirits, or wine, and sometimes coals; and, in the spirit-room, are stowed the wine and spirits for the ship’s use.

In the merchant-service, the stowage consists, besides the ballast, of casks, cases, bales, boxes, &c. which are all carefully wedged off from the bottom, sides, pump-well, &c. and great attention paid that the most weighty materials are stowed nearest to the centre of gravity, or bearing of the ship; and higher or lower in the hold agreeably to the form of the vessel. A full low-built vessel requires them to be stowed high up, that the centre of gravity may be raised, to keep her from rolling away her masts, and from being too stiff and laborsome; as, on the contrary, a narrow high-built vessel requires
the most weighty materials to be stowed low down, nearest the kelson, that the centre of gravity may be kept low, to enable her to carry sail, and prevent her oversetting.

By the 19th Geo II. it is enacted, that if after June 1, 1746, any master or owner, or any person acting as master of any ship or other vessel whatsoever, shall cast, throw out, or unlade, or if there shall be thrown out, &c. of any vessel, being within any haven, port, road, channel, or navigable river, within England, any ballast, rubbish, gravel, earth, stone, wreck, or filth, but only upon the land, where the tide or water never flows or runs; any one or more justices for the county or place where or near which the offence shall be committed, upon the information thereof, shall summon, or issue his warrant for bringing the master or owner of the vessel, or other person acting as such, before him, and upon appearance or default, shall proceed to examine the matter of fact, and upon proof made thereof, either by confession of the party, or on view of the justice, or upon oath of one or more creditable witnesses, he shall convict the said master, &c. and fine him at his discretion for every such offence any sum not exceeding 5l. nor under 50s. &c. and, for want of sufficient distress, the justice is to commit the master, or person acting as such, and convicted as aforesaid, to the common goal or house of correction, for the space of two months, or until payment of the penalties.

Besides the above general act relating to ballast, there are the 6 Geo. II. c. 29. and the 32 Geo. II. which regulate the ballasting of merchant-vessels in the river Thames, placing it under the direction of the corporation of the Trinity-house.

MANNER OF GETTING ON BOARD AND STOWING THE ANCHORS, AND CABLES.

ANCHORS, though they bear different names on board of ships in the royal navy, as sheet, best bower, small bower, and spare, are of the same weight. The stream and kedge anchors are smaller, and grapnels are for boats.

Ships of 100, 98, and 90 guns, have 7 anchors; from 80 to 20 guns inclusive, 6 anchors; ships of 300 tons and sloops have 5; and brigs and cutters 3 anchors.

In fitting out ships, the anchors are brought in craft near the bows, being most convenient to the hawse-holes, through which the cables pass to be clenched.

The BOWER-ANCHORS are first catted; which is performed by hooking the hook of the cat-block into the ring of the anchor, and bowing upon the fall that leads in through a snatch-block on the forecastle; the cat-falls being previously reeved through the sheaves of the cat-head and cat-block, keeping the hook of the cat-block downwards and its point inwards. They are then fished, by means of the half-davit, pendent, and tackle, thus: The davit is first stepped in the channel on the side wanted, and supported by guys; the masthead-guy goes over the end of the davit, with an eye. The other end fastens round the fore-masthead, with a round turn and two half-hitches. The foremost guy goes over the end of the davit, the other end fastens round the cat-head, with two half-hitches, and is securely stopt. The after-guy goes over the end of the davit, and makes fast with two half-hitches, through an eye-bolt in the after part of the fore-channel. At the outer end of the davit is hung, by its straps, a large single block; through which is reeved the pendent, with a large iron hook spliced in the lower end, to hook the anchor within the flukes; then, to the inner end of the pendent, is made fast a tackle, by thrusting a toggle through an eye in the block-strap: after that has passed through an eye in the pendent, the other block of the tackle is hooked in an
eye-bolt in the fore part of the quarter-deck; the effort of the tackle is communicated to the hook, by means of the pendent, by men's bowstring on the tackle-fall. Thus the flukes of the anchor are raised and placed on the gunwale, where it is made fast by the shank-painter chain. That the flukes may lie level, the shock is bowsed upon by the anchor-stock tackle, the double block of which is hooked to a selvagee, fastened round the stock of the anchor under the first hoop, and connected by its fall to a single block, hooked to a selvagee fastened round the laniard of the main stay: the fall leads in upon the forecastle.

The best bower is then placed forward near the bows on the starboard side, the small bower near the bows on the larboard side, a little abaft their respective cat-heads, and are secured by their stoppers, from the cat-heads and shank-painters. The stopper has one end clinched round the cat-head; the other end passesthrough the ring of the anchor, returns upwards, and leads over a large thumb-cleat bolted to the cat-head, and is made fast with several turns, and the end hitched round the head-rail and timber-head, on the fore side of the cat-head. The shank-painter hangs the shank and fluke of the anchor to the ship's side outboard; and, when stowed, the shank-painter is passed under the inner fluke round the shank of the anchor, and made fast with two or three turns, and the end stopped round timber-heads on the forecastle. With these two bower-anchor ships are generally moored when lying in a tide’s way or in a fleet.

The sheet and spare anchors are hoisted by runners and tackles, main stay and yard tackles, and are stowed securely with stock and bill lashings at the after-part of the fore-shrouds, before the chess-trees on each side of the ship, with one of their arms resting on a chock, bolted to the gunwale; the stock being bowsed to by the anchor-stock tackle. The sheet-anchor is stowed on the larboard side, and is the first resource in a gale of wind, after parting with either of the bowers; for which reason, when in port, the sheet-cable is kept bent, and the anchor is over the side, suspended by the stopper and shank-painter, ready for cutting away in case of necessity. The spare anchor is stowed on the starboard-side, and is seldom used, but when one of the others is lost.

The stream-anchor is stowed on the spare anchor; and, when used, it is sent in the long-boat or launch, with its cable bent, and let go at any particular spot, either for steadying the ship, when riding by only one bower, or to assist a ship when in shore, or to warp her, &c.

The kedge is stowed on the stream and spare anchors, and is frequently used to stop a ship for a tide in little winds; but, if the wind is too powerful for the kedge, the stream-anchor is substituted. The kedge is sometimes used, in moderate weather, to warp the ship so as to shift her birth.

The cables also are brought in craft alongside; and, should they be new from the rope-walk, let them be coiled down in the craft, the same way they are to be coiled on board.

It is recommended to merchant-ships, especially of the smaller size, that their cables should be coiled the way they bit, or the way they run round the windlass; and their tiers should be on the side opposite to that on which they lead. But this practice cannot be approved of for the royal navy, nor is it indeed there adopted; because, when heaving in upon one cable, and veering out upon another, the cables, by being crossed, are apt to foul in the hatchway. The best bower, which is mostly the working cable, should lead foremost up the hatchway on the starboard-side; then the small bower on the larboard side; and, afore the latter, the sheet; which, being the least used, can be triced close round the fore part of the hatchway, out of the way.

A cable generally grinds or kinks from more turns being forced into it by the coiling than it had when first made; and the only way to get rid of those
grinds or kinks is to coil the cable across the hatchway, from side to side, in large flakes, with the sun; then take the upper end through the coil, and coil the cable down in the tier the way required. By this means, as many turns will be taken out of the cable as there are flakes coiled round the hatchway.

It should be a rule in coiling cables, never to lay out near the hatchway, but to keep that part of the tier as low as possible, that the bends may have sufficient room to upset.

Were all store-cables first coiled down from the rope-walk against the sun, they would be better adapted to coil on either side of the ship; for a cable coiled against the sun will more easily reverse, and have less grinds or kinks in it than a cable coiled with the sun.

Anchors, (except when at sea) should always have a cable clinched to the ring ready for letting go, and a buoy-rope with a buoy.

To clinch a cable; run it through the hawse-hole and the ring of the anchor three or four fathoms in length; then haul the bight up in the head, and pass the end of the cable over the bight and through the ring, between it and its own part; then pass the cable-bends, and cross them with strands, well greased, one at the end, and the other about one foot from the end; and be careful not to form the clinch larger than the ring of the anchor.

From the moorings a ship, when fitted, removes, in order to take in her guns and proceed to sea; but, before she finally sets sail, she generally comes to anchor, and is moored once with her own anchors and cables, which will be treated of hereafter. At present it is sufficient to give the following caution at

GETTING UNDER WAY FROM RIVER MOORINGS.

If it be in a tideway and with a leading wind, so that the ship can stem the tide; let it be a rule, when the tide serves, to get under way, and sail against the flood; which gives time to clear a ship of her moorings, and affords a more powerful effect to the helm, to steer the vessel clear of other ships and any particular danger.

PREPARATIONS NECESSARY TO BE MADE FOR ANCHORING.

On approaching an anchorage, the anchor and buoy are got clear, and a range of cable stretched along the deck suitable to the depth of water. Care should be taken, that nothing is in the way to check the cable, or stop its running out; then, at a proper distance, a turn is taken round the bits with the cable, thus: First pass the cable from the anchor underneath the cross-piece, then take up a bight of the cable abaft the bits, and throw it over the bit-head. The end of the cable is clinched round the orlop-beams in the royal navy, and round the main-mast in the merchant-service.

It is necessary to have water near the bits to prevent its firing by the friction. Stoppers and ring-ropes of all kinds should be ready for use. The stock-lashing being cast off, and nothing but the anchor-stopper and shank-painter retaining the anchor, men are stationed to stand by them, and let go at the moment ordered.

To secure the cable when out, deck-stoppers are thus previously prepared: They are turned into the ring-bolts on the deck round a large iron thimble, and fastened with a throat and end seizing. Each stopper has a laniard spliced round the head, under the knot, by which several turns are taken round the cable, and the end stop.
Besides the deck-stoppers, others are used as an additional security to the cable; such are the bit-stoppers, &c.

**Bit-stoppers.** Each stopper is reeved through a hole in the standard knee, against the fore part of the riding-bits, and is turned in or spliced. It has a laniard spliced round the head, under the knot. When used, several turns are taken with the laniard round the cable, and the end stopped. It is to check the cable in bringing up the ship. Another bit-stopper much approved of is about four fathoms long, and tailed out like a nipper at one end, and knotted at the other. Let this stopper be rove through the hole in standard knee. To pass it, let it be held aft, inside, over the cable, and under the bits, outside the cable; then worm it round the cable before the bits. Then, as the cable runs out and it is required to check the ship, haul tight the worming; and, by the cables drawing forward, it will tighten the stopper, and bend the cable so close to the bits as effectually to bring the ship up. This stopper is not likely to jamb, therefore is extremely well calculated for bringing a ship up with ease; as, by slacking, and hauling tight the worming, the cable may be suffered to run out, or be checked at pleasure.

In heaving up in a heavy sea, when, by a sudden pitch of the ship, the messenger or nippers give way, this kind of stopper will be found extremely serviceable; for, upon these occasions, this stopper may be always passed ready, and the bight triced up abaft the bits with a rope-yarn clear of the cable.

Another bit-stopper, made with a large eye, that it may be thrown over the bit-head, and shifted over from side to side, is also much approved of.

**Dog-stoppers.** One end is clenched round the main-mast, and the other end wormed in the cuntines of the cable, and stopped in several places; then brought back with several turns over its own part, and the end stopped. It is of little service, unless it be long enough to clap on above the coamings.

**Wing-stoppers.** One end is clenched round the orlop-beams in the wings, and the other end is clapt on as the dog-stopper.

**Ring-ropes** are occasionally made fast to the ring-bolts in the deck and to the cable, by passing the ends through the ring of the bolt, and through the bright, then clapt on the cable with cross turns, and the ends stopped. Ring-ropes may be better single than double; they are passed with less confusion of turns. To pass a single ring-rope, and have it in readiness to check upon veering away the cable, take also three slack turns through the ring-bolt and round the cable, one before, the other, and hold up the parts fair; then take as many slack turns of worming round the cable, before the ring, and they held up fair, leaving sufficient room for the cable to pass through. When the cable is to be checked, haul tight the worming; and, by the cable's running out, it will readily draw the turns tight through the ring, and bind the cable so close to the ring, as to prove an excellent stopper. Ring-ropes are similar to the laniards of stoppers, to check the cable when freshening the hawse, or to add security to the stoppers in a heavy sea.

**Lengthening of cables.** Cables are lengthened by splicing one to the end of the other, thus: The closest and best method is to put the ends in twice each way; then, to pick out the strands, and worm part of them round the cable, and taper away the rest; which should be closely marled down, and a good throat and end seizing clapt on of six-thread ratline.

The strands of the best bowser and stream cable had better be pointed, that these cables may be more quickly spliced and unspliced in cases of necessity.

To prevent cables from chafing by friction in the hawse, and against the stem or cutwater, they are rounded or served thus: They should be served against the lay. The most expeditious way of clapping on rounding is with a top, where room to work it will admit; otherwise it must be beaten on with
mallets; and care taken to stop the service with spun-yarn at every six or eight turns.

Mooring services are clapped on about fifteen fathoms from the end or cable splice. Large vessels should have twelve or fourteen fathoms of service, half of it rounded and the rest plaited and keckled. Upon the best bower or working cable, there should be a short service of eight or ten fathoms at the half-cable.

Mats of the width of the cable's circumference, and about three fathoms long, are very convenient to have ready to lace on the cable with expedition, in cases of necessity, in the way of the hawse or cutwater.

The best service to prevent a cable's chafing is cut from a tanned horse-hide, big enough to wrap two or three times round the cable. The method of putting it on is, first to parcel the cable with two or three turns of old canvas, the length of the leather service; which, if too stiff to put on, only requires dipping in water and beating, which makes it soft and pliable: then pass it tight and smooth round the canvas, and stop it on with sennit or three-yarn knittles, well greasing them, and the service, before veering it into the hawse-hole. Avoid raising the surface of the leather by knittles, &c. underneath the canvas.

OF COMING TO ANCHOR.

A ship ought always, unless under some particular circumstances, to be brought to anchor under an easy sail, such as the three top-sails, jib, or fore-top-mast-stay-sail, and sometimes the mizen, according as the vessel has more or less inclination to fall off or come to the wind.

There are, no doubt, cases when more sail may be required; but they are exceptions to and do not destroy the general principle. Nor should an anchor ever be dropt to leeward of the place you mean to bring up in; because that would often occasion a necessity of casting two anchors at once, for fear of dropping still more to leeward.

When the wind is so violent as to bring the anchor home, and make the vessel drive, the cable is veered away; and, in veering away, the turns of the stopper-laniards are slackened, and a portion of the cable suffered to go out of the hawse, to let the vessel farther a-stern of her anchor; in which situation she bears less strain on the flukes, and is less liable to drag the anchor; for, the more cable is out, the flukes become deeper buried, and the ship rides in greater safety.

In letting go an anchor, great care should be taken that the water be not so shoal as to endanger the ship hurting herself upon it, and that the anchor be not fouled by the cable getting about the fluke or stock.

Nor should the water be too deep, because the cable, when out, should approach as near as possible to a horizontal direction. Indeed, this principle is so true, that three cables spliced together, an-end of each other, are kept bent to the best bower-anchor, to be used in cases of necessity; and it is found, that one good anchor, with a long range of cable, is a safer anchorage than two anchors with short cables. However, when the ship has not room to drive, and if the night be dark, let fall a second anchor under foot, with a range of cable above the deck. At all events, the deep-sea lead should be thrown over the gunwale, and the line frequently handled, to be certain that the ship does not drive.

In hard and rocky bottoms, where anchors cannot have much hold, cables are chafed and cut to pieces. When necessitated to anchor in such places, a chain should be run up the cable from the ring of the anchor to a certain dis-
to secure it from danger. When a chain is not to be had, (although the top chains may serve,) empty casks well bunged are good substitutes, slung and fastened to the cable at equal distances, to support and keep it from the bottom.

When ground is soft and oozy, and anchors will not hold securely, but come home with little wind, it is common to cover the flukes with a broad triangular piece of plank much larger than the fluke. Sometimes the anchor is backed, or retained, by carrying out the stream or kedge, a-head of the anchor the ship usually rides by. In this situation, the bower-anchor is confined by the stream, or kedge, in the same manner as the ship is restrained by the bower-anchor.

In preparing to come to anchor, when the wind is not violent, the topsails ought always to be clued up at the mast-heads; that is, let go the sheets and haul the clue-lines and bunt-lines close up; lower away the topsails and take in the slack of the braces as the yards come down. In this manner you run less danger of splitting and tearing the sails than by any other method.

In all operations hereafter treated of, it should be observed, that whether the wind is moderate or blows fresh, it makes this only difference, viz. the velocity of the ship’s movements, in the latter case, being considerably increased, the sails will require an earlier diminution to stop the head-way; and that of course less time in general is taken up in performing every operation.

**TO ANCHOR IN FINE WEATHER IN A PLACE WHERE YOU WILL RIDGE HEAD TO WIND, BEING CLOSE-HAULED.**

Being under the three topsails, fore-topmast stay-sail, and mizen, stand on until you are within about two ships’ lengths of the place where you mean to drop your anchor; then put the helm a-lee, and haul down the fore-topmast stay-sail. As soon as the topsails shiver, clue them up briskly, before you lower; except the mizen topsail, which is to be laid to the mast, and the mizen sheet hauled flat aft, the instant the ship begins to have stern-way, by reason of the wind being a-head. Then shift the helm to windward, and let go the anchor, veering away the cable, to give it time to settle in the ground, until the vessel falls off, when she is to be checked, to bring her head to the wind. When that is done, right the helm, and haul up the mizen.

**DEMONSTRATION.**

The ship is hove up in the wind by hauling down the fore-topmast stay-sail (§. 31) when nearly two ships’ lengths from the spot where the anchor is to be dropped, because the head-way is sufficient to shoot her that distance; and as, by this movement, the ship is generally found to stop a little to windward of the place where you mean to bring up, you wait till she begins to go a-stern a little before you let go the anchor, and the helm is at the same time shifted hard over the other way (§. 58) to moderate the ship’s falling off when she is head to the wind. The topsails are clued up as soon as they begin to shiver, not only because it can at that time be done easily, since they come in of themselves as they lower; but because, if delayed longer, the stern-way would become too rapid, since the sails would be all a-back, and would soon drive the ship to leeward of her intended anchorage. Besides, the celerity of her falling off would be such as to cause her to drag the anchor before it had got a proper hold of the ground; and that is the reason why the cable is veered away in order to give the anchor time to sink into the bottom by its weight.
The mizen topsail is braced perpendicular to the keel; because, in that situation, the ship is impelled (§. 36) a-stern exactly in the direction of her keel. The mizen sheet is hauled flat aft, to bring the ship's head sooner to the wind; (§. 40;) and, as soon as she arrives at that point, that sail shivers; in which case it is immediately brailed up, as being no longer of use. The helm is righted, having no longer any power; since the vessel is now brought up, and all the sails are furled, except the mizen topsail, which is flat a-back to the mast, to keep the ship steady at her anchor.

**To Anchor in Fine Weather in a Place Where You Will Ride Head to Wind, the Wind Being Large.**

If you have the wind large, whether on the beam or more aft, the operation is still the same, only hauling up a little sooner to keep to windward, because it is in your power to drift as much as you think requisite, and because the ship will be entirely stopped as soon as all her sails begin to catch a-back, and you will have done cluing them up when they begin to shake. The mizen topsail is next to be hoisted to the mast, the helm put a-weather, (§. 58,) and the anchor let go, as soon as the head-way ceases: then, after giving her a sufficiency of cable, bring the ship up. If she has been going large, she will not range precisely head to wind, since her headway ceases as soon as the sails are taken a-back, and the effort of the wind acts on all the rigging of the ship to impel her both a-stern and to leeward, which is indeed augmenting the effect of the rudder, as the helm is a-weather to bring the vessel to the wind: (§ 58 :) but, as the power of the wind is very great to pay the ship's head off, it balances wholly or partly (according as the ship goes a-stern with more or less velocity) the effort of the rudder and that of the mizen; thus she drifts, and remains as it were lying-to with all her sails a-back. This is the reason why we keep a little to windward, and let go the anchor, to bring the ship head to wind at the proper time; which she will do the more readily as she is withheld forward only by the cable, while the wind on her side forces her to leeward.

**To Anchor in Fine Weather in a Place Where You Are to Ride Head to the Stream and Wind, the Wind Being Large.**

If you are obliged to ride with the head to the stream, you must, when it comes from to windward, put the helm a-lee in setting the mizen, then clue up the sails; and, when the ship's head is right in the direction of the stream, let go the anchor, provided she has quite lost her head-way; for, else, you would get foul of the anchor-stock by running over it. This must never be neglected, unless you find yourself under the necessity to bring up in any situation in which you may happen to be, which is almost always the case when you are taken too short to have time to stop the vessel: a reason why there is often a necessity of casting a second anchor, which generally catches the ground by assistance of the first, which has begun to diminish the velocity of the ship; and as many of the sails are to be hauled down as you can, and as quick as possible.
THE PRACTICE OF WORKING SHIPS.

ANCHOR IN FINE WEATHER IN A PLACE WHERE YOU WILL RIDE
HEAD TO THE STREAM, WHICH COMES FROM LEEWARD,
THE WIND BEING LARGE.

When the current comes from to leeward, you must keep the ship away till
her head comes to the set of the stream, and take in all the sails, to diminish
as speedily as possible her head-way, which always continues of itself long
enough when the wind is aft or very large; and when the ship is stopped by
the effort of the water, let go the anchor, without waiting for the vessel gath-
ering sternway, if the current is rapid; and, in this case, as well as all those
wherein there is a sea, or blowing fresh, the ship requires a great length of
cable.

TO COME TO AN ANCHOR WITH THE WIND AFT.

First, hand the main topsail, and then lower the fore topsail down on the
spars; and, when you are within a reasonable distance of the place where you
mean to drop anchor, (which distance is to be judged of from the readiness
of the ship to obey the helm, and from her velocity,) the tiller may be put either
one way or the other, (§. 50,) the fore-topsail and fore-topmast staysail clued
up and taken in, the mizen-topsail braced sharp up, and the mizp-sheer
hauled flat aft. When the ship ranges close to the wind, she is, as it were,
lying-to under the mizen and mizen-topsails, with the last-mentioned sail full
or a-back, according as you may have occasion to shoot a-head or drop a-stern:
so that, if you are too much to windward of the spot where you mean to bring
to, you drift till you arrive at it: if you are precisely in the proper birth, you
let go the anchor in lowering down the mizen-topsail, which is to be furled
as soon as the vessel is brought up; then the ship will come head to wind by
the power of the mizen, which must be brailed up as soon as it shakes.

DEMONSTRATION.

The main-topsail is taken in, and the fore-topsail lowered down, to diminish
the great velocity which a ship commonly has when the wind is aft, in order
to estimate the distance with greater precision, and to have her movements
more under command. When you think yourself at the necessary distance
the ship requires to stop close-hauled, at the place you wish to anchor, you
put the helm on board one way or the other (§. 50); you braces sharp the miz-
en-topsail for the tack you haul upon, (§. 41,) and haul the mizen out to
bring the ship rapidly to the wind. (§. 40.)

In the same moment, the fore-topsail is to be clued-up and handed, and
the fore-topmast staysail hauling down, because they oppose the movement of
the ship (§. 31, 32, and 33) as she is coming to. When you are close to the
wind, the anchor is let go, if you are in the birth you wish: if still too far to
windward, you can drift, keeping the mizen-topsail full; and, when you are
to windward, should you find yourself too far a-head, lay the mizen-topsail
a-back to go a-stern, (§. 44,) putting at the same time the helm a-weather.
(§. 58.) When the vessel has drifted sufficiently, let go the anchor, and furl
the mizen-topsail; because the cable might be injured, should it blow fresh:
then the ship will soon range head to wind, though the mizen be still out;
(§. 40;) and when that is attained, the mizen is brailed up to prevent the ship
sheering; and the helm is righted for the same reason.

In some cases you are obliged to come to an anchor with the wind aft,
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standing end-on, because there is not always a space necessary to deaden the ship's way. In this situation the sails are to be taken in as soon as possible, in order to lessen the velocity of the ship. When come to your birth, let go the anchor, and veer away the cable plentifully, that the anchor may have time to take the ground; then begin to check her gently, veering still more cable as the ring-ropes or stoppers, placed on it before-hand, break away; for they should be permitted to break, in order that you may not be exposed to drag your anchor, by bringing the vessel up at once.

SCUDDING UNDER A FORESAIL, TO COME TO AN ANCHOR.

The foresail must be clued up when at some distance from your birth; and, some part of the way run under bare poles. When near enough to sheer to the wind, you execute it by putting the helm hard a-lee; and, as soon as the ship is come-to, let go the anchor, giving her a large scope of cable, and observing to check her handsomely, in order to make her ride head to wind: as stopping her at first too short might very well endanger her cable or anchor. Should the first not bring her up, a second may be let go.

DEMONSTRATION.

As you cannot run for an anchorage under a foresail, unless before the wind, or very free, you are necessarily obliged to furl that sail at a great distance; because, in that position, the velocity of the ship will, by the violence of the wind, be but too much kept up, so as to make you run the rest of the way, which may perhaps be a quarter or half a league, under bare poles, the wind being nearly aft. If you were obliged to run at that distance close-hauled, you would never reach your birth, should the foresail even be set; because the ship would be laid-to, as was shewn before. You put your helm over to sheer to windward when you think you are at the necessary distance, that you may have time to deaden the ship's head-way: and as, when she stops coming to, her head-way ceases, you let go the anchor, and veer away a great extent of cable; because, when it blows hard, there is commonly a great swell, and the pitching motion it gives to the ship, joined to the effort of the wind on the rigging, would bring home the anchor. You are therefore obliged to veer away a great length of cable, to give the anchor time to settle, and to cause the cable to make a very acute angle with the ground, by which the strain is much reduced.

TO ANCHOR WITH A SPRING IN ORDER TO PRESENT THE VESSEL'S SIDE TO A PLACE OR SHIP YOU WISH TO CANNONADE.

This is executed when you know that the wind or current will bring your head, when at anchor, towards the object you mean to attack: for, should the wind or tide bring your broad-side to bear on the object you mean to cannonade, the spring would only be a precaution, to get under way more quickly in case you were obliged to retreat, or in case the wind or tide should shift. Get a large snatch-block in the aftermost port, on the same side you wish to present to the wind or current, and on the same side with the anchor and cable with which you mean to bring up; then, through the block, reeve a hawser, the end of which is to be clinched to the ring of the anchor you mean to let go; the other part is brought to the capstern, with necessary ran-
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The practice of working ships. That done, and the ship being arrived at the birth, you are to deaden her way according to circumstances: you let go the anchor, and veer away enough cable and hawser, now a little more of the one, and then a little more of the other, according as you wish to present more head or stern; which you can do by heaving on the spring, or what is the same, veering away more cable. Should you find it requisite to shift your position, you have only to veer out more of the hawser.

TO COME TO AN ANCHOR IN ROADS THAT ARE OFTEN CROWDED WITH SHIPS, AND TO LEAVE CLEAR BIRTHS FOR OTHERS.

The best anchoring births in these places are mostly known by marks, and of course are occupied by the first ships.

In a tide or trade wind road-stead, the next ship that comes should not anchor right a-head or a-stern of the first ship and so as to lie in the other’s hawse, but should come to on the bow and quarter at a sufficient distance to prevent other ships from coming between, and in a slanting direction from the tide or wind. This might contribute to the safety of ships when it blows strong upon a lee-tide or in strong sea-breezes, as each single ship may then veer away what cable necessary, and keep clear of the other ship’s hawse a-stern; or, in case of driving or casting, they have a better chance of keeping clear of each other.

A good anchoring birth in a crowded road-stead is obtained by first running down through the middle of the fleet, and taking notice where a good birth is left vacant by some ship that has sailed from the middle of the fleet; then steer out from among the ships, and turn to windward so far, as to give time to take in and furl all the sails, and run down before the wind amongst the ships without any sail, and let go the anchor at the intended birth.

TO COME TO AN ANCHOR WITH THE WIND ACROSS THE TIDE.

The ship should, if possible, be put upon the tack that stems against the tide when the anchor is let go; and, if it be designed to continue at a single anchor, in order to keep it clear, sheer the ship and keep her to leeward of the anchor, by keeping the helm a-weather and the fore-topmast staysail set, with the sheet to windward.

Much benefit may result from letting go the anchor stemming against the tide, especially with a rapid tide; for it gives an opportunity to observe at what rate the ship drives a-stern, so as to judge whether it may not be necessary to keep sail set, in order to bring the ship up to ride easy in a rapid tide, and keep her clear of shoals, &c. a-stern.

TO COME TO AN ANCHOR WHEN THE WIND IS RIGHT AGAINST THE TIDE, THE SHIP DRIVING WITH THE STRENGTH OF THE TIDE AGAINST THE WIND.

Shoot the ship a-head of her anchor, or sheer her clear of it, upon the same tack as she is meant to shoot upon the next tide, always endeavoring to keep the ship, in swinging with the tide, on one side of the anchor, to clear it. Suppose that the ship, driving to windward, has got to an anchoring-birth, or that the tide is so far spent that she will drive no farther to windward, and
must come to an anchor on the starboard tack. In letting go the anchor, the ship should be shot a-head of it, and kept a-head with the helm a-weather, the yards braced full with the larboard-braces, the fore-top-mast stay-sail and mizen set full, till the windward tide is done; then she falls to leeward and rides windroad, with the wind and anchor right a-head; in which position she will lie clear of the anchor till the next windward tide.

TO COME TO AN ANCHOR WITHOUT TENDING.

If it happens that a ship is to be brought up in a place where there is not sufficient room to tend her, reduce her head-way as much as possible before she comes to her anchoring birth, so that a less scope of cable will bring her up.

DESCRIPTION OF A FLOATING ANCHOR, TO RIDE BY IN A Gale OF WIND.

This simple machine is made to dive beneath the swell of the sea, and retain the vessel where there may be no other anchorage.
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It consists of two flat bars of iron, each in length half the breadth of the midship beam of the vessel for which it is used, and rivetted together in the middle by an iron saucer-headed bolt, clenched at its point, that they may be swung parallel to each other for easy stowage. At each end of the bars is a hole for a rope, or swifter, to pass through, which must be hove tight, to extend the bars at right angles. To this swifter is marled a double or four-fold canvass cloth, made of No. 1, of the same shape, so as to be on that side of the iron bars nearest the vessel when used.

In each bar are two holes, at equal distances from the centre; and to these holes the ends of two pieces of rope are fastened: the ropes are seized together in the middle so as to form a crowfoot, having an eye in the centre, which is well served with spun yarn, and to this is bent, when the anchor is used, a cable or hawser, by which it is made to sink and incline in the water.

In the end of one of the bars is fitted an iron ring, to which a buoy is made fast, by a rope about 12 fathoms long, to prevent the anchor from sinking to the bottom. When it is thrown over board, the cable and a rope, made fast to the head of the buoy, are veered away sufficiently to ride the vessel.

To get it on board, haul upon the buoy-rope, which will bring it to the water's surface so as to be easily drawn to the vessel. Have the mizen-staysail ready to hoist, to keep the vessel to the wind till the anchor is hauled on board.

INSTRUCTIONS FOR THE MANAGEMENT OF SHIPS AT SINGLE ANCHOR.

BY SHEERING A SHIP.

If the side of a ship at anchor is presented to the tide by any means, the water will act upon her two ways; one in the direction of her keel, the other in the direction of her beams; the last will cause her to sheer out to one side of her anchor, which was a-head before. Suppose, for example, the power which presents the ship's side to the tide to be a spring; from the anchor coming in aft on the starboard side upon heaving in the spring, the ship will sheer over to port, bringing the anchor upon the starboard bow: the more the spring is hove in, the more the ship will go a-head, and, over to port, until her side makes an angle with the tide of 45 degrees, as the farthest she can go over from her anchor: for the spring hove in after this will cause the ship to return, and be in the stream of her anchor when she is hove round a broadside to the tide. Now, if the helm is put over to starboard, it will act as the spring, by forcing the ship's stern to starboard; and thus, by causing the water to act upon her starboard-side, the ship will be forced over to port: on the contrary, had the helm been put to port, the larboard side would be presented to the action of the water, and the ship will go over to starboard; but the power of the rudder being according to the strength of the tide, its action lessens upon the rudder, as the ship sheers obliquely to the stream, and cannot produce so great an effect as the spring.
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RIDING AT ANCHOR IN MODERATE WEATHER.

When riding in a tideway with a fresh wind, the cable should have a short or windward service, of about 45 or 50 fathoms from the manger-board outwards, always sheered to leeward, (not to windward as thought by some,) not with the helm hard down constantly, but more or less so, according to the strength or weakness of the tide. Many ships have sheered their anchors home, driven on board other ships, or on sands near which they rode, before the anchor was discovered to have moved from the place where let go.

TO BACK A SHIP.

When the wind is cross or nearly off shore, or in the opposite direction, ships will always back by the mizen-topsail, assisted if necessary by the mizen-staysail. If no mizen-topsail, the main-topsail is used.

In backing, always keep a tight cable to wind the ship, that the anchor may be drawn round. If the wind is not sufficient for this purpose, the ship must be hove a-peek.

OF BRACING THE YARDS.

Riding with the wind afore the beam, brace the yards forward: if abaft the beam, brace them all a-back.

OF RIDING WHEN IN DANGER OF BREAKING THE SHEER.

If the wind is so far aft that the ship will not back, she must be set a-head; but never attempt to back, if, when the tide ceases, the ship forges a-head, and brings the buoy on the lee-quarter. If the wind is far aft and blows fresh, the greatest attention is required; as ships, riding in this situation, often break their sheer and come again to windward of their anchors; to prevent which, the after-yards must be braced forward, and the fore-yards aft; thus she will be safe, so long as the buoy can be kept on the lee-quarter; or, suppose the helm to port, so long as the buoy is on the larboard quarter. With the helm thus, and the wind right aft or nearly so, the starboard main and fore braces should be hauled aft if led aft, and forward if they lead forward.

HOW TO MANAGE A SHIP WHEN HER SHEER IS BROKEN.

If the ship tends to leeward, and the buoy comes on the weather-quarter, and she breaks her sheer, brace about the main yard quickly; if she recovers and brings the buoy, on the lee or larboard quarter, let the mait-yard be again braced about; but, if she comes to her sheer the other way, by bringing the buoy on her starboard quarter, change the helm and brace the fore-yard to.
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OF TENDING TO LEEWARD WHEN THE SHIP MUST BE SET A-HEAD.

When the ship begins to tend to leeward, and the buoy comes on the weather-quarter; first brace about the fore-yard; and, when the wind comes near the beam, set the fore-staysail, and keep it standing until it shivers; then brace all the yards sharp forward, especially if it is likely to blow hard.

It sometimes happens that, when the fore-staysail is set too soon, the ship’s head will pay round off, and she will break her sheer: to prevent this, and to keep the wind broad upon the beam, it will often be necessary to set the mizen-staysail also; which should be hauled down as soon as the wind comes before the beam, otherwise the ship’s head will be thrown in the wind too soon.

WHEN THE SHIP IS LIKELY TO GO TO WINDWARD WITH A LONG SERVICE OUT.

Riding leeward-tide with more cable than the windward-service, and expecting the ship will go to windward of her anchor, begin, as soon as the tide cases, to shorten in the cable. This work is sometimes hard, but very necessary; otherwise the anchor may be foul by the great length of cable the ship has to draw round, or the cable would be damaged by the bows and cut-water.

When a ship rides windward-tide, the cable should be keckled from the short service towards the anchor, as far as will prevent its touching the cut-water.

When the ship tends to windward, and must be set a-head, hoist the fore-staysail as soon as it will stand; and, in moderate weather, the jib also; and, when the buoy comes on the lee-quarter, haul down the fore-staysail, and jib, if set; brace-to the fore-yard, and put the helm a-lee; for, till then, the helm must be kept a-weather, and all the yards full.

TO MANAGE IN A STORM.

When a ship rides leeward-tide, and the wind increases, give her more cable, otherwise the anchor may start by not doing so in time, and the ship will not easily be brought up again: this is the more necessary when riding in the hawse of another ship. Previously to giving a long service, it is usual to take a weather-bit, or a turn of the cable round the windlass-end, that, in veering away, the ship may not overpower you. Grease the service, to prevent its chafing in the hawse.

If the gale increases, the topmasts should be timely struck, but the fore-yard seldom, if ever, should be lowered down, that, in case of parting, the foresail may be always ready. At these times, let there be more people on deck than the usual anchor-watch, that no accident may happen from inattention.

TO TEND A SHIP FOR A WEATHER-TIDE.

A ship riding at anchor upon a lee-tide, with the wind in the direction of the tide, requires, upon the tide’s setting to windward, to tend clear of her
anchor: for this purpose, when the weather tide sets, and brings the wind broad upon either bow, hoist the jib and fore-staysail, and brace full the yards to shoot the ship a tight cable from her anchor: then put the helm a-lee, and wait until the buoy comes upon the lee-side: this done, brace-to the head-yard, and keep the after-yards full to assist the helm. If the buoy bears nearly a-beam, the jib and fore-staysail may be hauled down; but, if the wind is fresh, and shoots the ship nearly-end on with the cable, bringing the buoy upon the quarter, keep up the fore-staysail; as, in this situation, the ship will be in danger of breaking her sheer against the helm; and the fore-staysail will be ready to catch her before she can fall to windward of her anchor. As the weather-tide slack, the ship will gradually fall wind-road; then haul down the fore-staysail and right the helm: should it blow fresh, let the yards be braced forward, and give the ship sufficient cable.

TO TEND A SHIP WITH THE WIND A FEW POINTS ACROSS THE TIDE.

If a ship riding at anchor upon a lee-tide, with the wind two or three points upon the bow, is to be cast for a weather-tide; when the tide is done, the ship will become wind-road, and of course must cast with her head to the weather-shore. As the lee-tide makes and brings the wind on either side, put the helm a-lee, hoist the jib and fore-staysail with the sheets to windward, brace a-back the head-yards, and fill the after-yards. When the ship has sheered tight to windward of her anchor, haul down the jib and fore-staysail; and, as the wind is broad upon the quarter, she will lie quiet the remainder of the tide. As the weather-tide slack, the ship will shoot end on with the cable, bringing the buoy upon the weather quarter. When the wind is a-beam, if it is thought necessary, the jib and fore-staysail should be hoisted to force the ship a tight cable from her anchor; and hauled down when they shiver. Should it blow fresh, give the ship sufficient cable before the lee-tide makes, and point the yards to the wind.

TO TEND A SHIP WITH THE WIND ACROSS THE TIDE.

The simplest way of tending a ship is to keep each tide to leeward of her anchor. At each slack water the ship will become wind-road; and, as she tends and brings the wind on either side, put the helm a-weather, and hoist the fore-staysail with the sheet to windward, to force the ship a tight cable from her anchor. When the tide is set, and the ship upon a proper sheer to leeward of her anchor, the fore-staysail may be hauled down.

GENERAL OBSERVATIONS UPON SHIPS AT SINGLE ANCHOR.

If at any time the anchor-watch should wind the ship, or permit her to break her sheer, the anchor should be hove in sight immediately, or on the first opportunity.

When lying in a road-stead, the anchor should be hove in sight once a week, though there be no suspicion of its being foul, for sometimes the cable is damaged by sweeping wrecks, or lost anchors, or from rocks or stones. It is often needful to trip the anchor, to take a clearer birth, particularly when any
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Ship brings up too near; but, if there is the least suspicion of the ship's having come near her anchor, it should be sighted the first opportunity.

A good road-stead is much better than a bad harbor, and more safe: therefore never leave a good road-stead for the latter, without real necessity, which can only be when you can ride no longer, and have no lee-road to fly to.

There are road-steads where an anchor will bury itself, so that the bight of the cable cannot foul it. In such places, where there is room, it is better to lie at single anchor than to moor.

If it is possible always shoot a ship on the same side of her anchor each tide, to prevent danger from the anchor's not turning as the ship swings; for the anchor, by not turning in the ground, endangers fouling the cable round the upper fluke or stock, which will either trip the anchor or damage the cable: and it often happens, when an anchor is tripped out of stiff ground, that it will not take hold a second time, without the upper fluke should cant down; for the quantity of clay sticking to the fluke prevents its setting into the ground again: so the anchor keeps tripping over the surface, and another anchor must be let go before the ship can be brought up. As a ship, by being sheered, presents one bow to the tide, if the wind is against the tide, it must blow upon the opposite quarter.

It is not always necessary to use the yards, in tending a ship, to shoot her a tight cable from her anchor. In general the jib, fore-staysail, and main-topmast staysail, will be sufficient for the purpose. Should the wind shift at any time, it will be necessary to alter the sheer of the ship accordingly.

ON MOORING.

When a ship is come to anchor in a place where she is intended to remain, prudence dictates that she should be well secured. For this purpose the putting down additional anchors is calculated, and has been denominated mooring. The various situations of places, settings of tides, &c. occasion the necessity of the following particular directions.

When the best bower is gone, and about two cable's length is run out, the small bower is let go; and, when that has taken the ground, you heave in one cable's length upon the best bower, and veer away a cable's length of the small bower; and thus the ship is kept at an equal distance between both, the one lying to the head, and the other to the stern.

In roads where there is much tide, and freshes are expected, ships moor according to the set of the current, one anchor riding to the flood, and the best anchor and cable to the ebb.

In roads where there is little or no tide, ships moor according to the set of the most prevailing wind on the coast.

It may so happen, according to circumstance and situation, that the vessel must ride by a greater scope on one cable than the other, but still the manner of letting go the anchors is the same.

Another method of mooring is, by carrying the last anchor out in a boat to the place appointed, and there letting it go. Steadying or mooring with a kedge is usually done in this manner.
This is done by letting go the number of anchors necessary, and veering away; this being no ordinary practice, but only adopted in cases of danger and peculiarity of circumstance; time, place, and situation, must be the only guide to such an operation: as one instance, suppose a ship cannot clear the shore under her lee by sailing, owing to a strong wind and high sea, the only resource is to let go all the anchors to the best advantage. For this purpose, let the cables that are bent be got clear for running. Then furl all the square-sails as quick as possible, and shoot the ship along the shore under the staysails. When the square-sails are furled, let go the weathermost-anchor, and veer away the cable quickly; then let go the next weathermost, and so on, till all the anchors are gone nearly in a line along the shore: thus, when the ship becomes windroad, all the cables may be made to bear an equal strain, and are separated from each other.

To back an anchor is to let go a small anchor a-head of a large one, to which it is fastened, to partake of the strain, and to serve as a check upon it, should it come home. The backing anchor is carried out in a long-boat, to the buoy of the one already down, whose buoy-rope is cast off and bent to the cable or hawser of the backing-anchor; that done, the boat is rowed farther a-head, till the buoy-rope and cable of the backing-anchor become tight, when it is let go, the buoy that was taken from the large one being previously bent to it.

In this situation, should the large anchor come home, the scope of cable from it to the anchor a-head, participating of the strain communicated to the innermost one, checks its progress, and ensures to the vessel a greater security.

Where there is more room to drive without danger, and it blows so hard, that the sea runs too high for boats to work, an anchor is backed by clenching, round that part of the cable next the hawse-hole, the end of a cable bent to another anchor on board. This being done, the second anchor is let go under foot; the ship is then suffered to drive, and the cable, by the driving of the ship, becomes tight from the ring of the anchor last down to its own anchor, which, by the driving also, is now become a cable's length a-head of the former anchor.

To bring a ship up at high water, with an intention to moor with the best bower to the ebb, let go the best bower, and bring her up with the cable stoppered, until the ebb makes strong; then veer away two cables; and, if possible, assist her a-stern with the mizen-topsail. If, when two cables are out and the ship in the stream of her anchor, it is thought, when moored, she will ride too near any other vessel, sheer her over from that vessel, and let go the small bower-anchor; then ship the capstern bars, bring-to the best bower, veer away the small bower, and heave in the best bower to the whole cable-service; then bit and stopper the cables, leaving sufficient service within board to freshen the hawse.
TO MOOR WITH AN OPEN HAWSE TO ANY PARTICULAR QUARTER:

Suppose, for example, the road-stead or river, intended to moor the ship in, to lie north and south, (in which direction the anchors are to be laid,) and that her best bower is carried on the larboard side, and it is meant, when moored, the ship shall swing with an open hawse to the eastward. In this case the best bower must be the northern anchor; but, if the hawse had been required to be open when her head was swung to the westward, the best bower must have been the southern anchor.

HOW THE WEAKEST MOORINGS MAY BE BEST APPLIED TO HELP A SHIP TO RIDE OUT A STORM...

It may happen that the small bower cable may be too much worn, or the small moorings known to be too weak, to ride a ship out a storm, when the anchor at the best cable is in danger, or expected to come home. In this case, to make the weak moorings serve for a backing to the best anchor and cable, contrive a traveller, of sufficient sized rope to go slack round the best cable, without the hawse, and well secure it with rolling hitches seized to the weak moorings, that may be veered away, or let go, as occasion may require; if short of rope to make a proper traveller, a large stopper may be clapt on without the hawse, till the end of the small moorings is fastened round the best bower cable, with a bowline-knot open enough to slide along the best cable, until it comes to the ring, which may prove such a sure backing, as to prevent its coming home.

OF KEEPING A CLEAR HAWSE.

When a ship is moored, she is often thought to be in such a state of security, that the keeping a clear hawse is too often neglected.

If the hawse is clear, the ship must ever swing with her stern to the side on which the headmost cable leads.

If, to keep a clear hawse, the ship should swing with her stern to windward, it will be impracticable to get her the right way by any sail that can be set; for, as the tide slackens, she will fall wind-road; and, when the tide sets, it will take her upon the wrong side. However, if the wind continues, she cannot foul her hawse any more, as at the next tide, the same wind will undo the cross it caused. When the wind is either a-head or a- stern, by the assistance of the mizen-topsail or jib, the ship can mostly be made to swing the right way. For example, suppose the wind a-head, or even a little upon the starboard-bow, and that the ship's stern is to swing to starboard: in this case, set the mizen-topsail, with the starboard yard-arms braced forward, haul up the starboard-bowline, and hoist the jib with the sheet to windward; then, before the lee-tide is done, put the helm to starboard, to give the ship a sheer, which will be preserved by the position of the sails. At slack water shift the helm: thus, when the tide makes, it will act against the larboard side of the rudder and stern, and very much assist to swing the ship the right way. Again, should the wind be a- stern, and a little upon the wrong quarter, if the helm be attended to, and the mizen-topsail braced full the right way, in all probability the ship will swing as wanted.
If the helm were only properly attended, it would often save the labor of clearing the hawse.

It would be highly necessary, at all times, to have a small anchor and rope ready abaft, to run out and haul the ship round in calm weather.

**EXPLANATION OF A FOUL HAWSE.**

When a ship is moored, attention must be paid to her swinging at the turn of tide, or shift of wind, to prevent the cables overlaying each other, or getting a foul hawse, which is prejudicial, as the cables chafe each other, and as the vessel is not in that perfect state of security enjoyed by riding with an open hawse. The explanation of this turn will be better comprehended by a reference to the figures.
For example: if a ship be moored east and west, and swings to the northward, the cable of the anchor, lying to the eastward, is from the hawse-hole on the larboard-side, and that to the westward from the hawse-hole on the starboard side; should the wind or tide change, so as to bring the ship to the southward of her anchors, the western anchor will be on the larboard-side the vessel, and the eastern anchor on the starboard side. These two cables (the one from out of the larboard hawse-hole, and leading towards the eastward, or starboard of the ship, and that from out of the starboard hawse-hole leading to the westward, or larboard-side of the ship) must consequently cross each other; that by which she rode, when making the movement of swinging, remaining above the other. Suppose, in the present case, the ship has swung by the eastern anchor to the western side, it will then be found in the position shewn in fig. 1.

If, in a second change of situation, the ship is observed to turn round the same anchor, and to the westward, the cross will be taken out, and the cables will resume their first disposition, as in fig. 1.

If, on the contrary, the cross is not taken out, but she swings to the eastward, the cross will be doubled, and form an elbow, fig. 2; and, should she continue to turn westward to the southward, the cables will be again twisted, and form a round turn, as fig. 3, which should be carefully avoided.

When two cables are crossed, to take the cross out, the ship must swing to the upper cable, drawing it tight, and by that means slacking the other cable: when the cross is doubled, and becomes an elbow, the cable, which at first was the uppermost, being overlaid by the other, and making a turn, it is always on the first that the ship should make the evolution to take the turn out.

OF CLEARING THE HAWSE.

This can only be attempted when the ship does not ride by the clearing-cable. To execute it, bend a fish-hook to the fore-bowline, hook this to the cable the ship is riding by, below the turns in the hawse, and bowse it well up out of the water; then lash the cables together at the turns. If the cable.
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by which the hawse is cleared, leads on the starboard side, send the larboard fore-top bowline into the hawse-hole under the cable, or under and over, according as the cable to be cleared is either below or above the other, which must be bent about three fathoms within the hawse. Then send in the starboard-bowline, which should be bent well in towards the end of the cable, and stopped along the cable every fathom; and let a hawse-rove be bent to the end of the cable. When all the bowlines are fast, unbit the cable, and haul out upon the starboard-bowline; let the stops be cut, as the cable comes out of the hawse. When a long bight is out, haul upon the larboard bowline, and trice this bight up to the bowsprit. Should this one bight not sufficiently expend the cable, that its end may be taken round the other, hang it to the bowsprit, and send down the larboard-bowline for a second bight. When the end of the cable is round the other, shift the hawse-rove, and haul it in again. The hawse being clear, bit the cable and unlash it.

Should it blow fresh, and the tide run to windward, it will be imprudent to trust only to the lashings, lest the cable should run out end for end. In this case, bend the hawser, with a rolling hitch, to the clearing cable, below the turns of the hawse, and let it be hove tight, as a double security.

If it is moderate weather and an easy tide, the hawse may be readily cleared, by bowsing the headmost cable well up out of the water, and bending to it a hawser from the hawse below the turns. Then unbit the cable, veer away upon the hawser, and pass the headmost cable round the other until its end is clear; then heave in upon the hawser, take in the cable, and bit it. Should it come on to blow a gale of wind, when a ship is moored, from that quarter which will oblige her to ride equally by each cable, and the hawse is clear, it will be necessary to splice a second cable to the small bower, and to veer away equally upon both cables: but, should the hawse be foul, and it is expected that the cables will damage each other, bend a hawser below the turns in the hawse to the small bower, which slip, and let the ship swing to the best bower. When the weather moderates, heave in the end of the small bower, and the ship will be moored as before with a clear hawse.

OF GETTING UP OR WEIGHING ANCHOR.

Previously to entering upon directions for unmooring and getting under sail, it is necessary to shew the various modes of getting up an anchor, as this operation is often requisite where it is not designed to unmoor, and as it is necessary to know how to overcome the difficulties of getting up an anchor in all cases whatever.

TO GET UP AN ANCHOR, IN SHIPS WHICH HAVE A MAIN AND JEER CAPSTERN.

In large ships which have a main and jeer capstern, and the strain is thought too great for the messenger alone, the viol is used thus: Three or four turns are taken round the jeer-capstern with one end, so as to leave that side clear on which the cable is coming in; and pass the other end through the viol-block, which is lashed round the main-mast on the lower deck. It is then carried forward, and passed round the rollers in the manger near the
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hawse-holes; then brought aft, and spliced to the other end with a short splice, and the ends marled down tight. That side of the viol on which the cable is coming in is fastened to the cable by nippers; and thus the continued efforts of the capstern are conveyed to the cable, until it is hove in. The nippers are clapt on in the manger; from one to two fathoms asunder; and the viol is applied to the midships, or inside of the cable. Nippers are clapt on by taking three or four turns round the viol, four turns round the cable and viol, and then three or four turns round the cable. This method is an exceeding good one, and very suitable to quick heaving; but, when the strain is great, and the cable muddy, the nippers clapt on after this method will not nip sufficiently; and sometimes recourse is had to the following method: throw sand or ashes upon the cable, and take a long dry niper; which middle and pass one half aft, racking it in and out round the cable and viol; then worm its end round the viol only. After this pass the other half in the same manner forward, but worm its end round the cable only, and let each end of the niper be held on. The advantages of this method are, that, as the strain of the cable lies forward and that of the viol aft, the niper will be drawn so tight as effectually to hold the cable till something gives way; also they can never jamb, for both ends are clear for taking off. Another method, when the strain is great, is, to have nippers with an overhand-knot made at one end; and with that end a round turn taken round the cable, and viol, leaving three or four feet of the end; then, with the other end, take three or four racking turns, and expend nearly the remainder with turns round the cable and viol, laying the knotted end under and over each of the last turns: the end is then held fast. The men who clapt on the nippers are attended by boys, who hold the ends of them; and follow the progression of the cable as it is hove in; and, as the nippers arrive near the main-hatchway, they are taken off and carried forward, where they are again clapt on: and so in succession, until the cable is hove in sufficiently to raise the anchor above the water. It is then stoppered round all before the bits: that is, round the cable and viol. The anchor is then catted, and afterwards fished. To shift the viol for heaving in a second anchor, it must be unspliced, and the turns round the capstern reversed. When the strain is so great as to require other purchases, the top tackles may be used thus: the double block is lashed to the main-mast or topsail-sheet bits, the treble block is lashed on the cable, and the fall brought to the capstern. If the top-tackle falls are thought insufficient, any hawser may be used that will receive through the blocks.

TO GET UP AN ANCHOR IN SHIPS WHICH HAVE NOT A JEER CAPSTERN.

Ships without a jeer-capstern have no viol, but heave in their cables by the messenger, which has an eye spliced in each end; one of which ends is passed with three or four turns round the capstern on the upper deck, and the other end passed forwards round the rollers, at the fore-part of the manger; then brought aft to the other end, and lashed thus: several turns are passed through the eyes crossing each other in the middle, then a half-hitch is taken round the parts, and the end stopped with spun yarn. The remainder of the operation is performed as by the viol, with this exception; the messenger is applied to the outside of the cable; and, when the nippers are insufficient, the messenger may be hitched thus: the bight of the messenger is fastened round the cable at the manger with a rolling hitch, and the bight seized round the cable before the hitch. This practice is by no means so good as the others.

When getting under way in a sea gale, the viol is better than a messenger, as the sending of the ship carries all the strain to the main-capstern, and en-
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dangers the men at the bars; whereas, with a viol, the strain is taken to the viol-block, and the men at the fore-jeer capstern heave in security.

TO GET UP A SECOND ANCHOR.

Suppose, by the former methods, that the starboard anchor is gotten up, and that the cable of the second anchor enters the larboard hawse-hole, the operation of getting up the second anchor is the same, observing only, that the messenger must be shifted, and the turns on the capstern reversed, to change the disposition and side: and the men, who before held on the larboard-side in the first operation, will hold on the starboard side now: the motion of the capstern is performed the contrary way, and the cable on the larboard side is fixed and hove in.

TO GET UP AN ANCHOR IN MERCHANT-SHIPS.

Most merchant-ships and small vessels heave up their anchors by a windlass; round which are taken three turns of the cable, and held on by hand, or by a jigger thus: the end of the rope which has the sheave is passed round the cable, with a round turn, close to the windlass, the leading part of the rope coming over the sheave, and stretched aft, by means of the fall passing through the jigger-block; the standing part of the fall is made fast round a stantion, at the fore-part of the quarter-deck, and the leading part is bowsed upon, which jambs the turns taken round the cable; and, when the jigger arrives abreast of the hatchway, it is removed forward, and the cable is jamb-ed by a handspeck at the windlass, until the jigger is refixed.

TO WEIGH AN ANCHOR WITH THE LONG-BOAT.

This is done, by taking the long-boat to the buoy of the anchor; and putting the buoy-rope over the davit of the long-boat, and a tackle on the buoy-rope; by which, with the assistance of men on the fall, the anchor is weighed out of the ground. This being accomplished, the cable is hove in on board; the buoy-rope and tackle being secured in the boat, they approach the ship as the cable is hove in, and the anchor catted and stowed. Small anchors and grapnels are got up by the davit, hauling upon the cable or grapnel-rope by hand.

TO WEIGH AN ANCHOR BY UNDER-RUNNING.

This is by placing the cable over the davit-head, and under-running it, till it is nearly a-peek, when it is tripped by means of tackles as before by the buoy-rope. This method is troublesome, and is only adopted when the buoy is gone, and a ship cannot get near her anchor for want of water.
OF CUTTING OR SLIPPING THE CABLE TO MAKE SAIL.

This is a quick but very expensive method, and practised but in cases of the greatest necessity; such as when the anchor is hooked to rocks, and cannot be purchased; in bad weather; when at anchor on a lee-shore and in danger of being embayed; or when compelled to fly from or pursue an enemy. The cable is cut by an axe at the hawse-holes or at the bits. Slipping the cable if time will permit, (which prevents losing the anchor and cable, and is more prudent than cutting,) is by letting the cable run out end for end. Observing however before it is either cut or slipped to pass a spare buoy-rope in the hawse-hole, and fasten it near the end with a rolling hitch; worm the end in the cuntline and stop it, that it may be easily regained.

TO SWEEP AN ANCHOR.

To sweep an anchor is seeking at the bottom for one lost, by means of a rope called a sweep. This rope has its two ends made fast to two boats abreast of each other, at a small distance asunder. On the bight of the sweep is fixed a weight of shot, ballast, &c. to keep it at the bottom. The two boats row on toward the place where the anchor is supposed to be, and consequently draw along the sweep; which, taking the bottom, hooks or entangles itself with the object of their search. The boats then row across each other twice, so as to take a round turn with the sweep, which being a hawser, both parts are brought into the hawse-hole and to the capstern, (or if small to the long-boat,) and hove in upon as before.

TO UNMOOR.

Should the ship to be unmoored have her best bower to the ebb, let her be unmoored upon the ebb-tide: but, if there were a necessity to unmoor upon the flood, the stream-cable must be spliced to the small bower, supposing the small bower has but one cable. To unmoor upon the ebb, when it has made strong, veer away the best bower, bring-to and heave in the small bower, and keep veering away the best, till the small bower is up-and-down; then stopper the best bower.

The small bower being up, cat the anchor, shift the messenger, bring-to the best bower, and heave into the whole or half cable service, as may be thought necessary; then bit the cable, and fish the small bower anchor.

Should a ship be under the necessity of unmooring upon a windward-tide with a strong wind, it will be very difficult and dangerous to take up the sternmost anchor. In this case, if there be no ships in the way, the headmost anchor may be the first taken up with safety, and the sternmost cable be hove in towards slack water.
Whenever a ship is preparing to get under sail, the topsail-yards ought to be at the mast-head, and her sails stopped with rope-yarns. And indeed all persons that pique themselves on rapid execution ought to observe this precaution when the wind is not too powerful.

When the tide takes a ship on the beam, and she is to cast the other way, it is evident that the tiller in the first instant must be put on the side the current runs from, because the rudder will be in such a situation as to receive very obliquely the impulse of the fluid, and consequently will but little oppose the ship's falling off, provided the ship's velocity does not exceed that of the current.

When in a situation where it is indifferent whether the ship be cast one way or the other, always, let it be to leeward of the anchor, that there may be no risk of its getting foul of the cutwater.

It happens sometimes, in getting under sail, that you are obliged to heave the anchor up to leeward; which often requires a dangerous strain to the capstern; because the ship, driving to leeward as soon as the anchor is a-weigh, causes the cable to girt against the lee-bow, and the stock of the anchor is very apt to catch the cutwater. To avoid this, let the ship, (if you are near the land,) get offing enough to wear and bring the anchor on the weather bow: then the ship, lying to leeward of the anchor, or standing on under an easy sail, drifts, and consequently leaves the anchor disengaged to windward; in which situation it may be hove with facility.

**To Get Under Sail When the Ship is Swinging Head to Wind, and you Want to Cast Either to Starboard or Larboard, in a Place Where There is No Current.**

Heave short on your anchor till it is a-peek: then haul in quite home the larboard braces forward and starboard braces abaft: loosen, sheet-home, and hoist, the topsails, should they not be so already: put the helm a-starboard, and heave till the anchor is a-weigh. The moment the anchor quits the ground, the ship will begin to fall off to starboard. As soon as this movement is perceived, hoist the jib and fore-topmast staysail, if necessary, to help her: and, when she has sufficiently fallen off, her sails abaft (which are trimmed sharp for the larboard-tack) will fill. But, unless for very superior reasons, you had better continue lying-to till the anchor is catted, taking care to haul the mizen-sheets close aft, if the ship be inclined to fall off too much.

**To Cast to Larboard.**

Haul in the starboard-braces forward and the larboard aft, and put the helm a-port. The rest of the operation is the same as the preceding; and will be equally proved in the following demonstration, by only changing starboard for port.
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DEMONSTRATION.

You have short before the top-sails are loosened, in order to facilitate the working of the capstern, which would require dangerous efforts if they were set; since they would be a-back, and consequently in a situation to send the ship a-stern; whereas she should go a-head when you are heaving on your cable. The larboard-braces are hauled in forwards, because, in that situation, the sails are so braced as to cast the ship's head to starboard, since they make with the keel the most acute angle possible a-starboard forward, and are at the same time a-back. Besides, the after-sails, being braced sharp up to starboard, are also taken a-back like the others, and receive the wind in such a manner as to turn the after-part to port. So that there are always two powers acting in contrary directions, one before and the other abaft the centre of gravity of the ship; the one forcing the fore-part to starboard, and the other impelling the after-part to larboard. As these two effects cannot happen without the ship's going a-stern the moment the anchor quits the ground, since she is no longer withheld by any thing, and is moved by an exterior power, the fluid, which carries her in this direction, part of the effect of her sails giving her stern-way; (§v21;) it follows, that the helm must be put to starboard, that the rudder may help her after-part round to larboard. (§.58.) Thus every thing is disposed to make the ship fall off to starboard. The jib and foyle-topmast-staysail are not added, unless there be reasons to fear the ship will not fall off fast enough; and, when you find she has sufficiently done so, the mizen is to be hauled out, to procure the contrary effect, and thereby to counterbalance the jib and stay-sail, which it is very often necessary to keep set.

TO GET UNDER SAIL, WHEN THE SHIP IS RIDING HEAD TO WIND AND TIDE.

If a ship, riding head to wind and tide, wanted to get under sail, after having decided on which side it is best to have her cast, it must be performed according to one of the foregoing methods, except with regard to the helm, which must be put to starboard, either before the anchor loosens, or while it does, if you wish to cast to port; because the water, coming from forward, acts with the same force on the rudder as if the ship went with the current, impelling the rudder to starboard and the head to port. Therefore it is evident, in this case, the helm ought to be put to starboard; which, on the contrary, would be put to larboard, was the ship to be cast to port.

If the ship, after the anchor is out of the ground, goes a-stern faster than the current runs, the helm must then be used as if there was no current, because the excess of velocity, whereby the ship exceeds that of the water, acts upon the rudder.

If it blows fresh, so that you cannot set your topsails without reefing them, let that be done before they are sheeted home; and if it blew so hard as to be obliged to go only under a fore-sail, it would be then sufficient to loosen the fore-topsail, without sheeting it home, after having braced it quite close on the side opposite to that you want the ship to cast, not forgetting however to put the helm the same way as you cast, as soon as you perceive the ship going a-stern: and when the ship has fallen off sufficiently, then is the time to fill and trim the fore-sail.
THE PRACTICE OF WORKING SHIPS.

To get under sail when the ship is swinging with her head to the current, and with the wind a point abaft the beam.

The topsails being stopped with rope-yarns, let them and the mizen-topsail be hoisted, and properly trimmed, as if they were set; and, when every thing is properly disposed, heave short on your anchor till it is a-peek; next to this, loosen, sheet home the fore-sail and mizen-topsail, keeping the wind in, and heave vigorously at the capstern till the anchor is a-weigh. At the same time hoist the jib and fore-topmast staysail, or haul out the mizen, according as circumstances may require. Whether you wish to come to windward, or fall off more quickly, you must still continue to heave round the capstern briskly to get the anchor up, till you find yourself sufficiently offward to bring to, in order to stow it with ease, or to stand on under an easy sail, with the anchor hanging out to windward, if the situation of things will admit of it. You may sometimes also hoist up both the main and fore topsails, as soon as you get ready; but, in certain cases, as when obliged to make the best of your way from an enemy, every sail possible must be set at once which the weather will admit of; especially when obliged to haul by the wind; in which case, the anchor must be got up and catted as well as it can: there are cases even when, without losing your time in weighing it, you crowd as many sails as you possibly can, and depart in cutting or slipping the cable.

Demonstration.

The topsails and mizen-topsails are hoisted up, because the sails in that situation are more easily sheeted home and trimmed; and because, as soon as the rope-yarns are cut, the sails fill, and give the ship head-way, the moment the anchor quits the ground. The mizen-topsail is used to make the ship steer well, by keeping it either filled or loose to the wind, according as the ship is griping or the contrary.

To get under sail with a spring.

If a ship be in a place too confined to cast under her sails only, or being obliged to put to sea in a gale of wind, without hoisting the anchors; you must, for greater safety, in casting the right way, get a spring out to be clapped on the cable by which the ship swings, by passing a hawser or a stream-cable through the aftermost port, on the opposite side to that you mean to cast; and, after that spring is well hove tight at the capstern, hoist the jib and fore-topmast staysails, loose and sheet home the fore-topsail; when that is done, and if the weather permits, brace quite close the head-sails on the same side with the spring. When this is executed, slip or cut the cable, heaving briskly at the same time on the spring, till the ship has paid off sufficiently. Then fill the sails, by setting the mizen-topsail and every other sail you mean to employ, and slip or cut the spring, as circumstances may require. Care must be taken, not to let the ship fall off too much before the spring is cut; because, having no way through the water, she will not come to the wind so soon as might be wished; and, for the same reason, the spring must not be cut, till she has fallen off as much as is necessary; because, although she has no other motion but that of falling off, the vessel might perhaps not wear enough to answer the purpose.
DEMONSTRATION.

As reasons have been shewn before why the head-sails are braced up on the opposite side to that on which the ship casts, they need not be repeated here. Although we suppose the wind so strong as to keep the ship wind-road, it may be proved that the ship turns almost on the middle of her length; since the moment the fore-part begins its movement of falling off on one side, the after-part makes another to approach the point from which the head is receding. Now she turns so much the more surely on her centre, and her evolution is so much the more rapid, as the force used in heaving at the cap-stern is stronger: because the more powerful the heaving is, the more of the hawser comes in, and consequently the more easily and with the greatest rapidity will the after-part approach the point the head of the ship has left.

When she has fallen off enough, slip the spring, because she gathers headway in proportion as the sails are filling, and in that case the hawser would only hinder the ship going a-head, or cause her to fall off more, which would be equally prejudicial. The hawser or stream-cable is passed aft as far as possible; because, being at the extremity of the ship, the capstern strains less, and the vessel turns with more celerity.

If this operation is performed when it blows hard, you must not sheet home the fore-topsail: for, if the wind is absolutely too strong, you must only loosen this sail, and hoist the fore-topmast staysail: but if the weather is pretty tolerable, it will be found sufficient to sheet home the fore-topsail without hoisting it.

TO GET UNDER SAIL WITH A LEADING WIND IN A TIDE-WAY.

If the ship to be got under sail has a leading wind, and is in the midst of vessels, or in a narrow channel, where it would be difficult to cast her upon the lee-tide, she should be got under sail before the weather-tide is done. Thus the casting of the ship would be avoided, and she may be steered through the fleet or channel with safety.

Should it, however, blow so fresh upon the windward-tide, as to force the ship end-on with her cable, it will be impossible to heave it in, without sheering the ship over from side to side, and heaving in briskly, as the ship slacks the cable; but, as this is attended with much danger, by the ship suddenly bringing up upon each sheer, it will be best to heave a-peck upon the first setting of the windward-tide, before the ship swings, to bring the wind aft.

TO CAST A SHIP UPON THE LARBOARD TACK, AND BACK HER A-STERN OF DANGER.

We suppose the ship to lie at single anchor, with the wind and tide the same way, and ships or shoals right a-stern, in the intended course, and that, to clear them, you must cast upon the larboard-tack, and make a sternboard.

Make every thing as ready as possible before weighing: let the three topsails be hoisted, the yards braced up sharp with the larboard braces, and the mizen hauled out. Thus situated, when the anchor weighs, put the helm aport.

The tide, running aft, acts against the starboard-side of the rudder; and, in that direction, it will cast the ship the right way, and bring the wind upon
the larboard bow. The wind may be thus kept, at pleasure, by the helm, till
the ship begins to get sternway through the water, which should be attentive-
ly noticed, to put the helm hard a-port. The wind, being on the larboard-
bow and the topsails a-back, will soon give the ship sternway through the
water; then the water will act against the larboard-side of the rudder, and
powerfully prevent the ship falling too fast off from the wind. Thus she
will drive till the anchor is got quite up, and may be so continued till she
has past the shoals, and has room to veer, and get upon her proper course.

It is advantageous to make a stern-board in getting under way from a sin-
gle anchor in the above situation. The anchor heaves up more easily when
the ship goes a-stern; and, while heaving up, it serves to keep the ship’s head
to the wind. A ship, however, cannot long be steered stern foremost when
under sail, so as to keep the wind before the beam; but she will in a little
time drive broadside through the water, till she gets headway, and then it is
proper to veer, provided the anchor be quite up.

**TO CAST A SHIP ON THE LARBOARD TACK, IN A TIDE-WAY, WITH THE
WIND TWO POINTS ON THE STARBOARD-BOW.**

A ship riding in a tide-way, with the wind two points on the starboard-bow,
and so near the shore, on the larboard-side, that she must be cast upon the lar-
board-tack to clear the shore, the three topsails must be hoisted, and the yards
sharp braced up, with the larboard- braces forward, and the starboard braces
aft, with the starboard fore-top bowline well hauled, putting the helm hard to
port at the anchor’s weighing: the tide acting upon the rudder, and the wind
upon the sails braced in that direction, brings the ship about, with the wind
on the larboard-bow, before she gets sternway, which should be always strict-
ly noticed; for, in all proceedings of this kind, if a ship gets sternway be-
fore she brings the wind right a-head, she will not come about the right way.
In that case, it is best to veer away the cable directly, and bring the ship up
again: and carry out a kedge or small anchor on the larboard-bow, hauling
its cable or hawser in tight, on the larboard quarter, when the bower-anchor
is a-peek. If this fail, the ship must lie till the windward-tide makes, to
bring the wind on the larboard-bow, when the ship may be got under way,
and clear the shore.

**TO CAST A SHIP UPON THE LARBOARD TACK, AND SHOOT HER BY THE
WIND A-HEAD OF DANGER.**

If there is but just room enough close by the wind to clear a danger lying to
leeward, much depends on heaving up briskly the anchor after it is out of the
ground, and having proper sails ready to set to the best advantage. The
three topsails must be hoisted, and the yard sharp braced up with the larboard-
braces forward, and the starboard- braces aft, when the anchor is at a long
peek. At weighing the anchor, put the helm hard to port, then the action of
the tide upon the rudder, and the wind on the fore-topsail, will cast the ship
off the right way, so as to fill the after-sails, when the fore-topsail may be
soon braced about and filled before she gets sternway. The helm will keep
the ship under command sufficiently to steer her by the wind a-head clear of
danger; but, if the ship gets sternway in casting, the helm should be kept
hard a-weather to prevent her falling off too much from the wind; and, when
she gets headway again, be cautious how the weather-helm is eased with the
anchor much below the bows, by which the resistance forward is increased, and the ship may be brought up in the wind, so as to prevent her shooting clear of the danger. This must be guarded against by the weather-helm, and head-sails, as jib, fore-topmast, staysail, &c. As soon as the ship has shot far enough a-head to clear the danger to leeward, and there be but little room a-head, it is best to bring the ship to and drive with the helm a-lee, with the main and mizen topsail a-back, and the fore-topsail shivering till the anchor is up: then take proper time to veer.

TO CAST ON THE LARBOARD TACK, WHEN RIDING WITH THE WIND RIGHT A-HEAD, AND TO VEER HER SHORT ROUND BEFORE THE WIND IN LITTLE ROOM.

The head-sails should only be loose, viz. the fore-topsail hoisted and the fore-sail loose: brace sharp up with the larboard-braces, the jib and fore-topmast staysail set, with the larboard-sheets flat aft. When the anchor is a-peek, and the lee-tide running, at weighing the anchor, the helm should be put to port so far as to bring the wind two points on the larboard-bow, which should be kept so by steering the ship till the tide ceases to run aft. Then put the helm hard to starboard, or a-lee; and, when the ship gets sternway, the water will act powerfully on the starboard, or lee, side of the rudder, turning the ship’s stern to windward, whilst the wind, acting at the same time upon the head-sails a-back, will box her round off upon her heel, so as to bring the wind nearly aft by the time she loses her sternway. Then the ship will cease falling off and soon get head-way, which should be attended to, and the head-sails braced about flat with the starboard-braces, and the helm shifted hard to port at the same time.

When there is no tide, but still water, at weighing the anchor, the helm must be hard to starboard; and, as the ship gets sternway, the water meets with so much resistance against the starboard-side of the rudder in that direction, that the rudder acts with great power to turn the ship’s stern round to port, and the head-sails being set and trimmed as before-mentioned, and the foresail let fall with the starboard-bowline hauled close forward, will assist to cast the ship so far round the right way, by the same time she loses her sternway, as then to permit your proceeding as before directed. To ensure success, heave the anchor up briskly. The same methods are adopted in casting the ship on the starboard-tack, only the helm and sails are managed the contrary way.

ON TACKING.

TO TACK A SHIP IN GETTING TO WINDWARD AS MUCH AS POSSIBLE.

To execute this with propriety, care must be taken that the ship does not yaw, that she is not too near or too far from the wind; because both situations are equally prejudicial.

When this medium is obtained, haul the mizen out, while you put at the same time the helm a-lee, and brace the bow-line quite to leeward, that the mizen may be as much as possible exposed to the wind. When the ship is
come to the wind, so as to cause the square-sails to shiver, let go the jib and all the staysail sheets before the main-mast: at the moment when all the sails catch a-back, and particularly the mizen-topsail, let it be braced sharp about the other way; hauling up at the same time the weather-clue of the main-sail; and, when the wind is right a-head, or even a little before, haul the main-sail, and trim sharp for the other tack as fast as possible. The jib and staysail sheets are also to be shifted over at the same time, in righting the helm, whether the ship has lost her way, or even still advances a-head. Then, as soon as she has passed the direction of the wind about 45°, in continuing her evolution, shift the foremast's sails, which are to be trimmed with the same celerity as in putting the helm a-lee, if you fear the ship (which must still go a- stern if the operation be slowly executed) will not fall off sufficiently: for, if the sails are braced about briskly, she will never have stern-way; on the contrary, she will get a great deal to windward.

DEMONSTRATION.

If the ship be too near the wind, when the helm is put a-lee, she will most probably miss stays; since, not having sufficient way through the water, the rudder will not have a sufficient power to cause the ship to double the critical point where all the sails shiver. The power of the rudder to turn the ship is in proportion to the force with which the water strikes it (§ 58.) Hence it follows, that if the ship has not sufficient velocity, the rudder will not have force enough to cause her to double the point, where all that can augment or keep up the rapidity of sailing (and of consequence the power of the helm) will cease, the sails being all shivering. The ship must then necessarily fall off, since the helm is a-lee, and none of her sails tend to shoot her a-head. On the contrary, her mizen being out, and braced quite to leeward, forces the stern of the ship a-hawth (§ 40;) while, by the wind that strikes her sails, rigging and hull, she is but too ready to drive a- stern, as a ship always finds great difficulty to divide the fluid laterally. Thus it is clear, that, every thing being disposed for driving the ship the sternway, she must infallibly both go a-stern and to leeward. (§ 58.) This is confirmed by experience; for, whenever a ship misses stays, she is visibly perceived to fall abaft.

If, previous to tacking, a ship is kept too much away, she will be longer in ranging to the wind; which must consequently be disadvantageous to the evolution. We should not have mentioned this custom, did not many seamen, through mere habit, put it in practice, and thereby fail in this operation, which would however have succeeded, had they not had the habit of letting go the fore, jib, and staysail sheets. When these have been kept fast, the edging away can only prolong the time of the evolution; but, if the fore, jib, and staysail sheets be let go, as a great many do at every turn, and as in some particular cases it is really found necessary, care must be taken not to suffer the ship to fall off too much: because the velocity of the ship not being sufficiently kept up (§ 40) till the ship comes to the wind, it follows that she has lost a good deal of it, before she arrives at the critical part of the evolution, where all the sails shake. So that, when the ship is at that point, the velocity is so much diminished, the rudder has not power enough to make her double it: on the other hand, the fore-part of the ship is no longer carried to the wind with the same force, since the vessel no longer shocks the fluid (§ 47) with her first velocity.

'The mizen is hauled out to help the rudder; because these two forces act together in impelling the after-part of the ship to leeward (§ 40 and 50.) When the helm is a-lee, the ship of course comes head to wind; and continues that circular motion, first by the effect of the rudder, till the head-way ceases, and then by that of the mizen, till the other sails take the wind from
THE PRACTICE OF WORKING SHIPS.

it. Therefore, when the mizen is becalmed by the other sails, the evolution is sure, as this could not happen if those sails were not taken a-back.

You must wait till the square-sails begin to shiver, before letting go the jib and all the staysail-sheets before the main-mast; because, till that moment, these sails concur to maintain an equilibrium with the others, and keep up the ship's velocity; since it is the disposition of the different sails set on the different parts of the ship, which gives her more or less way through the water. (§. 46.) These however being now the only sails which tend to make the ship fall off, (§ 31,) since they are the only sails full, the others being shivering, it is absolutely necessary at this moment to suppress that effect, since it is contrary to the movement of coming-to; the action of the mizen is, however, to be preserved as long as possible, in order to help the rudder, which, in keeping up the movement of rotation of the ship, will soon make her clear the critical point of the evolution.

Experience teaches that the motion of the ship, in coming to the wind, at the moment the jib and staysail-sheets are let go, is very rapid, provided the other sails shiver; because the velocity of the ship, at that moment, is as great as when all the sails were exposed to the impulsion of the wind. Consequently, the effort of the rudder is likewise very powerful, (§. 50,) since the rapidity of sailing has not diminished.

The mizen sail is to be braced up so far as to join the main-shrouds to windward; because in that situation it is exposed as much as it possibly can to the wind, and receives consequently a stronger and longer impulsion; and, again, because it is trimmed as it will remain ever after the evolution has been performed.

The mizen-topsail should be braced about as soon as it is taken a-back, because it will then impel the stern to leeward, jointly with the mizen, (§. 44,) and, by this new disposition, accelerate the evolution; whereas, if it were continued in its first situation, it would retard the circular motion of the ship, by impelling the after-part to windward. (§. 45.) It will also, in this situation become very useful, in moderating the stern and leeway of the ship.

At this same time, the weather clue and sheets of the main-sail are hauled up, in order that all may be ready to brace round for the other tack.

The main-sails are to be hauled about and filled when the wind is right a-head; because, 1st, at this time the sails on that mast are becalmed by those of the fore-mast: 2dly, should they be left longer in this situation, they would counteract the head-sails, (§ 37, 38. 44. and 45.) which are braced up for the same tack, and in the same manner; and, finally, because, were it not for this, the sine of incidence of the wind on them would be continually increasing as the ship were falling off, which would more and more retard her bearing away.

It is, notwithstanding, not untrue, that the evolution would be more rapid, if the sails on the mainmast were filled as soon as they are taken a-back; because (§. 44) they would impel the after-part of the ship to leeward. But this effect of the after-sails ought not to be attended to, except when the ship has lost her velocity, and the rudder its power. Whence it must be concluded, that the ship will always fall off with great celerity as soon as the main-sail is hauled.

The jib and staysail sheets are also shifted at this time, if they have not been lowered before; because, if sooner, they would take the wind in again, which must not be done before the ship has fallen off sufficiently to clear the direction of the wind.

The helm is to be righted if the ship has lost her way; because, if it were continued a-lee, as in the first instant, and the ship should get sternway, the rudder (§. 58) would oppose the evolution, which must now be finished with sufficient rapidity by the sole effect of the head-sails, as these are now fully
exposed to the power of the wind. Great care must be taken not to slack
the bow-lines, as is often done by the people who act more from custom than
reflection.

The head-sails are to be braced about and filled, when the ship has got
over the direction of the wind by 45°, or thereabouts; because, if they were
left longer a-back, the motion of the ship's falling off would become too rapid
and too great. If they are braced about briskly at the time before mentioned,
they may be made to shiver; which, by diminishing their effect, will moder-
ate the great velocity of falling off which the ship has acquired. (§. 37.)

The helm ought to be put a-lee (§. 58) if the ship goes a-stern, to aid her
calling off, which is now carried on only by the jib and stay-sails before the
centre of gravity. Thus the ship falls off moderately, in yielding to the wind
by 12° or 20° only, more large than if close-hauled; because the after-sails,
being trimmed sharp, soon bring the ship to the wind, and give her head-way.

Let it not be forgotten, that the helm ought not to be put a-lee in
hauling off all, unless you judge the ship not sufficiently inclined to fall off,
which however seldom happens when she is come to this point.

THE DEMONSTRATION OF THIS EVOLUTION COMPREHENDS THE WHOLE
PLAY OF THE SAILS AND OF THE RUDDER; SO THAT ALL OTHER DEMON-
STRATIONS MIGHT BE CONSIDERED AS SO MANY COROLLARIES DERIVED
FROM IT.

TO TACK A SHIP, WITHOUT ENDEAVORING TO GET TO WINDWARD.

There are circumstances sometimes when it is found necessary to tack,
without caring much whether the ship loses to windward. For example:
when a ship is found suddenly to be close to the land, in the night, or in fog-
gy weather, near a danger, or some vessel, which must instantly be avoided
by staying the ship, because you find yourself to windward, and too near the
object from which you wish to recede: in this case, when it is necessary to
deaden the ship's way, and tack at the same time, you must suddenly put the
helm hard a-lee; and, in the same instant, let go the jib, fore, and staysail,
sheets, without touching the bowlines; and great care must be taken that the
effect of the mizen is preserved as much as possible. When the sails begin
to shiver, the mizen is to be hauled quite in the lee-braces; then, if the ship
takes well the wind a-head, the remainder of the operation must be executed
as directed in the preceding case; but, if you should miss stays, you must
proceed according to the second method of veering, called BOX-HAULING.

DEMONSTRATION.

It is easily conceived, that, in letting go the fore, the jib, and staysail,
sheets, the ship's head-way will be diminished. (§. 46.) while, at the same time,
almost all the forces forward are taken away, which might hinder her coming
to the wind: (§. 31.) therefore the ship must come to it rapidly, by the ef-
fect of her after-sails, (§. 41.) which are trimmed sharp, and by the power of
the helm, (§. 50.) till all the sails shake. It is also easy to conceive, that,
when the mizen is hauled in the lee-braces, it has a greater power to impel
the after-part of the ship to leeward, and the sails consequently to take a-back.
So that the ship's head-way will the sooner be stopped; and, the fore-sheet be-
ing gone, the sail to windward makes a large cavity between the masts and
shrouds, which very much contributes to send the ship a-stern. Attention
ought therefore to be paid to catch the instant, when the head-way ceases, to
shift the helm and aid the ship in her evolution; as we hinted already. The
reason this method is not always practised is, because the ship would lose a
deal of ground in driving to leeward. It ought, therefore, never to be used
but when necessity obliges, and the vessel has good way through the water;
for, if she has not, she will generally miss stays.

TO TACK A SHIP IN A DANGEROUS ROUGH SEA, WHEN HER STAYING IS
DOUBTFUL.

Let every thing be got clear and ready; the hands at their proper stations,
the sails trimmed fair, and the ship steered just full and close by the wind.
Take the advantage of the smoothest time when the ship has the most head-
way. The other necessary precautions are, to haul down the jib, if set, and
not to put the helm a-lee all at once, but to luff the ship up by degrees, to
shake the sails. When they shake, give these orders:—The helm hard a-lee;
let go the lee-sheets forward, but not the lee-braces and fore-top bow-line,
as that usual practice backs the head-sails too soon, and stops the ship's head-
way, which ought to continue to give power to the helm till the wind is brought
a-head, or the ship will not stay. Raise tacks and sheets and main-sail haul,
when the wind is a-point on the weather-bow; this swings the yards round
sharp, that the main tack may be got close down, whilst the head-sails be-
calm the fore-leech of the main and main-top sails; while the wind, blowing
aslant on the after-leech of these sails, acts jointly with the rudder to turn
the ship's stern, so as to bring her about the right way. When she has fall-
en off five or six points, let go and haul.

When a ship comes about, she is sure to have sternway by the time the
head-sails are hauled; therefore, the helm should not then be shifted a-lee,
but should be kept hard a-weather, till her sternway ceases. The water, act-
ing upon the weather-side of the rudder prevents the ship falling round off
from the wind, which the helm, when hard a-lee, occasions, while the stern-
way continues. Notice should be made by the compass, that the ship con-
tinues coming about till the wind is on the other bow; for, if she stops with
the wind a-head, and her headway is perceived to be done, the helm should
be directly shifted to the other side; so that, by the sternway, the water may
act upon the rudder and bring her about, and then the helm should not be
kept a-lee, but directly shifted and kept hard a-weather till her sternway
ceases. For the reason just given, the head-sails may be hauled as soon as
possible; for, the ship will be sure to fall off the faster and farther in propor-
tion to her sternway; so that the weather-braces should be tended, to prevent
the head-yards flying fore and aft, as they will do when it blows fresh; and to
keep the head-sails shivering, that the fore-tack may be got close down easi-
lv, and the ship stop the sooner from falling off. Shift the helm a-lee when
the sternway ceases, and the head-sails may be trimmed sharp, as the ship is
perceived to come-to.

ON TURNING TO WINDWARD IN VERY NARROW CHANNELS.

At weighing, if the wind is partly across the tide, it will cast the ship with
her head towards the weather shore, which she may be kept clear of, by driv-
ing with the sails a-back till the anchor is up and stowed; and, as the tack to-
wards the weather-shore is the shortest, it is prudent to back as near the lee-
side as possible, in order to make the first board the longer; to get the three
top-sails, jib, stay-sail, and mizen, properly set; and to get all ready in time
THE PRACTICE OF WORKING SHIPS.

for tacking. Make as bold as possible with the weather-shore, because on that side a ship is always surest in coming about; and, in case of missing stays, a ship may be backed off from the weather-shore, till she has room to fill and set the sails, and get sufficient headway to try her in stays again without danger. But, when the ship is got about, and standing towards the lee-shore, it may be necessary to put her in stays in good time; because she does not so certainly stay when going slanting with the tide as when going across it.

By staying her thus in good time, if she even miss stays, there may be room enough to fill and try her the second time, or to use such means as may prevent her going on shore.

But, when the wind is right against the tide, which begins to make to windward; be cautious not to weigh the anchor till the ship swings end-on to the tide, and brings the wind so far aft, that she may be steered right against the tide till the anchor is up and stowed, and the sails, with which the ship is to work, are all ready.

Haul the wind and get ready for tacking, when you are close over to one side; to gain the whole breadth of the channel for getting under way. For this purpose, let the first trip be made as short as possible, till it is found how the ship works upon both tacks; and then make longer or shorter boards accordingly, but take care not to stand into an eddy tide on either side, which has often occasioned ships to miss stays and go on shore. If a ship will not stay, she must be veered, box-hauled, or club-hauled.

OF VEERING.

TO VEER A SHIP WITHOUT LOSING THE WIND OUT OF HER SAILS.

To execute this evolution both the main-sail and mizen must be hauled up, the helm put a-weather, and the mizen top-sail a shivering, which will be kept so till the wind be right aft, suppressing for that purpose the effect of all the staysails abaft the centre of gravity. As the ship falls off, (which she will do very rapidly,) round-in the weather-braces of the sails on the fore and main mast, keeping them exactly trimmed to the direction of the wind, and remembering also that the bowlines are not to be started till the ship begins to veer. As she falls off, ease away the fore-sheet, raise the fore-tack, and get aft the weather-sheet, as the lee one is cased off; so that, when the ship is right before the wind, the yards will be exactly square. Then shift over the jib and staysail sheets; and, the ship continuing her evolution, haul on board the fore and main tacks, and trim all sharp fore and aft, remembering to haul aft the mizen and mizen-staysail sheets as soon as they will take the right away, or when the ship's stern has a little passed the direction of the wind. When the wind is on the beam, right the helm to moderate the great velocity with which the ship comes-to; the sails being trimmed, stand on by the wind.

DEMONSTRATION.

The main-sail and mizen are hauled up, and the mizen-topsail shivered, in order to facilitate the evolution. (§ 40 and 41.) The main-sail, however, might be excepted from this rule, by letting go the main-sheet, § 49,) and working it like the main-topsail. The helm is put a-weather, because, in
that situation, the rudder (§. 50) causes the ship to fall off, or yield to the impulse of the wind, by impelling the after-part of the ship to windward with so much the more velocity, as the power of the head-sails exceeds that of those abaft; (§. 47 ;) and, as the rapidity of sailing increases, the effect of the helm augments in the same proportion. The sails are trimmed to the direction of the wind, as the ship veers, to increase her head-way, and of course the power of the rudder (§. 58); which, in great evolutions, is the chief mover and principal agent of the movement of the ship. So that, its effects being augmented, the ship's circular motion is of course accelerated in the same ratio; and, if the wind be well followed, every sail will be found properly trimmed when the evolution is finished. Since the sails must be kept in a proper situation with respect to the wind, except the mizen topsail, (which, from its situation on the after-extremity of the ship, would retard her veering,) the fore-sheet must be eased off to leeward, and gathered aft to windward, but in proportion as the ship falls off. It is also evident, for the same reason, that the bowlines must not be started till the ship begins to veer. When the ship is right aft, the jib and staysail sheets, which are then becalmed by the square-sails, are shifted; because, the ship coming to the wind, they are ready trimmed, and highly serviceable in keeping her under command.

The mizen is hauled out as soon as the ship's stern has passed the direction of the wind, to accelerate her coming-to (§. 40); and the sails fore and aft ought to be trimmed sharp at the same moment, in order to keep to the wind without losing any time. For the above mentioned reasons, the main-tack is got on board, and the sheet aft, when the wind is on the quarter.

TO VEER A SHIP THAT HAS LOST HER FORE-MAST.

Run out the end of a cable or hawser over the lee-quarter, and buoy it up from the ground with empty casks, &c. in case of coming into shoal-water with little wind. This will assist the helm with such power as to make the ship veer and steer at pleasure.

A spare yard or boom, rigged out abaft the mizen-shrouds, may guy the end of the cable or hawser more or less on either quarter, according as the ship may have occasion to sail. It may be easily shifted from side to side, and guyed out to leeward in proportion to the ship's griping, to answer sailing upon both tacks; and, when sailing before the wind, it may be secured over the middle of the stern, which will prevent the ship's broaching-to against the helm either way.

This would likewise much assist deep-laded bad-steering ships, and prevent their broaching-to; to which they are liable in spite of the best helmsmen, often occasioning them to lie-to, even with a fair wind. With a little contrivance, by blocks lashed to the rails on the quarters, to lead the guys fair to the steering wheel-barrel, it may be made to steer a ship that has lost her rudder. The invention of Capt. Edward Pakenham is, however, far preferable for this purpose.

TO VEER WHEN LYING-TO UNDER A MAINSAIL.

Advantage must be taken of the ship's falling off to put the helm a-weather, and ease away the main-sheet roundly; and, when the ship has fallen off about 30°, let go the main bowline, and rounding the weather-brace, taking care to keep the sail full. When the ship is before the wind, get on board the main tack, and right the helm, to moderate her coming-to.
If, in the beginning, the ship is found difficult to veer, the fore staysail may be hoisted, and the sheets hauled well aft; but it is to be hauled down as soon as the ship is before the wind.

DEMONSTRATION.

Opportunity must be taken of the ship's falling off, because that motion of the ship gives her way, and makes her of course better disposed to gather way. For that reason, also, the helm is then put a-weather, (§ 50, 58,) and the main-sheet eased off roundly, (§ 49,) that only that part of the sail which is before the centre of gravity of the ship may be left to act. The main bow-line is kept fast till the ship has fallen off 30° at least, and then let go directly, because the wind is then more easily kept in the sail, the velocity of the ship increased, and consequently the power of the helm (§ 58) and the movement of rotation is also accelerated. (§ 16, 17, 18.) By hauling in the weather-brace, you follow the wind with the sail; and, when the wind is right aft, that sail will be found square. To trim it, you have but to ease off the brace, and bring the tack on the same board as you take the wind; an operation for which you have full time sufficient, as by righting the helm, you moderate the velocity with which the ship flies to the wind, since, by that action, the effect of the rudder is totally suppressed.

A SECOND METHOD.

Make fast a four-inch rope to the slings of the main-yard; and, when the ship comes to, so as to shiver the main-sail, bring it down before the sail to the topsail-sheet bitts, and let it be hauled tight and belayed. Then, as soon as she falls off, put the helm a-weather, and let go the main sheet. By these means, the lee-part of the sail no longer has any power to keep the ship to the wind, and the weather-part acting before the centre of gravity will cause her to veer faster than by the first method; though, in general, the first method will answer the purpose.

TO VEER UNDER BARE POLES.

The fore-staysail must, if circumstances will allow it, be hoisted. (§ 31.) But, if that cannot be done, the head-yards are to be braced up as sharp as possible, and those abaft pointed to the wind. Then, if the ship veers, she will steer under the masts and ropes only. A number of seamen, sent up and placed close to each other in the weather fore-shrouds, will be found also of very great service.

TO BOX-HAUL A SHIP, OR THE SECOND METHOD OF VEERING.

In this evolution, the most rapid execution is necessary. Briskly, and at the same instant, haul up both the main-sail and the mizen; shiver the main and mizen topsails; put the helm hard a-lee; raise the fore-tack; let go the head-bowlines, and brace about the head-yards sharp the other way; and let the jib and staysail sheets go in the same instant. When the ship has fallen off 90°, brace the after-yards square, in order to give the ship a little way, and to help her (with the rudder, the situation of which must be changed) to double the point where all the sails shiver; and, when the wind is aft, you
THE PRACTICE OF WORKING SHIPS.

will proceed as in the method of "Veering without losing the wind out of "the sails."

If the circular motion of the ship, after she has fallen off 90°, continues pretty rapid, the filling of the after-sails, to give the ship headway, may be dispensed with; because she continues to turn by the effect of her helm, which must not be shifted, (§. 58.) since the vessel still continues her stern-way. Therefore, after having veered a few degrees more, the wind will fill all the sails, and the ship consequently will have headway. (§. 35 and 43.) Then change the situation of the rudder; (§. 50,) to bring her before the wind.

In a case of absolute danger, when it might be necessary to go a-stern and fall off more rapidly, put the helm a-lee, brace all the sails a-back, observing not to brace the after-sails more than square, that they may not counteract the head-sails, which are braced sharp a-back to pay the ship's head off; because the effect of the after-sails, in this situation, is to impel the ship abaft in the direction of her keel; (§. 36;) which, with those forward, contribute to give her fresh sternway, in order to cause the ship to veer (§. 58) with greater celerity. The jib and fore-topmast staysail sheets being hauled over to windward, will assist the ship in falling off and going a-stern. (§. 31.)

When a ship is taken a-back, by bad steerage or a shift of wind, she may sometimes be brought on the same tack again, by instantly bracing sharp round the head-sails, and keeping fast the jib and staysail sheets. One must recollect, also, the after-sails are not to be touched (§. 45) till the ship has sufficiently fallen off; and, when that shall be the case, trim the sails and stand on as before. The rudder is to be used, as occasion may require, according to §. 50 and 58, whether the ship has head or stern way.

DEMONSTRATION.

This operation should be performed with the greatest alacrity, because it is only practised in critical situations; such as finding the ship unexpectedly too near the land, or because the ship misses stays.

The reasons for hauling up the main and the mizen sails, and shivering the mizen-top sail, having been given before, we have only to add, that the reason why the main-top sail is shivered is, that, if it were kept full, it would bring the ship to the wind, (§ 41,) by shooting her a-head, so that she would almost be laid-to. If this sail were braced a-back, more than perfectly square or perpendicular to the keel, it would still keep the ship to the wind, since it would be braced the same way with the head sails. Therefore, it would impel the after-part of the ship to leeward, (§. 44,) and act consequently against the power of the head-sails, which ought to cause the ship to veer rapidly, because they receive the wind on their anterior surfaces (§. 37 and 38) with a very great sine of incidence. It is therefore absolutely necessary to keep the after-sails shivering till the ship has fallen off 90°, or thereabouts; because, then, all the sails are trimmed and shivering in the same direction, since the head-sails were suddenly braced sharp a-back, in the beginning, to promote the ship's veering; and the after-sails were also changed at the same time, by bracing them by little and little to the wind, to keep them shivering, as the ship falls off. If the sails are well worked, they will all be found shivering at the same time; and then they no longer act on the ship, which will not double this point by the sole effect of the helm, for the helm was put hard a-lee in the beginning, to heave up in the wind with all possible expedition; but the ship, soon after getting sternway, falls off rapidly, both by the effects of her sails, and by that of her rudder, which is well disposed for this movement, (§. 58,) but has not always sufficient force to cause the ship to double the point where all her sails shiver; because the wind, being then on her
quarter, acts on the whole machine to send her a-head; so that, if one ceased working here for a moment, the ship would be motionless for a time, having lost her stern-way. To put her again in action, and to prevent her from driving more than is necessary to leeward, fill the after-sails, as mentioned above, to give her headway, in order that, by shifting the helm, (§ 50,) the wind may be quickly brought aft.

The jib and staysail sheets are let go, because they tend to draw the ship a-head. (§. 31.)

Box-hauling is deemed the surest and readiest way to get a ship under command of the helm and sails, with the least loss of ground to leeward, when a ship refuses stays. The masters of sloop-rigged vessels, turning to windward in narrow channels, when they want but little to weather a certain point, run up in the wind till the headway ceases, then they fill again upon the same tack: this they call making a half-board. Thus a ship, in box-hauling, may be said to make two half-boards, first running with her head, then with her stern, up in the wind; by which two motions a ship rather gains to windward.

TO CLUB-HAUL A SHIP.

Club-hauling is practised when it is expected that a ship will refuse stays upon a lee-shore. Place the hands to their stations for putting the ship about, and some by the lee-anchor; then put the helm down, and if the ship make a stand before she brings the wind a-head, let go the anchor and haul the main-sail. When the wind is a head, cut the cable, and the ship will cast the way required. The after-sails being full, let go and haul.

ANOTHER METHOD.

Bend a hawser to the kedge-anchor on the lee-bow, and bring the end into one of the after-ports, or over the taffarel. Let go the anchor, brace up all sharp the contrary way, put the helm a-lee, and haul in briskly on the hawser. As soon as she gets headway, cut or slip the hawser, and carry a press of sail.

OF LYING-TO, &c.

OF LYING-TO IN FAIR WEATHER.

Lying-to is the art of disposing the sails in such a manner, that, counter-acting each other, they render the ship as it were, for a time, immoveable.

This is seldom practised but under the three topsails; yet it is indifferent whether the fore or main topsails be braced a-back or kept full; because, as these two sails have surfaces nearly equal, they have nearly the same power either to stop the ship's way, or to cause her to run a-head. When these two sails act together, or one against the other, one always tends to pay the ship's head off, and the other to keep her to the wind, (§. 32, 37, 41, and 44.) But there are other considerations to be attended to, when necessity requires this operation to be practised.
**TO LIE-TO TO WINDWARD OF A SHIP, SO AS NOT TO DRIFT NEAR HER.**

The main-topsail must be braced sharp a-back, keeping the fore and mizen topsails full; because the wind acts with a very small sine of incidence on a sail when full, in comparison to what it does when braced sharp a-back: so that the fore-topsail, being full, draws the ship a-head, and the effect of falling off is opposed by the main and mizen topsails. She will of course not fall off much; nor will her lee-way be very considerable; for the ship is well kept to the wind, by the disposition given to her sails.

**TO LIE-TO UNDER THE LEE OF ANOTHER SHIP.**

The fore-topsail ought to be braced sharp a-back, the main and mizen topsails kept full, because these two last-mentioned sails tend to give the ship headway, and keep her to the wind: they may be assisted by the mizen, which will oppose the falling off occasioned by the fore-topsail. Thus, should the ship to windward fall off violently, or drift too much, you are more ready to veer short round, and avoid being boarded; because the fore-topsail being braced sharp a-back, the impulse of the wind on it is much greater than if it were full; and it is well disposed to veer suddenly, as soon as the power of the other sails is suppressed.

**TO BRING-TO WITH THE FORE OR MAIN TOPSAILS A-BACK TO THE MAST OR FILLED.**

Either the fore or main topsail must be braced sharp a-back, and the lee-bow line hauled up a little: the other two topsails trimmed sharp; with the mizen hauled out, and the helm a-lee.

If you bring-to with the fore topsail to the mast, the head-yards may be only laid square. Then the wind will act obliquely on the sail, and the ship will fall off but little, because its effect is in the direction of the keel from forward aft, and the sails abaft keep the ship to. The main-topsail may be worked in the same manner, if you wish not to expose yourself much to the wind.

**DEMONSTRATION.**

It has already been demonstrated, that if the fore or main topsail be braced sharp a-back, while the other remains full by the wind, the ship stands as if it were immovable, for their actions are absolutely contrary with respect to the centre of gravity, (§ 18,) and very nearly equal; therefore, in this situation, the ship can but drive to leeward at the rate of about half a league an hour.

**TO BRING-TO WITH THE THREE TOPSAILS A-BACK.**

The jib and staysails being hauled down, brace sharp round at once all the sails you wish to lie a-back in hauling up the lee-bow-lines, the better to expose the sails to the action of the wind: haul out the mizen, and put the helm hard a-weather.
DEMONSTRATION.

The jib and all the staysails are hauled down, because they are before the centre of gravity (§. 31) and the head-sails, being braced sharp a-back, have force enough (§. 37) to balance the effect of those abaft (§. 44) which, being braced in the same manner, receive the wind with the same sine of incidence as those forward. But, as in that situation the head-sails, having more power to cause the ship to fall off (§. 12) than those abaft, being a little becalmed by those forward, have to bring her to the wind, the mizen is hauled out (§. 40), and the helm is put a-weather (§. 58), because the ship goes a-stern with all the topsails to the mast. In this situation, then, the sails, assisted by the rudder, act the one against the other, and balance reciprocally their effects of springing the luff and falling off; and, though the ship goes a-stern and drifts a great deal, she is laid-to; because, in that situation, she yields but with great difficulty to the impulse of her sails, on account of the resistance of the water (§. 5), opposed to the very great surface of her bottom under the lee.

If there were occasion to keep the mizen topsail full, it might be done with advantage; because the effect of its acting against the other sails is so considerable, that it cannot admit of a comparison, as its surface is hardly half that of the main topsail.

If it be desired to go a-stern without falling off, the head-sails are to be laid square only.

TO FILL, WHEN LYING-TO WITH THE FORE TOPSAIL TO THE MAST.

Brail up the mizen, hoist the jib and fore-topmast staysail, shiver the main and mizen topsails, and, when the ship has fallen off 20° or 30°, fill the fore-topsail, which was a-back before, and stand on.

DEMONSTRATION.

The mizen is hauled up, that its effect of keeping the ship to the wind may cease (§. 40). The jib and fore-topmast staysails are hoisted, to help the ship in falling off (§. 31). The main and mizen topsails are shivered, because their effects are contrary (§. 41 and 44) to the movement expected from the ship. Every thing, therefore, which causes her keeping to the wind, ceasing to act, and all that promote her falling off now operating, it follows that she must fall off with a rapidity so much the greater, as the helm is still a-lee (§. 58). The ship goes a-stern, since her head-sails are braced a-back, and her after-sails so disposed and shivering, that when she has fallen off sufficiently, the head-sails fill, and you stand on directly.

TO FILL, WHEN LYING-TO WITH THE MAIN-TOPSAIL TO THE MAST.

Brace sharp and briskly the fore-topsail a-back; shiver the main and mizen topsails; hoist the jib and fore-topmast staysails, and brail up the mizen, all at the same time; and, when the ship has fallen off 20° or 30°, fill the fore-topsail, and stand on.

If you are obliged to keep the wind on the same tack as that on which you are lying-to, you have only to right the helm, fill the topsail which is a-back, and trim it sharp, to continue your course.
The fore-topsail is braced sharp a-back, in order to cause the vessel to fall off more readily, as then it receives a very strong impulse from the wind (§ 37). The rest of the demonstration will be found in the preceding.

A SECOND METHOD.

Trim the topsail which was to the mast, in order to give the ship way through the water, and be able to tack, or run large, according as may be found necessary. But this method is very tedious, unless you mean to heave in stays; in which case it will be most expeditious.

A THIRD METHOD.

Shiver the main and mizen topsail, keeping the fore-topsail full, righting the helm, and running up the jib and fore-topmast staysail at the same time. As soon as the ship has fallen off enough to get headway, fill the after-sails, and keep the ship in the direction you mean to follow. It is easily seen that this method, though the most common, is not the most expeditious, when you have to veer considerably.

TO FILL, WHEN LYING-TO WITH ALL THE SAILS TO THE MAST.

Brail up the mizen, lay the after-yards square, and shift the helm a-lee. When the ship has fallen off sufficiently to fill the after-sails, those forward are then to be braced about and trimmed full also, in order to stand on.

DEMONSTRATION.

The mizen is brailed up, because its effect is to keep the ship to the wind (§ 40). The after-yards are laid square, because then they give the ship sternway (§ 36), which causes her to fall off, since they increase her velocity in the last-mentioned direction, the helm being a-lee so as to turn the stern to windward (§ 58). The head-sails are braced about and filled at the same time as the after-sails are, that the ship may not be as it were laid-to, and that she may get headway to continue her course.

OF LYING-TO IN A GALE OF WIND.

To lie-to when it blows hard, keep as close to the wind as possible under some one sail well trimmed, with the helm lashed a-lee as much as may be requisite for the ship; and, as ships commonly bring-to from the stress of contrary winds, care should be taken to heave-to under such sail as will least strain the ship; because there are some ships which lie-to better under the fore-sail than the main-sail, others are more easy under the main-sail, some under a mizen, and many vessels lie-to best under a main-staysail.

LYING-TO UNDER A FORESAIL.

This is advantageous for veering (§ 32) when you are well to windward:
but it augments the lee-way, and is more subject to break the sea on-board, on account of the ship's continual falling off: because, in that movement, she gathers way by yielding to the impulse of the gale, and is afterwards recalled to the wind by the helm (§ 50); so that, in springing the luff, she meets the wave which comes from to windward.

**LYING-TO UNDER A MAINSAIL.**

The ship does not, in this situation, fall off so easily as in the last-mentioned mode, because its effect passes abaft the centre of gravity of the ship (§ 41); but it keeps the ship more to the wind, and consequently occasions less lee-way.

**LYING-TO UNDER THE MizEN.**

Under the mizen ships keep better to the wind than under any other sail, because it is farther abaft the centre of gravity (§ 40) than any of the rest; consequently ought to keep the vessel from drifting more than any of the others; but is inconvenient, should you have occasion to veer suddenly.

**LYING-TO UNDER THE MAIN-STATSAIL.**

Under the main-staysail a ship will not make so much lee-way as under a foresail, because its effort passes very near the centre of gravity; but it will however cause her to drift more (§ 31) than the main-sail (§ 41); so that this mode of lying-to is a mean between the two others, and is preferable when it blows strong enough for that sail to support the rolling of the ship. It ought likewise to be preferred, because the ship will veer under that sail, the action of which passes at a small distance from the centre of gravity (§ 31), and the power of which overcomes the resistance which all ships meet from the fluid under their lee; a resistance which always gives them a great inclination to fly up in the wind, when it blows hard, or when under a heavy press of sail.

**LYING-TO UNDER THE FORE, MAIN, AND MIZEN, STATSAILS.**

All the preceding modes of lying-to have their peculiar faults; but the preferable way is under the fore-staysail, the main-staysail, and mizen-staysail; because, under these sails, the ship will steer (§ 46), and is in a better situation for veering than under any other sail; for, only haul down the mizen-staysail, and put the helm a-weather; when the two other sails, being before the centre of gravity, (§ 30 and 31,) will cause her to fall off; she will then soon gather way and steer easily.

Should the gale continue very hard, and one of these staysails be blown away, the loss is not of much consequence; as the courses, in case of an emergency, are ready to set; whereas the courses are not so readily replaced...
when lost. This mode, therefore, appears preferable in every respect,*
whether you wish to veer or keep your wind: because, if the ship does not
sufficiently keep the wind, you may haul out the balanced mizen (§. 40), or
take in the fore-staysail (§. 31), or even the main-staysail. One of these
staysails, before the centre of gravity of the ship, is sufficient to make her
veer as soon as the after-ones are suppressed. There are, besides, these fol-
lowing considerations for so doing: the ship will carry sail better; because,
as the centre of effort of those on her is very low, she drifts less, holds a bet-
ter wind, and goes faster through the water (§. 25 and 46); and these three
or four sails are so situated as to give the whole body of the ship play, which
will strain her less than when under one single sail, which cannot by itself
work it from aft forward.

DEMONSTRATION.

The object of lying-to being to keep to windward as much as possible,
when foul winds and tempestuous weather prevent you from pursuing your
course, it follows, as much sail should be carried as is consistent with safety;
and, as you are often unable to set more than one sail, it is trimmed sharp,
that the ship may keep her wind as much as possible. It is likewise for this
reason that the helm is at the same time put a-lee; because the ship, having
but very little way, (§. 46;) falls off, by yielding from time to time to the im-
pulse of the wind, which unceasingly acts on her; but, as soon as she has
fallen off, she is brought-to again by the effect of the rudder (§. 50), which
must act upon her if the water has the smallest power upon it.

The same happens in lying-to under the three staysails, (though the ship
makes more headway under any other sail,) because the effect of these sails
is better distributed (§. 46) than when one only is set; notwithstanding they
have not power enough to procure the ship much velocity, nor to make her
steer properly: the helm is therefore put a-lee as in lying-to under any other
sail. It is always more advantageous to keep the ship under way and lively,
than to let her lie, at the mercy of the wind and waves.

When the wind is so violent that no sail can be carried, you lie-to a-try;
that is to say, under bare poles and ropes, which serve instead of sails, and
lash the helm a-lee as usual.

OF SOUNDING IN FAIR WEATHER, WHETHER CLOSE-HAULED OR GOING LARGE.

CLOSE-HAULED.

If close-hauled, brail up the mizen and mizen-staysail, let go the main-sheet
that the sail may shiver, put the helm a-lee, and back the mizen-topsail by
bracing it square. The head-sails, as well as the jib and staysails, are to be
kept in their first situation; recollecting to haul tight and belay the lee-braces.
When the ship has nearly lost her headway, though continuing still to come
to the wind, you catch that moment to heave the lead, and it is to be hauled
in again with all possible despatch. ‘To fill again, haul aft the main-sheet,
trim the mizen-topsail, and right the helm.

* Should the sea run too high for the lower staysails to keep the ship steady, a close-reefed main-
topsail (particularly if it has four reefs in it to come close down to the cap) will be found to an-
swer the purpose admirably.
THE PRACTICE OF WORKING SHIPS.

GOING LARGE.

In going large, you have only to put the helm a-lee, to brail up the mizen, and to belay the lee-braces quite tight, to prevent the yards having too much play when the sails are shivering. It is impossible to tack in this situation, as the jib and head-sails are always in action (§ 31); and the square-sails, soon coming to shake, on account of their sheets not being tacked, they lose all their power, and the ship is soon at a stand.

DEMONSTRATION.

The mizen and mizen-staysail are brailed up, because their effect to bring the ship to the wind would be too powerful (§ 40). For the same reason, the main-sheet is let go (§ 41), though there is another reason for it, which is, that it destroys the equilibrium that existed between the sails forward and the sails aft (§ 46 and 49); whence the rapidity of sailing is diminished, as well as the effect of the helm, which acted (§ 50) to bring the ship to the wind, while at the same time it opposes her velocity (§ 59). The mizen-top sail is braced a-back, to impel the ship a-stern in the direction of her length (§ 36); so that her head way, being now much diminished, the ship, by the effect of the rudder, ranges to the wind so far as to shake the main-top sail and the sails on the foremost, which, to that very moment, had acted to keep up the celerity of sailing (§ 32 and 41). But, as the effect of the rudder is very faint, since the velocity of the ship is greatly diminished (§ 58) when the sails have lost their action, the ship must stop, and is not able to come sufficiently to the wind, to bring her about, because the jib and staysail sheets, being hauled aft, oppose the effect of the helm; so that she rests, as it were, motionless for an instant, which must be seized to throw the lead with the greatest dispatch; because, should the ship fall off by the effect of her jib and staysail, which are the only ones in action, the other sails might suddenly fill and give her headway, which would prevent you from getting soundings, were you too dilatory in throwing the lead. Whether you do or do not find any bottom, haul in your line as fast as possible, and seize the opportunity of the ship's falling off to fill and stand on again.

If the ship, in spite of the disposition given her, should come head to wind, (which could only happen from her having preserved some velocity,) the helm must be kept a-lee, but the head-sails should quickly be laid square, and the jib and staysails hauled down; then the ship will soon after be found to veer.

ANOTHER METHOD PREFERABLE TO THE FORMER.

GOING LARGE.

Brace the head-sails square, haul down the jib and staysails, without stirring the after-sails, and put the helm a-lee. While the ship has still a little headway, heave the lead from the place where you haul it in; that lead will go first a little a-stern; but the ship, being head to wind, will soon herself go a-stern right upon the line; and, as the helm is a-lee, the ship easily veers. But, if you wish to keep her to longer, right the helm and haul the mizen out, to prevent the ship's falling off.

If you have studding-sails set, they must be hauled down, particularly the lower ones; because, should the wind take them a-back, their power on the boom might bring the ship round entirely; for, they act on a lever without the ship, the fulcrum of which is on the outside of the vessel before the centre of gravity. If, however, the helm is continued a-lee till the ship fails off,
THE PRACTICE OF WORKING SHIPS.

If close-hauled, or a very little from the wind, the helm is to be put a-lee; and, the instant the sails are taken a-back, the head sails are to be filled by briskly bracing them square, without waiting for the wind being right a-head; then, a little before the ship has lost her way, heave the lead from the place where you haul it in, and then proceed as before.

ON SHIPS DRIVING.

When it happens that there is not sufficient room to work in a tide's way, through a crowd of ships, or in a narrow channel, but that a ship must drive by the help of the tide, it may be done, provided the tide be strong enough, in proportion to the wind. This art consists of keeping the ship in a fair way, by a management of the rudder and the sails.

TO DRIVE TO WINDWARD, WHEN THE WIND IS AGAINST THE TIDE.

If the channel is sufficiently broad, the ship should be drifted broad-side to the wind, as the tide will then have the greatest power on her; and, could the ship be backed a-stern or shot a-head at pleasure, she might be kept drifting upon the same tack with safety; but ship's in a tide's way can never be backed so far a-stern as they will shoot a-head. At the first of a stern-board a ship will go briskly a-stern, but will soon fall off, and drift with the wind abaft the beam, forging a-head; for this reason she must be drifted with the helm a-lee. It follows, as a ship will shoot more a-head than she can be backed a-stern, that she will at length arrive at the opposite shore, when she must be stayed or veered, and drifted upon the other tack. If she is to be stayed, (which is preferable, because less drift will be lost by it,) let the sails be filled in time, to give the ship sufficient headway to bring her about; then put the helm a-lee. Should she come about, the sails and helm, having now a proper position for a stern-board upon the other tack, need not be touched till her sternway ceases, when the helm must be shifted a-lee; but, should the ship refuse stays, then brace sharp round the head-yards, and box-haul her, by which method she will lose much less drift than by veering.

If the ship, now drifting broad-side, is approaching a narrow channel, where drifting in this position, she must be veered and dropped stemming the tide, stern foremost. In this case, that the drift may be as much as possible, it will be necessary to take in sail, and reduce the ship's headway till she has only steerage-way left; thus a vessel may be dropped through a fleet of ships at anchor without danger.
THE PRACTICE OF WORKING SHIPS.

TO DRIVE, WHEN THE WIND IS ACROSS THE TIDE.

Should the wind be a little across the tide, a ship may be easily drifted in the fair way, with her head towards the weather-shore; for thus it will be found that she can be backed and filled at pleasure, and generally be drifted with the sails shivering, in which position they oppose least power to prevent the drift. It frequently happens in serpentine rivers that the tide sets across; in this case the ship must be drifted with her head to the side from which the tide sets. These sets are best discovered by observing the opening or shutting of two objects in the direction of the channel.

ON BENDING SAILS.

TO BEND A COURSE IN FAIR WEATHER.

Stretch the sail a-thwart the deck, the starboard-side of the sail to the starboard-side, the larboard to the larboard-side; then bend yard-ropes to the earing cringles, and make fast the head earrings a few feet up upon the yard-ropes. The bunt-lines, leech-lines, clue-garnets, and all the gear bent, make fast a rope-band to each buntline and leech-line leg, that the men may be enabled to catch the head of the sail from the yard. Now man well the yard-ropes, bunt-lines, leech-lines, and clue-garnets, and run the sail up to the yard. The sail aloft, send the hands up to bring it to, and let them haul out the weather ear-ring first, then the lee; and, if it is a new sail, let them ride the head-rope to stretch it. The sail being hauled square out upon the yard, make fast the rope-bands, keeping the head of the sail well upon the yard.

TO BEND A TOPSAIL IN FAIR WEATHER.

Overhaul the leeches of the sail, put in the ear-rings, bend the bowline-legs, lay out the clues, and open them if necessary, and make the sail up snug again; then round down upon the lee top-sail-haliards till the weather fly-block is high enough to bring the sail up over the guard-iron; then rack the tie over to the weather-rigging. Now pile the sail upon slings, with the lee-side uppermost; hook on the topsail-haliards, and run the topsail up into the top; then stretch the sail round—the fore part of the top, bend the jeer, and make fast the head earrings a few feet up upon the reef-tackle pendants, with a rope-band or two to each bunt-line leg. The jeer being bent, man the reef-tackles, bunt-lines, and clue-lines, and haul out the sail. Now let the hands lay out upon the yard, and haul out the weather ear-rings first; then haul out to leeward, and ease off to windward till the sail is square, when make fast the rope-bands, keeping the head of the sail well up upon the yard.
THE PRACTICE OF WORKING SHIPS.

UPON SETTING AND TAKING IN SAILS IN BLOWING WEATHER.

TO SET A MAINSAIL.

Before the sail is loosed, let the double block of a tackle be made fast to the weather-clue, and the single block be hooked low down upon the chess-tree, and the tall lead ait. Then man well the main tack and fall at the same time; and, when the sail is loosed, ease away the weather-clue-garnet, let go the bunt-lines and leech-lines, bowse down upon the tackle, and take in the main-tack: the main-tack being down, haul aft the sheet, brace up the yard, and haul the main-bowline.

TO SET A FORESAIL.

A foresail is set after the same manner as a mainsail; but, as the fore-tacks generally lead double, they are a sufficient purchase without the aid of a tackle to the weather-clue.

TO SET A TOPSAIL.

Let a tackle be in readiness to clap on either sheet, as may be required. First, man the lee-sheet; and, the sail being loosed, ease down the bunt-lines and weather-clue-line, and haul home the lee-sheet; then haul home the weather-sheet, hoist the sail, and brace up as required.

Should the wind be quartering, the lower and topsail yards should be braced well into the wind, before the sail is sheeted home.

TO TAKE IN A COURSE.

Man well the weather-clue-garnet, ease off the tack and bowline, and run it up; then man the lee-clue-garnet, bunt-lines, leech-lines, and weather-brace; and, being all ready, ease away the sheet, haul up the clue-garnet, bunt-lines, and leech-lines, and round-in the weather-brace, till the yard is pointed to the wind. Then haul tight the trusses, braces, lifts, and rolling tackle, and let the hands furl the sail.

TO TAKE IN THE FORESAIL IN THE TIME OF VEERING.

When the ship begins to veer, the yard being kept braced sharp up, let go the tack and bowline, and haul up the weather-clue-garnet. When the ship is nearly before the wind, the bunt and leech-lines, and the other clue-garnet, may be hauled up; and, if the situation admits of it, and occasion requires, the ship may be steered with the wind on the quarter, till the sail is secured.

TO TAKE IN A TOPSAIL.

There are many opinions upon the best mode of performing this. Some approve of clueing up to windward first, and others to leeward. If the weather-
side is to be clued up first, the weather-brace must be rounded well in, and the yard got close down upon the lifts, otherwise the lee-rigging will be in danger of being carried away by the great pressure of the lee yard-arm. If the weather-brace can be rounded well in, and the yard be got close down, it will be best to clue up to windward first, for thus the sail may be taken in without a shake; but, if the weather-brace cannot be hauled in to ease the yard off the lee-rigging, recourse must be had to clueing up to leeward first. In this case, it will be best, if hands can be spared, to man both the clue lines, bunt-lines, and weather-brace, at the same time; thus, when the lee-sheet is eased off, the weather-brace may be hauled in with ease, and the yard laid to the wind; and, when the lee-clue-line is half up, ease off the weather-sheet, and run up the weather-clue-line; then haul tight the lee-brace, bow set tight the rolling-tackle, and furl the sail.

**TO TAKE IN A JIB.**

Man well the down-haul, let go the haliards, ease off the sheet, and haul down briskly; and, when the sail is close down, ease away the out-haul, and haul the sail in to the bowsprit-cap; then let it be stowed away in the fore-staysail netting.

**TO HAUL IN A LOWER STUDDING-SAIL.**

To haul in a lower studding-sail, blowing fresh, lead one of the sheets clear aft, and man it well; then lower away briskly the outer haliards, to spill the sail; ease off the tack, run in upon the sheet, and lower away the inner haliards as required.

**TO HAUL DOWN A TOPMAST STUDDING-SAIL.**

Man well the deck-sheet and down-haul, ease off the yard-sheet, and haul the yard close out to the tack-block; then ease away the tack; and haul down both upon the deck-sheet and down-haul.

**TO BRAIL UP AND HAUL DOWN A MAIN-TOPOMAST STAY-SAIL.**

Man well the lee-brail and down-haul, having a few hands to gather in the slack of the weather-brail; then let go the haliards, ease off the sheet, and haul down and brail up as briskly as possible. When the sail is down, let go the tack, and stop the sail over to the lee fore-rigging.

**TO BRAIL UP A MIZEN.**

Man well the lee-brails, and in particular the throat-brails, which should have a whip purchase; ease off the mizen-sheet, and brail up briskly, taking in at the same time the slack of the weather-brail. After the sail is hauled up, stop its foot by passing the gasket round to leeward, which will spill it.
THE PRACTICE OF WORKING SHIPS.

TO TAKE IN A TOPGALLANT-SAIL.

The lee-sheet must be started first; for, if the weather-sheet is first eased off, the yard will fly fore-and-aft.

TO UNBEND A COURSE.

First furl the sail, then cast off the rope-bands, and make them fast round the sail, clear of the gaskets. When the rope-bands are all off, ease off the lee ear-ring, and lower down the sail; and, when the people upon deck have got hold of the lee-part of the sail, ease away the weather ear-ring.

TO UNBEND A TOPSAIL.

First cast off the points of the reefs, keeping fast the ear-rings; then furl the sail and cast off the rope-bands, which make fast round the sail, clear of the gaskets. After this, cast off the lee ear-rings, and haul the lee-side of the sail into the top; then haul in the weather-side. Now unbend the reef-tackle pendants, bunt-lines, and bow-lines; bight the sail snugly up together; and send it down by the clue-lines to windward or leeward, as most convenient.

ON SCUDDING OR BEARING AWAY IN A STORM.

When the waves run high, and sudden necessity requires to bear away, it should be considered that the lower sails forward, which the ship may be veered under when she comes before the wind, may be becalmed by the height of the waves breaking violently against the stern; and that therefore a close-reefed main-top-sail should be set to catch the wind, because it is a loftier sail, and may always be kept drawing full above the waves. This increases the ship's headway so much, that the waves will not strike her abaft with so great a velocity as when her headway is less.

Hence it follows, that, when going to scud before high waves, the close-reefed main-top-sail should be the last square-sail taken in in a laboursome ship.

OF A SHIP OVERTURNED ON HER SIDE.

A common but not always a certain method to recover ships from this dangerous situation, is to cut away the masts: however, as this expensive method may fail, stopwaters only, at the lee quarter at sea, may cause the ship to veer; or, where there is ground, an anchor or anchors, dropped from the lee-bow, may bring the wind a-head, and take the sails a-back, so as to cast the ship on the other tack, and bring her upright.
THE PRACTICE OF WORKING SHIPS.

ON CHASING.

A vessel that chases another ought to have the advantage of sailing. We shall therefore suppose this to be the case; because, were the ship chased as good a sailor as the chaser, she never could come up with her, if they manoeuvred equally and at the same time. It is then useless to chase a ship over which you have not the superiority in sailing, unless it be found that she does not know how to take the benefit of her equality.

To know if your ship sails quicker than your adversary, you must get on the same tack, under the same sails, and keep the same course with the vessel you wish to chase, and set her exactly with a compass. If you sail best, the chase will soon be drawn a point more aft; but, if she has the advantage, you will in a short time bring her a point farther forward: if you sail equally, she will remain on the point you set her at first.

TO CHASE A SHIP WHICH IS TO WINDWARD, AND TO JOIN HER IN THE SHORTEST METHOD.

When the ship is to leeward of the vessel he means to pursue, he ought to run on the same tack as the enemy, till he brings her to bear exactly perpendicular to his course, if he has not however already passed that point; then tack and continue the second board till he brings the chase again perpendicular to the direction on which he is standing by the wind, and he must then heave about again; always continuing the same manoeuvre, by tacking every time he brings the chase perpendicular to his course on either board. In this manner, the chaser will, by the superiority only of his sailing, join the other by the shortest method.

DEMONSTRATION.

FIGURE 20.

When the ship A (fig. 20) chases the ship B, which is three leagues to windward, A having one-fourth advantage of sailing, the chaser is not to tack till he reaches the point C; because then the ship B will be right on his beam at the point D. He then runs on the tack C E, till he brings the chase again perpendicular to his course at the point F. The ship A is to continue working thus every time she brings the vessel B right a-breast of her, whether the chase continues on the same tack or not; and thus the chaser will join the other at H, so that she will be able neither to change her course nor fly from him.

You continue on the same tack as the enemy, when first seen, in order to lose no time; because you will always bring the ship you are in chase of right on your beam, when you have a superiority of sailing, whatever may be the track she is
**THE PRACTICE OF WORKING SHIPS.**

On, provided you are careful not to pass that point; but, if perchance you should, you must get on the other tack with all possible despatch.

The chaser heaves about as soon as the vessel he is in pursuit of is on his beam; because she is, at this time, at the shortest possible distance; if he chases on the same tack and steers the same course with the vessel chased. If the chaser runs on a different tack from the vessel chased, he is still to tack when the latter is on his beam, because the distance is the least possible between them on the different boards they hold.

This mode is preferable to all others, it not only being the shortest, but because you force the chase to fly from you close upon a wind, pressing her more and more from the leeward, by never passing the point at which the distance between the two vessels, in plying to windward, is the shortest possible.

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**OBSERVATIONS FOR THE SHIP TO WINDWARD, WHICH IS CHASED.**

The weather-ship, which flies, will always be joined by the chaser, since it is granted that she does not sail as well as the pursuing vessel. It is therefore her advantage constantly to keep one course without losing time to heave about, as tacking cannot be so favourable to her as to her adversary, whose sailing is superior.

If the chaser should mistakingly stand on a long way, and tack in the wake of the chase, the best thing she can do is to heave-in-stays, and pass to windward of him on the other tack, unless you suppose your vessel would have a large superiority. If the chaser persists in tacking in the wake of the other ship, the chase will be very much prolonged.

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**TO CHASE A SHIP WHICH IS TO LEWARD.**

When to windward of a vessel you wish to chase, keep the ship away, to cut her off; and, steering continually on that course, you come at last together at the point where the courses run by the two vessels intersecting each other. This will be exactly executed by the chasing-ship, if, in the course she has chosen, she constantly keeps chase on the same degree of the compass as at the beginning of the pursuit. This principle applies equally to all the courses which the retreating ship steers; for over-taking can only be obtained by keeping on a straight line, which is the shortest possible that can be drawn between any two points.

If you take another course than that which keeps you in the same point of bearing you were in with respect to the vessel pursued, at the beginning of the chase, you would fail, by being either too far a-head or too far a-stern; that is to say, if the chaser keeps his wind too close, he will be too much a-head, and consequently prolong the chase; and, if he keeps too much away, he will be too far a-stern. These are the only two considerations to be made for the performance of this manœuvre; considerations which are easily observed, and corrected with an azimuth-compass; for, when you see that at the end of a certain time you bring the chase more aft than her first point of bearing, it is evident you keep your wind too much; if, on the contrary, you draw her forward, it is a proof that you keep too much away. These errors are easily corrected, by steering, for the first case, so as to see that the chase is always kept exactly on the same degree of the compass; and, for the second, you keep your wind a little more, till you see that you rest on the same point of bearing with respect to one another. Then, it is evident, you chase by the shortest and most certain method, since you reach the chase, in running on a straight line.
THE PRACTICE OF WORKING SHIPS.

OBSERVATIONS FOR THE SHIP TO LEEWARD, WHICH IS CHASING:

She ought to run on the course that will carry her most immediately from the chaser. Some vessels have more advantage in going large than others; some with the wind right aft; and others, again, are to be found which go best close-hauled. So that attention should be paid to the known qualities of a ship, in order to take the most advantageous and convenient directions capable to effect a retreat. It is, however, nearly certain, that, if the chase does not sail at least at an equal rate with the chaser, whatever manoeuvre she may practise, she will at length be overtaken by a skilful chaser adhering to principles.

OF BOARDING.

Boarding is the art of approaching the ship of an enemy so near, that you can easily, and in spite of him, throw on board the grappings, which are fixed on the lower yard-arms, at the forecastle, gangways, &c. for the purpose of being thrown into the enemy's ship, as soon as along-side, in order to confine the vessels together, and give the people an opportunity of getting on board, to carry the adverse ship sword in hand.

TO BOARD TO WINDWARD, OR TO AVOID BEING BOARDED.

If it be desired to board a ship which keeps her wind under an easy sail; or that does not shorten sail, but over which the boarding vessel has the advantage of sailing; she must get on the weather-quarter of the ship she means to board, within half a pistol-shot. She should then begin the action, and continue it with vivacity, to cover her manoeuvre by the smoke of the cannon and musquetry of both ships; then, under the cover of this cloud, let her make more sail if she has not way enough, in order to augment the velocity of the ship and the rapidity of her movements, that she may more readily lay on board her enemy, on the weather-side, either exactly a-breast or a little abaft. This is very easily executed, by edging down suddenly upon her; so, however, as not to be raked by the enemy's fire. The ship boarded by this manoeuvre can hardly suspect the design but at the moment when, or very little before, the grappens will be on board of her. In this situation the boarded vessel has but one doubtful experiment to try, and which even will be of no service if the boarder observes her well. For, the moment she braces sharp a-back her head-sails, to cause the ship's falling off, (§ 37,) and squares those a'ft (§ 36) to give her sternway, the boarder has only to perform briskly the same manoeuvre, and they will then be both as near for boarding as before, provided the boarding ship feels quickly the impulse of her sails and halm, which ought to be put a-weather (§ 50) and kept so till the ship's head-way ceases, when it is to be put a-lee (§ 58) to assist her in falling off, in manoeuvring as in box-hauling, in order to board the enemy to leeward; for, the boarder ought to be on the quarter of the other; since, at the moment the two ships were right before the wind, she who was directly to windward, and wished to board, had only to continue her movement of rotation, and render her velocity equal to that of her adversary, by shortening sail in order not to pass her. If, therefore, the circular motion is kept up by the boarder, which at first caused him to fall off, and now brings him to the wind on the other tack, he will join
the enemy to leeward; for, it is evident that, if this motion of turning be more rapid than that of the ship which wishes to avoid boarding, the boarder will close her before she can range to the wind on the other tack, since the boarder comes round with greater celerity. However, if the ship which fears boarding was pressed thus closely, she could make no other attempt than to throw once more all her sails to the mast, by bracing them only perpendicularly to the keel to give her sternway, (§ 36,) and putting the helm a-weather, to keep her to the wind, as soon as her headway ceases; (§ 58;) observing that, she being to windward, this manœuvre may cause her to drive on the boarder, as he is then watching for her under her lee. As there is no other resource, necessity obliges her to this expedient; because, if the ship which is attacked could go a-stern with sufficient velocity, she might let the boarder pass a-head, veer under his stern, and rake him, if he is not as quick as the other to foresee this manœuvre, and as nimble in manœuvring in the same manner as the enemy’s ship: because, the great velocity with which he comes to the wind and goes a-head, (his sails being still full,) puts him in this bad situation, which may prevent his persisting in the inclination of boarding. It is however very clear that the boarder will attain his purpose, if he takes care to throw all his sails a-back at the same time as the ship to windward; because, the attacked ship dropping to leeward, and having sternway first, approaches a little the boarder, who has still preserved his position on the quarter, and longer kept his luff, by having gone a-stern somewhat later than the weather-ship. It must be farther observed, that when the two ships are right before the wind, if the vessel which fears boarding moves quicker to the wind than the one which attacks, she will avoid it, as the retreating ship will be close to the wind before the other, and able to get a-head of her by making all sail to keep her wind, or to heave in stays and get upon the other tack. But, it must be considered that this last movement is disadvantageous; as, by so doing, it will present the stern to a ship, which no doubt will take advantage of that situation, and rake her; which might be more destructive than a well-opposed attack by boarding.

There is, however, no doubt that if the ship inclined to board sails better than the other, it will always be in her power to execute that design, if she is manœuvred as the ship which flies.

To Board to Leeward, when Close to the Wind, or to Avoid Being Boarded.

In order to execute this manœuvre, the boarder is to come within pistol-shot, close in the wake, or, at most, to the weather-quarter, of the ship he means to attack; taking care to continue steering so as not to be raked by any of the guns which belong to the quarter he stands on. Then, to come up with his adversary, he must edge away a little, and range round aft, so close upon the enemy’s lee-quarter, that his cat-head may almost touch her quarter-gallery. Now, when you have shot sufficiently a-head, your ship being parallel to your adversary’s, so as to bring your forecastle a-breast of your enemy’s mainmast, the mizen and mizen-staysail sheets are to be hauled well aft, the helm put hard a-lee, and the head-sheets let fly; then, your ship, coming rapidly to the wind, (§ 40, 50, and 51,) shivers her sails, and closes the opposing vessel side to side. This manœuvre is infallible when you have the advantage of sailing, provided very great attention is paid to it. But great attention is necessary; because, if at this moment the weather-ship, which wishes to avoid the boarding, either sets her courses, or lays all those flat a-back which she had set, she may perchance break the grapnels if you
have neglected to trim your sails in the same manner as hers: for, by making more sail, if the wind be a little fresh, she will shoot a-head through the water, and drag the boarder with such force as to break the chains or hawser by which the two ships are confined together. By laying all flat to the mast, the boarded vessel is still more likely to succeed, since the sails of one ship will be full, while those of the other are a-back.

This mode of boarding may, as shewn before, be anticipated and avoided, if the boarder does not pay the strictest attention to his own as well as to his adversary's manoeuvres: but it may be still more readily avoided, if the last-mentioned vessel braces her head-sails sharp a-back, setting only, if necessary, the fore-sail (§. 37), at the same instant laying to the mast or shivering (according to the necessity for more or less sternway) all those which are abaft, (§. 36,) and putting the helm hard a-lee. (§. 58) All this is to be executed when the boarder is still about a ship's length (more or less) a-stern of the other vessel. The quickness of this evolution, and the rapid veering of the weather-ship, may bring the boarding-vessel, which is a little to leeward or a-stern of the other, into the most dangerous situation, if she does not manoeuvre in the same manner and with equal celerity; as the boarder's sails, being full, keep up his velocity, and may, before he can veer, engage his bowsprit in the main-shrouds of the enemy, who pays short round on her head.

This terrible and dangerous situation is infinitely to be dreaded; and it is of the highest importance to pay the strictest attention to your own manoeuvres, and to those of your opponent, which you are to endeavor to foresee and avoid as much as possible.

It is easy to conceive, that, if you wish to board a ship, and to engage your enemy's bowsprit in your main-shrouds, you need only get a little to windward of her, and about one or two ships' lengths a-head, more or less, as (from the knowledge you have of the celerity of your ship's movements) may be judged sufficient; then brace sharp a-back the head-sails, shiver the after ones, or lay them flat to the mast, with the helm a-lee. This manoeuvre, well executed, and covered by a brisk fire, will commonly succeed: but care must be taken not to come round too soon, but to range very close to your adversary; because, if you should not be a-head enough of him, you might fail in boarding, by paying too short round, and then you would infallibly get your bowsprit foul of his fore shrouds, which would be highly disadvantageous.

If you should find yourself too far a-head, the design will be frustrated, by your passing under the bowsprit of the enemy, who will however be thereby exposed to be raked at his head, if he does not manoeuvre in the same manner and with equal swiftness as the boarding-vessel, which has the great advantage of priority.

It is absolutely necessary to range very close to the ship, whose bowsprit you wish to engage in your rigging; because, if you attempted to execute this at only a ship's length large and to windward of your opponent, he has only, the instant he perceives your design, to put the helm hard a-lee and heave-in stays, if he does not choose to act in the same manner as you do. If this last method is properly executed, the two ships can only range very near each other and exchange their broadsides, and the lee-ship will immediately gain the wind of her adversary. Therefore, to execute this manoeuvre well, the vessels must be nearly yard-arm and yard-arm.

If the boarder be at a certain distance aft on the weather-quarter, the ship, wishing to avoid boarding, must heave-in stays as soon as the other vessel is in the act of veering, in order to close her to leeward. By this manoeuvre they will find themselves head to head; so that they may fire reciprocally their broadsides, in passing on opposite directions, and the lee-ship will get to windward.
THE PRACTICE OF WORKING SHIPS.

TO BOARD WITH THE WIND LARGE.

If two ships engage with the wind large, the boarding-vessel should keep as close as possible on the lee-quarter of the ship she means to attack thus, that she may execute this design, as has been shown before, by coming rapidly to the wind, and being careful not to pass a-head of her opponent.

The weather-ship, to avoid being boarded, must act on her part as was directed in the preceding article, according to circumstances.

A ship may also be boarded on the weather-side, by conforming to what has been said of boarding to windward.

When two vessels are engaged, with the wind right a'ft, the ship, desirous of boarding, ought to drop a-stern of the enemy, in order to run up close a-long-side of him, if the boarder has the advantage of sailing; for, as she then advances towards her adversary, her adversary can only endeavor to range rapidly to the wind on the other tack, as soon as the bowsprit of the boarder is a-breast of her stern, and thus gain the wind, in order to be in a situation to extricate herself more easily by a good manoeuvre.

The boarding-vessel should be permitted to come a-breast of the stern of her adversary before she hauls her wind; because, if she were to do this sooner, the ship a-stern, at a small distance, would board her perfectly well, even if they sail equally swift, since the boarder would be to windward, would run large longer than the other, would range more slowly to the wind, and continue to stem a-head of the flying ship. What makes this more evident is, that the boarder, coming from windward, preserves longer his velocity, trimming his sails only as the ship comes to the wind, and cuts the course of his adversary with a line less curved than that described by the retreating ship.

If, by coming too soon or too fast to the wind, the boarder chose to abandon his design, he might do so by veering a few points on the other tack and shortening sail; so that the retreating ship will shew her stern, and the boarder can then rake her by passing under her stern.

When you attack a ship closely to leeward, you may keep away a little, when you are a-breast of her, seeming to yield under her fire. If this should induce the opposing ship to veer, in order to keep you more under her guns, you have only to heave rapidly to the wind, by putting the helm a-lee, trimming all sharp abaft, and suppressing the effect of the head-sails; all of which is to be done in the same instant you perceive the enemy bears down upon you. The quickness of this manoeuvre, and the priority of the movement you gain thus on your enemy, will soon close the two ships; and, if proper attention be paid, and the distance well measured, it may happen that the enemy's bowsprit will be entangled in your fore or main rigging; which would be a most advantageous thing in your attempt to board. But much confidence must not be placed in this, as you do not frequently meet with persons so easily duped: it may even happen that you will no longer be able to attempt the boarding, if the weather-ship, instead of bearing away, plied to windward more and more; for this feint manoeuvre may take you too far off to leeward of your adversary. If you should happen to be a ship's length to leeward, you may under cover of a heavy fire, heave-in stays. By this manoeuvre you came right athwart the enemy's hawse, rake him fore and aft, and board him; his bowsprit being right over your gangway; nor can he possibly avoid your broadside; for, if he heave all a-back and make a-stern board, which is his only resource, he may avoid being boarded, but will always be in a very bad situation.
THE PRACTICE OF WORKING SHIPS.

BOARDING AT AN ANCHOR.

If it be intended to board a ship which is at an anchor, riding head to wind, it must be executed under sail; for, if you cannot approach the enemy but by towing yourself a-head, you will never be able to board her against her will; since it will always be in her power to annoy the boats which are laying out the tow-lines. It ought not, therefore, to be attempted, unless you are under way. To perform this with success, you must be sufficiently to windward to approach her by a little falling off, without exposing your stern to her fire, which she could play on you with great advantage in this situation. Supposing, therefore, the boarder to be thus to windward, so as to be able to approach his opponent at anchor, the assailant ought to stop his headway, by taking a-back his mizen-topsail and fore-staysail, and, when about a ship's length a-head of the vessel he means to board, let go an anchor; then work in such a manner, that, as soon as the mizen-topsail is taken a-back, the mizen close aft, the topsails clued up, and the fore-topmast staysail hauled down, he may come head to wind, and veer away cable, till, by falling off, he comes board-and-board with his opponent, who is still riding at her moorings, and who, at that instant, ought also to be raked by the boarder.

The boarding-ship has no other way of manoeuvring but this; because, as soon as the anchor is gone, the ship acquires sternway; and, when the cable is checked, she comes head to wind, in which she is greatly assisted by the mizen and mizen-topsail, which impel her stern to leeward (§. 40 and 44), till the wind is right in the direction of the keel; and, as the cable is veered away till exactly along-side the ship at anchor, her own anchor being right a-head of the vessel she means to board, it follows, that as soon as the boarding-ship comes head to wind, she is in a proper situation to throw her grapnels, and send her crew on board of the other, if they are the strongest.

The ship at anchor should never wait for the enemy in that situation, which is always disadvantageous, and there is always much greater probability of getting clear when under way. But if, for some unforeseen cause, you are obliged to continue at anchor; you are to take advantage of the moment, when the ship which attacks lets go her anchor, to cut the cable by which you ride. By this maneouv're you fall athwart, rake your adversary, avoid being boarded, and bring up with your lee-anchor. Besides, if time will admit before the attack, you should not neglect to cast two springs out, one on each side of the cable by which the vessel rides, if you have not had time before to lay out two anchors, in order not to be surprised, in case the ship which attacks has it in her power to pass on either side of you; and, when you perceive for which side she is determined, you heave on the spring which is on the same side. She has let go her anchor if she be a-head, and on the opposite if she be a-stern, veering out at the same time the other spring and cable, till you bring the assailant right a-breast of you. Then you may rake him at pleasure, as he has no way of getting out of this dangerous situation. His only course would be to prevent this danger by having a spring also; and, under cover of a brisk fire, veer upon that spring and cable to lay his enemy handsomely on board. But, if he has neglected this precaution, he must cut his cable, and drop on board of the ship te leeward; who, on the other hand, has no way to avoid being boarded, but by cutting, to get under way or to run on shore.

It is always easy to board a ship at anchor, when the wind will allow you to approach her under sail; and the best way to proceed is, to run her alongside, or to bring-to windward of the ship you wish to attack, keeping her exactly to leeward of you; then drift on board of her, by trimming your sails in such a manner, as to keep, as near as possible, your broadside opposite to
that of the adverse ship; annoying her with your guns till you can close her, and your constant cannonading may prevent her fire being so well served as might otherwise be.

When you are under way, and purpose to board a vessel moored, let go an anchor at the time of boarding; for, if the ship attacked should at this moment cut her cables to drive on shore, this would prevent your running a ground together.
A SYSTEM OF NAVAL TACTICS AND SIGNALS

UPON CHASING TO WINDWARD.

The best method of chasing to windward is disputed: many seamen think it proper to tack when arrived in the wake of the chase. Theorists are of opinion, that, to tack each time the chase bears a-beam has the advantage. Let us examine the difference. If it be granted that there be no advantage or disadvantage arising from staying, a ship will ply as much to windward by sailing 10 miles on one tack, as by sailing the same distance on ten different boards, or any number of boards; therefore, whether the chaser tacks when in the wake of the chase, or when the chase is a-beam, she must ever pass over the same distance to arrive at her, provided she keeps the wind. After having gained the wake of the chase, if the chaser tacks each time the masts of the chase are in one, she must follow in exactly the same track; but if the chaser tacks each time she brings the chase a-beam, she will follow, during the pursuit, a track to leeward of the chase's track, but gradually approaching it till she joins her. Thus, let C, D, E, figure 15, represent the track of a chase:

FIG. 15.
now, if the chaser A, upon discovering the chase C, stands towards B, till she arrives at the wake of C, and then stands after her, following her wake, she will sail through the same track, till she joins her at E; but if the chaser tacks each time the chase is a-beam, she will pass through the dotted track, to leeward of the other, till she joins her at E.

By the first method, after gaining the wake of the chase, no more tacks are made by the chaser than the chase; but by the second, a much greater number are made, which gradually become quicker and shorter. If the water be smooth, and the chaser works quick, keeping fresh head-way in stays, it will certainly be most advantageous to follow the last-mentioned plan; because she gains to windward in stays, and because, by plying close under the lee of the chase, she forces her to keep her wind, and prevents the possibility of an escape while day-light remains. The objections to the first method are, that if the vessels be far distant, by A's standing to gain the wake of C, she would be removed too far to observe her manoeuvres; and when the wake is gained, she leaves the chase at liberty to bear up.

Upon summing up these facts, it may be concluded, that while the chaser works quick, to tack when the chase is a-beam is preferable. But if it be found that tacking is disadvantageous, let tacking a-beam be practised only till the chaser may stand for the wake of the chase, without too great a separation, but by no means stand beyond the wake, on the contrary, rather tack short of it, so as to have the chase, when on the same tack, open on the weather-bow.

UPON CHASING TO LEEWARD.

To pursue a chase to leeward, through the shortest distance, the chaser must steer such a course as will keep the chase at the same bearings throughout the pursuit. The reason of this will appear by the assistance of figure 16, where

A, the chaser, upon discovering B, the chase, standing along the course B C, makes sail after her, upon the course A C; which approaches their line of bearing A B, by such a quantity as preserves B on the same point of the compass throughout the chase. Thus when A has arrived at D, B continuing her first bearings, will have arrived at E, the distance A D being to the sailing of the chaser, as B E is to the sailing of the chase; and if A D be continued till it cuts the course of the chase, the cutting-point will be their point of meeting, and shows the distance each must sail before they join. For, the respective legs of the triangle, A C and B C, are proportional to the sailing of the two vessels: that is, by A's preserving B at the same bearings, they both pass through, at the same time, two legs of a triangle, which are each respectively proportional to their sailing.

Instead of shaping such a course as to preserve the chase at her original bearings; suppose the chaser (which is often done) should haul for the chase, keeping her directly a-head throughout the pursuit, what will be the consequence?
TACTICS AND SIGNALS.

Why, to arrive at her, she must sail through a much greater distance in a curved line, (as represented by the dotted curve in the triangle,) steering through all the different courses contained between the line A B continued, and the line B C.

OBSERVATIONS FOR THE CHASE.

If the chase be closely plied to windward, by the chaser continuing under her lee, she must not attempt to bear-up, but continue her course to the utmost, in hopes of being favoured by night. Should the chaser tack in her wake, and be far distant, it is in the power of the chase to bear up, if it be thought beneficial; but this must be done in a slight degree only, for, if the chase bears up much, it will shorten the distance of the pursuit.

When it is discovered by a vessel to leeward that she is chased, (granting that she sails as well with respect to other vessels by the wind, as large,) she must steer directly away, making her course opposite to the bearings of the chaser, as this course must prolong the pursuit more than any other.

When it is discovered by a vessel to leeward that she is chased, (granting that she sails as well with respect to other vessels by the wind, as large,) she must steer directly away, making her course opposite to the bearings of the chaser, as this course must prolong the pursuit more than any other.

If the chase be far to windward, she has little to fear, as a pursuit to windward is prolonged beyond one in a direct course of the same distance, by the difference of time required between sailing direct, and working to windward:—this difference is about three to one.

REMARK.

When chasing, the bearings of the chase must be accurately observed with an azimuth compass; and if the chase cannot be preserved at her first bearings, she sails better than the chaser. [A few azimuth Compasses for sale at the Quadrant, No. 202, Water Street, New-York.]

UPON SAILING AGAINST A-SEA.

Making sail against a head-sea is attended with considerable danger, particularly if the sea be short; thus when one sea has passed abaft a vessel's masts and depressed her head, she will be met by a second, before her head has risen, which will shock and pass over her with a force expressed by the square of the united velocities of the ship and sea; therefore, by reducing the headway, it will diminish the power of the waves. If this be accomplished by taking in the square-sails forward, it will also prevent her pitching so deep into the sea.

It is a custom when a sea is seen coming upon the bow to put the helm down, and thus cause the ship to meet it. This practice, I should imagine, must have arisen from its relieving the person who is steering from the weight of the helm, which is greater as the sea passes aft and strikes the rudder; for it is attended with the expressions, "Ease her, ease her!" but it does not appear that the pitching is in the least prevented; the helmsman being eased of his burden, it is concluded the ship suffers a general relief. However, it has the advantage of easing the rudder from the sudden jirk of the sea, and prevents the ship being thrown off from her course; but if a towering sea is observed coming upon the beam, it would be the height of imprudence to put the helm down; rather put it up, and thus diminish the force of the wave by running from it.

We cannot conclude this chapter, without particularly advising the practice of keeping the people to fixed stations. By frequent custom, an evolution becomes familiar. Therefore, let station-lists be made out for the principal manoeuvres, such as tacking, veering, furling sails, reefing, and heaving up the anchor.
To hoist in a long boat, let the fore-tackle be toggled into a long pendant from the after part of the fore-top-mast-head; also let the main-tackle be toggled into another pendant from the fore part of the main-top-mast-head. Guy the fore-tackle aft to plumb the chestree by a stout guy from the main-mast-head, and guy the main-tackle over the side by a tackle from the main-yard-arm. Hook the main and fore-tackles to the stern and bow of the boat; and the main and fore-yard tackles both to the bow, which latter being thus hooked, will have a tendency to bear the bow of the boat from the side, at the same time the main-yard-tackle will draw her aft clear of the anchor. The main-stay-tackle is to be hooked into the bight of a slue-rope fixed to slide up the inner gun-wale of the boat, and several capstern-bars are to be hung over the side as fenders for the boat to bear against. Being thus prepared, man all the tackles and hoist away, and when the boat is high enough, ease the yard-tackles, and allow her to swing into her birth a-midships.

REMARK.

To prevent the fore-top-mast from drawing aft, it may be thought necessary to set up the foremost breast-back-stays to each cat-head previous to hoisting.

OF GETTING GUNS ON BOARD.

To hoist guns on board with care and expedition, the main tackle is to be fixed, and guyed out to the yard-arm, as stated under the preceding head, and the guns are to be slung by a sling about two fathoms long, the opposite bights of which are to be so seized as to form two eyes.

To sling a gun, one eye of the sling is to be placed over the pomigion, the sling is then to be laid along upon the upper part of the gun, and lashed to it, by a few turns of a limp piece of rope, just on the muzzle-side of the trunnions, so that the gun, when poised, will hang obliquely with the breech down. If the gun is to be mounted, have its carriage ready at the gang-way to receive it. Now the main-tackle being guyed out to the main-yard-arm, so as to plumb the hatchway of the craft containing the guns, and being hooked to the remaining eye of the sling, hoist up the gun; and when its breech is sufficiently high to enter the port, the people from within the port are to hook on an in-and-out-tackle to a small strap fixed to that eye of the sling which goes over the pomigion. By this means they are to house in the breech of the gun, while the people upon deck are to ease in the yard-tackle, and allow the gun to settle into its carriage.

With a craft of guns on each side, and two tackles kept alternately going, much work may be done in a short time.

Mounted guns are to be delivered from their carriages into the craft by tackles fixed in the same way.

Where it is required to hoist the guns from the craft and to strike them down the hatchway, the main-tackle is to be fixed in the same way, otherwise than it will now be found necessary to have a guy from the fore-mast-head to guy the main-tackle to plumb the hatchway.—Indeed this guy may be useful in the former case.

REMARK.

In transporting and getting on board anchors, guns, long-boat, &c. much anxiety and labour may be saved by proper attention to the fixing of the put-
TACTICS AND SIGNALS.

In the performance of this duty a ship's company are frequently worn with fatigue for want of judgment in the boatswain, or his commanding officer. If the purchases be properly fixed, without tending to act against each other, and to bind against the side of the vessel, the hoisting on board a long-boat, or transporting a sheet-anchor from the bow aft, is the work only of a few minutes.

UPON LEAKS.

Water presses as the square-root of its altitude: that is, suppose equal holes be made in the bottom of the vessel at one foot, four feet, nine feet, and sixteen feet beneath the surface of the water, the water will rush in at these holes with a velocity equal to the square-roots of their respective depths; for instance, at the four feet hole it will rush in twice as fast as at the one; at the nine feet, three times as fast; and at the sixteen feet, four times as fast; which is the law it will follow, provided the water be pumped out of the vessel as fast as it comes in. But if the water is suffered to rise in the vessel and to cover any of the holes, the covered holes will then run with the same velocity, regardless of their depths,—which velocity will be as the square-root of the difference of the level between the water within and without the vessel; for example, let it be presumed, that the hole at sixteen feet was quite at the bottom of the vessel; and that the water had risen in her twelve feet, then as its surface is even with the four feet hole, the two covered holes will run with the velocity only of the four feet hole, since four feet is the difference between the level of the water within and without the vessel.

From the foregoing reasoning it appears, that if a ship springs a leak under her bottom, although the water should increase upon the pumps at first, yet, after the water has risen a certain height above the leak, the pumps will then be enabled to prevent it from rising higher.

Let us now consider how a leak in a vessel's bow and stern will be effected by her motion through the water. Let the leaks under consideration be of equal size, and nine feet deep, then the water will rush in at each leak with a velocity that may be expressed by three, while the ship is without motion and in still water; but if the vessel be given head-way, the leak at the bow will be augmented in proportion to the head-way, while the leak at the stern will diminish in an equal ratio; and should she sail so fast as to double the running in of the water at the bow, the leak at the stern will become nothing. Thus it appears, that a leak at the bow is more dangerous than a leak at the stern. A leak also on the lee-side is more dangerous than a leak on the weather-side, since it is augmented not only by the lee way, but also by the deeper position of the leak, occasioned by the heeling of the vessel.

The following rules, founded upon the foregoing reasoning, may lead to a discovery of the situation of a single leak. First, if the ship increases making water as she sails, the leak is in the bow; but on the contrary, if she decreases making water as she sails, the leak is in the stern; and, secondly, when sailing before the wind, if the ship makes neither more nor less water, the leak is on either side, which side may be discovered by hauling upon a wind; then if the ship makes more water, it is on the lee-side, otherwise it is on the weather-side. It has been asserted, that by following round a leaky vessel in a calm, with a pole, keeping one end applied to the ear, and the other to the vessel's bottom, that, should the end of the pole chance to pass near the leak, a rumbling noise will be heard coming up the pole, and thus point out its place.

Should a leak be in the bow, it certainly may, in a great measure, be remedied at sea, by spreading a tarred sail with oakum sewed to it across the bows, and confining it there by ropes; then the motion of the vessel forward will press the sail close to the bow, and prevent the water from entering the leak.
To prevent the water from entering the seams between wind and water, (for some vessels by their working are continually losing their oakum,) it will be better to nail double canvas, or leather with oakum beneath it, along the seams, than to cover them with lead, which is subject to be broken.

It has frequently happened that ships have been left by their crews, because the water gained upon the pumps, and that the same vessels have been met with afterwards and brought into port. If a ship's cargo, when soaked in water, would of itself float, there would be no danger of the ship's sinking; for, as the water rose in the hold, the cargo immersed would become of no weight, but, on the contrary, would act as a support to the vessel by as much as it is lighter than water. Thus, a ship loaded with timber, although the water should be up to her decks, would not sink; and, probably, a ship loaded with spirits, would not sink lower, after the whole cargo was immersed. Therefore, a commander, knowing that his cargo when soaked in water will float, should be very backward in deserting his vessel, for he may yet find more safety on board her than in open boats.

The danger to be expected on board a vessel in this situation is, her upsetting; for as the cargo immersed bears less upon the vessel, her stability must proportionately decrease; and should the immersed part of the cargo beneath the centre of motion, consist of articles of the same weight, or specifically lighter than water, without iron or leaden ballast in her bottom to keep her erect, she must inevitably turn bottom up. The criterion to judge of a vessel's stability in this situation is her roll, which becomes greater and slower as her stability lessens. Upon occasions of this kind, it is recommended to place all heavy materials of every description, as lead, guns, and iron, as low into the hold as possible; to throw overboard every article above the orlop deck, except the necessary conveniences of life; and to strike all top-hamper from aloft. It is likewise recommended to stanchion and lash the decks together round the beams, that they may sustain each other, and prevent their being blown up; also to fill the orlop deck with as many empty casks as can be procured properly bunged up, which should be secured a head, and prevented from floating about, in case the vessel should fill so much as to immerse them. Thus prepared, the ship may have sufficient stability while in the act of sinking; and upon the empty casks being immersed, (since they are above the centre of motion) they will not only tend to float her, but will add to her stability. After the casks are immersed, every attempt is to be made to prevent the water from rising higher: if this cannot be effected, the vessel must be quitted.

TO PRESERVE A BOAT FROM FOUNDERING IN A GALE OF WIND.

When the crew of a ship have occasion to quit their vessel and to take to their boat for safety, it may be the means of preserving the boat from founder in a heavy sea, if they be careful to carry with them a small spar, as a top-gallant-yard, which if it cannot be taken on board the boat, may be towed astern. Being thus provided, should the sea rise so high as to endanger the boat, let the spar be spanned with a small rope from end to end, and let the boat's grapnel be suspended from the middle of the spar by several fathoms of rope. Now bend the boat's painter to the middle of the spar, and back the boat to leeward of the spar, which taking a position across the sea, and being as it were anchored by the grapnel, will prevent the sea from breaking, and cause smooth water under its lee for the boat to ride in:—it may be necessary to keep two hands at the oars occasionally to back; and thereby preserve the boat and spar in their respective positions.
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UPON STEERING A SHIP WHICH HAS LOST HER FOREMAST.

A ship that has lost her fore-mast can only be steered with the wind aft, and even then she is subject to broach-to. Immediately that a ship thus circumstances receives the wind sideways, all the lateral pressure of her sails will be abaft the centre of gravity, which her rudder not being able to counteract, her head must approach the wind; but could the power of the rudder be increased to any required degree, a ship could be steered with the wind beamng, notwithstanding the loss of her fore-mast. To do which, let the following method be practised: veer a-stern 20 or 30 fathoms of cable, which, if the ship is in shoal water, should be buoyed up. Then rig out a boom with a stout guy upon each quarter, and let the guys be bent to the cable a few fathoms abaft the stern. While the ship is sailing before the wind, let the cable be guyed to tow am ships of the stern, and it will prevent her from broaching-to; but while the wind blows sideways upon the ship, let it be guyed out to the lee-boom, which will greatly assist the weather-helm.

UPON MANOEVRING A FLEET.

Of the Command and Division of Fleets.

The whole fleet is under the general direction of one commanding officer; but for the sake of discipline it is divided into three grand divisions of equal force, denominated the centre, van, and rear divisions. The centre is more particularly commanded by the superior officer of the fleet, the van by the second officer in command, and the rear by the third officer. Besides these divisions, for particular services it is found necessary to have squadrons, composed of ships having particular qualities.

The ships of the centre division are known by carrying their distinguishing vanes at the main, the van division by carrying their vanes at the fore, and the rear division by carrying their vanes at the mizen; each commanding officer being distinguished by his flag at the main, fore, or mizen, according to the rank he bears.

Of the Order of Sailing.

The order of sailing is, that particular order which a fleet preserves, for the sake of regularity, when pursuing its proper course. The disposition of this order rests with the commander of the fleet. It should be so contrived that the ships may not molest each other, and yet be capable of assuming the order of battle and retreat with facility. We shall consider the order of sailing throughout this chapter as composed of three lines, the ships sailing abreast of each other, because lines can more readily assume the order of battle or retreat.

Of the Order of Battle.

A fleet is in the order of battle when the ships are one ahead of the other in a line of six points from the wind, either upon the starboard or larboard tack.

Of the Order of Retreat.

We shall here consider the order of retreat only in a line at right-angles.

*There are three classes of commanders in the United States' Navy, and agreeable to regulations of the navy department they are designated by broad blue, red, and white pendants, with stars. Every commodore, (whatever may be his class) is entitled to wear the broad blue pendant, when not in company with an officer superior to himself: should he meet with such an officer, he then wears the pendant of the class to which he belongs.
with the direction of the wind, because hence the order of battle is more easily attained. The intention of this order is to conduct a fleet of merchantmen from the enemy with safety. The merchantmen are to situate themselves before the order of retreat, and not to extend without the line on either side.

**Of the Lines of Bearing.**

The line of direction which a fleet preserves in either of the orders, is termed the line of bearing of the order. Thus the line of bearing of the order of battle is six points from the wind on either tack; the line of bearing of the order of retreat is across the wind; and the line of bearing of the order of sailing is the course steered.

**Prob. III.**

*From the Order of Sailing with a Side Wind, to form the Order of Battle on the same Tack.*

Let the small circles, figure 40, represent a fleet in the order of sailing with the wind on the larboard side, in the direction of the arrow: then CA is the larboard line of bearing from the van ship of the lee-line.

**Figure 40.**

The van ship of the lee-line being in the line of bearing, this line is to heave-to; the centre and weather-lines bearing up in succession to a course as much off from the former course as half the angle ACD, formed by the line of the ships a-breast, and the line of bearing; thus their vans will arrive at the points B and A in the line of bearing, at the same distance they held in the order of sailing.

The centre line is to heave-to when its van arrives at the point B, and the weather-line is to haul the wind in succession along the line of bearing, as the ships arrive at the point A. The other lines are to make sail again and follow, as mentioned in the foregoing problem.

The van of the centre-line is in the line of bearing, when the van of the lee-line bears six points from the point opposite to the wind; and the van of the weather-line, when the van ships of the lee-line are in the same direction.

To form the order upon the other tack, first form the order upon the same tack, then tack in succession.
From the Order of Sailing with the Wind aflat, to form the order of Retreat.

Let the small circles in the three lines, figure 41, represent a fleet in the order of sailing, the wind being aft, in the direction of the arrow. Then AC is the line of bearing of the order of retreat.

**Figure 41.**

If it be required to form the order of retreat to starboard, let the van ship of the starboard line haul along the line of bearing on the starboard tack, keeping the wind abeam; the remainder of the lines following as related in problem 11. When all the fleet are in the line of bearing, they are to bear-away together, and steer the intended course, as represented by the dotted parallel lines, regulating their way so as to continue in a line across the wind.

**Prob. V.**

From the Order of Sailing with a Side Wind, to form the Order of Retreat.

Let the small circles, figure 42, represent a fleet in the order of sailing with a side wind, in the direction of the arrow. Then CA is the line of bearing of the order of retreat, from the van ship of the lee-line.

The van ship of the lee-line being in the line of bearing, this line is to heave to, the centre and weather-lines bearing up in succession to a course as much off from the former course as half the angle BCD, for the reason given in problem 11. The center line is to heave to when its van arrives to the point B, the weather-line hauling its wind abeam at the point A, along the line of bearing CA, the lee-lines following in succession, as related at the conclusion of problem 11. When all the ships are in the line of bearing, they are to bear away altogether to the intended course, as shown by the parallel lines.

**Prob. VI.**

From the Order of Battle to form the Order of Sailing, on the same tack, upon particular bearings.

Let A C, figure 43, represent the order of battle upon the larboard tack:
A 1, B 2, C 3, the intended lines of the order of sailing from the ships A, B, and C, which are to become the van ships of the three lines.

Now, to form the order of sailing, let the van ships A, B, C, bear away, and steer along their respective lines of bearings, the rest of the ships following in succession their respective vans. When the weather-line has formed, it is to heave to; when the centre is abreast of the weather, it also is to heave to; and when the lee-line is abreast of both, they are all to make sail together.

If the lines are now at an improper distance, they are to be regulated accordingly.

**PROB. VII.**

*From the Order of Battle to form the Order of Retreat.*

Let A B, figure 44, be the order of battle on the larboard tack, and B C the line of bearing of the order of retreat.

Now, to form the order of retreat, the rear ship B of the line of battle is to heave to, and the rest of the ships are to bear away, and steer with the wind one point upon the larboard quarter till they successively bring the ship B at right angles with the wind, when they are to heave to. The ships being arrived in the order of retreat, they are to proceed upon the proper course, being careful to regulate their sailing so as to preserve themselves in a line across the wind.

Was the fleet in a line upon the starboard tack, the rear ship is to heave to, and the rest are to steer with the wind a point upon the starboard quarter, till they bring the rear ship at right angles with the wind. The bearing away of the fleet, and sailing along with the wind a point quartering, will cause them
to arrive in the line of bearings of the order of retreat, B C, at the same distance from each other which they held in the order of battle, for the reason given in problem xi.

**PROB. VIII.**

*From the Order of Retreat to form the Order of Sailing, with the Wind on the starboard side.*

Let A, B, C, figure 45, represent the order of retreat, A 1, B 2, C 3, the three lines of the order of sailing from the ships A, B, and C, which are to become the vans.

![Figure 45](image)

Now, to form the order of sailing, let the van ships A, B, and C, steer along their respective lines of bearings, the rest of the fleet hauling the wind abeam, and following their van, as they successively arrive in their wakes at the points A, B, C. When the weather-line C 3 has formed, it is to heave to, the centre doing the same when abreast of the weather-line; and when the lee-line is abreast of both, they are to make sail. If the lines be now at an improper distance, they are to regulate accordingly.

To form the order with the wind on the larboard side, D is to become the van of the weather-line, and the ships are to haul the wind upon the larboard tack, following their respective vans.

**PROB. IX.**

*From the Order of Retreat to form the Order of Battle.*

Let A, D, figure 44, represent the ships in the order of retreat, and A B the larboard line of bearing of the order of battle.

Now, to form the order of battle on the larboard tack, the larboard ship A, which is to become the van of the order of battle, is to heave to on the larboard tack, and the remainder of the ships are to steer with the wind a point upon the larboard quarter, till they bring the van to bear six points from the wind, when they are to heave to on the larboard tack. Thus they will proceed along the dotted parallels, and arrive in the order of battle at the same distance from each other they held in the order of retreat, B A D being an isosceles triangle.

If it be required to form upon the starboard tack, the ship D is to heave to upon the starboard tack, and the rest are to steer with the wind a point upon the starboard quarter, till D bears six points from the wind, when they are to heave to on the starboard tack.
PROB. X.

To work to Windward in the Order of Sailing.

Let the three lines, A 1, B 5, C 8, figure 46, represent the lines of bearings of the order of sailing when close hauled upon the larboard tack, and the three lines 1 C, 5 D, 8 E, the three lines or bearings, when close hauled upon the starboard tack; also let the small circles numbered 1, 4, 7, represent the van ships in the order of sailing upon the larboard tack abreast of each other.

To explain the manner of performing this problem, for the sake of simplicity,

we shall consider the manoeuvres of the three van ships only, which is sufficient, as the remainder of the ships are to tack in succession after their respective van.

Now, to form the order of sailing on the other tack, let the van ship, 1, of the lee-line tack and stand on; and when the van ship 4 of the centre line brings the van of the lee-line four points abaft her lee-beam, viz. in the direction 5, 2, she is to tack; the van of the weather line tacking when the van of the centre is four points abaft her lee-beam, viz. in the direction 8, 6, at which time the ships will be abreast of each other upon the starboard tack, as represented by the large dots 3, 6, 8.

PROB. XI.

To work to Windward in the Order of Battle.

To work to windward in the order of battle, the van ship is to tack first, and the rest are to tack in succession, in the wake of the next ahead.

PROB. XII.

To restore the Order of Battle should the Wind come forward less than six points.

Let A B, figure 47, represent the order of battle before the wind shifts, B C the line of bearing of the order of battle, from the rear ship B, after the wind has shifted.
TACTICS AND SIGNALS.

Figure 47.

Now, that the ships may form in the line of bearing BC, let the rear ship B heave to, and let the rest box-off, and bear up as many points from the line AB as half the difference between 16 and the number of points the wind has altered, added to what it has altered, till each ship from rear to van, shall successively bring the rear ship to bear six points from the point opposite to the wind, when they are to heave to, till the line be formed, as then they are in the line of bearing BC.

PROB. XIII.

To restore the Order of Battle, should the Wind draw aft less than six points.

Let A B, figure 48, be the order of battle before the wind changes; A C the line of bearing of the order of battle, from the van ship A, after the wind has changed. Now, that the ships may form in the line of bearing A C, the van

Figure 48.

*That the ships in the line of battle A B may form, at their respective distances, in the line of bearing BC, it is necessary that the course of each ship shall be parallel to the base of the isosceles triangle ABC. Therefore, each must bear up equal to the angle D A C, which is equal to ABC plus A C B. Now, ABC is equal to what the wind has shifted, and as all the
ship is to heave to, and the rest are to bear up equal to the angle A B C, which is half the difference between 16 points and what the wind has changed; thus they will proceed along the dotted parallel lines; and as each ship successively, from van to rear, shall bring the van ship to bear six points from the wind, she is to heave to, as then she is in the line of bearing A C.

REMARK:

The distance of the ships from each other, and the distance of the lines, may be regulated with accuracy according to the method proposed in the chapter on signals.

On Day Signals.

All signals, to be effectual, must be simple, and composed in such a manner as to express the same signification at whatever mast-head, or yard-arm, they may be displayed from. The following day signals will be found to have these advantages.

The plan is, to express numbers by distinctly coloured flags, each number referring to a certain signification, to be agreed on beforehand.

Mode of expressing 999 Numbers by Eleven Flags and One Pennant.

In the table of flags, page 153, there are ten flags, each flag representing the number placed against it, and a substitute flag representing the same number with any flag hoisted next above it. To express from 9 to 99, hoist the flag standing for the first figure of the given number, above the flag standing for the second; that is, to express 45, hoist flag 4, above flag 5;—but should the given number be two similar figures, for instance 55, it is to be expressed by hoisting flag 5, above the substitute. To express from 99 to 999, hoist the flags one above the other in the order of the figures of the given number; thus, 245 is expressed by hoisting flag 2, above 4, above 5; and 225 by flag 2, above the substitute, above 5; and 522, by flag 5, above 2, above the substitute. But as there are some instances in which the eleven flags are insufficient to express numbers above 99, a short thick pennant, denoting that the last figure of the given number is the same as the first, is proposed to remedy the defect; therefore, to express 545, which is a number that could not be expressed by the eleven flags, hoist flag 5, above 4, above the pennant; also to express 444, hoist flag 4, above the substitute, above the pennant.

Should it not be required to make more than 299 significations, the hundreds may be simply expressed by the introduction of a yellow triangular flag, which angles together of the isosceles triangle A B C are equal 16 points, the angles at the base must each be equal to half the difference between the angle B and 16. The value of the angles B and C being thus attained, their sum is the value of the angle D A C, which is required to be known.

* The foregoing note being understood, the validity of this rule must also be evident.

† The author having viewed with astonishment the abundant and unnecessary manoeuvres which are set forth in some translations of Naval Tactics, was induced to draw up the foregoing problems, which he trusts are calculated to give a clear and distinct idea of such manoeuvres as may be practised with facility. The rules for knowing the number of points, which the ships have to haul or bear-up are distinctly expressed; and geometrically explained, which has been hitherto omitted. It might here be expected that the author should treat on the mode of engaging an enemy, but this circumstance having been practically explained, it has become unnecessary to inform them that short balls are more certain than long balls. Let our countrymen place their ships beside the enemy, and we need not care for the supposed expertness of other gunnery, as our shots must assuredly hit. By this practice we may rest certain that the banners of the United States will not be disgraced on the main.
TACTICS AND SIGNALS.

being hoisted above the flag or flags shall denote 100, and when hoisted beneath, 200.

To facilitate the communication by signals it is necessary that each ship should be denoted by a particular vane, which being affixed to the fore, main, or mizen, explains at once to the commodore and the fleet, the name of the ship and the division to which she belongs.

Also a pennant must be assigned to each ship of the fleet, which being displayed by the commodore, expresses that the signal flying applies to that ship only.

It will be found convenient to have each ship’s pennant similarly coloured to her vane, and that it be displayed at the same mast-head to which the vane is affixed; thus one pennant will serve to express three ships.

In addition to the foregoing pennant, each division of the fleet should be expressed by a separate pennant; — for instance, the van division by a white pennant, the centre division by a red pennant, and the rear division by a blue pennant.

Each flag should be marked on the tabling with the number it represents, which will identify the flag without unfolding it, and should be fitted with a tack, or distance line, about a fathom long, for the purpose of bending them to each other at equal and distinct distances. Also each ship’s distinguishing vane, together with all national flags, should be marked and similarly fitted.

The numerical flags and distinguishing pennants, being thus prepared, are to be placed in a range of cells, fitted up at some convenient part of the poop or quarter deck, each cell being marked with the number of the flag or pennant it contains. Such an arrangement will greatly facilitate the operation of making signals.

In the table of flags which follow, attention has been paid to contrast the colours with boldness, also to the proper disposition of the dark colours, as it frequently happens, for want of sufficient light, that the dark colours do not appear distinct. On viewing the table of flags, it will appear that the colours red and blue are so opposed to each other throughout the flags, that were they only composed of white and one dark colour, they would still remain distinct. For instance, No. 2 and 3 cannot be mistaken, although it be not in the power of the observer to say which contains red and which contains blue, for the dark colour of the one is above and the other beneath the white; also with respect to the flags 4 and 5, the dark colour of the one is to the mast and the other to the fly, and the same observations apply equally to the whole table of flags.

Of Shape Signals.

As flag signals are frequently rendered indistinct, either from position, want of light, or wind to display them, the author presumes that day signals composed of cones and cylinders would be the most perfect kind hitherto invented, since they neither require wind, nor a very distinct light, and have the same appearance from every horizontal position. By means of the eleven shapes contained in the table of shapes, p. 153, 999 numbers may be expressed. These shapes represent the same signification with their corresponding flags, therefore the numbers are expressed by them in the same manner as by the flags.

The shapes may be made of light wicker, or basket-work, and painted black; and if about three feet diameter, they will appear distinct to a considerable distance. A top-gallant truck, an object not more than a foot over, will appear distinct, when the colour of the flag hoisted to it is perfectly indistinct.

* The shape signals are the invention of Mr. Gower, and were first published in the second edition of his work, in 1796. He is not aware that they have ever been put in practice. He trusted that he should have been able to recommend them from experience, but at a time when the most favourable opportunity offered of putting them to the test on ship-board, he had the
Should the room the shapes occupy, when made of wicker, render them objectionable, they may be formed of canvass, set out with hoops; thus made, they will collapse into a small compass when they are out of use.

The shapes will show to greater advantage if they be hoisted to the yard-arms, or stays, as represented by figure 49, instead of the mast-heads.

**Figure 49.**

"A Show-Board."

In blowing weather, or when from circumstances ships cannot approach near enough to each other to hail, it will be found convenient to have a light board, about eight feet by three, painted *black*, that the latitude, longitude, and any short sentences, may be communicated by writing upon the board with chalk. Upon showing the board, wave a small white flag to the ship you wish to communicate with, which is to be repeated by her when the writing is understood.

**A Naval Telegraph.**

A telegraph will also be found extremely convenient to express the numerical signals, and may be formed in the following manner. Figure 50 repre...
TACTICS AND SIGNALS. 151

sents a large board, contrived to turn round upon the pole A C:—B D, B D are grooves to receive the figures of the number to be shown, as represented by 453, each figure being painted black upon a thin white board or sheet of tin. Let the other side of the board be prepared with grooves in the same manner, for the convenience of fixing another number while the first is exhibiting. Between each exhibition, wave a white flag to denote that the number is understood.

By the addition of an alphabet to this telegraph, words may be expressed to distant parties: for instance, let each party have a dictionary with the words numbered throughout the letter A, and again repeated throughout the letter B, and so on throughout the dictionary; then, to express any word, shew its number and the letter it begins with, as represented in the figure by A 453. The alphabet is also necessary to spell the names of persons and places.

To communicate a sentence expeditiously, let it be written as short as possible, leaving out such words as can be omitted without destroying the sense, and above each word write the number placed against it in the dictionary: a sentence thus prepared, and placed before the person who attends the telegraph, will very much facilitate the communication. By this means the commanding officer of a fleet may communicate secret orders and intelligence to a particular ship in blowing weather. The flags or shapes may also be adapted to express the same ideas.

To regulate the Distance of the Ships.

As it is impossible to regulate the distance of the ships from each other by guess, it is recommended to station them, by observing the angle formed between the main-top-gallant truck and water-line of the ship next ahead or abreast, which, as there is no great dissimilarity between the height of one large ship and another, must evidently produce a near resemblance to the truth.

The more readily to effect this purpose, a calculation has been made on the supposition that the height of a large ship, from the water-line to the truck, is 168 feet. Such being the case, at half a cable off, the angle subtended between the truck and water-line will be 21° 1', at a cable off, 13° 8', and so on as expressed by the continuance of this table in the following instructions.

The commodore having assigned by signal the distance of the lines, and the distance of the ships from each other; the officer of the deck is to set the index of his quadrant to the assigned angle, and so to regulate the distance of his ship from the next ahead or abreast, that the reflected image of her main-top-gallant truck, when viewed through his quadrant, shall appear in contact with the water-line.

* This mode of communicating significations, and even a complete language, is the invention of Mr. Gower, and was first published in the second edition of his Seamanship, in 1796. Having quitted the sea service since the year 1802, the author was not aware that a telegraph of the kind had been introduced into the navy, under the patronage of government, until accidentally explaining his invention to a naval friend, and setting forth the advantage to be derived by secret communication, he was informed, to his astonishment, that the thing was already done, by the recent introduction of "Sir Home Popham's Telegraphic Signals." The author himself cannot for an instant suppose, that Sir Home Popham would take merit for the invention of another;—but, as thought is the prerogative of man, the thoughts of Sir Home may have run, by chance, parallel with the thoughts of the author. At the same time it must be observed, that had the author possessed sufficient influence to introduce his telegraphic signals, previous to the introduction of Sir Home's,—Sir Home's would have remained dormant, and the author would have reaped whatever merit is attached to them.
On Night Signals.

Night signals should be used as little as possible, since they are frequently misunderstood. Of necessity, they must be composed either of sound or light, or the two blended together. If several lights are shown together, that they may have the same appearance from every horizontal situation, it will be necessary to hoist them in a vertical position. In the following night signals, this circumstance is attended to: the plan is, to express numbers by means of guns, lights, and blue lights. A single gun being left at liberty to draw the attention of the fleet, and to point out the position of the commodore.

On Fog Signals.

Fog signals being very imperfect for want of distinct light, we must be content with such significations only as are absolutely necessary to preserve a fleet together in safety.—These signals are composed of different kinds of sound, and guns at various intervals, as set forth in the following table of fog signals.

CODE OF MARINE SIGNALS.

"The following significations and instructions were, for the most part, compiled for the immediate use of a fleet of East-Indiamen, at a time when the author, from his official situation, possessed the best opportunity of noting the general poverty of signals, as the various circumstances of a fleet exposed them to view. These periods naturally gave birth to such significations as appeared best calculated to supply the deficiency; he therefore trusts, this code of signals will be found not only equal to the safe guidance of a convoy, but that it will also meet the mutual convenience of the ships in every particular."
EXPLANATION OF THE TABLE.

To represent any number consisting of one figure, hoist the flag representing that figure. If the number consists of two figures, hoist the flag representing the first figure of the number above the flag representing the second; but should the figures of the number be alike, as for instance 44, then hoist flag four above the substitute, which signifies that the last figure of the number is alike with the first. If the number to be represented consists of more than 100, as for instance 124, then hoist the yellow triangular flag above the flag repre-
senting 24; and was the number 224, then hoist the yellow flag beneath the flags representing 24.

As the numbers 100 and 200 could not both be expressed by the yellow flag alone, those numbers are not attached to any of the following significations.

Table of distinguishing Vanes and Pennants.

<table>
<thead>
<tr>
<th>Vanes</th>
<th>Fore</th>
<th>Main</th>
<th>Mizen</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td>A</td>
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<td>E</td>
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<td>D</td>
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<td>H</td>
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<td></td>
<td></td>
<td></td>
<td>M</td>
</tr>
</tbody>
</table>

Division Pennants

EXPLANATION OF THE TABLE.

In the above table the letters A, B, C, &c. represent the names of the different ships.

Each ship's distinguishing vane is to be affixed to the mast-head as expressed in the table, as for instance, ship A is designated by red above white at the fore; and the vanes should not be less than eighteen inches deep, and six feet in the fly. The distinguishing pennants being similar in colour to the vanes, will be displayed by the commodore, at the same mast-head to which the vane of the ship he wishes to address attaches.

When any ship's pennant is displayed with a numerical signal, it expresses that the signal flying applies to her only; and if the pennant is hoisted alone, it merely expresses a wish to communicate with that ship.

When a division pennant is displayed with a numerical signal, it expresses that the signal flying applies to that division.

A table of the angles subtended by the main-top-gallant-truck and water-line of a ship, at different distances from the observer.

This table is given with a view to regulate the distance of the ships from each other, also the distance of the lines when formed in the order of sailing. It is calculated on the supposition that the height from the water-line to the truck of a large ship is 168 feet.

At a half cable off, the angle will be $25^\circ 1'$
At one ditto, ditto, - $13^\circ 8'$
At one and a half ditto, ditto, - $8^\circ 50'$
### TACTICS AND SIGNALS

<table>
<thead>
<tr>
<th>Angle</th>
<th>Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>2° 13'</td>
<td>At four ditto, ditto, - 3° 20'</td>
</tr>
<tr>
<td>4° 26'</td>
<td>At three ditto, ditto, -</td>
</tr>
<tr>
<td>6° 39'</td>
<td>At two cables off, the angle will be</td>
</tr>
</tbody>
</table>

**EXPLANATION OF THE TABLE.**

The officer of the deck having the index of his quadrant set to any of the above angles as expressed by the Commodore, is so to regulate the distance of his ship from the next ahead or abreast, that the reflected image of her main-top-gallant-truck, as viewed through his quadrant, may appear in contact with her water-line.

**The Order of Sailing:**

The order of sailing is to be preserved in three lines abreast, as represented at the bottom of the diagrams No. 1 and 2. In forming this order, the leading ships of the starboard and larboard lines are to place themselves abreast of the leading ship of the center line, at the distance as assigned by signal; and the following ships of each line are to take their respective stations astern of each other, at the distance as expressed by the commodore.
Diagram necessary to explain the readiest Method of forming the Line of Battle from the Order of Sailing.

The line of battle is complete, when the fleets are arranged upon a wind in a line ahead of each other at equal distances. To attain this position from the order of sailing, without confusion, the commodore will make the signal to form in the order of battle on the same tack the fleet then happens to be sailing upon.

For example, suppose the ships were in the order of sailing with the wind on the larboard side, as represented at the bottom of diagram No. 1. Then the starboard or lee-line of the order is to heave to, as shewn by their yards being braced aback, while the centre and weather-lines bear up, and continue a course along the dotted lines, so as to arrange themselves ahead of the lee-line.
The sternmost ship of the centre line having arrived at its position ahead of the lee line, her line is to heave to; and when the sternmost ship of the weather line shall have arrived at its position, the whole fleet are to make sail and follow the leading ship. Had the ships been upon the starboard tack, then the lee or larboard line is to heave to, and the centre and weather lines are to form ahead of it, as represented by diagram No. 2. Should the fleet have been close hauled, as represented in the diagrams, when the signal was made to form the line, they naturally will be in the order of battle when arrived in a line ahead of the lee line; but should the fleet have been sailing from the wind at the time, the line ahead thus formed must approach the wind before it assumes the proper bearings of the order of battle, which is six points from the wind. In this case, that the line may approach the wind with regularity, the leading ship must haul the wind, and the rest must follow in succession, as they arrive in the wake of their next ahead; which evolution being performed, the fleet will then be in the order of battle.

To change the Order of Battle from one tack to the other.

On the signal being made to change the order of battle, the leading ship is to tack, and the rest are to follow tacking in succession, in the wake of the ship next ahead which has already gone about.

Remarks.

Any vacancies which may happen in the line of battle, are to be made good by the rear closing up. All vessels not included in the line of battle are to place themselves on the opposite side of the line to the enemy, and give all the assistance in their power to tow away disabled ships.

Order of Retreat.

In retreating from an enemy, the ships of the line will preserve themselves abreast of each other in near order astern of the convoy, the better to enable them to assume the line of battle on either tack should the enemy press them too closely,
### Table of Significations

#### General Significations

The substitute flag being hoisted alone, signifies that a man has fallen overboard; ships astern will therefore be upon the lookout to save him.

0. A general acknowledgment that the signal made is understood.

1. Annuling flag.

2. Tack, headmost and weathermost first.

3. Veer, sternmost and leewardmost first.

4. Make sail, if in close order headmost first.

5. Shorten sail, if in close order sternmost first.


7. Ships astern make more sail.

8. Gather together in close order.

9. Open to a greater distance.

10. Heave to upon the starboard tack.

11. Heave to upon the larboard tack.

12. Take in your studding-sails, and prepare to haul the wind.

13. Prepare to anchor.

14. Come to an anchor.

15. Haul the wind to starboard.

16. Haul the wind to port.

17. Ships to starboard join the fleet.

18. Ships to port join the fleet.

19. Continue as before, regardless of the commodore.

20. Prepare to hoist the colours of that nation whose jack is now displayed.


22. Show no lights during the night, and keep in close order, as I do not intend to carry a top-light.

23. Carry all the sail you can without risk.

24. You may communicate with the stranger, or ship, whose pennant is shown.

25. The ship whose pennant is shown is about to quit the fleet, and the fleet are at liberty to send letters on board her.

26. Bear away for the port under your lee.

27. If it can be avoided, it is my intention not to exceed the rate of sailing as expressed by the next numerical signal.

28. A strange sail is supposed to be in the fleet; the ship discovering the stranger is to hoist her colours and run towards her.

29. Disperse, and each vessel do the best for her safety.

30. Be particularly attentive, as I am going to make several signals which are intended to be acted upon after dark.
31. Observe my telegraph, or show board.

32. Commanders of ships are required on board the commodore, or the commander only of the ship whose pennant is shown.

33. An officer is required from every ship, or from that ship only whose pennant is shown.

34. A boat is required from every ship, regardless of an officer, or from that ship only whose pennant is shown.

35. Should the wind come fair, steer the course as shown on your acknowledging the present signal.

36. Open your signal letter, and act as therein directed.*

### Hour Significations

<table>
<thead>
<tr>
<th>37. At the hour of 6</th>
<th>38. Ditto</th>
</tr>
</thead>
<tbody>
<tr>
<td>39. Ditto</td>
<td>40. Ditto</td>
</tr>
<tr>
<td>41. Ditto</td>
<td>42. Ditto</td>
</tr>
<tr>
<td>43. Ditto</td>
<td>44. Ditto</td>
</tr>
<tr>
<td>45. Ditto</td>
<td>46. Ditto</td>
</tr>
<tr>
<td>47. Ditto</td>
<td>48. Ditto</td>
</tr>
<tr>
<td>49. Ditto</td>
<td>50. North</td>
</tr>
</tbody>
</table>

* To prevent these signals being of service to the enemy, should it be supposed that a copy may have fallen into their hands, each commander is provided with a letter, directed signal letter, and expressing, that after the signal shall be made to open the letter, the numbers annexed to the significations are to be differently arranged. For instance, let the significations in future, beginning at "a general acknowledgement," be numbered 1, 2, 3, 4, &c. &c. instead of 0, 1, 2, 3, &c. &c.

### Compass Significations

|--------------------|-------------|--------------|----------------|---------|----------------|-------------|-------------|

### EXPLANATION

The above significations are useful to point out during the day, at what hour of the night the commodore intends to perform a particular manoeuvre. For instance, let it be presumed that the fleet should be chased during the day, and that it is the wish of the commodore to avoid the enemy by altering the course after dark. In this case the commodore will first express the hour, which being acknowledged, he will then express the course to be steered after that hour. The fleet being thus made acquainted with the course to be steered after dark, avoids the necessity of a night signal, which in the present instance would show too clearly the position of the fleet to the enemy. Or again, should it be required to lie-by at a particular hour of the night; the commodore will first express the hour, which being acknowledged, he will then express the tack to lie-by upon. This timely information will prevent the confusion too frequently occasioned by heaving to after dark without previous warning, as now each ship will be upon the look-out to execute the duty at the appointed hour.
To express half points hoist an American pennant with the flags, which let denote half a point to starboard. To express, therefore; any half point, as for instance, N. $\frac{1}{2}$ E. hoist the north signal with the pennant.

These significations are necessary to point out the course to be steered, or the bearings of any object expressed by signal.

Significations by which any Vessel of the Fleet may express herself to the Commodore, and to the Fleet in general.

82. One strange sail.
83. Two strange sail.
84. Three strange sail.
85. A fleet.

86. Request the assistance of a surgeon. On this signal being hoisted, the nearest vessel having a surgeon on board is to acknowledge the signal, and to send her surgeon immediately.

87. Request to head the fleet to set up my rigging.
88. Request to hail the Commodore. Ships near the commodore are to repeat this signal, and show the vessel's pennant which first made it.

89. We are overpressed with sail.
90. We have sprung a leak.
91. We see danger. On this signal being acknowledged, express the bearings.
92. Let every ship avoid my present position.
93. I have touched the ground.
94. We are in want of carpenters.
95. We are in want of caulkers.
96. We are in want of armourers.
97. We are in want of provisions.
98. We are in want of water.
99. We are in want of a kedge anchor and hawser.
100. We are in want of a tow-ropes.
101. We have broke the tow-ropes.
102. The ship near us is on fire.
103. A mutiny is on board. Send boats manned and armed.
104. We see the land.
105. We have got soundings.
106. We require the immediate assistance of boats from the fleet.
107. We have sprung a lower-mast, yard, or bowsprit.
108. We have sprung a top-mast, or top-sail-yard.
109. We are ready to proceed.

Significations addressed to particular Ships:

111. Those ships whose pennants are shown, are to change positions with each other.
112. Come within hail.
113. I intend to send a boat on board you, be in readiness to receive her.
114. Lead the fleet and carry a top-light during the night.
115. Take the ship in tow, whose pennant will be shown on your acknowledging this signal.
116. Cast off the ship in tow.
117. Make sail upon the bearings pointed out, on your acknowledging the present signal, and look out for land and strangers.
120. Make sail upon the bearings pointed out, on your acknowledging the present signal, and sound.
121. Chase upon the bearings pointed out, on your acknowledging the present signal, and give me your opinion of the chase.
122. Bring the stranger to me.
123. Examine the stranger; if neutral, pass her.
124. Hoist the commodore's signal.
125. Endeavour to join the fleet.
126. Hoist the signal No. 156, expressing, Who are you? If the vessel be of the fleet, she naturally will answer with No. 165, viz. A friend.
127. Return to the fleet.
128. Situate yourself between the distant ships and the fleet, to repeat signals.
129. Keep your station.
130. I do not understand your signal.
131. Bring up the rear of the fleet.
132. Express the bearings of the object seen.
133. You mistake my signal.
134. Your actions lead me to imagine your mind is made up to parting company.—Remember you do it at your peril.
135. Hail the ship pointed out, on your acknowledging this signal, and desire her to keep her station.
136. You act disobediently.
137. Repeat the signal made.
138. Fire across the stranger, and bring her to.
139. Give the ship whose pennant is shown, on your acknowledging this signal, the assistance she requires.
140. Look out on the starboard beam. Keeping my signals distinctly in view.
141. Look out on the larboard beam.
142. You are standing into danger.
143. Return your signals and instructions.
144. Proceed on the service previously made known to you.
145. The commodore will lead the fleet. The leading ship will resume her station.

REMARK.

The ships to whom these significations are addressed, will be denoted by their pennants being displayed with the signal.

—Question Significations—

146. How many days water have you on board?
147. What is the number of your sick?
148. Can any ship of the fleet inform the commodore of the ship whose pennant is shown? If so, let that ship answer with the affirmative signal, No. 164, and do her endeavour to hail the commodore.
149. Do you see the land?
150. Have you got soundings?
151. Let me know your opinion of the chase.
152. Do you gain upon the chase?
153. Is the chase a friend, enemy, or neutral?
154. How is the chase standing? Answer by compass signal.
155. Is the chase of force?
156. Who are you?
157. What was your longitude, from the mean of your late observations continued by chronometer to the last noon?

158. What was your longitude by chronometer brought up to last noon?

159. What was your latitude by meridian or double altitude last noon?

160. What is your variation?

161. What are your soundings?

162. How many strange sail do you count?

**Explanation.**

Latitude, longitude, and variation, is readily answered, first by hoisting the flags expressing the number of degrees, which being acknowledged, then hoist the flags expressing the number of minutes; or if the numbers will admit the circumstance, hoist the flags expressing the degrees above and minutes below at the same time. If the number of strange sail you count, or the depth of your soundings, or the number of your sick be required, these questions also are readily answered, by hoisting the flags expressive of the respective numbers. To prevent mistake, whenever the flags relate to numbers only, let a short swallow-tailed white pennant be displayed with the flags.

**Answering Significations.**

163. No—or negative.
164. Yes—or affirmative.
165. The chase is, a friend.
166. Ditto, neutral.
167. Ditto, an enemy.
168. Ditto, suspicious.
169. Ditto, a line of battle ship.
170. Ditto, a frigate.
171. Ditto, a merchant vessel.
172. Ditto, on the starboard tack.
173. Ditto, on the larboard tack.
174. I cannot inform you.
175. Unable to execute the duty.

**Significations applicable when at anchor.**

176. Row-guard to-night. I will express the parole on your acknowledging this signal.
177. No boat will be allowed to pass without possessing the parole.
178. Repair on board every person belonging to the fleet.
179. Prepare to sail.
180. Unmoor.
181. Moor.
182. Lie at single anchor.
183. The commodore will weigh in the night, on this signal being acknowledged, the hour will be expressed.
184. Weigh, outermost or leewardmost ships first.
185. Cut or slip, outermost or leewardmost ships first.

**Significations appertaining to Battle.**

186. Keep your people to their quarters.
187. Exercise the great guns and small arms.
188. Van, or starboard division engage.
TACTICS AND SIGNALS.

189. Centre division engage.
190. Rear, or larboard division engage.
191. Engage generally.
192. Leave off engaging.
193. Take suitable stations for your mutual support, and engage the enemy on coming up with them.
194. Gain the wind of the enemy.
195. Cut off a disabled ship, or ships, as pointed out by compass signal on your acknowledging the present signal.
196. Engage the enemy to windward.
197. Engage the enemy to leeward.
198. Engage the enemy's van.
199. Engage the enemy's centre.
200. Engage the enemy's rear.
202. Leading division, break through the enemy's van-line, each astern of the other in succession, and engage them under the lee. Centre division double the enemy's van by engaging them to windward. Following division take suitable positions the better to support the leading and centre divisions.
203. Leading division, break through the enemy's rear-line, each astern of the other in succession. Centre division double the enemy's rear by engaging them to windward. Following division take suitable positions the better to support the leading and centre divisions.

Regular Manoeuvring Significations.

204. Form the order of sailing.
205. Form the order of battle on the starboard tack.
206. Form the order of battle on the larboard tack.
207. Form the order of battle, each ship taking a station, either ahead or astern of the commodore, as best suited to form the line with readiness.
208. Form the order of retreat.
209. Starboard line heave to.
210. Centre line heave to.
211. Larboard line heave to.
212. Starboard line make sail and follow in succession.
213. Centre line make sail and follow in succession.
214. Larboard line make sail and follow in succession.
215. Tack altogether.
216. Tack in succession, in the wake of your next ahead.
217. Tack, so as to continue the order of sailing.
218. Rear ship heave to, the rest form the order of retreat.
219. Starboard ship heave to, the rest form the order of battle on the starboard tack.
220. Larboard ship heave to, the rest form the order of battle on the larboard tack.
221. Van ship heave to, the rest form again in the order of battle upon the same tack.
222. Rear ship heave to, the rest form again in the order of battle upon the same tack.
223. Each leading ship of the starboard and larboard lines will preserve the distance of three cables, or angle 4° 26' from the leading ship of the centre line.
224. Ditto, 4 cables, or angle 3° 20'.
225. Ditto, 6 cables, or angle 2° 13'.
226. Ditto, 8 cables, or angle 1° 40'.
227. Each ship from her next ahead will preserve the distance of half a cable, or angle 25° 1'.
228. Ditto, 1 cable, or angle 13° 8'.
229. Ditto, 1 ½ cables, or angle 8° 50'.
230. Ditto, 2 cables, or angle 6° 39'.
231. Ditto, 3 cables, or angle 4° 26'.
232. Ditto, 4 cables, or angle 3° 20'.

REMARK.

As several of the significations under this head do not appear necessary to the general purposes of a convoy, it may be well to observe, they were adapted to the purpose of manoeuvring a fleet as explained in the foregoing chapter.

Numerical Signals expressing the Parole.

234. Bainbridge. 239. Shaw. 244. Lawrence.

EXPLANATION.

Paroles are useful at sea to discover if a vessel is belonging to the fleet. For instance, should any vessel be supposed a stranger, let her be hailed and questioned for the parole. If the vessel cannot answer, she evidently must be considered as a stranger to the fleet. Also at anchor, it is necessary that paroles should be daily given out to the fleet to enable the guard boats to detect all strangers.

Any parole given out is to be considered as remaining in full force, till done away by the giving out of another parole, which at sea may be unnecessary for a length of time. To prevent mistakes, therefore, it is proper that each ship should note the parole in her log-book at the time of making the parole signal.
TACTICS AND SIGNALS.

NIGHT SIGNALS.

A Table of the Number of Guns, Lights, and Blue-lights, employed to express Numbers, which refer to certain Significations as set forth in the Table.

<table>
<thead>
<tr>
<th>Guns</th>
<th>Blue Lights</th>
<th>Lights</th>
<th>Numbers</th>
</tr>
</thead>
<tbody>
<tr>
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<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
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<tr>
<td>1</td>
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<td>2</td>
<td>2</td>
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<tr>
<td>1</td>
<td>4</td>
<td>3</td>
<td>3</td>
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<td>2</td>
<td>1</td>
<td>4</td>
<td>4</td>
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</tr>
<tr>
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<td>1</td>
<td>21</td>
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</tr>
<tr>
<td>3</td>
<td>2</td>
<td>22</td>
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</tr>
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<td>23</td>
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</tr>
<tr>
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<td>24</td>
<td>South.</td>
</tr>
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<td>25</td>
<td>S. W.</td>
</tr>
<tr>
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<td>6</td>
<td>26</td>
<td>West.</td>
</tr>
<tr>
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<td>7</td>
<td>27</td>
<td>N. W.</td>
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<tr>
<td>3</td>
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<td>9</td>
<td>29</td>
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<tr>
<td>4</td>
<td>1</td>
<td>30</td>
<td></td>
</tr>
</tbody>
</table>

EXPLANATION OF THE TABLE.

Each lantern-light to four, expresses 1, 2, 3, 4, respectively. One blue-light expresses 5. Two guns express 0, three guns express 20, and four guns 30. To express any number, therefore, as for instance 19, fire two guns, burn one blue light, and hoist four vertical lights where best to be seen.

INSTRUCTIONS.

Previous to making any of the first nine signals which do not require guns to express the number, one gun will be fired to draw the attention of the fleet, and in making the remaining signals the necessary guns will be fired to draw the attention of the fleet, previous to hoisting the lights or burning the blue light.
To prevent a confusion of lights when a signal is made from the commodore; the top-light well be covered.

It is recommended to use glass signal-lanthorns, as horn admits a very dull light. Such lanthorns should be well strengthened down the sides, and be provided with a secure ring at the bottom as well as at the top, for the convenience of bending them to each other; and to the top ring of three of the signal lanthorns, a tack should be fitted, about a fathom long, to admit their being bent to each other with regularity and dispatch.

_Fog Signals._

1 Gun at intervals. - - - To point out my situation.
2 Guns quick. - - - Stand upon the starboard tack.
3 Guns quick. - - - Stand upon the larboard tack.
2 Guns a minute apart. - - - Lie-to on the starboard tack.
3 Guns a minute apart. - - - Lie-to on the larboard tack.
2 Guns two minutes apart.
3 Guns two minutes apart.
4 Guns quick. - - - Shorten sail.
5 Guns quick. - - - Requiring assistance.
5 Guns quick. - - - On discovering danger.

_INSTRUCTIONS._

All ships continuing upon their proper tack and course are to ring their bells at intervals.

All ships upon the wrong tack, laying-to, or away from their proper course, are to fire muskets repeatedly till they renew their proper course.

Any acknowledgment to the signal made is avoided, as guns from the different ships of the fleet would cause confusion.

_General instructions._

Should the commodore be put upon the other tack by shift of wind or other means, and it is his wish to continue the tack, he will make the signal; otherwise the fleet are to regard the circumstance as a matter of mere accident.

Should the commodore heave to in the night, he will carry a light at his bowsprit end.

On dark unpleasant nights the commodore will frequently make the signal expressive of his situation.

Manoeuvring in the night will be avoided as much as possible. And since night signals are frequently misunderstood, whenever the circumstance will admit, the commodore will express his intentions during the day.

On the contrary tacks, the ships upon the starboard tack are to keep the wind, and the ships upon the larboard tack are to bear up whenever there is reason to doubt the circumstance of weathering.

Upon tacking or veering in dark nights, every ship is to show a light at each cat-head as she gets round on the other tack.

Should any ship thwart in the night, to save a man, or otherwise, she is immediately to show two distinct lights over her weather side; for instance, one over the bow and the other over the quarter.

If the officer of the fleet be careful to make a comparative estimate between the sailing of their respective ships and the commodore's, there will be less probability of parting company in the night.

If any ship in the night be suspected a stranger to the fleet, and the ship discovering the same be incapable of asking her for the parole; let her present three horizontal lights to the vessel, which is to be answered by two horizontal
lights. If the answer is not properly returned, the suspicion is to be considered as confirmed, and the signal for a stranger is to be made to the fleet.

The ships of the fleet will be careful not to proceed ahead of the commodore, particularly in the night.

Ships in chase will make the admiralty signal to the stranger; or, on suspecting she is a missing ship from the fleet, let them make the signal number 156, viz. who are you? If of the fleet, she naturally will answer by number 165, viz. a friend. Ships in chase also will make known the opinion they form of the chase, from time to time, as they near the vessel and gain more intimate information.

All ships joining the fleet will hoist their distinguishing pennants, or the signal number 165, viz. a friend.

Guns will occasionally be fired to enforce a signal, or to draw the attention of the fleet.

Should a ship's signal be unnoticed by the commodore, other ships nearer the commodore will repeat the signal and hoist that ship's distinguishing pennant; on these occasions it will be necessary to enforce the signal by a gun.

It is requested that each ship will be provided with a light black board, about six feet by two, as a show-board for the purpose of communicating latitude, longitude, and short sentences written in chalk. The sentence being chalked on the board in bold thick letters, the board is to be shown to the ship you wish to address, waving at the same time a white hand-flag, to draw their attention. The contents of the board being understood, the ship is to express the circumstance by waving her flag in turn, and is then to prepare her board with an answer. Thus by reciprocally showing the board, a conversation may be held, at a time when the ships could not venture sufficiently near to hail.
NAVAL REGULATIONS

ISSUED BY COMMAND OF THE PRESIDENT OF THE UNITED STATES OF AMERICA.

Of the Duties of a Commander in Chief, or Commander of a Squadron.

1. HE is to inform the secretary of the navy of all his proceedings which relate to the service.

2. He is to correspond with the public offices, about such matters as relate to them, and send to them an account of all directions given by him, which concern the said offices.

3. He shall inform himself of the properties of the vessels in his squadron, that he may make use of them to advantage as occasion may require.

4. In order to facilitate the operations for which the squadron is destined, its commandant shall take care to distribute his orders to all the commanders under him, regulated by his instructions from the secretary of the navy.

5. Immediately on his receiving orders to sail, he shall execute it as soon as the weather will permit; and previous to his departure, he shall give an account to the secretary of the navy of the condition of his squadron, without omitting any essential circumstance.

6. He shall suit his sails according to the knowledge he ought to have of the qualities of the ships and circumstances of the weather, without obliging the heaviest sailors to an extraordinary exertion, from whence damage may result.

7. When the fleet shall be divided into squadrons or divisions, all the ships shall regulate their motions by those of their respective chiefs.

8. The commandant shall always maintain his squadron in a readiness to sail expeditiously; he shall from time to time visit the ships, as well to examine if they are in this due disposition, as to take care that they observe a good discipline.

9. He may suspend from their employ the captains of vessels, or any other officers under his command, who, by their bad conduct, or other motives, he shall think deserving of such a punishment; but must immediately transmit an account thereof to the secretary of the navy, specifying his reasons for so doing, and furnish the captain or officer suspended with a copy thereof.

10. The commandant of the squadron ought not to alter the appointments assigned to the officers, at the time of fitting out, without the weightiest and well founded reasons.
11. He is to preserve his instructions and particular orders, that he shall have received during the campaign, and other papers relative to his government, in the most intelligible disposition.

12. At the end of the cruise he shall transmit to the secretary of the navy a fair copy of all his official correspondence. He is to deliver to the secretary of the navy the journal of his navigation, which he is to make during the cruise with the greatest exactness.

13. He is never to give orders to any captain to bear supernumeraries, unless there be good cause for it, which is to be expressed in the body of the order; and he is to inform the secretary of the navy when he gives such orders, and of his reasons for so doing.

14. When he is at sea, he is frequently to exercise the ships under his command, and draw them into lines of battle, when the weather is fair, and the same can be done consistently with his cruising orders and without interruption to the voyage.

15. He is to visit the ships of his squadron or division, and view the men on board, and see them mustered, as often as he shall think necessary.

16. When he is in foreign parts, where naval or other officers are established, he is to conform himself as much as possible to the standing rules of the navy, in such directions as he shall have occasion to give them; and never to put them under any extraordinary expenses, unless the service should absolutely require the same.

17. He is never to interest himself in the purchase of any stores or provisions in foreign parts, where there are proper officers appointed for that service; except there shall be an absolute necessity to make use of his credit or authority, to procure such provisions or stores as are wanted; but in that case, he shall not be so concerned as to have any private interest in the same.

Of the Duties of a Captain, or Commander.

1. When a captain or commander is appointed to command one of the United States ships, he is immediately to repair on board, and visit her throughout.

2. To give his constant attendance on board and quicken the dispatch of the work; and to send to the navy department weekly accounts, or oftener if necessary, of the condition and circumstances she is in, and the progress made in fitting her out.

3. To take inventories of all the stores committed to the charge of his officers respectively, and to require from his boatswain, gunner, sail-maker, carpenter and purser, counterparts of their respective indents.

4. To cause his clerk to be present, and to take an account of all the stores and provisions that come on board, and when; which account he is to compare with the indents, in order to prevent any fraud or neglect.

5. To keep counter books of the expense of the ships stores and provisions, whereby to know the state and condition of the same; and to audit the accounts of the officers, entrusted therewith, once a week, in order to be a check upon them.

6. When ordered to recruit, he is to use his best endeavours to get the ship manned, but those men examined by the surgeon's mate, and not to enter any but men of able bodies, and fit for service; he is to keep the established number of men complete, and not to exceed his complement.

7. When the ships company is completed they shall not only be divided into messes and guards, but into so many divisions; each division to be commanded by a lieutenant, who alone is to be responsible for the cleanliness of his men; he must see that they have the quantity of clothing ordered by the captain.
he must also attend to their hammocks; and he shall order without delay the
partition of the people for an engagement, to the end that, before they sail, every one may know his post.

8. He may grant to private ships of the nation the succours he lawfully may,
taking from their captains or patrons a correspondent security, that the owners may satisfy the amount or value of the things supplied.

9. At all times, whether sailing alone or in a squadron, he shall have his ship ready for an immediate engagement: to which purpose, he shall not permit any thing to be on deck, that may embarrass the management of the guns, and not be readily cleared away.

10. As, from the beginning of the campaign, the plan of the combat ought to be formed, he shall have his directions given, and his people so placed, as not to be unprovided against any accident which may happen.

11. If it is determined to board the enemy, the captain is not under any pretext to quit his ship, whose preservation must be the chief object of his care; but he may appoint his second in command, or any other officer he thinks proper for the function, without attending to his antiquity.

12. He shall observe, during his cruise, the capacity, application, and behaviour of his officers; and for experience, he shall employ them in works and commissions that may manifest their intelligence.

13. He is to cause all new raised men and others, not skilled in seamanship, daily to lash up their hammocks, and carry them to the proper places for barricading the ship, whenever the weather will permit; and also to have them practised in going frequently every day, up and down the shrouds, and employed on all kinds of work, to be created purposely, to keep them in action and to teach them the duty of seamen.

14. To keep a regular muster-book, setting down therein the names of all persons entered to serve on board, with all circumstances relating to them.

15. Himself to muster the ship's company at least once a week, in port or at sea, and to be very exact in his duty; and if any person shall absent himself from his duty, without leave, for three successive musters, he is to be marked as a run-away, on the ships books.

16. To send every month, one muster-book complete to the navy office, signed by himself and purser.

17. To make a list of seamen run away, inserting the same at the end of the muster-books, and to distinguish the time, manner, and by opportunity they made their escape: if the desertion happens in any port of the United States, he is to send to the navy department their names, place of abode, and all the circumstances of their escape.

18. The captain of the ship shall be responsible for his crew, whose desertion shall be laid to his charge, whenever it proceeds from a want of necessary care; but if it proceeds from the neglect of an officer who shall have the charge of a watering party, or any other duty on shore, and from his negligence any part of the crew entrusted to him shall desert, that officer shall be responsible for the same.

19. He is to make out tickets for all such seamen as shall be discharged from his books, signed by himself and purser, and to deliver them to none but the party; and if he be dead or absent he is to send the ticket forthwith to the navy office.

20. He is not to suffer the ship's stores to be misapplied or wasted, and if such loss happens by the negligence or wilfulness of any of the ship's company, he is to charge the value thereof against the wages of the offender on the muster and pay-books.

21. He shall make no alteration in any part of the ship.

22. He is to keep sentinels posted at the scuttle, leading into all the store-rooms, and no person is to pass down but by leave from the captain or com-
manding officer of the watch; which leave must be signified to the sentinel from
the quarter-deck.
23. He is to observe reasonable times in setting up his shrouds and other
rigging, especially when they are new and apt to stretch; and also to favour
his masts as much as possible.
24. He is to cause such stores as require it, to be frequently surveyed and
aired, and their defects repaired; and the store-rooms to be kept airy and in
good condition, and secured against rats.
25. He is not to make use of ship's sails for covering boats, or for awn-
ings.
26. The decks or gratings are not to be scraped oftener than is necessary,
but are to be washed and swabbed once a day, and air let into the hold as of-
ten as may be. The birth-deck is not to be washed on any account, but when
necessary must be scraped, and every day dry scrubbed. The men must not
be allowed to eat on the birth deck, but every attention paid to keep the deck
as clean and as dry as possible.
27. He is to permit every officer to possess his proper cabin, and not to make
any variation therein.
28. No person is to lie upon the orlop but by leave from the captain, nor to
go among the cables with candles, but when service requires it.
29. Such as smoke tobacco are to take it in the fore-castle, and in no other
place without the captain's permission, which is never to be given to smoke
below the upper gun-deck.
30. Care is to be taken every night, on setting the watch, that all fire and
candles be extinguished, in the cock-room, hold, steward-room, cock-pit, and
every where between decks; nor are candles to be used in any other part of
the ship but in lanterns, and that not without the captain's leave; and the lan-
terns must always be whole and unbroken.
31. He is not to suffer any person to suttle or sell any sorts of liquors to the
ship's company, nor any debts for the same to be inserted in the slop-book, on
any pretence whatsoever.
32. Before the ship proceeds to sea, he is, without any partiality or favour,
to examine and rate the ship's company, according to their abilities, and to
take care that every person in the ship, without distinction, do actually per-
form the duty for which he is rated.
33. Before the ship sails, he is to make a regulation for quartering the offi-
cers and men, and distributing them to the great guns, small arms, rigging,
&c. and a list of such order and distribution is to be fixed up in the most pub-
lic place of the ship. He is also frequently to exercise the ship's company in
the use of the great guns and small arms; and to set down in his journal the
times he exercises them.
34. The following number of men at least, (exclusive of marines) are to be
exercised and trained up to the use of small arms, under the particular care of
a lieutenant or master at arms.

<table>
<thead>
<tr>
<th>Ships</th>
<th>Men</th>
</tr>
</thead>
<tbody>
<tr>
<td>44 gun ship</td>
<td>75</td>
</tr>
<tr>
<td>36 do.</td>
<td>60</td>
</tr>
<tr>
<td>32 do.</td>
<td>45</td>
</tr>
<tr>
<td>24 and under 32 do.</td>
<td>40</td>
</tr>
<tr>
<td>18 and under 24 do.</td>
<td>30</td>
</tr>
<tr>
<td>All smaller vessels</td>
<td>20</td>
</tr>
</tbody>
</table>

35. If any officers are absent from their duty when the ship is under sailing
orders, he is to send their names to the navy office, with the cause of their ab-
sence.

He is to take care of his boats, and secure them before blowing wea-
ther; also the colours are not to be kept abroad in windy weather, but due
care taken of them.
36. He is not to carry any woman to sea, without orders from the navy office, or the commander of the squadron.

37. When he is to sail from port to port in time of war, or appearance thereof, he is to give notice to merchantmen bound his way, and take them under his care, if they are ready; but not to make unnecessary stay, or deviate from his orders on that account.

38. He is to keep a regular journal, and at the end of every three months, he is to send a copy thereof to the navy office; and at the expiration of the voyage, to give in a general copy.

39. He is by all opportunities to send an account of his proceedings to the navy office, with the condition of the ship, men, &c. he is likewise to keep a punctual correspondence with every of the public offices, in whatsoever respectively concerns them.

40. He is not to go into any port, but such as are directed by his orders, unless necessitously obliged, and then not to make any unnecessary stay: if employed in cruising, he is to keep she sea the time required by his orders, or give reasons for acting to the contrary.

41. Upon all occasions of anchoring, he is to take great care in the choice of a good birth, and examine the quality of the ground for anchoring, where he is a stranger, sounding at least three cable's lengths round the ship.

42. In foreign ports he is to use the utmost good husbandry in careening the ship, and not to do it but under an absolute necessity; none are to be employed in careening and refitting the ship but the ship's company, where it can be avoided, and for the encouragement of his own men, they are entitled to an extraordinary allowance per day; and to prevent any abuse herein, each ship has the number of operative men limited, as follows:

<table>
<thead>
<tr>
<th>In the United States</th>
<th>In all foreign parts</th>
</tr>
</thead>
<tbody>
<tr>
<td>To master carpenters, carpenter's mates, shipwrights and caulkers, for working on board the ship they belong to, in caulking and fitting her for careen, and graving or tallowing her, per day,</td>
<td>50 cents.</td>
</tr>
<tr>
<td>For working on board any other of the United States' ships,</td>
<td>75 cents.</td>
</tr>
</tbody>
</table>

And there shall be allowed no more for caulking a ship, fitting her for careen, graving or tallowing her, or other necessary works, for each careening or cleaning, than what amounts to the labour of the following number of men for one day, viz.

For a 44—180 men for one day.
For a 36—160 do. do.
For a 32—140 do. do.
For a 24—90 do. do.
For an 18—70 do. do.
All under—30 do. do.

43. If he is obliged to take up money abroad for the use of the ship, he is to negotiate it at the best exchange.

44. He is to advise the proper officer of what bills he draws, with the reasons thereof, and with the said bills send duplicates of his accounts, and vouchers for his disbursements, signed by himself and purser.

45. He is to take care that all stores brought on board be delivered to the proper officers; and to take their receipts for the same.

46. Upon the death of any officer, he is to take care that an inventory be taken of all his goods and papers, and that the same be sealed up, and reserved for the use of such as have a legal right to demand them.
47. When any officer who has the custody of stores or provisions, shall die; be removed or suspended, he is to cause an exact survey and inventory to be taken forthwith of the remains of such stores, which is to be signed by the successor, who is to keep a duplicate thereof, and also by the surveying officers.

48. Upon his own removal into another ship, he is to show the originals of all such orders as have been sent to him and remain unexecuted, to his successor, and leave with him attested copies of the same.

49. He is to leave with his successor a complete muster-book, and send up all other books and accounts under his charge, to the officers they respectively relate to.

50. In case of shipwreck or other disaster, whereby the ship may perish, the officers and men are to stay with the remains as long as possible, and save all they can.

51. When any men borne for wages are discharged from one ship to another, the captain of the ship, from which they are so discharged, is to send immediately pay lists for such men to the navy office, and the purser of the ship from which they are so discharged, is also to supply the purser of the ship to which they are transferred, a pay list, stating the balances respectively due them.

52. To promote cleanliness and health, the following rules are to be attended to. 1. All men on board are to keep themselves in every respect as clean as possible. 2. That the ship be aired between decks as much as may be, and that she be always kept thoroughly clean and dry. 3. That all necessary precautions be used, by placing sentinels or otherwise, to prevent people easing themselves in the hold, or throwing any thing there that may occasion nastiness. 4. That no fruit or strong liquors be sold on board the ship; except in the judgment of the surgeon of the ship, in which case he will issue an order.

53. He is responsible for the whole conduct and good government of the ship, and for the due execution of all regulations which concern the several duties of the officers and company of the ship, who are to obey him in all things, which he shall direct them for the service of the United States.

54. He is answerable for the faults of his clerk; nor can he receive his wages without the proper certificates, and must make good all damages sustained by his neglect or irregularity.

55. The quarter-deck must never be left without one commissioned officer at least, and the other necessary officers which the captain may deem proper, to attend to the duty of the ship.

56. Commanding officers are to discourage seamen from selling their wages; and not to attest letters of attorney, if the same appear granted in consideration of money given for the purchase of wages.

Of the Duties of a Lieutenant:

1. He shall promptly, faithfully, and diligently, execute all such orders as he shall receive from his commander, for the public service, nor absent himself from the ship without leave, on any pretence.

2. He is to keep a list of the officers and men in his watch, muster them, and report the names of the absentees. He is to see that good order be kept in his watch, that no fire or candle be burning, and that no tobacco be smokèd between decks.

3. He is not to change the course of the ship at sea without the captain's directions, unless to prevent an immediate danger.

4. No boats are to come on board or go off without the lieutenant of the watch being acquainted with it.

5. He is to inform the captain of all irregularities, and to be upon deck in his watch, and prevent noise or confusion.
6. He is to see that the men be in their proper quarters in time of action; and that they do perform all their duty.

7. He is to keep a journal, and, at the end of the voyage, to deliver a copy thereof into the navy office.

8. The youngest lieutenant is frequently to exercise the seamen in the use of small arms; and in the time of action he is to be chiefly with them.

9. He is to take great care of the small arms, and see that they be kept clean and in good condition for service, and that they be not lost or embezzeled.

10. The first lieutenant is to make out a general alphabetical book of the ship's company, and proper watch, quarter and station bills, in case of fire, manning of ship, loosing and furling of sails, reefing of top-sails at sea, working of ship, mooring and unmooring, &c. leaving room for unavoidable alterations. This is to be hung in some public part of the ship, for the inspection of every person concerned.

11. No lieutenant or other officer belonging to a ship of the United States to go on shore, or on board another vessel, without first obtaining permission from the captain or commanding officer, on his peril; and in the absence of the captain, the commanding officer to grant no permission of this sort without authority from the captain previous to the captain's leaving the ship.

Of the Duties of a Sailing-Master.

1. He is to inspect the provisions and stores sent on board, and of what appears not good, he is to acquaint the captain.

2. He is to take care of the ballast, and see that it be clean and wholesome, and sign the quantity delivered; and in returning ballast, to see that vessels carry away their full lading.

3. He is to give his directions in stowing the hold for the mast-room, trimming the ship, and for preservation of the provisions; and the oldest provisions to be stowed so as to be first expended.

4. He is to take special care that the rigging and stores be duly preserved; and to sign the carpenter's and boatswain's expense-book, taking care not to sign undue allowances.

5. He is to navigate the ship, under the direction of his superior officer, and see that the log and log-book be duly kept, and to keep a good look out.

6. He is duly to observe the appearances of coasts; and if he discovers any new shoals, or rocks under water, to note them down in his journal, with their bearing and depth of water.

7. He is to keep the hawser clear when the ship is at anchor, and see that she is not girt with her cables.

8. He is to provide himself with proper instruments, and books of navigation, and keep a regular journal, noting therein the going out and coming in of all stores and provisions; and at the end of every cruise, deliver a copy thereof into the navy office, with his log-book.

9. He is to be very careful not to sign any accounts, books, lists or tickets, before he has thoroughly informed himself of the truth of every particular contained in the same.

10. He is to keep the ship in constant trim, and frequently to note her draught of water in the log-book. He is to observe the alterations made by taking in stores, water, or ballast, and when the ship is in chase, or trying her sailing with another, he is to make memorandums of the draughts of water, the rake of the masts, state of the rigging, and to note every possible observation that may lead to the knowledge of the ship's best point of sailing.
Of the Duties of a Surgeon.

1. To inspect and take care of the necessaries sent on board for the use of the sick men; if not good, he must acquaint the captain; and he must see that they are duly served out for the relief of the sick.

2. To visit the men under his care twice a day, or oftener, if circumstances require it; he must see that his mates do their duty, so that none want due attendance and relief.

3. In cases that are difficult he is to advise with the surgeons of the squadron.

4. To inform the captain daily of the state of his patients.

5. When the sick are ordered to the hospitals, he is to send with them to the surgeon, an account of the time and manner of their being taken ill, and how they have been treated.

6. But none are to be sent to sick quarters, unless their distempers, or the number of the sick on board, are such, that they cannot be taken due care of; and this the surgeon is to certify under his hand before removal. If the surgeon of the hospital finds they might have been cured in a little time on board, the surgeon of the ship is to have charged against his wages for every man so sent, ten dollars.

7. To be ready with his mates and assistants in an engagement, having all things at hand necessary for stopping of blood and dressing of wounds.

8. To keep a day-book of his practice, containing the names of his patients, their hurts, distempers, when taken ill, when recovered, removal, death, prescriptions, and method of treatment, while under cure.

9. From the last book he is to form two journals, one containing his physical, and the other his chirurgical practice; which are to be sent to the navy office at the end of every voyage.

10. Stores for the medical department are to be furnished upon his requisition, and he will be held responsible for the expenditure thereof.

11. He will keep a regular account of his receipts and expenditures of such stores, and transmit an account thereof to the accountant of the navy, at the end of every cruise.

Of the Duties of a Chaplain.

1. He is to read prayers at stated periods; perform all funeral ceremonies over such persons as may die in the service, in the vessel to which he belongs; or, if directed by the commanding officer, over any person that may die in any other public vessel.

2. He shall perform the duty of a school-master; and to that end he shall instruct the midshipmen and volunteers, in writing, arithmetic, and navigation, and in whatsoever may contribute to render them proficient. He is likewise to teach the other youths of the ship, according to such orders as he shall receive from the captain. He is to be diligent in his office, and such as are idle must be represented to the captain, who shall take due notice thereof.

Of the Duties of a Boatswain and Master-Sail-Maker.

1. The boatswain is to receive into his charge the rigging, cables, cordage, anchors, sails, boats, &c.

2. He is not to cut up any cordage or canvass without an order in writing from the captain, and under the inspection of the master; and always to have by him a good quantity of small plats for security of the cables.

3. He and his mates are to assist and relieve the watch, see that the men attend upon deck, and that the working of the ship be performed with as little confusion as may be.
4. His accounts are to be audited and vouched by the captain and master, and transmitted to the navy office.

5. If he has cause of complaint against any of the officers of the ship, with relation to the disposition of the stores under his charge, he is to represent the same to the navy office, before the pay of the ship. He is not to receive his own wages until his accounts are passed.

6. He is not to sign any accounts, books, lists, or tickets, before he has thoroughly informed himself of the truth of every particular therein contained.

7. Master-Sail-Maker. He is, with his mate and crew, to examine all sails that are brought on board, and to attend all surveys and conversions of sails.

8. He is always and in due time to repair and keep the sails in order, fit for service.

9. He is to see that they are dry when put into the store-room, or very soon to have them taken up and aired, and see that they are secured from drips, damp, and vermin, as much as possible.

10. When any sails are to be returned into store, he is to attend the delivery of them for their greater safety.

Of the Duties of a Gunner, Armorer, and Gun-Smith.

1. The gunner is to receive by indenture, the ordnance, ammunition, small arms, and other stores allowed for the voyage; and if any part thereof be not good, he is to represent the same to the captain, in order to its being surveyed and returned.

2. He is to see that the powder-room be well secured, and in right order, before the powder is brought into the ship.

3. Powder in the copper-hooped barrels to be lodged in the ground tier; to see that the doors of the powder-room be fast locked, the skuttle well shut and covered, and to deliver the keys to the captain.

4. He is timely to advise the captain when any powder comes on board, nor is he to remove it, prepare fuzes, &c. without the captain's directions, so that the fire and candles may be extinguished, sentinels posted, and all care used to prevent accidents.

5. He is not to go or send any one into the powder-rooms, but by leave of the captain, and to take care that they have nothing about them that will strike fire in falling.

6. No more than three rounds of partchment cartridges are to be filled at a time.

7. Perishing stores are to be surveyed and condemned: but if near any port in the United States, and they can conveniently be returned into store, they must be, otherwise may be thrown over board.

8. Empty powder barrels are not to be staved, but preserved, to shift such as may be decayed.

9. The Armorer and Gun-Smith are to assist the gunner in the survey and receipt of small arms, and to keep them clean and in good order; but not to take them too often to pieces, which is detrimental to locks, &c.

10. Their station is in the gun-room, or such other place as the commanding officer may direct, where they are to observe the gunner's orders.

11. The Gunner is to receive the armorer's tools, and to account for them at the end of the voyage, in the same manner as for the other stores under his charge.

12. In foreign parts, if the small arms want such repairs as cannot be done on board, the captain must cause a survey, and the defects may be sent
ashore to be repaired; but the armorer or gun-smith must attend to see the repairs well executed. They must return the small arms into store clean and in good order.

13. The quantities of powder for exercise, and on occasions of service and scaling, must be regulated by the captain or commanding officer. In time of action the allowance of powder must be reduced by degrees, until the same be lessened to one fourth of the weight of the shot. He is not to swab a gun when it grows hot, for fear of splitting.

14. He is to take care that the guns be placed upon their proper carriages; for by this means they will fit, and stand a proper height for the fill of the ports.

15. He is not to scale the guns oftener than the ship is refitted, unless upon extraordinary occasions, and with the captain's orders; and when they are loaded for service, he is to see them well tampioned and the vents filled with oakum.

16. He is to use great caution in order to prevent damage to such guns as are struck in the hold, by paying them all over with a coat of warm tar and tallow mixt, &c.

17. He is to take care of the stores committed to him; for no waste, that is not perishable, will be allowed him, only reasonable wear; and if any accident, it must be vouched by the captain.

18. He is to keep the boxes of grape-shot and hand-grenadoes in a dry place.

19. He is not to load the guns with unfett mixtures, which greatly endanger their splitting.

20. If he has cause of complaint against any of the officers of the ship, with relation to the disposition of the stores under his charge, he is to represent the same to the navy office, before the pay of the ship.

**Of the Duties of a Carpenter.**

1. To take upon him the care and preservation of the ship's hull, masts, &c. and also the stores committed to him by indenture.

2. To visit and inspect all parts of the ship daily, to see that all things are well secured and caulked, order the pumps and make reports to the captain.

3. In an engagement he is to be watchful, and have all materials ready to repair damages; and frequently to pass up and down the hold with his crew, to be ready to plug up shot-holes.

**Of the Duties of a Master-at-arms and Corporal.**

1. Daily, by turns (as the captain shall appoint) to exercise the ship's company.

2. He is to place and relieve sentinels, to mount with the guard, and to see that the arms be kept in order.

3. He is to see that the fire and candles be put out in season, and according to the captain's order.

4. He is to visit all vessels coming to the ship, and prevent the seamen going from the ship without leave.

5. He is to acquaint the officer of the watch with all irregularities in the ship, which shall come to his knowledge.

6. The Corporals are to act in subordination to the master-at-arms, and to perform the same duty under him, and to perform the duty themselves where a master-at-arms is not allowed.
Of the Duties of Midshipmen:

1. No particular duties can be assigned to this class of officers.
2. They are promptly and faithfully to execute all orders for the public service, of their commanding officers.
3. The commanding officers will consider the midshipmen, as a class of officers meriting, in an especial degree, the fostering care of their government. They will see, therefore, that the school-masters perform their duty towards them, by diligently and faithfully instructing them in those sciences appertaining to their department; that they use their utmost care, to render them proficient therein.
4. Midshipmen are to keep regular journals, and deliver them to the commanding officer at the stated periods, in due form.
5. They are to consider it as the duty they owe to their country, to employ a due portion of their time in the study of naval tactics, and in acquiring a thorough and extensive knowledge of all the various duties to be performed on board of a ship of war.

Of the Duties of a Cook.

1. He is to have charge of the steep-tub, and is answerable for the meat put therein.
2. He is to see the meat duly watered, and the provisions carefully and cleanly boiled, and delivered to the men according to the practice of the navy.
3. In stormy weather he is to secure the steep-tub, that it may not be washed over board; but if it should be inevitably lost, the captain must certify it, and he is to make oath to the number of pieces so lost, that it may be allowed in the purser's account.

There shall be a distinct apartment appropriated on board of each vessel, for the surgeon, purser, boatswain, gunner, sail-maker, and carpenter, that they may keep the public goods committed respectively to their care.

Regulations to be observed respecting Provisions.

1. Provisions and slops are to be furnished upon the requisitions of the commanding officer, founded upon the purser's indents.
2. The purser being held responsible for the expenditure, shall, as far as may be practicable, examine and inspect all provisions offered to the vessel, and none shall be received that are objected to by him, unless they are examined and approved of by at least two commissioned officers of the vessel.
3. In all cases where it may appear to the purser, that provisions are damaged or spoiling, it will be his duty to apply to the commanding officer, who will direct a survey, by three officers, one of whom, at least, to be commissioned.
4. If upon a settlement of the purser's provision account, there shall appear a loss or deficiency of more than seven and a half per cent. upon the amount of provisions received, he will be charged with and held responsible for such loss or deficiency exceeding the seven and a half per cent. unless he shows by regular surveys that the loss has been unavoidably sustained by damage or otherwise.
5. Captains may shorten the daily allowance of provisions, when necessity shall require it, taking due care that each man has credit for his deficiency, that he may be paid for the same.
6. No officer is to have whole allowance while the company is at short.
7. Beef for the use of the navy is to be cut into 10 pound pieces, pork into
NAVAL REGULATIONS.

S pound; and every cask to have the contents thereof marked on the head, and the person's name by whom the same was furnished.

8. If there be a want of pork, the captain may order beef, in the proportion established, to be given out in lieu thereof, and vice versa.

9. One half gallon of water at least shall be allowed every man in foreign voyages, and such further quantity as shall be thought necessary on the home station, but on particular occasions the captain may shorten this allowance.

10. To prevent the buying of casks abroad, no casks are to be shipped which will want to be replaced by new ones before the vessel's return to the United States.

11. If any provisions slip out of the slings, or are damaged through carelessness, the captain is to charge the value against the wages of the offender.

12. Every ship to be provided with a seine, and the crew supplied with fresh provisions as it can conveniently be done.

Regulations respecting Slops,

1. Slop clothing is to be charged to the purser at the cost and charges, and he is to be held accountable for the expenditure.

2. And in no case will the purser be credited even for any alleged loss by damage in slops, unless he shows by regular surveys signed by three officers, one of whom at least to be commissioned, that the loss has been unavoidably sustained by damage, and not by any neglect or inattention on his part.

3. And as a compensation for the risk and responsibility, the purser shall be authorized to dispose of the slops to the crew at a profit of ten per cent; but he must at the end of every cruise render a regular and particular slop account, showing by appropriate columns, the quantities of each several kinds of articles received or purchased, and the prices and amount, and from whom, when and where, and he shall show the quantities disposed of, and to whom, and at what prices; so that his slop account will show the articles, prices, and amount received and disposed of.

4. On the death or removal of a purser, the commanding officer will cause a regular survey to be made on the slops remaining on hand, and an inventory thereof to be made out and signed by at least two commissioned officers.

5. Seamen destitute of necessaries may be supplied with slops by an order from the captain, after the vessel has commenced her voyage.

6. None are to receive a second supply until they have served full two months and then not exceeding half their pay, and in the same proportion for every two months if they shall be in want.

7. Slops are to be issued out publicly and in the presence of an officer, who is to be appointed by the captain, to see the articles delivered to the seamen and others, and the receipts given for the same, which he is also to certify.

8. The captain is to oblige those who are ragged or want bedding, to receive such necessaries as they stand in need of.

9. The captain is to sign the slop-book before the ship is paid off, or on his removal from the ship at any time, the purser is to send the same to the proper accounting officer duly signed.

10. On the discharge of a man by ticket, the value of the clothes he has been supplied with must be noted on the same in words at length.

11. If necessity requires the buying of clothes in foreign parts, the captain must cause them to be procured of the kinds prescribed for the navy, and as moderate as possible; he must also, by the first opportunity, cause an invoice of the same to be forwarded to the navy department.
Regulations Respecting the Form and Mode of keeping the Log-Book and Journals, on board of Ships or other vessels of the United States.

For the purpose of establishing uniformity, the president orders as follows, viz.

1. The quarter bill, log-tables or book, and journals of officers, must be kept conformably to the annexed models.

2. The captains or commanders will cause to be laid before them the first and fifteenth of every month, the journals of the sea lieutenants, masters, midshipmen, and volunteers under their orders, will examine and compare them with their own, and will send them at the end of every cruise or expedition to the navy department.

3. If any of the said journals contain observations or remarks which may contribute to the improvement of geography, by ascertaining the latitude and longitude, fixing, or rectifying the position of places, the heights and depth of land, charts, plans or descriptions of any port, anchorage ground, coasts, islands or danger little known; remarks relative to the direction and effects of currents, tides, or winds; the officers or persons appointed to examine them, will make extracts of whatever appears to merit to be preserved, and after these extracts have been communicated to the officer or author of the journal from which they have been drawn, and that he has certified in writing to the fidelity of his journal, as well as of the charts, plans and views, which he has joined to it, the same shall be signed by the officers and examiners, and transmitted with their opinion thereon to the secretary of the navy, to be preserved in the depot of charts, plans, and journals.
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<thead>
<tr>
<th>H.</th>
<th>K.</th>
<th>F.</th>
<th>Courses</th>
<th>Winds</th>
<th>Occurrences, remarks and historical events, &amp;c. made on board the United States of guns, Commander, on the 6 day of Jan. year 1811</th>
<th>Result of day's work</th>
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Distance per Log — 182 1/2 Miles

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<tr>
<th>H.</th>
<th>K.</th>
<th>F.</th>
<th>Courses</th>
<th>Winds</th>
<th>Occurrences and remarks, on board the United States' frigate of guns, Commander, on the day of year</th>
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Lati'de. obs'd.
Long'de. obs'd.
Vari. Even'g. Amp'de.
Vari. Morn'g. Amp'de.
**Regulations respecting Courts Martial.**

1. All courts martial are to be held, offenses tried, sentences pronounced, and execution of such sentences done, agreeably to the articles and orders contained in an act of Congress, made on the 23rd of April, in the year 1800, entitled "an act for the better government of the navy of the United States."

2. Courts martial may be convened as often as the President of the United States, the secretary of the navy, or commander in chief of a fleet, or commander of a squadron, while acting out of the United States, shall deem it necessary.

3. All complaints are to be made in writing, in which are to be set forth the facts, time, place, and the manner how they were committed.

4. The judge advocate is to examine witnesses upon oath, and by order of the commander in chief, or in his absence, of the president of the court, to send an attested copy of the charge to the party accused, in time to admit his preparing his defence.

5. In all cases, the youngest member must vote first, and so proceed up to the president.

**Regulations respecting Convoys.**

1. A commander of a squadron or commander of a ship appointed to convoy the trade of the United States, must give necessary and proper instructions in writing, and signed by himself, to all the masters of merchant ships and vessels under his protection.

2. He is to take an exact list in proper form, containing the names of all the ships and vessels under his convoy, and send a copy thereof to the navy department, before he sails.

3. He is not, in time of actual war, to chase out of sight of his convoy, but be watchful to defend them from attack or surprize; and if distressed, to afford them all necessary assistance.—He is to extend the same protection to his convoy, when the United States are not engaged in war.

4. If the master of a ship shall misbehave, by delaying the convoy, abandoning, or disobeying the established instructions, the commander is to report him with a narrative of the facts to the secretary of the navy, by the first opportunity.

5. The commander is to carry a top-light in the night, to prevent separation, unless on particular occasions, he may deem it improper.

6. He may order his signals to be repeated by as many ships of war under his command, as he may think fit.

7. When different convoys set sail at the same time, or join at sea, they are to keep together, so long as their courses lie together: when it thus happens, the eldest commander of a convoy, shall command in the first post; the next eldest in the second, and so on according to seniority.

8. Commanders of different convoys are to wear the lights of their respective posts, and repeat the signals, in order, as is usual to flag officers.

9. Convoys are to sail like divisions, and proper signals to be made at separation.

*The President of the United States of America, ordains and directs the commanders of squadrons, and all captains and other officers in the navy of the United States, to execute, and cause to be executed, the aforesaid regulations.*
HAVING COMPLETED THE INSTRUCTIONS OF THE PRESIDENT OF THE
UNITED STATES, WE SUBJOIN

REMARKS ON THE GENERAL UTILITY OF

ONE UNIFORM SYSTEM OF GOVERNMENT ON BOARD ALL SHIPS OF WAR.

The utility of a general system of acting is found indispensable, and seems to have been adopted, in every profession but that of the navy.

Ships are constructed on the same models, navigated by the same principles, but not governed by the same regulations. The consequences hence arising are so apparent, that we shall endeavour to point out the advantages which would result from the adoption of an uniform principle, and mark the prejudicial tendency which the want of it has at present on the service. The Articles of War, which specify crimes and punishments, are, indeed, general, but it is not on them alone that the internal regulation of a ship depends. Good discipline is acquired by approved laws and regulations, duly observed and enforced, which will assist what must always, in a great measure, depend on the abilities and disposition of the commander. Regulations may sometimes be adopted by a captain, which have been composed by some other person; and, it will be happy for the service when, conscious of his own inability, he accepts that assistance from another, which his own experience cannot afford him. It is surely better to have good regulations, without adequate abilities, than to possess neither; but an entire dependence on the qualifications of a single person to conduct so great a charge, where so many casualties may intervene to prevent his doing justice to it, strengthens the idea of the necessity of establishing general rules for the internal government of the navy: for besides the beauty of appearance in having an uniform method of carrying into execution the duty of a ship, it would have the good effect of preventing discontent amongst seamen, by the frequent alterations made by different captains, who when they succeed to the command, very often change every existing regulation. The officer, also, who has been many years on half pay, cannot be supposed to have every form so ready, as the one who has been constantly in employ. The spring of action may be relaxed with, out being broken, but time will be required to reanimate it. A well-chosen and public system of carrying on his duty may therefore assist him, when his services are called forth after a long interval of inaction. The American navy has shown with great splendor in its several combats, but that must be attributed to the spirit of Americans. Discipline may overawe a coward, but cannot make him brave; the dread of ignomy and punishment may act as a spur on a poltroon, and command his attention, but to Americans it is rarely wanted.

This has been evinced by the voluntary acts of bravery displayed in different actions, on board private armed vessels. We call them voluntary, because where discipline relaxes, commands become less attended to, and the inclination of the seaman is alone depended upon in obeying them. The officer who comes forward from half pay, after a long interval of relaxation on shore, finds himself deficient in the common points, which are habitual to those in employ; he executes his charge of fitting the ship for sea, with that diffidence which belongs to inexperience; and, instead of establishing his method in a progressive state, and instructing the inferior officers and seamen, with that particular mode of carrying on the duty which he means to pursue, every thing is neglected. In this case, the seaman, from not being
confined to one system, acquires a careless indifferent habit, which becomes the
more apparent when the ship arrives in company with a well-disciplined man of
war. Its commander then sees her inferiority, and recovers from his apathy;—
new rules and regulations are now made, or perhaps first instituted, and the
whole economy of the ship becomes a wild chaos of confusion. Innovations
are multiplied without number, and what would at first have given general satis-
faction, is now the subject of ridicule and disgust; which, to an ill-disposed
ship's company, is the forerunner of desertion and discontent. We shall there-
fore commence our remarks at the first commissioning of a ship, and go regular-
ly through those leading points that are attached to every man of war, and to
which every officer appointed to the rank of a Lieutenant is supposed to be
competent.—The first object of every captain in the navy, on his appointment
to a ship, must be to have those officers with him whose dispositions he is ac-
quainted with, and upon whose abilities and attention, his character, comfort, and
happiness, are, in a great measure dependant. Indeed, it is almost necessary, in
order to have good discipline in a ship, that the captain and officers should serve
together by choice; the good understanding subsisting between them would then
beget that confidence so essentially requisite between a superior and his inferiors.
When persons so widely separated by rank and command as the captain and his
junior officers, accidentally meet together, the former is naturally tenacious of
his authority, and cautious of every power that he delegates to another; to one
especially, with whose abilities and disposition he is unacquainted. On the other
hand, perhaps, from being too scrupulous, the officers become diffident of exert-
ing themselves; and from not impartially weighing the motives of their com-
mander, may sometimes neglect those points which would be of the greatest ser-
vice. This consideration, although affecting all officers, more particularly affects
the first lieutenant, as the executive officer, upon whose abilities the whole move-
ment of a ship depends.

A captain therefore satisfied with the person in this situation, has a degree of
policy in leaving the whole internal management to his direction, marking out
the chief lines by which he means the duty and government of his ship shall be
performed; at the same time leaving him a certain latitude to improve and di-
gest them into method and regularity. Hence appears the propriety of the first
lieutenant's being appointed on the recommendation of the captain; for as he
lives with the other officers, he will make the captain's method and disposition
known to them and reconcile things which, at first sight, might be disagreeable.
Every captain of a ship of war should recollect, when he has obtained his
chosen first lieutenant, that the exertions of this officer will be in proportion to
the confidence reposed in him; and that interference in his department, and un-
necessary orders, are the most certain means of damping his zeal and ardour.

A sensible good officer, when trust is confided in his abilities, will never take
advantage of it, but deem such confidence an additional spur to his exertions.
To have good discipline and order in a ship, must be by the unanimity of the
whole, which cannot be obtained without little concessions on all sides. The cap-
tain may give violent and disagreeable orders, by which he gets that duty per-
formed through fear, which if temporized, might be done by good will. It
too often happens, that the disposition of superior officers is biased by pas-
sion and prejudice, which, when once suffered, is with difficulty subdued again.
To be angry with, or to express a contempt, for an officer, because he is awkward
in his person, does not dress immediately to the taste of his commander, or has
a way of carrying on duty different to his own, is ridiculous; these are points easily
to be gotten over, and at worst but trifles in themselves, particularly when com-
pared with those of inability, drunkenness, and neglect of duty. A ship has
few comforts in herself; those she possesses ought, therefore, to be cultivated with
the greatest assiduity. How shocking is the idea, that an individual, placed
over a large community, should rack and torture his imagination to invent new
modes of harassing and perplexing those under his command! Let every neces-

necessary point of duty be carried on with that spirit and authority, which will stamp and give credit to order and discipline, and which will never suffer the smallest relaxation to interrupt the service required to be performed. Let the conduct of a commander be uniformly strict and circumspect, that he may hold out an example in himself, and by his impartiality in doing justice to merit, hold forth at the same time, an encouragement to men to use superior exertions in their duty, and to comport themselves with becoming propriety. Let his orders be given with that grace and good nature which cannot fail to please the person who receives them; and, when he can grant an indulgence, let it be granted cheerfully and graciously.

What a contrast may be observed between the captain, respected and beloved by his officer's and ship's company, who are never so happy as when he is amongst them, and the captain whom every one reviles for his cruelty and oppression, in whose ship no ease or comfort exists but in his absence! There is an error, which seems to have been sometimes acted upon by commanders of ships of war, arising from the idea that a captain would do himself service by obtaining the good-will of his ship's company at the expense of that of the officers.—How mistaken is such an idea! To seek for popularity by making those appear ridiculous to whom he looks up in the hour of danger, is highly derogatory to the character of an officer.

The high opinion of a ship's company is very transitory, and seldom possessed for any period of time without some variation; prejudice, most frequently, will bias its opinion; and besides, no fame is either so permanent or so easily obtained, as that which is acquired by doing justice to all. Let the name and character of an officer be held sacred; and, if, contrary to the sense of dignity and honour which he ought to feel himself the guardian of, he should be found to have forfeited the respect due to his situation, the rigour of the law, if only as an act of justice to other officers, should be enforced. It is very seldom that seamen entertain contempt for their officers, unless when those officers have sacrificed their own characters. When gentlemen strip themselves of that consequence which makes their inferiors look up to them with respect, are they to expect that every improper act which they commit will be attributed to accident, or can they suppose that their subordinates will seek for excuses to palliate their misconduct? No. It is for these reasons that persons placed in a superior situation should be guarded in all their actions; for, it is obvious, that in proportion as the seamen get enlightened, the officer should exalt in his conduct and example, because vices and misconduct that would not be noticed by absolutely ignorant people, will be severely scrutinized and investigated by those of more knowledge and discernment. We may also observe, that a captain cannot be too particular in checking every growing folly amongst the officers. Young men frequently expose themselves to ridicule from imitating the manners of others, without considering the motive, or judging of the propriety of the example they vainly attempt to follow.

I have always observed, that precept and example is as much studied and attended to on board ship as in any part of society, and where the captain is particular in his own conduct, and vigilant over that of his officers, the people are more orderly and punishment is the less necessary. The necessity of giving written orders, as we have observed, is subject to a variety of opinions; but when an officer reflects that this mode of conveying the directions of his superior, is not only a memento of his commands, whereby all whim and previration is baffled, but also an authority and justification for whatever he does, I think no one can dispute the solid advantages to each party of the one, over the ideal delicacy of the other. As the most certain method of having orders generally understood and duly obeyed, we would recommend written orders to be always preferred whenever it is possible to issue them, and have for that purpose selected the most approved Rules and Regulations, which are subjoined hereafter under the head of General Orders.
OF THE CONDUCT AND DUTY OF A FIRST LIEUTENANT.

We have already remarked, that the whole discipline of a ship in a great measure, depends on the abilities and good conduct of the First Lieutenant; with this idea he should, therefore, be prepared to meet and discharge the duty of the station, so that it may reflect honour on his own character and credit to the ship. To acquire this desirable end, it will be found most essential to his purpose to render the officers subordinate to him pleased and satisfied with his conduct; for, when this is the case, the duty of the ship goes on with spirit, emulation is displayed in every part, each person exerts himself in his separate department, and the whole result of their activity becomes the suffrage to his system and arrangement. The deportment of an officer of this class generally stamps his good or bad name.

He who is polite in giving his orders, and constantly attentive to the ease and comfort of others, will have many little defects in his character as an officer overlooked, whilst a man inattentive to those points, will be the subject of every person's scrutiny and examination, and liable to the most unjust and illiberal imputations. As he associates occasionally, not only with his brother officers, but with the heads of the several departments, his conversation should be enlarged, and so directed as, if possible, never to suffer a circumstance which has happened in the duty of the ship to be spoken of at the mess-table. Should conversation accidentally have a tendency to produce that effect, he should retire to his cabin; and he should upon all occasions consider the quarter-deck as the parade, where all orders ought to be delivered.

By these means many disagreeable altercation will be avoided, which would properly occur, were an officer to disclose his intentions in private. Whenever disputes arise, he should be the peaceful mediator; his interposition will carry authority with it from his situation; and, when exercised with propriety, will ensure him the respect of his contemporaries. He should strive, by his own example to rectify or form that of others; for if an officer once forgets his consequence by any improper behaviour, he opens a door to the contempt and derision of every subordinate, deprives himself of the principal spring of authority, and thus subjects himself to the mercy of every officer on board, by being obliged to request with solicitations such an attention and obedience to orders, as might otherwise be commanded with a consciousness of that proud feeling that an officer confident in his own integrity has in commanding the same. When all hands are on deck, he should never fail to attend, as his presence will always enforce a more speedy compliance, and general attention to the duty which is performing; it will likewise enable him to ascertain and judge of the abilities and disposition of the people. His conduct should be marked by its system and regularity, never engaging in familiarities, or disgusting his associates by a proud reserve. And if contrary to every sense of feeling and propriety, a subordinate officer should happen to be insensible to this mode of behaviour, and attempt to thwart or disobey his superior in the execution of his duty, he ought most scrupulously to assert and maintain the consequence and authority vested in his station. As he is the executive officer who regulates the ship’s company, he should endeavour to ascertain each man’s ability to acquire the number of effective men, and then dispose of them accordingly. As for example the heavy work falls principally on the afterguard and waisters, who are generally composed of ordinary seamen and landmen of whom there are a greater number than of seamen, consequently the largest portion of duty must attach to persons in those situations, including a few good seamen to lead and instruct the rest. The boatswain’s mates ought to be very select men, as the leaders of a ship’s company; they should be very perfect seamen; and as having an irksome, unpopular part to perform, they ought to be circumspect and determined in their conduct.

The necessary qualities requisite to form a good boatswain’s mate, makes them very rare; the situation must be countenanced and supported as no man otherwise would feel spirit sufficient to enforce the orders he delivers, and obedience
to his commands. The quarter-master and gunners are generally men of prime abilities; the former are more in the line of officers than the latter, but both situations comprehend the nicest and most skilful parts of seamanship, and should be considered as the line of encouragement to good men, and a reserve for good seamen. The duty is not so laborious as in other situations, which makes it frequently the retreat for old seamen; a circumstance which although arising from humane principles, destroys the vigour of the station. As a choice situation it ought to be filled by deserving men; and the man who has been the longest time in the service, and bears a good character, has undoubtedly a prior claim to fill up any vacancy that may happen, in preference to a person of superior ability who has but recently entered the service, as it will operate both as a compensation to the men who have entered early into the navy, and as an inducement to others to do the same. A desire to soften the feelings of old age, and to afford comfort and relief to the man that has devoted his best days to the profession, is very natural, but the necessity of having a reserve of vigor and ability in those situations will shew the impossibility of devoting them to that purpose, without sacrificing the interest of the service. Wounded seamen who have conducted themselves with propriety, will have an asylum, which by a proper representation of their merits from their captain, insures them in the decline of life, repose from their fatigues, together with all the comfort and happiness resulting from the society of their former associates. Here the wise economy of a munificent and well regulated establishment, not only affords them a competent subsistence, but provides them likewise with a periodical allowance to furnish what may be considered as the luxuries of life. The gunner's crew in a ship appears to be a class much neglected; for, instead of making them skilful artillerymen, and retaining them principally for that service, they are too often suffered to remain totally ignorant of it and only perform that part of the duty of seamen which is attached to their station. As gunners it was certainly intended, from the name they bear, that they should be acquainted with some part of the art of gunnery: and if this was the case they ought first to be well acquainted with it themselves, that it may become their duty to instruct the raw hands in the knowledge of it afterwards. The forecastlemen are generally chosen from their abilities as seamen, and from some peculiar distinctions attached to the station, feel a pride in their department: after the three first stations this follows; in small ships they are usually all seamen, but in large ones, where a great number is required, and real seamen are scarce, the compliment is made up by ordinary seamen. Top men are mostly composed of young active men who have been at sea three or four years, and understand the rudiments of seamanship; they have the large share of duty to perform, and are the most useful class of people on board. As young seamen, whom an officer is to regard as the rising part of his crew, he should use every endeavour to induce them to feel a pride and emulation in acquiring the necessary qualifications of seamanship, in order to fill a superior situation; and nothing will ease the trouble of the executive officer more in this respect, or conduct to form this spirit sooner, than placing a good leader over them. The captain of the top should be an enterprising active man, who shews a pride in excelling his fellows in promptitude and good appearance, and who would encourage the men under him to exert themselves in their duty. The after guard and waisters are generally composed of indifferent seamen and landsmen, and are the largest part of the crew, on whom the whole drudgery of the ship devolves. These men have not only the burden, but every dirty and inferior duty to execute; to them I conceive an officer's principal attention should be directed and every encouragement and inducement made use of to reconcile them to the service, and to acquire a knowledge of seamanship. Rewards and punishments are ever the most certain mode of succeeding where the object requires a stimulus to animation, and a check against sloth and laziness. This observation points out the necessity of having recourse to superior ratings where an individual distinguishes himself by his attention or quickness in learning his duty, and of punishing him if he is negligent or inatt
tive, with inferior rating, and degrading duty. Great pains ought to be taken, in
order to teach young seamen the names of the ropes, and their different uses;
how to knot and splice, reef and furl a sail, steer a ship, heave the lead, and row
in boats; together with the exercise of the great guns and small arms. By com-
mencing this system of instruction with the landsman, it will stimulate the seaman
to improve himself in those respects wherein he is not perfect, and will keep in his
remembrance that which he is acquainted with. I conceive every man before he
is rated from a landsman to an ordinary seaman should be examined by the first
lieutenant, master, and boatswain, and should be required to know the following
points, viz. all the names of the ropes, the exercise of the great guns, and small
arms, to be able to row, make sinnet and knot yarns, and again, before he is rated
an able seaman, that he shall be able to steer, heave the lead, knot, splice, secure
a gun, make points, robands and gaskets, set studding sails, make up sails, serve
rigging, stop blocks, turn in a dead eye; and clap on a seizing; the latter, as a
new thing may be laughed at, but let any man consider how landmen are to be
made seamen, but by instruction, and how is instruction to be communicated but
by a systematic plan, and forwarded by means of rewards and punishments.

When every profession feels the necessity of education and practice why should
it be neglected in the navy? A ship that is well manned, and which receives a
certain proportion of landmen, the officers too often look on them as an incum-
brance; and instead of pursuing the measures which are intended for their in-
struction, appropriate that service for them to perform which stifle emulation,
and keeps them in that state of ignorance which nothing but their natural dispo-
sition will ever remove them out of.

The boys in a ship might be made of much greater use than they generally
are, and a foundation laid for their future improvement. The present custom is,
to suffer the officers to take such as they think proper to attend on them, and those
who have no masters, are permitted to go at large, or perhaps admitted into the
mess of a boatswain's mate, or quarter master, on condition that they perform all
the menial offices of the birth; in lieu of this, I would recommend the surplus
part, after the officers are provided with servants, to be attached proportionably
to the different stations, under the immediate charge and authority of the cap-
tains of the tops, forecastle, and sail-maker, who should have some remunera-
tion for instructing them. The want of some fixed plan for carrying these systems
into execution, appears to be the greatest bar to their adoption. The difficulty of re-
ducing men's minds to bear, with satisfaction, the confinement of a ship, their ha-
vying few objects to attract attention, the compactness of their society, the secrecy
of their opinions, and their particular attachments to each other, are circumstan-
ces which render the discipline of a ship less attainable than that of a regiment.
For these reasons, an officer who commands seamen should make himself acquain-
ted with their dispositions and characters, in preference to any other considera-
tion.

By this he will be enabled to improve every favourable opportunity of render-
ing discipline subservient to his command; and if he adds a liberal confidence
and good encouragement to the marines, he will find that he has taken the surest
methods of establishing good order and regularity on board. In having dwelt on
the two situations of captain and first lieutenant, I have supposed the latter to be
entrusted with that power which constitutes an executive officer, and having trea-
ted on his situation from that idea; as, without such a position, I could not have
described what I consider as essential to the relative distinctions between a cap-
tain and his first lieutenant, however such distinctions may vary according to the
character and abilities of these officers respectively.

I shall now proceed, in a progressive manner, from a ship's being first comis-
sioned, to the various stages she is liable to be placed in, and point out the most
approved method of acting in each so as to constitute and preserve discipline. In
speaking of the executive officer I shall always mean the first lieutenant, who, when
receiving the sanction and support of his captain, may justly be considered such.
The other officers in a ship, who act a subordinate part, and have no lead in the
ON THE DUTY OF A FIRST LIEUTENANT.

The ready equipment of a ship just commissioned, will depend on her number of men; and, as dispatch is generally the prevailing motive, a great deal of work in a short time is the general result, which proceeds from a praise-worthy zeal. But as a ship on being first commissioned, requires so much adjustment for her permanent advantage, it appears better if the service will allow it, to devote a longer period than that usually taken for her equipment, which ultimately, may not prove a loss of time. In time of war, seamen are sometimes so numerous that they are chosen from their size or abilities.

A master at arms, corporals, boatswain's mates, fifers and painters, being difficult to acquire, the executive officer should use every endeavour, while the ship is fitting to procure them. They are most likely to be had from ships which are intended to be paid off. The two first classes of men are so essential to the future good order of the ship, that none ought to be received but such as produce a recommendation or certificate of their good behaviour from their last captain. The captain when he has determined on the manner in which he chooses to have his ship rigged, stowed and fitted, gives his directions to the executive officer, and will perceive that the duty proceeds in proportion to the number of men on board.

As ships are, at first, most commonly rigged by contract, it will be impossible to lay down here any specific rule for that operation. The ground tier is generally first stowed, to give the ship stability, and the rigging completely fitted, that it may be stretched as much as possible, before the ship proceeds to sea. The executive officer must now calculate the number of men and make his arrangements accordingly; reserving that duty which may be performed under cover for rainy weather; such as making mats, making points, robands and gasketts for two sets of sails; sinnets, spun yarn, &c.

The gunner must be allowed to have the greatest part of his crew with him on shore at the gun wharf, in order to prepare the tackle and breechings for the guns, by the time the ship is ready to receive them. The carpenter should get the boats fitted and painted; hammock cloths and tarpaulins nailed up and painted, that they may be perfectly dry by the time they are wanted.

The ship being rigged, the provisions on board and all ready to proceed from moorings, the sea-stores may now be drawn, but not sooner, as they are intended only for the precise object signified by the name they bare, and might otherwise be frequently misused if the warrant officers were allowed to demand them. To reduce this point to a more intelligible signification, I shall proceed to state what is considered under the head of sea stores, &c. viz. In the boatswain's charge there are stores of three denominations, 1st. present use store, which consists principally of tallow, twine, junk, spun yarn, &c. the second called ship's furniture, comprehends all the ship's standing and running rigging, studden-sail-geer, preventer braces, and every equipment for sea, excepting top-gallant-sheets, which are not allowed in the rigging warrant, as double top-sail lifts are supposed to answer the purpose, by having them single, and appropriating the overplus of rope accordingly; but for large ships, which have double top-sail lifts, top-gallant sheets are granted on demand.
commanders, mallets, spare ropes, &c. not rove for the above occasions. The frequent deficiency of stores has made me more particular on that account, as young officers, unacquainted with the nature of sea stores, frequently suffer the boatswains to draw them at first, on some specious excuse, who then convert them to some purpose different from the use to which they ought solely to be appropriated. The consequence is embezzlement, and the want of them when at sea. Ships are allowed a sufficiency of almost every article, and their being short at any time, must proceed either from neglect or embezzlement. Be guarded, therefore, against both. At every conversion of stores the master should be present, and he should see the rigging cut out, of which all should be done at the same time, and at as short a period before going to sea as possible, that once getting it out of the store-room might be sufficient, and that by not having it rove whilst in harbour, the plunder of thieves, which infest every sea-port, might be prevented. The ship having now her sea store on board, and every thing ready for sea, let the executive officer look round and see every thing in its place as follows:

The spare top-masts, top-gallant masts, and top-gallant yards fitted; all the spare sails ready for bending, the storm-stay-sail, halyards, stays, and sheet rove; the ship's company watched, quartered, and stationed; the stores and provisions completed; the three months advance paid previous to going to sea; the hammock scrubbed, and linen washed, the lower yards slung; the studding-sails bent, sheet anchor stowed, and the cable unbent, but as short a period before going to sea as possible; and in some cases, it will be prudent not to unbend it until the ship is at sea. All the arm chests and hen-coops cleated, the guns secured, a sufficient number of cartridges and powder-horns filled; the screens for the hatchways fitted.

As soon as at sea, the preventer braces should be rove, the lower yards, anchors, and gaff slung in chains; slings for the top-sail yards in the tops, messenger unrove and quailed in the tier, buoy and buoy ropes off the anchors, toggles on the braces and bowline briddles; all the lumber off the decks, casks of water lashed, and match-tubs distributed at the quarters.

In going to the East or West Indies, have boats, staunchions, and awnings fitted before the ship arrives; and when going to a foreign port, have boats, pendant-staffs and pendants made. The ship's company should now be made perfect at their quarters and stations, both by day and night; also in making sail, shortening sail, reefing topsails, &c. for which purpose it appears proper to reef every night, and in the day time always to turn the hands up at performing every evolution that the ship's company may perfect themselves in their stations, and acquire the method by which the duty is carried on. When the hands are on deck, every piece of duty should be performed in a regular systematic manner. The lanterns should be always ready for the quarters, and the candles ends matched in them, with painted bags to cover them; a sufficient number of false fires on deck to make the private signal, and two matches always kept lighted during the night.

REMARKS ON GOING INTO ACTION.

In coming into action at night, or on a sudden, it will be best, if the enemy is to leeward, or an inferior sailing ship, to lie by till everything is properly prepared, during which time the ship should be well barricaded, every kind of lumber cleared off the deck and the quarters well lighted up. When this necessary preparation is finished, the private signal whilst standing towards the stranger, should be made, and now proceed within hail, fully prepared for either alternative.

The preparation is begun by issuing the order to clear the ship for action, which is repeated by the boatswain and his mates, at all the hatchways, or stair-cases leading to the different batteries. As the management of the artillery in a vessel of war, requires a considerable number of men, it is evident that the officers and men must be restrained to a narrow space in their usual habitations, in order to
REMARKS ON GOING INTO ACTION.

The remarks on going into action. Hence the hammocks or hanging
beds of the latter, are crowded together as close as possible between decks, each
of them being limited to the breadth of fourteen inches. They are hung parallel
to each other in rows stretching from one side of the ship to the other, nearly
throughout her whole length, so as to admit of no passage but by stooping under
them. As the cannon, therefore, cannot be worked while the hammocks are sus-
pended in this situation, it becomes necessary to remove them as quickly as possible.
At the summons of the boatswain, up all hammocks! every officer as well
as sailor, repairs to his own; and having stowed his bedding properly, he cords it
up firmly with a lashing, or line provided for that purpose; he then carries it to
the quarter deck, poop, or forecastle, or wherever it may be necessary. At these
different places they are firmly stowed by the quarter master in proper nettings
on each side, or on the tops, so as to form an excellent parapet to prevent the execu-
tion of small shot on the quarter deck, tops and forecastle.

A platform must be made either in the tiers or after hold, with the awnings
spread over it, for wounded people. The decks to be wet, and sand strewn over
them. The lanters hung up in their places. The topsail-yards slung, and topsail-
sheets stopped. Buckets filled with water in the chains, ready to extin-
guish any fire; the engine filled, and placed on the poop of a line of battle ship,
and on the quarter-deck of a frigate. Preventer braces led along. Salt boxes
filled, and match-tubs in their places; the fire screens hung round the hatchways.
The spare tiller ready to ship. Locks on the guns; vent stoppers to every man.

Let the men at their quarters be cautioned not to fire a gun until they are or-
dered. Should the strange ship prove that of an enemy, direct the first broadside
with the utmost precision, with the guns rather depressed than otherwise. Have
two or three guns with skilful men at them, to fire at the masts and rigging only,
for this will probably be found very serviceable.

When the batteries of cannon are cleared of all incumbrances, and the ship
ready for action, the gunner, with his mates, and quarter gunners, is busied in ex-
amining the cannon of the different batteries, to see that their charges are thorough-
ly dry and fit for execution; to have every thing ready for furnishing the great
guns and small arms with powder as soon as the action begins, and to keep a su-
ficient number of cartridges, continually filled to supply the place of those ex-
peded in battle.

A lintstock with match gunners is lighted for every cannon; several other pieces
of match are also lighted in the cock room, and plates of match, tresses, with
priming, are made ready for the occasion. A sentry is placed at each hatchway,
whose duty is to maintain a free passage for the powder, and to drive away any
person holding light or fire. For further precaution, a wet swab is placed at each
hatchway.

The powder cartridges filled for service are carried to the ship’s head or bow,
either in bags or budge barrels, and arranged in the boatswain’s store room, observ-
ing to place those of the same caliber together, which prevents confusion. It is
best to carry at first more than may be supposed to be necessary than to be with-
out during the action.

Shot and wads are brought upon the deck, exclusive of such as are already in
the lockers, spare wheels, gun tackles, breechings and their lashings. The whole
is distributed along the batteries, to replace, on occasion, such as may be damaged.
From the spare room store are provided, axes, hammers, splicing fids, clamps
or carriage cap-squares; lines; marlines; flathead, carriage axeltrees; sacks,

* These plates, tresses, are made of three ends of slow-match, which are light-
red together, and are often used to fire the guns with more certainty.
† The budge or grenade barrel is made in a frustum of a cone; the smaller end
is open, and fitted with leather, or painted canvass, which is drawn close as a purse.
They serve to carry the cartridges to the battery, or to put in the grenades alred-
ady loaded and primed. When the ship is cleared for action, one of these last is
carried up to each top, two on each casito, gangway and kook, each of which cc
reics; strops, horses; staples; forelocks; suet or tar; and other articles that may
be wanting or missing during the action. Part of them are deposited in baskets at
the foot of the main capstern, and at the bits on each battery, where they may be
easily found when wanted.

Grenades, in case of boarding, are distributed partly on the maintop and poop;
partly on the foretop and forecastle. They are carried in budge barrels, with a
few pieces of lighted slow match.

The battery fire tubs are visited; they ought to be two thirds, or at least half
filled with water, with a swab to each tub. Each is marked with the number of
the division and gun to which they belong.

Each captain of a gun sees that all the implements which are necessary for the
engagement are placed in order by the side of his gun. Round, chain, double
headed and grape shot cases are placed in the midships.

The lantern of the after magazine light room is lighted; two signal lanterns are
placed on the foretop deck, towards the stewards hatchway, one starboard, the
other a larboard, and as far as possible; another signal lantern is placed at the
fore magazine light room. These three lanterns serve to light the way for those
who go for and pass the cartridges.

All the other signal and fighting lanterns must be kept in readiness, together
with their candles and lashings, in case the engagement would take place or con-
tinue by night.

All the powder which is near the bulk head is taken from the gun room, the
bathing tubs, as well as the match tubs* ready furnished primings, &c. and all
that is not necessary, during the engagement, for the service of the cannon, is car-
rried down in the hold. The gun and stateroom bulkheads, or partitions, are re-
moved and carried to a place destined for that purpose to clear the deck for ac-
tion. Every captain of a gun provides himself with some hemp to make small
plugs to stop the vent when the cannon are fired.

Spare breechings, trucks, and tackles, distributed at the different hatchways,
ready to supply the place of those which may be carried away.

A sufficient number of pistols, and pistol cartridge boxes filled and at hand.

The half pikes, tomahawks, &c. ready and at hand. The boarders to have their
belts and cutlasses at their quarters. The firemen a bucket and swab at each
gun. The powder-horns to be all filled. In pricking the cartridge, it has been
observed, that ramming the wire hard in, occasions a great part of the powder,
and the arse of the cartridge to remain in the gun; of this circumstance every
seaman should be cautioned, as likewise that very dangerous consequences have
resulted from not ramming the cartridge home, and putting in too many shot.

When the hostile ships have approached each other to a competent distance, the
drum beats to arms; the boatswain and his mates pipe all hands to quarters at
every hatchway. All the persons appointed to manage the great guns repair to
their respective stations. Those who are to go down the magazines, must have
neither shoe buckles, knives or pipes. The hatches of the gun room, spare room,
cable stage, boatswain's store room, and after hold, are immediately laid, and only
a hole is left in each of them sufficiently wide to pass the cartridges. A centinel,
amined with a sabre, is placed at each of the hatches, to prevent any one deserting
his post by escaping into the lower apartments or coming near them with fire or
without orders. The lashings of the great guns are cast loose, and the tompions
withdrawn; the gun tackles are stretched along to the recoil, and the running
part of this fall is coiled, lashed and arranged close to the ship's sides; the whole
of the artillery, above and below, is run out of the ports, and levelled to the point
range ready for firing.

* The match tub is a cask, stayed at one end; on the end of which notches are
cut to pass the lighted matches, the end of which is within the cask, so that the
sparkles may fall either into the water, or on the sand with which they are filled.
THE ACTION.

The necessary preparations being completed, and the gunners, &c. ready at their respective stations to obey the order, the commencement of the action is determined by the mutual distance and situation of the adverse ship. The cannon being levelled in parallel rows from the ship's side, the combat then begins by a vigorous cannonade, accompanied with the whole effort of the great guns and small arms, as the captain must endeavour to bring his ship within the point blank range of a musket of his adversary, which is the most convenient distance, so that all his artillery may do effectual execution.

The method of firing in platoons, or volleys of cannon at once, appears inconvenient in the sea service, and perhaps should never be attempted unless in the battering of a fortification. The sides and decks of the ship, although sufficiently strong for all the purposes of war, would be too much shaken by so violent an explosion and recoil. The general rule observed on this occasion throughout the ship, is to load, fire, and spunge the gun, with all possible expedition, yet without confusion or precipitation. The captain of each gun is particularly enjoined to fire only when the piece is properly directed to its object, that the shot may not be fruitlessly expended. The lieutenants, who command the different batteries, traverse the deck to see that the battle is prosecuted with vivacity, and to exhort the men to their duty. The midshipmen second these injunctions, and give the necessary assistance wherever it may be required, at the guns committed to their charge. The gunner should be particularly attentive that all the artillery is sufficiently supplied with powder, and that the cartridges are carefully conveyed along the decks in covered boxes.

The havoc produced by a continuation of this mutual assault, may be easily conjectured by the reader's imagination. Battering, penetrating and splintering the sides and decks; shattering and dismounting the cannon; mangling and destroying the rigging; cutting asunder or carrying away the masts; piercing and tearing the sails, so as to render them useless; and wounding and killing the ship's company.

The comparative vigour and resolution of the assailant to effect these previous consequences in each other, generally determines their success or defeat; we may say generally, because the fate of the combat may sometimes be determined by some unforeseen accident, equally fortunate for the one and fatal to the other; such, for instance, as one of the ships falling in the situation of raking the other; that is to say, cannonading her on the stern or head, so that the balls shall range the whole length of the decks of her adversary. This is one of the most dangerous incidents that can happen in a sea engagement. It is frequently called raking fore and aft, and is similar to what engineers term enflading. During the engagement, no captain of a gun will suffer his gun to be loaded with double headed, bar or grape shot cases, without orders.

No one must quit his post upon pain of death, and should any one happen to refuse obeying his officer, he ought to be put to death on the spot. The greatest silence is to be observed, in order to act with concert according to the occasion, and without confusion.

The captain of the gun must observe, that there are never two cartridges a time brought to his gun; that the matross, who is charged with supplying them, be not remiss in his duty; that the cannon be well spunged every time it is fired; that no cartridge be opened with a knife; to have a wet swab passed from time to time in front of the carriage and on the port-hole side, to wash off the powder that may have fallen in the explosion; to have likewise a wet swab passed on the oakum of the seams of the ceiling of the second deck, over against the vents of the guns; and that the guns should be cooled outside with small wet swabs, and inside with sponges dipped in water.

* The guns are cooled with a mixture of vinegar and water, in the proportion of one to five or six parts, which is called extemin. It is sometimes issued to the ship's company, as a remedy to lessen the inflammatory disposition.
The Action.

If it happens so that any of the cannon be dismounted, the lieutenant commanding the battery will see that the damage is repaired, by the same who work the piece, and to take no men from the other guns unnecessarily.

The matrosses who serve a cannon relieve each other when tired, by changing their situations.

If any gunner or matross be disabled in the service of the cannon, the lieutenant will take a man from another piece to supply the deficiency.

When fighting both sides at once, each chief of a piece will command two cannon on the same board, viz. 1st. the chief of the first piece astern with his men, serves the two first cannon a starboard; the chief of the second piece with his men, serves the two first cannon a larboard; the chief of the third serves the third and fourth cannon a starboard; the chief of the fourth serves the third and fourth a larboard, and so on to the last. 2ndly. When one of his cannon is fired, the chief of the piece leaves there three men, one to stop the vent, another to load, and a third to supply the second, and with the other matrosses goes to point and fire the next gun; he then returns to the first, which, during the interval has been charged, and does to the second as he has done to the first. In such cases it may be proper to take some of the marines to assist in serving the cannon.

The Repair.

The engagement being concluded, they begin to repair; the cannon are secured by their breechings and tackles with all convenient expedition. and those of the first battery are housed. The linstocks are put out, the lighted end of the slow match cut off, and thrown into the fighting match tubs. Each gunner returns to the gun-room the primings and match tubs, with such furniture as may remain; the steward's mate's platform is inspected, as well as those of the boatswain's room and the ship's waists fore and aft; the remaining cartridges are carried back to the gun-room, and all these places are swept and washed with a wet swab, that the gunner may arrange and secure the powder as it was before the engagement.

All the lanterns are extinguished and carried back to their places; the gunners who were stationed in the powder rooms, and all their assistants, go upon deck; the guns are visited to ascertain whether they are damaged or no; the vents are sounded with a gimblet, to disengage such as may want it, and prepare them to be primed for another occasion; the carriages are likewise visited, as well as the implements which have been used in the action; all damage is repaired, and every article returned to its place.

The gunner and his assistants are busied in replenishing the allotted number of charged cartridges, to supply the place of those which have been expended, and have them ready for another engagement, and in preparing the priming; for this he must apply for the captain's orders. He also examines all the charges and sets to right such as are not.

Lastly, the cartridges which have been transported ahead, are carried back to the powder room, provided there be no appearance of a fresh engagement.

The great science of a gunner, the merit of a captain of a gun, consists in pointing with precision, so as to strike the enemy's ship, and especially the part of her he means to destroy. In order to attain this end, particularly at sea, to great practice he must unite sense and judgment; the theory of the motion of projectiles can be of some assistance in the practical service of artillery on land, but it is absolutely disconcerted at sea; where judgment only can determine both distances and the moment of firing relatively to the combined motion of the ship. We will not however, close this chapter without impressing into the mind of the sea gunner, the necessity of becoming master of that theory, as he may be oftentimes employed in serving the sea coast batteries; and to study especially the method of firing point-blank and a ricochet.
NAMES OF THE SEVERAL PARTS OF A CANNON.

The Muzzle. That part of a cannon between the muzzle astragal, and the quick of the mouth.
The Chace is the whole space from the trunnions to the muzzle.
The Second Reinforce, begins where the first ends, and is made something smaller than the first; it comprehends the trunnions and dolphins, or handles.
The First Reinforce, is that part of a gun near the breech, which is made strong so as to resist the powder.
The Cascable, the hindermost part of the cannon, from the plate band of the breech to the button, including the breech, listel, neck, and the knob.
The Knob.
The Neck, that part which joins the button to the breech.
The Breech is the solid piece of metal behind the gun, from the plate-band of the breech to the neck of the cascable.
The Trunnions are two cylindrical pieces of metal, in every gun, which project from the piece, and by which it is suspended upon its carriage.
The Dolphins are the two handles placed on the second reinforce of brass guns, resembling, formerly, the fish of that name. They are at present made of a square form. They serve for mounting and dismounting the guns. Cannon for light troops, and iron guns for the navy have no handles.
The Rimbases of the Trunnions. These serve to give additional strength to the trunnions, by attaching them more strongly to the lower part of the reinforce.
The Vent, in all kinds of fire arms, is called the touch-hole; it is a small hole placed at the end, or near to it, of the bore or chamber to prime the piece with powder, or to introduce the tube, in order, when lighted, to set fire to the charge.
The Bore, the vacant cylinder wherein the powder and ball are lodged.

Names of the Mouldings.

1. Base ring.
2. Breech astragal.
3. Filet or listel of the breech astragal.
4. Concave quarter of the breech.
5. Girdle of the first reinforce.
6. Ogee of the second reinforce.
7. Chace girdle of the second reinforce.
8. Ogee of the chace girdle.
9. Inferior fillet of the muzzle astragal.
10. Muzzle astragal.
11. Superior fillet of the muzzle astragal.
12. The curve from the swelling to the astragal of the collar, or muzzle. The radius to describe it, is one seventh and two thirds of a seventh of the length of the piece.
14. Concave quarter round the mouth.
15. Relief of the breech.
16. Listel of the button's neck.
ON A SHIP’S COMING TO ANCHOR FROM SEA, INCLUDING SOME REMARKS ON REVIEWING OR SURVEYING A SHIP, PREVIOUS TO HER GOING TO SEA.

The officers and ship’s company dressed. The buoy and buoy ropes on the anchor, a range of the cables up. The messenger passed for mooring ship, and the nippers* in their places.

Tackles ready for swaying up the lower yards. If it blows hard the sheet cable bent, and the anchor over the side. If necessary, double bit the cables, have the dog stoppers up, and good seamen stationed to attend them, axes on the forecastle to cut away the stoppers if they hold.

If the wind and tide answer, veer away and moor at once. The guns unsotted, half ports off, the studding-sail gear unrove. The hoses to be ready for watering and the launch fitted. As soon as the ship is at anchor, sway the lower yards up, and square all the yards, see that the top-mast and top-gallant-masts are properly stayed, and upright; the guess wharf, and booms ready to get out, scrub booms, ready to scrub the bends; all the mats taken down, if the ship is to remain long in port. The centinels on the gangways. If going into a port where a Commodore is lying, the guns should be ready for saluting, or the people for cheering.

If the ship be running in before the wind to anchorage, and there is no probability of baffling winds, to require bracing up, the lower yards may be swayed up and squared; the travelling back-stay hauls up in the tops, the top-sail sheets singled.

When the sail is shortened, care should be taken that nothing impedes the movement, and the ropes should be so distributed that the people may have good room to work in; one top-sail halyard overhauled, and the fly blocks hauled up, and laid in the after part of the tops. If the top-sails only are to be taken in, the topsail-yard men may be in the tops to man the bunt-lines; good hands should be stationed at the braces, who ought to gather in the slack of them as the yards come down. If the wind does not blow too hard or there is too strong a tide running; the cable may be unbitted to facilitate veering away for morning. In furling, every precaution should be taken for being quick in following the Commodore’s motions when he looses sails. The bowlines should be overhauled and bent to the bunt-line-crigules, the clue-lines and bunt-lines hauled up in the tops, and clear for running; the fore and main bunt-lines hauled up on the fore part of the yard and overhauled for running; the studding-sail booms ready to trice up, and harbour sheets ready to carry out on the lower yard, in case the top-sails should be hoisted.

ON REVIEWING A SHIP BEFORE PROCEEDING TO SEA.

We frequently see ships of war commissioned, and ordered to be fitted for sea with the greatest dispatch; sometimes an emulation exists between two ships preparing at the same time, and every thing is made subservient to equipment; the consequences are, that the ship is badly fitted, the hold carelessly stowed, the rigging not stretched, the stores deficient, the sails not fitted, and nothing to resist

* The captain of the nippers should be ordered, after the ship gets under weigh, to dry all the nippers, make them up, and return them to the boatswain's yeoman, as they would otherwise rot, and if not taken care of, would be appropriated to every idle purpose

† In manning the rigging for cheering, the people should be chosen by their size, to stand together on the same ratlines, observing the space of two or three ratlines between each tier; the men should be drest alike, the marines at the time drawn up on the gangway without their arms. After the three cheers have been given, if the Commodore returns the same number, it must be answered by one; if he returns but one, no farther notice to be taken, and the people called down.
On Reviewing a Ship, &c.

Chafing, or the inclemency of the weather. The commanding officer at the port is naturally pleased at the exertions of the captain, without perhaps, reflecting on what the condition of the ship will be when she gets to sea.

As for example, a storm comes on, the sails split; to replace them is not possible; the rigging stretches; a raw undisciplined ship's company whose abilities have not been ascertained cannot be depended on.

In this situation, the ship on a lee shore, is threatened with becoming a wreck, or in another point of view, still more dismal, she falls in with an enemy*, the crew are not quartered, the cartridges are empty, the stores are not arranged, and the most dreadful confusion prevails. Shall the American flag be tarnished by flying from an equal, or perhaps an inferior force of the enemy? To prevent so disgraceful an event, would it be improper that every ship of war should be reviewed, previous to her going to sea, by different officers for each department; (or in another phrase) that every officer's charge should be surveyed by other officers of his own rank.

For example, three captains might examine the established rules and regulations of the ship, the general system of discipline, the strength and abilities of the crew in the various manoeuvres of exercising the great guns, of making and shortening sail, reefing and furling. Three masters might inspect the stowage of the hold and cables. Three purgers might, in like manner, inspect the quantity of fuel, candles, and the other necessaries and provisions. Three surgeons, that the necessaries allowed by government for the use of the sick are complete, that the medicine chest is properly furnished, and the instruments of a proper quality and in good order. Three boatswains should inspect the sea stores, the stowage and fitting of the spare sails, see that the mats are in their places, that the rigging leads fair, and that every thing in their department is appropriated to the greatest advantage. Three gunners and carpenters, that their stores are complete, that the store rooms are properly arranged, and every thing disposed of for the general convenience of the ship.

When the survey is finished, separate reports may be written out, shewing the opinion of each class on the state and condition of every department, and delivered to the Commodore or senior officer. To this system we are aware that objections will be made; it will be said that it will interfere with the responsibility attached to every commanding officer, that it would repress the ardour and spirit of the service, and operate as a stigma on officers, which their general zeal renders unwarrantable. On the contrary, if it was established into a fixed rule, no individual could conceive himself implicated by it. The exertions of officers would be insured, embezzlement of stores prevented, and a most certain method introduced of having every ship of war prepared both for opposing the enemy and for resisting the effects of bad weather.

As every private consideration should yield to public advantage, perhaps no plan can be adopted more likely to meet the exigences of the circumstances treated on, than the mode here proposed. A good officer who is thoroughly acquainted with his duty, whose experience has improved on the system usually pursued, would consider it as the proudest and most satisfactory testimony of his abilities, to find that his zeal and attention had been represented to the navy department. It can only be objected to by those, who are ignorant of their profession, by the very persons most liable to be deceived, and to whom every precaution should be most particularly directed.

OF MAKING AND SHORTENING SAIL.

To make all sail, from being close hauled (with reefs in) before the wind; square the yards by the lifts and braces; bowset to the trusses; send the people up to

* It is an acknowledged fact, notwithstanding the greatest attention in fitting a vessel for sea, she is never in readiness till after leaving her port a week, and in a ship of war the odds is as 3 to 4.
let the reefs out; and send down the studding-sail-geer; the people on deck getting the studding-sails ready, whilst the men aloft are letting out the reefs. The reefs being let out, hoist the top sails; when hoisted up, loose and set the top-gallant sails; get the royals on the top-gallant-yards; bower taught the top-sail-lifts, hortons, and rolling tackles; settle a foot or two of the haulyards, to let them all bear an equal strain, which will add both to the security, and appearance of the yard. The studding-sails being ready to send up, and the booms to rig out, man the boom-tackle-sails, top-mast, and top-gallant-studding-sail-haulyards. Rig out and hoist away together, get the studding-sails on the yards, cut the stokes, and then man the lower and top-mast-studding-sail-haulyards on deck, and the top-gallant-studding-sail-haulyards in the tops; ready hoist away altogether. This evolution might certainly be performed much quicker if the sail was set as it becomes ready, but the beauty of appearance, and regularity in the movement would be sacrificed, which if time will allow, seems better avoided, as a ship of war should if possible, always be systematical in her manoeuvres, as it gives a dignity (if I may use the expression) to her rank, and marks the distinction between herself and a merchant vessel.

In making sail up on a wind, whilst the top-men are letting out the reefs, haul on board the tacks, and set all the stay-sails, which, with dispatch, may be completed by the time the reefs are let out. Men should be ready to lose the top-gallant sails, as soon as the top-sails are up; this may be performed in three movements as follows; 1st. set the courses and hoist the stay-sails together; 2d. hoist the top-sails; 3d. loose and set the top-gallant sails.

**SHORTENING SAIL.**

When every sail in a ship is set, the room will not permit all to be reduced at the same time; some part must be neglected. On this account it appears best to make two movements, that the whole may be performed with promptitude and regularity. In the first instance, therefore, haul down the studding sails, take in the royals, and rig in the booms; when this is finished, haul up the courses, take in the top-gallant-sails, haul down the jib and stay-sails, and brail up the spanker.

If the ship is to be brought to the wind, the back-stays should be set well up; if it is necessary to reef, as the ship is brought to the wind, and the sails begin to lilt, lower away the top-sails. If the ship is to lie to, keep the main yard square. In bringing the ship to the wind, be careful that it is done by degrees, for if the helm is put hard down at once, she will, if it is smooth water, come quite round.

**OF REEFING TOP-SAILS.**

The people should be aloft in the top-mast rigging ready to lay out when ordered. If going before the wind we must depend entirely on its strength, whether it will be necessary to bring the ship to or not, for that purpose: in which case it must be done just so much as to spill the sail for lying quiet whilst the men are on the yard. As the ship comes to lower the top-sails yard, bower out the reef tackles, and haul taught the hunt lines; keep the yard square; when secured, send the people out. In moderate weather, reefing before the wind is performed as at all other times reefing upon a wind is done. To reef upon a wind, man the weather brace, luff the ship up that the weather leech may lift, let go the

* A top-gallant-sail should never be loosed till the top-sail-yard is hoisted up, as it looks slovenly, and hurts that symmetry and regularity so essential to good order; the men should cast off the gaskets, and hold up the sail in their arms.
* As soon as the studding-sails are down, the butrons should be taken off the yards, and the jiggers off the lifts.
* If it blows strong whilst lying to settle some of the top-sail-haulyards, that the top-mast may neither cut nor chafe the sail.
ON REEFING TOPSAILS, &c.

bowline and lower away. In taking the third reef in, it is usual when the wind blows fresh to start four or five fathoms off the weather-sheet (to ease the reef-tackle-pendant,) and to haul up the clue-line and bunt-lines. When the course is not set, the lower yard* being sufficiently squared will answer the same purpose. In close reefing, the weather-clue-line is generally hauled quite up. The principal points to be attended to in reefing a sail are, to spill it by the braces and the helm, so that the people may perform their duty with ease, and free from danger; hauling forward on the lee-bowline prevents the sail from getting over the lee-yard arm, but the following method of taking a sail in, will have the same effect. Keep the ship a point free, haul up the lee-clue-line and bunt-line; when up, haul up the weather clue-line; when half up, let go the bowline and halyards; round in the weather brace, bring the ship to the wind, and spill the sail. Leech lines are very convenient for spilling top-sails.

ON JOINING COMPANY WITH A COMMODORE AT SEA.

When sufficiently near the commodore, or strange sail, make the private signal. If a salute be required, have irons† heated in the fire, and the guns loaded and primed. If on the contrary, the salute is by cheering, have the ship’s company dressed, and shew them their stations† in the rigging; make all possible sail to join company with dispatch, take care that the hammocks are well stowed, that nothing is towing overboard, that the rigging is free from clothes, the sides and head well washed down, the half-ports off, the sheets close home and sails well set. If the commodore’s flag is of a different colour to that which the ship is under, she should be ready to change the ensign as soon as he has answered the salute. If the commodore is lying-to, continue the sail out till the ship is sufficiently near to be able to shorten it, before it is necessary to man the rigging and to cheer in passing his ship. If the commodore should not bring to, and it is requisite to send a boat on board, continue the sail till far enough a-head to be able to hoist a boat out before he can pass. Every ship on joining a fleet or squadron, is more or less taken notice of, and her name is most likely to be stamped for the good or bad order which is seen to prevail; therefore the utmost pains should be taken to make her appearance as good as possible. It very frequently happens that by not making proper allowance for the commodore’s forereaching whilst lying-to under a main-top-sail, that the ship which joins company brings to too soon, and is obliged afterwards to make sail, or that the boat is a long time in rowing on board, which to those who are spectators, has a very ridiculous appearance.

ON STRIKING TOP-MASTS.

Top-masts should be struck but in few instances without first getting the top-gallant-mast on deck. It is a prevailing idea, but certainly without much foundation on reason, that the rigging of a top-mast when down, counter-balances the desired effect of striking it, and the immense lever only which a fiddled top-mast constitutes, bespeaks the utility of striking it, particularly if there should be a swell. If pains be taken to bowse the rigging well down afterwards, and frap it round the mast, the quantity of wind it may hold may, perhaps, be greater than if fiddled, but certainly not so much as to render the effect of striking the top-mast useless.

* When this is done, care must be taken to bowse the trusses taught and to haul taught the braces, or else the yard will fly about.
† Irons are the most approved means of firing a salute.
‡ See the preceding instructions for coming to an anchor.
Top-masts are most commonly stuck in an open roadstead, when the wind blows directly in, and no possibility exists of getting to sea: to render the want of top-sails requisite, or when the safety of an anchorage is preferred to that of the sea. The top-masts being unfiddled, if the lower yards are up, they should be lowered together, with the top-tackle blocks a few feet from the catarpins so that if required, the top-tackle-pendants may be let out to lower the masts lower down. In swaying up top-masts and lower yards, the top-masts are generally run up till the fid-holes are in sight; then the lower yards, bringing the main-geer to the cap-stern: otherwise if strong enough, away both up by hand, when a block, fid the top-masts: stay them and step up the rigging.

ON REFITTING A SHIP, OR GOING INTO DOCK.

Previous to beginning to refit, every running rope, shroud and back-stay should be examined, that is likely to want replacing, and a memorandum made of the whole to prevent confusion when stripping; all old stoppers, tackle-falls and unserviceable rope; should be returned for new. The lower yards, blocks and sails should be sent on shore as soon as possible, to have the battens taken off and examined, to new strop the blocks and to cut out the new sails. Precious to sending the sails on shore, all the points and robands should be taken out, as they will not return them if sent to the sail-loft.

All the boatswains stores should be sent on shore together, that one survey may answer for the whole. It is recommended not to send shrouds or back-stays on shore to be surveyed, as they are frequently condemned, although serviceable, which occasions a great deal of trouble, and, in the winter, is sometimes dangerous. The ship's effects should be sent on shore as soon as possible, and given to the master attendant for the boatswain's charge, and to the master shipwright for the carpenter's, the new work done in a ship by the navy-yard men is always primed for painting by themselves, and when the shipwrights and joiners work is finished, the painters will be ordered to paint the ship on application. Previous to beginning to strip the ship, prepare tallies for the sails and rigging, take the first opportunity of drying the sails, particularly in the winter season, as it will otherwise delay all the other work. When ready to begin, if the ship is to go into dock, the main-yard is to be kept up to get the guns out, and to clear the hold. The first lieutenant should make his arrangements as follows; to each lieutenant attach a proportion of mates and midshipmen, with a division of the ship's company reserving a certain number of men, according to the size of the ship, denominated riggers, to be aloft to take off the rigging; then, with the people divided as above, let sub-divisions, under midshipmen, be employed to sway off, receive, make up, tally, and hand into the lighter, the rigging from the mast heads.

The top-men are generally employed aloft till the tops are gotten off, then the gunners and forecastle men to strip the lower masts. Careful hands should be employed to tally the rigging, that no mistake may happen. This system more immediately belongs to a ship that is stripping only; for, in preparing to go into dock with dispatch, the executive officer must attend to those things first which will facilitate the service generally. Much will depend on the weather, and on being supplied with craft to take away the guns, powder, stores, empty casks, &c. The spirits, wine, and provisions, are never received into the victualling office unless a ship is to be paid off, or they are condemned by survey; they must there-

* When the top-masts are high enough, if the top-gallant-masts are down let hands go up and place the rigging, and be ready to receive them as soon as the top-masts are fiddled.

† The riggers in the dock-yard new strop the blocks, and begin about them in rotation as they are sent on shore.

‡ The sail-makers will not begin on the new sails till the old ones have been surveyed.
On Refitting, or Going into Dock.

before be taken on board the hulk, and properly secured. The first thing generally
attended to, is starting the filled cartridges into the powder casks, and sending all
the powder and musket cartridges on shore; then the guns and gunners stores; but
I would advise the executive officer to calculate the number of things he can do
at one time; as, for example, if the guns are first taken out, everything is at a
stand for them, and all hands are confined to that single point of service; whereas
if the ship was unrigged, the boatswain with a division of the ship’s company,
might be spared, out of a full manned ship, to return the sails, rigging, &c. whilst
the remainder of the crew are employed in getting them out; and thus two pieces
of duty are performed at the same time; which would otherwise have occupied
separate intervals. If the ship is weakly manned, and has only a sufficient num-
ber of men to get the guns out, this should be the first object attended to, as it will
afford more room afterwards to work in. The leading principle should be, to
proportion the people to the work, and to undertake as many things at the same
time as the room on board and the number of hands will admit. The executive
officer should calculate the quantity of work he expects to be performed in each
separate day, and give his directions to the officers in their departments, to apply
for lighters as he supposes he shall want them, according to his arrangements.
Great care should be taken if the ship is only to be docked, of all the masts,
points, robands, gaskets, &c. and every thing which may be useful in her equipment.
To give an idea of the regularity which ought to prevail in stripping, I shall state
the manner in which it should be performed: supposing the sails to be thoroughly
dry, (for if they are not the master sail-maker will not receive them, and it will be
necessary to send people on shore to dry them,) send for a covered lighter to carry
the sails to the navy-yard. On beginning to unbend them, the robands being all
cast off, ease the earings down together, and lower the stay-sails down after unree-
ving the stays from the hanks; prepare a platform in the lighter of the running
rigging to lay the sails upon, and get them in as soon as possible, that the deck
may be clear of lumber. Some hands at this time may be employed to cut the
seizings of the ratlines off the top-mast-rigging, to unreeve the top-sail-tyes, and
reeve hawser, to get the top-sail-yards down; and to unreeve the top-gallant
shroud. When the sails and running rigging are made up, tallied, and put into
the lighter, get the top-gallant-mast down on deck, and top-gallant rigging, then
get the top-sail and cross jack yards and gaff down, and sprit-sail-yard in; unreeve
one of the top-tackle pendants, and reeve a hauser in lieu. If the ship is going
into dock, the main-top-mast may be kept up till the main-yard is lowered down;
when ready, unfld the top-masts, and cast the lashing off the heel of the jib-boom;
lower the lower yards and top-masts down together, and get the jib-boom in at the
same time. The top-masts being low enough to urrig, the lower yards to launch
overboard, some hands must be employed to urrig the lower yards and top-masts,
tallying,* making up, and carrying away the rigging. When the top-masts are
urriged and the cross-trees got down, hang the top-mast by the hauser or top-
rope, whilst the opposite top-block is unhooked and lashed to the side of the masts,
for getting the cap off; when it is done, bowse it well taught, and come up the
other which must be lashed in the same manner, to be able to sway on both.
When the top-blocks are properly lashed, lash the lower caps to the top-mast-
heads, and with a capstan bar, slug at the after part of the masts for a bumper,
get them off by mutually swaying the mast up and bumping with the bumper, that
no part may take against the masts. Some hands may now be employed in the low-
er rigging, to cast off the ratlines, taking care to leave them only on one pair, (the
second is commonly preferred.) When the caps are got into the tops and unlashed
from the top-masts, lash the span-blocks on the lower masts-heads, and reeve girt-

* The shrouds and back-stays are marked as they go over the mast-head and
numbered by knots made on a rope-yarn; as for example, the first pair is number-
ed with one knot, the second by two, and so on for every additional number.
† The top-blocks may be unhooked and lashed previous to commencing which
will add to the appearance of dispatch.
SEMAKKS ON FAINTING A SHIP.

ikies forgetting the tops off; get the top-masts either on the booms, up and down
the lower masts, or launched overboard; the first if the lower masts are to be
shifted, or the step lifted; the second if the lower rigging only is to be overhauled,
and the carpenters are perfectly certain, that there is no defect in the masts; and
the third, if the mast is defective, if the ship is to be paid off or the spars sent to
the dock-yard; then with the girtlines move for getting the tops off, sling the caps,
weigh them, and bowse them out of the tops by the fore and aft girtlines; lower
them either into the lighter or on deck. Send the carpenters up to unbolt the
tops,* which may now be gotten off. If they are to be sent on shore, lower them
into the lighter, otherwise lash them up and down the mast securely. The tops
being off, and the rigging in the lighter, unbolt the fore-mast cross-tree, sling it and
send it down. The gunners and forecastle men should now go up to lash the mast-
head and girtline blocks, to get the stays off, and then the rigging down, which ei-
ther lower into the lighter or on deck. The runner pendants in a roadstead should
be immediately overhauled and got over again, that the runners may steady the
mast whilst the rigging is off, the ship being unrigged, which is but a few hours
work, if she is to go into dock, some hands should have been employed in starting
the water whilst the ship has been unrigging; it will therefore require a short time
to pump her out during which interval, the fore and after hold may be worked at;
then the cables got out; observing whilst the ground tier is breaking out, which is
a tedious work for a proportion of men to perform, the stores may be returning in
the dock-yard.

When the hold is clear of casks, half tubs must be sung at the different hatch-
ways, to get the ballast up on the lower gun deck, which is thrown to a man on a
grating, sung on the outside of the port, who again heaves it into the lighter.

REMARKS ON PAINTING A SHIP.

If a ship is along side a hulk in harbour, painting her should be deferred till
the last thing, and then, if time and circumstances will permit, she should be hauled
off to moorings, and ship keepers only left on board. If application be made,
painters† will be sent from the dock-yard to paint her, but as it may be performed
equally as well by the ship's painters, it is better to demand the paint, and have it
done by the persons on board.

Great pains should be taken in mixing the paint, which should be tried on a
clean board previous to laying it on, recollecting that the colour will always ap-
ppear two or three shades darker than when dry. If the paint is mixed too thick
it soon dries, but peals off, and does not go so far as it would if mixed thinly. If
however, it has not a proper consistence, it will neither make a good appearance
nor last long, and, from the quantity of oil, is a long time drying; a painter or man
of sufficient judgment is, therefore, required to mix the paint. Spirit of turpen-
tine is frequently put in to make it dry soon, but the sun always extracts the spir-
it, and makes the work blister. The following is a simple, easy, and approved
method of mixing paint.

Take the proportions of yellow and white paint, oil and litharge, that will make,
it of the intended colour and consistence; put them altogether into one of the boat
swains fish kettles, stir them well up, and boil the composition, then pour it off,
strain it through a bread bag, and lay it on warm; the warmer it is laid on the bet-

* It is the custom in some ships not to get the tops off; this is not only a sloven-
ly lazy method but a negligent one, as the trussle-trees and cross-trees, or even
the top may be defective or injured, which it will not be possible to discover unless
gotten off.

† Ships are painted by contract, and unless the captain of a private ship will
pay the painter for additional white to be mixed with the yellow, it is so very dark
a colour that it makes the ship look very dirty and dismal.
INSTRUCTIONS FOR AN OFFICER IN HIS WATCH.

As soon as an officer relieves the deck, he should examine the ship's courses, see that the sails are properly trimmed forward and aft, and the back stays well up; that the people stationed to look out are relieved; that the watch are all up, and the ship in her station, which he should carefully preserve, and insert the bearings of the Commodore's light on the log-board every hour. A careful midshipman should be sent to visit the lower decks every half hour. When the wind blows hard if the ship be at anchor, send the mate of the watch down every hour, to see that the cable does not chafe against the manger-board or in the hawser, and that the stoppers hold. When it blows hard at sea, have hands stationed at the relieving tackle. Let the gunner's mate report the security of the guns every hour, and the carpenter's mate the quantity of water in the well. Proper people should be stationed to stand by the haul-yards and sheets, and the clew garnets, clew lines, down hauls, &c. should always be stretched along.

GENERAL DISPOSAL OF STORES, &c. NOT IN IMMEDIATE USE.

The boatswain and carpenter's sea-stores should be so arranged in their store rooms, that whatever may be wanted may be obtained with the greatest ease. The bending sails, for instance, should be kept in one sail room; the awnings and spare sails in the other. The shroud hawser fitted and kept tried up in the

* Small battens, or sinnets is generally nailed on, to point out the lines as a guide to paint by.
hawser teet; three or four stout huff-tackles fitted and kept below, to be ready to hand up in action, or in bad weather to secure a mast.

Spare buoys, in line of battle ships, are either triced up in the manger, kept in the coal hole, or forehold. In frigates they are usually triced up in the manger, and which should be slung and ready for use. Top-sail sheet blocks stopped, and fitted with lashing eyes, in the block room. Slings from the lower yards triced up in the block room.

The spare tillers triced up between two beams, one on each deck. Rudder chocks slung, and at hand to fix if wanted. The top chains, in time of peace, kept in the corners of the teers. The dead lights triced up in the passage to the well. There are many things kept below in ships of war, which foreign officers, upon their visits, are astonished to see, as supposing them to be without. These with arrangement and taste, might be disposed of to much advantage, both to set off their appearance and to be in readiness at the quarters the moment they are wanted. As for example, the match-tubs, wads, salt-boxes, powder-horns, pikes, tomahawks, and tube-boxes, which are absolutely necessary to be at hand; but particularly in a cruising ship; and at the same time it furnishes the executive officer with an opportunity of displaying his abilities in disposing them to advantage. The fire buckets are generally well painted, and hung in a row round the file-rail, and the lower part of the breast work of the poop, having their laniards flemished close down inside, which disposes of the whole that is allowed. Some ships that do not stow hammocks in the breast work of the poop, have a breast work made of pikes which in general appears heavy, and without taste. If there should not be any breast work, the best substitute is a half circle of tomahawks on each side, and in large ships two, which are light, and look well. The pikes as they have no beauty in appearance, but are instruments necessary to be at hand, may be kept out of sight, (the handles either scraped very clean, or painted white, and the pike black) under the half deck. The tomahawks crossed and nailed up over each gun with a powder-horn between them. The wads made up in cheeses, and covered with canvass, having an emblematical painting on it. The salt-boxes painted in the same manner, and fixed over the gun. The tube-boxes ranged in a dry place, painted and numbered, for the guns; they are commonly put under the half deck, against the bulk head of the cabin, under the charge of the centinel at the cabin door. The locks are in some ships, kept constantly on the guns, with covers cut out of solid blocks of wood, or cast lead; these covers may keep the wet from them, but cannot prevent the damp, which will, of course, render them unfit for use, and shews the impropriety of keeping them on. It appears better to place them in a dry situation, after having been fitted, with the number of the gun to which they belong affixed over them. One man at each gun should be taught to fix them on, who should be stationed to perform this particular service, when the drummer beats to quarters. Preventer lower braces on the yards, stopped into the bunt and down the stays. Strops should be fitted on the yard-arms, with thimbles to hook the braces, which are kept in the tops. The spare cap is either kept before the fore or main-mast. The jack in the boxes before the main-hatch way under the ladders. The engine on the poop. The geers coiled neatly up and triced to the deck. The signal colours kept in a chest on the poop. The ensigns rolled well up, and kept in the sail-room. The capstan-bars under the booms.

The fire booms in line of battle ships triced up on the lower gun-deck, between two beams, to be in readiness to rig out of the ports if required. In frigates, they are stowed with the other spars.

A boat's arm chest should be kept complete with muskets, pistols, cutlasses, and ammunition, under the centinel's charge, at the cabin door, to be in readiness to hand into any boat that may be ordered away in the night time or upon a sudden emergency.

* To prevent the rope from rotting off by being kept below, these tackle-falls should be unroved every four or five months, and appropriated to another use, and new rope run in lieu thereof.
REMARKS ON PUNISHMENTS.

POINTS of service ought to supercede every private consideration. The officer that does not feel a zeal and pride to excel in his department is unworthy of the rank he holds; for how can he expect more from the men whom he commands than he himself exhibits. A proper degree of spirit, mixed with encouragement, will always forward the duty better than oaths and coersion. It should therefore be the study of every executive officer to instil with equanimity of temper, a spirit of emulation into his inferiors; which will in the event of success, or superiority, over any other ship of war, spread satisfaction over the whole; and all will in that case be as studious to excel, as the officer to whose plans and arrangements the merit is attributed. When people know that their actions are noticed, and that every reward or punishment is apportioned accordingly, they naturally become cautious of avoiding censure, and desirous to promote their own happiness and advantage.

Examples, at first should be severe, and although a crime, at another time might be forgiven, in a well disciplined ship, it ought at this time to be regarded with more than ordinary severity; for by this a great deal of punishment will be obviated, which otherwise might become necessary. When rules and regulations, which beget order and discipline, are known and established, it requires very little trouble to keep them in force; the want of energy and vigilant attention are the only obstacles that would impede their operation. When no regular discipline is established, a good man frequently suffers from accident, whilst a man of bad character, by the same cause, escapes it.

This proceeds from caprice of disposition, or when crimes have passed so long unheeded, and the discipline is so much impaired, that every inadvertence is made a plea to restore it. But the act of a moment never should betray an officer to the commission of injustice. If a man commits an offence, he should be confined at least twelve hours, or until every spark of resentment has subsided; as the distinction between guilt and error, should be the grand criterion of forming an officer's judgment on the propriety of punishing or acquitting the culprit. To confound the good and the bad would be to destroy all emulation, and every stimulus that would incite a man to exertions deserving of superior notice. When a prisoner is summoned, let each party be heard, and every circumstance fairly and impartially stated; if doubts exist, or it appears that the crime may have proceeded from ignorance, or mistake, the character of the accused should always be referred to, which will convince men of the importance of possessing a good name; but, if punishment must be inflicted, it should be done so as to strike others with a sense of its necessity, and the force of its example. The task of pronouncing punishment must be painful to the feeling of every officer who is to decide on the case; yet it is so necessary a thing, that all regularity and order is dependant upon it; and this consideration should prevent any mistaken notion of lenity from betraying a captain to forgive where he ought to punish; for, if his passions are to be affected by forced grimace, or pretended sufferings, punishment becomes only the ridicule of those who ought to suffer it. When a prisoner is released from his confinement, either in consequence of his innocence, or as an act of grace to his merit and former good character, it should be done as publicly as if punishment had been inflicted.

Example, in all cases, is the grand object; and as example on an individual tends to produce the same good effect on the whole, a selection should be made of those most notorious in their conduct; that when their misbehaviour brings them to punishment, the severity of the law might be stretched to the utmost.

To conclude this subject, I have always observed that, where the discipline and subordination of a ship was regular, the people were happy; and the officers and ship's company, from an acquaintance with each other's system, acquired and maintained a reciprocal respect for, and confidence in each other.
REMARKS ON CARRYING ON DUTY.

In the executive movements of a ship, nothing forwards the duty more than a proper division of the officers and ship's company. The officers commanding in different stations, should have the immediate superintendence and command of those parts; and previous to any duty being performed, the executive officer should send for the principal officers, and acquaint them with what is to be done, and the manner by which it is to be performed. Silence in almost every instance is the chief criterion by which a ship's discipline may be estimated. Not that dark mysterious awe which fear begets, but a cheerful attention wherein every man's mind is wrapped up in the service that is carrying on. The greatest attention should be paid to the orders of the executive officer, and of the principal officers at their stations, who are the only persons to repeat the orders given, or to reply to those received. Should one piece of service grow out of another, whilst the hands are upon deck, they should be piped specifically to perform that which is created anew, that the people may repair to their stations accordingly. When petty officers are so scarce as not to admit of any being stationed in the tops, the captains of them should have the whole command and responsibility there, and be the only people to repeat the orders given, or to reply to questions addressed. If this system be adopted and duly enforced, it will produce the happiest effects, in preventing confusion by a multiplicity of voices, and maintaining a proper subordination; and likewise by giving the officers discretionary powers will ultimately save the executive officer an immensity of trouble, which he must undergo were he obliged to inspect every department himself.

PARTICULAR POINTS REQUISITE TO KEEP A SHIP CLEAN.

Whatever conduces to the preservation of health on board a ship should be attended to with the utmost strictness. That very anxious care for the preservation of salubrity, exhibited by some officers, has sometimes, however, led them into extremes, as we have seen exemplified in the article of washing; which has been, in some ships, repeated with the same invariable constancy in the winter as in the summer, in cold climates as in hot. On the contrary in some ships, the officers seem to have fear that the seamen, who withstand the inclemency of the weather in a half dried pea-jacket upon deck, should be affected by the humility of his birth below, arising from its being washed; and this salutary operation has consequently been entirely prohibited. By not attending to the principles of a case, we are led into error. Excessive washing, in improper seasons and climates, will produce damps which occasion colds, the forerunner of most disorders generated on board ship; but no washing at all must render a ship loathsome, by suffering the generation of filth and vermin.

The lower deck of every ship, but more especially that of frigates and sloops of war, ought to be particularly attended to; as the small space which contains so many men requires the greatest attention for preserving it clean and well aired. One washing day in a week, in the winter season, or in bad weather, will be found sufficient, and then every moveable article should be taken upon deck; the beams, carlines, &c. should be washed with vinegar; and after the whole is finished, stoves should be lighted, and moved to the different parts of the ship, in order to air and dry it completely, before the people are suffered to go below.

On other days, after breakfast, one man from each mess should get a wet swab, and sweep out and swab his birth, with the part opposite to it. The principal object requisite for the preservation of cleanliness is, to have the decks as free of lumber as possible. Each mess to be allowed a certain number of chests, and the deficiency of room to keep the people's clothes in to be made up by bags, which
PARTICULAR POINTS REQUISITE TO KEEP A SHIP CLEAN.

should be numbered with that of their hammocks, and the same attention paid in having them scrubbed and brought up on the booms as to the hammocks. The ship's company should fix themselves in messes of not more than six, or less than four, the eldest man in each mess to have the charge, care, and authority of it; and to be responsible for its being clean, quiet, and regular; and to report the misconduct of any person belonging to it. If any complaint be made of the victuals or respecting any thing which concerns the mess, it should come by him and him, only. A free circulation of air is the most essential requisite for the preservation of salubrity below. In harbours and at sea, the wind sails should be constantly sent down and trimmed, the ventilators should be at work, and the hammocks never kept below, if it be possible to preserve them from wet upon deck.

In wet weather or on washing days, the people should not be allowed to carry their wet clothes below; dry tubs should be provided, and placed under the sentinel's charge, at the cabin door, to put them in, till the weather will permit them to be dried, nothing being more prejudicial to health than the humid vapours which they occasion when below. Battens should be nailed down to keep the chests in their limits, and to prevent them from rolling, on board frigates, and sloops of war.

Every captain commanding a ship of war, who feels a just pride in his situation, will consider the health of the people under him, as the most material charge entrusted to his care and discernment. He is the guardian of their lives, their happiness, and their comfort. On him depends the success of enterprise. Evincing in all that he is concerned in, a parental feeling for those whom he commands, he is obeyed with cheerfulness. His seamen become fearless of danger; they dread nothing but the anger of their commander. All who are under him are satisfied; and that satisfaction brightens into active zeal, when occasion calls it forth.

ON DISCIPLINE IN GENERAL.

Having treated on the different points most essentially requisite to be attended to by the captain of a ship of war, we shall now present a summary or abridgment, in which we would depict what ought to be the characteristic of his command. Let him fancy the movements of his ship to be those of a great machine, whose vigour, expertness, utility, and effect, are dependant on discipline, and discipline on himself. Let discipline then be considered as the great wheel, which sets in motion numberless small ones: the great cause of every success; the vital spring of subordination: the commanding invigorating principle of every action; the power which rewards and protects; whose advantages include all that is derived from the laws, authority and obedience, created with, and expiring only with his command.

Let the health, ease, comfort, and happiness of those under his command, be his domestic charge, reserving their strength for opportunities, which will compensate his attention. A system clear and methodical; the execution of it precise and regular. A friend to good and deserving men; a terror to bad ones; the protector of the weak, and an impartial administrator to the whole. If we reflect on the number and description of men on board ship, we shall perceive a society frequently composed of men possessing the most turbulent unruly dispositions; among whom may be found foreigners, mechanics, husbandmen, labourers, fishermen, and all those good and bad, who destitute of a livelihood, embark from necessity to procure one.

Need we urge the propriety of bridling the dispositions of such a motley group, and bending their minds to one system of discipline? If such a number of the bad part of the above description, as may be supposed to belong to a first or a second rate ship, were on shore in one society, it may be readily imagined what trouble they would give magistrates, and how little the tedious form of a court of jus-
tice, its protracted mode of punishment, and feeble retribution would tend to prevent their misdemeanors. Great, however, as the charge appears, no vigilant commander, entrusted with the peace and good order of such a society, would compromise his authority and prefer a tame submission to outrages to the exertion of that authority in repelling their offences.

From the same principle, why should a few designing men be suffered to take advantage of their local habitation on board a ship, because, unable to gratify their ambition, they oppose every restrictive measure that is adopted; and by their influence mislead the more credulous and ignorant part, who, if checked in time, might be reduced to obedience and good behaviour. It appears very extraordinary, that the arm of power should ever have relaxed so much, as to suffer its authority even to become disputed; that a decay so certain in its termination should be blindly preferred to the gentle exercise, which keeps in force and progressively invigorates, its salutary purposes. It is much safer to make laws than to alter them when established, and it is likewise safer to create a power than to alter or abridge it; hence, as the meritorious behaviour of a seaman at one time, and necessity at others, may render it necessary to promote him to the rank of an inferior officer, very few circumstances should induce an officer of superior rank to debase him to his former class; for the mind of a man, in a degraded state, always retains a deadly poison, which only requires opportunity to burst forth, and shew itself under the worst appearances. Is it not an august sight to see, when the first motive, the ruling principle of a great character, who possesses power, is the good and happiness of those over whom he presides; who renders justice to all, and dispenses wherever they become due, rewards and punishments, with strict impartiality? such should be the commander of every American ship of war. Of such we now have some bright examples. And we may ask,—In what respect can a command be more desirable, than in the power of promoting the comfort, and of rewarding the industry, the integrity, and bravery of every person subordinate to it? We shall now proceed to state those internal regulations which are requisite to be adopted and publicly made known, for the acquisition and preservation of order, method, and regularity on board a ship.

FORM OF GENERAL ORDERS FOR THE BETTER GOVERNMENT AND DISCIPLINE OF AMERICAN SHIPS. (SUPPOSED TO BE ISSUED BY THE CAPTAIN.)

General Orders for the better government and discipline of the United States ship **under my command.**

Having thought proper to establish the following rules for the guidance of the officers and ship's company under my command it is strictly required, that no deviation whatever takes place, without my knowledge and concurrence; but that every person obey them in the fullest sense, together with any additional instructions that I may think proper to insert in the orderly book, for the good of the United States Navy.

1st. Each lieutenant is to take a copy of the general orders, and of those issued separately to the officers in their respective departments, after which he is to sign his name in the orderly book, which signature is to be considered as an acknowledgment of his having so done.

2d. The health of the ship's company being the first consideration, every possible attention is to be paid to promote it; for which purpose a free circulation of air must always be kept up, the hammocks got up in the summer time, at seven o'clock when in harbour, and at half past seven when at sea, or in the winter season; the summer and winter to be considered as ascertained from firing the evening gun at eight or nine o'clock, after which the decks are to be
swept, and the breakfast piped precisely at eight, unless the duty of the ship should prevent it. The hands to be afterwards called at three quarters past eight; the chests moved or triced up to the decks; the births swept and swabbed out clean, the ladders scraped, and the gratings taken off fore and aft. Sentinels are then to be placed at each hatchway, to prevent any person from going below till seven bells, at which time the decks are to be cleared, the work made up, and returned to the boatswain. If possible the dinner is to be piped at twelve. If no particular service requires the ship's company sooner, they are to be allowed one hour at dinner. The chests afterwards moved and the parts beneath them swept.

The lieutenant of the morning watch is to have the charge of the decks for the day, and to report the state of them to the commanding officer when the above mentioned service is finished. In the absence of the lieutenant, the mate of his watch is to superintend and report the duty for him.

The wind sails are to be constantly down, and when the surgeon judges it necessary, stoves are to be lighted. The between decks are to be washed every morning, if other duty does not interfere; but if it does, the following day is to be appropriated, and stoves are afterwards to be kept lighted till the decks are perfectly dry.

3d. On Saturday mornings, the ship's cooks are to be called at four o'clock, to boil water for washing the ship's company's clothes; the hands to be turned up at six and to continue washing till half past seven. Clothes-lines cut out of white line, are to be kept for that particular purpose by the boatswain's yeoman; the lines to be rove and marked off the preceding night, and the linen hung between the fore and main shrouds, in harbour, and between the main and mizen shrouds at sea. Should it rain before they are perfectly dry, they are to be taken down, and put into clean half tubs under the charge of the sentinel at the cabin door.

4th. At sea the ship's company is to be mustered at quarters and the lieutenants are to inspect and see that every thing is clear and ready for action, and afterwards report it to the captain. The ship's company is to be mustered by divisions at the time the lieutenants are to examine and see that the men are clean and neat in their persons, or report the contrary to the commanding officer after he has inspected them. On the divisions are to be beat, and the officers are to see that the men have washed their dirty clothes, and that they have their compliment complete. No man is to be allowed to convert any article of his wearing apparel to another use, without having first received the approbation of his officer of division.

5th. When the service will allow of leave being granted to the seamen and marines to go on shore a regular list, in the prescribed form, is to be kept and none are to be permitted but by the first lieutenant, or with his consent; and when the ship's company is allowed to have spirits from the shore, a list is likewise to be kept.

* Forms of the list to be kept for men having leave to go on shore, and to have spirits brought on board.

<table>
<thead>
<tr>
<th>Men's Names</th>
<th>Day of the Month when Leave is granted.</th>
<th>Time when the Person is to return</th>
<th>Time when the Person returns.</th>
<th>Men's Names.</th>
<th>Number of the Mes.</th>
<th>Number of Men in the Men.</th>
<th>Quantity granted.</th>
<th>Sum given.</th>
<th>To whom given.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Forms of the list to be kept for men having leave to go on shore, and to have spirits brought on board.
kept in the form as directed, and no mess is to be allowed more than at the rate of half a pint to each man.

6th. The raw hands to be exercised at reefing and furling sails, one hour every day, till they are perfect in doing it. The boatswain's mate to have the superintendence of this duty by turns; and the same people are to be exercised by the gunner's mates in rotation, at the great guns, one hour in every day.

7th. When in harbour or at sea, and particular duty does not interfere, or when in company with a senior officer, who does not make the signal periodically, mornings are to be appropriated to the exercise of the great guns and small arms; on which day every officer on the spot is particularly required to attend. If in harbour and the weather will permit, the sails are to be loosened and every evolution practised which may occur in action at sea.

8th. When in harbour, and particular duty on board prevents the motions of the senior officer from being followed, a message is always to be sent, specifying the reasons which so prevented it.

And when a commanding officer gets under weigh, his motions, if the weather will permit, are to be followed till he is clear of the harbour. When a commodore arrives in port, the sails are to be loosened and taken in, agreeable to his movements; but, should any strange ship appear off the harbour, no boat is to board them until it is ascertained that they are friends.

9th. When in harbour and other duty does not prevent it, the hands are to be turned up in the summer season at . The boats required for the duty of the ship are to be hoisted out, and the decks scrubbed and washed; the comings, ladders, channels and gratings, are to be particularly well scrubbed, the yards squared, and hammock-cloths spread by seven o'clock. In the winter the hands are to be turned up at and the decks cleaned by 7 bells when the hammocks are to be gotten up. These are always to be piped down after beating the retreat from quarters at sea, and after hoisting the boats in when at anchor.

10th. When in port and the duty of the ship will admit of the indulgence, a boat is to be ready at nine o'clock, every morning to carry any person (who may have permission) on shore; another boat to go at one, and another at a sufficient time before sun-set to admit of her return to the ship by that time. She is on no pretence whatever to be detained after that period.

11th. When any duty is to be performed out of the ship, where a part of the ship's company is required, an officer, with his division, is to be sent; and in like manner, when the service requires but a sub-division, a mate or midshipman, with his proportion of the company, is to be sent; always taking great care that the officers and ship's company are sent upon all duties in rotation.

12th. When in port the beer and water to be demanded from the victualling office are to arrive along side on mornings; but when the ship is watered by the launch, she is always to be kept complete.

13th. On afternoons, if the duty of the ship will permit, the ship's company are to be ordered to mend their clothes.

14th. When the ship arrives from sea, the greatest dispatch is to be used in refitting and getting ready for sea again; and until she is so, no officer or seaman, is, on any account, to absent himself from duty. Watering the ship must always be considered as the first service to be attended to, for which purpose, different boats crews are to be selected to relieve each other.

15th. When an officer receives leave of absence, he is to consider it for that day only, unless expressly stated to the contrary, as no person whatever is to sleep out of the ship without the captain's leave.

16th. The ship is never to be left without lieutenants, and mates, and midshipmen; or without one warrant officer, who in the absence of the others, is to inspect the store rooms and return the keys to the senior lieutenant.
PARTICULAR ORDERS TO THE OFFICERS RESPECTIVELY.

1. PARTICULAR ORDERS TO THE FIRST LIEUTENANT.

The ship's company if possible, to be at three watches, and to be divided into as many divisions, of equal parts, of the different stations, as there are lieutenants belonging to the ship, with a proportion of mates and midshipmen. Complete watch stations and quarter bills are always to be hung by the articles of war, under the half deck; and every man is to be made perfect in his station. In harbour when the officer of the watch inspects the cleaning of the decks, it is not intended to preclude the first lieutenant from interfering, if he thinks proper; but only as an assistance from the other fatigues of the station. The newly raised men, who are not acquainted with the exercise of the great guns, small arms, and sails, are to be divided into divisions, according to the instructions contained in the 6th article of general orders. Particular attention is to be paid to the order respecting boats. The keys of the magazines are to be kept in the first lieutenant's cabin, in a place known only to the other lieutenants; and never delivered to any person but the gunner. The keys of the warrant officer's store rooms are to be hung on the outside of the first lieutenant's cabin, and delivered only to a midshipman or warrant officer.

2. ORDERS TO THE LIEUTENANTS OF THE SHIP.

Each division is to be subdivided by the officer who has the charge of it, into proportional parts of seamen and landmen, taken from the different stations, which are to be under the inspection of the petty officers, who are to examine and make their reports to their respective lieutenants. Lists are to be kept of the seaman's clothes, in the prescribed form,* which are to be examined every The quantity of clothing is always to be kept complete, according to the established number, as specified in Article 3d of Orders to the Ship's Company; and should any man be detected, or suspected of having sold any of his clothes, he is immediately to be reported to the captain.

The established discipline of the ship must be always most rigidly obeyed, the orders given for the better government of the ship most scrupulously attended to, and the method of carrying on the duty, by the senior officer, followed by all the others; as a variety in giving orders, by different officers, will, of course, create confusion amongst the ship's company.

Every officer is to appear in his proper uniform both on board and on shore.

Should it be necessary to call the captain during the night, and the officer of the watch does not think it safe to leave the deck, he is to send a midshipman, or sentinel, to inform him of what it may be necessary he should be acquainted with.

* FORM OF THE LIST FOR THE MEN'S CLOTHES.

<table>
<thead>
<tr>
<th>Men's Names</th>
<th>Stations</th>
<th>Number of Shirts</th>
<th>Number of Stockings</th>
<th>Pairs of Trowsers</th>
<th>Outside Jackets</th>
<th>Inside jackets</th>
<th>Waistcoats</th>
<th>Shirts</th>
<th>Hats or Caps</th>
<th>Hankies</th>
<th>Chiefs</th>
<th>Blankets</th>
</tr>
</thead>
</table>


ORDERS TO THE MARINE OFFICERS.

The lieutenants are always to be deemed, both at sea and in harbour, to have the charge of their respective watches, and to be responsible for the safety, good order and discipline of the ship, during each; at the end of which they are to sign their names on the log-board.

3. ORDERS TO THE MARINE OFFICERS.

When in harbour, the marines are to be divided, if possible, into three parts; one of which parts to compose a guard, and to do the duty of sentinels. They are to perform this service for a week, and to relieve each other alternately. The remaining two parts to act as a working party, and to assist in the ordinary duty of the ship.

One marine officer is to be constantly on board.

The general orders of the ship are to be carefully attended to, and obeyed, by the officers of marines, who are expected to instruct the private marines in the established regulations.

It is expected that one of the officers of marines shall examine into the state of the marines' births every day; and give the necessary orders to have them kept clean.

The senior officer of the marines is to muster the marines every evening, on beating to quarters; and to examine the arms and accoutrements, the state and condition of which he is to report to the captain.

When the senior officer of marines wishes to exercise his men, or to drill the raw hands, permission will be granted, on application to the commanding officer, if the duty of the ship will permit it.

All complaints from the marines are to be made through their officers, that the captain may be acquainted with the characters of the parties.

The senior officer is to keep the keys of the arm-chests in his cabin; during his absence they are to be kept by the officer next in rank, and so in succession; but no person of inferior rank to a serjeant is to be allowed to go to the chests.

The guard, in harbour is to be paraded at and to be dismissed at

4. ORDERS TO THE PURSER.

The purser is always to have charge of the key of the steward-room; and, in his absence, to deliver it to the master. He is to cause the steward room to be opened, for the purpose of serving provisions, between the hours of and in the morning, and between and in the evening. At all other times the door is to be locked, and no light suffered to be in it; nor is an atom of any kind of provisions to be served, but by the express order of the commanding officer.

The purser is to be accountable for the candles being in the lanterns designed for the quarters, before they are taken on deck at night.

The purser is to consider himself responsible for the regularity and cleanliness of the steward's room.

When any provisions are decayed, or in a state requisite to be surveyed, the purser is to make it known to the captain as soon as possible, that he may apply for an order to have it done.

The purser is to be very particular in providing a sufficient quantity of vegetables for the broth of the ship's company, when fresh beef is issued.

The purser is to deliver, at sea, a weekly report to the captain, of the expense of provisions, and the quantity of each particular species remaining.

No slops, or tobacco, to be issued to any man, without an order from the lieutenant of his division.
5. ORDERS TO THE MATES AND MIDSHIPMEN.

The general orders of the ship are to be always most scrupulously obeyed, and the mates and midshipmen are required to have a watch-bill about them, and a list of the people stationed under their orders. It will, on no account, be forgiven, should they quit the deck, during their watch, without being regularly relieved. The first lieutenant will, when in harbour, if the service permits it, regulate them in such a manner as to consult their accommodation.

When ordered on duty, in a boat, to take care of the crew, they must recollect that the people are individually under their charge, and that no circumstance can warrant a breach of this important service.

The good conduct of the mates and midshipmen will never be overlooked, and every degree of attention and indulgence will be regulated by it, which, it is hoped, will operate as inducements to them to do their duty with becoming spirit and activity; and, when they are below, that they conduct themselves with such respect and decorum towards each other, as shall insure them a superior degree of consequence in the eyes of the ship's company.

GENERAL OBSERVATIONS.

Having now finished the orders requisite to be given to the different officers in their separate departments, we shall proceed to state those which are necessary for the guidance of the ship's company; but must beg leave to remark, that it must not, in any case, be considered as the intention, by addressing the orders to the officers individually, to vest any particular authority in them, independent of their superior officers, but only to make them clearer in their signification, and to impress upon the minds of the respective officers the duty which is most immediately belonging to their station, and which the superior officers will, of course, see punctually obeyed.

FORM OF GENERAL ORDERS TO A SHIP'S COMPANY.

One washing day in a week will be always allowed, both at sea and in harbour; it is therefore strictly forbidden that any water shall be appropriated to that purpose, but what may be served out.

The ship's company are to form themselves into messes of not more than six, or less than four persons; the oldest man in each mess will be held responsible for the cleanliness and regularity of the birth, and the quietness of the other people belonging to it. He is to make them take it by turns to clean the birth after every meal; and is to apply for any redress as to the provisions, or what may respect the concerns of the mess.

The following articles of clothing are to be always kept complete, if it be possible; namely, three shirts, two jackets, one (red or white) waistcoat, three pair of trowsers, two pair of shoes, two hats, or one hat and one cap, and one black handkerchief.

* From ten to eight, otherwise there would not be sufficient births for the ship's company.

† The quarter masters captain of the tops, and boatswains mates should be divided among the birth's and have charge of them.
The various disorders incident to people on board ship most commonly proceed from colds, acquired by wet clothes and foul air; it is therefore strictly commanded, that every man who gets wet, takes the first opportunity to dry his clothes, and that he never carries any thing which is wet below, but leaves it under charge of the sentinel at the cabin door, where dry tubs will be placed to receive such articles. Nothing is ever to be hung in the shrouds, or about the bowsprit and rigging, when in port; but, should any person be desirous of drying his wet clothes, he will be allowed to hang lines between the fore and main shrouds for that purpose.

Any thing found lying about the deck, for which no owner appears, is to be brought aft on the quarter-deck, where every person who loses any thing is to apply.

The alacrity of the seamen in the performance of their duty, which reflects so much credit on their ship, and a quiet deportment when below, so essential to the happiness of both officers and ship's company, will be duly noticed: so that, whoever distinguishes himself by such a line of conduct, may depend on having a preference in every advancement and indulgence.

Any man, having cause of complaint, is to come quietly aft on the quarter-deck, and make it known to the officer of the watch; where every redress, consistent with the justice of the case, and the rules of the service, is assured. But no man is to presume, from litigious motives, to violate this regulation; as the person complained of will then become the injured party.

† Slops will be issued on the first Monday of every month; at which time all persons wanting them, are to apply to the officers of their division, who will, if necessary, grant them an order to receive them; but no man is to sell any of his clothes, or convert one article to the use of another, without having first received the consent of the officer of his division. If any man should lose any part of his clothing, he is immediately to report it to the officer of his division.

When boats are absent from the ship, without an officer, they are to be considered as under the immediate command of the coxswain, whose orders are to be equally obeyed. He will be responsible that a boat-keeper is always in the boat, to whose charge every thing belonging to the boat is to be committed.

No man is to presume to bring any liquor on board without particular leave. When permission is granted for liquor to be brought on board, the people who may be desirous of having it, are to apply to the midshipman of the watch, who will report it to the first lieutenant, and if he thinks the service of the ship will admit of such an indulgence, a quantity may be admitted, not exceeding half a pint to each man, for a certain number of messes, which will be varied in their turns, and particularized according to their merits, and the use or abuse they make of it.

REMARKS ON STATIONING A SHIP'S COMPANY.

Stationing a ship's company, at every common evolution, is absolutely necessary for its being performed with regularity and dispatch. In a large ship it requires more pains, and must be done on a large scale; whereas, in a small ship it may be reduced to the most simple and precise rules.

Watching the ship's company must be considered as the groundwork to the whole of the rest. This should be done, by taking equal proportions of the strength and abilities of the seamen, for the different watches, and then appropriating them to the various stations according to their respective qualifications.

* To have this order put in execution, the men's clothes should be marked in paint according to their number on the ship's books.

† The mate of each division should make out a list of slops wanted by the division and obtain the lieutenant's signature, and then to attend while the slops are served out, as a check upon the purser; and no slops can be charged against a man's wages without the purser's producing his receipt.
To ascertain the number of effective men, the widow's men, officers, marines, boys, and idlers, must be subtracted from the whole complement; the remainder will be the number to watch. But, as the quantity of ropes which lead on the quarter-deck of some ships, is greater than that on the quarter deck of others, it will be difficult to affix the precise number of men which should be stationed in the waist and after-guard. This number must vary in the above proportion; but as the qualities that are requisite for one station will answer for the other, so it does not signify so much as it would, if the higher stations were liable to such a variation; and the officer who makes out his watch-table must be guided by that rule in either adding to, or diminishing from, the strength of those stations.

In small ships it is most advantageous to have the greatest number of ropes on the quarter-deck, as they are immediately under the eye of the officer of the watch; but, in large ships where there is a profusion of men, and the quarter-deck is considered more as a parade than otherwise, and having the greatest room in the waist, it is preferable to lead them there. I shall, for those reasons, proportion them by that rule, but the ship's company should be prevented as much as possible from imbibing an idea that because they belong to one part of the ship they are not to go to another where their services may be wanted. By not adhering to this regulation, the ship's company, in small ships, is frequently kept at two watches, when they might be at three, if every man in the watch was compelled to assist in the duty which is carrying on.
### TABLE I.
FOR WATCHING THE SHIP'S COMPANY OF EVERY RATE.

<table>
<thead>
<tr>
<th>Rates</th>
<th>Number of Guns</th>
<th>Full Complement</th>
<th>Forecastle men</th>
<th>Fore-top men</th>
<th>Main-top men</th>
<th>Mizzen-top men</th>
<th>After-guard</th>
<th>Waiters</th>
<th>Quarter-masters</th>
<th>Quarter-guns</th>
<th>Carpenter's Crew</th>
<th>Boatswain's Mates and Yeoman of the Sheets</th>
<th>Total Number of Men watching</th>
<th>Number of Officers, Matroses, Seamen, Boys, and Seamen's mates</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st.</td>
<td>100</td>
<td>839</td>
<td>60</td>
<td>63</td>
<td>69</td>
<td>27</td>
<td>94</td>
<td>171</td>
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<tr>
<td>2d.</td>
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<td>50</td>
<td>54</td>
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<td>8</td>
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<td>77</td>
</tr>
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<td>9th.</td>
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<td>2</td>
<td>1</td>
<td>59</td>
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</tr>
</tbody>
</table>
FORM OF A WATCH-BILL,
TO BE HUNG ON THE MAIN DECK FOR THE STARBOARD WATCH.

The same form for the larboard Watch, is to correspond exactly in numbers, with a column for the numbers of the hammocks. The second part may, as the occasion requires, form a Quarter Watch.

<table>
<thead>
<tr>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2d. Part</td>
<td></td>
<td>2d. Capt.</td>
<td></td>
<td>2d. Capt.</td>
<td></td>
</tr>
<tr>
<td>Quarter-masters'</td>
<td></td>
<td></td>
<td>Fore-top-men.</td>
<td></td>
<td>Wasters.</td>
</tr>
<tr>
<td>2d. Part</td>
<td></td>
<td>2d. Capt.</td>
<td></td>
<td></td>
<td>2d. Capt.</td>
</tr>
<tr>
<td>2d. Part</td>
<td></td>
<td>2d. Capt.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2d. Part</td>
<td></td>
<td>2d. Capt.</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Having given the form of a watch-bill with a hammock-list annexed to it for the starboard-watch, it is to be supposed that the same form for the larboard one is made out, corresponding exactly in numbers, and as nearly in strength and abilities, as possible. The number of the hammock may represent the person in the station bill, which will make it perpetual, and prevent a great deal of trouble in erasing names on every change. This may be exemplified, by supposing a boatswain's mate, belonging to the starboard-watch whose number is one; and, on a large sheet of paper, the table, as follows, may be constructed; with every man's station opposite to his number in the marginal column.
REMJKRS ON WATCHING A SHIP'S COMPANY.

I have not taken any notice of the marines in my watch-bill, which will account for the difference of numbers stationed in the waist and afterguard; as it appears preferable to leave them to the immediate disposal of their own officers, giving them instructions how to dispose of the men. The marines should have their hammocks marked with red figures, and births to mess in, apart from the ship's company.

As there are various opinions respecting the propriety of a ship's company being at three watches, it may not be superfluous to make a few remarks on the subject. An insufficient number of men cannot be offered as an objection, in large ships, and I think not, with propriety, in small ones. A large frigate, that has not more men in her watch at two watches than a sixty-four has at three, with deeper courses, and every other sail in proportion, frequently excels her in the smartness of her manoeuvres; whilst, with such an inferior complement, she is at three watches, and the sixty-four gun ship at two. This circumstance, strange in its principle, and dangerous in its tendency, may be attributed to many causes; but the most prevailing ones are,—That captains, prejudiced in favor of old customs, cannot divest themselves of the idea, that their ships would not be safe with less than half the ship's company upon deck: and again, it is a very predominant opinion, that a ship's crew, being at three watches, acquire a habit of laziness, which disqualifies them for active pursuits when required; and that, by inaction, a restlessness of disposition is created, which degenerates either into gambling, or a spirit for politics, two of the most baneful tendencies of a ship's company. Upon this ground an objection may fairly be started, if an adequate remedy cannot be found; but, if it can, what solid advantages are not to be derived? And where is the officer, possessed of experience, who cannot invent some work for them to perform, even if there should be really nothing in the common movements of the ship to give them employment. We should then see their health and vigour preserved, unimpaired by fatigue, or the disastrous consequences of wet clothes, which men at two watches, have neither the requisite time, nor means of getting dried. To the utility of the plan for keeping the ship's company at three watches.

<table>
<thead>
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<th></th>
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</thead>
<tbody>
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<td>2</td>
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<td></td>
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<tr>
<td>3</td>
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<td>4</td>
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<td>5</td>
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</tbody>
</table>
REMARKS ON WATCHING A SHIP'S COMPANY.

es, I am confident, the medical part of the service will give their sanction; as, in a single point of view, it holds out an inestimable advantage against catching cold; because, all the watch will then be enabled, and should be required, to walk the deck, which will prevent them from lying down on the damp deck, or in wet places, a practice that does more injury to the constitution of seamen, than at the moment can be imagined; and which, when a ship's company is at two watches, it is scarcely possible to prevent.

Fixing a ship's company at three watches should be done after the ship has been some time in commission, and at sea, that it may be considered as an indulgence; and that if, from sickness, desertion or any other cause of being short of compliment, it be necessary to reduce them to two watches again, it should not be considered as a hardship.

In large ships, the crew may be watched with a first and second part, and the quarters and stations regulated by them at three watches, giving each lieutenant a division to superintend, instead of those people at his quarters according to the usual, although very improper method. Ships that have only four lieutenants, or less than that number, may consider the watch as a division; but as it will more frequently happen to small ship's than to large ones, to be obliged to put the ship's company to two watches, it appears preferable to consider them as always at two, and to style them accordingly whilst watching at three divisions.

OBSERVATIONS ON THE DIVISION OF A SHIP'S COMPANY.

Having frequently adverted to the term division, it may not be improper to describe precisely what my ideas on that head are. In large ships, or, as for example, on board a first rate, where there are nine lieutenants, the first (or executive) and signal officer, with the signal midshipmen, have that peculiar duty only to attend, which renders it impossible for them to take charge of a division; the remaining seven lieutenants have the ship's duty only to attend, which, in various cases, requires a part to be sent on service out of the ship, as in a prize; or, to the assistance of a ship in distress; or, to the dock yard; or, to execute any duty on board, distinct from that which is carrying on upon deck which, if no previous arrangement has been made, it requires considerable time to adjust, and to make out lists of the men's names, who are to go with the officers; but if divided into proportional parts taken from the different stations and allotted to the respective officers, a division of the ship's company composing a proportional part of the strength and abilities of the whole, is ready at the shortest notice to leave the ship, properly commanded by a sufficient number of officers, without interfering with the strength of any particular station. The 2d and junior lieutenants, in large ships, and the junior only in small ones, should have the command of the boarders, who ought to constitute at other times a small-arm party, regularly trained to the uses of musquetry, the pike and cutlass. If cudgel sticks could be provided, to teach the boarders the sword exercise, it might prove of the greatest advantage against an enemy. The first lieutenant commonly commands all the boarders unless they land, and then they are commanded by their respective officers. At these times an uniform, made of canvas, for a jacket and trousers, edged with blue cloth, and a cap of the same kind, with the ship's name to which they belong painted on it, would not only add to the beauty of appearance, but be the means of preserving regularity, and of preventing, in a great measure, straggling, and desertion.
REMARKS ON QUARTERING A SHIP'S COMPANY.

Quartersing a ship's company requires the greatest attention; and when a ship is first put into commission, the people should be frequently exercised at their quarters, that they may be familiarized to the various occurrences which are likely to happen in action. When the men are perfect in one station at the gun, they should be appointed to another, that they may acquire a proficiency in the whole. The men should be quartered by the watch bill, taking equal proportions from the several watches. This plan will be found most advantageous in small ships, in which, when at sea, the people are frequently called to their quarters in the night; and in this case, the men who belong to the watch will naturally be employed in getting their quarters ready, whilst those below are bringing up their hammocks. In a ship whose crew are at three watches, they should be compelled, in fine weather, to bring them up, stow them, and cover them well up in the nettings; which in the event of falling in with an enemy, would be of incalculable advantage.

The men at the guns should be stationed in the following manner:—the whole number divided into two equal parts, under a first and second captain, having their respective boarders, with their belts and cutlass; sail-trimmers; larboard men, to fetch a lantern; fire men with a bucket and swab; winch men, to pump the ship if required; port tackle fall men, to lower the port; and powder men to fetch powder; under the orders and direction of officers especially nominated to superintend these different duties.

On beating to quarters, the first captain, with his party, is to get the starboard guns ready; and the second captain, with his party, should get the larboard ones. In fighting both sides at once, the people should be taught to work from two guns together: thus, whilst one gun is in, and the people are worming, sponging, and loading it, the other should be run out with the spare men from the gun which is in, in addition to those belonging to the gun which is to be run out, and to continue alternately to assist each other. When one side only is engaged, the first party of the men stationed at the gun should stand on the fore part of the gun and the second party on the after part. The first captain should prick, prime, and point the gun to the object; the second captain should secure the powder horn and stop the vent. The boarders should sponge and load the gun; the firemen should choke the tackle-falls, and handle the crows and handspikes; the rest of the people should work the gun.

As nothing, in action, conduces more to keep up a brisk fire than being well supplied with powder, every necessary arrangement should be made for that purpose, by stationing a sufficient number of men to hand it along the passages, and dividing the supply as much as possible, that no confusion, or mistake, may happen in distributing the cartridges. In three deckers it is usual to supply the lower deck with cartridges from the grand magazine, handed up at the fore hatchway; the middle deck, from the fore-hanging magazine, handed along by the sail room up the main hatchway; the main deck, forecastle, and quarter deck, from the after magazine, with whips at the foot of the ladder coming off the middle deck. Positive orders should be given, that no cartridge shall be given out to any person who does not deliver an empty cartridge box.
<table>
<thead>
<tr>
<th>Class of Ships</th>
<th>First</th>
<th>Second</th>
<th>Third</th>
<th>Fourth</th>
<th>Fifth</th>
<th>Sixth</th>
<th>Seventh</th>
<th>Eighth</th>
<th>Ninth</th>
<th>Captain</th>
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<td></td>
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<td></td>
</tr>
<tr>
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</table>

**TABLE I.—SHOWING THE STATIONS OF THE DIFFERENT OFFICERS AT QUARTERS.**

The letters in the columns signify the stations, and the figures the number of petty officers at each; as for example, Q D, quarter deck; F c, forecastle; M a, main deck.
TABLE II.—THE GENERAL APPROPRIATION OF MEN AT QUARTERS, FOR THE DIFFERENT CLASSES OF SHIPS IN THE AMERICAN NAVY.

<table>
<thead>
<tr>
<th>Class of Ships</th>
<th>1500 Tons</th>
<th>1500 Tons</th>
<th>1500 Tons</th>
<th>1000 Tons</th>
<th>1000 Tons</th>
<th>1000 Tons</th>
<th>1000 Tons</th>
<th>1000 Tons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whole Complement of Men</td>
<td>18</td>
<td>15</td>
<td>10</td>
<td>8</td>
<td>6</td>
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<td>4</td>
</tr>
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<td>Number of Officers</td>
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<td>6</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Number of Matrons and Midshipmen</td>
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<td>10</td>
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<td>10</td>
</tr>
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<td>10</td>
<td>10</td>
<td>10</td>
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<td>Number of Officers</td>
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<tr>
<td>Whole Complement of Men</td>
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<td>10</td>
<td>8</td>
<td>6</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Number of Officers</td>
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<td>6</td>
<td>4</td>
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<td>4</td>
<td>4</td>
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</tr>
<tr>
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</tr>
<tr>
<td>Number of Mates, 2nd Class</td>
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<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Whole Complement of Men</td>
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<td>15</td>
<td>10</td>
<td>8</td>
<td>6</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Number of Officers</td>
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<td>6</td>
<td>4</td>
<td>4</td>
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<td>4</td>
<td>4</td>
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<tr>
<td>Number of Matrons and Midshipmen</td>
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<tr>
<td>Number of Mates, 2nd Class</td>
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<td>10</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Whole Complement of Men</td>
<td>18</td>
<td>15</td>
<td>10</td>
<td>8</td>
<td>6</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>
OBSERVATIONS ON THE FOREGOING TABLE.

The calculation for regulating the men at quarters differs from that of all other stations, by including the marines, boys of the 1st class, and idlers. The boys of the 1st class may be entrusted to hand powder along the passages. The cooper should be quartered in the magazine, to be ready to open powder barrels. The ship's cook and master-at-arms in the light room. In line-of-battle ships, proper men should be quartered at the after-guns, in the gun-room, to be ready to attend the relieving tackel; and, in frigates, men should be appointed to attend this duty. The carpenters in frigates should assist, when not occupied in their own line, to hand powder between decks. The assistance of the purser, to superintend the distribution of powder at the hatchways, and, to arrange and command the people stationed to hand it along, appears to be a much more eligible mode of employing his services than to station him in the cockpit. Line-of-battle ships that have carronades on their poop, may either work them with the small-arm party, or take one man from each gun that can best spare him. The riggers in line-of-battle ships should assist at the guns whilst they are not occupied about the rigging. In frigates, one man from each gun, on the forecastle and quarter-deck, to be stationed at this service.

ON FURLING SAILS.

It will appear by the following Table of Proportions for Furling Sails, compared with the number of men watched, what an advantage a first rate has over every other class of ships; for with smaller yards than, and sails not so deep as, those of an eighty gun ship, they have more men; which with the advantage of much more room to work in, will evince how they ought to excel in their manoeuvres. Forty-four gun frigates, and sloops of war, are evidently the weakest in their working hand, although they have men enough to work their guns, which is generally considered as the criterion to judge by. In small ships, the idlers are usually sent on the main yard to furl the main sail; and the boys on the mizen top sail, and top gallant yards. In ships that have no station bill for MANNING THE YARDS, this will answer the purpose, taking care to have an equal number of men on each yard-arm of the different yards; and, if time will permit, the men should be selected by their size, and the tallest men placed at the bunt, to reduce them gradually to the shortest at the yard-arms.

The main yard men consist, in large ships, of the quarter-masters, gunners, and carpenters; the fore and main top, and top gallant yard men, of the people belonging to the respective tops, when they have a sufficient number; which, if they have not, the deficiency is to be made up from the afterguard. The jib is to be stowed by the forecastle men; the foresail furled by forecastle men and waisters; mizen-top and top-gallant sail by the afterguard and mizen-top men; the mizen stay-sail to be stowed by the afterguard.
### TABLE IV.

PROPORTIONS FOR STATIONING MEN, AT FURLING SAILS, FOR ALL CLASSES OF SHIPS OF WAR.

<table>
<thead>
<tr>
<th>Class of ships</th>
<th>Main Top sail yard.</th>
<th>Top gallowant yard.</th>
<th>Fore Top sail yard.</th>
<th>Top gallowant yard.</th>
<th>Mizen Top sail yard.</th>
<th>Stow the Main stay sail.</th>
<th>Minor stay sail.</th>
<th>Total number of men stationed</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>54.40</td>
<td>50.36</td>
<td>24.6</td>
<td>20.12</td>
<td>4</td>
<td>262</td>
<td></td>
<td></td>
</tr>
<tr>
<td>80</td>
<td>50.36</td>
<td>44.13</td>
<td>20.6</td>
<td>16.10</td>
<td>4</td>
<td>232</td>
<td></td>
<td></td>
</tr>
<tr>
<td>large 74</td>
<td>56.40</td>
<td>52.36</td>
<td>24.6</td>
<td>20.12</td>
<td>4</td>
<td>266</td>
<td></td>
<td></td>
</tr>
<tr>
<td>small 74</td>
<td>42.36</td>
<td>40.32</td>
<td>20.6</td>
<td>16.10</td>
<td>4</td>
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</tr>
<tr>
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<td>18.32</td>
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<tr>
<td>50</td>
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<td>14.4</td>
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<tr>
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<td>38.30</td>
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<tr>
<td>38</td>
<td>34.26</td>
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<td>12.8</td>
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<td>169</td>
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<td></td>
</tr>
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<tr>
<td>small 32</td>
<td>22.18</td>
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<td>3</td>
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### OBSERVATIONS ON MOORING AND UNMOORING.

It is as necessary for preserving regularity in mooring and unmooring ship, to have a station-bill, as in most other points of service; but as it is impossible to employ all the people, in large ships, at this specific duty, without creating confusion, by too great a number, or imposing the weight of it on one particular class, the following Table has been computed only from a fifty-guus ship downwards, upon the supposition that all ships above that rate may perform it with two watch- es, reserving the third to make sail, &c.
The people are disposed of as follows: one quartermaster at the helm; the afterguard and waisters at the capstain; a few gunners, and all the idlers, to hold on the messenger and light it round. The fore-top men to clap on the nippers, and the main-top men to take them off and hold them on; waisters, at the corners of the hatchways to haw in the cable; the quarter masters, forecastle men, and, in small ships, some of the gunners, to coil away and light out the veering cable; fore and main-top men, to rouse up and veer away; gunners to get the fish tackle along the gangway: forecastle men to overhaul the cat and get the davit rigged, &c. We have taken no notice of the marines, boys, or idlers, as the number of the former is doubtful from their employment as sentinels, &c.

The boys commonly attend the nippers, to carry them forward when taken off, and the regulation respecting idlers, who are excused from duty, differs in almost every ship; but those who attend, assist in lighting round the messenger and holding it on with the gunners and carpenters. The marines always assist at the capstan, which will make up for the deficiency of men absent in boats, or who may be sick.
REMARKS ON MAKING AND SHORTENING SAIL.

The peculiar difficulty, as we have before remarked, of stationing the whole of a large ship's company to perform some points of service, is also experienced in making sail; for it scarcely requires more men aloft, to make sail in a first rate, than it does on board a large frigate; consequently, the additional number, if all were stationed in a large ship, would incommode each other, and be the means of impeding that duty which they are meant to accelerate; but, in a small ship, all may be attached to separate occupations, without feeling any inconvenience from their number. In line of battleships, that are at three watches, if the watch upon deck is not adequate to the duty which is to be performed, it is usual to call the one which follows it; therefore the officers, in their stations, must supply the deficiency of a station bill, by seeing every thing clear and properly disposed.

Cruising ships should never be without a station bill, to make and shorten sail, for, independent of the smartness and regularity of the movement gained by it, considerable advantages would be derived in chacing an enemy, who might practise measures, that would require an instantaneous shortening or making of sail, to baffle his endeavours; or, in the night time, when an officer is prevented from seeing every station filled, which might be neglected unless this previous regulation had been established. For these reasons, as in a former case, the following Table commences with a fifty gun ship.
For Stationing Men to Make and Shorten Sail, from a Fifty Gun Ship to a Sloop of War.

<table>
<thead>
<tr>
<th>Rate</th>
<th>Main</th>
<th>Fore</th>
<th>Mizen</th>
<th>Main</th>
<th>Fore</th>
<th>Mizen</th>
<th>Main</th>
<th>Fore</th>
<th>Mizen</th>
<th>Main</th>
<th>Fore</th>
<th>Mizen</th>
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<td>8</td>
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<td>2</td>
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<td>8</td>
<td>6</td>
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<td>4</td>
<td>4</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

The top men, after letting the reefs out, to hook the burtons on the top-sail yards, and rig out the booms. The men who loose the top gallant sails should set the royals; those stationed in the tops are immediately to trice the stay sails up, if required, and to get the royals and top gallant studding sails ready to set. The forecastle men, after having bowered the lifts, trusses and reef tackles taut, are to get their studding sails to hand; but some ships, in the day time, have their top mast studding sails stopped in the shrouds, with the inner yard arm resting in the chains, the tuck and halyards bent, and stopped up to the lower yard, after being sufficiently overhauling for bracing up; which appears a good and expeditious method. The afterguard and waisters are not stationed to any particular service, as their assistance must be appropriated to whatever is going on. The stations are calculated for both sides, so that the officer, who makes out a bill from these statements, must appoint the starboard watch to attend on the starboard side, and the larboard watch on the larboard.
REMARKS ON TACKING SHIP.

The same reasons which we have shewn for requiring men to be stationed at mooring ship and making sail, may be offered, for the same purpose, in tacking ship; with the addition, that, as it is so frequently performed, and sometimes in the night, where the single omission of letting go a rope might be of fatal consequence, it appears more necessary, if possible, than in the other cases.
### TABLE VII.

**For Stationing the Men, from a Fifty-Gun Ship to a Sloop of War, at Tacking Ship.**

<table>
<thead>
<tr>
<th>Rates</th>
<th>Tops.</th>
<th>Braces.</th>
<th>Tacks to let go and overhaul</th>
<th>Bowlines to let go</th>
<th>Sheets to let go</th>
</tr>
</thead>
<tbody>
<tr>
<td>-------</td>
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<tr>
<td>50</td>
<td>2</td>
<td>3</td>
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<td>7</td>
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<td>25</td>
<td>7</td>
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<tr>
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<td>2</td>
<td>17</td>
<td>7</td>
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<tr>
<td>28</td>
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<td>1</td>
<td>1</td>
<td>17</td>
<td>7</td>
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<td>1</td>
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<td>17</td>
<td>7</td>
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<td>1</td>
<td>12</td>
<td>5</td>
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<tr>
<td>18</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>8</td>
<td>3</td>
</tr>
</tbody>
</table>
EXPLANATION OF THE FOREGOING TABLE.

The marines, as in former cases, are not stationed: nor are the idlers and boys; it being an invariable rule to station the former on the quarter-deck, where they assist in whatever duty is going forward. The idlers are in all ships stationed at the main-tack; and the boys at the cross-jack braces and mizen-top-bowline. The man at the fore-tack lets go the fore-bowline.

The fore-castle-men should be divided, to let go the main and main-top-bowline, fore-tack and bowline, to brail up the main-top-mast stay-sail, and haul aft the jib, and stay-sail-sheets, to raise the fore-tack, and one man to be at the helm and the remainder in the waist.

The fore-top-men should be employed at the fore-top-gallant-branches, in the top, to bear the backstays-aft, at the spritsail-branches, and backstay-falls, and fore-top-mast-stay-sail-sheet, the remainder to be in the waist.

The main-top-men are to attend in the top, at the cross-jack-branches, with the boys at the main, and fore-top-sail-branches, main-sheet, and mizen-stay-sail-sheet; in the chains, to keep the main-tack and sheet clear of the guns; and at the mizen-stay-sail-brails and back-stay-falls.

The mizen-top-men are to be in the top, at the mizen-top-sail, and top-gallant-branches, and 'driver-boom. The after-guard and marines at the main and fore-branches, and main-sheet. The quarter-masters at the conn, main-top-gallant-branches, and driver-boom.

The gunners to let go the fore-sheet and main-tack, and to overhaul them on the gangways, to let go the stay-sail-sheets, and haul aft the others.

The carpenters, waisters, idlers, and overplus of the forecastle-men and fore-top men, to haul up the clue-garnet, and to man the main-tack, main, and main-top-bowline, then the fore-bowline, tack, and sheet.

The captain of the after-guard generally stands by the lee-mast-brace, the captain of the main-top by the main-sheet, the gunner's-mate by the main-tack, and the captain of the fore-castle by the main-bowline. The ropes are generally bighted down as being more clear for running than when coiled.

REMARKS ON THE NECESSITY OF A FIRE BILL, &c.

We now come to the most important of all the regulations of a ship, namely, those which operate against the fatal and shocking effects of fire. The dreadful mischief that a drunken man might create, where in many cases, no alternative exists between the fury of the flames and that of the ocean, very naturally excites at the moment in which it bursts forth, the most violent agitation: And we find, that the example of others, without reflecting on the consequences of the act, has frequently plunged many unhappy victims into a watery grave, at a time when, by a proper degree of coolness and caution, their lives might have been preserved, and the flames overcome.

To reflect on the event, and consult the best means of providing against it, appear to be the most likely means of preparing the minds of men to receive the shock of an alarm undaunted. This, admitted, will shew the propriety and necessity of having a firebill: for, whatever good results from stationing people in ordinary cases, cannot be put in competition with this, which provides against the most dreadful catastrophe incident to a ship.

In ships that have established regulations for guarding against this event, whenever it may unfortunately happen, the people naturally fly on the signal of alarm to their posts, and employ themselves eagerly to extinguish the flames; but, how widely different is the confusion, when such a circumstance has been kept out of the contemplation of men's minds; then, timid, and confused, one man follows
REMARKS ON THE NECESSITY OF A FIREBILL.

Another, and the place of danger is perhaps abandoned whilst that of unconcern is crowded with idle spectators.

From the number of unfortunate accidents of this nature which happened during the last war we surely ought to be prepared to our utmost for such an event; first, by internal precautions, and, secondly, by the means of exerting ourselves against the danger. Exercising the people at their stations, as shown by the annexed fire bill, appears to me as necessary as teaching men to reef topsails by practising on the mizen-top-sail-yard before they are sent to either of the other stations; and every manœuvre should be taught that is likely to happen in a case of reality. In ships that have not a fire bill, when fire is discovered, the usual mode is to beat to quarters, that it may detach their minds from viewing the danger, and prevent them from leaping overboard. We shall now shew the proportions for a fire bill for all rates, with an explanation, but the executive officer must arrange and put it in force according to the size and circumstances of the ship.

### TABLE VIII.

<table>
<thead>
<tr>
<th>Class of Ships</th>
<th>To man the Runners or stays at the Main Hatchway.</th>
<th>Draw Water on the Main Hatchway.</th>
<th>To hand Water from Main Hatchway.</th>
<th>Party with the</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
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<td>small 74</td>
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<tr>
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<td>18</td>
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</tbody>
</table>

The ship being on fire, the bell is to be rung as an alarm, (which is to be avoided on every other occasion); the officers and men are to repair to their respective stations, and execute such orders as they may receive for extinguishing it.
EXPLANATION OF THE FIRE BILL.

The forecastle men and quarter masters are to be divided under the command of the master and boatswain. The former is, with his party, to be employed in removing any stores, &c. to which the fire may be likely to communicate. The latter is, with his party, to collect wet hammocks, sails, &c. to smooth it. The gunner, with his crew, to be employed in the store-room, in removing stores and extinguishing the fire there. The top men, in line of battle ships and frigates, on the gangways, drawing water, (which should be emptied into tubs, for the purpose of being handed from thence) at the cistern pump, and to work the engine. The remainder to assist the afterguard, in passing it along, and returning the empty buckets. The waisters, and some part of the afterguard, at the fore and main hatchways, to hoist any thing up from below which it may be necessary to remove. The carpenter, and all his crew, to attend with their tools, to be ready to perform any service which the exigency of the case may require, and the mariners should be divided round the ship with loaded musquets and fixed bayonets, to prevent any person from leaping overboard.

N. B. Care should be taken, upon the discovery of fire, to prevent any air getting to it. The ports should be lowered, and the gratings laid on with tarpaulines over them; oatmeal has been found a very good thing to smother fire, as well as wet swabs, hammocks, and sails.

ON THE NECESSITY OF ADHERING TO ONE GENERAL SET OF COMMANDS.

It must be, to every officer of experience and judgment, a subject of regret no specific terms are generally made use of in carrying on the duty of a ship. With different officers each has his particular mode of expression, and each perhaps differs from the rest; which, to those who are to obey, will give continual perplexity.

Trifling as this circumstance may appear to a superficial mind, it is of real consequence; for to preserve order and regularity, it seems requisite that one system of delivery should be observed by all the different officers. My purpose, therefore, is, to select a few hints for the assistance of the younger and inexperienced officer. I hope it will not be deemed insignificant to insert those most commonly made use of, which I shall state, without entering into any detail of the manoeuvre, and note the separate orders by figures 1, 2, 3, &c.

In every word of command the officer should be as concise as possible; and, previous to the commencement of any evolution, he should give his orders to prepare; then, as soon as he gains the reply of "ready" he may commence. For example, if the courses and staysails are to be set, give the word "haul aboard,"—"hoist away," in preference to enumerating the different sails, &c. by saying, "haul on board the fore and main tack."—"hoist amast, the jib, main topmast, middle and top gallant stay sails," which would require much breath, that the duty might almost be performed in the time that the people are waiting to receive orders.

Previous to the hoisting of any thing, the words "haul taut" are a necessary preparative; and at other times, "stand by." They serve to confine the attention of the people, and infuse a degree of emulation by the idea of a competition; from which circumstance I shall always suppose these to be general terms, and consequently omit them in the following observations.

In tacking and wearing, the hands being called is a preparative in itself, but if it is done by the watch, the officers on the quarter deck, should call their attention by saying "ready about," or, "see all clear for wearing." The officers in their station naturally report when therefore render; then if no more be

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ON ADHERING TO ONE GENERAL SET OF COMMANDS.

1—"Ready;" 2—"The helm's a lee;" 3—(if requisite) "Brace to;" 4—"Raise tacks and sheets;" 5—"Haul-taut;" 6—"Main sail haul;" 7—"Let go and haul;" 8—(if necessary) "Brace up and haul aft." In wearing: 1—"Let go the main-top bowline;" 2—"Raise the fore tack, and let go the head bowlines."

In reefing top sails: 1—"Let go the bowlines;" 2—"Lower away the top sails;" 3—"Trice up and man the yards;" 4—"Hoist away the top sails."

In setting studdensails: 1—"Rig out, hoist away;" 2—"Hoist away." Shortening Sail: 1—"In studding sails, rig in the booms;" 2—"Clue up, haul down."

In loosing sails and getting up top gallant yards together: 1—"Away up and sway out of the chains;" 2—"Sway away, trice up, and man the yards;" 3—"Sway across, let fall, hoist away;" (if the top sails are to be hoisted) 4—"Hoist away the top sails;" (if the bowlines are to be hauled out) 5—"Haul out;" (if the top gallant yards only are got up) 1—"Away up, sway out;" 2—"Sway away;" 3—"Sway across."

Getting down top gallant yards: 1—"Away up;" 2—"Break the stops;" 3—"Sway away."

In striking lower yards and top masts, or top gallant masts: 1—"Sway away;" 2—"Lower away."

In setting courses and stay-sails together: 1—"Haul aboard, hoist away;" 2—"Clue up, haul down."

In setting a main sail: 1—"Haul aboard." If a fore sail, 1—"Down fore sail."

In taking in the top sails only: 1—"Let go the bowlines;" 2—"In top sails;" 3—"Lower away the top sails."

Whenever top sails, of courses and stay-sails are taken in together: 1—"Clue up, haul down."

In loosing top gallant sails: 1—"Top men to the mast head, stand by to loose top gallant sails;" 2—"Let fall—sheet home—hoist away."

In taking in top gallant sails: 1—"Man the top gallant clue lines;" 2—"Let go the top gallant bowlines;" 3—"In top gallant sails."

In setting the royals: 1—"Top men get the royals ready to set;" 2—"Hoist away."

In taking in the royals: 1—"Stand by to take in the royals;" 2—"In royals."

In getting down the hammocks, two pipes are to be made use of: 1—The hammocks to be piped down, or "To stand by the hammocks;" when the men are to come up and take their hammocks out of the nettings; which when ready, a second pipe only, and the people to carry them away.
The following, on NAVAL DISCIPLINE, was handed us by Mr. RINALDO D'ELVILLE, which, we annex without alteration: many of the subsequent remarks have been already made, but repetitions are more pardonable than omissions.

GENERAL REMARKS.

To Officers of Privateers, bred entirely in the merchant service, this work must be of particular use, forming a general system of discipline, reduced to that which all seamen who have been in public services have been rendered familiar with. The same mode of discipline ought to be adopted on board of all our Privateers, as it would be advantageous on changing their crews, in which case, each would receive others already organized to their hands. It is to be remembered, that these regulations are written for the government of a Ship or a Brig, from which, however, smaller vessels may deduce much information.

OF THE CAPTAIN.*

On being nominated to a command, he should consider the arduous and intricate, although honourable situation he undertakes, and from that decided mode of conduct which never fails to insure respect, and promote the happiness, as well as the esteem of his officers and crew. Too much severity or moderation, are equally obnoxious to the good discipline of a ship's company, on which all enterprise and success entirely depends.

The refractory and idle should be punished by a Captain, not in the heat of passion, but in such a manner, as to convince the offender that he deserves his punishment, and that all the officers and crew hold him in contempt. This will hurt his pride, if he is not an abandoned transgressor, and by future good conduct he will endeavour to gain a good reputation. Nor should a Captain ever so far forget himself, as to reprimand an officer publicly on the quarter deck, but choose the cabin to correct any error an officer may commit; for he should recollect, that in lessening an officer in the eyes of a ship's company he degrades himself, and gives a death blow to the peace and discipline of the ship. Seamen are strict observers on the conduct of their superiors: therefore, a Captain has only by his own good example, to enforce a strict obedience to his orders, and the duty of his ship will be executed with such alertness and pleasure, as must give him every satisfaction.

A Captain should leave the executive duty of the ship to the First Lieutenant, except in particular cases, such as an engagement, in chase, in a squall, &c. He should, when in any difficulty, always call a council of war of his officers, on the quarter deck. It is his duty to prevent all tyranny of superior officers, and should never allow insolence from an inferior to a superior, to pass unattended with a just censure.

No man ought to be struck by an officer, or punished, without his sanction: in short, all the duty and orders of the ship should receive his approbation, and be executed by the direction of the 1st. Lieutenant.

FIRST LIEUTENANT:

He is the executive officer of the ship, under the Captain, and all duty, both military and civil, is under his direction. He is to pay a strict attention to see that the vessel is properly fitted for sea, and he has the charge of all her stores and armament. All quarrels and dissentions amongst the ship's company, is to be justly decided by him.

He is, when the weather will permit, frequently to exercise the ship's company at great guns and small arms, pikes, &c.

In action, he is, under the Captain, to fight the ship, and should by a good
example, encourage the men to fight bravely. He commands the first division, or boarders, and in boarding, he is always to lead in person; and should he survive the contest, his humanity will teach him, when he has possession, to check all cruelty, and stop any further effusion of blood; and should the prize throw any females into their power, his authority ought to prevent any licentious madness in the crew, but his honor ought to induce him to treat the unfortunate captives with that delicacy and attention, which the fair sex always meet with from a truly brave man.

He is to see all prisoners sufficiently guarded, and well attended to.

He is to muster the ship's company once a week by divisions, to see that they are clean.

He is to watch, station, and quarter the ship's company.

He is to see that the ship's company have their just and full allowance of provisions, and always to investigate into any complaints or murmurings of the ship's company, and as far as is in his power, he is to rectify such discontent.

He has charge of the keys of all the store rooms, but the Captain keeps the keys of the magazine. When the hands are turned up, he or the captain are always to command in person. He is to pay a strict attention to the subordination of the inferior officers and ship's company, and implicitly to obey all orders which he may receive from his Captain.

SECOND LIEUTENANT.

He is second in rank, next to the 1st. Lieutenant, and in his absence, succeeds to his functions. He has, should the 1st. Lieutenant keep no watch, charge of the first watch.

He is frequently to cause the watch to be mustered, to see that they are on deck, and to report all absentees, to be reported through the 1st. Lieutenant to the Captain, in the morning. He has frequently to hail the look-outs, to keep them alert, and to see that they are regularly relieved.

He is not to make or shorten sail, except in case of immediate necessity, without acquainting the Captain of it; as also, of all strange sails, or other material circumstances.

When the 1st. Lieutenant takes charge of the quarter deck, his station is on the fore-castle; as also, when the hands are turned up, to work ship.

In action, he commands the 1st division, or foremost guns, and the second division or firemen. He is to shew a good example and obey all orders of his superior officers.

THIRD LIEUTENANT.

He takes charge of the second or third watch; his duty on all hands working ship, is in the waist. In the night, he is to muster the watch as before.

In action he commands the second division, or aftermost guns, and the third division, or sail-trimmers; he is under all orders of his superior officers.

THE MASTER.

He has charge of the steerage and navigation of the ship under the command of the captain. He is to see the hold stowed, and has the charge of the water, provisions, and all the ship's stores. In working ship, his station is on the quarter deck.

He has charge of the ship's log, and is to keep an account, by the clerk, of the expenditures of ship's stores.

In harbor, he is to pay strict attention to the swinging of the ship, to keep a clear hawse, or at single anchor, to prevent her going over it. He is to superintend at mooring, or unmooring, and if there is no pilot on board, to take charge of the ship.
When it blows hard, he is to attend freshening hawse, see the tiers clear, and sheet or other anchors ready for letting go. He or his mates will see the service in the hawse or the rounding clapped well on the cable. One mate will always attend in the tier at coiling away cables.

In action, his station is on the quarter deck, to assist the captain in working ship; he is to pay particular attention to her steerage, and if necessary, take the helm himself.

He is to inspect the alteration of sails or rigging.

At sea he is to make a daily report to the first Lieutenant, of the expenditure and remains of water, as also a weekly report of the expenditures of provisions and ship's stores. He will frequently inspect the Warrant Officers store-rooms, and prevent all wasteful expenditure or embezzlement of stores.

He is to send the log-book and his day's work to the Captain for inspection, as soon after noon as possible.

He is under the immediate orders of his superior officers.

OF THE MARINE* OFFICER.

He commands the Marines, and is, whenever the ship's duty or weather will permit, frequently to exercise and drill them in the Manual and Platoon Exercise, as also the ship's company when ordered. He is to keep the Arms and Accoutrements in good order, and fit for service.

In action, he will place his men in the most advantageous position; on boarding, he will cover the boarders, hold the ground they gain, to second, if necessary, a good retreat, or by a cool and steady charge, and well directed fire, to afford them time to rally.

The prisoners of War are under his charge, and he is to see them well guarded and attended to.

In harbour, he is to see the guard relieved every morning, and that the duty of the sentinels are as regular as possible.

PRIZE MASTERS.

On board of an armed ship, they are considered in every respect to be in the same situations as Midshipmen and Mates of men of war.

They take charge of those stations in which the first Lieutenant places them, and are always under the order of some superior officer, except when the Captain nominates them to the charge of a prize, or to some particular duty.

In action, they are in the tops with small arms, and in necessary stations. They are in watch with Lieutenants, to pass the word, muster the watch, and see that the orders of the officer of the watch are executed with punctuality and dispatch.

They are to prevent all skulking, heave the log, report the rate of her sailing to the officer of the watch, and mark down on the log-board, what the officer of the watch directs.

The prize master of the morning watch, are to see the hammocks up when piped, and the between decks put to rights and cleaned after breakfast, and report the same when finished to the Lieutenant of their watch, who will report and inspect the same.

In working ship, making and shortening sail, &c. they will be in their respective stations, keeping silence in the crew, and execute the word of command.

They are to keep a reckoning, and send into the Captain, every day at noon, their day's work.

When they have charge of a boat on shore, they are to keep the boat's crew sober, and prevent their deserting or leaving the boat without permission, and execute with dispatch the orders entrusted to them; nor are they to allow any liquor to be brought on board in the boat, without permission from the first Lieutenant; to whom they will always report their return on board.

* See page 214.
† See page 215, “Orders to Mates and Midshipmen.”
They are to have a Watch Bill and Station List, constantly in their possession, to muster the people when ordered; other duties depend entirely upon the orders of their superior officers.

**BOATSWAIN.**

He is the chief of the crew, and as such, is to see that every man is attentive to his duty.

In harbor, he will turn the hands up, and see that every man is upon deck, and report the same to the first Lieutenant. He has charge, under the Master, of all the sails and rigging, in service, or in the store-rooms.

He is to see that there is not any neglect or wasteful expenditure of the stores under his charge, that the spare sails and others are dry, and constantly at hand for setting or bending.

When the hands are ordered to be called on any service, he will first pipe attention! and then call them to the duty intended, whilst his mates pipe at each hatchway. When the hammocks or bags are piped up or down, he reports the same to the first Lieutenant.

He must pay every attention when in harbor that the yards are squared by the lifts and braces, and that there is nothing out of order about the rigging.

On hoisting out of the boats, he is always to attend; his mates will hoist up or lower down the jolly-boat.

He is to set the people to work according to the directions of the first Lieutenant.

On mooring, and unmooring, working ship, making and shortening sail, &c. his station is on the forecastle.

In action, his station is on the forecastle, with four men, to repair damages and attend the head-sails.

At sea, he will every morning come upon deck at day-light, and with his mates on duty, inspect the rigging and sails fore-and- aft, and make a faithful report thereof to the first Lieutenant before 3 o'clock.

He will, on making use of his stores, make a weekly account of the expenditures of the same, and give it to the master. On coming upon deck, he will examine and report to the officer of the watch, that every thing is ready for making sail, jewel blocks on the yards, studding sails at hand, haulyards rove, &c. he will also see the yards well trimmed, top-sails and top-gallant sheets hauled close home, tacks aboard, &c.

He is strictly to obey all orders from his superior officers; avoid all gross familiarity with the ship's company; have his orders implicitly obeyed, by which he will insure the esteem of his officers and the respect of the crew.

**GUNNER.**

He has charge of the armament and all the stores in that department, for the expenditure of which, he will keep a weekly account and give it to the master. He will see that the small arms, pikes, cutlasses and accoutrements, are always kept in good order and ready at hand for service. In harbor, on hoisting the colors, he will attend to running the guns out and see that they, as well as the ports, are squared for the better appearance of the ship, and on running them in at sun-set; he will see the ports secured. At sea, he will keep the guns in good order and their charges dry; and also, that they are properly housed and secured.

He will on no account, ever open the magazine, without express permission from the 1st. Lieutenant; he will pay strict attention that it is ever kept in good order, at the same time that no person ever goes into it with his shoes on, or with any iron or steel about him, such as knives, &c. He is also to keep a sufficient quantity of cartridges ready fitted for exercise, or action, and that:
they are, as well as the barrels, regularly turned. In harbor, he will have a sufficient quantity of blank cartridges filled for the marines.

At sea, he will see every thing in his department in a state of readiness for action; he will see that good flints are in the guns, match-tubs on deck, and wads, pikes, small arms, cutlasses, &c. at hand.

In action, he will be careful in handing the powder, and by coolness, keep the guns well supplied, and thus avoid all accidents; likewise, he will attend the magazine; the Master at arms the light room, and the ship's Coporal, will superintend handing the powder.

On closing the magazine, he will see that every thing is in exact order, and that all is safe as before; the light in the light-room extinguished; and then return the keys to the first Lieutenant. On getting under weigh he is to see the messenger brought too, and that the buoy is hauled in, as also, streamed on coming to an anchor. On making or shortening sail, or working ship, he or his mates must attend in the waist, it being their duty to see the main-tack haul'd aboard, sheet or sheets hauled aft, shifting and hauling aft the staysail-sheets, setting the lower studding and topmast-studding sails, &c.

On reefing the main-course, the first Mate goes out to the weather earing, and the second Mate to the lee one; on handing the course, they are to be in the bunt.

He is to obey all orders of their superior officers, and be responsible for any orders that he may give his Mates.

CARPENTER.

He is to take charge of the stores in his trust, and give a weekly account of their expenditure to the master. He is to keep the boats in good repair and fit for service, and attend carefully to every thing in his department about the ship. He will keep his axes always well ground and at hand, in case of an emergency. He, with his mates, will every morning go aloft and inspect the yards and spars, and make a faithful report thereof to the first Lieutenant before eight o'clock.

He is to keep the pumps in good order, frequently inspect them, and have their gear constantly at hand. He will have a sufficient quantity of shot-plugs made for action. In a gale of wind, he will see the hatches well secured with tarpaulines, &c. and also after the cables are unbent and stowed; he is to see the hawse-plugs in the hawse. In action he will get the pumps rigged, axes upon deck, &c. and with his crew plug up the shot holes and repair damages; other duty depends upon the order of their superior officers.

SURGEON AND SURGEON'S MATE.

They are for the relief of the sick and wounded. They are to be careful, previous to their sailing, to have a complete Medicine Chest, Instruments, Tournequett, &c. &c. They are to inspect the sick as often as may be deemed necessary, at least twice a-day morning and evening, and give a list to the first Lieutenant with their case. They are to put every evening at sun-set, a sick-list in the binacle drawer, for the inspection of the officers of the watches, as no person, but what is in the sick-list, is ever to be excused from duty on pretence of indisposition.

In harbor, they can never both leave the ship together; one of these officers must remain constantly on board in case of any accidents.

In action they are to be in the most convenient and safe part of the ship; should a wounded man expire after being brought below, he is immediately to be taken on deck and thrown overboard, to make room for the living.

They are to obey all orders of their superior officers.
CAPTAIN'S CLERK.

He is to keep the Captain's logs, and keep an account of the expenditure of stores and provisions. He will write the station-bills, &c. for the officers, do the writing for the ship, and obey the orders of all superior officers.

MASTER AT ARMS AND SHIP'S CORPORAL.

A Master at Arms and Ship's Corporal are generally considered on board of armed ship's or vessels of war, as the Provost-Guard; that is, they have the superintendence of the Civil and Military crimes of the ship's company, and act as Sergeant and Corporal when the seamen are employed on shore. The duty on board as follows, viz.

MASTER AT ARMS.

He is to be a strict observer on the Ship's Company, discover those addicted to drunkenness, fighting, laziness, and malcontents, and report a private list to the first Lieutenant, that such characters being known, proper measures may be taken to prevent the ill effects of a breach of discipline, and to secure the comfort of the Ship's Company. He is to suppress and report all seditious meetings or conspiracies amongst the Ship's Company, which he may know or have suspicion of.

He has charge of all Prisoners, both Civil and Military, under the Marine Officer. He is to give a report each morning at eight o'clock to the first Lieutenant for the Captain's inspection of civil crimes. The Military are Prisoners of War, and consequently under the immediate charge of the Marine Officer.

He is to see all lights and fires put out fore-and-aft when ordered, prevent all smoking whatever, except in the galley, and attend the magazine when open. He will report all disorderly persons, and never sanction any irregular conduct. He has charge of the boys of the ship, and is to see that they keep themselves clean. He is to see that no liquor whatever is brought into the ship without express permission from the first Lieutenant.

He is to inspect all boats, sloops, &c. on leaving the vessel, to see that none of the crew desert; a ship's Corporal in harbor should always be near and attend the gangways.

At sea, he is to keep night watch with a ship's Corporal, and report every hour to the officer of the watch "all is well below!" that there is no noise or drunkenness in the 'tween decks, and that the Prisoners (if any on board) are quiet and well guarded. His station in action is the light-room and magazine. He ranks with a Warrant Officer and messes with them.

He is considered answerable for all the Prisoners under his charge; the ship's Corporal and himself are under the immediate orders of all superior officers.

SHIP'S STEWARD.

He is to serve out the provisions to the Ship's Company, under the inspection of the Prize Master, Captain of the Forecastle, and Boatswain's Mate, which will prevent all disputes.

His duty depends upon the orders of his superior officers.

ON *WATCHING A SHIP'S COMPANY.

A ship's company should first be divided into three distinct classes, viz. Able Seamen, Ordinary, and Landsmen.

These classes are again to be equally divided into two watches, viz. larboard and starboard.
Each watch is to consist of the four following grades or divisions, viz. Fore-castlemen, Fire-top-men, Gunners-crew, Carpenters-crew, After-guard, Waisters, Idlers, and Boys; which grades are again divided into two equal parts, viz. first and second part, with a captain to each. Care should be taken in distributing the men, according to their abilities, and the duty they have to perform; the oldest and best seamen should be stationed on the Fore-castle, and in the Gunners-crew, the most alert in the tops; the Ordinary in the after-guard, and the Landsmen in the waist.

The Captains of each grade should be chosen men, as the good conduct of each division depends a great deal on their example; the Captains of the after-guard should also both be good seamen, and they are all considered answerable for every thing in their respective departments; it is also their duty to see the relief, and regulate the turns of the mast-head men and lookouts.

The watch-keepers are placed at sun set in the following order, viz.: Fore and main-yard, fore and main-top-men, forward, one forecastle-man, and one fore-top-man, gangways, one gunner, and one waister. Quarters, one after-guard, one mizen-top-man. The petty officers of the watch consist generally of two boatswains' mates, two quarter-masters, two gunners-mates, two helmsmen, two captains of the mast, and a ships corporal, or master-at-arms.

The idlers and officers' servants are attached to the watches, though excused from working ship, except in particular cases, such as all hands, &c. &c.

The marines are divided into two watches with the seamen, and assist on the quarter deck, from which a corporals-guard is extracted, to mount as a provost-guard, whose duty it is to go round the ship at night every hour, visit the sentinels, take charge of all prisoners, see all is quiet below, and report the same to the officer of the watch. Each watch should have their hammocks numbered and marked against the men's names in the watch-bill, that the officers may know to whom they belong.

The watch should on no account ever be permitted to go below without being regularly relieved.

**ON DIVISIONS.**

A ship's company, should be divided into three divisions, with their respective officers to each, viz. one Lieutenant, and two Midshipmen; and mustered at least twice a week, to see that their clothes are kept in good order and clean.

The usual method of forming the divisions, is by dividing the able-seamen, ordinary, and landsmen, into three classes each, which makes an equal distribution of the men, as the same divisions form the boarders, sail-trimmers, and firemen in the quarter-list; and the men by this plan are already selected for any sudden occasion, such as taking possession of a prize, landing, &c. as any one division, or part, can be immediately ordered on the service; on beating to divisions, the men should fall in, and be mustered and inspected by their respective officers, and reported to the 1st Lieutenant.

The officers of the divisions should keep an account of what slops their men may want or have had, as a satisfaction to them for a check against the purser.

The Captain generally inspects the divisions, after which they are dismissed.

**THE STATIONS OF THE DIFFERENT GRADES IN STAYING AND WEARING.**

_The First Lieutenant_, commands on the quarter deck.

_Second Lieutenant_, on the fore-castle.

_Third Lieutenant_, in the waist, and the midshipmen in necessary stations, under their superior officers.

_The Boatswain_, on the fore-castle.

_Gunner_, on the gangway.

_Carpenter_, in the waist.
Boatswain's Mates, on the quarter deck, fore-castle and waist.
Quartermasters, coon, letting-go the main-topsail braces, and bracing round the main-top gallant-yard.
Captain of the forecastle, to raise the fore-tack, gunner's mate the main-tack.
Captains of the after guard, head- braces.
Second Captains of the after guard, one to the stopper of the main-braze; the other to let go the cross-jack, and mizen top-sail braces.
Captain of the waist, let go the fore-sheet.
Second captain of the main-top, let go the main sheet.
Forecastle men, to the jib-sheets, one hand on the Bowsprit, to shift the sheets over the stay; to the fore-lift and trusses and fore-crew-garnets; haul aboard the fore-tack, and rouse out the head-bowlines.
Foretopmen, one division in the top, to attend the royal-braces, shift the staysails-sheets over; overhaul the lee fore-lift, and bear the back-stays aft, and abreast. The remainder, on deck, to shift the staysails-tacks, set up the backstays, attend the foretop-gallant-braces, and haul out the main bowlines.
Main-top men, one division, in the top, as before, and on deck, to set up the Backstays, brace round the top-sail yard, and assist to haul aft the main-sheet, and bowse taught the weather main-lift.
Mizen-top men, one hand in the top, the rest attend the boom-sheet.
Gunner's Crew stay-sail sheets, main tack, and brake the main-bowline.
Carpenter's Crew, in the waist.
After Guard, main-lifts and trusses, mizen-stay-sails sheets.—Idlers, in the waist.
Boys, cross-jack, and mizen-top-sail braces, and bowlines.

REEFING AND FURLING.

Officers, in their respective stations, a midshipman in each top.
Topsail yards, the topmen of each watch the larboard watch, lay out on the larboard yard-arm, the starboard watch, on the starboard: the captains of each watch to the earings.
Fore yard, fore-castle-men and waisters.
Main yard, gunner's crew and after-guard.
Fore-castle-men, stow the jibs and main stay-sail.
Fore-top men, the topmast stay-sails, &c.
After-guard, mizen stay-sail and spanker, mizen top-men, gaff-top-sail and peak.
Main-top-sail braces, quarter masters.
Fore-top-sail braces, captains of the afterguard.
Mizen-top-sail braces, boys.
Fore-top-sail-haulyards, fore castle men, fore-top-men, and waisters.
Main-top-sail haulyards, main-top-men, afterguard and marines.
Mizen top-sail haulyards, mizen top men, idlers and boys.

N. B. When the sails are furled, the boatswain should square the yards. In reefing, the men should not lay out until the yards are down by the lifts, and the word given, trice up, lay out, when they lay in, the commanding officer should order them down to the top-sail haulyards, leaving only one division in the top to light up the g eer, and when the topsails are hoisted, trim sails.

MOORING AND UNMOORING.

Officers, in their respective stations, two midshipmen to the capstan.
Forecastle men, overhaul, fish-tackle and cat-falls, get the shank-painter ready, and see all clear for making sail.
Fore-top-men, to attend veering cable, stoppers, &c.
Main-top men, to hold on the nippers.
Gunners, in the tier, attend the voil, and hold on the messenger.
Carpenters, rig the capstan. (Carpenters)

Tierers, in the tier with a midshipman to coil away cable; these men are selected from the fore-castle tops, captains of the hold, &c.

Boys, to carry nippers.

Afterguard, waisters, &c. to the capstan bars.

N. B. The gunners both stream and haul in the buoy. Two men in each top to prepare for making sail.

*MAKING AND SHORTENING SAIL.*

Officers, in their respective stations, a midshipman in each top.

Top-men, shake out reefs, loose top-gallant-sails, royals, staysails, &c. hook the burtons or the top-sail yards, and set the top-gallant studding sails.

Fore-castle-men, Loose the jibs, rig out the top-mast studding-sail, and swinging booms and set the top-mast and lower studding-sails.

Gunners, rig out the main-top-mast studding sail booms, and set the sails; afterguard, marines, waisters, &c. in their respective stations. For shortening sail, in the same manner.

†ON QUARTERING A SHIP'S COMPANY.

As soon as the ship's company are stationed to their different duties in working ship, &c. they should be quartered and exercised at the great guns and small arms as often as the duty of the ship will permit; and this exercise should be rendered as simple as possible, for the more familiar the men are with the exercise the more active are they in action and the less confused. There are generally six; but, in my opinion there should be seven men to each gun, and a boy to every two guns to carry powder; for, whilst this enables them to work the gun brisk in the commencement of the action it does not distress it by calling away the sail trimmers or fire-men, nor is it so soon unmanned, for I have found in several actions that I lost more men by their moving about, than by their being stationary; which induced me to adopt the following method, to wit;

I stationed seven men to each gun with a boy to every two guns to carry powder, and each man had his allotted duty which prevented all confusion, and I would advise other captains to do the same, as it is their duty to be as economical of their men's lives as possible, for I have often seen in action, two men run for the same thing, and killed by one shot; this harum-skarum conduct caused confusion, and confusion lost the ship. The following is the duty which I allotted to each man at the gun. viz.

1st. The captain:—He is to direct the men of his gun in all their evolutions. He is to point, prime, and fire the gun, being careful, the moment she is discharged, to stop the vent, with the twisted piece of oakum; a quantity of which, he should have for that purpose, in a small tin box with tubs for primers, buckled round his waist. He is also to prick the cartridge to know when it is home.

2nd. The rammer and spunger:—He stands abaft the gun on the larboard side and before the gun on the starboard side, next to the muzzle. He is to spunge the gun and ram home the charge, and should be very careful in knocking off loose particles of fire from the sponge, on the sill of the port. When he has rammed home the charge, he should lay his spunge always athwart the deck, whilst he runs out the gun.

3d. Pow erm an:—He stands next to the muzzle, opposite to the spunger, he is to receive the charge and load the gun; he is to be careful in putting the cartridge in arse foremost and seam downwards; shot next to the cartridge and wad next to the shot; every third round he is to worm the gun.

4th and 5th are swabbers; they stand opposite each other next to the spunger and powderman; the one that stands aft, hands the cartridge and the wad to the powder man, and the one that stands forward hands the shot; they are also to swab round the gun, to take up loose particles of powder and assist the boy in fitching it.
NAVAL DISCIPLINE.

8th and 7th, are trainers; they stand opposite each other next to the breech, to train, elevate, or depress the gun as the captain directs.

Boy, fetches powder from the hatchway, and gives the cartridge-box to the swabber, and receives the empty one which he immediately hands below and receives another full one. The above regulations give three men to each tackle fall for running out the gun, and a captain to direct it, as they are killed, or wounded, the next takes his place, and when the gun is unmanned, the officers must remove men from other guns, make a virtue of necessity, and do the best they can.

There are several methods of quartering a ship's company, but to be concise, I shall exemplify my own in two quarter-bills, one for a frigate of 44 guns, and the other for a privateer of 18 guns, from which, officers may deduce theirs.

A QUARTER BILL,

For a frigate of 44 guns, with a compliment of three hundred men.

QUARTER DECK.

The captain to command the whole, 1
1st lieutenant to assist in fighting the ship, 1
Two midshipmen as aid de camps, 2
The master to attend the steerage, 1
A master's-mate to attend the braces and working ship, 1
A midshipman to fight the quarter deck guns, 1
Boatswains' mate and six men, to repair damages, 7
Two quarter masters and two men at the helm, 4
A quarter master at the conn, 1
Seven men to each gun, 35
A hand at the hatchway to receive powder, 1
Boys as carriers, 3
Purser and captain's clerk to take minutes, 2

FORE-CASTLE.

A master's-mate to command, 1
Boatswain and four men to repair damages, 5
Boatswains' mate assist working ship, 1
Seven men to each gun, 14
A boy as carrier, 1
A hand to give powder from the hatchway, 1

MAIN DECK.

Second lieutenant and a midshipman foremost division, 2
Third aftermost 2
Boatswains' mates working ship, 2
Captains of the mast at the mast, 2
Seven men to each gun, 105
Boys as carriers, 7
Two men at each hatchway to receive powder, 9

TOPS.

A midshipman and four men in the fore and main tops with small arms, and two men in the mizen, 12
Carpenter, his mate and two men in the wings, 4

*Two of these should be captains of the afterguard to attend the head braces.
### Magazine

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<th>Position</th>
<th>Officers</th>
<th>Total</th>
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<tr>
<td>Gunner, his mate and two men</td>
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<td>Light room, the cook</td>
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<tr>
<td>Master at arms, ship's corporal</td>
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<td></td>
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<tr>
<td>and six men in the 'tween decks</td>
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<td>powder</td>
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### Cock-Pit

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<td>Surgeon and his assistant</td>
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<tr>
<td>Chaplain and two loblolly boys</td>
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### Marines

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<tbody>
<tr>
<td>First and second lieutenant</td>
<td>2</td>
</tr>
<tr>
<td>A Serjeant and two corporals</td>
<td>3</td>
</tr>
<tr>
<td>A drummer and fifer</td>
<td>2</td>
</tr>
<tr>
<td>Rank and file</td>
<td>50</td>
</tr>
</tbody>
</table>

**Sum total 300**

**N. B.** The marines should be stationed on the quarter deck, fore-castle and gangway, with musketry.

### A Quarter Bill

**N. B.** Privateers of this class should carry one hundred and eighty-five men as prize crews, and always if possible return to port when reduced below one hundred and forty.

<table>
<thead>
<tr>
<th>Position</th>
<th>Officers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Captain to command the whole</td>
<td>1</td>
</tr>
<tr>
<td>First lieutenant to assist</td>
<td>1</td>
</tr>
<tr>
<td>Prize master as aid de camp</td>
<td>1</td>
</tr>
<tr>
<td>Master attend the steerage</td>
<td>1</td>
</tr>
<tr>
<td>2d. Lieutenant and one prize master, 1st division of guns</td>
<td>2</td>
</tr>
<tr>
<td>3d. Lieutenant 2d. division</td>
<td>2</td>
</tr>
<tr>
<td>Clerk to take minutes</td>
<td>1</td>
</tr>
<tr>
<td>Prize master forecastle to command</td>
<td>1</td>
</tr>
<tr>
<td>Boatswain and four men forward to repair damages</td>
<td>5</td>
</tr>
<tr>
<td>Boatswain's mate and four men aft</td>
<td>5</td>
</tr>
<tr>
<td>Prize master and four men in fore main tops small arms</td>
<td>10</td>
</tr>
<tr>
<td>Two men in the mizen-top</td>
<td>2</td>
</tr>
<tr>
<td>Gunner and two men in the magazine</td>
<td>3</td>
</tr>
<tr>
<td>One prize master to work ship aft</td>
<td>1</td>
</tr>
<tr>
<td>Two captains afterguard head braces</td>
<td>2</td>
</tr>
<tr>
<td>Boatswain's mate in the waist</td>
<td>1</td>
</tr>
<tr>
<td>Master at arms in the light room</td>
<td>1</td>
</tr>
<tr>
<td>Ship's corporal and four men hand powder</td>
<td>5</td>
</tr>
<tr>
<td>Carpenter, mate and two men in the wings</td>
<td>4</td>
</tr>
<tr>
<td>Surgeon, mate and one hand dress the wounded</td>
<td>3</td>
</tr>
<tr>
<td>Seven men to each gun with the boys</td>
<td>69</td>
</tr>
<tr>
<td>Helm and conn</td>
<td>3</td>
</tr>
<tr>
<td>To receive powder on deck</td>
<td>3</td>
</tr>
<tr>
<td>Two men attend the main braces</td>
<td>2</td>
</tr>
<tr>
<td>One lieutenant</td>
<td>1</td>
</tr>
<tr>
<td>One sergeant</td>
<td>1</td>
</tr>
<tr>
<td>Two corporals</td>
<td>2</td>
</tr>
<tr>
<td>Drummer and fifer</td>
<td>2</td>
</tr>
<tr>
<td>Rank and file</td>
<td>20</td>
</tr>
</tbody>
</table>

**Total 155**
BOARDERS, SAIL-TRIMMERS, AND FIREMEN.

Boarders are the first division, under the command of the 1st Lieutenant, and are called on being boarded, to repel the attack;—this method not only prevents confusion, but gives every advantage, for whilst they are opposing the assailants, the remainder at the guns can keep up a brisk fire on the enemy, without having it returned, as he would be afraid of killing his own men; though should the boarders be found insufficient to defend the ship, the remaining divisions should be led in order, to the charge. I would also advise boarding with the three divisions with pikes, cutlasses, and tomahawks, under their respective officers, and led by the captain or commanding officer, with the marines to cover them, and hold the ground they gain, as it will speedily decide the contest, and spare a great effusion of blood.

Sail-Trimmers are the second division under the command of the 2d. Lieutenant, and are to trim sails in action; they should also be subdivided into three divisions, as part of their duty may not require the whole, and the commanding officer can without confusion, order any part to the service required; for instance, ‘Send the first division of Sail-Trimmers aft to the weather main-brace. First division Sail-Trimmers, forward; second and third, aft, wear ship,’ &c. &c. when the duty is done they return to their quarters.

Firemen are the third division under the command of the 3d. Lieutenant;—they are always to have their fire-buckets kept in good order and hung in their places, as also near their respective quarters in action. They are to be subdivided into three divisions, as the ship in action may be on fire in several places at once. The first of the subdivisions are to work the engine, and the second and third divisions draw and carry water to the place in their fire-buckets. On coming into action in the night, they are to get the fighting lanterns from the officer who distributes them, and hang them against the side immediately over the port, and when exercise or action is over, return them.

These divisions should be frequently exercised in their relative duties, for practice makes perfect, and perfection is mostly attended with success, and sham-fights both amuse and instruct crews. [Captain Rousseau, late of the French imperial frigate La Junon, who bravely fell in an engagement with the British frigates Horatio and Latona, in the West-Indies, used to allow his men to decide his own private quarrels, in a fair combat, with single sticks; and though this was not according to the strict rules of discipline, it had the desired effect of preventing petty complaints, and rendering the men familiar with the sword.]

ON EXERCISE.

Whenever the weather and the ship’s duty will permit, the Captain should direct the ship’s company to be exercised at the great guns, small arms, pikes, &c. for surely assiduous attention to this most principal part of naval discipline, can never too much engross the care of a commander, since the honor of his ship is so nearly allied to it, as the primitive step to victory, or a hard contested action.

EXERCISE OF THE GREAT GUNS.

When the drum beats to arms, every officer, and man, should repair to his respective station. The officers will muster their men, see every thing requisite for coming into action in its proper place, as it relates to their respective departments, and report the same when done to the 1st. Lieutenant.

The marines will fall in on the quarter-deck, and after having been mustered and inspected, they will be placed in the most advantageous posts for musquetry, as the judgment of the commanding officer may direct.

When every thing has been reported to be in readiness for exercise, or action
to the 1st. Lieutenant, he should first inspect the same, and then proceed to the following evolutions, viz.

1st....Silence!

The men are to keep a strict silence, and pay an implicit obedience to their officer's orders.

2d....Cast loose your guns!

The trainers are to cast loose the gun, and hook the train-tackle, the swabbers at the same time will either coil down, or choke, the side-tackle falls, as the motion of the ship may render it expedient.

3d....Take out your Tompions!

The powderman is to remove the Tompion from the gun, with an iron and mallet, for that purpose, and place it out of the way, where it may be found after exercise.

4th....Take off your Aprons!

The trainer who stands abaft the gun, is to take off the Apron, and the one who stands forward, should have the powder-horn ready to give to the captain of the gun, at the next word.

5th....Handle your Powder-horns!

The captain of the gun, receives the powder-horn from the Trainer, pricks the cartridge to know that it is home, and wipes the loose particles of powder off the priming wire, on the back of his hand, to learn if the charge is dry; if wet, he will report the same to the officer of his division, who will order it to be drawn, and the gun re-loaded.

6th....Prime your Guns!

The captain of the gun half cocks the lock, places a tube on the vent, tearing first the paper from its face, and covers it, as well as the pan, with loose priming, which he should be careful in bruising with his powder-horn.

7th....Return your Powder-horns!

The captain of the gun returns the powder-horn to the trainer who removes it to a place of safety.

8th....Lay on your Aprons!

The trainer who took the Apron off, lays it on again.

9th....Point your guns to the object.

2....Points abaft the beam, &c. &c.

The trainers handle their crows and handspikes and by the direction of the Captain, train the gun to the object.

10th....Stand by and take off your Aprons!

The Apron will be taken off as before, and the trainers will train the gun to the eye of the captain, who will take as exact aim as possible, either at the horizon, a ship in company, or a cask thrown overboard for that intent, for he should remember that in action one shot to do execution, is better than a whole broadside thrown hastily away. The swabber who stands forward of the gun, will have the powder-horn ready to renew the priming should it flash in the pan, and the one who stands aft the linstock ready to give the captain should the gun hang or miss-fire.

11th....Fire!

The captain of the gun, sure of his mark, is to discharge the piece, and instantly stop the vent with a twisted piece of oaken made for that purpose. The swabbers swab round the gun, and the sponger prepares to sponge it.

12th....Run in your Guns!

The men clap on the train-tackle-fall and run in the gun. N. B. Most guns will recoil in of themselves, but seldom or ever far enough, or in a position for loading.

13th....Sponge your Guns!

The sponger is to sponge the gun; he should be careful in rubbing well round the chamber, to extinguish any loose particles of fire that may remain, as well as to knock the same off of the sponge on the cell of the port. N. B. Every bird round the powderman is to return the way.
14th...Load with Cartridge!

The powderman receives the cartridge from the swabber, who stands aft, and shoves it into the gun as far as his arm will permit, being careful to place it arse foremost and seam downwards. The boy receives the empty powder-box from the swabber, and returns it to the hatchway for a full one.

15th...Ram home your Cartridge!

The sponger rams home the cartridge, and the captain of the gun pricks it with his priming wire at the vent to know when it is home.

16th...Shot your Guns!

The swabber who stands forward, hands the shot to the powderman who puts it into the gun. The captains of the guns may load with round and grape, but should never fire two round shot together, as it endangers the gun.

17th...Wad to your Shot!

The swabber who stands aft hands the wad to the powderman who puts it into the gun.

18th...Ram home Wad and Shot!

The sponger rams home both and returns the sponge.

19th...Man your side-tackle-falls!

The men on each side of the gun man the side-tackle-falls and prepare to run out the gun. The trainers, if they are exercising the weather guns, unhook the train tackle, but if the lee ones, they ease the gun out.

20th...Run out your Guns!

The gun is run out, the captain taking particular care to overhaul the breeching that it should not choke the trunks and retard the progress of the gun.

After this they again return to the fourth article and so continue. The boarders, sail-trimmers, and firemen, should be frequently called in the exercise to their different duties, as mentioned under that head, and the officers should be careful in preventing the men from slovenly passing through their exercise, or omitting the most minute particular.

When the exercise is over, the guns are to be secured and every thing returned to its respective department, the keys of the magazine returned and reports made to the 1st. lieutenant that as above has been done, when he will order the retreat to be beat; the watch or all hands called as required, and the decks washed down. The gunner will see that all lights near the magazine are extinguished and with his mates inspect the guns.

ON SMALL ARMS.

The manual and platoon exercise, so excellent and essential in itself, and so necessary to ships of war, have ever been unfortunately despised by the seamen of most services, and too much neglected by the commanders. This disgust to so warlike and useful a part of military science, arises from a strong affinity it has to the soldier, to whom seamen, from some strange cause or other, bear a most invincible dislike; however, captains and commanders of ships of war, convinced of its utility, ought to crush this obnoxious evil, and persevere in rendering the officers and men, from frequent exercise, familiar with it, not only as it relates to the ship, but as it relates to the service on shore, nor should the officers and seamen feel the least repugnance in thus acquiring a perfect practical and scientific knowledge of military discipline and duty, since the various events of war may require their services on shore, where honor and conquest is as likely to crown good discipline and order, as defeat and disgrace is sure to attend the want of it; and for the good of the public service, I would advise commanders to render themselves as familiar with military tactics as intense study and the duty of their ships will permit, for as I have said before, the various events of war may often call forth the military talents of a naval officer to honor and advantage both to himself and his country. [Witness the gallant affair of St. Jean D'Acre, where Sir Sidney Smith with a handful of seamen and marines, assisted in a most efficient way by the powdermaker against the consumpti
skill and bravery of Bonaparte and his army, and though the works were out of repair, his brilliant military talent not only succeeded in defending the place, but reflected eternal honor on him and his followers.] And though the military skill of a naval officer may not be called into action, it must be a great satisfaction to say with the greatest commanders of former ages, "I can serve my country," to use their favorite motto, pro maré et terram.

The field and platoon manoeuvres as practised by the army of the United States, are certainly too intricate and numerous for seamen, and require too much space for ships of war; therefore, whilst I approve of the manual exercise, I shall alone exemplify my own method of forming companies, platoons, &c. which I recommend from its requiring less space and for its conciseness and simplicity.

The men for instance; say one of the divisions fall in, in a direct line, the tallest men in succession from the right, at order arms.

Each division is considered the same as a company in a regular regiment, the lieutenant of which acts as captain, the two midshipmen as lieutenants, one man as seaman, and two as corporals.

The sergeant forms the men in a single line and calls the roll, and the senior midshipman forms the company in the following manner, viz.

1st...Shoulder arms!—Call yourselves off from right to left!

The whole shoulder arms, and the first man in the line calls out right, the one next to him left, the next again right, and so on, right and left down the line. This should be repeated to prevent any mistake.

2d...Form two deep—Left files to the right double—March!

At the word march, the left files (that is to say the men who called left) step together in the rear of the right files; or the men to their right.

3d...On the right—Close!

The right hand men remain fast, and the remainder close on the right which forms the division or company, two deep.

The officer then divides the company into two equal divisions.

4th....Second Division—two paces to the left—march!

At the word march, the second division or platoon closes two paces to the left, which marks the distinction between each platoon, or the first division may be ordered to close to the right, just as the officer conceives best for the position, or the most room.

5th....Order arms—six bayonets—shoulder arms!

When this evolution is performed, the officer reports the company formed to the Lieutenant, who comes in front and takes the command; he then proceeds to the following evolutions, viz.

1st....Officers—take post in front of your respective divisions—march!

The midshipmen take post some distance in front, and at the word march, they step off at ordinary time; the drums beat a march, and when within two or three paces of the line they face about and the music ceases. N. B. The senior midshipman commands the first division, and the junior midshipman the second.

2d....Present Arms!

Both divisions present arms together, the officers salute with their swords, and the drums beat a march.

3d...Shoulder arms!—Order arms!—Handle arms!—To the right, face!

This evolution is performed by both divisions together.

4th....Officers—inspect your respective divisions—march!

The officers order the men to draw ramrods, which they drive forcibly into the barrel as the officers pass down the line, to shew that their pieces are not loaded, and also lay the ramrod across the muzzle to shew that they are clean; as fast as each man is inspected, he will return his ramrod, face in front, and ease arms. The officers after inspecting their respective divisions, will take post in front, and with a motion of their swords, report their divisions thus far inspected.
NAVAL DISCIPLINE.

Shoulder arms!—Port arms!—Open pans!

The officers will again inspect their respective divisions, examine their locks and flints, and report the same as before.

Shut pans! Shoulder arms! Officers take post on the right of your respective divisions!

The officers take post on the right of their respective divisions, and the lieutenant will next proceed to the manual exercise, firing by volleys, divisions, &c.

The whole form in close column, 1st. division in front.

Senior midshipman orders. First division, one pace forward, march! Junior midshipman orders: Second division to the right face, forward march! And when in rear of the first division, Halt, front! Cover your files and dress! This forms the company in a close column or four deep, and two companies may be thrown into close columns in the same simple way.

THE PIKE.

The pike is the most useful weapon used on board ships of war, either in attack or defence; as a close column of pikes formed in order, with musquetry in their rear, present such a barrier to the enemy that they can seldom or ever cut through, or sustain the force and weight of this phalanx in a well directed vigorous charge.

The men should be exercised with the pike, as before with small arms, as far as it relates to platoons, companies, columns, &c. and in the manual exercise as follows, viz.

N. B. The pike is exercised in the right hand instead of the left as with a musket.

1st....Shoulder Arms—3 motions.

1st. The pike is lifted with the right hand, to bring the end of the staff on a line with the knee. 2d. The pike is supported with the left hand, whilst the right takes a fresh grasp at its full extent. 3d. The left hand brought down again to the side.

2d....Present Arms!—1 motion.

1st. The pikes are lowered or bowed in front together, as a salute, and brought again to the shoulder.

3d....Order Arms!—2 motions.

1st. The pike is let at once on the deck. 2d. The hand is brought in front and the pike supported against the shoulder.

4th....Trail Arms!—1 motion.

The pike is grasped at a poise, and trailed by the side. N. B. Brought to the order as before.

5th....Handle Arms!—1 motion.

1st. The pike is grasped with the right hand in a line with the eye.

6th....Ground Arms!—3 motions.

1st. The pike is thrust at the arms extent in front. 2d. Kneel and ground the pike. 3d. Rise on the ranks. Take up arms the same way in three motions.

7th....Port Arms!—1 motion.

1st. The pike is let fall across the chest into the left hand.

8th....Charge!—2 motions.

1st. Face half a twin to the right. 2d. Bring the pike firm down to the side.

9th....Shoulder Arms!—2 motions.

1st. The pike is brought to the shoulder. 2d. The left hand brought down to the side.

10th....Advance!—Charge!

This is the word of command to charge.

THE SWORD.

Few men require a more perfect knowledge of the sword than seamen of armed vessels, and unfortunately few possess it long. In action, a good swordsmen...
has not only a better chance of preserving his own life, but is more destructive to an enemy than from the tumult in boarding we might suppose, for with judicious parrys and scientific cuts and thrusts he mows down all the inexperienced that oppose him. The practice and use of single sticks is excellent, but the sword exercise is the best and most exact.

ON COMING INTO *ACTION.

When the Captain, or commander of a ship of war deems it expedient, he will order the 1st. Lieutenant to prepare for action.

The Boatswain, from the 1st. Lieutenant's order, turns the hands up, to clear ship, which his mates repeat at each hatchway.

The sail-trimmers will trim sails and attend upon deck whilst in chase, get the lower and topsail-yards slung, preventer braces rove and stretched along, topsail sheets stoppered, get splicing fids, axes, spunchars, strops, blocks, lashings, spare rigging, &c. on deck, and see all clear for shortening sail.

The boarders will get the main deck guns cleared of all incumbrances, and ready for action; they will prick the cartridges, and those that are found damp will be drawn and the gun reloaded; have shot and wads brought upon deck.

The grape, and cannister cases placed in midships, rammers, and sponges, laid upon deck, by the side of the guns, boarding pikes, cutlasses, small arms, &c. at hand, match tubs half filled with water, salt boxes filled, decks wet and strewed with sand, &c.

The firemen will get their fire-buckets near their respective quarters, a tub filled with water and a bucket at each hatchway, tubs filled with water in each chain, logger heads heated and hung up in the galley, engine filled with water, and placed upon the poop, or quarter deck, matches lighted, and placed in the match-tubs.

If it is night, fighting lanterns, hung over each gun, against the side. Fire-tube, half filled with water, with two swabs to each, and placed at their respective guns, each fire-tub as well as bucket is numbered that it may be known to which gun they belong. The officers are to pay particular attention to their divisions and see that every man is at work in preparing every thing ready for action.

The Gunners. The gunner will receive the keys of the magazine from the 1st. Lieutenant, open the same, and send the men that are stationed there into it; he will make them pull off their shoes, and see that they have no knives, nails, buckles, iron, steel, &c. about them. They will prepare to hand the powder to the carriers.

The master at arms and ship's corporal will, with the men stationed with them, light up the light room, hang lanterns in the store rooms, orlop deck and magazine passage. Tubs filled with water, with fire buckets at the magazine and store room doors or scuttles, and in the 'tween decks. They will have the budge barrels filled with musket, cannon, and pistol cartridges, ranged in the 'tween decks near each hatchway ready for handing them up, the hatchway men handing the empty ones down and receiving full ones to supply the carriers and boys.

A gunner's mate and the starboard watch of the gunners, will inspect the guns and see that they are supplied with everything necessary for action. They will have spare locks, breechings with lashings, gun tackles, spare falls, trucks, &c., distributed along the decks, to replace such as may be damaged; they will give the arms to the people, and the powder-horns, tube boxes, and spare furls, &c. to the captains of the guns.

A gunner's mate or quarter gunner, with four of the gunners, will supply the carriers with the powder boxes, budge barrels, &c. and the firemen with the spare stores and what may be wanted from the gunner's department. They will keep an account of what stores are issued out, and compare it, with what are returned.
NAVAL DISCIPLINE.

ON SINGLE ACTIONS.

It is impossible to delineate any regular system or line of conduct for commanders to pursue in action, since so much will always depend on particular circumstances, such as wind and weather, positions and evolutions of the enemy, &c., from which it is obvious that a manoeuvre which would be attended with success and advantage in one instance, might be the reverse in another; therefore, judgment and skill alone must direct them; yet a few observations may not be unattended with the desired effect of assisting the practical knowledge of the American officers, and of the juvenile part in particular.

When a commander is informed that a strange sail is in sight, he should give immediate orders to the 1st lieutenant (except when on particular service) to make all possible sail in chase.

He should select the necessary signals to be made and have them written on paper, ready, when they are required, to give to the signal officer, and should have the signal books packed in an iron case, to be thrown overboard should the event of the engagement terminate in his defeat.

When sufficiently near the stranger to discover that she is a vessel of war, he should order the 1st lieutenant to prepare for action and beat to quarters, and the signal officer to make the private signals, which will be answered by her if she is a United States vessel, yet though she should answer the signals and display the American flag, I would still advise him to keep his men at their quarters until the fact is determined either by one of his officers going, or one of them coming on board, for deceptions are often practised by an enemy when they have gained possession of the private and other signals, nor would her being a United States vessel, and well known to every officer on board, be any excuse for dismissing the men from their quarters too soon, or exculpate him from the just censure of a court-martial, should he suffer a surprise from an American vessel in the possession of an enemy, or one of their own vessels in disguise, when such things may so often occur. [I shall here mention as an example a curious circumstance of this kind which happened in the year 1805, in the English grand fleet under the command of Lord Cornwallis, then cruising in the chops of the British channel, watching the motions of the French fleet in the harbour of Brest. A French line of battle ship, commanded, I believe, by an Irishman, was separated from the Rochfort squadron in a gale of wind on the coast of France, and bore up for Brest, in which attempt he had the misfortune, when standing in for Ushant, on a very dark night, to find himself in the centre of the British fleet. What was to be done? To make sail might draw the attention of the fleet, and even should he get clear of them, the look-out frigates would discover him at day-light and either bring him to action or alarm the in-shore squadron; thus situated he knew that stratagem alone could save the ship, and with the greatest presence of mind he shortened sail and joined the lee line of the lee division, then commanded by Sir Charles Cotton, and strange to relate, he remained two days with the fleet, mistaken for the Montague 74, who had separated the night before from a squadron, which had that day joined the fleet from Torbay—he now admirably followed their evolutions, answered the signals, with the rest, and guessed their signification, from the manoeuvres of the surrounding ships: on the third day, the fleet stretched into Ushant, with a fine leading breeze, to relieve the in-shore squadron, and when the general signal was made for all captains to repair on board of the Admiral's ship, Pat quietly dropped out of the line, in shore, and prepared for a start, whilst the Admiral's and captains were on duty on board of the Ville de Paris, then the flag ship, and though many of the officers thought the captain of the Montague was very careless, yet no suspicion was awakened until he was nearly out of gun-shot, when he upstudding sails and French colours, and to the astonishment and mortification of the British ran safe into Brest.]
Should the chase prove an American man of war he will discover on her shewing her number if her commander is his superior officer, or not, as it is the etiquette of the service, for the inferior commanders, on falling in with a superior at sea, personally to pay their respects to him, and produce the orders they are acting under, except when they have dispatches on board, which should be made known to such superior officer, either by telegraph or signal.

Should the chase neither answer the signals nor shew her colors, a commander is justified in supposing her to be an enemy, and should, if not of too superior a force, prepare to bring her to action; yet as she might be a neutral vessel of war, he should, when sufficiently near to shorten sail, first hoist his colors, and fire a shot across her, to make her heave too and shew hers.

This complied with, will determine of what nation she belongs; but should she after this summons, still persist in not shewing her colors, a commander of a national vessel at war, is justifiable in treating such ship, though a neutral, as an enemy, until he is perfectly convinced of the contrary.

When a commander has discovered the chase to be an enemy, nothing remains for him to do, but to bring her to action and exert his utmost skill and endeavours to capture her.

Evolutions so much admired by most naval officers, are in my opinion, unless to gain a raking position, unnecessary in single actions, though certainly in general engagements of essential service, and indispensable utility, for why should these manœuvres, uncertain in their effect, and dilatory in their execution, be pursued, when a more determined and decisive mode of fighting, may be followed, and which will so speedily decide the contest, unless the commanders wish to impress each other, with the admiration of their skill, instead of their courage. I would recommend to a commander from much experience, and many reasons which I shall bring forward in support of this, my favourite manœuvre, always if the wind and sea will permit, instantly to board the enemy, by running close up along-side, discharging a well directed broadside, and throwing the men on board if possible, on his weather bow; this would evidently take him by surprise, as his men would be at their quarters, in expectation of a cannonade, however I shall dwell more particular on this point under the head of boarding, and confine myself here to the remark, that boarding has universally succeeded, when attempted on the commencement of an action, and as universally failed, when embraced by desperation as a last resource, for an example, of which, in the first instance, we have only to refer to the actions between the Chesapeake and Shannon—Milan and Cleopatra—Wasp and Frolic, with Paul Jones and the Serapis, and for the second instance, I may bring forward the affair of the La Pique and the Blanche, with a number of others too tedious to insert.

The cause why success generally attends the manœuvre of boarding, on the first onset, and the want of it, when delayed, is obvious; for this manœuvre, on the commencement of an action, is always attended with some degree of surprize, both from its being unexpected and so seldom practised, and the assailants are full of ardor, courage and strength, whilst their sudden and determined attack must strike a panic (for the bravest men* are liable to it on sudden events) and confusion amongst the enemy, which will spread, for it is infectious, and soon ripens into flight or disorder, either of which must make their ship an easy conquest. But allowing the enemy to be prepared for such an event, is it not better to decide the contest boldly at once, than to waste a greater effusion of blood, and endanger your vessel from a heavy cannonade, and which may compel you at last to board under every disadvantage, for the enemy aware that it is your last resource, and that your numbers must be few, will receive your poor dispirited men, jaded from the fatigues of the action, with twice their vigor and courage, convinced that a brave defence must terminate in your defeat.

Privateers, as they cruise alone for plunder, should be as economical of their spars and men as possible, which boarding alone can insure, as it prevents that

*Witnessthe British General, Sir John Moore, at the battle of Corunna.
destruction which is sure to ensue from a heavy cannonade, and as they chiefly attack letters of marque and merchantmen that are easily overpowered by the superior numbers of a privateer.

Should it be found impossible to board from its blowing strong, with a high sea, which must endanger the vessel, a commander must endeavour to lay his ship, on the enemy's weather quarter, and order a platoon of the four aftermost guns, to keep up a constant fire at the rudder and stern—one gun forward—one in midships and one aft, with good marksmen, to fire solely at her masts, and the remainder to keep up a brisk and constant discharge of round and grape, and level alone for her ports, for in this position it will be an oblique or raking fire, which will render her unmanageable; unman, and dismount her guns, and appal the stoutest heart, with the slaughter which a well directed fire must cause from such a manoeuvre, nor can she extricate herself from such a position, which gives you so much advantage, without changing it for a worse—for,

Should she attempt to wear, give her a broadside when her stern is exposed in the evoluation; then fill and heave in stays, which will enable you to bear down again on the same point or across her bows, as circumstances may require, or

Should she fill and attempt to shoot ahead to get across your bows, put your helm up, run close under her stern, give her your whole broadside, then put your helm hard a lee, shoot up upon her weather quarter again, and give her the other broadside, and if not altogether impracticable, P would instantly board her in the smoke, but as I have said, these manoeuvres will alone depend on the skill and judgment of the commanders.

ON FIGHTING BOTH SIDES.

The men of every other gun, beginning from forward or aft, are to be stationed to the guns opposite, and as this leaves every other gun on both sides vacant, the men of the next gun, beginning from forward or aft, will work both, leaving always the sponger and powderman, to load one, whilst they run out, and discharge the other, and so on; alternately.

ON BOARDING.

I would recommend laying an enemy on board on the weather-bow, for several reasons, viz: 1st. You can extricate the ship from that position better than any other. 2nd. If you hold fast or get lashed, you are in a position for raking instead of being raked, as you would be if you was on either quarter, which was the case with the La Pique when she attempted to board the Blanche. 3d. In this position you can board with more regularity and with greater numbers entering at once from several points, as for instance from the fore-chains, bow-sprit and head, whilst only the numbers which will fill up the gangways can oppose you until you drive them back into a more open space; your marines taking care to scour the booms, tops, and boats, &c. and lastly, if you are compelled to make a precipitate retreat, you can cover it better, and then if you please, either extricate yourself, or commence a raking fire.

On preparing to board, the marines will be drawn up to cover the boarders. The boarders will be drawn up in two distinct close columns, with pikes and cutlasses, &c. under the command of the 2d. and 3d. Lieutenants.

Two platoons of 20 men each, under the command of mates or midshipmen, will be drawn up with musketry to act as lines of reserve, or support to the columns. Two detachments of 10 men* each, with small arms under the command of midshipmen, will be drawn up to act as light companions or scouts, that is, to hover about and prick off the stragglers, men in the tops, &c.

When the word is given to board, the 1st. Lieutenant is to command in person.

* These men should be selected for good marksmen.
The marines will open a brisk fire on the enemy's deck to afford a landing. The column commanded by the 2nd. Lieutenant will board first and get possession of the opposite side of the deck.

The column under the command of the 3rd. Lieutenant will follow and take possession of the side on which they board.

Both columns will then charge the enemy along each gangway, and when they gain the quarter-deck each column will extend its line by bringing up the rear ranks in front; however, they are not to be less than three deep.

The lines of reserve follow next; they are to support and flank the columns, the detachments then go over, they are to hover about, pick the men off, in the tops, waist, and wherever they can see them, aiming chiefly at the officers; in short they are the same as light or rifle companies in a field of battle. The marines will remain in the rear some distance, and keep possession of the ground already gained, and those in the waist in check.

The 1st. Lieutenant's judgment and circumstances must now certainly direct him, and should he get repulsed, he should endeavour to rally his men, which if found impossible he should conduct a good retreat, under the cover of the lines of reserve and marines.

When the enemy has struck, her commanding, or surviving officer, should be brought on board to surrender his sword, the ship's papers secured, the prize manned, and the prisoners removed, and well guarded, the guns of both ships, and magazines should be next secured, the dead thrown overboard, and the decks washed down, and every thing safely returned to its respective departments; after which, a general muster should take place, and a list of the killed, wounded and missing taken, after which, both ships will repair damages, and either separate or remain in company, as the commander may judge expedient.

**RULES AND REGULATIONS IN HARBOUR.**

When the general and respective orders are issued, each Lieutenant will take a copy of them, and sign his name in the orderly book as an acknowledgement of the same.

The officers are considered always to be answerable for their respective watches. All boats on their return on board, are to be reported to the 1st. Lieutenant and the officer of the watch.

The boat-keeper of the day, has charge of the boat's furniture, and will keep her clean and in good order.

On coming along-side he will either haul her out to the guesswarp, or veer her astern.

The officers and coxswains of the boats are particularly ordered, never to bring liquor of any kind on board of the ship without permission from the first Lieutenant; they are also to use their utmost exertions in preventing it being smuggled on board, as they are answerable for the conduct of their crews.

The officer of the morning watch will order a midshipman to call the 1st. Lieutenant at day-light and have the Boatswain and his mates ready for turning the hands up.

When the hands are turned up the people will muster on the quarter deck, answer to the roll and be then set to their respective duties.

At seven bells the hammocks will be piped up, and the quarter masters will stow them, under the inspection of the midshipmen of the watch.

After the hammocks are stowed, the officer of the watch will have the decks swept down, the ropes hauled taut, fore and aft, the top-gallant yard ropes, stretched along, and top-men sent to each mast head, to overhaul their lines and braces.

The officer of the morning watch, will immediately after the people have answered to the roll, order the boatswain to hoist out, and lower down the boats, and despatch them, on any necessary service, from the orders of the first lieutenant.
after which he will wash decks; and should the boats not be wanted, the respective boat-keepers of the day, will clean them out.

If the weather permits, at ten minutes before eight in summer, and nine in winter, the hands will be turned up, “up top gallant yards,” every man will repair to his station, and every officer, is expected to attend upon deck. At the word sway across, the yards will be crossed, the bell struck, and the colours hoisted at the same time, after which, the yards will be squared, and the people go to breakfast; but it is to be remembered, that if a commodore, or a superior officer is in the harbour, this evolution will be followed from his motions.

The midshipman of the watch, will report to the first lieutenant, when the allotted time for the people’s breakfast is expired, which is half an hour, when the hands will be turned up, and set to their respective duties.

When the hands are turned up, after breakfast, and set to their relative duties, one division will be left below to clean the ’tween decks, under the inspection of the officers of the morning watch, who will report the same to the 1st lieutenant, when finished.

The Surgeon and his assistants, will always visit and attend the sick, at ten o’clock, and present a written statement of their case to the 1st Lieutenant and captain; his assistant will also place a sick list in the binnacle drawer, for the inspection of the officers of the watches, as no man on any account, will ever be excused from duty, without he has reported himself to the surgeon, and had his name inserted in this list.

The signal-men will be ordered to keep a strict look-out for the Commodore’s signals and motions.

The quarter-masters of the watch will attend to the swinging of the ship, and boats coming on board, reporting the same with the rank of the officer in her, to the officer of the watch, that he may order the side to be manned accordingly.

A boatswain’s mate and the sides-men should always be near the gangways to attend the side when ordered.

A master-at-arms or ship’s corporal is always to be on the gangway from morning until evening gun-fire, to prevent any desertion or nefarious practice being carried on by the boats.

The sentinels will be positively ordered, never to permit a shore-boat along side, without the sanction of an officer of the watch.

The sailing-master will attend to the swinging of the ship, will endeavor to keep a clear hawse, and when necessary ask permission of the 1st lieutenant, either to clear hawse, or sight the anchor; which duty he of course will immediately order to be completed.

When an officer of either rank leaves the ship to answer a signal, he will carry the order book with him to copy orders, and report, and shew the same to the 1st Lieutenant, on his return on board.

When the commander or any captain either leaves, or comes on board of the ship, he will be received by a guard, and all the officers are expected to attend upon the quarter-deck.

When any of the keys of the store-rooms are wanted, they will be asked for on the quarter-deck, and fetched by a midshipman of the watch, to whom they will also be returned when done with; this rule will be observed both at sea, and in harbour.

Three smart boys will be selected, and put into each watch; they are to stay on the quarter-deck, to carry any of the officer’s messages, and call the midshipmen when below, for any duty required. They should wear caps, with a winged mercury painted on them.

An orderly, besides the sentinel, will always be planted near the cabin-door, with side-arms only, to carry the captain’s orders and messages.

The inferior officers will always walk the quarter-deck, on the side opposite to that occupied by their superiors, and as the quarter deck is considered as a parade, each officer will pay that respect, of removing his hat on coming on it.
Every officer is expected to be in uniform when on the quarter-deck, nor is he ever to leave the ship on duty without side-arms.

The ship's steward will receive orders from the 1st. Lieutenant, when to serve out provisions, as it will depend a great deal on the duty of the ship.

When a sloop, or lighter, &c. is cleared, she will be first inspected, before she leaves the ship, by a midshipman, and a ship's corporal, to prevent any men deserting in her.

At seven bells, the day mate will get the spirits up, and mix the people's grog, the work will then be returned to its respective department, and the decks swept down. At noon, the boatswain and his mates will be ordered to pipe to dinner.

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morning, to boil the water for washing, and the hands at six o'clock will be turned up to wash clothes, and continue washing until half past nine or ten, when they will be hung on white-lines rove the night previous for that purpose, between the fore, main and mizen rigging; should it come on to rain before they are dry, they will be piped down, and placed in kids under the charge of the sentinel at the cabin door, until an opportunity again offers to dry them; when perfectly dry they will be piped down, the stops cut off of the lines, which will be unrove and returned to the boatswain's yeoman.

The wind sails are to be constantly kept down and trimmed, and the 'tween decks is to be frequently aired by swinging stoves appropriated for that purpose.

When duty is required of the men at the Navy Yard or on shore, a division or sub-division as may be deemed adequate to such duty, will be sent to execute it.

Things found lying about the deck are to be put into the charge of the master-at-arms until their owners claim and describe their property.

Dead men's cloathes are to be sold by auction at the mast to the highest bidder, and the sum deposited in the purser's hands, for the benefit of the deceased's relations, to whom a fair account of stoppages and wages due to the deceased, will be rendered by the purser the first opportunity.

Deserters clothes will be sold also at the mast, by auction, and the sum there of deposited into the purser's hands, to be appropriated to the fund for widows and orphans.

On receiving volunteers, or fresh men on board, the first day is always allowed them for slinging their hammocks.

The mate of the hold should be careful, when working in the spirit room, nor should he ever allow, without permission from the 1st. Lieutenant, the captain of the hold to take the empty spirit casks, to make what they term a bull, which is done by putting water into them, and letting it remain until it partakes of the cask which makes pretty strong grog, and is frequently the cause of much drunkenness.

The ship's company's lights are to be extinguished at eight o'clock, the midshipmen and warrant officers at nine, and the Lieutenant's at ten, though an extension of time will be allowed to the officers when requested of the 1st. Lieutenant.

The master-at-arms will see that all lights are extinguished, and report the same when done to the 1st. Lieutenant.

To dwell on every minuitia of the naval service, would swell a volume, therefore I shall conclude this work with a few principal rules and regulations for sea.

**RULES AND REGULATIONS FOR SEA.**

Every officer is to have a respective list of the ship's company, that when required they can muster the people and prevent a neglect of duty.

On the setting of each watch, the mate will muster the people and report the absentee's to the officer of the watch.

Look-outs will be placed on each bow, gangways and quarters, who will keep a strict look-out for all strange sail and sing out every half hour. They are to be inspected and regularly relieved by the directions of the officer of the watch.

The officer of the watch is neither to make or shorten sail without permission from the captain without a squall or other occurrences may render it necessary, which, if material, is to be reported to the captain.

The officer of the watch will pay a strict attention to the steerage, nor alter the course without permission or necessity; he will see that the course and distance is marked by the mate of the watch every half hour on the log-board to which he will affix his signature at the end of the watch.

On seeing a strange sail in the night he will immediately inform the captain of the circumstance.

If in company or under a commodore, his bearing and distance will be inserted every half hour on the log-board.
No officer is to quit the deck on any pretence without being regularly relieved by the officers of the next watch.

On relieving the deck, the officer will receive the orders of the night and be informed how many knots the ship went the last time the log was hove, what sail is set, what watch is on deck, the bearing of the commodore's light with other particulars previous to the officer he relieved, leaving the deck.

Any change of weather or material circumstance will be reported to the captain.

The officer of the morning watch, will commence washing decks at day-light if the duty of the ship will permit; he will then get the sails trimmed, top-sail and top-gallant sheets hauled close home, tacks aboard, &c. and every thing prepared for making sail. The mast head men will always be sent up at day-light and be relieved every hour.

The mate of the watch will always call the 1st. lieutenant at day-light.

The hammocks will be piped up at seven bells, and at eight the people will go to breakfast if the duty of the ship will permit.

In tacking or wearing by watches the idlers will be called to assist, as also on washing decks, unless they have been on particular duty during the night.

The boys are to be mustered aft on the quarter deck by the master-at-arms or ship's corporal at seven bells, and inspected by the officer of the watch or first lieutenant to see they are clean.

When the watch is called after breakfast, the officers of the morning watch will, with the watch below, clean the 'tween decks and report the same to the first lieutenant when finished.

The purser's steward will at nine o'clock in the morning commence serving out provisions, and that by messes.

The ship's company will form themselves into messes of six men in each mess and not less than four.

A master's mate, a quarter master, a captain of the forecastle, and a boatswain's mate will always attend at the cutting up of beef and pork to prevent any discontent of the ship's company.

Each mess will place their respective tallies on their beef, pork, puddings, &c. on putting them into the coppers, which will prevent all disputes. The ship's cook will take up the dinner at seven bells when the duty of the ship will permit the ship's company to go to dinner at twelve o'clock.

After dinner the cooks will clean the coppers out, select the cinders, and throw the ashes overboard, the master-at-arms will inspect the same and report it when done to the first lieutenant.

The washing days will be the same as in harbor, and one afternoon in the week will be allowed the ship's company to mend their clothes.

Any man having a just cause of complaint, will come quietly aft and make the same to the officer of the watch, who will report it to the first lieutenant for investigation and redress, but all litigious and ungrounded complaints will be severely punished.

One hour before sun-set the hands will be piped to supper, after which the seamen and marines will be mustered at quarters and every thing seen ready for action in the night, the hammocks will be then piped down except in chase.

For shortening sail for the night is from the captain's orders.

A midshipman of the watch, calls the lieutenant of the next watch, and a quartermaster calls the midshipmen.

When the hands are turned up on any service, the officers below are to be informed of it in the same manner.

On all hands being called for working ship, the people will repair to their respective stations, keep a strict silence and obey their officer's orders.

Every commander expects that a mutual advantage combined with a desire of doing their duty, will always induce the officers.

Seamen and marines under his command to execute their duty with cheerfulness and care, to labor, not to idly loiter. No one will be permitted of the ship's
### TABLE IX.

**TABLE OF THE REQUISITE CHARGES OF ALL PIECES ON ALL OCCASIONS**

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**TO MAKE MATCH-ROPE.**

Take a quarter inch white rope, as old and as rotten as possible, boil it in a strong solution of Salt petre for an hour, (a strong solution is one pound Salt petre to four pints water) then dry it well and it will be fit for use. It may be dried in an oven, if wanted in a hurry, but otherwise in the sun.
APPENDIX.

AN ACT
FOR THE GOVERNMENT OF THE
NAVY OF THE UNITED STATES.

Be it enacted by the Senate and House of Representatives of the United States of America, in Congress assembled, That from and after the first day of June, 1800, the following rules and regulations be adopted and put in force, for the government of the navy of the United States.

The commanders of all ships and vessels of war belonging to the navy, are strictly enjoined and required to shew in themselves a good example of virtue, honor, patriotism and subordination; and be vigilant in inspecting the conduct of all such as are placed under their command and to guard against, and suppress all dissolute and immoral practices, and to correct all such as are guilty of them, according to the usage of the sea service.

The commanders of all ships and vessels in the navy, having chaplains on board, shall take care that divine service be performed in a solemn, orderly, and reverent manner twice a day, and a sermon preached on Sunday, unless bad weather, or other extraordinary accidents prevent it; and that they cause all, or as many of the ship's company as can be spared from duty, to attend at every performance of the worship of Almighty God.

Any officer, or other person in the navy, who shall be guilty of oppression, cruelty, fraud, profane swearing, drunkenness, or any other scandalous conduct, tending to the destruction of good morals, shall, if an officer, be cashiered, or suffer such other punishment as a court martial shall adjudge; if a private, shall be put in irons, or flogged, at the discretion of the captain, not exceeding twelve lashes; but if the offence require severer punishment, he shall be tried by a court martial, and suffer such punishment as said court shall inflict.

Every commander or other officer who shall, upon signal for battle, or on the probability of an engagement, neglect to clear his ship for action, or shall not use his utmost exertions to bring his ship to battle, or shall fail to encourage, in his own person, his inferior officers and men to fight courageously, such offender shall suffer death, or such other punishment as a court martial shall adjudge; or any officer neglecting, on sight of any vessel or vessels of an enemy, to clear his ship for action, shall suffer such punishment as a court martial shall adjudge: And if any person in the navy shall treacherously yield, or pusillanimously cry for quarters, he shall suffer death, on conviction thereof, by a general court martial.

Every officer or private who shall not properly observe the orders of his commanding officer, or shall not use his utmost exertions to carry them into execution, when ordered to prepare for, join in, or when actually engaged in battle; or shall at such time, basely desert his duty or station, either then, or while in sight of an enemy, or shall induce others to do so, every person so offending shall, on conviction thereof by a general court martial, suffer death, or such other punishment as the said court shall adjudge.

Every officer or private who shall, through cowardice, negligence, or disaffection in time of action, withdraw from, or keep out of battle, or shall not do his utmost to take or destroy every vessel which it is his duty to encounter, or shall not do his utmost endeavour to afford relief to ships belonging to the United States, every such offender shall, on conviction thereof by a general court martial, suffer death, or such other punishment as the said court shall adjudge.

The commanding officer of every ship or vessel in the navy, who shall capture, or seize upon any vessel as a prize, shall carefully preserve all the papers and
Appendix.

judge of the district to which such prize is ordered to proceed, and shall transmit to the Navy Department, and to the agent appointed to pay the prize money, complete lists of the officers and men entitled to a share of the capture, inserting therein the quality of every person rating, on pain of forfeiting his whole share of the prize money resulting from such capture, and suffering such further punishment as a court martial shall adjudge.

No person in the navy shall take out of a prize, or vessel seized as prize, any money, plate, goods, or any part of her rigging, unless it be for the better preservation thereof, or absolutely necessary for the use of any of the vessels of the United States, before the same shall be adjudged lawful prize by a competent court; but the whole, without fraud, concealment, or embezzlement, shall be brought in, and judgment passed thereon, upon pain that every person offending herein shall forfeit his share of the capture, and suffer such further punishment as a court martial, or the court of admiralty in which the prize is adjudged, shall impose.

No person in the navy shall strip of their clothes, or pillage, or in any manner maltreat persons taken on board a prize, on pain of such punishment as a court martial shall adjudge.

No person in the navy shall give, hold, or entertain any intercourse or intelligence to or with any enemy or rebel, without leave from the president of the United States, the Secretary of the Navy, the commander in chief of a fleet, or the commander of a squadron; or in case of a vessel acting singly, from his commanding officer, on pain of death, or such other punishment as a court martial shall adjudge.

If any letter or message from an enemy or rebel, be conveyed to any officer or private of the navy, and he shall not, within twelve hours, make the same known, having opportunity so to do, to his superior or commanding officer; or if any officer commanding a ship or vessel, being acquainted therewith, shall not, with all convenient speed, reveal the same to the commander in chief of the fleet, commander of a squadron, or other proper officer whose duty it may be to take cognizance thereof, every such offender shall suffer death, or such other punishment as a court martial shall adjudge.

Spies, and all persons who shall come or be found in the capacity of spies, or who shall bring or deliver any seducing letter or message from an enemy or rebel, or endeavour to corrupt any person in the navy to betray his trust, shall suffer death, or such other punishment as a court martial shall adjudge.

If any person in the navy shall make or attempt to make any mutinous assembly, he shall, on conviction thereof by a court martial, suffer death; and if any person as aforesaid shall utter any seditious or mutinous words, or shall conceal or connive at any mutinous or seditious practices, or shall treat with contempt his superior, being in the execution of his office; or being witness to any mutiny or sedition, shall not do his utmost to suppress it, he shall be punished at the discretion of a court martial.

No officer or private in the navy, shall disobey the lawful orders of his superior officer, or strike him, or draw, or offer to draw, or raise any weapon against him, while in the execution of the duties of his office, on pain of death, or such other punishment as a court martial shall inflict.

No person in the navy shall quarrel with any other person in the navy, nor use provoking or reproachful words, gestures, or menaces, on pain of such punishment as a court martial shall adjudge.

If any person in the navy shall desert to an enemy or rebel, he shall suffer death.

If any person in the navy shall desert, or shall entice others to desert, he shall suffer death, or such other punishment as a court martial shall adjudge; and if any officer or other person belonging to the navy, shall receive or entertain any deserter from any other vessel of the navy, knowing him to be such, and shall not with all convenient speed, give notice of such deserter to the commander of the vessel to which he belongs, or to the commander in chief, or to the commander of
discretion of a court martial. All offences committed by persons belonging to the navy while on shore, shall be punished in the same manner as if they had been committed at sea.

If any person in the navy shall knowingly make or sign, or shall aid, abet, direct, or procure the making or signing of any false muster, or shall execute, or attempt, or countenance any fraud against the United States, he shall, on conviction, be cashiered and rendered forever incapable of any future employment in the service of the United States, and shall forfeit all the pay and subsistence due him, and suffer such other punishment as a court martial shall inflict.

If any officer, or other person in the navy, shall through intention, negligence, or any other fault, suffer any vessel of the navy to be stranded, or run upon rocks or shoals, or hazarded, he shall suffer such punishment as a court martial shall adjudge.

If any person in the navy shall sleep upon his watch, or negligently perform the duty assigned him, or leave his station before regularly relieved, he shall suffer death, or such punishment as a court martial shall adjudge; or if the offender be a private, he may, at the discretion of the captain, be put in irons, or flogged not exceeding twelve lashes.

The crime of murder, when committed by any officer, seaman or marine, belonging to any public ship or vessel of the United States, without the territorial jurisdiction of the same, may be punished with death by the sentence of a court martial.

The officers and privates of every ship or vessel, appointed as convoy to merchant or other vessels, shall diligently and faithfully discharge the duties of their appointment, nor shall they demand or exact any compensation for their services, nor maltreat any of the officers or crews of such merchant or other vessels, on pain of making such reparation as a court of admiralty may award, and of suffering such further punishment as a court martial shall adjudge.

If any commander or other officer shall receive or permit to be received, on board his vessel, any goods or merchandise, other than for the sole use of his vessel, except gold, silver, or jewels, and except the goods or merchandise of vessels which may be in distress, or shipwrecked, or in imminent danger of being shipwrecked, in order to preserve them for their owner, without orders from the President of the United States or the Navy department, he shall, on conviction thereof, be cashiered, and be incapacitated forever afterwards, for any place or office in the navy.

If any person in the navy shall waste, embezzle, or fraudulently buy, sell, or receive any ammunition, provisions, or other public stores; or if any officer or other person, shall, knowingly, permit through design, negligence, or inattention any such waste, embezzlement, sale or receipt, every such person shall forfeit all the pay and subsistence then due him, and suffer such further punishment as a court martial shall direct.

If any person in the navy shall unlawfully set fire to or burn any kind of public property, not then in the possession of an enemy, pirate, or rebel, he shall suffer death: And if any person shall in any other manner, destroy such property, or shall not use his best exertions to prevent the destruction thereof by others, he shall be punished at the discretion of a court martial.

Any theft not exceeding twenty dollars may be punished at the discretion of the captain, and above that sum, as a court martial shall direct.

If any person in the navy shall, when on shore, plunder, abuse, or maltreat any inhabitant, or injure his property in any way, he shall suffer such punishment as a court martial shall adjudge.

Every person in the navy shall use his utmost exertions to detect, apprehend, and bring to punishment all offenders, and shall, at all times, aid and assist all persons appointed for this purpose, on pain of such punishment as a court martial shall adjudge.

Each commanding officer shall, whenever a seaman enters on board, cause an accurate entry to be made in the books of the name, rank, time and term of his service.
APPENDIX.

service; and before sailing transmit to the Secretary of the Navy, a complete list or muster roll of the officers and men under his command, with the date of their entering, time and terms of their service annexed; and shall cause similar lists to be made out on the first day of every second month, to be transmitted to the Secretary of the Navy, as opportunities shall occur; accounting in such lists or muster rolls, for any casualties which may have taken place since the last list or muster roll. He shall cause to be accurately minuted on the ship's books, the names of, and times at which any death or desertion may occur; and in case of death, shall take care that the purser secure all the property of the deceased for the benefit of his legal representative or representatives. He shall cause frequent inspections to be made into the condition of the provisions, and use every precaution for its preservation. He shall, whenever he orders officers and men to take charge of a prize, and proceed to the United States, and whenever officers and men are sent from his ship for whatever cause, take care that each man be furnished with a complete statement of his account, specifying the date of his enlistment, and the period and terms of his service; which account shall be signed by the commanding officer and purser. He shall cause the rules for the government of the navy to be hung up in some public part of the ship, and read once a month to his ship's company. He shall cause a convenient place to be set apart for sick or disabled men, to which he shall have them removed, with their hammocks and bedding, when the surgeon shall so advise, and shall direct that some of the crew attend them and keep the place clean; and if necessary, shall direct that cradles, and buckets with covers, be made for their use: And when his crew is finally paid off, he shall attend in person, or appoint a proper officer, to see that justice be done to the men, and to the United States, in the settlement of the accounts: Any commanding officer, offending herein, shall be punished at the discretion of a court martial.

No commanding officer shall, of his own authority, discharge a commissioned or warrant officer, nor strike, nor punish him otherwise than by suspension or confinement, nor shall he, of his own authority, inflict a punishment on any private beyond twelve lashes with a cat-of-nine-tails, nor shall he suffer any wired, or other than a plain cat-of-nine-tails, to be used on board his ship; nor shall any officer who may command by accident, or in the absence of the commanding officer (except such commander be absent for a time by leave) order or inflict any other punishment than confinement, for which he shall account on the return of such absent commanding officer. Nor shall any commanding officer receive on board any petty officers or men turned over from any other vessel to him, unless each of such officers and men produce to him an account signed by the captain and purser of the vessel from which they came, specifying the date of such officer's or man's entry, the period and terms of service, the sums paid and the balance due him, and the quality in which he was rated on board such ship. Nor shall any commanding officer, having received any petty officer or man as aforesaid, rate him in a lower or worse station than that in which he formerly served: Any commanding officer offending herein, shall be punished at the discretion of a court martial.

Any master at arms, or other person of whom the duty of master at arms is required, who shall refuse to receive such prisoners as shall he committed to his charge, or having received them, shall suffer them to escape, or dismiss them without orders from proper authority, shall suffer in such prisoners steal, or be punished otherwise at the discretion of a court martial.

All crimes committed by persons belonging to the navy, which are not specified in the foregoing articles, shall be punished according to the laws and customs in such cases at sea.

All officers, not holding commissions or warrants, or who are not entitled to them, except such as are temporarily appointed to the duties of a commissioned or warrant officer, are deemed petty officers.

Any person entitled to wages or prize money, may have the same paid to him...
case of the assignment of wages, the power shall specify the precise time they commence. But the commander of every vessel is required to discourage his crew from selling any part of their wages or prize money, and never to attest any power of attorney, until he is satisfied that the same is not granted in consideration of money given for the purchase of wages or prize money.

If any officer of the navy or marines shall be killed or die, by reason of a wound received in the line of his duty, leaving a widow, or if no widow, a child or children, under sixteen years of age, such widow, or if no widow, such child or children, shall be entitled to receive half the monthly pay to which the deceased was entitled at the time of his death, which allowance shall continue for and during the term of five years; but in case of the death or intermarriage of such widow, before the expiration of the said term of five years, the half pay for the remainder shall go to the child or children of the said deceased officer: Provided, That such half pay shall cease on the death of such child or children, and the money required for this purpose shall be paid out of the navy pension fund, under the direction of the commissioners of that fund.

NAVAL GENERAL COURTS MARTIAL.

General courts martial may be convened as often as the President of the United States, the Secretary of the Navy, or the commander in chief of the fleet, or commander of a squadron, while acting out of the United States, shall deem it necessary: Provided, that no general court martial shall consist of more than thirteen, nor less than five members, and as many officers shall be summoned on every such court as can be convened without injury to the service, so as not to exceed thirteen, and the senior officer shall always preside, the others ranking agreeable to the date of their commissions; and in no case, where it can be avoided without injury to the service, shall more than one half the members, exclusive of the President, be junior to the officer to be tried.

Each member of the court, before proceeding to trial, shall take the following oath or affirmation, which the Judge Advocate, or person officiating as such is hereby authorized to administer.

"I, A. B. do swear [or affirm] that I will truly try, without prejudice or partiality, the case now depending, according to the evidence which shall come before the court, the rules for the government of the navy and my own conscience; and that I will not by any means divulge or disclose the sentence of the court, until it shall have been approved by the proper authority, nor will I at any time divulge or disclose the vote or opinion of any particular member of the court, unless required so to do before a court of justice in due course of law."

This oath or affirmation being duly administered, the president is authorised and required to administer the following oath or affirmation to the Judge Advocate, or person officiating as such.

"I, A. B. do swear [or affirm] that I will keep a true record of the evidence given to and the proceedings of this court; nor will I divulge or by any means disclose the sentence of the court until it shall have been approved by the proper authority; nor will I at any time divulge or disclose the vote or opinion of any particular member of the court, unless required so to do before a court of justice in due course of law."

All testimony given to a general court martial shall be on oath or affirmation, which the President of the court is hereby authorized to administer, and if any person shall refuse to give his evidence as aforesaid, or shall pervert, or shall behave with contempt to the court, it shall and may be lawful for the court to imprison such offender at their discretion; provided that the imprisonment in no case shall exceed two months; and every person who shall commit wilful perjury on examination on oath or affirmation before such court, or who shall corruptly procure, or suborn any person to commit such wilful perjury, shall and may be
prosecuted by indictment or information, in any court of justice of the United States, and shall suffer such penalties as are authorized by the laws of the United States in cases of perjury or the subordination thereof. And in every prosecution for perjury or the subordination thereof under this act, it shall be sufficient to set forth the offence charged on the defendant, without setting forth the authority by which the court was held, or the particular matters brought or intended to be brought before the said court.

All charges on which an application for a general court martial is founded, shall be exhibited in writing to the proper officer, and the person demanding the court shall take care that the person accused be furnished with a true copy of the charges, with the specifications, at the time he is put under arrest, nor shall any other charge or charges, than those so exhibited, be urged against the person to be tried before the court, unless it appear to the court that intelligence of such charge had not reached the person demanding the court, when the person so to be tried was put under arrest, or that some witness material to the support of such charge, who was at that time absent, can be produced; in which case, reasonable time shall be given to the person to be tried, to make his defence against such new charge. Every officer so arrested is to deliver up his sword to his commanding officer, and to confine himself to the limits assigned him, under pain of dismissal from service.

When the proceedings of any general court martial shall have commenced, they shall not be suspended or delayed on account of the absence of any of the members, provided five or more be assembled; but the court is enjoined to sit from day to day, Sundays excepted, until sentence be given. And no member of said court shall, after the proceedings are begun absent himself therefrom, unless in case of sickness, or orders to go on duty from a superior officer, on pain of being cashiered.

Whenever a court martial shall sentence any officer to be suspended, the court shall have power to suspend his pay and emoluments for the whole, or any part of the time of his suspension.

All sentences of courts martial which shall extend to the loss of life, shall require the concurrence of two thirds of the members present; and no such sentence shall be carried into execution, until confirmed by the President of the United States; or if the trial take place out of the United States, until it be confirmed by the commander of the fleet or squadron: All other sentences may be determined by a majority of votes, and carried into execution on confirmation of the commander of the fleet, or officer ordering the court, except such as go to the dismissal of a commissioned or warrant officer, which are first to be approved by the President of the United States.

A court martial shall not, for any one offence not capital, inflict a punishment beyond one hundred lashes.

The President of the United States, or when the trial takes place out of the United States, the commander of the fleet or squadron, shall possess full power to pardon any offence committed against these articles, after conviction, or to mitigate the punishment decreed by a court martial.

Courts of inquiry may be ordered by the President of the United States, the Secretary of the navy, or the commander of a fleet or squadron, provided such court shall not consist of more than three members who shall be commissioned officers, and a judge advocate, or person to do duty as such; and such courts shall have power to summon witnesses, administer oaths, and punish contempt in the same manner as courts martial. But such court shall merely state facts, and not give their opinion, unless expressly required so to do in the order for convening; and the party whose conduct shall be the subject of inquiry, shall have permission to cross examine all the witnesses.

The proceedings of courts of inquiry shall be authenticated by the signature of the president of the court and judge advocate, and shall, in all cases not capital, or extending to the dismissal of commissioned or warrant officers, be evidence before a court martial, provided oral testimony cannot be obtained.
The judge advocate, or person officiating as such, shall administer to the members the following oath or affirmation:

"You do swear, [or affirm] well and truly to examine and inquire according to the evidence, into the matter now before you, without partiality or prejudice."

After which, the president shall administer to the judge advocate, or person officiating as such, the following oath or affirmation:

"You do swear, [or affirm] truly to record the proceedings of this court, and the evidence to be given in the case of hearing."

In all cases where the crews of the ships or vessels of the United States shall be separated from their vessels, by the latter being wrecked, lost or destroyed, all the command, power and authority, given to the officers of such ships or vessels, shall remain and be in full force as effectually as if such ship or vessel were not so wrecked, lost or destroyed, until such ship's company be regularly discharged from, or ordered again into the service, or until a court martial shall be held to inquire into the loss of such ship or vessel; and if by the sentence of such court, or other satisfactory evidence, it shall appear that all, or any of the officers and men of such ship's company did their utmost to preserve her, and after the loss thereof behaved themselves agreeably to the discipline of the navy, then the pay and emoluments of such officers and men, or such of them as shall have done their duty as aforesaid, shall go on until their discharge or death; and every officer or private who shall, after the loss of such vessel, act contrary, to the discipline of the navy shall be punished at the discretion of a court martial, in the same manner as if such vessel had not been so lost.

All the pay and emoluments of such officers and men, of any of the ships or vessels of the United States taken by an enemy, who shall appear by the sentence of a court martial, or otherwise, to have done their utmost to preserve and defend their ship or vessel, and, after taking thereof, have behaved themselves obediently to their superiors, agreeably to the discipline of the navy, shall go on and be paid them until their death, exchange, or discharge.

The proceeds of all ships and vessels, and the goods taken on board of them which shall be adjudged good prize, shall, when of equal or superior force to the vessel or vessels making the capture, be the sole property of the captors; and when of inferior force, shall be divided equally between the United States and the officers and men making the capture.

The prize money belonging to the officers and men, shall be distributed in the following manner:

To the commanding officers of fleets, squadrons, or single ships, three twentieths, of which the commanding officer of the fleet or squadron shall have one twentieth, if the prize be taken by a ship or vessel acting under his command, and the commander of single ships, two twentieths, but where the prize is taken by a ship acting independently of such superior officer, the three twentieths shall belong to her commander.

To sea lieutenants, captains of marines, and sailing masters, two twentieths; but where there is a captain, without a lieutenant of marines, these officers shall be entitled to two twentieths and one-third of a twentieth, which third, in such case, shall be deducted from the share of the officers mentioned in the next paragraph.

To chaplains, lieutenants of marines, surgeons, pursers, boatswains, gunners, carpenters, and masters mates, two twentieths.

To midshipmen, surgeons mates, captains clerks, schoolmasters, boatswains mates, gunners mates, carpenters mates, ships' stewards, sail makers, master at arms, armourers, cockswains, and coopers, three twentieths and an half.

To gunners yeomen, boatswains yeomen, quarter masters, quarter gunners, sail makers mates, serjeants and corporals of marines, drummers, fifers and extra petty officers, two twentieths and an half.

To seamen, ordinary seamen, marines, and all other persons doing duty on board, seven twentieths.
Whenever one or more public ships or vessels are in sight at the time any one or more ships are taken a prize or prizes, they shall all share equally in the prize or prizes, according to the number of men and guns on board each ship in sight.

No commander of a fleet or squadron shall be entitled to receive any share of prizes taken by vessels not under his immediate command; nor of such prizes as may have been taken by ships or vessels intended to be placed under his command, before they have acted under his immediate orders; nor shall a commander of a fleet or squadron, leaving the station where he had the command, have any share in the prizes taken by ships left on such station, after he has gone out of the limits of his said command.

A bounty shall be paid by the United States, of twenty dollars, for each person on board any ship of an enemy at the commencement of an engagement, which shall be sunk or destroyed by any ship or vessel belonging to the United States of equal or inferior force, the same to be divided among the officers and crew in the same manner as prize money.

Every officer, seaman or marine, disabled in the line of his duty, shall be entitled to receive for life, or during his disability a pension from the United States according to the nature and degree of his disability, not exceeding one half his monthly pay.

All money accruing, or which has already accrued to the United States from the sale of prizes, shall be and remain forever a fund for the payment of pensions and half pay, should the same be hereafter granted to the officers and seamen who may be entitled to receive the same; and if the said fund shall be insufficient for the purpose, the public faith is hereby pledged to make up the deficiency; but if it should be more than sufficient, the surplus shall be applied to the making of further provision for the comfort of the disabled officers, seamen, and marines, and for such as though not disabled, may merit by their bravery, or long and faithful services, the gratitude of their country.

The said fund shall be under the management and direction of the Secretary of the Navy, the Secretary of the Treasury, and the Secretary of War, for the time being, who are hereby authorized to receive any sums to which the United States may be entitled from the sale of prizes, and employ and invest the same, and the interest arising therefrom, in any manner which a majority of them may deem most advantageous: And it shall be the duty of the said commissioners to lay before Congress, annually, in the first week of their session, a minute statement of their proceedings relative to the management of said fund.

AN ACT

For the Regulation of Seamen

ON BOARD THE PUBLIC AND PRIVATE VESSELS OF THE UNITED STATES.

FROM and after the termination of the war in which the United States are now engaged with Great-Britain, it shall not be lawful to employ on board any of the public or private vessels of the United States, any person or persons, except citizens of the United States, or persons of colour, natives of the United States.
Sec. 2. That from and after the time when this act shall take effect, it shall not be lawful to employ as aforesaid, any naturalized citizen of the United States, unless such citizen shall produce to the commander of the public vessel, if to be employed on board such vessel, or to a collector of the customs a certified copy of the act by which he shall have been naturalized, setting forth such naturalization and the time thereof.

Sec. 3. In all cases of private vessels of the United States sailing from a port in the United States to a foreign port, the list of the crew, made as heretofore directed by law, shall be examined by the collector for the district from which the vessel shall clear out, and if approved of by him, shall be certified accordingly. And no person shall be admitted or employed aforesaid, on board of any vessel aforesaid, unless his name shall have been entered in the list of the crew, approved and certified by the collector for the district from which the vessel shall clear out as aforesaid. And the said collector before he delivers the list of the crew, approved and certified as aforesaid, to the captain, master, or proper officer of the vessel to which the same belongs, shall cause the same to be recorded in a book by him for that purpose to be provided, and the said record shall be open for the inspection of all persons, and a certified copy thereof shall be admitted in evidence in any court in which any question may arise, under any of the provisions of this act.

Sec. 4. That the president of the United States be, and he hereby is authorized from time to time to make such further regulations, and to give such directions to the several commanders of public vessels, and to the several collectors, as may be proper and necessary respecting the proofs of citizenship, to be exhibited to the commanders or collectors aforesaid: Provided, that nothing contained in such regulations or directions shall be repugnant to any of the provisions of this act.

Sec. 5. From and after the time when this act shall take effect, no seaman or other seafaring man, not being a citizen of the United States, shall be admitted or received as a passenger on board of any public or private vessel of the United States, in a foreign port, without permission in writing from the proper officers of the country of which such seaman or seafaring man may be subject or citizen.

Sec. 6. From and after the time when this act shall take effect, the consuls or commercial agents of any nation at peace with the United States shall be admitted (under such regulations as may be prescribed by the president of the United States) to state their objections to the proper commander or collector as aforesaid, against the employment of any seaman or seafaring man on board of any public or private vessel of the United States, on account of his being a native subject or citizen of such nation, and not embraced within the description of persons who may be lawfully employed, according to the provisions of this act; and the said consuls or commercial agents shall also be admitted under the said regulations, to be present at the time when the proofs of citizenship of the persons against whom such objections may have been made, shall be investigated by such commander or collector.

Sec. 7. If any commander of a public vessel of the United States, shall knowingly employ or permit to be employed, or shall admit or receive, or permit to be permitted or received, on board his vessel, any person whose employment or admission is prohibited by the provisions of this act, he shall on conviction thereof, forfeit and pay the sum of one thousand dollars for each person thus unlawfully employed or admitted on board such vessel.

Sec. 8. If any person shall, contrary to the prohibitions of this act, be employed, or be received on board of any private vessel, the master or commander and the owners of such vessel, knowing thereof, shall respectively forfeit and pay five hundred dollars for each person thus unlawfully employed or received in any voyage; which sum or sums shall be recovered, although such seaman or person shall have been admitted and entered in the certified list of the crew aforesaid, by the collector for the district to which the vessel may belong; and all penalties and forfeitures in this act mentioned shall be proceeding against the person so employed or received.
APPENDIX.

Proceeded, and recovered, with costs of suit by action of debt, and shall accrue and be one moiety thereof to the use of the person who shall sue for the same, and the other moiety thereof to the use of the United States.

Sec. 9. Nothing in this act contained shall be construed to prohibit any commander or master of a public or private vessel of the United States, whilst in a foreign port or place, from receiving any American seamen in conformity to law, or supplying any deficiency of seamen on board such vessel, by employing American seamen or subjects of such foreign country, the employment of whom shall not be prohibited by the laws thereof.

Sec. 10. The provisions of this act shall have no effect or operation with respect to the employment as seamen of the subjects or citizens of any foreign nation which shall not, by treaty or special convention with the government of the United States, have prohibited on board of her public and private vessels the employment of native citizens of the United States, who have not become a citizen or subject of such nation.

Sec. 11. Nothing in this act contained shall be so construed as to prevent any arrangement between the United States and any foreign nation, which may take place under any treaty or convention, made and ratified in the manner prescribed by the constitution of the United States.

Sec. 12. No person who shall arrive in the United States, from and after the time when this act shall take effect, shall be admitted to become a citizen of the United States, who shall not for the continued term of five years next preceding his admission as aforesaid have resided within the United States, without being at any time during the said five years, out of the territory of the United States.

Sec. 13. If any person shall falsely make, forge or counterfeit, or cause or procure to be falsely made, forged or counterfeited, any certificate or evidence of citizenship referred to in this act; or shall pass, utter or use as true, any false, forged or counterfeited certificate of citizenship, or shall make, sell or dispose of any certificate of citizenship to any person other than the person for whom it was originally issued, and to whom it may of right belong, every such person shall be deemed and adjudged guilty of felony: and being thereof convicted by due course of law, shall be sentenced to be imprisoned and kept to hard labour for a period not less than three, or more than five years, or be fined in a sum not less than five hundred dollars, nor more than one thousand dollars at the discretion of the court taking cognizance thereof.

Sec. 14. No suit shall be brought for any forfeiture or penalty incurred under the provisions of this act, unless the suit be commenced within three years from the time of the forfeiture.

AN ACT

To Encourage the Destruction of

THE ARMED VESSELS OF WAR OF THE ENEMY.

During the present war with Great Britain, it shall be lawful for any person or persons to burn, sink, and destroy, any British armed vessels of war, except vessels coming as cartel or flags of truce; and for that purpose to use torpedoes, submarine instruments, or any other destructive machine whatever; and a bounty of one half the value of the armed vessels so burnt, sunk or destroyed, and also one half the value of her guns, cargo, tackle and apparel; shall be paid out of the treasury of the United States to such person or persons who shall effect the same, otherwise than by the armed or commissioned vessels of the United States.
AN ACT
CONCERNING
LETTERS OF MARQUE, PRIZES,
AND
PRIZE GOODS.

BE IT ENACTED BY THE SENATE AND HOUSE OF REPRESENTATIVES OF THE UNITED STATES OF AMERICA IN CONGRESS ASSEMBLED, That the President of the United States shall be, and he is hereby authorised and empowered to revoke and annul at pleasure, all letters of marque and reprisal which he shall or may at any time grant, pursuant to an act entitled "An act declaring war between the United Kingdom of Great Britain and Ireland and the dependencies thereof, and the United States of America and their territories."

Sec. 2. All persons applying for letters of marque and reprisal, pursuant to the act aforesaid, shall state in writing, the name and a suitable description of the tonnage and force of the vessel, and the name and place of residence of each owner concerned therein, and the intended number of the crew; which statement shall be signed by the person or persons making such application, and filed with the Secretary of State, or shall be delivered to any other officer or person who shall be employed to deliver out such commissions, to be by him transmitted to the Secretary of State.

Sec. 3. Before any commission of letters of marque and reprisal shall be issued as aforesaid, the owner or owners of the ship or vessel for which the same shall be requested, and the commander thereof, for the time being, shall give bond to the United States, with at least two responsible sureties, not interested in such vessel, in the penal sum of five thousand dollars; or if such vessel be provided with more than one hundred and fifty men, then in the penal sum of ten thousand dollars; with condition that the owners, officers and crew, who shall be employed on board such commissioned vessel, shall and will observe the treaties and laws of the United States, and the instructions which shall be given them according to law for the regulation of their conduct; and will satisfy all damages and injuries which shall be done or committed contrary to the tenor thereof by such vessel, during her commission, and to deliver up the same when revoked by the President of the United States.

Sec. 4. All captures and prizes of vessels and property, shall be forfeited and shall accrue to the owners, officers and crews of the vessels by whom such captures and prizes shall be made; and on due condemnation had, shall be distributed according to any written agreement which shall be made between them; and if there be no such agreement, then one moiety to the owners, and the other moiety to the officers and crew, to be distributed between the officers and crew as nearly as may be, according to the rules prescribed for the distribution of prize money, by the act entitled "An act for the better government of the navy of the United States," passed the twenty-third day of April, one thousand eight hundred.

Sec. 5. All vessels, goods and effects, the property of any citizen of the United States or of persons resident within and under the protection of the United States, or of persons permanently resident within and under the protection of any foreign prince, government or state, in amity with the United States, which shall have been captured by the enemy and which shall be recaptured by vessels commissioned as aforesaid, shall be restored to the lawful owners, upon payment by them respectively of a just and reasonable salvage, to be determined by the mu...
tual agreement of the parties concerned, or by the decree of any court having competent jurisdiction, according to the nature of each case, agreeably to the provisions heretofore established by law. And such salvage shall be distributed among the owners, officers and crews of the vessels commissioned as aforesaid, and making such re-captures, according to any written agreement which shall be between them; and in case of no such agreement, then in the same manner and upon the principles herein before provided in case of capture.

Sec. 6. Before breaking bulk of any vessel which shall be captured as aforesaid, or other disposal or conversion thereof, or of any articles which shall be found on board the same, such captured vessel, goods or effects, shall be brought into some port of the United States, or into some port of a nation in amity with the United States, and shall be proceeded against, before a competent tribunal, and after condemnation and forfeiture thereof, shall belong to the owners and captors thereof, and be distributed as aforesaid. And in the case of all captured vessels, goods and effects which shall be brought within the jurisdiction of the United States, the district courts of the United States shall have exclusive original cognizance thereof, as in civil causes of admiralty and maritime jurisdiction; and the said courts, or the courts, being courts of the United States, into which such cases shall be removed, and in which they shall be finally decided, shall and may decree restitution, in whole or in part, when the capture shall have been made without just cause. And if made without probable cause, or otherwise unreasonably, may order and decree damages and costs to the party injured, and for which the owners and commanders of the vessels making such captures, and also the vessels shall be liable.

Sec. 7. All prisoners found on board any captured vessel, or on board any re-captured vessel, shall be reported to the collector of the port in the United States in which they shall first arrive, and shall be delivered into the custody of the marshal of the district or some civil or military officer of the United States, or of any state in or near such port, who shall take charge of their safe keeping and support, at the expense of the United States.

Sec. 8. The President of the United States shall be, and he is hereby authorised to establish and order suitable instructions for the better governing and directing the conduct of the vessels, so commissioned, their officers and crews, copies of which shall be delivered, by the collector of the customs, to the commanders when they give bond as aforesaid.

Sec. 9. A bounty shall be paid by the United States of twenty dollars for each person on board any armed ship or vessel, belonging to the enemy, at the commencement of an engagement, which shall be burnt, sunk or destroyed by any vessel commissioned as aforesaid, which shall be of equal or inferior force, the same to be divided as in other cases of prize money.

Sec. 10. The commanding officer of every vessel having a commission, or letters of marque and reprisal, during the present hostilities between the United States and Great Britain shall keep a regular journal, containing a true and exact account of his daily transactions and proceedings with such vessel and the crew thereof; the ports and places he shall put into or cast anchor in; the time of his stay there and the cause thereof; the prizes he shall take; the nature and probable value of such prizes; the times and places, when and where taken, and how and in what manner he shall dispose of the same; the ships or vessels he shall fall in with; the times and places, when and where, he shall meet with them, and his observations and remarks thereon; also, whatever else shall occur to him or any of his officers or mariners, or be discovered and found out by examination or conference with any mariners or passengers of, or in any other ships and vessels, or by any other ways or means whatsoever, touching or concerning the fleets, vessels and forces of the enemy, their posts and places of station and destination, strength, numbers, intents and designs: And such commanding officer shall, immediately on his arrival in any port of the United States or the territories thereof, from or during the continuance of any voyage or cruise, produce his commission, or letters of marque and reprisal aforesaid, and shall sign the same, if required, for any such purpose.
with his proper name and handwriting, to the collector or other chief officer of the customs, at or nearest to such port; the truth of which journal shall be verified by the oath of the commanding officer for the time being; and such collector or other chief officer of the customs shall, immediately on the arrival of such vessel, order the proper officer of the customs to go on board and take an account of the officers and men, the number and nature of the guns, and whatever else shall occur to him, on examination, material to be known; and no such vessel shall be permitted to sail out of port again after such arrival, until such journal shall have been delivered up, and a certificate obtained under the hand of such collector or other chief officer of the customs, that she is manned and armed according to her commission; and upon delivery of such certificate, any former certificate of a like nature, which shall have been obtained by the commander of such vessel, shall be delivered up.

Sec. 11. Captains and commanders of vessels having letters of marque and reprisal, in case of falling in with any of the vessels of war or revenue of the United States, shall produce to the commanding officer of such vessels their journals, commissions and certificates as aforesaid; and the commanding officers of such ships of war or revenue, shall make respectively, a memorandum in such journal of the day on which it was so produced to him, and shall subscribe his name to it: and in case such vessel, having letters of marque as aforesaid, shall put into any foreign port where there is an American consul or other public agent of the United States, the commander shall produce his journal, commission and certificate aforesaid, to such consul or agent, who may go on board and number the officers and crew, and examine the guns, and if the same shall not correspond with the commission and certificate respectively, such consul or agent shall forthwith communicate the same to the Secretary of the Navy.

Sec. 12. The commanders of vessels having letters of marque and reprisal as aforesaid, neglecting to keep a journal as aforesaid, or willfully making fraudulent entries therein, or obliterating any material transactions therein, where the interests of the United States is in any manner concerned, or refusing to produce such journal, commission or certificate, pursuant to the preceding section of this act, then and in such cases, the commissions or letters of marque and reprisal of such vessels, shall be liable to be revoked; and such commanders respectively, shall forfeit for every such offence the sum of one thousand dollars, one moiety thereof to the use of the United States, and the other to the informer.

Sec. 13. The owners or commanders of vessels having letters of marque and reprisal as aforesaid, who shall violate any of the acts of Congress for the collection of the revenue of the United States, and for the prevention of smuggling, shall forfeit the commission or letters of marque and reprisal, and they, and the vessels owned or commanded by them, shall be liable to all the penalties and forfeitures attaching to merchant vessels in like cases.

Sec. 14. So much of any act or acts as prohibits the importation of goods, wares and merchandise, of the growth, produce and manufacture of the dominions, colonies and dependencies of the United Kingdom of Great Britain and Ireland, or of goods, wares and merchandise imported from the dominions, colonies, and dependencies of the United Kingdom of Great Britain and Ireland, be, and the same is hereby repealed, so far as the same may prohibit the importation or introduction into the United States and their territories of such goods, wares and merchandise as may be captured from the enemy and made good and lawful prize of war, either by vessels having letters of marque and reprisal or by the vessels of war and revenue of the United States. And all such goods, wares and merchandise, when imported or brought into the United States or their territories, shall pay the same duties, to be secured and collected in the same manner and under the same regulations, as the like goods, wares and merchandise, if imported in vessels of the United States from any foreign port or place, in the ordinary course of trade, are now or may at the time be liable to.
Sec. 15. All offences committed by any officer or seamen on board any such vessel, having letters of marque and reprisal, during the present hostilities against Great Britain, shall be tried and punished in such manner as the like offences are or may be tried and punished when committed by any person belonging to the public ships of war of the United States: Provided always, That all offenders who shall be accused of such crimes as are cognizable by a court martial, shall be confined on board the vessel in which such offence is alleged to have been committed, until her arrival at some port in the United States or their territories; or until she shall meet with one or more of the public armed vessels of the United States abroad, the officers whereof shall be sufficient to make a court martial for the trial of the accused; and upon application made by the commander of such vessel, on board of which the offence is alleged to have been committed, to the Secretary of the Navy, or to the commander or senior officer of the ship or ships of war of the United States abroad as aforesaid, the Secretary of the Navy, or such commander or officer, is hereby authorized to order a court martial of the officers of the navy of the United States, for the trial of the accused, who shall be tried by the said court.

Sec. 16. That an act entitled "An act laying an embargo on all the ships and vessels in the ports and harbours of the United States, for a limited time," passed the fourth day of April, one thousand eight hundred and twelve; and an act entitled "An act to prohibit the exportation of specie, goods, wares and merchandize, for a limited time," passed April fourteenth one thousand eight hundred and twelve, so far as they relate to ships and vessels having commissions or letters of marque and reprisals, or sailing under the same, be, and they hereby are respectively repealed.

Sec. 17. That two per centum on the net amount (after deducting all charges and expenditures) of the prize money arising from captured vessels and cargoes, and on the net amount of the salvage of vessels and cargoes re-captured by the private armed vessels of the United States, shall be secured and paid over to the collector or other chief officer of the customs at the port or place in the United States, at which such captured or re-captured vessel may arrive; or to the consul or other public agent of the United States residing at the port or place, not within the United States, at which such captured or re-captured vessels may arrive. And the monies arising therefrom, shall be held and hereby is pledged by the government of the United States as a fund for the support and maintenance of the widows and orphans of such persons as may be slain; and for the support and maintenance of such persons as may be wounded and disabled on board of the private armed vessels of the United States in any engagement with the enemy, to be assigned and distributed in such manner as shall hereafter be provided.

AN ACT

IN ADDITION TO THE ACT CONCERNING

Letters of Marque, prizes, and Prize Goods.

ALL prizes of vessels and property captured by private armed ships, commissioned under the authority of the United States, which may be condemned in any district or circuit court of the United States shall be sold at public auction, by the marshal of the district in which the same shall be condemned, within sixty days after the condemnation thereof, sufficient notice of the time and place and conditions of sale being first given, on such day or days, or such terms of credit, and in such lots or proportions as may be designated by the owner or owners, or agent of the owner or owners of the privateer which may have captured the same; Provided, That the term of such credit shall not exceed ninety days.
the said marshal is hereby directed to take and receive from the purchaser or purchasers of such prize vessel and property, the money therefor, or his, her or their promissory notes with endorsers, to be approved by the owner or owners of the privateer, to the amount of the purchase, payable according to the terms thereof.

Sec. 2. Upon all duties, costs and charges being paid according to law, the said marshal shall, on demand, deliver and pay over to the owner or owners of the privateer, or to the agent of such owner or owners of the privateer, which may have captured such prize vessel and property, a just and equal proportion of the funds received on account of the sale thereof, and of the promissory notes directed to be taken as aforesaid, to which the said owner or owners may be entitled, according to the articles of agreement between the said owner or owners, and the officers and crew of the said privateer; and a just and equal proportion of the proceeds of the sale as aforesaid, shall on demand be also paid over, by the said marshal to the officers and crew of the said privateer or to their agent or agents. And if there be no written agreement, it shall be the duty of the marshal to pay over in manner as aforesaid, one moiety of the proceeds of the sale of such prize vessel and property, to the owner or owners, agents of the owners or owners of the privateer which may have captured the same; and the other moiety of the said proceeds to the agent or agents of the officers and crew of the said privateer, to be distributed according to law, or to any agreement by them made; Provided, The said officers and crew, of their agent or agents, shall, have first refunded to the owner or owners or to the agent of the owner or owners of the privateer aforesaid, the full amount of advances which shall have been made by the owner or owners of the privateer to the officers and crew thereof.

Sec. 3. For the selling prize property, and receiving and paying over the proceeds as aforesaid, the marshal shall be entitled to a commission of one per cent, and no more, first deducting all duties, costs and charges, which may have accrued on said property: Provided, that on no case of condemnation and sale of any prize vessel and cargo, shall the commissions of the marshal exceed two hundred and fifty dollars.

Sec. 4. It shall be the duty of the marshal, within fifteen days after any sale of prize property, to file in the office of the clerk of the district court, of the district wherein such sale may be made, a just and true account of the sales of such prize property, and of all duties and charges thereon, together with a statement thereto annexed of the promissory notes taken on account thereof, which account shall be verified by the oath of the said marshal; and if the said marshal shall wilfully neglect, or refuse to file such account, he shall forfeit and pay the sum of five hundred dollars, for each omission or refusal as aforesaid, to be recovered in an action of debt by any person interested in such sale, and suing for the said penalty, on account of the party or parties interested in the prize vessel or property sold as aforesaid, in any court having cognizance thereof.

Sec. 5. The owner or owners of any private armed vessel or vessels, or their agent or agents, may, at any time before a libel shall be filed against any captured vessel or cargo, remove the same from any port into which such prize vessel or property may be first brought to any other port in the United States, to be designated at the time of the removal as aforesaid, subject to the same restrictions and complying with the same regulations with respect to the payment of duties, which are provided by law, in relation to other vessels arriving in port with cargoes subject to the payment of duties; provided, that before such removal, the said captured property shall not have been attached at the suit of any adverse claimant, or a claim against the same have been interposed in behalf the United States.
AN ACT
REGULATING PENSIONS

To persons on board private armed ships.

THAT the two per centum reserved in the hands of the collectors and consuls by the act of June, eighteen hundred and twelve, entitled "An act concerning letters of marque, prizes and prize goods," shall be paid to the Treasury, under the like regulations provided for other public money, and shall constitute a fund for the purposes provided for by the seventeenth section of the before mentioned act.

Sec. 2 That the Secretary of the Navy be authorized and required to place on the pension list, under the like regulations, and restrictions, as are used in relation to the navy of the United States, any officer, seaman or marine, who, on board of any private armed ship or vessels bearing a commission of letter of marque, shall have been in any engagement with the enemy, wounded or otherwise disabled; allowing to the captain a sum not exceeding twenty dollars per month; to lieutenants and sailing master a sum not exceeding twelve dollars each per month; to marine officer, boatswain, gunner, carpenter, master's mate and prize masters, a sum not exceeding ten dollars each per month; to all other officers a sum not exceeding eight dollars per month, for the highest rate of disability, and so in proportion; and to a seaman, or acting as a marine, the sum of six dollars per month, for the highest rate of disability, and so in proportion: which several pensions shall be paid, by direction of the Secretary of the Navy, out of the fund above provided, and from no other.

Sec. 3. That the commanding officer of every vessel having a commission, or letters of marque and reprisal, shall enter in his journal the name and rank of any officer, and the name of any seaman, who, during his cruise, shall have been wounded or disabled as aforesaid, describing the manner and extent, as far as practicable, of such wound or disability.

Sec. 4. That every collector shall transmit quarterly to the Secretary of the Navy, a transcript of such journals as may have been reported to him, so far as it gives a list of the officers and crew, and the description of wounds and disabilities, the better to enable the Secretary to decide on claims for pensions.

Instructions for those entitled to the benefit of the above act.

To enable those who may be wounded, or disabled, in any engagement with the enemy, to obtain certificates entitling them to pensions, the like regulations and restrictions as are used in relation to the navy of the United States, are to be observed, to wit:

That the commanding officer of every vessel having a commission, or letters of marque and reprisal, cause to be given to any officer, or seaman, who, during his cruise, shall have been wounded, or disabled, as aforesaid, a certificate of the Surgeon on board, to be approved and signed by such commanding officer, describing the nature and degree, as far as practicable, of such wound, or disability, naming his place of residence and the rate of wages, if any, to which he was entitled at the time of receiving such wound, or disability; and that such certificate be transmitted to this department.

The widows (or Orphans, where the wife is dead) of those persons who may be slain, in any engagement with the enemy, on board such vessels, will be entitled to pension certificates, upon forwarding to this office a certificate from the commanding officer of the vessel to which such persons were attached, of their having been slain as aforesaid: and the certificate of a justice of the peace, for the county in which such widows, or orphans, may reside, that they actually stand in that relation to the deceased.
AN ACT
FOR PROVIDING FOR
NAVY PENSIONS
In certain cases.

If any officer of the navy or marines shall be killed or die, by reason of a wound received in the line of his duty, leaving a widow, or if no widow, a child or children, under sixteen years of age, such widow, or if no widow, such child or children, shall be entitled to receive half the monthly pay to which the deceased was entitled at the time of his death, which allowance shall continue for and during the term of five years: but in case of the death or intermarriage of such widow, before the expiration of the said term of five years, the half pay for the remainder shall go to the child or children of the said deceased officer: provided, that such half pay shall cease on the death of such child or children: and the money required for this purpose shall be paid out of the navy pension fund, under the direction of the commissioners of that fund.

Instructions for the Private Armed Vessels of the United States.

TO CAPTAIN COMMANDER OF THE PRIVATE ARMED CALLED THE

1. The tenor of your commission under the act of Congress, entitled "An Act concerning Letters of Marque, Prizes and Prize Goods," a copy of which is hereunto annexed, will be kept constantly in view. The high seas referred to you in your commission, you will understand generally, to extend to low water mark; but with the exception of the space within one league, or three miles, from the shore of countries at peace both with Great Britain and the United States. You may nevertheless execute your commission within that distance of the shore of a nation at war with Great Britain, and even on the waters within the jurisdiction of such nation if permitted so to do.

2. You are to pay the strictest regard to the rights of neutral powers, and the usages of civilized nations; and in all your proceedings towards neutral vessels, you are to give them as little molestation or interruption as will consist with the right of ascertaining their neutral character, and of detaining and bringing them in for regular adjudication, in the proper cases. You are particularly to avoid even the appearance of using force or seduction with a view to deprive such vessels of their crews, or of their passengers, other than persons in the military service of the enemy.

3. Towards enemy vessels and their crews, you are to proceed in exercising the rights of war, with all the justice and humanity which characterise the nation of which you are members.

4. The master, and one or more of the principal persons belonging to captured vessels, are to be sent as soon after the capture as may be to the judge or judges of the proper courts of the United States, to be examined upon oath, touching the interest or property of the captured vessel and her lading: and
APPENDIX.

Wr-parties, bills of lading, invoices, letters, and other documents and writings found on board; the said papers to be proved by the affidavit of the commander of the capturing vessel, or some other person present at the capture, to be produced as they were received, without fraud, addition, seduction or embezzlement.

By command of the President of the United States.  
JAMES MONROE, Secretary of State.

Additional Instruction to the public and private armed vessels of the United States.

The public and private armed vessels of the United States are not to interrupt any vessels belonging to citizens of the United States coming from British ports to the United States laden with British merchandise, in consequence of the alleged repeal of the British Orders in Council, but are on the contrary to give aid and assistance to the same; in order that such vessels and their cargoes may be dealt with on their arrival as may be decided by the competent authorities.

By command of the President of the United States of America,  
JAMES MONROE, Secretary of State.

Additional Instruction to the public and private armed vessels of the United States.

The public and private armed vessels of the United States are not to interrupt any British unarmed vessels bound to Sable Island, and laden with supplies for the humane establishment at that place. By command of the President of the United States.

JAMES MONROE, Secretary of State.

CARTEL

FOR THE EXCHANGE OF PRISONERS OF WAR,  
BETWEEN GREAT BRITAIN,  
AND THE UNITED STATES OF AMERICA.

THE provisional agreement for the exchange of naval prisoners of war, made and concluded at Halifax, in the the province of Nova Scotia, on the 28th day of November, 1812—between the Honorable Richard John Uniacke, His Britannic Majesty's Attorney and Advocate General for the province of Nova Scotia, and William Miller, Esq. Lieutenant in the Royal Navy, and Agent for Prisoners of War at Halifax, and John Mitchell, Esq. late Consul of the United States at St. Jago de Cuba, American agent for prisoners of war at Halifax, having been transmitted to the Department of state of the United States for approval, and John Mason, Esq. Commissary General for prisoners for the United States, having been duly authorised to meet Thomas Barclay, Esq. his Britannic Majesty's agent for Prisoners of war, and for carrying on an exchange of prisoners, for the purpose of considering and revising the said provisional agreement; and the articles of the said agreement having been by them considered and disscussed, it has been agreed by the said Thomas Barclay and John Mason, subject to the ratification of both their governments, that the said provisional agreement shall be so altered and revised as to stand expressed in the following words:

Article 1st. The Prisoners taken at sea, or on land, on both sides shall be treated with humanity, conformable to the usage and practice of the most civilized nations during war; and such prisoners shall without delay, and as speedily as circumstances will admit, be exchanged on the following terms and condition:
That is to say: An Admiral or a General commanding in chief shall be exchanged for officers of equal rank, or for sixty men each; a vice Admiral, or a Lieutenant General, for officers of equal rank, or for forty men each; a Rear Admiral, or a Major General, for officers of equal rank, or for thirty men each; a Commodore with a broad pendant, and a captain under him, or a Brigadier General, for officers of equal rank, or for twenty men each; a captain of a line of battle ship, or a Colonel, for officers of equal rank, or for fifteen men each: a captain of a frigate, or Lieutenant Colonel, for officers, of equal rank, or for ten men each; Commanders of sloops of war, bomb ketches, fire ships and packets, or a Major, for officers of equal rank, or for eight men each; Lieutenants or masters in the navy, or captains in the army, for officers of equal rank, or for six men each; master's-mates, or lieutenants in the army, for officers of equal rank, or for four men each; midshipmen, warrant officers, masters of merchant vessels, and captains of private armed vessels, or sub-lieutenants and ensigns, for officers of equal rank, or for three men each; lieutenants and mates of private armed vessels, mates of merchant vessels, and all petty officers of ships of war, or all non-commissioned officers of the army, for officers of equal rank, or for two men each; seaman and private soldiers one for the other.

Second.— All non-combatants, that is to say, surgeons and surgeons mates, pursers, secretaries, chaplains and schoolmasters, belonging to the army or men of war; surgeons and surgeons mates of merchant vessels, or privateers, passengers, and all other men who are not engaged in the naval or military service of the enemy, not being sea-faring persons; all women and girls, and all boys under twelve years of age; every person of the foregoing description, or of whatever description exempt from capture by the usage and practice of the most civilized nations, when at war—if taken, shall be immediately released without exchange, and shall take their departure at their own charge, agreeably to passports to be granted them—or otherwise shall be put on board the next cartel which sails—persons found on board recaptured ships, whatever situation they may have held in the capturing ship—shall not be considered as non-combatants. Non-combatants are not to be imprisoned except for improper conduct, and if poor or unprovided with means to support themselves, the government of each nation will allow a reasonable subsistence, having respect to their rank and situation in life.

Third.— American prisoners taken and brought within any of the dominions of his Britannic Majesty, shall be stationed for exchange at Halifax in Nova Scotia, Quebec, Bridge-town in Barbadoes, Kingston in Jamaica, Falmouth and Liverpool in England, and at no other ports or places, and British prisoners taken and brought into the U. States, shall be stationed at Salem in Massachusetts—Shenectady in the state of New-York—Providence in Rhode-Island—Wilmington in Delaware—Annapolis in Maryland—Savannah in Georgia—New-Orleans in Louisiana, and at no other ports or places in the United States.—The government of Great Britain will receive and protect an agent to be appointed by the government of the United States, to reside at or near each of the before mentioned places in the British dominions, for the purpose of inspecting the management and care which is taken of the American prisoners of war at each station; and the government of the United States will in like manner receive and protect an agent to be appointed by the British government, to reside at or near each of the stations before mentioned, within the dominions of the United States, for the like purpose of inspecting the management and care taken of the British prisoners of war at each of the stations; and each government shall be at liberty to appoint an agent to reside at or near any depot established for prisoners by the other nation, for the purpose of taking care and inspecting the state and situation of such prisoners; and such agents shall be protected respectively in the same manner as the agents at the stations for exchange.

Fourth.—Whenever a prisoner is admitted to parole, the form of such parole shall be as follows:
Whereas the Agent appointed for the Care and Custody of Prisoners of War at

leave to the Undersigned Prisoner of war, as described on

the back hereof, to reside in

Upon Condition that

give Parole of Honour not to withdraw from the bounds

prescribed there without leave for that purpose from the said Agent.

That will behave decently and with due respect to the laws

of this Country, and also that will not during continu

ance in either directly or indirectly carry on a Correspondence

with any of the enemies of or receive or write any let

ter or letters whatever, but through the hands of said Agent, in order that they

may be read and approved by him do hereby declare hath given Parole of Honor accordingly; and that will keep it inviolably. Dated at

Signature. Quality. Ships or Corpse. Men of War, Privateer, or

Merchantmen in which taken.

And the agent who shall take such parole shall grant a certificate to each pris

oner so paroled, certifying the limits to which his parole extends, the hours and other rules to be observed, and granting permission to such person to remain un

molested within such limits: and every commissioned officer, in the navy or ar

my, when so paroled, if in health, shall be paid by the agent that has granted such parole to him, during the continuance thereof, the sum of three shillings sterling per day each, for subsistence: and all other prisoners so paroled shall be paid each person at the rate of one shilling and sixpence per day sterling, at the rate of four shillings and sixpence sterling per American milled dollar; which pay in case of actual sickness, shall be doubled to each so long as the surgeon shall cer

tify the continuance of such sickness; and each sick prisoner shall also be allowed the attendance of a nurse, in case the surgeon shall certify the person to be so ill as to require such help; all which subsistence and pay is to be paid in advance twice in every week: and prisoners who shall wilfully disobey the rules and reg

ulations established for prisoners on parole, may be sent to prison, and all rules and regulations to be observed by prisoners on parole are to be published and made known to each prisoner; and when any prisoner shall be allowed to depart at his own expense, if he has not a sufficiency of money for that purpose, he shall be al

lowed necessary money, not to exceed the parole subsistence to which he would have been entitled for one month, if he had remained.

Fifth.—And in case any prisoner be permitted to return to his own country on parole, on condition of not serving until duly exchanged, such prisoner shall sign an engagement in the following form:

Whereas, Agent for the Care

and Custody of Prisoners of War at

has granted me the Undersigned Prisoner, described on the back hereof, permis

sion to return to upon condition that I give my Parole

of Honour that I will not enter into any Naval, Military, or other Service what

ever, against the or any of the Dominions thereunto be

longing: or against any powers at peace with until I shall have been regularly exchanged, and that I will surrender myself if required by the Agent of the Government, at such place, and at such time, as may be appointed, in case my Exchange shall not be effected; and I will, until exchang

ged, give notice from time to time of my place of residence. Now in considera

tion of my enlargement, I do hereby declare, that I have given my Parole of Hon

or accordingly, and that I will keep it inviolably. Given under my hand at

in the Year of our Lord

APPENDIX.
And to the prisoner so granted his enlargement on parole, shall be given a certificate and passport, specifying the terms and conditions of his enlargement, and a description of his person, and notice of such parole agreement shall be sent to the agent for prisoners of war, at the nearest station to the place where such parole shall be granted.

Sixth.—In case any prisoner of war shall become unmindful of the honourable obligation he lies under to the nation which shall have granted him his parole, and shall violate the same, he shall be liable to be dealt with according to the usages and customs observed in such cases by the most civilized nations when at war, and either nation shall have a right to demand from the other the surrender and restoration of any prisoner of war who shall violate his parole, and every just and reasonable satisfaction shall be given to the nation demanding the same, to shew that if such prisoner be not returned, it is by reason of its not being in the power of the nation to which he originally belonged.

Seventh.—No prisoner shall be struck with the hand, whip, stick or any other weapon whatever. The complaints of the prisoners shall be attended to, and real grievances redressed; and if they behave disorderly, they may be closely confined, and kept on two thirds allowance for a reasonable time, not exceeding ten days. They are to be furnished by the government in whose possession they may be, with a subsistence of sound and wholesome provisions, consisting of one pound of beef, or 12 ounces of pork; one pound of wheaten bread, and a quarter of a pint of pease, or six ounces of rice, or a pound of potatoes, per day, to each man; and of salt and vinegar in the proportion of two quarts of salt, and four quarts of vinegar, to every hundred days subsistence. Or the ration shall consist of such other meats and vegetables (not changing the proportion of meat to the vegetables, and the quantity of bread, salt and vinegar always remaining the same) as may from time to time be agreed on, at the several stations, by the respective agents of the two governments, as of equal nutriment with the ration first described—Both governments shall be at liberty, by means of their respective agents to supply their prisoners with clothing, and such other small allowances, as may be deemed reasonable, and to inspect at all times the quality and quantity of subsistence provided for the prisoners of their nations respectively, as stipulated in this article.

Eighth.—Every facility shall be given as far as circumstances will permit, to the exchange of prisoners; and they shall be selected for exchange according to the scale hereby established on both sides, by the respective agents of the country to which they may belong, without any interference whatever of the government in whose possession they may be; and if any prisoner is kept back, when his exchange shall be applied for, good and sufficient cause shall be assigned for such detention.

Ninth.—To carry on a regular exchange of prisoners between the two countries, four vessels shall be employed, two of which shall be provided by the British government, and two by the government of the U. States; and the two vessels of each government shall be as near as possible of the burthen of five hundred tons together, and neither of them less than two hundred tons; and shall be manned, victualled, and provided with every necessary and convenience for the safe transportation of prisoners; the expence of the two British vessels is to be defrayed by the British government and of the two American vessels, by the government of the U. States. When these vessels are provided, surveyed and approved of, by the proper officers of both governments, they shall be furnished with passports from each government, as flags of truce, and shall carry arms, and ammunition sufficient, with a guard not exceeding a non-commissioned officer and six men, to guard the prisoners, and keep them in subjection; and shall each carry one signal gun with a few charges of powder, and shall carry a white flag constantly at the fore top-mast-head—the British cartel ships shall carry a British ensign at the gaff end, or ensign staff, and the American ensign at the main top-mast-head—and the American cartel ships shall carry the American ensign at the gaff end or
ensign staff, and the British ensign at the main top-mast-head. No cartel shall be suffered to proceed to sea with less than thirty days full allowance of water and provisions for the ships company, and the number of prisoners embarked on board; and when such cartels shall be established, they shall be kept at all times constantly well provided with sails, rigging, and every thing proper and necessary to make them staunch, safe, and sea-worthy; and shall be constantly employed in carrying prisoners to and from the different stations herein before named, and appointed for the exchange of prisoners; and when carrying American prisoners from a British port to an American port, the American agent at the port of embarkation shall direct the station at which such prisoners shall be delivered, and when carrying British prisoners from an American port, the British agent shall direct at which of the British stations such prisoners shall be delivered; and the agents for prisoners of war on both sides, shall by agreement settle and fix the several species of provisions which shall constitute the daily ration to be served out to prisoners while on board cartels, with the value thereof; and a regular account shall be kept of the number of days each prisoner shall have been victualled on board each cartel, and the British government shall pay at that rate the expense and cost of victualling the British prisoners delivered at a British station; and so the American government shall, in like manner, pay at the same rate the daily charge for victualling the American prisoners, delivered at an American station; but no charge is to be introduced for the transportation or carriage of prisoners, as each nation is to furnish for that service an equal number of tons of shipping.—No cartel shall be permitted to remain in port more than ten days after her arrival unless delayed by winds or weather, or the order of the commanding officer of the station at which she may be, whether British or American. And in future, cartels shall on no account, unless driven by stress of weather, or some other unavoidable necessity, put into any British or American port—save the ports herein before appointed for the exchange of prisoners, unless specially agreed upon by the principal agents of the two governments. And in case the number of vessels now agreed on to be provided as cartels, shall be found insufficient, the number may be increased, and so in like manner diminished, by agreement, as the occasion may require; each nation always furnishing an equal share of the tonnage necessary.

Tenth.—Until regular cartels shall be provided, as stipulated in the foregoing article, the transportation of prisoners is to be conducted and paid for by each nation, according to the method hitherto observed in the present war; and after regular cartels are established, in case a number of prisoners, not less than one hundred, may be collected at any British or American port, different from the ports before named, a temporary cartel may be fitted out by order of the commanding officer at such port or ports, for the purpose of carrying such prisoners, if British to one of the British stations before named; and if American, to one of the American stations before named, and to no other port or place; Provided always, that such cartel shall bring at least one hundred prisoners, and shall receive an equal number in exchange, with liberty to return with them to any port of the nation to which she belongs. And the prisoners so delivered in exchange on board such temporary cartels, shall be certified to one of the regular stations of exchange, where they shall be credited to the nation so delivering them in exchange, whether they arrive at the port of destination or not. But should there not be an equal number at such station to exchange for the number brought, the transportation in such temporary cartel must be paid for so many prisoners as shall not be exchanged.

Eleventh.—Commanders of all public ships of war of either of the two nations, shall be permitted to send flags of truce into any of the established stations for exchange of prisoners of the other nation, with prisoners, to be delivered to the agent for prisoners of war of the nation to which such port belongs, and the agent receiving them shall give a receipt for them, specifying their names, quality, when and in what ship taken; and the prisoners so delivered, shall be placed to the
Twelfth.— Commanders of ships of war, captains of privateers and letters of marque, of either of the two nations, shall be permitted to send prisoners, belonging to the other nation, in neutral vessels to any of the stations for exchange aforesaid, of the nation to which the prisoners belong; and they shall be delivered to the agent, and received for in the same manner as is directed and expressed in the eleventh article; and the prisoners when delivered, shall be placed to the credit of the nation sending them in the neutral vessels. The expenses incurred under this and the eleventh article, are to be paid by the nation sending the prisoners; and the prisoners, so embarked in neutral vessels, shall be permitted to proceed to the port of destination, without molestation or other interruption by the subjects or citizens of either of the nations.

Thirteenth.— Lists shall be exchanged by the agents on both sides, of the prisoners hitherto delivered, and after such lists are adjusted and signed agreeably to the rule of exchange hereby established—the persons named therein shall be considered as liberated and free to serve again, as well as those heretofore exchanged, notwithstanding any parole or engagement they may have previously entered into. And in future prisoners embarked in a cartel belonging to the nation sending such prisoners, shall not be credited to the nation so sending them, until they are delivered at one of the stations of the nation to which such prisoners belong, and a receipt is obtained from the proper agent of such delivery. But where the prisoners and cartel both belong to the same nation, the delivery shall take place and receipts be given at the port of embarkation; provided that the delivery shall not be considered complete, until the cartel is in the act of departing the port, and the nation delivering the prisoners shall retain the custody of them by maintaining a sufficient guard on board the cartel until she is actually under way; when the receipt shall be duly executed and delivered, and when special exchanges are negociated in discharge of special paroles, a certificate of such exchange must be forwarded to the station where the parole was granted.

Fourteenth.— If either nation shall at any time have delivered more prisoners than it has received, it is optional with such nation to stop sending any more prisoners on credit, until a return shall be made equal in number to the balance so in advance.

Fifteenth.— This cartel is to be submitted for ratification to the secretary of state, for and in behalf of the government of the United States, and to the right honorable the Lord’s commissioners of the admiralty, for and in behalf of the government of Great Britain, and if approved by the Secretary of State of the United States—shall be provisionally executed until the assent or dissent of the Lords commissioners of the admiralty of Great Britain be known—and it is further agreed that after the mutual ratification of this cartel, either of the parties, on six months notice to the other, may declare and render the same null and no longer binding.

In Witness Whereof, We, the Undersigned, have hereunto set our Hands and Seals at Washington, this Twelfth Day of May, in the Year of our Lord One Thousand Eight Hundred and Thirteen.

Seal. J. MASON.
Seal. THOS. BARCLAY.

Having seen and considered the foregoing cartel for the Exchange of Prisoners, in all and every one of its articles, and approved the same, I do hereby declare that the said cartel is accepted, ratified and confirmed on the part of the United States.

Seal.

In Faith Whereof, I have caused the Seal of the department of State for the said United States, to be hereunto affixed. Done at Washington, this 14th day of May, in the year of our Lord 1813, and of the Independence of these States the thirty-seventh.

JAMES MONROE, Sec’y of State.
AN ACT

For reducing the duties payable on prize goods, captured by the private armed vessels of the United States.

BE it enacted by the senate and house of representatives of the United States of America, in congress assembled, That the first section of the act passed on the first day of July, one thousand eight hundred and twelve, entitled, "An act for imposing additional duties upon all goods, wares, and merchandize, imported from any foreign port or place, and for other purposes"—so far as the same applies to goods, wares and merchandize, captured from the enemy, and made good and lawful prize of war, by any private armed ship or vessel of the United States, having a commission for making captures upon the enemy, or letters of marque and reprisal, and brought into the United States or their territories, be and the same is hereby repealed; and from and after the passing of this act, all such goods, wares and merchandize thus captured, when imported or brought into the United States or their territories, shall pay the same duties to be secured and collected in the same manner and under the same regulations, as the like goods, wares and merchandize would have paid and been subject to, if imported in vessels of the United States, from any foreign port or place, previous to the passing of the act before recited.

AN ACT

Allowing a bounty to the owners, officers and crews of the private armed vessels.

That a bounty of twenty-five dollars be paid to the owners, officers and crews of the private armed vessels of the United States commissioned as letters of marque, for each and every prisoner by them captured and brought into port, and delivered to an agent authorised to receive them, in any part of the United States; and that the secretary of the treasury is hereby authorised and required to pay or cause to be paid to such owners, officers and crews of private armed vessels commissioned as aforesaid, or their agent, the aforesaid bounty for each person, captured and delivered as aforesaid.

That the sum of fifty thousand dollars, out of any money in the treasury not otherwise appropriated, be and the same is hereby appropriated.

DRUGS AND MEDICINES.

AT THE MEDICINAL STORE OF
HENRY CALAM,
(SUCCESSOR TO DR. J. BLOODGOOD)
No. 125 Cherry-street, near New-Market,
Adjoining Catherine-Slip, NEW-YORK,
May be had Drugs and Medicines of the first qualities.
Physicians supplied on reasonable terms with warranted articles.
Family prescriptions put up with accuracy, and such directions given when required as will prove satisfactory to the purchaser.
Compasses, Sextants, and Quadrants,
REPAIRED BY
EDMUND M. BLUNT,
No. 202,
Water Street, corner of Beekman Slip,
NEW YORK.

††† Gentlemen wanting either of the above-mentioned Instruments repaired, shall have them sent for, and returned when complete.
August, 1813.
Charts and Quadrants.

NAUTICAL BOOKS AND CHARTS,
PUBLISHED BY
EDMUND M. BLUNT,
AT THE QUADRANT,
202 Water-Street, corner of Beekman-Slip,
NEW-YORK.

BLUNT'S American Coast Pilot, shewing the courses, and giving directions for sailing into all the harbours in North America, and West-Indies.

The American Practical Navigator. Seamanship both in theory and practice, to which is annexed an essay on Naval Tactics and Signals, also, regulations for the government of the navy of the United States of America, and observations and instructions for the use of the commissioned, the Junior, and other officers of the American navy, on all the material points of professional duty, including also forms of general and particular orders for the better government and discipline of armed ships: together with a variety of useful tables; among which are general tables for watching ship's companies in all rates; for shewing the stations of the different officers at quarters; for the general approbation of men at quarters, in ships of every class; for furling sails; mooring and unmooring; making and shortening sail; tacking ship, &c.—also, all the laws for government of Letters of Marque and Reprisals.

A new system of Mercantile Arithmetic.

THE NAUTICAL ALMANAC
FOR THE YEARS
1811, 1812, 1813, 1814, 1815, 1816, 1817, & 1818.

Which will be continued annually.

SUBSTITUTE for a lost Rudder, with directions for preventing its being lost.

Seaman's Journals, in English, Portuguese and Spanish languages.

Blank Log-Books, for private or armed vessels.

CHARTS.

The whole coast of North America, on eight sheets, including the Bahama Banks, on a very extensive scale. [This chart is the production of four years labor, and is the only one extant which even agrees in latitude with correct observations.]

A new Chart of the West-Indies including Florida Gulf and Stream.

A new and improved Chart of the Gulf and River of St. Lawrence.

A chart of the coast of Labrador.

A new chart of Long Island Sound, from survey ordered by government.

NOW ENGRAVING,
A CHART OF THE
Atlantic, or Western Ocean.

[The publisher submits this to those who purchase Charts for utility, with an assurance that it excels in usefulness, any now extant, it being more correct, and on an extensive scale.] It will be published in January, 1814.

Also,—on a very extensive scale,

A plan of New-London harbour, from a survey ordered by Commodore Rodgers, to whom it is respectfully dedicated.
E. M. Blunt's advertisement continued.

FOR SALE,

Besides those already named, the following articles, viz.

Sextants, Spy-glasses, for day and night; Quadrants; Dividers; Scales; Parallel Ru
Azimuth, Binnacle, Amplitude, and hanging compasses; half Hour and Log-glass
Cases Mathematical Instruments.

Writing, Letter, Cartridge and Log Paper; Ink Powder; Lead Pencils; Slates
Pencils; Mercantile Blanks of every description. Cargo and blank Books of e
description, useful at sea.—Stone Ink stands calculated for ship's use, together wi
general assortment of

Charts and Pilots,

FOR EVERY PART OF THE WORLD.

New and second hand Quadrants, Spy-Glasses, Sextants and Charts purchased.
The advantage of purchasing Nautical or Mathematical Instruments where they are
adjusted, must be obvious to every scientific gentleman. Every possible exertion will
be made to give satisfaction, and personal attention at all hours.

N. B. Gentlemen who are detained on shore, and wish to deposit their Instruments or
Charts for safe keeping, shall have every attention paid them gratis. Those who want
Charts and Instruments repaired, shall by leaving an order have them sent for, to any
part of the city, and when completed, returned.

Aug. 1813.

JAMES T. SMITH,
PARASOL AND UMBRELLA MANUFACTURER,
No. 302 PEARL-STREET,
Two doors from the Friends Meeting, New-York.

Respectfully informs his friends and patrons, that he keeps a constant assortment of
UMBRELLAS and PARASOLS of the latest and most approved fashions, which he will sell
Wholesale and Retail on terms accommodating to purchasers.

* Old Brass, Pewter, Lead, Whalebone in slab or otherwise, &c. taken in payment.
N. B. Orders from any part of the United States promptly and faithfully attended to
Old Umbrellas repaired, and new covered, with neatness and dispatch.

SAIL LOFT, AND SAIL DUCK STORE.

THOMAS HINTON,
SAIL MAKER, AND SAIL DUCK STORE,
Corner of Coenties-Slip and South Street, and on Clason's Wharf, Charlotte-Slip,
NEW-YORK.

Has constantly for sale, first and second quality Russian Duck, Raven do. Ticklenburg
HAT STORE.

LEARY & EASTWOOD,
No. 144 Front-Street, near Fly-Market,
NEW-YORK.

Offer for sale a complete assortment of the most fashionable London and American manufactured HATS, of the very first quality; with a constant supply of Warranted LEATHER HATS.

Those who may please to favour them with their custom, may depend on being supplied, Wholesale and Retail, with as good hats, and as cheap, as can be purchased in the city.

NATHAN JACKSON,
INFORMS MASTERS AND MARINERS, THAT HE KEEPS A TAVERN AND BOARDING HOUSE,
At that well known stand, 272 Water-Street, corner of Beekman-Slip,
NEW-YORK.

Also, a general assortment of Seamen's Clothing. Sea Stores put up at the shortest notice. His house is large and sufficiently commodious to accommodate fifty boarders.

N. B. Passengers and officers of vessels can be accommodated with Boarding and Lodging on moderate terms.

JOHN VAN TASSIL,
No. 207 Water-Street, New-York.

Offers for sale a complete assortment of the most fashionable London and American manufactured Hats of the very first quality, with a constant supply of warranted leather Hats.

WILLIAM SPENCER,
TRUNK AND PLATE CASE MAKER,
No. 320 Pearl-Street.

Three doors East from Peck-Slip, New-York.

Makes and sells, wholesale and retail, all sorts of hair and brass mounted travelling trunks; such as Postchaise Trunks, Flat and Spanish Sumpters, Hair and Black Leather Portmanteaus, Chaise seat Trunks, and small do. to go under the seats of stage coaches, and fancy Morocco Leather Work Trunks.

Merchants supplied with all sorts of Nests of Trunks, for the Southern and West-India trade. Likewise light Sole leather Trunks to go behind servants on horseback. Old Trunks repaired or exchanged.

C. CHESTER,
No. 143 Front-Street, New-York.
NEW-ENGLAND MARINE HOTEL.
BOARDING.

Wine and Liquors of the first quality.

N. B. Travellers accommodated with refreshments at all hours at the shortest notice.
SEAMAN & SELLICK,
MERCHANT TAYLORS,
No. 288 Pearl-Street,
Opposite Beekman-Street, New-York.
Inform their friends and the public that any orders they may be favoured with in their line shall be attended to with punctuality.
Orders left at 202 Water-street, or enquiries made, will be duly attended to.

JOHN TIEBOUT,
No. 238 Water-Street, New-York,
HAS FOR SALE,
Cartridge and Log paper,
WHOLESALE AND RETAIL.

OLIVER H. TAYLOR,
BOOT AND SHOE MAKER,
No. 290 Pearl-Street, opposite Beekman-Street, New-York.
Gentlemen's most fashionable BOOTS and SHOES,
WHOLESALE, RETAIL, AND FOR EXPORTATION.

NAVIGATION AND LUNAR OBSERVATIONS,
TAUGHT IN A SHORT AND EASY METHOD BY
J. RICHARDSON,
No. 13 BEEKMAN-SLIP,
FIRST DOOR BELOW WATER-STREET.
N. B. Attendance will be given from eight o'clock till noon; from half past one till five; and from seven till nine in the evening.
Application may be made at the Quadrant, 202 Water-street.
Aug. 1813.

C. BLOCHBERGER,
HAS REMOVED FROM
No. 90, to 200 WATER-STREET.
(adjoining the Chart and Quadrant Store of E. M. BLUNT.)
BEEKMAN-SLIP, NEW-YORK,
Where he still continues to carry on the
TIN, COPPER AND SHEET-IRON BUSINESS,
In all its various branches.

JAMES RAMSAY,
SHIP CHANDLER, CHART SELLER AND GROCER,
No. 23 Thames-Street, BALTIMORE.
HAS FOR SALE,