

- Introduction
- Navigation
- Ship building - construction
- Launch - Rigging
- Gun provisions
- + ~~Compass~~ - Deck

Kales

	Gun	M	Mon	Levy	Pr ²
1	= 100	= 850	- 150	222	: 5200
2	= 90	= 750	120		on Mud
3	= 80	664			74
4	60 to 50 not of the line				

366. Frigate

	Shoors	Out	2 nd	Sum
1	= 42	= 24	= 12	= 6 = 100
	= 32	= 18	=	9 = 74

Admiral - Subdiver
3 ranks - 3
- Blue White Red
Rear - Vice - Admiral -
- Flag where hoisted
- 3 Flag officers in a fleet

Signals -
- Day - night - Flags.
- Rockets - Lantorns -
- Guns fired as a prepara-
- tive

"Magnetism" Magnet
- Properties of the ~~compass~~
1. Attraction, long time
2. Stability in the 13 or 14 Cent.
3. Experiments -
4. Compass - Described -
5. Deviation
6. Method of making
magnets and touching
needles -

Sailing —

— Ship a Globe —
— Long form — left rudder
against the head —

+ Terms on board
Head Stern — fore — aft

Bow — quarter —
Starboard — Larboard —
Windward Leeward —

— weather bow — &c

+ Sails in the wind's eye
on a wind or close
hauled — Large —

— on the beam —

— on the Quarter best

— Wake — See way

+ Ship to windward bringing
one to leeward to reti-

3 ways

1. Heaving directly down

— 20:1 against the attacking
ship, 2 guns on the fore-
cable again 40 heavy —

* Ship took men and
rigging more exposed
Disabled in her rigging
before she gained a proper
position for annoying her
adversary — close action

2. Running down astern
into the wake — brought
to the course — On equal
terms — Bow shows Stern

3. Shoot a head, ~~wear~~ and
run down on her weather
bow, she will force her to bear
away to leeward

+ Shot against the hull
and rigging.

1 Two ships one to wind
bearing down, the other to
be down firing at her rigging
- Disabled the lee ship with
shot of or up to her adversary
- Comparison bulk of the
Two objects - Tugging more
than 20 times that of the

Hull -

- Capturing a ship enables
her adversary either to come
up with her or run away.

+ Trench fire at our rigging, we
at their hulls -

+ At what Distance one ship
can be fired on by 3 miles
of battle -

$1\frac{1}{2}$ cable = 360 yards the distance
for one ship to be fired on by 3 will
be 1080 yards - at 2

cables length proportionally
greater - The ship a head

cannot bring her head near
to the wind and consequently

her broadside to bear on the
single ship + The ship a star

by tugging her broadside
to bear could run to leeward

and both could be exposed
to be raked by their oppo-

nents in the line
+ When ever one ship has
sustained the fire of three at
once she must have been at
a great Distance, or her line
divided -

- To Dispute the wind
- Different methods of tacking
- Ship by ship, whole
- once.
- Line of battle a breast
- a head - Bow and Quarter
- + Engagement described
- + Lee and weather line
- compared -
- + Leading ships -
- Repeating frigates
- when is the best station
- of the Admiral? -

- Tacking - wearing
- fore sail line - bent -
- gain - - - - - - - - - -
- hoove

-
- Fleet
 - in three Divisions
 - line abreast
 - - - - - a head
 - Van - Center - Rear -
 - + Admiral ship -
 - + Repeating frigates
 - + Leading ships -

Line

Line a head close hauled
- Ships stationary - 400
- Caber length 120 fath: 240
+ See and weather gauge

~~Line~~
Line

1. Determine the line
2. Double on the Van and see
3. Let in comrad by some A

See line

1. Can fight this lower

Waterline -

2. Early move out of the
line

The fleet cannot easily
bring the other to action

- Manoeuvring

- + Tackling the whole fleet
- + Turn and Defeat Tacks

Ship prepared

+

3. Throw the shot further

X Springs on a cable -

Brush - French affect
The whole - impossible
- Lasting time desirable
- Can receive the fire of the
whole time -

X New made of affect
- Three shapes -

Sailing ~

- Mariners compass
- points properly named
- + Before the wind
- Directly against the wind impossible
- + within 6 points - sailing on a wind - Close hauled - Cutters and some frigates within 5 points
- Partly to the shape of the vessel partly to the helm.
- Position of the sail oblique to the wind - Helm to windward
- Howers when close hauled
- useful - necessary ~

Lee way greatest when close
hauled - how determined -
+ Sailing large 1 point -
- wind on the beam -
- position of the sail -
- 3 points large or 1 aft
the beam - 2 3 -
- 4 points on Quarter
ship sails best on this
point - sails not be come
before the wind, some
of the sails Don's Drags -

Tacking

A point to windward
the ship cannot sail through
to it - Tack - beat to
windward -
- Starboard - Larboard courses
or tacks -
- Manner of tacking -
- fore sails shiver - impulse
of the helm -
- Both tacks of equal length
+ If the sea runs high so
as to make it necessary
run the top sails the ship
will make two points of
Lee way and consequently
will never arrive at her
point

Rearing or Weathering
Opposite to Tacking —
Turns her Stern to Wind.

Manoeuvring of Rearing —
beats away for — sails
toward the stern part or
stern while the fore sails
are spread —

Loses ground more than
in tacking — Seldom practised
except in cases of necessity
Danger —

+ Bringing the vessel up to
the wind is called hauling
the wind —

He hauled his wind and
threw off —

Fleet —

Sails in two or three vol.
— near together — can be soon
prepared for action —

— Conveys a signal before —

+ Signals — Flags hoisted
Gun fired — rockets —
bombs &c —

— Private signals — prin-
cipal is to know a strange
sail —

Line

- The arrangement of the fleet of ships if we are disposed to engage on money
- Long line - a head - in the wake of each other
- 200 yards or cables length
- 100 yards or cables length
- Advantage of this arrange^t - sustain and support each other
- + Line close hauled is chosen this order extremely convenient - as ships differ so much in their rate of sailing the distance would not otherwise be preserved -
- The sails in this position are so disposed as to wind

- act each other by ^{what} ~~the~~ means she will advance nor retreat
- By this means they are enabled to retain their stations and prosecute the battle with vigor free from perplexity and disorder
- + place of each division and each ship is previously determined -
- Two ships to lead on the Starboard and Larboard Tacks -
- + Admiral in the center -
- Advantage - Signals more easily seen - State of the fleet or enemy better observed -
- + Respecting private

Line abreast

— How formed on any point.
— This line is most commonly
made use in convoys: in
pursuing or retreating —
— always before the wind
+ From them to form the line
a head.

* To tack a fleet
— two ways. Ship by ship
— this was an enemy danger-
ous — the weight double
upon van — Center was —
— 2 All together — Bear away
4 points then tacks all
at once — advantage of this
— when a ship is much da-
mage she cannot tack —
— wears — even if neither

she must be taken in tow —
≠ From the line a breast
to form the line a head —
= haul. Thus the wind two
points on the Quarter you
mean to haul to E. S.
+ Wind at south — To form the
line on the larboard tack
— two points on the Starb.
— quarter bring the main-
march N. W. and E. N. E.
— haul your wind and
the ships are in a line
a head on the Starb. tack.

Now on Quarter line
- To form ^{line abrad by the} the Bow and Quarter
line on my Starboard tack
= Rule Keep the wind 2 points
on the Starboard Quarter -
Main Mast then bear E S E
and W N W - then haul to
your Starboard tack and the
sheet will be in a bow and
quarter line - Tack altogether
and the line a head is formed
on the Starboard tack -
+ Strongest vessel in the
Center -

Fleet brought to action
- Windward and leeward
+ Disadvantages of a Weather
gauge -

1. Can determine the time of
action
2. If more numerous may
double the van or rear.
3. Little incommoded by their
own smoke and not at
all by that of the enemy.
4. Can dispatch fire ships.

- Disadvantages -

1. When the sea runs high
cannot sight their lower
Guns
2. Disabled must tack to avoid
falling into the enemy's net.
- This sometimes impossible

3. Men more exposed on the
upper decks —

— Line

Advantages —

1. Can fight their lower guns
2. May have the opportunity
sinking and cutting off part
of the enemy — although
it cannot double — it may
oblige them to bear away.
3. Disabled ships more easily
removed out of the line —

— Disadvantages

1. Cannot decide the time and
distance of battle — It may
unwittingly be attacked before
it is prepared —
2. The enemy can bear down
out of line of battle

the better, my course is the same
says the ^{east} ~~sea~~ boat which is carried
the case and velocity with which it
is made the great willing to do
find we must be convinced that
a ship is by the north side
of the sea that has ever been
by man. Let us try if possible
to find out what is a true
of our present experience. Let us
suppose we have never observed
any body floating on water, so
that a man could not
composing the balance that
on a certain occasion he came
a floating wood more than
of a long and narrow
floating on the water of the sea
and carrying about two or three
being at the end of the main

That the force of a single man
could change its direction.

That he saw it lay its broadside
to a city and in a few hours reduce
it to ashes &c — What credit would
we give to such a relation? How
different is the estimate we form of
the works either of nature or of art
when we consider them as single
detached facts, and when we view
them through the various steps
according to which they have
arrived at their present pitch
of improvement —

To give some account of the
notions and aspects of this
wonderful machine is the intention
of this lecture —

A machine so large and comp^d
must necessarily consist of a great
variety of different parts —
— Names of the principal parts —

States

British Navy into six rates

		Men	Mon: S.	1/2
1.	100	~ 850	150	222. 52x
2.	90	750	120	} x 2162
3.	80, 64	650	100	
4.	60	50		Tom

586 Frigates

	1/2	2	3	2	
1.	42	24	12	6	100
3.	32	18		9	74
	32	or 24	12	6	64
		24	12	6	50

Frigates 9 P. — 32
Ships 4 P.

Sailing

Martin's Compass

- Points properly named
- when the vessel a globe and
- no helm she must always
- sail before the wind —
- but from her sheeps —
- must have a head — helm —
- can sail near the wind —
- within six points — sailing
- on a wind — Close hauled —
- within five points
- Position of the sails —
- 1 point large
- 2 wind on the beam
- 3 large Tacking —
- 4 aback the beam — Quarter
- this the best sailing point —
- before the wind the sails don't draw

[Faint handwritten notes, possibly bleed-through from the reverse side]

1	100	100	100	100
2	150	150	150	150
3	200	200	200	200
4	250	250	250	250
5	300	300	300	300
6	350	350	350	350
7	400	400	400	400
8	450	450	450	450
9	500	500	500	500
10	550	550	550	550
11	600	600	600	600
12	650	650	650	650
13	700	700	700	700
14	750	750	750	750
15	800	800	800	800
16	850	850	850	850
17	900	900	900	900
18	950	950	950	950
19	1000	1000	1000	1000

Terms

- windward - Lee ward -
- weather bow - Lee quarter -
- Starboard - Larboard -
- Wake - Lee-way bow
obscured -
- I haul'd my wind - bore
down - I steered her to
bow - the ⁺ ~~at~~ her ⁺ ~~house~~ ⁺ ~~+~~
- laid her on board the Larboard.
- Quarters - Cap. Jarvis -
- Brake her fore and aft -
- why this fire is more dang'rous
- board a midships -
- Port the helm - Larboard -
- Suff -

Tacking & Wearing

- A port to windward - Ship
cannot sail directly to it
- Tack - Beat to wind? - Board -
- How performed - fore sail loose -
helm a lee or to port -
- In tacking her head is brought
across the wind -
- + Wearing - how performed -
bears a way - after sail loose -
- bears to avoid some danger - when
she cannot tack -
- In wearing her stern is brought
across the wind -
- In the former she is gaining on
the latter losing ground -

Anchoring - in
a stream wind across
wind up Down
Spring on the cable -

Admiral -

Three ranks of Admirals
- Blue - White - Red -

- Three sub-ranks -

Rear - Vice - Admiral -

- Order of Precedence -

- Admiral distinguished by
his flag - Red - White - Blue

- Admiral's flag Main mast head

- Vice Admiral fore mast - Red

+ Three Admirals flag officer
in a fleet -

1. Rear Admiral blue, white
red

2. Vice Admiral ^{blue} white, red

3. Admiral - blue white and
no red - Admirally flag -

Shot sailing

- In three Division -
- Centre by the Admiral -
- Van by the Vice ad
- Rear by the Rear ad
- suit in three parts. Line the
- commander some times lead
- at other times in the Centre -
- More easy communication of
- the orders - signals better
- observed - Conway keeps command
- of the fleet - reason Frigate
- on both sides - look out

Signals

- + Different flags hoisted on the same
- part of the ship -
- + Same flag on Different parts.
- + Guns - Rockets - Lanterns -
- + Private signals -

Line

- Line a head - wake of each other
- Cables length = 120 fath' 2 1/2
- + Line a breast
- + Bow and quarter line
- Line close hauled
- ~~the reason~~
- How to form the Line -
- Admirals place - reason
- cannot see his own line -
- + Repeating frigate -
- Vice and Rear in the Centre
- of their own Division -
- + Leading ships - Star. Larb.
- Top sails and jib - placed
- so as to command each other.
- Mizzen top sail reverse

Cutting the line —
+ Chasing — square —
x Ship to windward being
one to leeward to anchor

1^o bearing down. 20 to 1
against the attacking ship
Two guns for each against
40 — ship rather
rigging disabled. Rigging

2. Running down astern into
the wake parallel to the
course — Equal terms —
Bow and Stern Chores

3. Most a head to wind and

run down on her weather
bow, force her to bear away
to leeward —

Hull and rigging 1:20
Crippling a ship in either
her adversary either to come
up or run away
x French fire at our rigging
we at their hulls. —

+ Distance at which one
ship in a line can be
fired on by three at once
1 1/2 cables = 360 yards ships ahead
single ship 1000 yards at
least — ship ahead not more

the wind - They order -
cannot bear away to leeward,
for she would be ~~found~~
taken by our ships in Encomp
line -

- When ever our ships has
been joined on any three or
more she must have been
at a great distance or
her line disordered, broken.

+ Admirals place in the
center of the line - cannot
see his whole line

+ repeating frigate -
from ~~the~~ end to the Admi
ral - opposite to the
middle of the line - reach enemy

Weather and See Gauge

- Adv: weather Gauge

1. Bore down beyond the cabin
2. Double on the van or rear
3. Less incom: by stroke-[?]ft

- Adv: See line -

1. Fight lower deck gun.
2. Early move out of the
line to rejoin. -
3. ~~Less~~ men on the
upper deck up exposed

Single Ship on the lee
bow points her up.

Manoeuvring. —

2 modes of tacking
a fleet — Single Ships —
— all together — 4 examples
+ best line manoeuvring

[Faint, illegible handwriting, possibly bleed-through from the reverse side.]

Notes on Genl. Tachibana's
Pursuit of a Fleet into 3 Oct
3 orders of Admirals - Red,
White, Blue - Adm. of 2nd
carries the Union Flag at
N. 7. N. near the White, Blue
Commander of Division in
the center - Cornet of 2nd
is a sailing vessel. Lead:
- Party from eye of Fleet 3 Oct:
Time as near as possible
on any point from the wind
- "Hampshire" keep to windward
more out of danger - beam down
into the Fleet - Do not delay
- in a retreat "London" fire ships
placed to seaward -

Batt. of the York 13 Jun 1665
Duke of York - King -

London -

No.

1. Time of the action
2. If more men on each side
on the rear - rear of the Sea
that almost meets in the
rears.

3. Send down fire ships -

4. Smoke - sparks of fire

Sea war

1. All ports open 2. Fire
adm. Hawke 1759 20 Nov
- composition for water work
in

2. Early work Disabled ships
3. May now early retreat.

Weather Gauge

1. Can determine the true gale
2. Double on the van or head
3. Less in com. by smoke -
4. Dispatch fire ships

Advantages -

1. Can not open their lower ports -
2. Men more exposed
3. Must take to escape the enemy

See line

Advantages

- 1 - Can fight their lower part
2. Can easily repair the Oct
Dis-
greatly man. by smoke

The fleet cannot easily
bring the other to action -
must wait for a change of
the wind or some other sign
of the Enemy -

+ Fleet upon the same
tack - sometimes different
+ Superior fleet cannot be
long in the presence of a
sup. without being brought
to action - reason - Attack

* Battle of the Texel 1665
English 100 Ships - 150
miles - Duke - Prince Rupert
and Lord Sandwich -
from 9 till 2 o'clock - 2000
taken from the Dutch with
the loss only of one English
Ship

Order of Retreat
- Half moon - transports

- To Defend a fleet

- To engage in a current
- Spring on the Cable -
- fix sometimes to the ring
of the Anchor but more
commonly to the cable

* Both heads ---

Gunns - Charges - canns

- To prepare the Ship.
- Up Hamocks -
 - Double advantage -
 - * ~~Make~~ ^{Make} ~~him~~ ^{him} the sails
 - yards secured ~~boards~~
 - Carpenter shot pieces -
 - Sent visit the (Puffant Deck)
 - Draw boats to arms -
 - Marines are drawn up -
 - Boats: jugs all hands to quarters - hold up!
 - Guns run out - take
 - gun low - hold up land
 - * Red flag - signal for battle
 - Do not fire in broad side.

Greater's views —

.. The number of the Cannon —
— March marching of Men
— Fall of March — wreck of
ships — The Swarms of the Ocean
Amidst such a scene to pass
In mind — Pursuing order —
— Support and Maint — in
our line — favour to
moment when we resist —
Home — Country — Victory —
Repeat. Story —

Comparative Advantages

of Ship — and Batteries —

— Guns of batteries pointed
with more certainty than
ship guns — Can be fired
with more expedition —
— Ships can attack the weakest
part of a Battery can de-
termine their Distance — when
near can being more fire than
can be returned, fire from
the tops —

— If the cable is shot away
the ship may be exposed
to be taken by the battery
— If the tide changes the ship
is exposed for a short time
to be taken unless she is
moved both head and stern

on has a spring on her

collar and was full of

23rd Dec^r -

7 B 2 Sh -