

**PART 3**

**APPENDIX 1**

**Private Cunningham 's Attestation Papers<sup>1</sup>**

Printed text in the form is shown in upright letters, text printed in italic is shown underlined in italic letters. Sections written in manuscript are in italic script.

1st Page

<i>Ent<sup>d</sup></i>	<i>57 C<sup>o</sup></i>
Division	<i>Chatham</i>
Name	<i>W<sup>m</sup> K Cunningham</i>
Date	<i>19 December 1829</i>
<i>Enlisted</i>	<i>17 December 1829</i>

*Approved*

[Signed] *John B Savage*

*Colonel Commandant*

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*81 Company*

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*Head Quarters Recruit*  
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2nd Page

**ATTESTATION for the ROYAL MARINES**

*Form of OATH*

I, *William Keating Cunningham* do make oath that I am a *Clerk* and to the best of knowledge and belief was born in the Parish of *Holborn, London* in the County of *Middlesex* and that I have no Rupture, nor was troubled with Fits; and am no ways disabled by Lameness, or otherwise, but have perfect use of my Limbs; and that I am not an Apprentice; and that I do not belong to the Militia, or to any Regiment in his Majesty 's Service. or to His Majesty 's Navy or Royal Marines

As witness my hand at *Rochester* the *Nineteenth* day of *December* one thousand eight hundred and *twenty nine*

Sworn before me at *Rochester*  
This *nineteenth* day of  
*December* one thousand eight  
hundred and *twenty nine*

*William Keating* Signature  
*Cunningham* of  
Recruit

[Signed]  
*Chs Bathurst Mayor*

[Signed] *W<sup>m</sup> Worsley S<sup>t</sup>* Witness  
present

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<sup>1</sup> TNA ADM 157/21, Items 282 & 284.

Form of OATH of FIDELITY

I swear to be true to our Sovereign Lord King George, His Heirs and Successors, and to serve him and them honestly and faithfully, in defence of his Person, Crown and Dignity, against all his Enemies or Opposers whatsoever; and to observe and obey His Majesty's Orders, and the Orders of the Officers set over me by His Majesty.

As witness my hand at *Rochester* the *Nineteenth* day of *December* one thousand eight hundred and *twenty nine*

Sworn before me at *Rochester*  
this *nineteenth* day of  
*December* one thousand eight  
hundred and *twenty nine*

*William Keating* Signature  
*Cunningham* of  
Recruit

[Signed]  
*Chs Bathurst Mayor*

[Signed] *W<sup>m</sup> Worsley S<sup>t</sup>* Witness  
present

3rd Page

Form of the ATTESTATION

*City of Rochester*

to wit. I, *Charles Bathurst Esquire Mayor* and One of His Majesty's Justices of the Peace of the *City of Rochester* certify that *William Keating Cunningham* aged *twenty* years, *five feet ten inches & 3 quarters* high, *sallow* complexion, *Grey* eyes, *brown* hair, came before me, at *Rochester* on the *Nineteenth* day of *December* one thousand eight hundred and *twenty nine* and acknowledged that he had voluntarily enlisted for the Bounty of *Three Pounds* to serve His Majesty King George, His Heirs and Successors, in the Royal Marines, commanded by *Colonel John Boscawen Savage*. And I further certify, that in my presence the second and third sections of the Articles of War, against Mutiny and Desertion, were read over to him<sup>1</sup>, and that he took the Oath of Fidelity annexed hereto, and also the Oath above set forth, and that he received the sum of *two shillings and six pence* on being attested.

Signature of Magistrate  
[Signed] *Chas Bathurst Mayor*

N.B. The Magistrate is requested to cause the blanks to be filled by Words, not in Figures.

*I have examined William Keating Cunningham and find him free from Ruptures, Fits, diseased legs or the Marks of old sores, Fistula, Scrofula in Glands bones or joints, Blackened Stumps<sup>2</sup>, Defective Sight or Hearing; and in all other respects free from mental or Bodily defects.*

[Signed] *Arthur Fog*  
*Assist. Surgeon.*

4th Page

*Received the sum of Three Pounds as understated on being approved of for the Royal Marines*

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<sup>1</sup> See Appendix 6.

<sup>2</sup> The word *Stumps* (i.e. teeth) is not perfectly legible, but seems to be the best (and most logical) reading.

<i>Cash on attesting</i>	0 2 6
<i>Cash on final approval</i>	0 10 0
<i>Credit P<sup>r</sup> Ledger</i>	2 7 6
	£ 3 0 0

*Royal Marine Pay Office*  
*Chatham 21st Dec<sup>r</sup> 1829*

[Signed] *W<sup>m</sup> K Cunningham*

*Witness*

??

[Name illegible]

## APPENDIX 2

### Regulations for Royal Marines

#### ROYAL MARINES WHEN EMBARKED<sup>1</sup>

1

The Officers, Non-Commissioned Officers, Bombardiers, Drummers, Gunners, Private Men, and Boys of the Royal Marines belonging to His Majesty's Ships and Vessels, whether entered on the Ship's Books as part complement, or borne as Supernumeraries, shall be considered as entitled to all the advantages of the rest of the Ship's company, and subject in all respects to the discipline of the Fleet.

2

The Commissioned Officers are to be paid agreeably to such Regulations as His Majesty may from time to time appoint, by Order in Council, or under His Royal Sign Manual. The Non-Commissioned Officers, Bombardiers, Drummers, Gunners, Privates, and Boys, shall be borne on the Ship's Books for Pay and shall receive the Rates of Nett Sea Pay specified in the general Table of Complements and Pay as already provided, (Chap. V. S.1. Art. 1.)<sup>2</sup>

3

The Officers and Non-Commissioned Officers shall command each other and the Private Marines, agreeable to their respective ranks and the custom of the Marine Service, in all matters relating to their distinct duties as marines, but none of them are ever to assume any Naval Command or Authority whatsoever, unless ordered to do so by their superior Naval Officers, and they are to be in all matters whatsoever under the Command of the Captain or Commanding Officer of the Ship or Vessel in which they may be, and of the Officer of the Watch for the time being, whatsoever his rank may be.

4

The Officers of the Royal marines are to be treated on board with the respect due to the Commission which they bear, and the Non-Commissioned Officers are to be treated according their respective stations; and any disobedience of their lawful commands, or any insult or injury to their persons, shall be dealt with as if such offences were committed against the Officer or Petty Officers of the Navy of corresponding ranks.

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<sup>1</sup> *Regulations established by The King in council, for His Majesty's Service at Sea.* London, 1824, Chapter IX, pp. 75–80. The Regulations for 1833 are virtually identical.

<sup>2</sup> The rates of pay established by order in council of 23 June, 1824, remained the same until after the completion of the voyage, and did not change until 1851. The rate of sea-pay for a Sergeant was £2 0s 1d; for a Corporal, with over 14 years service, £1 12s 1d, between 7 and 14 years service, £1 9s 9d, all others £1 7s 5d; Drummer, £1 3s 4d; Private or Gunner, after 14 years, £1 4s 1d, 7 to 14 years £1 1s 9d, others £0 19s 5d, all rates per month. *Navy List*, 1827, 1839 & 1850.

5

No Non-Commissioned Officer or Bombardier is ever to be struck on any account, and no Drummer, Private or Boy, shall be punished, except in the manner that the seamen may lawfully be punished; but no Marine shall ever be required to go aloft, or punished or discountenanced for not doing so.

6

If any Non-Commissioned Officer shall be guilty of any such misconduct as in the opinion of the Captain or Commanding Officers of the Ship or Vessel, may require that he should be reduced from his rank, such Commanding Officer shall report the same to the Secretary of the Admiralty, or his Commander-in-Chief, and with the sanction of the Lords Commissioners of the Admiralty, or such Commander-in-Chief, he may reduce the offender; but if there be not an opportunity of reporting the case to the Admiralty, or to the Commander-in-Chief, the Commanding Officer may in such case with the concurrence of the Senior Marine Officer (if there be one on board, and if not, by his own authority) reduce the offender to a lower rank, giving notice thereof, and of the cause, by the first opportunity, to the Secretary of the Admiralty, or to the Commander-in-Chief, and in all cases to the Colonel Commandant of the division to which the man may belong.

7

The Marine Arms and Drums are to be under the charge of the Commanding Marine Officer on board, who is accountable for any loss or damage that may happen to them for want of sufficient care in him; and every such case and the particulars of the loss or damage shall be reported to the Secretary of the Admiralty, in order to its being charged against such Commanding Marine Officer, but if such loss or damage happen by the default of any other person, the Marine Officer is immediately to acquaint the Captain of the Ship therewith, who is to cause the value thereof to be forthwith noted against the defaulter's name in the Ship's books, in order to its being deducted from his Pay or Wages, and paid into the Office of Ordnance.

8

The Serjeants, Corporals, Bombardiers, Drummers, Private Men, and Boys of the Marine Divisional and Artillery Companies, are to be allowed an uniform new Clothing once a year; they are to be entitled thereto on the 23d of April, and the same is to be issued to them on that day, or as soon after as possible. The said Clothing is to consist of the particulars for each Man and Boy which have been, or shall hereafter be ordered by the Lords Commissioners of the Admiralty, in pursuance of His Majesty's Pleasure from time to time in that behalf signified; and the Captain or Commanding Officer of the Ship in which the Marines are embarked, and the Commanding Marine Officer of the same, are not on any pretence whatever, to permit the Clothing or Accoutrements to be cut or altered, except in strict conformity with the make and shape of the Clothes and Accoutrements ordered or established for the Royal Marines when on Shore.

9

Marines returning from foreign parts, and entitled to clothing, are to be supplied with a Suit of Clothing each; and if more than one Clothing shall be due to them, they are, upon their being landed, to be allowed for every additional Clothing that shall be due, such sum as may be established by Regulations relating to the Royal Marines when on shore.

10

Whenever any Marines are discharged, either to go on shore, or into another Ship, the Captain of the Ship and the Marine Officer are to be particularly careful that their Bedding, Clothes, Necessaries, Arms and Accoutrements, be sent along with them; and to note upon a Discharge List, the time when and where they were last clothed; and in case those discharged into other Ships shall be in debt, a state of such debt is also to be sent with them, and the Captain of the Ship into which they are turned over, is to charge against their growing Wages, and to cause the Commanding Marine Officer on board to be furnished with a copy of the state of such debt, for his information.

11

The Names of Marines are not to be intermixed with those of the Seamen, but they are to be borne upon a distinct List in the Ship's Pay and Muster Books, specifying the Number of the Company they belong to, the Qualities of the Commissioned and Non-commissioned Officers, the time of their coming on board, and from whence, and of their discharge, and whither, and for what reason; the times of the death or desertion of such as die or run away; and also the times any of them are put sick on shore, or on board an Hospital Ship,

and their return or discharge; and any other remarks that may be necessary to shew what becomes of the Marines embarked on board the Ship.

## 12

Marines serving on Board His Majesty's Ships (Commissioned Officers excepted), are to be paid for the time they so serve, by the Ship's Pay Books, as the Seamen are paid; but with respect to Marines discharged, before the Ships they are discharged from are under orders for Payment<sup>1</sup>, the Captains of such ships are strictly directed immediately to cause five complete Pay Lists of the name or names of such discharged Marines to be made out, and transmit them to the Navy Board, who are to cause the Men to be paid their Wages as soon after the time of their re-landing as possible, if any shall appear to be due to them, after deducting the Charges which may be against their Names upon the Ship's Books, as also the sum of Three Pounds, as a fund for supplying them with Necessaries on shore, or on their being re-embarked, which is to be paid into the hands of the Deputy Paymaster for that purpose; but if, at any time of paying any Marine his Sea-pay, there should not be so much as Three Pounds due to him, one half of whatever may be due is to be paid to the Deputy Paymaster, for the purpose before mentioned; a separate and particular account of which is to be kept by the Deputy Paymaster and Pay Captain, and the Balance, if any, paid to the Men, either on their embarkation, or discharge from the service; and whenever any Sea-pay is to be paid, the Commanding Marine Officer at the Head-quarters near which such payment shall be made, is always to cause proper Officer to attend thereat, to preserve order among the Men, and to conduct them to Quarters; and no Sea-pay is to be Paid unless Marine Officers attend accordingly.

### APPENDIX 3

#### Ship's Company – Recruitment, Service, Discharge and Desertion.

At the start of the nineteenth century the officers of the Royal Navy served on a career basis, going on half-pay between commissions. The sailors, however, were either pressed or volunteered for the duration of a commission at the conclusion of which they were paid off, as they had been for centuries<sup>2</sup>. Continuous service did not become available until 1853, (Admiralty Circular No. 121 of 14 June 1853) and was not compulsory until 1873.

The complement of HMS *Terror* was 64 men in total<sup>3</sup>; Ship's Company 57 and 7 Royal Marines. The ship sailed with the Captain, 3 commissioned officer, 11 warrant officers, 41 junior rates and 7 marines on board. The total number victualled, i.e. actually on board at any one time, varied between 63 and 61, except at the start when the Royal Artillery party was embarked for passage to St Helena<sup>4</sup> or when parties were checked ashore in Hobart.

The Complete Muster List of HMS *Terror* shows that the Commanding Officer, 3 officers, 11 warrant officer, 48 junior rates and 8 marines joined before sailing. A further officer, 4 warrant officers and 25 junior rates joined during the course of the commission.

The Muster List contains a column stating whether they were pressed men or volunteers. In *Terror* they are all shown as Volunteers. Of the seventy one junior rates listed fifty joined from 'First Entry' and the others from previous ships, so that 'Volunteer' may not be strictly accurate. It also contains a column for Discharge (D), either Paid Off or to another ship; to sick quarters (Dsq); dead (DD); or Run (R), i.e. deserted.

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<sup>1</sup> Seamen were paid when the ship paid off, hence the requirement to pay the marines as soon after landing as practicable.

<sup>2</sup> The Enlistment Act of 1835 (*An Act for the Encouragement of the Voluntary Enlistment of Seamen, and to make regulations for more effectually manning His Majesty's Navy*, 5 and 6 of William IV, cap. 24) set a limit of five years to the period of engagement, which, if abroad, the admiral could, under certain circumstances, extend by six months. It was possible, with the Commanding Officers approval, to reengage for a further five years. Bromley, *Manning*, p. 358.

<sup>3</sup> Details below are all taken from the ship's Muster List, TNA ADM 38/9162.

<sup>4</sup> This consisted of a Lieutenant, a Corporal, two Bombardiers and two Gunners, together with the Corporal's wife and two children and the wife and child of one of the Gunners. TNA ADM 38/9162.

The definition of a deserter and his prescribed financial penalty are given in the *Regulations for His Majesty's Service at Sea*, 1833, pp. 47–8, *Pay and Allowances*, Section III, *Special Deductions*, which state 'If a Man shall absent himself from his duty without leave, a mark, and the Date of his absence shall be put against his Name; and at the expiration of twenty-one days he shall be marked 'Run', on the day he left his duty. If any Man, after being so marked 'Run', shall be discovered, and brought on board, or if a Man without leave, but not having been absent long enough to be marked 'Run', shall be apprehended endeavouring to escape from the Seaport Town, or from the immediate neighbourhood of the place where his Ship may be, any person or persons apprehending and conveying him on board, under either of the said circumstances, shall be entitled to a Reward of Three Pounds, to be deducted from the Man's Wages<sup>1</sup>; and the Captain is to give such person or persons a Certificate of the Man's having been delivered up to the Ship, specifying in it the circumstances of the case, and that the Three Pounds have consequently been charged against his Wages on the Ship's Books. A man being absent from his duty without leave, but not under either of the foregoing circumstances, and being apprehended and brought on board, shall be liable to a deduction from his Wages, at the discretion of the Captain, as the case shall appear to him, not exceeding One Pound, and such Sum to be charged against him on the Ship's Books, and to be paid to the person conveying him on board, in the same manner as the before-mentioned cases, — the Three Pounds to be marked as "Desertion Money" and the One Pound or under to be termed "Stragglings Money." Should the Captain neglect to make the said charges on the Ship's Books, the amount will be deducted from his own pay.'

The list of deserters during *Terror's* commission, taken from the Muster List, is as follows:

4	Chas Levett AB	R 27.6.39 Chatham.
33	Tilden Taylor Young Gents Stwd	R 9.2.40 St Helena.
7	Thos Farr AB	Rq 14.9.40 Hobart. See No. 56.
49	Alexdr Coleston AB	R 23.9.40 Hobart.
20	Wm Evans AB	R 26.9.40 Hobart.
22	Peter Wallace AB	Rq 19.10.40 Hobart.
24	Wm Beautyman AB	Rq 19.10.40 Hobart.
45	Alexdr Turriff Carps Mate	Rq 21.10.40 Hobart.
6	Henry Barnes AB	Rq 26.10.40 Hobart.
28	Fred Collins AB	Rq 8.11.40 Hobart.
56	Thos Farr AB	Rq 8.11.40 Hobart, Re-entered at Hobart 14 Oct. 1840.
63	Chas Grimshaw AB	R 29.4.41 Hobart.
52	Thos Roberts AB	R 1.5.41 Hobart.
54	Jno Robertson AB	R 1.5.41 Hobart.
57	Richd Clark AB	R 1.5.41 Hobart.
65	Fras Hardy AB	R 1.5.41 Hobart.

From this list it is apparent that one sailor deserted in Chatham before the ship sailed, one left in St Helena and all the remainder at Hobart. Alex Coleston and Peter Wallace had tried to desert in Simon's town, but been brought back on board<sup>2</sup>; both subsequently deserted in Hobart.

The column in the Muster Book shows a number of men were mulcted for straggling/desertion, for example William Beautyman was fined 10/-, certificate given on 7 August 1839, 6/- on 19 September, 1839 and £3 0s 0d on 7 October 1840. It is not clear what additional punishments, if any, were given, but they were probably required to do extra work on board and other penalties may have been imposed. There is no record of corporal punishment being used for deserters.

It is also interesting to note that before sailing John Bodman, Captain's steward, Richard Evans,

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<sup>1</sup> Wages, in 1839, of a First Class Petty Officer varied between £3.11s.0d. (Master's Assistant) and £2.1s.0d. (Seaman's Schoolmaster); Second Class Petty Officer £2.0s.0d. (Sailmaker's Mate) and £1.18s.0d. (Captain of the Mast); Able Seaman £1.14s.0d, all per month. *Navy List*, 1839.

<sup>2</sup> Both have mulcts of £3, dated 27 March 1840, against their names.

Purser's Steward, Samuel Aldridge, AB, William Briggs, Gunroom Steward, were discharge from the service, and Samuel John, AB, went to Hospital, (rejoining again before sailing with a new ship's book number) while Thomas Clatworthy, Purser's steward was transferred to HMS *Gorgon*. Jas Gulliver and Martin Willis were discharged from the service at their own request on 8 February 1840, likewise Richd Roberts Young Gents Steward on 2 September 1840.

Of the remainder of the Ship's Company, one officer, Lieutenant Kay, one warrant officer, Midshipman Peter Scott (listed as Mate<sup>1</sup>) and one marine, Private Stevenson, were landed at the Observatory in Hobart<sup>2</sup> and are not shown as having been discharged from *Terror*. Lieutenant McMurdo was invalided from the Falkland Islands 27 August 1842, being replaced by Lieutenant Sibbald from the *Erebus*; the Boatswain, Robert Beeman was transferred to *Erebus*, 24 August 1840, being replaced by Edward Mann from *Erebus* the next day; William Rich, Carpenter was invalided, 30 March 1840; John Lumsden Acting Gunner, invalided, 3 July 1841; Charles Molloy, Mate, discharged to Military Hospital, Hobart, 31 October 1840; James Cleat, QM, promoted Acting Gunner discharged to Naval Hospital Cape of Good Hope, 28 May 1843; William Tyler, AB, and James Hands, AB, 22 October 1840 to Military Hospital, Hobart; Michael Latouch, Private to Melville Hospital, 19 September 1839, John Ottley, Private invalided from the Falkland Islands, 27 August 1842. Charles Gregory, AB, was discharged to HMS *Meville*, 27 March 1840; Thomas Jones died in Rio de Janeiro, 19 June 1843 and William Pennant was drowned at Woolwich 22 September 1843. In addition four junior rates were discharged from the service and one transferred to HMS *Gorgon*. before sailing, and a further three were discharged from the service at their own request in Hobart.

Of the 5 officers, 15 warrant officers<sup>3</sup>, 71 junior rates<sup>4</sup> and 8 marines whose names are listed in the *Terror*'s Muster List, 1 officer, 7 junior rates and 1 marine did not sail in her and 3 officers, 10 warrant officers, 42 junior rates (43 if William Pennant is included as having reached Woolwich) and 5 marines returned home in her.

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<sup>1</sup> All Midshipmen who passed the examination for Lieutenant were eligible to have a warrant or commission as Mate. They ranked with Ensigns, and when they had three years seniority, with Lieutenants in the army. Scott's warrant was dated 1 September, 1835. *The New Navy List*, May 1842. He was promoted Lieutenant on his return to England, 4 October 1843. O'Byrne, *Naval Biographical Dictionary*, and *Navy List*.

<sup>2</sup> They were accompanied by Midshipman Joseph Dayman, Mate (warrant 11 May, 1838) and one marine from *Erebus*.

<sup>3</sup> George Moubray, Acting Purser, appears twice in the list since news of his promotion was received in the Falkland Islands. He went on to be Naval Agent and Storekeeper at Constantinople during the Crimea War, retiring as Paymaster-in-Chief.

<sup>4</sup> The Muster List has 73 numbered men, Samuel John, who went to hospital and rejoined before sailing appears twice, as does Thomas Farr, who deserted, was re-engaged and deserted again. James Cleat, acting gunner also appears on this list and the list of Warrant Officers having been promoted during the commission.

APPENDIX 4<sup>1</sup>

## Scale of Victualling

Day	Sun	Mon	Tue	Wed	Thur	Fri	Sat	Total
Biscuit, Lbs.	1	1	1	1	1	1	1	7
Spirits, Gills.	1	1	1	1	1	1	1	7
Preserved Meat, Lbs.	-	½	-	½	-	½	-	1½
Corned Beef, Lbs.	¾	-	-	¾	-	-	-	1½
Pork, Lbs.	-	-	¾	-	-	-	¾	1½
Flour, Oz.	8	-	-	-	8	-	-	16
Suet or Raisons, Oz.	1½	-	-	-	1½	-	-	3
Vegetables, Lbs.	-	¾	-	-	-	-	¾	¾
Vegetable Soup, Lbs.	-	-	-	-	¾	-	-	¾
Pease, split. Pints.	-	-	¼	-	-	-	¼	½
Cocoa, Oz.	1	1	1	1	1	1	1	7
Sugar, Oz.	1½	1½	1½	1½	1½	1½	1½	10½
Lemon Juice and sugar, of each, Oz.	1	1	1	1	1	1	1	7
Pickles, Oz.	-	-	-	-	-	-	8	8
Mustard and Pepper.	6 ozs of pepper and 2 Bottles of Mustard per week to be divided equally to the crews							
Tea, Oz.	¼	¼	¼	¼	¼	¼	¼	1¾
Barley, Oz.	-	-	-	-	-	-	4	4
Cranberries, Oz.	-	-	-	-	-	-	2	2

Preserved meats, according to Donkin's invention, in consequence of their portability and excellence, formed a large proportion of our provisions; these were chiefly furnished by John Gillon and Co., of Leith, and proved most excellent of their kind. I would however suggest to them and others engaged in this branch of trade, that for voyages of several year's duration it would be better that canisters in which the meats are preserved, should be of stouter tin, equal at least to those originally used by Messrs. Donkin and Co., their canisters being liable to rust through when long on board a ship and in hot climates.'

The total amount supplied was 26 Tons 10 Cwt 2 Qrs and 14 Lbs. A list of the suppliers and the amounts of each article supplied is given by Captain Ross in his account. Ross, *Voyage*, I. pp. xix-xxi.

## APPENDIX 5

## Muster by Open List

Commanding Officers were required to muster their ship's companies individually at regular intervals. The requirement in force was published in *Regulations for His Majesty's Service at Sea*, 1833, p. 101.

The Captain or Commanding Officer is to muster the Ship's Company, as well in Port as at Sea, at least once per week. He is strictly enjoined not to employ any of the Ship's Company out of the Ship, on private Service, nor to bear any Men longer than the actual time of serving on board, nor to put down any fictitious Names in the Ship's Books.' The rule allowing Widow's Men<sup>2</sup> to be included on the Ship's Book

<sup>1</sup> UKHO MLP42. Incoming Letters, Miscellaneous letters and papers, Scale of Victualling.

<sup>2</sup> Smyth *Sailors Word-book*. WIDOWS MEN. Imaginary sailors, formerly borne on the books as A.B.s for wages in every ship in commission; they ceased with the consolidated pay at the close of the war. The institution was dated 24 Geo II; to meet widows' pensions; the amount of pay and provisions for two men in each hundred was paid over by the paymaster-general of the navy



was contained in the 1824 edition of the *Regulations* but had been removed by 1833.

In 1844 *The Queen's Regulations for the Government of Her Majesty's Service* relaxed the weekly muster requirement to 'at least twice a month.'

*Instructions Relating to His Majesty's Service at Sea*, 1833, gives instruction on the keeping of the Muster List, under the heading Captain, at items 2 and 3, pp. 58–64. He is to keep a complete 'Muster Book,' or 'Complete Book,' in which are to be inserted the names of all persons forming the complement of the Ship, with every circumstance relating to them<sup>1</sup>. 'p. 58. This is followed by details of the various lists of Officers, Petty Officers etc. On a separate List are to be entered the Names of the Marines forming part of the Ship's Company, with all the particulars relating to them.' p. 59. The Captain is to be very careful that this Book is kept with the utmost correctness, and that there are no irregularities in any part of it... He is, himself, to muster every Person on Board regularly twice a Month, and to enter the result of each Muster in the Ship's Muster Table. ... Any Man absent from the Service, without leave, for Twenty-one Days, is to be marked on the Muster Book, 'Run,' without any regard to the number of Musters he may have missed. 'p. 60. Upon the Ship's being paid off, her original Muster, or Complete Books in a perfect state for the whole period She was in Commission, are to be transmitted to the Admiralty Office.

The Open List is to be carefully kept in the Form provided for this Book. 'p. 61. This latter was a discrete gathering within the Muster List showing the names of the entire Ship's Company with their numbers, as in the Muster List itself, and containing a record of all musters. These show that the musters were carried out by a variety of officers at home and Crozier himself while away<sup>2</sup>. The space for recording the muster of men marked D (discharged), Dsq (discharged to sick quarters), DD (discharged dead), R (run, formerly runaway) was ruled through from the time they left the ship, and those checked to duty outside the ship was indicated as such.

The Purser's 'Victualling Book' being abolished, and the additional Columns of the 'Muster Book' being now to answer all purposes connected with Claims to Victualling, &c., the Book which the Purser keeps for his own guidance is in consequence to be compared with the Ship's 'Open List' at each of the Captain's Musters. 'p. 62.

A Certificate is to be written at the end of the Ship's Company, of the Articles of War having been read. 'p. 64.

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to the widows' fund.

<sup>1</sup> The list included among other columns, Number, date of joining, whence, pressed or volunteer, place of birth, name, rate, discharge with date, conduct certificate, details of pay e.g. allotment, slops (clothes purchased), tobacco, soap, stoppages, advanced allowance, straggling or run deduction (see Appendix 3), and sale of dead and run men's effects. *Regulations for His Majesty's Service at Sea*, 1833, pp. 46–7, Captain's instructions, state 'For the better security of the interest of the Public Service, no Man is to be permitted, on the first fitting out of a Ship, to sign a Declaration of allotment of part of his Wages, until the Ship is nearly ready for Sea, and the Crew have been inspected by the Admiral or Senior Officer of the Port; and the commencement of every allotment is to be regulated by the amount of charges incurred by a Man, or likely to be incurred by him, up to the period of the Ship's sailing; that is to say, if a Man has received Slops or other allowances to a certain amount, and is to be paid two months' advance, his allotment should be regulated so as to prevent his being in Debt at the expiration of the first six months. He is to be very exact in noting the time of any Man's death, Discharge, or Desertion, and is to inform the Secretary of the Admiralty thereof, if the man should have allotted part of his Pay, in order that the same may be stopped.'

<sup>2</sup> At Chatham the musters were carried out by Captain Jenkin Jones of HMS *Curaçoa*, Captain John Clavell, Captain-Superintendent Chatham Yard, Captain Ross HMS *Erebus*, and Captain Charles Henry Paget, HMS *Howe*, who all signed the muster book. The muster on 2 September 1839 was carried out by 'Lords of the Admiralty', who did not sign. The ships were visited that day by the Earl of Minto (First Lord), Vice Admiral Sir Charles Adam and Rear Admiral Sir William Parker, the three senior Lords Commissioners of the Admiralty. Ross, *Discovery*, I, p. 1.

On return to Sheerness the muster was carried out by Vice Admiral Sir Edward Brace, Flag Officer at the Nore.

## APPENDIX 6

### Articles of War

In Royal Naval vessels their Captains were required to display and read the Articles of War to their respective Ship's Companies. The rules in force, when the expedition sailed, for this were contained in the *Instructions relating to His Majesty's Service at Sea*, 1833, Captain: Discipline, item 26. Which states: He is to take care that the Articles of War, and the Abstracts of the Acts of Parliament for the encouragement of Seamen, be hung up in some public part of the Ship, and be read Monthly as directed by Law. '

In 1839, when the expedition sailed, the relevant Act was *An Act for amending, explaining and reducing into one Act of Parliament, the Laws relating to the Government of His Majesty's Ships, Vessels and Forces by Sea*, 22° Geo. 11 c.33 (1749), which had been amended once, by 19 Geo.III. cap. 17.

The Act of George II started by repealing all Acts relating to Sea Service from the time of Charles II until that time and enacting a new set of Articles.

**Commencement of the Articles.** And for the regulating and better Government of his Majesty's Navies, Ships of War, and Forces by Sea, whereon, under the good Providence of God, the Wealth, Safety, and Strength of this Kingdom chiefly depend; Be it enacted by the King's most Excellent Majesty, by and with the Advice and Consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the Authority of the same, That from and after the twenty-fifth Day of December one thousand seven hundred and forty-nine, the Articles and Orders herein and after following, as well in Time of Peace as in Time of War, shall be duly observed and put in Execution, in Manner herein after-mentioned.

#### I

**Publick Worship to be performed.** All Commanders, Captains, and Officers, in or belonging to any of His Majesty's Ships or Vessels of War, shall cause the publick Worship of Almighty God, according to the Liturgy of the Church of England established by Law, to be solemnly, orderly, and reverently performed in their respective Ships, and shall take care that Prayers and Preaching, by the Chaplains in Holy Orders of their respective Ships, be performed diligently; and that the Lord's Day be observed according to Law.

#### II

**Penalty of profane Swearing, &c.** All Flag Officers, and all Persons in or belonging to his Majesty's Ships or Vessels of War, being guilty of profane Oaths, Cursings, Execrations, Drunkenness, Uncleaness, or other scandalous Actions, in Derogation of God's Honour, and Corruption of good Manners, shall incur such Punishment as a Court-Martial shall think fit to impose, and as the Nature and Degree of their Offence deserve.

#### III

**Penalty of holding illegal Correspondence with an Enemy.** If any Officer, Marine, Soldier, or other Person of the Fleet, shall give, hold, or entertain intelligence to or with any Enemy or Rebel, without Leave from the King's Majesty, or the Lord High Admiral, or the Commissioners for executing the Office of Lord High Admiral, Commander in Chief, or his Commanding Officer, every such Person so offending and being thereof convicted by Sentence of Court-martial, shall be punished with Death.

#### IV

**of not acquainting the superior Officer with any Message from an Enemy.** If any Letter or Message from any Enemy or Rebel, be conveyed to any Officer, Mariner, or Soldier, or other in the Fleet, and the said Officer, Mariner Soldier, or other aforesaid, shall not within twelve Hours, having Opportunity so to do, acquaint his superior Officer, or the Officer commanding in Chief, with it; or if any superior Officer being

acquainted therewith, shall not in convenient Time reveal the same to the Commander in Chief of the Squadron, every such Person so offending, and being convicted thereof by the Sentence of the Court-martial, shall be punished with Death, or such other Punishment as the Nature and Degree of the Offence shall deserve, and the Court-martial shall impose.

## V

**of Spies and of delivering seducing Letters &c.** All Spies, and Persons whatsoever, who shall come or be found, in the Nature of Spies, to bring or deliver any seducing Letters or Messages from any Enemy or Rebel, or endeavour to corrupt any Captain, Officer, Mariner, or other in the Fleet, to betray his Trust, being convicted of any such Offence by Sentence of the Court-martial, shall be punished with Death, or such other Punishment as the Nature and Degree of the Crime shall deserve, and the Court-martial shall impose.

## VI

**of relieving an Enemy.** No Person in the Fleet shall relieve an Enemy or Rebel with Money, Victuals, Powder, Shot, Arms, Ammunition, or any other Supplies whatsoever, directly or indirectly, upon Pain of Death, or such other Punishment as the Court-martial shall think fit to impose, and as Nature and Degree of the Crime shall deserve.

## VII

**of not sending all Papers found aboard Prize Ships.** All the Papers, Charter Parties, Bills of Lading, Passports, and other Writings whatsoever, that shall be taken, seized or found aboard and Ship or Ships which shall be surprised or taken as Prize, shall be duly preserved, and the very Originals shall, by the Commanding Officers of the Ship which shall take such Prize, be sent entirely, and without Fraud, to the Court of Admiralty, or such other Court of Commissioners, as shall be authorized to determine whether such Prize be lawful Capture, there to be viewed, made use of, and proceeded upon according to law; upon Pain that every Person offending herein, shall forfeit and loose his Share of the Capture, and shall suffer such further Punishment, as the Nature and Degree of his Offence shall be found to deserve and the Court-martial shall impose.

## VIII

**of taking Effects out of any Prize before condemned.** No Person in or belonging to the Fleet shall take out of any Prize, or Ship seized for Prize, any Money, Plate, or Goods, unless it shall be necessary, for the better securing thereof, or for the necessary Use and Service of any of his Majesty's Ships or Vessels of War, before the same be adjudged lawful Prize in some Admiralty Court; but the full and entire Account of the whole, without Embezzlement, shall be brought in, and Judgement passed entirely upon the whole without Fraud; upon Pain that every Person offending herein, shall forfeit and loose his Share of the Capture, and suffer such further Punishment, as shall be imposed by a Court-martial, or such Admiralty Court, according to the Nature and Degree of his Offence.

## IX

**of Stripping or ill using Persons taken on board a Prize.** If any Ship or Vessel shall be taken as Prize, none of the Officers, Mariners, or other Persons on board her, shall be stripped of their Cloaths, or in any sort pillaged, beaten, or evil-treated; upon Pain that the Person or Persons so offending, shall be liable to such Punishment as a Court-martial shall think fit to inflict.

## X

**of not preparing for Fight, and encouraging the Men in time of Action.** Every Flag Officer, Captain and Commander in the Fleet, who, upon Signal or Order to Fight, or Sight of any Ship or Ships which it may be his Duty to engage, or who, upon Likelihood of Engagement, shall not make the necessary Preparations for Fight, and shall not in his own Person, and according to his Place, encourage the inferior Officers and men to fight courageously, shall suffer Death, or such other Punishment as from the Nature and Degree of the Offence a Court-martial shall deem him to deserve; and if any Person in the Fleet shall treacherously or cowardly yield or cry for Quarter, every Person so offending, and being convicted thereof by the sentence of a Court-martial, shall suffer Death.

## XI

**of disobeying Orders in time of Action &c.** Every Person in the Fleet, who shall not duly observe the Orders of the Admiral, Flag Officer, Commander of any Squadron or Division, or other his superior Officer, for assailing, joining Battle with, or making Defence against any Fleet Squadron or Ship, or shall not obey the Orders of his superior Officers as aforesaid in Time of Action, to the best of his Power, or shall not use all possible Endeavours to put the same effectually in Execution, every such Person so offending, and being convicted thereof by the Sentence of the Court-martial shall suffer Death, or such other Punishment, as from the Nature and Degree of the Offence a Court-martial shall deem him to deserve.

## XII

**of Cowardice or Neglect of Duty in time of Action.** Every Person in the Fleet, who through Cowardice, Negligence, or Disaffection, shall in Time of Action withdraw or keep back, or not come into the Fight or Engagement, or shall not do his utmost to take or destroy every Ship which it shall be his Duty to engage, and to assist and relieve all and every of his Majesty's Ships, or those of his Allies, which it shall be his Duty to assist and relieve, every such Person so offending, and being convicted thereof by the Sentence of Court-martial, shall suffer Death.

## XIII

**of not pursuing the Enemy, and in time of action not assisting a Friend.** Every Person in the Fleet, who through Cowardice, Negligence, or Disaffection, shall forebear to pursue the Chace of any Enemy, Pirate, or Rebel, beaten or flying; or shall not relieve or assist a known Friend in View to the utmost of his Power; being convicted of any such Offence by the Sentence of a Court-martial, shall suffer Death.

## XIV

**of delaying or discouraging the Service on Account of Wages, &c.** If when Action, or any Service shall be commanded, any Person in the Fleet shall presume to delay or discourage the said Action or Service, upon Pretence of Arrears of Wages, or upon any Pretence whatsoever, every Person so offending, being convicted thereof by the Sentence of the Court-martial, shall suffer Death, or such other Punishment, as from the Nature and Degree of the Offence a Court-martial shall deem him to deserve.

## XV

**of deserting or running away with Ship or Stores.** Every Person in or belonging to the Fleet, who shall desert to the Enemy, Pirate or rebel, or run away with any of His Majesty's Ships or Vessels of War, or Ordnance, Ammunition, Stores, or Provision belonging thereto, to the weakening of the service, or yield up the same cowardly or treacherously to the Enemy, Pirate, or rebel, being convicted of any such Offence by the Sentence of the Court-martial, shall suffer Death.

## XVI

**of deserting, or inticing others.** Every Person in or belonging to the Fleet, who shall desert or intice others so to do, shall suffer Death, or such other Punishment as the Circumstances of the Offence shall deserve, and a Court-martial shall judge fit: And if any Commanding Officer of any of his Majesty's Ships or Vessels of War shall receive or entertain a Deserter from any other of his Majesty's Ships or Vessels, after discovering him to be such Deserter, and shall not with all convenient Speed give Notice to the Captain of the Ship or Vessel to which such Deserter belongs; or if the said Ships or Vessels are at a considerable distance from each other, to the Secretary of the Admiralty, or to the Commander-in-Chief; every Person so offending, and being convicted thereof by the Sentence of the Court-martial, shall be cashiered.

## VII

**of not taking Care of Ships under Convoy.** The Officers and Seamen of all Ships appointed for Convoy and Guard of Merchant Ships, or any other, shall diligently attend upon that Charge, without Delay, according to their Instructions in that Behalf; and whosoever shall be faulty therein, and shall not faithfully perform their Duty, and defend the Ships and Goods in their Convoy, without either diverting to other Parts or Occasions, or refusing or neglecting to fight in their Defence, if they be assailed, or running away cowardly, and submitting the Ships of their Convoy to Peril and Hazard; or shall demand or exact any Money or other Reward from any Merchant or Master for convoying of any Ships or Vessels instructed to their Care, or shall misuse the Masters or Mariners thereof; shall be condemned to make Reparation of the Damage to the Merchants, Owners, and others as the Court of Admiralty shall adjudge, and also be punished criminally according to the Quality of their Offences, be it by Pains of Death or other Punishment, according as shall be adjudged by the Court-martial.

## XVIII

**of taking Goods on board other than Gold, Silver, Jewels &c.** If any Captain, Commander, or other Officer of any of his Majesty's Ships or Vessels, shall receive on board, or permit to be received on board such Ship or Vessel, any Goods or Merchandizes whatsoever, other than for the sole use of the Ship or Vessel, except Gold, Silver, or Jewels, and except the Goods and Merchandizes belonging to any Merchant or other Ship or Vessel which may be shipwrecked, or in imminent danger of being shipwrecked, either on the High Seas, or in any Port, Creek, or Harbour, in order to preserve them for their proper Owners, and except such Goods or Merchandizes as he shall at any Time be ordered to take or receive on board by Order of the Lord High Admiral of Great Britain, or the Commissioners for executing the Office of the Lord High Admiral for the Time being; every Person so offending, being convicted thereof by the Sentence of the Court-martial, shall be cashiered, and be for ever afterwards rendered incapable to serve in any Place or Office in the Naval Service of his Majesty, his Heirs and Successors.

## XIX

**of mutinous Assemblies or uttering seditious Words.** If any Person in or belonging to the Fleet shall make or endeavour to make any mutinous Assembly upon any Pretext whatsoever, every Person offending herein, and being convicted thereof by the Sentence of the Court-martial, shall suffer Death: And if any Person in or belonging to the Fleet shall utter Words of Sedition or Mutiny, he shall suffer Death, or such other Punishment as a Court-martial shall deem him to deserve: And if any Officer, Mariner, or Soldier in or belonging to the Fleet, shall behave himself with contempt to his superior Officer, such superior Officer being in the Execution of his Office, he shall be punished according to the Nature of the Offence by Judgement of a Court-martial.

## XX

**of concealing mutinous Practice or Words.** If any person in the Fleet shall conceal any traitorous or mutinous Practice or Design, being convicted thereof by the Sentence of a Court-martial, he shall suffer Death, or such other Punishment as a Court-martial shall think fit; and if any Person, in or belonging to the Fleet, shall conceal any traitorous or mutinous Words spoken by any, to the Prejudice of his Majesty or Government, or any Words, Practice, or Design, tending to the Hindrance of the Service, and shall not forthwith reveal the same to the Commanding Officer, or being present at any Mutiny or Sedition, shall not use his utmost Endeavours to suppress the same, he shall be punished as a Court-martial shall think he deserves.

## XXI

**of endeavouring to stir up Disturbance on Account of unwholesomeness of Victual &c.** If any Person in the Fleet shall find cause of Complaint of the Unwholesomeness of the Victual, or upon other just Ground, he shall quietly make the same known to his Superior or Captain, or Commander in Chief, as the Occasion may deserve, that such present Remedy may be had as the Matter may require; and the said Superior, Captain, or Commander in Chief, shall, as far as he is able, cause the same to be presently remedied; and no Person in the Fleet, upon any such or other Pretence, shall attempt to stir up any Disturbance, upon Pain of such Punishment as a Court-martial shall think to inflict, according to the Degree of the Offence.

## XXII

**of Striking, &c a Superior, or disobeying his lawful command.** If any Officer, Mariner, Soldier, or other Person in the Fleet, shall strike his superior Officer, or draw, or offer to draw, or lift up any Weapon against him, being in the Execution of his Office, on any Pretence whatsoever, every such Person, being convicted of any such Offence by the Sentence of a Court-martial, shall suffer Death; and if any officer, Mariner, Soldier, or other Person in the Fleet shall presume to quarrel with any of his superior Officers, being in the Execution of his Office, or shall disobey any lawful Command of any of his superior Officers, every such Person being convicted of any such Offence, by the Sentence of a Court-martial, shall suffer death, or such other punishment, as shall, according to the Nature and degree of his Offence, be inflicted upon him by the Sentence of a Court Martial.

## XXIII

**of Quarrelling, or using reproachful Speeches &c.** If any Person in the Fleet shall quarrel or fight with any other Person in the Fleet, or use reproachful or provoking Speeches or Gestures, tending to make any Quarrel or Disturbance, he shall upon being convicted thereof, suffer such Punishment as the Offence shall deserve, and a Court-martial impose.

## XXIV

**or wasting Stores &c.** There shall be no wasteful Expense of any Powder, Shot, Ammunition, or other Stores in the Fleet, nor any Embezzlement thereof, but the Stores and Provisions shall be carefully preserved, upon Pain of such Punishment to be inflicted upon the Offenders, Abettors, Buyers, and Receivers (being Persons subject to Naval Discipline) as shall be by a Court-martial found just in that Behalf.

## XXV

**of burning any Magazine or Vessel, &c not belonging to an Enemy.** Every person in the Fleet, who shall unlawfully burn or set Fire to any Magazine or Store of Powder, or Ship, Boat, Ketch, Hoy, or Vessel, or Tackle, or Furniture thereunto belonging, not then appertaining to an Enemy, Pirate, or Rebel, being convicted

of any such offence, by the Sentence of a Court-martial, shall suffer Death.

#### XXVI

**of Neglect in conducting and steering.** Care shall be taken in the conducting and steering of any of his Majesty's Ships, that through Wilfulness, Negligence, or other Defaults, no Ship be stranded or run upon any Rocks or Sands, or split or hazarded, upon Pain, that such as shall be found guilty therein, be punished by Death, or such other punishment as the Offence by a Court-martial shall be judged to deserve.

#### XXVII

**of sleeping on Watch, &c.** No Person in or belonging to the Fleet shall sleep upon his Watch, or negligently perform the Duty imposed on him, or forsake his Station, upon Pain of Death, or such other Punishment as a Court-martial shall think fit to impose, and as the Circumstances of the Case shall require.

#### XXVIII

**of Murder.** All Murders committed by any Person in the Fleet, shall be punished with Death by the Sentence of a Court-martial.

#### XXIX

**Buggery.** If any Person in the Fleet shall commit the unnatural and detestable Sin of Buggery or Sodomy with Man or Beast, he shall be punished with Death by the Sentence of a Court-martial.

#### XXX

**Robbery.** All Robbery committed by any Person in the Fleet, shall be punished with Death, or otherwise, as a Court-martial, upon Consideration of Circumstances, shall find meet.

#### XXXI

**False musters.** Every Officer or other Person in the Fleet, who shall knowingly make or sign a false Muster or Muster-book, or who shall command, counsel, or procure the making or signing thereof, or who shall aid or abet any other Person in the making or signing thereof, shall, upon Proof of any such Offence being made before a Court-martial, be cashiered, and rendered incapable of further Employment in His Majesty's Service.

#### XXXII

**not apprehending Prisoners, and permitting Escapes.** No Provost-martial belonging to the Fleet shall refuse to apprehend any Criminal, whom he shall be authorized by legal Warrant to apprehend, or to receive or keep any Prisoner committed to his Charge, or wilfully suffer him to escape, being once in his Custody, or dismiss him without lawful Order, upon Pain of such Punishment as a Court-martial shall deem him to deserve: and all Captains, Officers and others in the Fleet, shall do their Endeavour to detect, apprehend, and bring to Punishment all Offenders, and shall assist the Officers appointed for that Purpose therein, upon Pain of being proceeded against, and punished by a Court-martial, according to the Nature and Degree of the Offence.

#### XXXIII

**scandalous oppressive or fraudulent Behaviour of Officers.** If any Flag Officer, Captain or Commander, or Lieutenant belonging to the Fleet, shall be convicted before a Court-martial of behaving in a scandalous,

infamous, cruel, oppressive, or fraudulent Manner, unbecoming the Character of an Officer, he shall be dismissed from his Majesty's Service.

#### XXXIV

**Mutiny, Desertion or Disobedience on Shore.** Every Person being in actual Service and full Pay, and Part of the Crew in or belonging to any of his Majesty's Ships or Vessels of War, who shall be guilty of Mutiny, Desertion, or Disobedience to any lawful Command, in any Part of his Majesty's Dominions on Shore, when in actual Service relative to the Fleet, shall be liable to be tried by a Court-martial, and suffer the like Punishment for every such Offence, as if the same had been committed at Sea on Board any of his Majesty's Ships or Vessels of War.

#### XXXV

**committing on Shore any of the Crimes punishable by these Articles.** If any Person who shall be in the actual Service and full Pay of his Majesty's Ships and Vessels of War, shall commit upon the Shore in any Place or Places out of his Majesty's Dominions, any of the crimes punishable by these Articles and Orders, the Person so offending shall be liable to be tried and punished for the same in like Manner, to all Intents and Purposes, as if the said Crimes had been committed at Sea, on Board any of his Majesty's Ships or Vessels of War.

#### XXXVI

**Other Crimes not Capital, &c. to be punished according to the Custom of the Navy.** All other Crimes not Capital, committed by any Person or Persons of the Fleet, which are not mentioned in this Act, or for which no Punishment is hereby directed to be inflicted, shall be punished according to the Laws and Customs in such Cases used at Sea.

Provided always, That no Person convicted of any Offence shall, by the Sentence of any Court-martial to be held by virtue of this Act, be adjudged to be imprisoned for a longer Term than the Space of two Years.

The Act then goes on to detail the regulations for the holding of Courts-martial, who was entitled to convene them and the number of Flag Officers, Captain and Commanders (not more than thirteen and not less than five) required to sit on them. The sentence of Death (except in Cases of Mutiny) 'was not to be carried out without approval of the Lord High Admiral or Commissioners for executing the Office of the Lord High Admiral, or, overseas, the Commander in Chief. The Senior Officer of five or more ships, assembled in port overseas, was entitled to order the holding of a Court-martial, but, in this case, a sentence of death (except in Cases of Mutiny) 'needed the approval of the Lord High Admiral or Commissioners for executing the Office of the Lord High Admiral, before it could be carried out.

The Act of George III amended the rules for the absence of a member of the board of a Court-martial, but made no other change.



## APPENDIX 7

## Standing Orders and Routines

In 1837, Lieutenant Alex. Dingwall Fordyce published *Outlines of Naval Routine*, in which he gives an outline for the Captain's Standing Orders, taken from the orders of different Officers of note, whose Ships were in high order,<sup>1</sup> and suggested routines for naval vessels. Extracts from these are given below to indicate the sort of orders Captain Crozier is likely to have issued. It must, however, be born in mind that he is also likely to have issued orders to cover the conditions in which *Terror* had to operate. The timing of work and meals on board is also likely to have been dependant, to a certain extent, on the hours of daylight, and so may have varied considerably.

Captain's Standing Orders<sup>2</sup>

1. It appearing to me necessary to establish the following Regulations, in addition to the General Printed Instructions, for the observance of the Officers and Petty Officers of His Majesty's Ship under my command, it is strictly required that they be obeyed in the fullest manner, until contradicted or altered by me.

2. When I am out of the Ship, as the First Lieutenant is accountable to me for every thing that happens in my absence, and as all my orders will then go through him, he is to be considered as Captain for the time, and all his orders are to be strictly obeyed and enforced.

3. When the Ship is moored, three Commissioned Officers<sup>3</sup>, the Master being included as one, are constantly to be on board, except when called on duty, or my assent being obtained for more having leave of absence.

When at single Anchor, the First Lieutenant will give no leave of absence, without my previous permission. When leave is given to an Officer, he is to consider it for 24 hours only, unless expressly stated otherwise.

4. The respective Day-Mates will have charge of the Lower and Main Decks; the Boatswain, and Forecastle Midshipman, under the Officer of the Watch of the Forecastle. The Officers of the Morning Watch will attend in person to the cleaning and putting to rights the Lower Deck, after breakfast; reporting it when done to the First Lieutenant, who will then inform me of its being ready for inspection. It is expected and hoped that the Officer of the Watch, not only of the Morning Watch, but in Day Watches, will recollect how much may be done towards the Man-of-War like appearance of a Ship, by a constant and watchful attention to the neatness of the Decks, as well as of every thing aloft. They are requested to be particularly vigilant in seeing the Sails well set, Sheets close home, Staysails and Jibs well stowed, if down; and, without enumerating every different means, very few hands and little time will be taken up by this common and habitual practice with Watch-keeping Officers.

5. At Sea, the Hammocks are to be piped up at 6 Bells, A.M. [0700]; when every Officer in the Ship will attend to his Division (except the Lieutenant of the Middle Watch), and see that they are well and tightly lashed up, with 7 turns, including the end ones. They are, when possible, to have two Blankets, one Bed, and one Pillow, but no more of any thing. Those whose Hammocks are badly lashed up, to be made to do it, till well done, without wrinkles, &c.; and obstinate cases to be reported.

6. In the forenoon, the First Lieutenant will arrange the distribution of the Watch on Deck; and, if the weather will admit, the Gunner will daily, after application to the First Lieutenant, exercise three Guns, from 9h. 30m. to 11h. 30m. Every thing to be clean swept at 7 Bells [1130], preparatory to Dinner exactly at 12. At 4 in the afternoon, the Decks are to be cleaned up, and all Lumber sent below to the places appropriated for it. No Clothes are ever to be suffered to lie about, or to be hung up, without special leave from the First

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<sup>1</sup> Fordyce, *Outlines of Naval Routine*, p. 56.

<sup>2</sup> Ibid. pp. 56-60.

<sup>3</sup> In *Terror* there were only three commissioned officers (one of whom was left in the observatory in Hobart) and the master, so, while an order in this form is likely, it could not require three officers to remain on board.

Lieutenant.

7. The Well, at night, is to be sounded, and reported to the Officer of the Watch every two hours; and the ship to be pumped out every Middle Watch.

8. All complaints are to come to me through the First Lieutenant. When any Boat leaves the Ship at Sea for a short time, the Boat's Crew of the Watch will go in her; and if any difficulty arise, from sickness or other causes, the First Lieutenant will, on application, fill it up from the Watch on Deck. The Watch below, except in cleaning the Lower Deck, are never to be interfered with at all; but all jobs between Decks are to be done by parties sent from the Deck for that purpose.

In working Ship with the Watch, the Officer will, if every thing is clear and no cause for its being otherwise, enforce the alert and quick manner of doing things, by giving every encouragement when well done; and if it appear beneficial, repeat the operation, if ill done, until it improves. By this means, and a mild steady system of practice, the men will shortly feel convinced the only object in view is to have the duty properly done; and very little of any thing but clear orders will be necessary.

9. No Officer is every to punish, or order to be punished, any man corporally; but, when necessary, complaints are to come to me through the usual channel. The Watch is never to be turned up at Sea after meals, without first letting me know when they have had their time.

10. The Timekeepers are to be wound up every morning at 8; and the Sentry at the Cabin door<sup>1</sup> is not to be relieved till he has ascertained that they have been wound up, and reported their being so to the Officer of the Watch, who is to report to me.

11. The Fire, and Ship's Company Lights, are to be put out every night at 8; the Steerage Lights at 9; and the Gun-room at 10; and no Officer or any other person is, on any account, to read in bed by the light of a candle.

12. No private Gunpowder is to be permitted on board, unless deposited in the Magazine. No Stock or Animals, including Dogs, are to be brought on board, except such as can be stowed in the proper Pens and Coops. No Lumber is to be brought on board, except what can be conveniently stowed in the Owner's Cabin, if he have one.

13. No unslacked Lime is to be stowed below, nor Straw used in the Store Rooms.

14. No lounging, sitting, skylarking, or loud talking, to take place on the Quarter-deck; and no one, except on duty, to lean upon Hammocks or stand upon the Guns.

15. If a Man fall overboard while Studding-sails are set, the Hands to be piped, 'Shorten Sail.' If not set, 'About Ship,' and one or more men in each Top and Rigging to be instantly ordered to keep sight of their unfortunate Shipmate; and this, in addition to all other available means of saving him, which are to be instantly resorted to.

16. The different Officers and Petty Officers are to have in their possession, and forthcoming if called for, complete Watch Bills, General Quarter Bills, Division Lists, and General Station Bills, and these made out neatly enough to be legible. The respective Officers will sign their names to these Orders, in acknowledgement of having a copy of them.

The orders go on to specify the duties of the Gunner, Carpenter, and Boatswain.

#### Routine

0330	Get ready for washing decks
0400	Holystone or scrub Upper deck
Daylight	Take off lookout men and place them at Mast-head
0600	Make and Reset sail
0645	Lash up Hammocks
0700	Muster and stow
0725	Watch flemish ropes and spread awning
	Watch below clean Lower deck
0800	Breakfast

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<sup>1</sup> It was the standard practice for a Marine Sentry to be stationed at the door of the Captain's Cabin. The Captain's cabin is normally referred to as The Cabin.

0900	Clean decks
1000	Divisions, Work or exercise Arms, Guns etc by watch
1130	Clear decks, Up Spirits
1200	Dinner
1300	Clean up decks
1400	Pump water and serve out
1610	Clear decks and furl awnings
1700	Supper
1730	Evening quarters
Dusk	Place look-outs on deck Mast-head men down
2000	Down Hammocks
2010	Ship 's Company Fire & Lights out
2100	Steerage Lights out
2200	Gun-room Lights out.

The routine was varied from day to day throughout the week and that given above provides the basis of the fixed events which took place every day; Divisions and Evening Quarters did not take place every day.

## APPENDIX 8

### Sounding

Captain Ross used a reel of line carried away in a boat for deep soundings, since he believed the boats were less subject to drifting than the ship. The amount of line was timed as it ran out, every hundred fathoms, and a marked slowing down in the rate indicated that the bottom had been reached. This proved reasonably accurate in depths down to 2500 fathoms, but it was remarkably difficult to detect the slowing down, and this resulted in some erroneous depths. i.e. the Ross Deep where he sounded with 4000 line apparently without finding bottom, where the *Scotia* subsequently recorded a depth of 2660 fathoms only two miles away during Scottish Antarctic expedition, 1902-4<sup>1</sup>.

Extract from a letter from Capt. James Ross R.N. to the Hydrographer of the Admiralty.

H.M.S. Erebus, at sea 3rd. March, 1840

(Lat. 33°21'S. long 9°4'E.)

I have just obtained another deep sounding, and although we have not yet been able to get down as far as I wished, and still hope to do, I am quite satisfied that if we get into any sea deep enough, we shall have no difficulty in accomplishing it. The weight employed was 540lbs., and we had on the reel something more than 5000 fathoms of line: the first 437 fathoms were a single strand of whale line; the rest was of two strands of three-yarn spunyarn, and the following are the times of each of the marks passing off the reel.

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<sup>1</sup> Rice, Tony, *British Oceanographic Vessels*, pp. 63-8.

		h. m. s.	Intervals
Let go at		10 33 58	
	50 fathoms	34 23	0 25
	100	34 53	0 30
	150	35 22	0 29
	200	35 54	0 32
	250	36 26	0 32
	300	37 3	0 37
	350	37 40	0 37
	400	38 20	0 40
	477	39 32	
next	100	40 59	
	200	42 31	1 32
	300	44 8	1 37
	400	45 48	1 40
	500	47 28	1 40
	600	49 14	1 46
	700	51 2	1 48
	800	52 58	1 56
	900	54 56	1 58
	1000	56 56	2 00
	100	58 56	2 00
	200	11 0 56	2 00
	300	2 55	1 59
	400	5 2	2 7
	500	7 14	2 12
	600	9 27	2 13
	700	11 42	2 15
	800	13 58	2 16
	900	16 19	2 21
	2000	18 44	2 25
	100	21 11	2 27
	200	23 37	2 26
		stopped exactly at the mark.	
Total	2677 fathoms	29 39 time of sounding	

Crozier took down the time of each mark passing off the reel, and when the weight struck the bottom, it stopped so suddenly that the boats' crews all cried out, "It is down." We veered away 50 fathoms afterwards, and then hauled in again, but could not get an inch more than the mark at which it first struck. Nothing could be more satisfactory than this sounding, and it is more so from shewing very plainly that we have the means of getting soundings however deep the sea may be, and I trust our next trial will be in deeper water. I have ordered the line to be again completed to 5000 fathoms; but it would be useless to attempt it any more on this side of the Cape.

Ever yours faithfully  
James F. [C.] Ross.<sup>1</sup>

Extract from a letter from an officer of H.M.S. Erebus, 7 February 1840.

Perhaps the most interesting of our achievements will be the fact of our having gained bottom, at two

<sup>1</sup> *Nautical Magazine and Naval Chronicle*, 1840, pp. 507-8.

thousand four hundred and twenty six fathoms, in latitude 27°24'S. longitude 17°30'W. both ships being becalmed on the edge of the S.E. trade. A line of 3600 fathoms of spun-yarn being prepared, a weight of 72lbs was attached to it, and two boats were lowered to buoy up the line. The first 100 fathoms took 35 seconds reeling off, — the last nearly 6 minutes; we lifted the lead more than once, but of course the spun-yarn broke in the attempt to haul it up<sup>1</sup>.

## APPENDIX 9

### HMS *Terror*

HMS *Terror* was a bomb, built by Davey of Topsham, to the *Vesuvius* design; ordered 30 March 1812 and launched 29 June the next year. She was 102 feet long, on the range of deck (i.e. between perpendiculars), and 83 feet 10 inches on the keel, 27 feet beam and 12 feet 6 inches depth in hold and 326 tons<sup>2</sup>. Originally she would have carried two mortars, 1 x 13" and 1 x 10", together with 2 six-pounder long guns and 8 twenty-four pounder carronades. The design called for very strong and heavy construction to take the recoil forces generated by the discharge of the mortars, which were normally fired at an elevation of 45°. She had three masts and was ship rigged, i.e. with square sails on all masts<sup>3</sup>.

*Terror* served in the American war in 1815, after which she was paid off and lay in ordinary<sup>4</sup>, in Portsmouth, until 1828. She was then commissioned for work in the Mediterranean, but having been wrecked near Lisbon, returned to Plymouth for repairs. In 1836 *Terror*, without the mortars and barque rigged (square sails on fore and main masts and fore and aft sails on mizzen), was specially strengthened for work in the Arctic when a large number of whalers was detained by ice in Baffin Bay. She was then commissioned under the command of Captain George Back who was ordered to proceed to Hudson's Strait and thence to either Repulse Bay, Regent's Inlet or Wager Bay and find a secure shelter for the ship. He was then to take his boats across the isthmus of Melville Peninsula and survey the coastlines to connect with the previous work in the area north to Prince Regent Inlet. He was, if possible, to return the same year. In the event *Terror* was caught in the ice 136 miles short of Repulse Bay and severely damaged. On 15 March a tremendous rush of ice, from the north-west took the ship astern, and although buried to the flukes of the anchor in a dock of ice, such was the pressure, that she was forced upon it, and, at the same time, thrown over to starboard - the sternpost was carried away and the stern lifted seven feet out of the water. The same night, a second rush of ice tore up the remnants of our floe, and forced the ship on the ice, so that her forefoot was quite out of water — her sunken stern was threatened by an overhanging wave of ice, full thirty feet high ... the water poured in through the stern-frame — and the ship creaked and strained in every direction.<sup>5</sup> They prepared to abandon ship, which finally proved unnecessary. Eventually the ship escaped from the ice. Her condition was such that they had to pass a length of stream cable under the hull, four feet forward of the mizzen mast, and haul it tight on the capstan to prevent the hull breaking up. With her crew racked by scurvy and the pumps continually working, the ship finally made it across the Atlantic to Lough Swilly. By which time she was in such a state that she had to be beached immediately to stop her sinking and in response to a request for help a vessel came from Devonport to take off the sick and another came from Chatham with a team of shipwrights, under the direction of Mr. Rice, to her make her sea-worthy. She was then refloated and escorted back to Chatham for repairs<sup>6</sup>. By 1839 *Terror* had been repaired, by Mr Rice, who also strengthened HMS *Erebus*<sup>1</sup>, and was ready

<sup>1</sup> Ibid. pp. 386–7.

<sup>2</sup> This is Builders Old Measurement. It was a measure of volume of the hull, based on a formula involving length of keel, beam and depth in hold.

<sup>3</sup> Lyon, *The Sailing Navy List*, pp. 147–8.

<sup>4</sup> i.e. laid up, dismantled and moored in the harbour.

<sup>5</sup> Back, *A Brief Narrative*, pp. 458–9.

<sup>6</sup> Ibid. pp. 433–44.

for her next commission.

From the ship's plans, the *Terror* was fitted with Captain Phillips patent capstan<sup>2</sup> situated between the main and mizzen masts on the upper deck. The table on which the azimuth compass was mounted was about 9 feet abaft the capstan. HMS *Beagle* (Commander Pringle Stokes) had been fitted with a similar capstan for her surveys in Estrecho de Magallanes, in 1827, which Commander FitzRoy, when he had taken over command after Stokes's death, had had removed, because of the effect it had on his compass.

The ship carried one pinnace, 28 feet long, one galley 30 feet, two whale boats 30 feet, two cutters 28 feet, one cutter 23 feet, one gig 22 feet, and one dinghy 12 feet. They were all stowed on deck with some of the smaller boats inside the larger boats.

The upper deck was pierced with thirty Preston's patent illuminators, a relatively small thick lens set in a metal frame in the timber of the deck, to allow light from the upper deck to penetrate to the lower deck.

### Heating apparatus

Sylvester's heating apparatus was used in Captain Parry's second voyage for the discovery of the North-west Passage. In his account of this voyage he says '... recourse was also had to the most effective means of producing and distributing it [warmth]. With this view, an apparatus was fixed on the orlop deck of each ship, between the sail-room and the main hatchway, on a plan proposed and executed by Mr. Sylvester, for conveying a current of heated air into the several inhabited apartments. It is described by Mr. Sylvester to "consist of a wrought-iron vessel, about twenty-two inches square, placed upon pillars resting on a cast-iron frame upon the beams of the orlop deck. This vessel, or cockle, was four feet high, close at the top, having an opening in the front for the ash-pit and feeding-door, and another behind for the discharge of the smoke into a perpendicular iron tube. The fire-place is within this vessel, and the heat is given to its interior surface. On the outside is an iron covering containing tubes, which approach, nearly at right angles, to the surface of the cockle; these are divided into two portions, one below to receive the cold air, which impinges upon the cockle; the other above, for the discharge of the warm air. These two cavities are separated from each other by a second casing about four feet square below, for the cold air, and terminating in two feet square at the upper-deck where a part of the warm air is discharged; the rest is conveyed by flues on each side of the ship to the cabins of the commander and officers. The velocity of the warm air current through an aperture two feet square is about five or six feet per second." This stove was intended by the inventor to consume only five pecks, or a bushel and a quarter of coals, by a constant fire throughout the twenty-four hours; but even this quantity was found more than sufficient, except during the most severe part of the second winter.<sup>3</sup>

During *Terror*'s Arctic voyage in 1836-7, under Captain Back, the ship had been fitted with a different apparatus described by him as a purely wrought iron pipe two hundred and forty feet long, an inch in diameter, and of five eighths of an inch bore, extending nearly round the ship and the midship cabins; the solution of strong brine, with which it was filled, by the aid of a strong forcing-pump, being kept hot by means of a furnace, strongly built in brick within an iron tank or casing, in the interior of which several coils of pipe wound round. To guard against accidents, there were expansion tubes abaft the first bend coming from the furnace, which, in case of excessive heat, became filled, and so prevented the bursting of the apparatus. The advantage to be gained over the well tried method adopted by Sir E. Parry was a diminution in the consumption of coals, a bushel being considered quite enough for a day's use. This was not found to answer its intended purpose in the North<sup>4</sup> and Mr. Heath, one of the firm by which the apparatus was

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<sup>1</sup> Ross, *Voyage*, I, p.xix and Appendix I, pp. 327-8.

<sup>2</sup> Captain Phillips stated in his patent application that the improved capstan consists in an arrangement of wheels, cogs and other machinery as hereinafter described by which an increased velocity of motion is given to the whelps and other parts of the capstan connected with them at the expense of a certain degree of power or an increased power by a diminution of the velocity. TNA C54/9908, item 3.

<sup>3</sup> Parry, *Journal of a second voyage*. pp. v-vi.

<sup>4</sup> Back, *Narrative of an expedition*, p. 2.

provided ... declared, 'he would scarcely recommend so novel a scheme on a service such as ours, where, if an accident occurred, there would be considerable difficulty in making the necessary reparations.'"<sup>1</sup>

The *Terror* was fitted with Mr Sylvester's well tried system by the inventor himself. Crozier wrote to Ross 'Mr Sylvester seems a very strange fellow, he talked a great deal in theory but I begged him to fit us as near as possible as he did before ...'<sup>2</sup> From the plans the apparatus was fitted in the *Terror* in the hold and extended up through the orlop to the lower deck where the hot air was distributed. A pipe extends from the bottom of the furnace, up its forward side, to the upper deck, coming out abaft the windless and extending well above the deck, which is presumably the funnel.

## APPENDIX 10

### Ship Magnetism and Swinging Ship

The earth's magnetic field varies over the surface of the earth. Its effect can be likened to that of a bar magnet slightly inclined to the axis of the earth, and is normally considered in its component parts - horizontal and vertical, together with its intensity. The horizontal component is at its maximum at the magnetic equator and minimum at the magnetic poles, retaining its direction, while the vertical component is at its maximum at the magnetic poles and zero at the magnetic equator where it reverses direction. Intensity increases from a minimum at the magnetic equator to a maximum at the magnetic poles.

The magnetism in a ship is normally considered as being of two types, permanent and induced. The permanent magnetism is that induced by the earth's magnetic field in hard iron (normally steel) during the building and fitting out of a vessel, and, as its name implies, can be regarded as permanent. The induced magnetism is that induced in the soft iron in the ship and changes as the field which induces it changes. As a result the effect on the compass of the horizontal component changes with every alteration of course, and that of the vertical component also changes with every alteration of course and, additionally, with change of latitude, reversing on crossing the equator.

A ship is swung to calibrate the compass and record the errors (deviation, or the difference between magnetic north and north as shown by the compass) on different headings<sup>3</sup>. The process involves turning the ship slowly through 360°, normally at anchor using the ship's boats, and taking the compass bearing of some distant object, the correct magnetic bearing of which is already known, on different headings. It could also be done using a theodolite ashore, zeroed on a distant object the bearing of which was known, and observing the bearing of the ship at the same time as the magnetic bearing of the theodolite was taken from the ship. Comparison of the observed and correct magnetic bearings provides a variation table, which can then be applied to all magnetic bearings which, together with the variation gives the true bearings<sup>4</sup>.

Since the vertical component and intensity (i.e. strength of the magnetic field) change with latitude, it is necessary to swing a ship when the latitude changes, and indeed if large masses of iron are moved inside her. Time may also have an effect and a requirement was introduced to swing ships annually<sup>5</sup>.

The problems in wooden ships were largely due to iron carried on board (guns, davits, small arms,

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<sup>1</sup> Ibid. p. 3.

<sup>2</sup> SPRI MS 248/364/3, D.

<sup>3</sup> Permanent magnets are inserted in the binnacle to correct the ship's permanent magnetism, and soft iron, in the form of spheres on either side of the compass and a vertical bar (the Flinders Bar) in front of it, are used to correct the induced magnetism. The positions of these are adjusted to minimise the errors and the deviation table then produced. The correction of compasses in HM Ships did not start until 1844, when the compass of the iron steam-packet *Dover* was corrected; thereafter it was carried out on a very irregular basis. In 1853 the Admiralty directed that deviation should be reduced if the error exceeded one point (eleven and one quarter degrees).

<sup>4</sup> Captain Johnson was appointed in 1842 to advise and instruct the officers of the fleet in the practice of swinging ships and to advise the Master shipwrights of the dockyards on the positioning of the standard compass. Fanning, *Steady as she goes*, pp. 13-4.

<sup>5</sup> Introduced by Admiralty circular dated 12 May 1852. Fanning, *Steady as she goes*, p. 23.

capstan<sup>1</sup>, anchors, chain cables etc.); however the hull of *Erebus* was also strengthened with diagonal iron riders, iron hooks and crutches in the bow and sleepers abaft. <sup>2</sup> *Terror* was also strengthened for work in ice and no doubt had a similar additional amount of iron incorporated in her hull. Errors in wooden hulled ships could normally be corrected by the deviation table, but with the advent of iron hulled ships<sup>3</sup> they became very much greater, and correction was essential.

When a ship heels the iron in her is moved relative to the compass card, and so the deviation is altered. This may have quite an appreciable effect. Rolling can cause the compass card to oscillate, and in a sailing ship, lying over in a stiff breeze this could appear as a steady error and consequently effect the apparent course made good.

The deviation of the compass is also dependant on the position of that compass within the ship, hence bearings are normally taken from a standard compass, mounted so as reduce the effect of the ship's iron, and this is compared frequently with the steering compass.

The variation (difference between true and magnetic north) could always be obtained by taking a magnetic bearing of a heavenly body and calculating its true bearing. At sun rise and sun set this is termed an amplitude and at other times an azimuth. The factors required to carry out the calculation are the altitude of the body, its declination (i.e. its altitude relevant to the celestial equator) and the observer's latitude. This was normally done at regular intervals, sun rise and set if practicable, when the altitude is zero (zenith distance 90°), and tables could be provided, using declination and latitude as arguments obviating the necessity for calculation, to check that the deviation being applied was correct. There are difficulties with this in high latitudes, since, in summer, the sun may not set at all, and if it does it crosses the horizon at a shallow angle, so that it is very difficult to determine the exact time when the zenith distance is 90°, due to uncertainty about the refraction in the atmosphere. It was therefore necessary to take an azimuth, when the sun was about 10°–15° above the horizon, and calculate the true bearing<sup>4</sup>.

A ship that had been swung recently, in the latitude in which she was operating, was therefore able to correct bearings taken with the standard compass and courses steered to their respective true values - an essential requirement for safe navigation and hydrographic surveying.

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<sup>1</sup> Captain FitzRoy, on finding how efficient the windless he had had fitted proved, had Captain Phillips' patent capstan removed from the *Beagle* because of the additional iron in it and the effect it had on his compass — a deviation of 10°. Marquart, *Anatomy of the ship, HMS Beagle*, p. 30.

<sup>2</sup> Ross, *Voyage*, I, p. 328.

<sup>3</sup> The Admiralty purchased its first wooden steam paddle-tug in 1832. The first steam frigate, HMS *Gorgon*, wooden hulled with two 10" and four 32 pdr. guns, was launched in Pembroke Dock in 1837. The *Great Britain*, an iron paddle-steamer of 3490 tons, was laid down in 1838. Among the first iron paddle-frigates was HMS *Birkenhead*, launched in 1843 and wrecked in Algoa Bay, South Africa, in 1852. Fanning, *Steady as she goes*, pp. 18–20, and Colledge, *Ships of the Royal Navy*.

<sup>4</sup> The Revd James Inman, *Navigation and Nautical Astronomy*, 1835, explains the use of the Mariner's compass, pp. 20–22, mentioning variation, but he makes no mention of deviation. However when it comes to observing for variation, pp. 144–53, he notes that the simplest method is actually to find the variation by observation (p. 147) [i.e. by azimuth of a heavenly body], when the ship lies on different points of the compass, at a time when this can be done most conveniently and correctly. The result may be inserted in a small table, ... from which the proper variation, to be allowed according to the course steered, may be taken by inspection. The mean of all the variations put down will be the true variation. 'p. 151. No mention is made of swinging ship as such.



## APPENDIX 11

**Collision, 13 March 1842**  
**From HMS *Terror*.**

Davis, *Letter*, pp. 26–32. On the morning of Saturday, 12th March, the wind was light, but it rapidly increased and by noon it blew very hard, and the evening set in stormy and very thick hazy weather, with a heavy sea running and pitch dark. At mid-night we passed what was thought to be an ice-blink (that is a light thrown from large masses of ice). On Sunday morning it was my messmate Moore's watch, when he thought he saw an ice-blink ahead and broad on one of our bows<sup>1</sup>. We were going nearly eight knots and had just reefed the topsails, and we were going to haul up to clear it on the other hand, but the *Erebus* made the signal to keep further off, and we bore away again, closing the blink rapidly. Moore had told the captain, who was on deck at the time, and asked him to haul up without waiting for the *Erebus*, who apparently did not see it, and we were just going to do so at 12.50 when the *Erebus* must have seen the ice ahead, but not that which was now well on our beam and which she could have weathered, and she could not have tacked in such a heavy sea, and there was no room. She must have run right on the berg, which was now dimly visible with a small darkness that looked like a gap or a small opening in it. Her destruction would have been inevitable, but Providence, by dreadful accident, averted that calamity and saved her, for, as we were both suddenly hauling to the wind on opposite tacks, we came in contact; the *Erebus* striking this ship heavily on the starboard cat-head, breaking our anchor right in two and taking the cat-head and a part of the anchor away, carrying away the flying jibboom and jibboom, the former of which broke in three places and snapped close off at the cap, and carried away the lower studding-sail boom. Her damage was much greater, losing her bowsprit close off at the bows, fore-top-mast and main-top-gallant-mast, and the whole of the cat-head and anchor. After striking several times very hard she worked further aft, our anchors being cleared. She next struck us near the gangway, she then splintered the immense strengthening pieces outside which prevented our being cut down. Our yard-arms were now striking at every roll, and broke all the booms and boom irons, which came tumbling down without hurting anyone. She then (working further aft) struck us abreast the mizen-mast several times, smashed the quarter boat, broke the ice-plank, and again shattered the strengthening pieces outside and tore off all the iron work. We then separated, she carrying away our spanker boom.

All this time we had been bodily drifting on the bergs, so that when we cleared the *Erebus* we found an enormous iceberg close under our lee. A dreadful shipwreck and death then appeared inevitable; there was no alternative but to run for the dark place we had seen before, which might be an opening, or be smashed on the face of the cliff. The helm was immediately put a-starboard, and with the assistance of the sails she answered it very well. We were immediately rushing past an enormous berg, the ship being perfectly covered with foam caused by the sea breaking against it. Every moment we were expecting the ship to strike ice right ahead. "Hard-a-port" was screamed out from forward (then indeed hope died within us); "Hard-a-port; brace round the head-yards." "Shiver the main-top-sail," cried the Captain, as if he was steering into any harbour. The men flew to the ropes, although I should think at that moment that there was not one on board but thought all hope was fled. She came round, and passed through an opening between two bergs not twice the breadth of the ship, the foam and spray dashing over us on each side as we passed. Several other alarms were given owing to the brash (small stuff washed from the bergs) looking more like bergs in the darkness, but we were safe, but did not know it. The next cry was "Where's the *Erebus*?" - our own danger had made us entirely forget her for the time. All eyes were immediately straining through the gloom to find her. We burnt a blue light, and soon after had the happiness of seeing her burn one which we immediately answered; we knew then that she was safe, which with her losses we never expected. We then lay to, anxiously waiting for daylight to find the extent of her damages. As soon as it could be distinguished she made the signal that: "All was well, and that they could repair all their damages." We answered: "Thank God, we are the same."

And now, my dearest Emily, I must if possible describe my own proceedings and feelings during that eventful hour, for it was not more than that time from our getting foul till we were safe: I was in bed, and

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<sup>1</sup> Note in original. The port bow is meant - see plan [Fig. 36].

on the sick list with my hand<sup>1</sup>. I had been awoke by the noise of reefing topsails, and lay awake listening. I knew something must be wrong, by the constant commands to the helmsman. At last some one regularly screamed out down the fore hatchway, "All hands bear a hand on deck, every one"— and immediately after came a crash. "Good God," cried I, "we are foul of an iceberg." I opened my door, to prevent its being jammed, and hurriedly put on two or three articles of dress and jumped up the hatchway, fully expecting to see the cliff of an iceberg over our heads, instead of which, just abreast the gangway were the bows of the *Erebus*, on the top of a sea, as far as the copper above our gunwale, her fore-top-mast and bowsprit gone. Down she came crash, with a shock that nearly knocked me down; our men had all rushed up half naked and were perfectly bewildered. Nothing could be done more than we had, which was to set the fore-sail and brace the head yards up. Crash, crash, again and again as she worked aft. I had gone under the ice-plank, as I expected every moment to see her fore-mast come on board us, which would have taken our mizzen-mast in its fall, and I had more protection under a heavy piece of wood than on the open deck, but, thanks be to God, a belly-stay (an extra stay to the fore-mast independent of the bowsprit) held it. Up she would stand; "Clear the ice-plank," cried a dozen voices; down she came, crash went the ice-plank, at the same time the boat was cut in two as if with an immense hatchet. "Thank God, she is clear," cried I, as she passed under our stern, snapping our spanker-boom in two as if it had been straw.

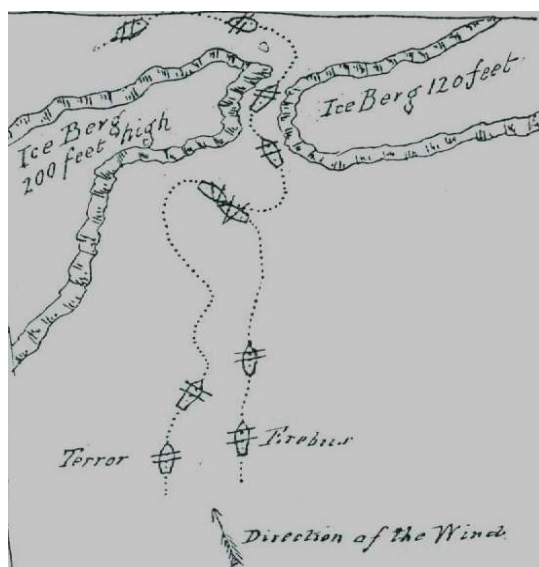


Fig. 36. Diagram of collision from Davis, *Letter*, p. 33.

But my joy was of short continuance, for no sooner were we clear of the *Erebus* than we had this immense berg under our lee, and so close that we already appeared to be in the foam. My thoughts from this time till we were through the passage were agonising. I believe myself to be no coward; I have often been in danger, and perhaps have had more than my share of it, but never till those moments did I in reality know what fear was ... I wonder now I did not lose my self-possession; but no, perhaps it was from example that I did not, but I repeated the orders and got what was necessary done more coolly in appearance than I felt. The Captain himself, when it was all over, said that he had not the slightest idea what he did during the time or how we got through. The men on the whole behaved very well throughout; only one was running about out of his senses, but two or three were crying.... That time will never be effaced from my memory. After daylight, and we had signaled with the *Erebus*, I went to my cabin; and never did a sinner offer up to the throne of the Almighty more sincere thanks for the reprieve granted to us, through His almighty mercy ...'

Anonymous letter from Berkeley Sound, [from on board *Terror*] in *The Athenaeum*, 4 March 1843. On the night of the 12th, or rather the morning of the 13th, for it was a little after midnight, the night being

<sup>1</sup> A jug of boiling water had spilled over Davis's hand on 11 February which, he said, raised a delightful blister.

pitch dark and stormy, with a heavy sea, running in latitude 60E, we were running east, wind nearly aft, when suddenly we found ourselves close to a chain of large icebergs, and in hauling up to clear them, (each ship doing so on opposite tacks) [*Erebus* was on the starboard beam of *Terror*, and the ships turned inwards towards each other] we came into unavoidable (and, as it proved to be, fortunate) contact, striking very violently; our starboard bows met. This ship carried away jib-boom, cat-head, anchor, yard-arms, booms, and a boat, &c.; but the loss experienced by the *Erebus* was much greater; her bowsprit close off to the bows, fore-topmast, car-head, anchor, and a number of small spars. Nothing but the extraordinary strength of the ships prevented our being cut down to the water's edge; as it was, she smashed our strengthening pieces outside, and her bulwarks forward were cut down to the deck. All the time we were foul we were helplessly drifting towards the icebergs, and we thought we were inevitably lost; but on the ships clearing, we saw one part of the bergs darker than the rest, and, fortunately, it was an opening. Immediately after clearing the ship, we were rushing close past an immense berg, and passed through an opening between two not more than twice the breadth of the ship, the foam caused by the sea against them breaking over us on each side. I have neither the time nor inclination to dwell on the events of that dreadful night; even now it makes me shudder to think of it, but some day, please God, through whose merciful interposition we were saved, I will give you an account when sitting over the fireside.

### **From HMS *Erebus*.**

Ross. *Voyage*. pp. 217-9. On the afternoon of the 12th, however, several [icebergs] were seen during thick weather, and whilst we were running, under all the sail we could carry, to a strong north westerly breeze. In the evening the wind increased so much, and the snow showers became so incessant, that we were obliged to proceed under more moderate sail. Numerous small pieces of ice were also met with, warning us of the presence of bergs, concealed by the thickly falling snow: before midnight I directed the topsails to be close-reefed, and every arrangement made for rounding to until daylight, deeming it too hazardous to run any longer: our people had hardly completed these operations when a large berg was seen ahead, and quite close to us; the ship was immediately hauled to the wind on the port tack, with the expectation of being able to weather it; but just at this moment the *Terror* was observed running down upon us, under her top-sails and foresail; and as it was impossible for her to clear both the berg and the *Erebus*, collision was inevitable. We instantly hove all aback to diminish the violence of the shock; but the concussion when she struck us was such as to throw almost every one off his feet; our bowsprit, fore-topmast and other smaller spars, were carried away; and the ships hanging together, entangled by their rigging, and dashing against each other with fearful violence, were falling down upon the weather face of the lofty berg under our lee, against which the waves were breaking and foaming to near the summit of its perpendicular cliffs. Sometimes she rose high above us, almost exposing her keel to view, and again descended as we in our turn rose to the top of the wave, threatening to bury her beneath us, whilst the crashing of the breaking upperworks and boats increased the horror of the scene. Providentially they gradually forged past each other, and separated before we drifted down amongst the foaming breakers, and we had the gratification of seeing her clear the end of the berg, and of feeling that she was safe. But she left us completely disabled; the wreck of the spars so encumbered the lower yards, that we were unable to make sail, so as to get headway on the ship; nor had we room to wear round, being by this time so close to the berg that the waves, when they struck against it, threw back their spray into the ship. The only way left to us to extricate ourselves from this awful and appalling situation was by resorting to the hazardous expedient of a stern-board, which nothing could justify during such a gale and with so high a sea running, but to avert the danger which every moment threatened us of being dashed to pieces. The heavy rolling of the vessel, and the probability of the masts giving way each time the lower yards struck against the cliffs, which were towering high above our mast-heads, rendered it a service of extreme danger to loose the main-sail; but no sooner was the order given, than the daring spirit of the British seaman manifested itself - the men ran up the rigging with as much alacrity as on any ordinary occasion; and although more than once driven off the yard, after a short time succeeded in loosing the sail. Amidst the roar of the wind and sea, it was difficult both to hear and to execute the orders that were given, so that it was three quarters of an hour before we could get the yards braced by, the maintack hauled on board sharp aback - an expedient that perhaps had never before been resorted to by seamen in such weather: but it had the desired effect; the ship gathered stern-way, plunging her stern into the sea, washing away the gig and quarter boats,

and with her lower yard-arms scraping the rugged face of the berg, we in a few minutes reached its western termination; the "under tow," as it is called, or the reaction of the water from its vertical cliffs, alone preventing us being driven to atoms against it. No sooner had we cleared it, than another was seen directly astern of us, against which we were running; and the difficulty now was to get the ship's head turned round and pointed fairly through between the two bergs, the breadth of the intervening space not exceeding three times her own breadth; this, however, we happily accomplished; and in a few minutes after getting before the wind, she dashed through the narrow channel, between two perpendicular walls of ice, and the foaming breakers which stretched across it, and the next moment we were in smooth water under its lee.

The *Terror*'s light was immediately seen and answered; she had rounded to, waiting for us, and the painful state of suspense her people must have endured as to our fate could not have been much less than our own; for the necessity of constant and energetic action to meet the momentarily varying circumstances of our situation, left us no time to reflect on our imminent danger.'

M<sup>c</sup>Cormick, *Voyages of Discovery*. pp. 274-7. 'A few minutes after I had turned in, and not long after the first watch had been relieved by the middle one, about one o'clock in the morning, I heard an unusual stir on deck over my head. The hurried tread of the watch at once suggested to my mind that something was going wrong; and, whilst listening in doubt as to the cause, the voice of the officer of the watch calling down the main hatch to "Turn up all hands," became very audible. It now at once occurred to me that we were about running into an iceberg, as they had been far too numerous of late in our course to render such a catastrophe at all unlikely. After hurrying on only a portion of my clothes, I had just reached the top of the companion-ladder to the quarter-deck, when I was all but hurled to the bottom of it by a shock we received, not from an iceberg, indeed, but from our consort the *Terror* falling across our bows.

On my gaining the deck what a scene met the eye! First, the massive hull of the *Terror* surging heavily in the swell on our starboard-bow, carrying away our bowsprit, and with it the fore-topmast; whilst above all, towered through the mist of a dark, gloomy night, the stupendous form of an enormous iceberg, whose perpendicular adamantine sides loomed in terrific grandeur high above our mast-heads, and threatened both ships with instant destruction, our own more especially, from the tangled wreck of spars, sails, and rigging hampering us forward, which for the moment rendered our position a most helpless one; a moment of one's life, indeed never to be forgotten, as the two ships' sides were furiously grinding against each other in the heavy sea that was running, blowing as it did, at the time, a hard gale of wind.

Our consort, as she rose above the surging swell, showed her bright copper sheathing, and the greater portion of her keel, above our gunwale; at one moment appearing as if her massive hull itself would come on board of us, and the next moment, in her descent, as we surged upwards, both hulls met together in fearful collision, but most fortunately in the encounter the yards of the ships escaped entanglement. The *Terror*, having received no injury to her spars and rigging, when her sails filled shot ahead, and, by way of a parting farewell, bounced her heavy stern into our starboard quarter-boat, crushing it like a nutshell, as she disappeared in the surrounding darkness and gloom, like a phantom of ill.

No sooner had we got clear of one danger than we were approaching another, of a far more threatening character. With all our head-sails a cumbrous wreck, we were fast closing in with the berg, its lofty, over-hanging crest, frowning destruction, as it loomed over the very trucks of our mast-head, and the ship drifting within the surf so angrily, surging around its hard-washed base. ... At such a perilous crisis a captain's position is assuredly not one to be envied, the responsibility is an awful one. We had no room to wear ship, the only alternative was making a stern-board, a hazardous one, in the sea that was running, and justifiable only by the circumstances of our position. However, Captain Ross was quite equal to the emergency, and folding his arms across his breast, as he stood like a statue on the afterpart of the quarter-deck, calmly gave the order to loose the main-sail. His whole bearing, whilst lacking nothing in firmness, yet betrayed both in the expression of his countenance and attitude, the all-but despair with which he anxiously watched the result of this last and only expedient left to us in the awful position we were placed in. This feeling, I believe, pervaded all; as but for the howling of the winds, and the turmoil of the roaring waters, the falling of a pin might have been heard on the *Erebus*'s deck, so silent and awestruck stood our fine crew in groups around, awaiting the result. So sudden was the collision that there was scant time for dressing, and an officer might have been seen clinging to the capstan in his nightshirt only.

I had myself seen much service in our old class of corvettes, very deep-waisted ships, frequently

over-masted, with a great spread of canvas, rendering them very ticklish craft to wear in a heavy sea, from their decks holding so much water between high bulwarks, should they get too much sternway on them. I fully realized all the perils of the manoeuvre of a stern-board in such a sea as this, with the addition of another element of danger, icebergs, in our drift; so that when the order was given to loose the main-sail, instinctively alive to our dangerous position, I flew to the main-tack, being the first to lay hold of it, followed by a lot of fine fellows, by whom it was hauled sharp a-back with a will. The good old ship soon gathered sternway, and, as Fenimore Cooper humorously has it in the 'Red Rover,' began "ploughing the waves with her taffrail," meantime brushing the sides of the berg with our lower yard-arms till we reached its western extremity.

Here we encountered another large berg, lying athwart the course of our drift, and on which we were dropping; and we had to get the ship's head round as well as we could, by means of the after-sails still available. Our situation now became a very critical one, with the loom of a third berg on the other side of us. At this moment, as I was looking aft, I saw our ice-mast, Abernethy - one of the most experienced icemen of our day, who had been in the old *Hecla* with me in Parry's attempt to reach the North Pole, ever vigilant and on the watch - extended full length on the ice-plank, with his gaze intently fixed on the berg, when suddenly he reported to Captain Ross an opening between the two bergs, through which we were soon running before the wind, Providence thus directing our course through this narrow surf-beaten strait, little wider than our own ship's length, none too soon before the meeting of the two bergs, which were rapidly approaching each other. As it was we passed so close to the vertical sides of the bergs that the foam and spray I felt rebound in my face, with such force as nearly to arrest the act of breathing when looking over the quarter,

Having run the gauntlet between these two giant bergs we emerged in the open sea beyond, and through the murky gloom of night, the *Terror*'s light, all at once, burst upon us at some distance ahead, hove-to under the lee of a berg. '

Account written by C. J. Sullivan, blacksmith on board HMS *Erebus*, for James Savage, sailor on board HMS *Erebus*. SPRI MS 367/22. (The initial part of this account, the first voyage to the south when Victoria Land was discovered, was written by Sullivan himself before Savage joined the expedition, the latter part, including the account of the collision itself may have been dictated by Savage, since on the second Antarctic voyage, he says on Decbr. 16<sup>th</sup> [1841] I saw the first ice Berge i ever Saw in my life no Small Sight 150 feet above the level of the Sea a Splendid sight to behold. )

Sunday Morning March 13<sup>th</sup> 1842 we Escaped through Providence one of the most frightful cases of Ship Wreckd. that Ever occurred on the high Seas. At one oclock a.m. we were in Company with the *Terror*. She was running into One ice Island and we in another under Close Reefed top Sails.

It was blowing a gale of wind at this time the watch was on the fore yard taking in the last Reef the night was Exceedingly dark we Could Scarcely See a hundred yards off. When Low we were Running into a Cluster of Ice islands at the rate of 7 Knots per hour. Poor James Angelie Since Drowned Cried out from the fore yard an Iceberg ahead.

The Mournful Cry on deck was General all hands all hands Soon Brought our naked tars on Deck. Before they Could all get on Deck Both Ships Struck with Such force we thought all was over.

When we reached the Deck the Awful Catastrophe presented to our View Shocking to Relate The *Terror* to Avoid instant danger put her helm hard a port we our helm hard a Starboard. All this Occurred in the Space of one minute the *Terror* had more way And, Canvas than we had the *Terror* was trying to Gow to Leeward of the *Erebus* but the ice berg would not moove out of the way. The officers in command was Actually Stupefied what to do at this perilous moment they did not know For if they hit against the berg they would Certainly be lost to avoid Either the berg or the *Erebus* was impossible.

Now the dreadful and memorable Scene took place. After the first Stroke a heavy Sea Elevated the *Terror* with our Bow Sprit Entangled a Cross her bows the bow Sprit was Snapped to atoms Fore top mast soon follow<sup>d</sup> fore top mast booms yards stays and every gear connected with the Ships fore castle was torn away at this time we expected the *Terror* would sink but she rose the victor to despute the conquest from this time out we were the sufferers the bow sprit carrying away Saved our lives five minutes longer would do the job but God decreed it not.

The *Terror* was at this time next the ice berg crackling along. She broke away our bower anchor And with the Elevating Sea the *Terror* was inclining towards us. But before the anchor could get clear Both Ships

Struck with Such force as to bury the anchor in our Starboard Side. we carried it for the Distance of 700 miles through a heavy Sea. Such my friend must be the Effect So terrible a Collision a weighty Stroke 4000 tons. My friend the next wave Lifted the Terror above our Main Top mast.

The most awful and Tremendous Sight we See yet at this moment we poor pilgrims of the Ocean thought it was our last in this Life. Some uttered a feint Shriek through instant Surprize. But the Almighty God helped our Sinking Spirits when we thought we would have a Dreadful Stroke from her. Like a Shot from a gun She made a lep a Stern and the next Sea Carried her Quite Clear of us.

If Both Ships was forty Seconds Longer in contact They would Gow down together and no Person would Live to tell the tale but God decreed our Separation.

When the Terror had Got clear of us then we had another Great danger to Encounter we were no more than Eight yards from the iceberg. Tremendous Sight to See we could distinctly discern the top of the berg. But a bluff projecting Summit far above our mast head. A heavy Sea pitched us against it at this Thom<sup>s</sup> Abernethy the Gunner was on the ice plank he Cried out a Loud Back the main yard it was instantly done the Ship heeled a little the wind caught the main top Sail and with the draw Back of a heavy Ebbing Sea with Gods help we Got clear off with every succeeding wave.

After a Little time we discover<sup>d</sup> we were in a cluster of ice islands. To help Revive Spirits The Carpenter announced the pomps to be free and clear. all went on well, by this time began to bestow a thought on the Terror. For actually we thought when she Leaped astern in her confusion and She having a Deal of Sail on that She hit Some of the bergs and went down. our Consorts Crew were more alarmed about our fate For they thought we were Gone and no Certainty of Escape. But Stop a Little before day Light we hoisted a blue Light immediately the Terror answered Judge my Friends our Feelings at Both Sides. God Almighty My friends alone that Saved us from a miserable death 3000 miles from any land.

At Four oclock the day began to dawn the happiest Sight we any of us ever welcomed its now with open day Light we Could we could See the Eminent and awful Danger we we[re] placed in a Little before with a good resolution all hands Set to work to clear away the Wreck the Sun Shone Beautiful the day was calm but the Sea run high we had fine weather for a week Thursday Evening we had a jury bow Sprit rigged fore top and Gallant masts and yards and all the Wreck well Supplied for rounding the Tempestuous Cape horn we Lost a man rounding the horn in the gale of wind and the 6<sup>th</sup>. of April we Cast Anchor at Port Louis Barkleys Sound Faulkland islands South America.

If our Ships were Merchantmen this Scribbled Description i give of our Miraculous Escape would never reach Great Britain But thanks to our noble Strong Barks they done their duty.

## BIBLIOGRAPHY

Admiralty, *Additional Instructions relating to Books and Accounts*, London, 1813.

Admiralty, *Instructions relating to His Majesty 's Service at Sea*, London, 1833.

Admiralty, *Regulations for His Majesty 's Service at Sea*, London, 1824 & 1833.

Anonymous, Letter from Berkeley Sound, dated July 31sr 1842, *Athenaeum*, 4 March 1843.

*An Act for amending, explaining and reducing into one Act of Parliament, the Laws relating to the Government of His Majesty 's Ships, Vessels and Forces by Sea*, 22E Geo II c.33 (1749).

*An act to explain and amend an act, made in the twenty-second year of the reign of his late Majesty King George the second, intituled, An Act for amending, explaining and reducing into one Act of Parliament, the Laws relating to the Government of His Majesty 's Ships, Vessels and Forces by Sea*. 19 Geo. III. cap.17 (1779).

Answer to some Magnetical Inquiries, *Philosophical Transactions* — - Royal Society , Vol. 2, pp. 478-9, 1667.

*Antarctic Pilot, The*, 4th Edn., Hydrographer of the Navy, 1974.

Armstrong, Terence., Roberts, Brian and Swithinbank, Charles, *Illustrated Glossary of Snow and Ice*, Cambridge, 1969.

Back, George, Captain R.N., *Narrative of an expedition in H.M.S. TERROR ... on the Artic Shores in the years 1836-7*, London, 1838.

Back, George, 'A Brief Narrative of the recent Voyage of H.M.S. Terror ', *Geographical Journal*, Vol. 7,

- 1837, pp. 457–60.
- Bailey, Alfred M. and Sorensen, J. H., *Subantarctic Campbell Island*, Denver, 1962.
- Barlow, William, *The Navigators Sypply. &c.*, G. Bishop, R. Newbery & R. Barker, 1597.
- Beaglehole, J. C., ed., *The Journals of Captain James Cook on his Voyages of Discovery*, 3 vols in 4, Hakluyt Society extra series, Cambridge, 1955–67.
- Belcher, Sir Edward, *Narrative of the Voyage of H.M.S. SAMARANG, during the years 1843–46, employed surveying the islands of the Eastern Archipelago*, 2 vols, London, 1848.
- Bilcliffe, John, *Irreproachable Character – The award of the Royal Marines Meritorious Service Medal*, Chippenham, 2005.
- Bromley J. S., ed., *The Manning of the Royal Navy – Selected Public Pamphlets 1693–1873*, Navy Record Society, Vol 119, London, 1974.
- Burney, James. *A Chronological History of the Voyages and Discoveries in the South Sea or Pacific Ocean*, 5 vols, London 1803–17, reprint Amsterdam, 1967.
- Campbell, R. J., 'The date of birth of Captain F. R. M. Crozier, R.N. ', *Polar Record*, vol. 45, no. 232, pp. 83–4, Cambridge, 2009.
- Campbell, R. J., ed., *The Discovery of the South Shetland Islands &c.* Hakluyt Society, 3rd ser. 4. London, 2000.
- Catton, John, 'An Attempt to account for the regular diurnal Variation of the horizontal magnetic Needle; also for its irregular Variation at the Time of an Aurora Borealis ', *Philosophical Transactions, Royal Society*, vol. 51, pp. 398–455, London, 1759.
- Cawood, John, 'The Magnetic Crusade: Science and Politics in Early Victorian Britain ', *Isis*, vol. 70, 1979, pp. 493–518.
- Cawood, John, 'Terrestrial Magnetism and the Development of International Collaboration in the Early Nineteenth Century ', *Isis*, vol. 34, 1977, pp. 551–87.
- Colledge, J. J., *Ships of the Royal Navy*, London, 1987.
- Cook, James, *A Voyage towards the South Pole and Round the World, performed in His Majesty's Ships the Resolution and Adventure, In the years 1772, 1773, 1774, and 1775*, London, 1777.
- Cyrax, Richard, J., *Sir John Franklin's last Arctic Expedition*, London, 1939.
- Davis, J. E., *A letter from the Antarctic*, London, 1901.
- 'Directions for Observations and Experiments to be made by Masters of Ships, Pilots, and other fit Persons in their Sea-Voyages ', *Philosophical Transactions - Royal Society*, vol. 2, pp. 433–48, London, 1667.
- 'Directions for Sea-men, bound for far voyages ', *Philosophical Transactions - Royal Society*, vol. 1, pp. 140–3, London, 1667.
- Douglas-Morris, Kenneth, *The Naval Long Service Medals*, London, 1991.
- Duyker, Edward, *An Officer of the Blue, Marc-Joseph Marion Dufresne, South Sea Explorer, 1724–1772*, Melbourne, 1994.
- Fanning, A. E., *Steady as she goes, A History of the Compass Department of the Admiralty*, London, 1986.
- Fara, Patricia, *Sympathetic Attractions, Magnetic Practices, Beliefs, and Symbolism in Eighteenth-century England*, Princetown, 1996.
- Flinders, Matthew, 'Concerning the Differences in the magnetic Needle, on Board the Investigator, arising from the Alteration in the Direction of the Ship's Head ', *Philosophical Transactions - Royal Society*, vol. 95, pp. 186–197, London, 1805.
- Fluhmann, May, *Second in Command*, Government of Northwest Territories, 1976.
- Fordyce, Lieut. Alex. Dingwall, R.N., *Outlines of Naval Routine*, London, 1837.
- Gellibrand, Henry, *A Discoverse Mathematical on the Variationm of the Magneticall Needle. &c.*, London, 1635.
- Gray, George Robert, 'Birds ', in Richardson and Gray, *The Zoology of the Voyage of H.M.S. EREBUS and TERROR ...*, London, 1846–75.
- Hadoram Shirihai, *The Complete Guide to Antarctic Wildlife*, Princetown & Oxford, 2002.
- Halley, Edmond, 'A Theory of the Variation of the Magnetic Compass ', *Philosophical Transactions - Royal Society*, vol. 13, pp. 208–21, London, 1683.
- Halley, Edmond, 'An Account of the cause of the Change of the Variation of the Magnetical Needle &c. ',

- Philosophical Transactions - Royal Society*, vol. 17, pp. 563–78, London, 1692.
- Harland, John, *Seamanship in the Age of Sail*, London, 1984.
- Hattersley-Smith, G., *A History of Place-Names in the British Antarctic Territory*, Cambridge, 1991.
- Headland, Robert K., *Chronological List of Antarctic Expeditions and Related Historical Events*, Cambridge, 1989.
- Herschel, Sir John F. W., Bart., (ed.) *A Manual of Scientific Enquiry*, London, 1849.
- Hooker, Joseph Dalton, *The Botany The Antarctic Voyage of H.M. Discovery Ships Erebus and Terror in the years 1839-1843 ...* 3 vols and 1 vol. plates, London, 1847–60, reprint Codicot and New York, 1963.
- Hooker, William Jackson, Notes on the Botany of H.M. Discovery Ships, Erebus and Terror in the Antarctic Voyage; with some account of the Tussac Grass of the Falkland Islands, by W.J.H. ', *London Journal of Botany*, vol. 5, pp. 247–329, London, 1843.
- Hunter Christie, S., Report on the State of our Knowledge respecting the Magnetism of the Earth ', *Report of the Third Meeting of the British Association for the Advancement of Science, held at Cambridge in 1833*, pp. 105–30, London, 1834.
- Inman, Rev. James, *Navigation and Nautical Astronomy for the use of British Seamen*, 3rd edn, London, 1835.
- Knight, Gowin, 'A Description of a Mariner's Compass contrived by Gowin Knight, M.B., F.R.S ', *Philosophical Transactions - Royal Society*, vol. 46, pp. 505–12, 1750.
- Laing, E. A. M., The Introduction of Canned Food into the Royal Navy 1811-52 ', *Mariner's Mirror*, vol. 50, pp. 146–8, London, 1964.
- Lyon, David, *The Sailing Navy List*, London, 1993.
- Marquardt, Karl Heinz, *Anatomy of the Ship, HMS Beagle*, London, 1997
- May, W.E., *A History of Navigation*, Henley-on-Thames, 1973.
- Maydman, Henry, *Naval Speculations and Maritime Politicks, being a ... brief discourse of the Royal Navy of England, &c.*, London, 1691.
- M'Cormack, Deputy Inspector-General R., *Voyages of Discovery in the Arctic and Antarctic Seas and Round the World ...*, 2 vols, London, 1884.
- McInnes, Ian, *The Yeomen of the Guard including the Body of Yeoman Warders H, M. Tower of London, members of the Sovereign's Body Guard (Extraordinary), 1823-1903*, Oldham, 2002.
- McPherron, Robert, L., 'The magnetic field of the Earth ', *Encyclopaedia Britannica*, 15th edn, vol. 17, pp. 581–94. 1998 printing.
- Morrell, Jack and Thackray, Arnold, *Gentlemen of Science, Early years of the British Association for the Advancement of Science*, Oxford, 1981.
- Mosley, Charles, (Ed.), *Burke's Peerage &c.* 107th edn, Wilmington, 2003.
- Nautical Magazine and Naval Chronicle*, 1840.
- Nordenskjöld, Otto, *Antarctica*, London & New York, 1905.
- O Byrne, William R., *A Naval Biographical Dictionary*, 1849, reprinted Polstead, 1990.
- Oxford Dictionary of National Biography*, Oxford, 2004.
- Parry, William Edward, *Journal of a Voyage for the Discovery of a North-west Passage .. in His Majesty's Ships Hecla and Gripper &c.*, London, 1821.
- Parry, William Edward, *Journal of a second Voyage for the Discovery of a North-west Passage from the Atlantic to the Pacific; performed in the years 1821-22-23, in His Majesty's Ships Fury and Hecla &c.*, London, 1824.
- Pringle, Sir John, *A Discourse upon some late improvements of the means for Preserving the Health of Mariners, delivered at the anniversary meeting of the Royal Society, Nov. 30, 1776*, London, 1776.
- Raleigh, Sir Walter, 'The First Invention of Shipping ', in *Judicious and Select Essayes*, London, 1650.
- Report of the President and Council of the Royal Society on the Instructions to be prepared for the Scientific Expedition to The Antarctic Regions*, London, 1839.
- Report of the First and Second Meetings of the British Association for the Advancement of Science; at York in 1831 and Oxford in 1832*, London, 1833.
- Report of the Third Meeting of the British Association for the Advancement of Science; held at Cambridge in 1833*, London, 1834.



- Report of the Fifth Meeting of the British Association for the Advancement of Science; held at Dublin in 1835*, London, 1836.
- Report of the Eighth Meeting of the British Association for the Advancement of Science; held at Newcastle in August 1838*, London, 1839.
- Report of the Ninth Meeting of the British Association for the Advancement of Science; held at Birmingham in August 1839*, London, 1840.
- Return to an Address of the Honourable The House of Commons dated 26 August 1841 - for, Copies of such Extracts from the Despatch of Captain James Ross from Van Diemen's Land etc. ...*, London, 1841.
- Rice, Tony, *British Oceanographic Vessels, 1800–1950*, London, 1986.
- Richardson, John and Gray, John Edward, *The Zoology of the Voyage of H.M.S. EREBUS and TERROR under the command of Captain Sir James Clark Ross, RN., FRS., 1839 to 1843*, London, 1846 to 1875.
- Riffenburgh, Beau (ed), *Encyclopedia of the Antarctic*, Abingdon, 2007.
- Roberts, Brian, (ed), *Edward Wilson 's Birds of the Antarctic*, London, 1967.
- Robertson, J., 'A few General Remarks on the Antarctic Continent, discovered by Captains Ross and Crozier', *Tasmanian Journal of Natural Science*, vol. 2, pp. 42–55, 1843.
- Rosove, Michael H., *Antarctica, 1772-1922. Freestanding Publications through 1999*, Santa Monica, 2001.
- Ross, Sir John, *Narrative of a Second Voyage in search of a North-west Passage, and of a residence in the Arctic Regions during the years 1829, 1830, 1831, 1832, 1833*, London, 1835.
- Ross, Sir James Clark, *A Voyage of Discovery and Research in the Southern and Antarctic Regions during the years 1839-43*, 2 vols, London, 1847.
- Ross, M. J., *Ross in the Antarctic*, Whitby, 1982.
- Scott, Robert Falcon, *Voyage of the Discovery*, 2 vols, London, 1905.
- Scott, Sir Walter, *The Talisman* (First published as *Tales of the Crusaders [The Betrothed and The Talisman]* by the author of "Waverly" etc., [Edinburgh, 1819], 1825) London, 1894.
- Sharp, Andrew, *The Journal of Jacob Roggeveen*, Oxford, 1970.
- Smith, Michael, *Captain Francis Crozier, Last man Standing?*, Cork, 2006.
- Smyth, Admiral W. H., *The Sailor 's Word-Book*, London, 1867.
- Some Observations about Load-stones, and Sea Compasses', *Philosophical Transactions - Royal Society*, vol. 26, pp. 413–4, London, 1667.
- Taylor, E. G. R., (ed), *A Regiment for the Sea and other writings on Navigation*, Hakluyt Society, 2nd ser. 121, Cambridge, 1963.
- Taylor, E. G. R., *The Haven-finding Art*, London, 1956.
- Thrower, Norman, J. W., (ed), *The Three Voyages of Edmond Halley in the Paramore, 1698–1701*, 2 vols. Hakluyt Society, 2nd. ser. 156 & 157, London, 1981.
- Tibbetts, G. R., *Arab Navigation in the Indian Ocean before the coming of the Portuguese*, London, 1981.
- Waters, David W., *The Art of Navigation in England in Elizabethan and Early Stuart Times*, London, 1958.
- Weddell, James, *A Voyage towards the South Pole &c.*, 2<sup>nd</sup> edn, London, 1827.
- Woodward, Sir Llewellyn, *The Age of Reform 1815–1870*, Oxford History of England, 2<sup>nd</sup> edn, Oxford, 1962.